CHRISTOPHER P. WILLIAMS ARCHITECTS, PLLC
PO Box 703 · Meredith, New Hampshire 03253 · 603-279-6513

Historic Building Assessment with Preservation Guidelines

New England Masonic Charitable Institute
(Historic Effingham Town Hall / Effingham Public Library)

May 2, 2019

Norman E. Larson, AIA, LEED AP
with Mae Williams, Architectural Historian

This report was funded, in part, by a grant from the New Hampshire Preservation Alliance with funding from the N.H. Land and Community Heritage Investment Program (LCHIP).

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Introduction

The purpose of this document is to assist the Town of Effingham to evaluate the existing conditions of the Historic Effingham Town Hall, which was originally built as the New England Masonic Charitable Institute and now houses the Effingham Public Library on the First Floor and the Charter Oak Masonic Lodge on the Second Floor. The building is located in the village of Center Effingham on Town House Road near the intersection of Corner Road. The building was built in 1858 by the members of the Charter Oak Lodge No. 58, a chartered lodge of the New Hampshire Free and Accepted Masons. It served as a private school with a dedicated Masonic Hall and anterooms on the second floor. The building was transferred to the Town of Effingham for $1 in 1891 following the closure of the school, for use as the town's Town Hall, the Mason's retaining a perpetual right to use the second floor. The Effingham Public Library made the building it's home in 1893 and shared the first floor with the town offices until 2005 when the town offices were relocated out of the building. The Library now occupies the entire main floor. It is the intent of the Town of Effingham that the building should continue to serve its current purpose, and to that end, this report will endeavor to make recommendation for a phased set of work to repair, maintain, and perhaps improve the building to serve the town library and the Masons far into the future

First inspections of the building took place in August of 2018 by Mae Williams, Preservation Consultant, of Unlocking History.com of Center Harbor NH and in on September 19th of 2018, by Norman E. Larson, AIA , of Christopher P. Williams, Architects of Meredith. Visual inspection of the building's exterior and interior materials, features, and conditions were noted and photographed. Investigative work on the history of the building continued into the fall and winter with Norman re-visiting the site October 5th and conducting a tour of the building with Ben Brungraber, PE of Fire Tower Engineered Timber of Providence. The conclusions of the Structural Engineer are incorporated into this report and the full report of Fire Tower Engineered Timber, Inc. is included in the appendix of this study. Mae returned to the site twice in November and on December 19th, Norman met with a large group of Effingham residents representing the Selectboard, the Library, the Effingham Preservation Society, and Effingham Connect to review preliminary findings. Mae made a final visit to the site in January 2019. Phasing priorities of the community were explored by the community in the spring and subjected to a vote at the town meeting of March 12, 2019, where a small working budget for the first repair projects was affirmed by the community.

The two and a half story, three bay by five bay Historic Effingham Town Hall / New England Masonic Charitable Institute sits on a hill with a two and a half story centered gable entry supporting a three stage tower on the southeastern façade. The building is a excellent example of the Italianate style with wide, double-bracketed denticulated eaves and rakes, quoins at the building corners, bracketed and pedimented crowns over the windows, and ornately hooded double entry doors. The building and its ornate square tower and octagonal belfry seem all the larger because of their placement on the hillside above the village. The timber-framed hall is finished in wood clapboards and rests on a granite post foundation infilled with brick masonry. The interior three-classroom main floor with central hall and entry vestibule have undergone some subdivision, but the molded casings remain visible in all of the rooms. A suspended ceiling throughout hides the original ceilings. On the second floor, the Charter Oak Lodge maintains a significant lodge space which includes masterfully painted trompe l'oeil murals depicting heavily molded paneled walls and ceiling with literal and figurative images meaningful to the masons, all painted in distemper paints on the actually flat plaster finishes to "fool the eye". The third floor is an open space under the

gabled roof with pairs of windows at the ends of the long room and facing the front of the building underneath the tower.

The NE Masonic Charitable Institute is a significant historical building in the state of New Hampshire and is currently in the process of being listed to the National Register of Historic Places. Constructed as the first and seemingly the only Masonic academy in the United States, the building retains its original Masonic Hall and anterooms on the second floor while the classrooms on the main level have served several uses since the school's closing in ca. 1880. The main level of the building is now serving as the town of Effingham's Public Library, following more than a century as the Town Hall. Previous renovations to the building have been limited, and generally additive in nature such that the original organization and finishes remain in place. The recommendations of this report beyond the scope of repair and maintenance are made in conformance with the Standards of Rehabilitation, one of four approaches to the treatment of historic properties outlined by the U.S. Secretary of the Interior. This standard, according to the NPS.gov website, "acknowledges the need to alter or add to a historic property to meet continuing or changing uses while retaining the property's historic character." The Standards for Rehabilitation "are applied to projects in a reasonable manner, taking into consideration economic and technical feasibility." The building is subject to the requirements of the American's with Disabilities Act and the NFPA Life Safety Code. Any modification would need to meet the requirements of the International Existing Building Code, a component of the New Hampshire State Building Code.

History and Development of the NE Masonic Charitable Institute *by Mae Williams*

The New England Masonic Charitable Institute in Effingham, New Hampshire was constructed in 1858. The building was built as a combination Masonic Lodge for the Charter Oak Lodge No. 58 and private academy. Between 1861 and ca. 1882, the building served as the New England Masonic Charitable Institute, the only private school in America known to be run by the Masons. After the Masonic Institute closed, the building was purchased by the Town of Effingham, and the Masons were given life-rights to the second floor so that they could continue to use their lodge. The first floor was renovated to create a Town Hall, town offices, and in 1893 a space for the Effingham Public Library. In 2005, the town offices moved out of the building, and the entire first floor has since been occupied by the Library.

Early History of Effingham (Bef. 1855)

The area that makes up the present Town of Effingham was first mentioned in 1749 at the house of Sarah Priest in Portsmouth.[1] Six square miles of land was granted by the Masonian Proprietors on June 28, 1749 to Nathaniel Gookin, Thomas Marston, Capt. John Leavitt, Thomas Parsons, Col. Abraham Drake, and seventy-three others under the name "**Leavitt's Town**" after Capt. Leavitt.[2]

[1] Georgia Drew Merrill, ed, *History of Carroll County, New Hampshire* (Boston: W. A. Fergusson & Co., 1889), 532.

[2] Effingham Historical Society, "Chronology of the Town of Effingham" (1955), 1; and State of New Hampshire, *Manual for the General Court* 1893, No. 3 (Concord: Ira C. Evans, Public Printer, 1893), 29. An addition was granted to the original territory on December 20, 1749.

On August 26, 1761, the proprietors met at John Leavitt's Inn in North Hampton[3] and voted to have Daniel Sanborn lay out the town with the assistance of five associated men. The men began to lay out lines in the first division of Leavitt's Town in October. In April of 1762, they laid out the second division.[4]

Even after the land was surveyed, Leavitt's Town remained an unknown and uncolonized wilderness area with no roads to the inland territories north of Wakefield (which was, at the time, called East Town). On September 27, 1762, it was voted at a proprietor's meeting in North Hampton to have **Col. Abraham Drake** (1715-1781) and Daniel Sanborn cut a road to the center of Leavitt's Town from Dover and Rochester.[5] That year a trail was blazed north from Wakefield through Ossipee Pocket to Leavitt Hill and what would become Drake's Corner (now Center Effingham), north to what would become Lord's Hill, and north to the Ossipee River.[6] This trail would eventually be laid out as a road in 1772, along the general path of what is now NH Route 153.

Leavitt's Town was not settled until shortly after the French and Indian War, and the earliest settler is said to have been **James C. Dearborn**. Dearborn came to the area from Stratham in 1768 and settled near the Hobbs Farm on what is now Hobbs Road.[7]

The Drake Family continued to be influential in the development of Effingham and the ultimate formation of the New England Masonic Charitable Institute. Two years later, in 1770, Col. Drake's eldest son **Weare Drake** (1738[8]-aft. 1810[9]) settled on a hill along the Province Lake Road, at what would become Drake's Corner or Drakesville (later Center Effingham).[10] In 1760, Drake had married Anna Taylor (1741-1811), and by the time they moved to Leavitt's Town they already had five children, all of whom were born in North Hampton.[11]

At approximately the same time as Weare Drake settled at what would become Center Effingham, settlement also began further north along the Province Lake Road at the intersection with several range roads. This second settlement became Lord's Hill.

The population of Leavitt's Town remained low during this early settlement period (Figure 1). In April 1776, seventeen men (including Weare Drake) signed the Association Test, a requirement of all men over the age of 21 in New Hampshire.[12] The economy was that of subsistence farming, as

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[3] GD Merrill, 533.
[4] Effingham Historical Society, 1.
[5] GD Merrill, 533.
[6] GD Merrill, 538.
[7] GD Merrill, 533 and H.E. Mitchell, *The Town Register: Wolfeboro, Ossipee, Effingham, Tuftonboro, Tamworth, Freedom* (Augusta, ME: The Mitchell-Cony Co., Inc., 1908), 59. Until Route 153/Province Lake Road was constructed, Hobbs Road connected Leavitt's Hill with Drake's Corner (Center Effingham)
[8] New Hampshire Bureau of Vital Records, "New Hampshire Birth Index, 1659-1900" (ancestry.com), Weare Drake.
[9] 1810 United States Federal Census, Effingham, Carroll County, New Hampshire.
[10] GD Merrill, 534. The house site was near where David Knowles [James M. Champion] lived in 1889 (approximately at the location of the present house of Blair Folts (984 Province Lake Road/204-14).
[11] Karen Payne, President of the Effingham Preservation Society, September 2018 letter to Chuck Fuller.
[12] The Association Test was created by the Committee of Safety in New Hampshire to have men of fighting age pledge their loyalty to the United American Colonies. The list excluded non-whites, people with mental disabilities and those opposed to taking up arms (such as ministers and Quakers).

settlers focused on clearing their land, creating roads, and raising enough crops to feed their families.

Figure 1: Topographical Map of the State of New Hampshire Surveyed under the Direction of Samuel Holland, printed 1784 (Dartmouth College Digital Collections)

On August 18, 1778 Leavitt's Town was reincorporated as **Effingham**.[13] The name was changed to Effingham after the Earls of Effingham, relatives of Governor Benning Wentworth's.

In the years after the incorporation of Effingham, a small village quickly grew up around the Drake Family in what would later become Center Effingham. On May 12, 1786 a vote was passed to construct a schoolhouse on the southeast corner of Lot 93 (owned by Josiah Wedgewood), on the road leading from Weare Drake's house to the mills.[14] The Drake's Corner School was built shortly thereafter and became the first school in the town.[15]

[13] Edwin A. Charlton, *New Hampshire As it Is…* (Claremont, NH: Tracy and Sanford, 1855), 197; Isaac W. Hammond, ed, *Documents Relating to Towns in New Hampshire "A" to "F"* Inclusive (Concord, NH: Parsons B. Cogswell, 1882), 604; and State of New Hampshire, 29

[14] GD Merrill, 64 and 551-552.

[15] The Drake's Corner School was moved across Town House Road when the Masonic Hall was constructed. A second Drake's Corner school on Route 153 was used until about 1964, when the Governor Wentworth Regional School District was formed. Both former schools are now private homes (Karen Payne, President of the Effingham Preservation Society).

A competition ensued between Drake's Corner and Lord's Hill in the 1790s as the two villages vied for the Town meetinghouse. Church services were held either at Drake's Corner under the leadership of Weare Drake or at Lord's Hill at Isaac Lord's house. In 1798,

> the Town, unable to decide the question on its own, voted to leave the location of the meetinghouse to a committee of distinguished and, hopefully, impartial non-residents. Isaac Lord entertained the committee at his Tavern, apparently with some success, as they decided to locate the meetinghouse on Lord's Hill, just opposite the tavern.[16]

In 1803, Reverend Gideon Burt became the Town's first settled minister in the Congregational Church.[17]

Despite the success of Lord's Hill, Drake's Corner continued to grow in the early 19th century. In ca. 1816, Weare Drake's grandson, **Thomas Parsons Drake** (1793-1861),[18] helped his grandfather to build a store at Drake's Corner.[19] Thomas Drake was heavily involved in politics, representing the town in the New Hampshire Legislature and serving as town clerk and selectman.[20] Just before Thomas Drake's death in 1861, the business was deeded to Major H. Folsom.[21]

By the time of Eliphalet and Phinehas Merrill's *Gazetteer of the State of New Hampshire* in 1817, Effingham's population had grown to 876 inhabitants with three religious societies (in two meetinghouses), four grain mills, four saw mills, a clothing mill and a carding machine.[22] A few years later, in 1822, a Calvinist Baptist Church was built at Drake's Corner.[23] By 1830, the overall population of Effingham had risen to 1,911.[24]

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[16] David Ruell, "Lord's Hill Historic District National Register of Historic Places Inventory – Nomination Form" (1985), 3.
[17] Charlton, 197.
[18] Anonymous, "Find A Grave – Millions of Cemetery Records Online" (www.findagrave.com), Thomas Parsons Drake, buried in Center Effingham Baptist Church Cemetery.
[19] GD Merrill, 546, and Effingham Historical Society, 1. Some sources state that the store was constructed by Weare Drake, but Weare appears to have deceased in ca. 1810, prior to this date.
[20] GD Merrill, 546.
[21] By ca. 1860, there were several stores in Drakes Corner that were associated with the Drake family. The ca. 1816 store was located at the intersection of Routes 153 and Town House Road. In 1913, Chester and Grace Drake sold the building to Grange No. 313 for $194.43 (In 1994, the Town of Effingham "accepted" the Grange building and property at Town Meeting, Article 34. It is now owned by the Effingham Preservation Society which purchased it from the Town for $1 in 2002.). Another early store was located on what is now Corner Road, adjacent to Thomas Drake's House (Upon Thomas Drake's death in 1861, the business would pass to his sons Cyrus and Josephus. The building was later the photography gallery of TP Drake's son Josephus L. Drake, and was eventually moved across the road to become the home of the Effingham Historical Society). In 1864, Cyrus K. Drake built a second store, the CK Drake & Co. Store, across the street from the Masonic Hall (According to GD Merrill, 546 this building was later associated with Cyrus' son, Alexander Milton/Mellon Drake. This building was moved to Center Ossipee in the 1920s to replace the Charles White Store. It later became the Public Service building, the Carroll County Extension offices, and, later, a consignment shop).
[22] Eliphalet & Phinehas Merrill, *A Gazetteer of the State of New Hampshire in Three Parts* (Exeter, NH: C. Norris & Co., 1817), 126.
[23] GD Merrill, 549.
[24] GD Merrill, 532.

While the population of Effingham grew, so did the town's interest in education. On June 18, 1819, the Effingham Union Academy was incorporated in Lord's Hill.[25] The private academy opened in September of 1820 and lasted a quarter of a century.[26] In 1830, new principal James W. Bradbury came from Parsonsfield, Maine on the condition that the school be 'for the instruction and training of teachers.'[27]

In 1835[28] or 1836[29] another school was organized in the Effingham village of Drake's Corner: The Carroll Literacy Institute. The academy was located in the building that had been constructed as the Weare Drake store in 1816 by Weare and Thomas Drake.[30]

Formation of Masonic Lodge (1855-1857)

The first steps were taken to form a masonic lodge in Effingham on January 1, 1855 when a letter was presented to the Grand Master of the Grand Lodge of New Hampshire, I. G. Jordan, asking for a dispensation to form the Charter Oak Lodge. This petition was signed by Cyrus K. Drake, Benjamin F. Taylor, John C. Leavitt, 2nd, Thomas P. Drake, Silas M. Morse, Augustus Colley, and Joseph P. Emerson.[31]

The Grand Lodge of New Hampshire Free and Accepted Masons was formed in 1789 by five Freemasons in the third floor of the William Pitt Tavern in Portsmouth. Masonry as we know it likely evolved from the Masonic Guilds of the middle ages: associations of craftsmen working together to create and enforce professional standards for their craft. By the 17th century, Guilds became called lodges, and honorific memberships were offered to individuals who were not masons by trade. These honorary members were called "Speculative" or "Free" Masons. In 1717, these organizations began to organize after four lodges in London formed the Grand Lodge of England. The fraternity spread quickly through Europe to the United States, so that when the New Hampshire Grand Lodge was formed, it was the fourteenth Grand Lodge formed world-wide. The membership of the fraternal organization was non-sectarian with members from all classes and emphasized personal study, self-improvement, and social betterment through individual involvement and philanthropy.

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[25] Ruell, 34.
[26] Ruell, 34. The school was discontinued in 1845, after attendance had fallen off. Between 1854 and 1921 the building was used as a public school.
[27] Eliphalet & Phinheas Merrill, 65. The Effingham Union Academy is said to be the first Normal School in the United States. Another Normal School was founded in Concord Vermont in 1823 by Rev. Samuel Read Hall, also claiming to be the first normal school in the United States, slightly ahead of the formation of an "instructor's school" the same year in Franklin, NH by Captain Tyler (George Gary Bush, ed. *History of Education in New Hampshire* (Washington: Government Printing Office, 1898), 42). Though the Effingham Union Academy was incorporated in 1819, it did not appear to become a Normal School until the arrival of Bradbury in 1830.
[28] GD Merrill, 552.
[29] Mitchell, 64.
[30] The building stands at the intersection of Route 153 and Town House Road. In 1857, the store was deeded by Thomas P Drake to Major H. Folsom (Carroll County Registry of Deeds Book 32, page 139). It then became the M. H. Folsom Store, A. F. Taylor Store, and then used as the Effingham Grange Hall and is now owned by the Effingham Preservation Society. The bell from the Literary Institute building is located within the belfry of the Center Effingham Baptist Church.
[31] GD Merrill, 195.

Dispensation to form the Charter Oak Lodge was granted on February 2, 1855 and the Lodge began holding meetings in the third story of Cyrus Drake's store the following day.[32] Cyrus K. Drake was named Master with Joseph P. Emerson Senior Warden and John C. Leavitt 2nd Junior Warden. At the next session of the Grand Lodge of New Hampshire on June 13, 1855, a charter for the **Charter Oak Lodge No. 58** was granted to Cyrus K. Drake, John C. Leavitt, Thomas P.. Drake, and Silas M. Morse of Effingham and Joseph P. Emerson, Bartlett Doe, and John Baily of Parsonsfield, Maine.[33] A few days later, on June 23, 1855, the Lodge held their first meeting, and officially elected the officials that had been selected earlier in the year.[34] On July 4, 1855, the Charter Oak Lodge No. 58 was publicly constituted and the officers were installed with ceremonies held in the Drake's Corner Baptist Church and adjoining grove.

On February 21, 1857, the Charter Oak Lodge voted "to build a Masonic Building for a Masonic Hall and other purposes."[35] On June 1, 1857, Thomas P. Drake sold a portion of his land for $300 to the Charter Oak Lodge (represented by **Cyrus K. Drake** [1819-1892, his eldest son], John Blackner, John Leavitt, Henry A. F. Colard, and **Josephus L. Drake** [1821-1903, his second eldest child])[36] with the condition that the Lodge must keep the land fenced or enclosed.

Effingham Masonic Lodge Built (1858-1860)

The Effingham Masonic Lodge was built in 1858.[37] The highly fashionable Italianate-style structure was built by brothers **Timothy** (1846-1911)[38] and **Benjamin Taylor (**ca. 1844-1887),[39] of Effingham.[40] Benjamin Taylor is said to have fallen off of the roof, and become permanently disabled as a result.[41]

[32] GD Merrill, 195. The Charter Oak Lodge meeting minutes go back to February 3, 1855. Drake's store was across the street from the present Masonic Charitable Institute building and was later moved to Center Ossipee.
[33] Leonard Epsie, ed, "Charter Oak Lodge No. 58 F&AM Effingham, New Hampshire 1855-2010" (Manuscript), 1.
[34] GD Merrill, 195.
[35] GD Merrill, 196.
[36] Carroll County Registry of Deeds, Book 36, page 143.
[37] GD Merrill, 196.
[38] Anonymous, "Find A Grave" (www.findagrave.com), Timothy C. Taylor, buried in Mount Auburn Cemetery, Cambridge, Massachusetts.
[39] New Hampshire Bureau of Vital Records, "New Hampshire Death and Disinterment Records, 1754-1947" (www.ancestry.com), Benjamin F. Taylor of Effingham died Jan, 25, 1887 as the "result of a fall." Benjamin Taylor's wife, Mary Ann *Brown* Taylor died of pneumonia the same day as her husband (Death Record of Mary A. Taylor of Effingham, January 25, 1887).
[40] Verso of photograph (Figure 2) in collection of the Effingham Historical Society.
[41] Verso of photograph (Figure 2) in collection of the Effingham Historical Society.

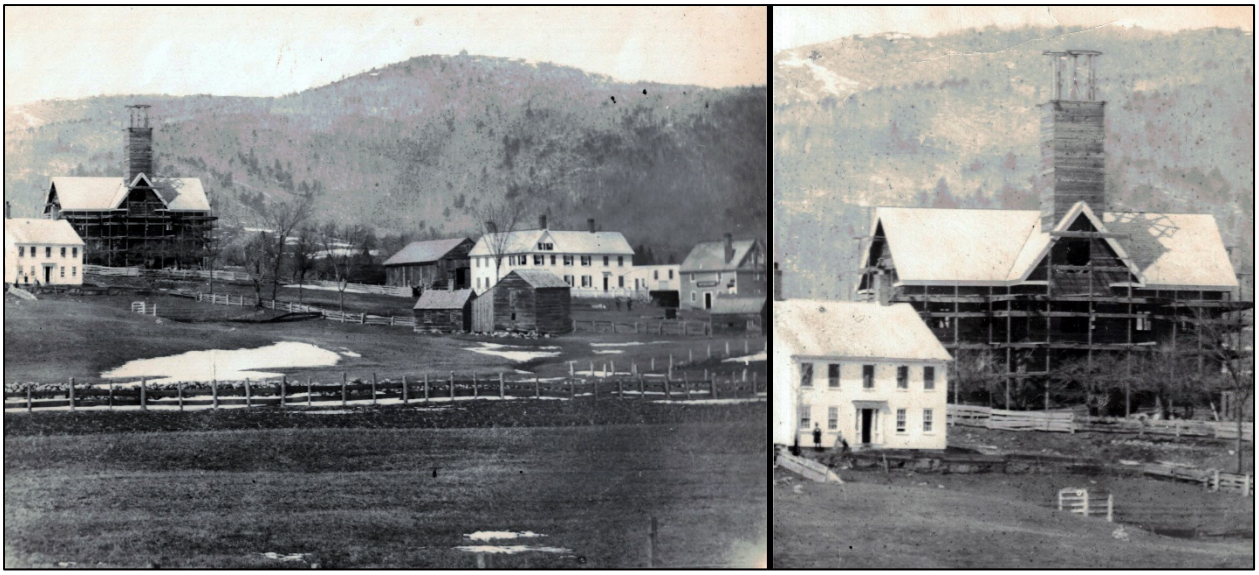

Figure 2: Effingham Town Hall under construction, 1858 (Collection of the Effingham Historical Society)

The new Masonic Hall at Drake's Corner was formally dedicated on August 24, 1859.[42] As part of the ceremonial dedication, the hall was presented with a piece of the Charter Oak in Hartford, Connecticut by **Ellen M. Stuart**, daughter of the custodian of the tree.[43] The original jurisdiction of the Lodge included nearly all of Ossipee and included members from Cornish, Porter, and Parsonsfield, Maine.

The elaborate murals of the Hall itself are first documented in the Charter Oak lodge minutes of December 1859.[44] Local legend identifies the painter as a traveling itinerant farmhand (and Mason) from Lawrence, Massachusetts named **A. Butler**.[45] Stories handed down claim he spent two years laboring over the *trompe l'oeil* paintings using "stale beer and sour milk in mixing his watercolors, and tinted them with roots and berries, and that he was given free board and room and a pint of rum per day".[46]

[42] Epsie, "Charter Oak Lodge History", 2; Effingham Historical Society, "Chronology", 2; and GD Merrill, 196..
[43] GD Merrill, 196. The Charter Oak is said to have served as the secure hiding place for the "Connecticut Charter" (a royal charter by King Charles II that allowed the colony a level of self-government) between 1687 and 1689. The Oak, which was estimated at approximately 1,000 years old, was destroyed during a violent storm on August 21, 1856. (Connecticut Public Broadcasting Network and the Connecticut Historical Society, "Connecticut's 'The Legend of the Charter Oak'" (https://connecticuthistory.org/connecticuts-the-legend-of-the-charter-oak/))
[44] Melissa Ferland, "New Hampshire Division of Historical Resources Individual Inventory Form for the NE Masonic Charitable Institute – EFF0001" (October 2001), 3.
[45] Ferland, 3 and Fritz Weatherbee, "Fritz Weatherbee's Lost New Hampshire: Of Masons and Murals" (*NH Magazine,* April 2002), 7.
[46] Epsie, "Charter Oak Lodge History", 2-3.

When the altar was reupholstered in the 1960s, workers found the name A. Butler in one of the paintings, reinforcing the former attribution of the paintings.[47] Recent research has uncovered that the painter was **Philip A. Butler** (1829-1916).[48] Butler was born in Candia, New Hampshire[49] and moved to Amesbury, Massachusetts with his family in about 1838. At the age of 17, he began a four-year apprenticeship with a portrait painter in Lawrence, Massachusetts named Mr. Rowell.[50] After his internship, Butler went into business as a fresco painter, focused on the decoration of churches and public halls. By 1865, Butler lived in South Framingham and had a studio in Boston, first at 81 Washington Street,[51] and later at 17 Pemberton Square (Figure 4).[52] He later changed his focus to landscape painting and exhibited at the Boston Art Club in 1890, 1891, and from 1895-1899 and Art Institute of Chicago in 1896, 1897, 1899 and 1913.[53] He died in Merrimac, Massachusetts in 1916.[54]

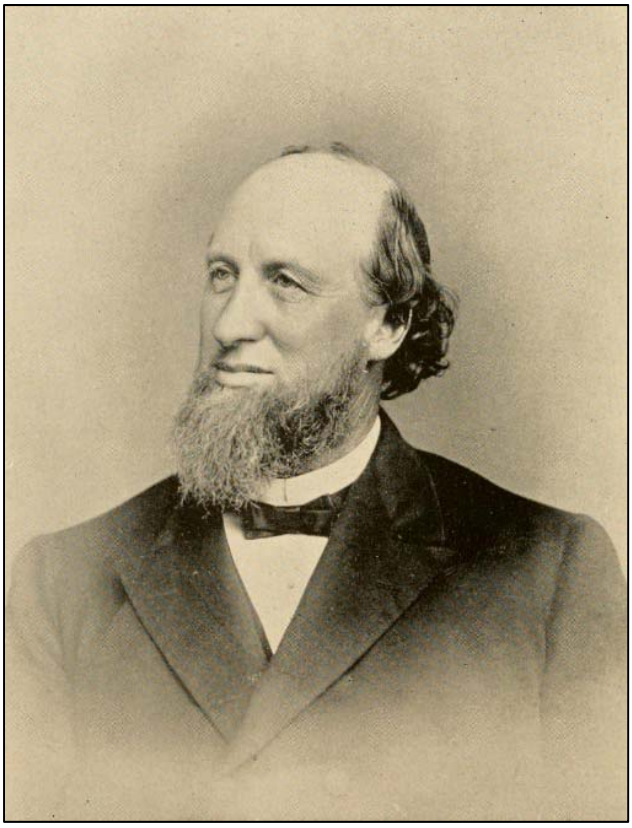

Figure 3: Philip A. Butler (from History of the Town of Candia, 304)

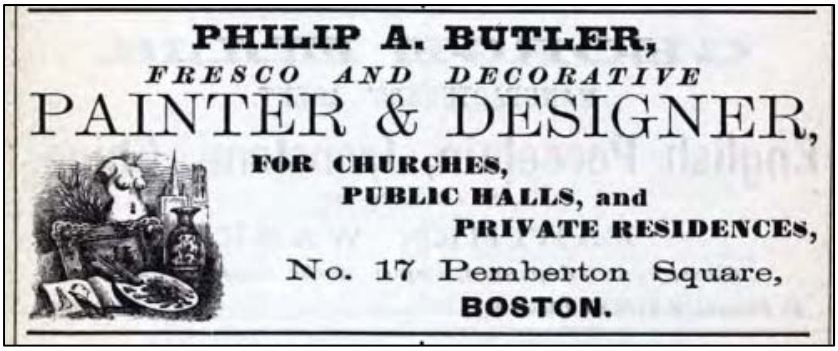

Figure 4: Advertisement for Philip Butler from 1870 Boston City Directory, page 1060

[47] Leonard Epsie, Brother of the Charter Oak Masonic Lodge No. 58 F&AM, in conversation with the author, November 9, 2018.
[48] Anonymous, "Find A Grave – Millions of Cemetery Records Online" (www.findagrave.com), Philip Augustus Butler (1829-1916).
[49] J. Bailey Moore, *History of the Town of Candia* (Manchester, NH: George W. Browne, 1893), 519.
[50] Moore, 519.
[51] *1865 Boston City Directory* (Boston, MA: George Adams, 1865), 74.
[52] *1870 Boston City Directory* (Boston, MA: George Adams, 1870), 130 and *1875 Boston City Directory* (Boston, MA: Sampson, Davenport & Company), 157.
[53] "Ask ART – Art Prices, Artist Art Auction Records, Art Research Tools" website, article titled: "Philip A. Butler – Artist Biography", accessed January 2019 (www.askart.com).
[54] "Ask Art", "Philip A. Butler – Artist Biography" and "Find A Grave", Philip Augustus Butler (1829-1916).

Masonic Charitable Instititue (1861-ca. 1882):

On February 7, 1861, **Cyrus K. Drake** sold the completed building to the Treasurer of the Charter Oak Lodge No. 58 of Ancient Free and Accepted Masons of Effingham for $4,000. The sale included

> all right title and personal interest of every nature that I [Cyrus Drake] have to the Masonic Temple (so called) including the fixtures in Masonic Hall the chandelier and fixtures for lighting the hall and anti-rooms, banner furnace and fixtures for heating, blinds to put upon the temple, and finish that is ready to put up.[55]

In the fall of 1861, the Charter Oak Lodge No. 58 opened the **New England Masonic Charitable Institute**[56] at the Masonic Temple building. The private school offered a three-year co-educational program.[57]

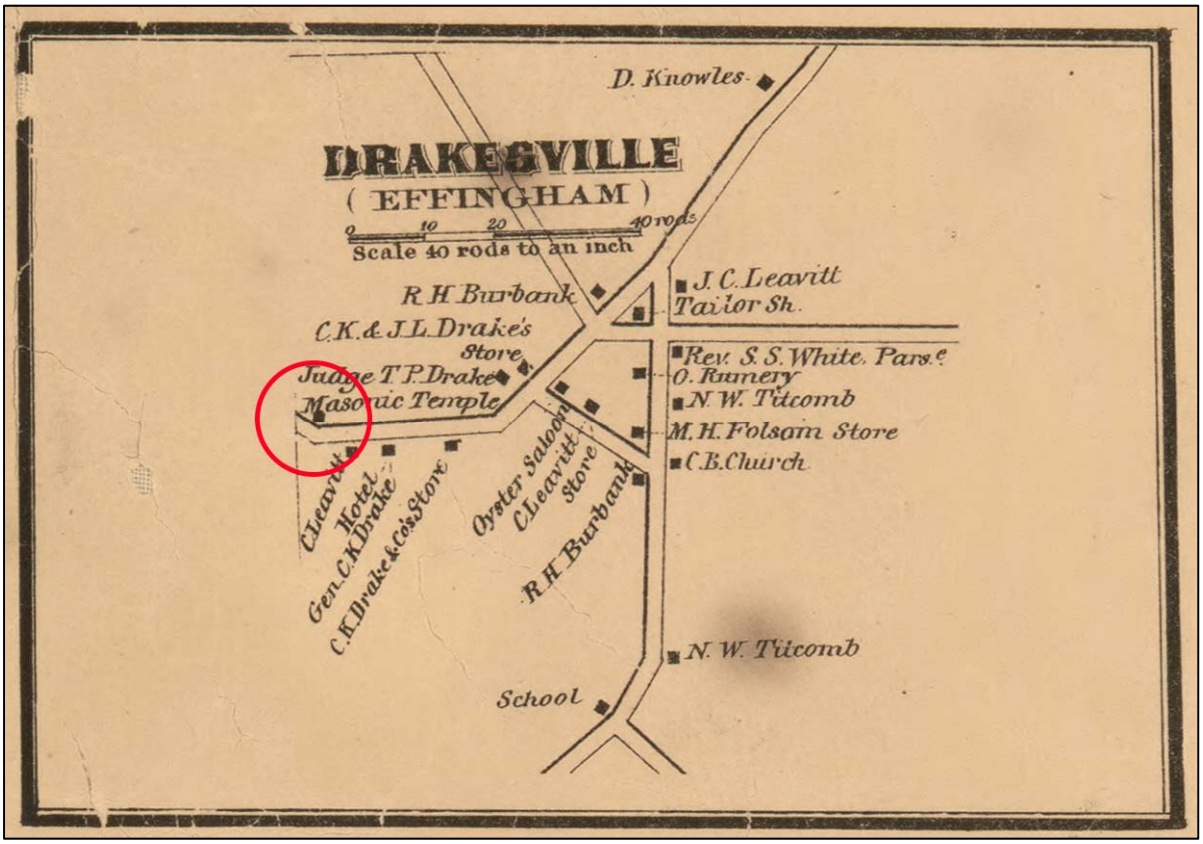

Figure 5: Drakesville/Drake's Corner, Effingham in 1861 (E. M. Woodford "Topographical Map of Carroll County.")

During the 1800s and early 1900s, Freemasonry grew dramatically. At the time, the government provided no social "safety net", and the Masons quickly established a tradition of founding orphanages, homes for widows, and homes for the aged. At the same time, they also supported the establishment of educational facilities in Europe and America through providing financial donations to institutions and sponsoring students through scholarships.

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[55] Carroll County Registry of Deeds, Book 39 page 147.
[56] Effingham Historical Society, "Chronology", 2. GD Merrill, 552. Mitchell,64.
[57] New England Masonic Charitable Institute, "New England Masonic Charitable Institute, Effingham, N.H. 1861-62" (Portland: Brown Thurston, 1862).

The Masonic Charitable Institute appears to have been a unique venture, with no other similar academies known to have existed in New Hampshire or anywhere else in the United States.[58] Masonic orphan asylums were relatively commonplace throughout the history of the Masonic Order, but Masonic schools were rare. The first masonic orphanage was founded in Sweden in 1753.[59] In 1788, dentist Chevalier Ruspini (1730-1813)[60] founded the "Royal Cumberland Free Mason's School for Girls" in London, England as a charitable institution for the children of Masons who had fallen on hard times or whose death had meant hardship on their families.[61] To date, this, the corresponding Masonic school for boys[62] and the New England Masonic Charitable Institute are the only known schools to have been run by the Freemasons, and the New England Masonic Charitable Institute is the only known school of this type in the United States,[63] and was certainly the only Masonic school in the history of New Hampshire.[64]

The fall 1861 class of the Masonic Charitable Institute in Effingham, New Hampshire had 55 students under principal Rev. **Elbridge Pepper** (1827-1910).[65] Other instructors included **Fannie C. Davis**, pianoforte instructor **Exa L. Drake**, and vocal teacher **Joseph P. Emerson**.[66] The building was described as containing "fine schoolrooms",[67] presumably on the first floor. There were 27 male and 28 female students in the first class, with one student all the way from Ryegate, Vermont.[68] The orphaned children of Masons were admitted for free, with other students paying tuition as well as room and board, and staying at Cyrus K. Drake's Hotel (21 Town House Road) and other local homes.[69]

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[58] Epsie, "Charter Oak Lodge History", 2.
[59] W. Bro. Dr. Brian Bowden, ed, *200 Years of a Future Through Education: A history of the Masonic Girls' Charity* (Dublin: The Masonic Girls' Benefit Fund, 1992), 8.
[60] Trustees of the British Museum, "Chevalier Ruspini (Biographical Details" (The British Museum website: www.britishmuseum.org, 2017).
[61] This school is still open, now operating as the Royal Masonic School for Girls. For more information on the school, please visit their website: www.rmsforgirls.org.uk. This school was used as the filming location for the campus where Indiana Jones teaches in *Indiana Jones and the Last Crusade.*
[62] A corresponding Masonic boys' school was set up in Bushey, Hertfordshire, UK in 1857 and closed in 1970. It was later used as one of the movie sets for the school scenes in *Pink Floyd: The Wall* and the "School Days" sketch in Monty Python's *The Meaning of Life.*
[63] Fritz Weatherbee and others have often miss-stated that this was the "only school in history that was built and operated by freemasons" (Fritz Weatherbee, "New England Masonic Charitable Institute" segment of *New Hampshire Chronicle on WMUR* aired May 9, 2017).
[64] Bush, 131.
[65] Mitchell, 64 and Epsie, "Charter Oak Lodge History", 2. Rev. Pepper lived between 1827-1910 and is buried in Riverview Cemetery, Norridgewock, Maine (Anonymous (www.findagrave.com), Rev. Elbridge Gleason Pepper.
[66] GD Merrill, 552.
[67] GD Merrill, 552.
[68] New England Masonic Charitable Institute, 7-9.
[69] Leonard Epsie in conversation with the author, November 9, 2018.

Figure 6: New England Masonic Charitable Institute, June 1860 (E. M. Woodford "Topographical Map of Carroll County.")

In the fall of 1862, there were 146 pupils registered in the Masonic Charitable Institute, 87 boys and 59 girls, with one student traveling all the way from Stoughton, Massachusetts.[70] School in 1862-1863 was taught in four terms, with Winter Term starting December 1, 1862; Spring Term starting February 18, 1863; Summer Term May 18, 1863; and Fall Term beginning August 26, 1863.[71] The Institute taught a variety of subjects including courses in

> English, Latin, Greek, German, and French Language; US History; arithmetic, algebra, and geometry; chemistry, botany, and geology; physiology, mental philosophy, rhetoric, and geography. Also, music, painting, drawing and penmanship were part of the curriculum. Cost of subjects ranged from $1.00 to $5.00 per semester. Board for the students ranged from $1.38 to $3.00 per week, and this included washing. Fuel and lights were extra.[72]

[70] New England Masonic Charitable Institute, 16.
[71] Charter Oak Lodge records.
[72] Epsie, "Charter Oak Lodge History", 2.

Figure 7: Students in front of the Masonic Charitable Institute (Collection of the Effingham Historical Society)

In addition, students were required to do daily devotional exercises and to attend worship on the Sabbath. **J. H. Jackson** was principal with **C. M. Jackson** preceptress before **Aretas G. Barker** and **M. M. Barker** took over in the fall of 1862 with **Frank K. Hobbs** and **Exa L. Drake** assistants, **Joseph P. Emerson** teaching vocal music, **Huldah L. Drake** teaching drawing, and **C. C. Dunnels** teaching penmanship.[73] The school itself seems to have been located on the main (first) floor of the building, beneath the Masonic Hall on the second level. The third floor of the building has been suggested by some to have been used as classroom space by the Masonic Institute.[74]

[73] GD Merrill, 552.
[74] Weatherbee, "Lost New Hampshire: Of Masons and Murals", 7.

Figure 8: Students in front of the Masonic Charitable Institute (Collection of the Effingham Historical Society)

In 1866, shortly after the school began, a post office was established at Drake's Corner, and the village was renamed Centre Effingham.[75]

Mr. Barker remained principal until 1867, when he was succeeded by Rev. **Nathaniel Melcher**.[76]

The exact date at which the Masonic Charitable Institute closed is somewhat of a mystery, and the records of the institution are unfortunately quite spotty. Though a school document from 1882 survives, it was reported in 1889 that "there has been no school there" for several years.[77] In 1908, it was reported that there had "been no school there for a quarter of a century."[78] Taken in combination, it can be presumed that the institute closed in ca. 1882. The reason for the closure is unknown, but it may be the result of the population of Effingham dropping from slightly over 1,200 in 1860 to 865 in 1880 as people abandoned local farms to travel west or to find work in industrialized cities.

By 1890, the future of the Masonic Charitable Institute building was in question.

[75] GD Merrill, 542.
[76] GD Merrill, 552.
[77] GD Merrill, 553.
[78] Mitchell, 64.

Effingham Town Hall (1891-2005)

Warrant Article 11 of the 1890 Effingham Town Warrant appointed a committee to investigate the present state of the building, costs of repairing, and ownership of the Masonic Building.[79] Up until this point the Effingham Town Hall was located further west along Town House Road. The Town was eyeing the semi-abandoned building as a potential replacement Hall.[80] The committee consisted of John K. Meloon, Francis W. Barker, William S. Taylor, John M. Drake, John L. Demerit, and F. Frank Taylor. In November, Francis W. Barker reported that no building investigation had been made, and the Town advised the committee to complete their assessment and report by March 1891.

At the March 1891 Town Meeting, the building committee was tasked with finding out if they could purchase the building, complete with School Bell and fixtures for $400.[81] On May 30, the Town of Effingham purchased the Quitclaim Deed of Cyrus K. Drake *et al* to the Masonic Building, giving the town his controlling share of the property.[82] On June 20, 1891 the Charter Oak Lodge sold the building to the Town of Effingham, reserving rights to the second floor lodge, anterooms, and furnace room for $1. The Masons agreed to pay ¼ of all external repairs, as determined by the committee, with the Town paying ¾ of the associated costs.

> The Town to make all agreed upon repairs and if in six months after the completion of such repairs, the Lodge shall fail to pay to the Town Treasurer its portion of the cost, then its part of the building shall be forfeited to the Town until the same shall be paid. And after repairs have been agreed upon by the lodge and the Town, and the Town shall fail to make the same after one year the lodge may make the same and collect the cost of the town after six months.[83]

The internal repairs to the building were to be divided by occupancy, with the Masons responsible for the second floor, and the Town for all other parts of the building. The town was also obliged by the sale to keep the way to the second story of the building clear, and allow free access for Masonic purposes.

On June 20, 1891, it was "voted that the Selectmen and Masonic Committee make such repairs as they think best."[84] J. L. Stevens was paid $32 for labor on the building and Geo. A Stephens was paid $26; C. I. Demerit was paid $98 to paint the building; George A. Stevens was paid $6.25 for lumber; C. E. Moore $4.00 for boards; Davis & Cate $17.55 for clapboards and $123.53 for shingles; J. N. Marston $13 for drawing shingles; C. M. Leavitt $137.73 for unspecified materials; and John M. Chase ($26), John A. Leavitt ($1.75), J. M. Meloon ($1.50), Chas. Littlefield ($0.75), Geo. E. Doane ($1.50), and J. P. Glidden ($10.50) for labor.[85] A total of $921.06 was spent on the repairs to the building and the demolition of the old Town Hall.

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[79] September 30, 1967 letter from the Town to the Charter Oak Lodge, Collection of the Charter Oak Lodge.
[80] It has been suggested that the former Town Hall may have been recently struck by lightning, and that this may have been the reason the Masonic Institute was considered as a potential new site for the Town Hall. (Interview with Leonard Epsie November 9, 2018) As of writing no written documentation of this occurrence has been found.
[81] September 30, 1967 letter from Town to Charter Oak Lodge.
[82] Carroll County Registry of Deeds Book 96 [not 95], page 4.
[83] Carroll County Registry of Deeds, Book 95, page 544.
[84] September 30, 1967 letter from Town to Charter Oak Lodge.
[85] Town of Effingham, *Annual Report of the Selectmen, Treasurer and Board of Education for the Financial Year Ending March 1, 1892* (Sandwich, NH: Sandwich Reporter Steam Job Print, 1892), 5-6.

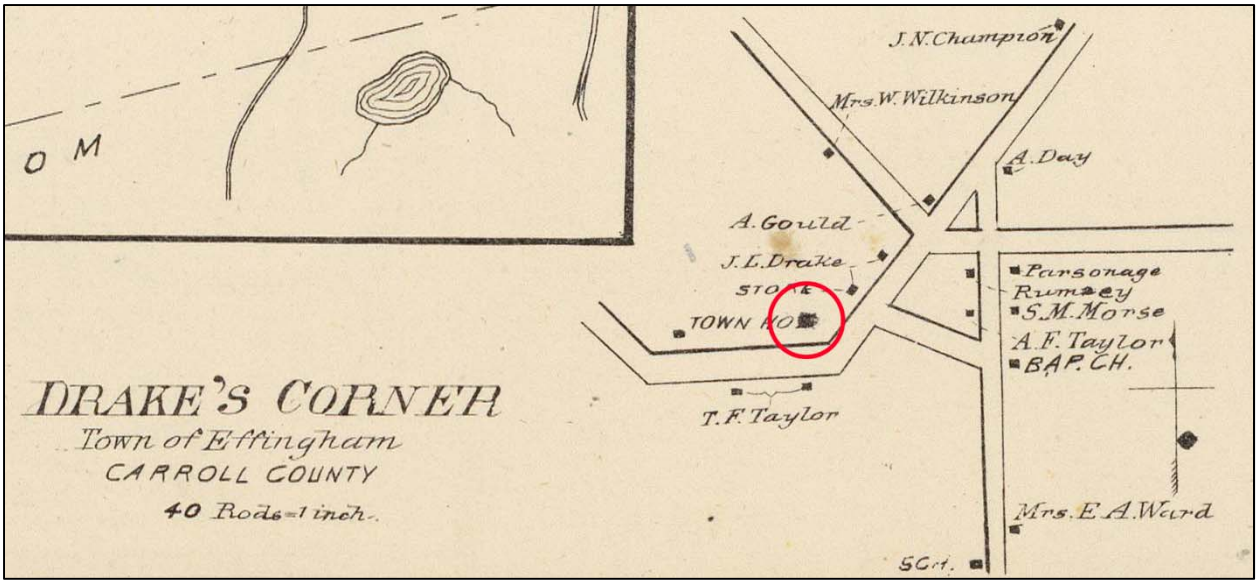

Figure 9: Drake's Corner in 1892 (Hurd Map)


Figure 10: Masonic Hall and Thomas P. Drake House ca. 1920 (Collection of the Effingham Historical Society)

After it was founded in 1893,[86] the Effingham Public Library moved into the newly repurposed building alongside the Town Offices. The first floor of the building was renovated, with new paint, plaster, and wallpaper. [87] The Library originally occupied the northeast corner of the first floor (East Room).[88] The west end (West Room) of the first floor remained a large open space, suitable for Town

[86] Effingham Historical Society, "Chronology", 2.
[87] Town of Effingham, *Annual Report Town of Effingham 1894,* 10.
[88] Norman E. Larson, "Baseline Documentation for NE Masonic Charitable Institute / Effingham Town Hall, Effingham, New Hampshire" (August 9, 2007), 2.

Meetings. The following year, in 1894, the Selectmen were authorized to build a suitable (and economical) privy to service the Hall.[89]

Several small changes were made to the interior of the building in the early 20th century. In 1903, the Town voted to build a vault inside the building for the storage of town records.[90] In 1908, $75 was allocated for unspecified repairs to the belfry.[91]

Rural electrification brought electricity to Effingham on July 3, 1931.[92] Though there is no known specific record of the date at which electricity was installed in the Town Hall, the building was likely wired at around this time.[93]

The veterans memorial, located to the south of the building, on the hill outside of the front entrance, was erected on August 24, 1933 in honor of Effingham men who served in the Revolutionary War, the War of 1812, United States Civil War, and the First World War. The plaque lists six men who served between 1775-1783 in the Revolutionary War, 26 who served in the "Great Britain-United States War" between 1812-1815; 37 who served in the Civil War between 1861-1865, and 13 men who served in the 1917-1918 World War.

During World War II, the bell of the Town Hall was used as an air-raid warning. In the 1940s, "a single horizontal member was added [to the tower] between two legs of the cupola to allow for the ringing of the bell from the exterior".[94] Photographic evidence suggests that the quatrefoil windows of the tower we replaced by the present square plexiglass panels in the mid-20th century.

[89] September 30, 1967 letter from Town to Charter Oak Lodge.
[90] September 30, 1967 letter from Town to Charter Oak Lodge. It is not apparent at this time whether this structure was ever actually constructed.
[91] September 30, 1967 letter from Town to Charter Oak Lodge.
[92] Effingham Historical Society, "Chronology", 3.
[93] In 1932, Public Service of N. H. was paid $25.90 by the town for unspecified wiring, possibly of the Town Hall building (Town of Effingham, *Annual Reports of Municipal Officers for the Year Ending Jan. 31, 1933,* 27).
[94] Larson, 6.

Figure 11: The quatrefoil windows of the bell tower replaced by the time of this undated photograph (Collections of the Effingham Historical Society)

The lot boundaries for the Masonic Charitable Institute/Effingham Town Hall were adjusted several times, starting in the mid-1960s. November 30, 1966, a boundary line agreement clarifying the lot lines was entered into between the Charter Oak Lodge and Richard A. and Thelma V. Bragdon, who owned the property next to the Town Hall (formerly the Estate of Helen Louisa Blaisdell).[95] On September 7, 1982, the Bragdons sold an additional section of their land, between their property and the Kirker property, to the Town so that the Town of Effingham could expand their parking area to the north.[96]

Two locally-regulated historic districts were established in the Town of Effingham in 1987. In March 1987, a warrant article called for the establishment of Historic Districts at Center Effingham and at Lord's Hill (which had been listed to the National Register of Historic Places in 1985). The "Town House" as the New England Masonic Charitable Institute building was then referred, was included at the northwestern edge of the district, which consisted of ten tax parcels.

During the summer of 1987, the Town of Effingham employed a contractor to complete repairs to the roof of the Town Hall. While the roof was underway, a thunderstorm struck, pelting the exposed building with rain and sending water into the building interior. The Masonic Murals of the Lodge were "streaked with soot that had accumulated over the years, carpets were destroyed and much of the interior of the second and third floors remained wet for an extended period".[97] Several sections

[95] Carroll County Registry of Deeds Book 409, pages 66-68.
[96] Carroll County Registry of Deeds Book 865, page 369.
[97] Ferland, 3.

of plaster became so water-logged that they fell from the ceiling all together.[98] As the building awaited repairs, additional water and snow leaked in at the junction of the roof and tower, where the roof had been improperly sealed.[99]

In the 1980s, the restrooms were added to the main level (first floor) of the building in an effort to comply with the Americans with Disabilities Act.[100] New doors and ramps were added to the north side of the building at approximately the same time as the interior modifications to increase accessibility to the building. The door openings were most likely added to the north side of the building at around the turn of the 20th century, replacing original windows with exterior doors to better serve the Town Hall function of the building. In the 1990s, the former electric baseboard heating was supplemented by the installation of kerosene-fired Monitor heaters.[101]

In 1990, a bronze plaque was installed at the Town Hall by the Effingham Landmarks Association. The plaque was unveiled by **Lloyd Sanborn**, oldest Effingham resident and member of the Charter Oak Lodge.[102]

An engineering study of the building was contracted in August of 2000. This study "found the exterior to be in good condition, the second floor to be in good to fair condition, the third floor (attic) to be in fair to poor condition, and the clock tower to be showing signs of serious structural difficulty".[103]

The study of the building by **Preservation Timber Framing, Inc.** (Arron Sturgis) of Berwick, Maine found three primary structural issues with the building:

- Severely damaged structural elements within the Clock Tower
- Significant failures in the queen post truss roof system
- Heaving and settling of the first floor framing, which sits atop a granite pier foundation with brick infill

Additional cosmetic issues were identified as well, including the need for plaster repairs through the building and the damage to the painted murals as a result of the 1987 storm.[104]

In November of 2001, the Town of Effingham applied for a grant of $150,000 (of an estimated $300,000) from the Land and Community Heritage Investment Program (LCHIP) to "restore and preserve the Effingham Town Hall and Masonic Lodge."[105] The project aimed to restore the entire building, including the bell tower and Masonic murals of the Lodge. $75,000 of the grant match was to be supplied by the Charter Oak Masonic Lodge No. 58 F&AM, $1,000 by the Mason Foundation, $60,000 by a March 2002 Town meeting Warrant Article to repair the bell tower,[106] and $3,000 from

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[98] Epsie, "Charter Oak Lodge History", 4.
[99] Ferland, 3.
[100] Ferland, 3.
[101] Ferland, 3.
[102] "Effingham dedicates plaque at town hall" un-dated newspaper clipping in the collection of the Effingham Historical Society.
[103] Ferland, 3.
[104] Town of Effingham,"2001 LCHIP Application…", 18.
[105] Town of Effingham, "2001 New Hampshire Land and Community Heritage Investment Program Application Packet (November 27, 2001), 2.
[106] This article passed by unanimous voice vote (*Town of Effingham Annual Reports 2002,* 22).

a local anonymous donor. Further funding was anticipated from the Potter Family Trust of Effingham.[107] In 2001, the first floor of the building housed the Selectmen's Office, a conference room, meeting hall, Town Clerk's Office, Library and two ADA restrooms with the second floor occupied by the Charter Oak Masonic Lodge. The building was used by the town clerk/tax collector, selectmen, various boards and committees, the Effingham Public Library, and for monthly meetings of the Charter Oak Masonic Lodge.[108]

In June 2002, the Town of Effingham received a grant of $150,000 from LCHIP to refurbish the frescoes, structurally repair and re-shingle the roof, and shingle and paint the bell tower and cupola. Though a separate $5,000 grant paid for the repair of the weathervane, and the Effingham Historical Society donated $9,300 towards painting the cupola. **Christopher P. Williams Architects** of Meredith were hired to design the repairs and coordinate the phasing of the work.

The repairs to the building started in 2004. **John P. Canning Co.** of Connecticut began the restoration of the Masonic Lodge, re-adhering plaster to the original lath, cleaning the murals, patching, consolidating, and minimally repainting in time for the 150th anniversary and re-dedication of the space in 2005.[109] Also in 2005, the Town Offices moved from the building to Effingham Falls.[110] The Effingham Public Library expanded in 2005 to fill the entire first floor of the building, absorbing the space formerly used by the Selectmen and Tax Collector.

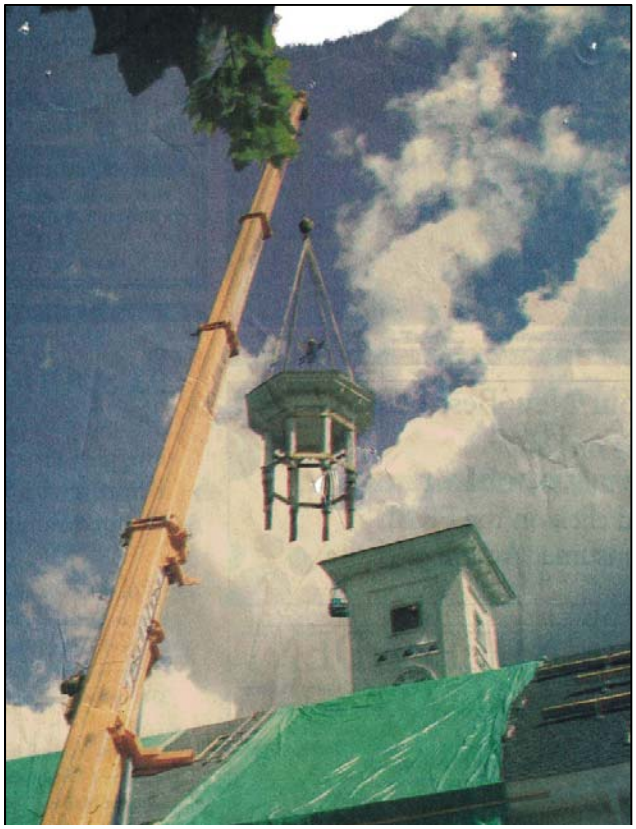

Figure 12: Removal of Belfry in 2006 (Newspaper Clipping in Collection of the Effingham Historical Society)

In 2006,[111] work was done to address the structural issues by **Target New England** contractors of Wolfeboro. Up to this time, the primary rafters of the roof were bearing weight directly onto the ends of the third floor beams, which extend beyond the exterior wall-plate. Diagonal braces, that had been spiked into the original trusses to keep the top chord from slipping off the building as part of an historic repair, were removed at the north eaves and replaced with modern horizontal ties drilled through the members, creating extra rigidity between the wall-plate and interior truss. The historic framing repairs were left intact at the south eaves. At the same time as the structural repairs were made to the roof, the cupola was lowered to the ground and restored. The weathervane was restored and reinstalled, and the asphalt shingle roof of the belfry was replaced. Repairs were made to the posts that support the cupola as the bottom of each was found to be rotted. Repairs to the cupola structure were made

[107] Town of Effingham,"2001 LCHIP Application…", 4.
[108] Town of Effingham,"2001 LCHIP Application…", 5.
[109] Epsie, "Charter Oak Lodge History", 4 and Larson, 2.
[110] Shelia T. Jones, "Schools in Effingham" (May 28, 2014), 2.
[111] Larson, 5.

in-kind, with original iron hold-downs re-used.[112] A new copper roof was installed on the bell platform, with flashing installed behind the finish of the cupola legs when it was hoisted back into position. Lumber for the project was donated from Eric Potter's land with Libby Logging cutting and removing the material at no charge, and the town paying $1,698 to mill the lumber.[113] The tower and cupola were then repainted, utilizing the money that had been given by the Effingham Historical Society.

After the structural repairs had been finished, Norman Larson of **Christopher P. Williams Architects** in Meredith prepared the "Baseline Documentation for the NE Masonic Charitable Institute/Effingham Town Hall" on August 9, 2007. Shortly after the completion of the report, the Town entered into a 10-year Stewardship Agreement deed restriction with LCHIP on October 24, 2007.[114] This deed restriction required the Town of Effingham to maintain the resource through the terms of the 10-year agreement with all work on the building undertaken in accordance with the *Secretary of the Interior's Standards.*

Very little work has been undertaken at the New England Masonic Charitable Institute/former Effingham Town Hall/Effingham Public Library since 2007.

In 2018, the Town of Effingham began work on a new Capital Improvements Plan. Residents and members of the Selectboard realized this was an appropriate time to discuss potential changes/improvements to the Town Hall. As part of this effort, the Town reached out to the New Hampshire Preservation Alliance to discuss the future of the building and options for funding the rehabilitation of the structure. As a result, the decision was made to nominate the building to the National Register of Historic Places. At the same time as the nomination was drafted, the Town asked the NHPA for a grant to help conduct this updated historic building assessment. A team was assembled in the fall of 2018 to develop a long-term holistic plan for the building, including multi-year phases for building repairs and renovations.

Statement of Significance

The New England Masonic Charitable Institute retains eligibility for the National Register of Historic Places with local significance under Criterion A and C. The New England Masonic Charitable Institute is significant under Criterion A, for education, politics/government, and social history. The building is a long-standing local landmark and has played a critical role in the history and development of the Town of Effingham.

The New England Masonic Charitable Institute is significant under National Register Criterion C as an example of a ca. 1860 Italianate style public building. The exterior of the New England Masonic Charitable Institute expresses many architectural details indicative of the Italianate style, which emerged in the 1830s and continued into the 1870s when the village of Drake's Corner was at its height. The style was highly popular in suburban and urban dwellings, and is less commonly seen in rural settings like Drake's Corner. Like the contemporary Gothic Revival style, the Italianate style originated in England as part of the Picturesque movement. This style imitated the

[112] Larson, 5.
[113] Kathryn C. Cauble, "Application for Preservation Services Grant – Effingham Town Hall" (December 2006), 3.
[114] Carroll County Registry of Deeds Book 2674, page 842.

rambling, informal style of Italian farmhouses and was popularized by the pattern books of Andrew Jackson Downing. Typical Italianate architectural details include the general form and massing of the building, especially the square tower; the paneled exterior double-doors beneath bracketed canopy, hood moldings and projecting bracketed sills of the windows; corner quoins; and elaborate cornice with paired brackets. The building retains integrity of location, design, setting, materials, workmanship, feeling and association.

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Architectural Description of the NE Masonic Charitable Institute *by Mae Williams*

The New England Masonic Charitable Institute is a multi-story Italianate hall, built on a hill overlooking the village of Center Effingham in Effingham, Carroll County, New Hampshire. The small village is located down the hill to the east of the building, and the surrounding area consists of small farms with a mixture of fields and woodlands. The 1858 building has many architectural details characteristic of the Italianate style, including corner quoins, paired eave brackets, denticulated cornice and elaborately ornamented belfry. In 1933, a memorial was placed at the southeast side of the building to commemorate Effingham veterans. Between 1861 and ca. 1882, the building served as the New England Masonic Charitable Institute, the only private school in America known to be run by the Masons. After the Masonic Institute closed, the building was purchased by the Town of Effingham, with the Charter Oak Lodge No. 58 retaining deeded life-rights to the second floor. The first floor was renovated to create a Town Hall, town offices, and in 1893 a space for the Effingham Public Library. In 2004, the town offices moved out of the building, and the entire first floor has since been occupied by the Library. The New England Masonic Charitable institute has a high degree of all aspects of historic integrity. Contributing resources consist of the Institute and Veteran's Memorial.

The identification of character-defining features of properties like the New England Masonic Charitable Institute is a critical first step in planning for its future life. Before applying *The Secretary of the Interior's Standards*, it is important to understand what physical features of the building help to tell the story of its history and architectural importance. The *Standards* recognize the importance of maintaining these original features and spaces while rehabilitating the property for a compatible use and future life. Recognizing that a property may have original features throughout that are all "character defining," the *Standards* allow for the categorization of the features into primary and secondary spaces and features. Primary spaces and features are those that should not be changed or removed unless they are beyond repair (at which time they should be replaced to match the old in design, color, texture, and materials). Secondary spaces and features are those that can be altered *when necessary* to accommodate compatible change that allows new and continued use of the property. The guidelines of the *Secretary of the Interior's Standards* state that "identification, retention, protection, and repair should be given first priority in every rehabilitation project." Interior spaces are not only defined by their finishes and features, but by the size and proportion of the rooms themselves and how they functioned in the historic use of the space. Distinctive features and finishes should be retained as much as possible in primary interior spaces, whereas extensive changes are more acceptable in the secondary interior spaces that service the primary or functional portion of the building. This does not mean that secondary interior spaces are insignificant or that all character-defining finishes can be removed from secondary spaces, it just means that more leeway is given for change needed to accommodate modern use in these areas.

Figure 13: New England Masonic Charitable Institute facing northwest.

New England Masonic Charitable Institute Site Description:

The New England Masonic Charitable Institute is a 2 ½ story Italianate hall. The timber-framed building is five by three bays with a single-bay gable entrance hall projecting from the center of the south side. The New England Masonic Charitable Institute was constructed in 1858 on a rise, overlooking the village of Drake's Corner (now Center Effingham) (Figure 13).

The building sits at the southeast side of the lot, on the north side of Town House Road, a rural local road that runs east-west between NH Route 153 in Center Effingham and eventually connects to NH Route 16 to the west through Jones Road or Champion Hill Road, in Ossipee. The Hall sits on a knoll, overlooking the small rural village. Most of the tax parcel is taken up by a large asphalt parking area, which is bounded on the west, north, and northeast by trees. There is a small grassy area at the edge of the hill to the southeast of the building, adjacent to the primary entrance. A set of stairs in the hill leads from Town House Road toward the building. There is a flagpole at the southwest side of the top of the stairs and a small veterans memorial, installed in 1933, to the northeast.

Figure 14: 1933 Veteran's Memorial

A Veteran's Memorial plaque was installed in front of the entrance of the New England Masonic Charitable Institute in 1933, when the Institute was used as the Effingham Town Hall (Figure 14). The memorial is located at the top of the landscaped stairs and consists of a bronze plaque mounted onto a rectangular piece of rusticated granite. The plaque lists all of the Effingham Men who served in the Revolutionary War, War of 1812, United States Civil War, and World War I.

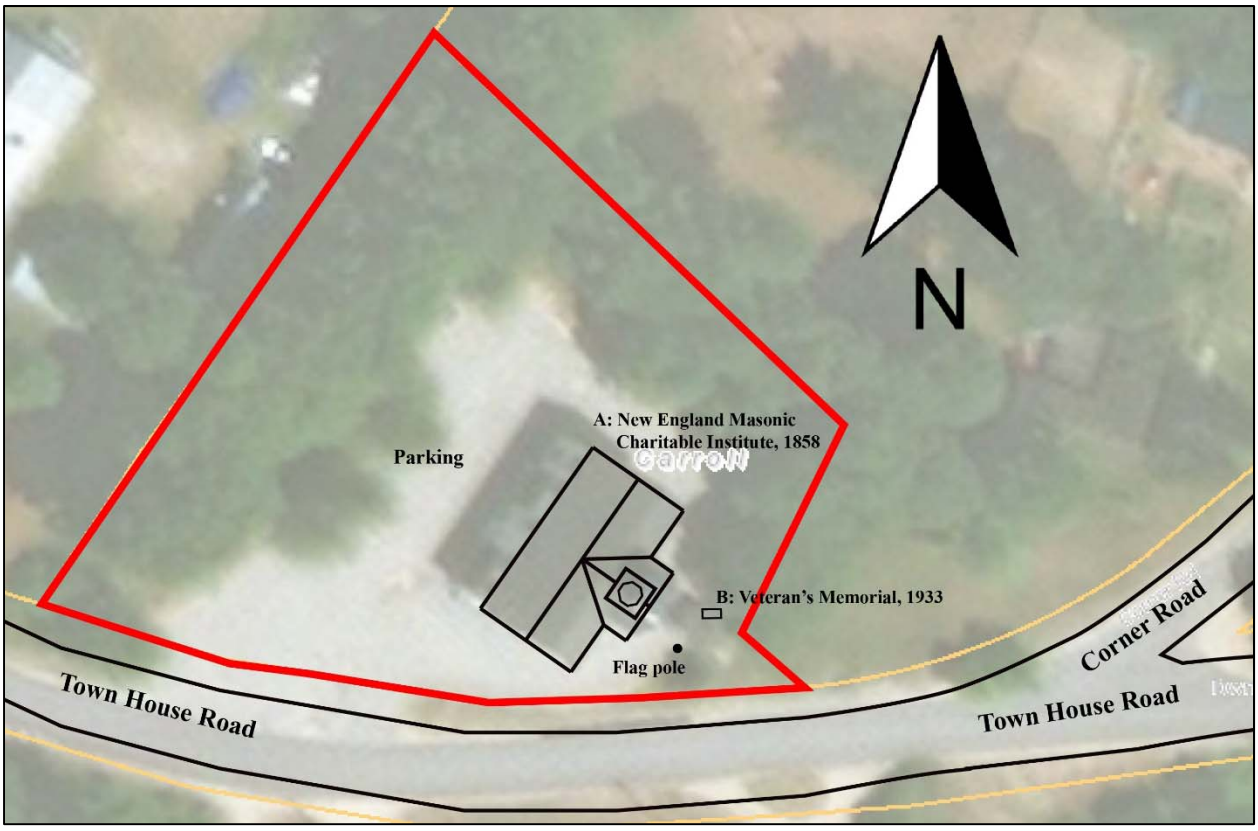


Figure 15: Location of the New England Masonic Charitable Institute

Character-Defining Features of the Site		
Primary Features	***Secondary Features***	***Non-Historic Features***
• *Veteran's Memorial (1933)*	• *Flag pole*	• *Parking Lot*

Figure 16: New England Masonic Charitable Institute, facing northeast.

Exterior Description:

The Italianate New England Masonic Charitable Institute is five by three bays and sits on a granite pier foundation, which is now infilled with brick to create an enclosed crawl space (Figure 16). The building has a hewn timber frame, and asphalt shingle roof. A 2 ½ story full-height entrance vestibule/stair tower projects off of the central bay of the primary façade, and supports a three-stage bell tower.

The timber frame building sits atop plug-split granite piers. The area between the piers is infilled with mortared brick (Figure 17), and the asphalt of the parking lot has been poured in direct contact with the foundation. The walls of the building are covered with wooden clapboards. The corners of the building are ornamented by heavy wooden quoins, and there are narrow flat moldings at the intersections between the main block and projecting center bay.

Figure 17: Detail of foundation

Figure 18: Detail of eave ornamentation

Figure 19: Primary Entrance

The roof of the building is sheathed in asphalt shingles. The cornice ornamentation is typical of the Italianate style, with widely projecting boxed eaves supported by paired scroll-sawn brackets (Figure 18). A crown shingle molding ornaments the fascia. The soffit is flat with a denticulated bed molding with wide frieze board. The scroll-sawn brackets are further decorated by drops. There are wide cornice returns at the gable ends.

The primary entrance to the New England Masonic Charitable Institute is through a projecting bay at the center of the southeast side (Figure 19). A set of modern wooden steps leads up to a small entrance porch. The porch is sheltered beneath a heavy entrance hood. The hood is supported by very large brackets, matching those of the building's cornice. The cornice of the hood is decorated to match that of the main building. The roof of the entrance hood is flat, and encircled by a low balustrade.

The primary entrance is through a pair of double four panel doors with very tall narrow panels above the lock rail and short nearly square panels in the lower section. The doors sit on loose-joint butt hinges and

have a modern thumb latch. There is a 10-light transom window above the doorway, and there are 10-light sidelights flanking either side. A Colonial-Revival style hanging light fixture dangles from the ceiling of the hood, above the entrance.

There are three secondary entrances to the New England Masonic Charitable Institute, all of which are located at the northwest side of the building. There is an historic doorway at the center of the rear (northwest) side of the building, directly opposite the main entry. This entrance has a set of paired four-panel doors (matching those of the opposite elevation), beneath a six-light transom (Figure 20). The doorway sits atop a high wooden threshold and has flat trim and is crowned by a flat hood molding supported by three brackets with drops, mimicking those of the cornice. Additional secondary entrances are located on either side of this doorway. These early 20th century entrances were augmented in the late 20th century to provide accessible entrances and exits to the building. The modern entrances each have wheel-chair ramps leading to modern doors with flat trim. Each ramp and entrance is protected by a shed roof which is supported by four square columns. There is also a modern basement bulkhead at the northeast corner of the building.

Figure 20: Central door at northwest elevation

The fenestration of the New England Masonic Charitable Institute is regular, with evenly spaced windows throughout the building. Each original window has 6/6 double-hung wooden sash with narrow muntins. The windows are each crowned by hood moldings, supported by scroll brackets. Each window has a matching projecting bracketed sill and is flanked by a pair of louvered shutters. The one exception to the regular windows is a single modern 8/8 window that was added to the northwest elevation in the late 20th century to light a municipal office on the first floor. Each gable-end of the building has a set of paired 4/4 windows at the attic level, with similar trim to that found throughout the rest of the building.

Perhaps the most striking feature of the exterior of the New England Masonic Charitable Institute is the bell tower and belfry above the entrance portico. The bell tower has three levels. The base of the tower has vertical plank sheathing. The square tower above the roof of the building has very wide flat corner boards with vertical planks between. There is a decorative Masonic seal in the southeast side of the tower at this level. Clock faces decorate the northeast and northwest sides.

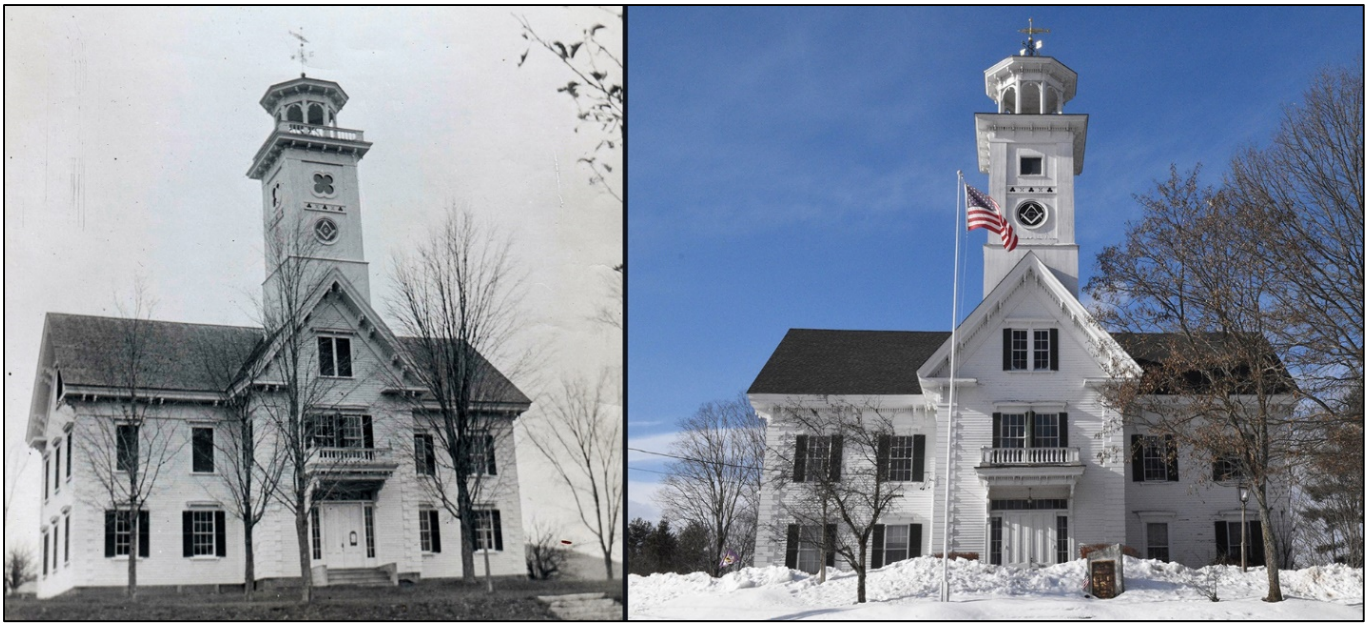


Figure 21: New England Masonic Charitable Institute in ca. 1900 and 2019

A decorative belt course with alternating triskelion and cross patterns articulates the floor level between the tower levels. The upper level of the tower has large square plexiglass windows with flat casings in each elevation. Historically, the tower at this level was decorated with quatrefoil (cloverleaf) windows at each elevation (Figure 21). The historic windows were removed in the mid-20th century. The top of the tower is decorated with the same style cornice as that of the main building.

An open belfry sits atop the flat roof of the bell tower and protects the historic bell. This octagonal structure is supported by posts at each corner and has cornice to match the rest of the building. The space between the columns is further decorated by scrollwork arches with decorative center drops. Historically, a low balustrade encircled the bell platform and was removed in the late 20th century. The bell itself remains *in situ* on a wooden cradle at the center of the platform and is marked with the date "1833." (Figure 22). The belfry is crowned by a weathervane which was restored in 2006.

Figure 22: Bell

Character-Defining Features of the Building's Exterior		
Primary Features	***Secondary Features***	***Non-historic Features***
• *Height & massing of building* • *Roof pitch* • *Regular, symmetrical window and door locations (fenestration)* • *Tower & Belfry* • *Primary entrance portico* • *Historic window frames & sash* • *Corner quoins and paired roof brackets*	• *Side & back elevations* • *Eave details and moldings* • *Early 20th century rear entrance locations*	• *Rear accessibility ramps and canopies* • *Modern window* • *Bulkhead*

Interior Description

The interior of the New England Masonic Charitable Institute is composed of three floors: the Library occupying the first floor, the Masonic rooms of the second floor, and the attic occupying the third floor. Most of the modern changes to the building have been additive in nature and much of the interior space retains historic partitions, doors, and moldings (See plans, pages 72-73).

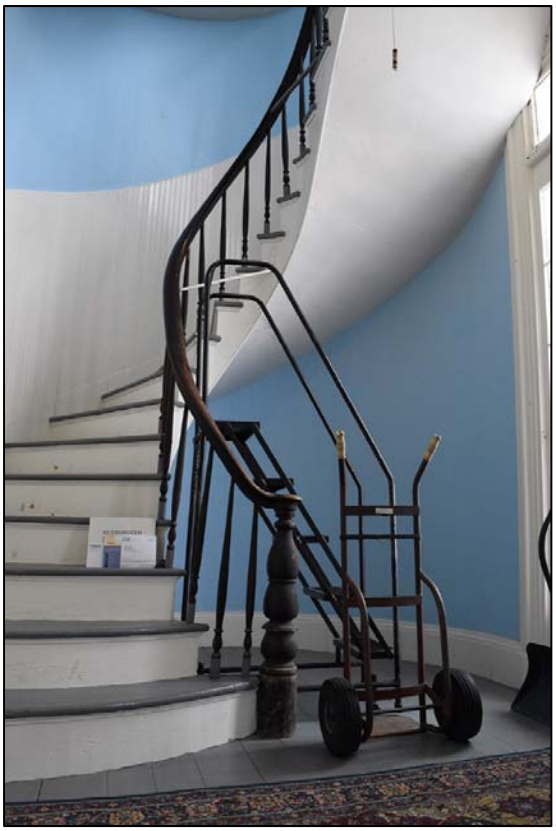


Figure 23: Entry vestibule

Effingham Public Library/First Floor:

The first floor of the New England Masonic Charitable Institute historically contained an entry vestibule and hall with classrooms on either side (one to the south and one or two on the north side). Modern partitions within these historic locations have created additional interior rooms within the historic layout as the space has adapted through time to meet the changing needs of the community.

Upon entering the building from the southeast one stands within the vestibule at the lower part of the stair hall (Figure 23). Like throughout the building, this room has a wood floor and plaster walls and ceiling. A modern interior wall on the southwest side of the room has created a small electrical closet. The northeast side of the space is occupied by a steep curved staircase. The walls of the stair have vertical beadboard wainscot. The delicate stair is suspended in the space, and the underside of the staircase is covered in smooth plaster. The stair climbs clockwise, and the curving inner

balustrade is anchored by a heavy turned newel post.

Double four-panel doors at the northwest side of the space lead into a small hall. The double-doors have a six-light fixed transom window, porcelain knob and loose-joint butt hinges. Historically this hall extended the depth of the building, terminating with the set of matching exterior doors with transom at the opposite side of the building. When it was constructed, this hallway had two doors off of either side, leading to the classroom spaces. Now, a modern wall at the northwest side of the hall was added to create a central office. What remains of the hall has plaster walls and ceiling and a wood floor. There is a central hanging light fixture. The space retains historic baseboard trim. Historic doorways on the sides of the hall lead to former classroom space. Each of these doorways retain historic trim and original four-panel doors with porcelain knobs and is suspended by loose-joint butt hinges.

Figure 24: Proscenium in West Room

The room at the southwest end of the building is now used by the library as the primary circulation room. Historically this large open room was used as a single classroom by the Masonic Institute. In the 1890s it became the Effingham Town Hall. As with most of the rooms of the first floor, the library room has a modern suspended ceiling below the historic plaster ceiling. The walls are plaster and the floor is wood. This space retains original baseboard trim and heavily molded door and window casings. There is a large proscenium at the northeast wall, behind the modern circulation desk (Figure 24). Markings on the floor indicate where a single step platform or stage once extended into the space. The use of vertical bead-board above the decorative wooden arch suggests that this stage was not part of the original interior layout of the building and was more likely constructed in ca. 1890, when the building was renovated for use by the Town. A window has

been cut into the interior wall beneath the arch to create a pass-through between the office and circulation desk.

Figure 25: Transom window above former door

An original door at the northeast corner of the circulation room leads into a small library room that was part of the historic hallway before it was used for file storage by the Town. The paired entry doors at the northwest wall have been fixed in the closed position and are covered over on the interior by a sheet of paneling, completely obscuring the doors from view. A window well in the suspended ceiling above, allows light into the space thorough the six-light fixed transom window (Figure 25).

A door at the northeast side of this space leads into what is now the Children's Room. Historically the northeast side of the building appears to have been divided into two classroom spaces with a plastered wall with four-panel door on loose-joint butt hinges dividing them. The western room was divided in the late 20th century to create what is now the Children's Room, a small hallway and two small bathrooms. Until 2004, the Children's Room was used by the Town of Effingham Tax Collector. While used by the town, a modern 8/8 window was installed within the northwest wall and the early 20th century exterior door was replaced by the modern steel door. An exposed single-flue brick chimney is located at the southeast corner of the Children's Room, and likely dates to the Town Hall era in the 1890s.[115] This now abandoned chimney extends up through the second floor and attic above, and terminates below the roof.

Figure 26: Exposed chimney in Children's Room

[115] This chimney may have been installed by 1892-1893, as the *Town Report for the Fiscal Year Ending March 1, 1893* lists payments related to the installation of a stove in a Town building (unfortunately no specifics are given). George W. Shaw was paid $1.34 freight for carting stove and C. F. Merrill paid $0.62 for stove faucet (*Annual Report of the Town officers of the Town of Effingham for the Fiscal Year ending March 1, 1893.* Manchester, NH: John B. Clarke Company, 1893).

Figure 27: Stair landing

An historic opening in the southeast wall of the bathroom hall leads into the large East Room. Though the historic door is no longer in place, the opening retains the historic hinges and a four-light transom window. The East Room was used as a classroom by the Masonic Charitable Institute and served as the Effingham Public Library between 1893 and 2004. This room is now used as a public meeting room. The space retains historic plaster walls, window casings and vertical board wainscot along the southeast and northeast walls. The floor is carpeted, and modern counter and cabinets have been installed along the interior walls.

Charter Oak Masonic Lodge/Second Floor:

The rooms of the upper levels of the New England Masonic Charitable Institute remain largely unchanged from their ca. 1860 historic layout and finishes. Throughout the second-floor historic baseboard trim and molded door and window casing remain, as well as historic plaster finishes.

There is a large landing at the second-floor level within the stair hall. This hall has a wide board wooden floor and plaster walls and ceilings. A 1930s-era light fixture hangs from the ceiling within the stair hall, illuminating the steps (Figure 28). This fixture may date to when electricity was first installed in the building. The curved stair continues upward from the landing at a lower pitch. When it reaches the southeast wall, the ascent is interrupted by a vertical plank door. Behind the door the stairs straighten, as they ascend to the attic level.

A doorway in the northwest wall of the stair hall leads into a small vestibule. Heavy cased interior doors from this space lead to a public meeting room at the right (northeast) and the private ante-rooms of the Masonic Hall to the left (southwest). The floor of the vestibule is painted wood, and the space retains historic baseboard molding and an historic metal hook coat rack along the stair hall wall. The vestibule room has a suspended ceiling beneath the original plaster ceiling.

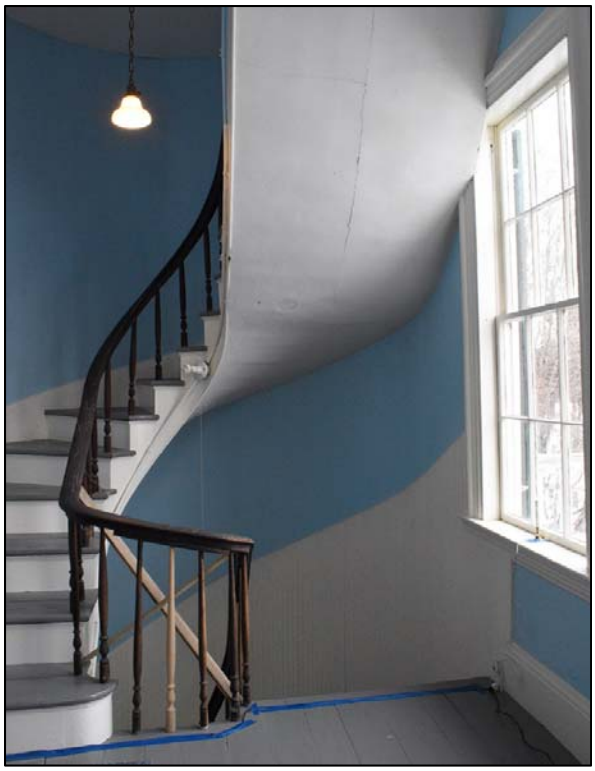


Figure 28: Stair landing

Figure 29: Masonic Meeting Room

Figure 30: 1930s light fixture

A large public meeting room makes up the entire width of the northeast end of the building (Figure 29). The meeting room retains unpainted wide-pine flooring, plaster walls and ceiling, as well as original baseboard trim and window and door casings. An exposed single-flue brick chimney is located at the southeast wall and was likely added when the first floor was converted for use as the Town Hall in the 1890s. Two large molded glass art-deco style light fixtures hang from the ceiling to light the space (Figure 30). These fixtures likely date to the 1930s, when the Town Hall was first wired for electricity.

The south corner of the second floor is divided into a series of private ante-rooms and closet that are used by the Masons. Each of these rooms has a modern suspended ceiling and carpeted floor. The rooms have four-panel interior doors with porcelain knobs and decorative metal key hole covers and are suspended on loose-joint butt hinges. The rooms retain historic plaster walls, baseboard trim, and window and door casings.

The rest of the second floor of the New England Masonic Charitable Institute is devoted to the Masonic Lodge (Figure 31). The lodge room has plaster walls and ceiling and carpeted floor. Platforms around the edges of the room elevate benches for the Masons and there are daises at either opposing end of the room and a ceremonial table at the center, beneath a spotlight.

Figure 31: Masonic Hall, facing North

The entire surface of the walls and ceiling of the Masonic Lodge room are covered in the elaborate *trompe l'oeil* paintings of Philip A. Butler of Boston. *Trompe l'oeil* refers to a type of painting in which the artist used optical illusion to "trick the eye" into perceiving painted detail as three-dimensional objects. Here, Butler created faux panels, implied wainscot and denticulated crown molding, and engaged columns on either side of a painted cloth-draped dais. The faux architectural details of the room are further painted to simulate marble, adding a level of grandeur to the space. The center of the ceiling, within the elaborate marble "panels" depicts the night sky, with a dark blue ground and delicate gold stars. A series of four early to mid-20th century suspended pendant light fixtures dangle from the corners of the night sky, and there is an elaborately painted modillion at the center of the room which surrounds a modern spotlight over the altar. When it was painted, a chandelier likely hung from this location. The other light fixtures were probably added in the 1930s to illuminate the space.

Elaborate distemper paintings within the panels of the walls depict Masonic symbols. Some of the panels are made up of small vignettes, such as the All-Seeing Eye above the Sun, Moon, Stars, Noah's Ark, and Anchor, and etc. (Figure 32). Other paintings are figural, such as the tryptic along the northwest wall of Faith and Hope on either side of Charity. Still other panels depict

architectural scenes, such as golden columns supporting the terrestrial and celestial globe on either side of a marble staircase. All of the paintings of the Masonic Lodge were heavily damaged during the roof replacement project in the late 1980s and the plaster was repaired with minimal cleaning and minimal infill painting in 2004 by John P. Canning Co. of Connecticut.

Figure 32: Example Masonic Hall panels

Attic/Third Floor:

The third floor of the New England Masonic Charitable Institute has been used as storage since at least the 1890s. This level is divided into the top of the stair hall and a hallway leading into a large attic room with small unfinished attic spaces along the sides within the eaves. The walls and ceilings of the two rooms are all covered in historic plaster. In many places this plaster has fallen away to reveal the riven (split board) lath beneath. The floors are roughly finished pine boards, with clearly marked circular saw marks and little wear, suggesting that this space was rarely used. The trim throughout this level is simplified in comparison with that of the first and second floors of the building, with flat window and door casings and simple baseboard trim. Late nineteenth and early twentieth century graffiti are found throughout the space. Though some of the graffiti documents early 20th century repairs to the space, some of the graffiti may date to the early years of the building.[116]

[116] A cursive pencil inscription at the edge of the floor between the second and third floor within the stairwell says "Thomas Drake" and may have even been left by the patron of the building. Another inscription near the window in this room lists all of the numbers from 1 to 22 and may have been left by one of the Masonic Institute's students.

Figure 33: Possible graffiti signature of Thomas Drake at top of attic stairs

A very steep straight flight of steps leads from the top of the curved stairs between the second-floor stair hall and this attic level. The door casing at the end of the intersection between the hall and attic suggests that there was once an interior door at this location (Figure 34). The attic itself is a long narrow room which is well-lit by the paired windows at either gable end (Figure 35). The room is interrupted by the top of the ca. 1890 brick chimney, which terminates just below the ceiling (Figure 36). This room contains many mid-to-late 19th century desks and other furniture.

Figure 34:View from Stair Hall toward Attic

Figure 35: Attic, facing north

Figure 36:Chimney

Figure 37: Desks in Attic

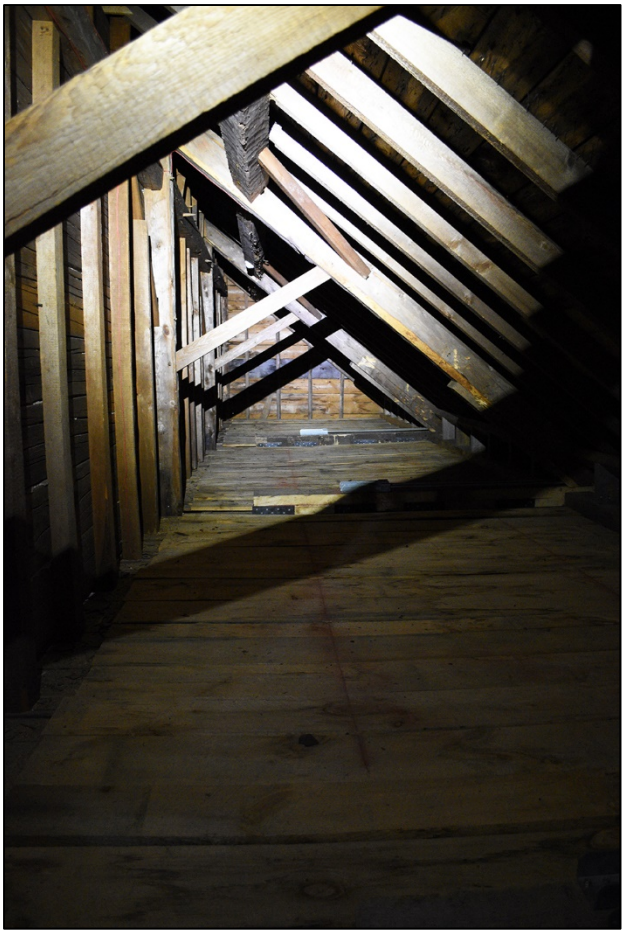


Figure 38: Northeast eave showing 2006 repairs

Figure 39: Unaltered southeast eave

The eave space along either side of the attic room is accessed through openings in the walls. A low cased door to the north of the chimney allows access to the northwest eaves. Much of the framing within the northeast eave was altered in 2006 to increase the rigidity of the building frame. When constructed in 1858, the roof rafters bore weight on the end of the floor beams, outside of the wall plate. At an unspecified time the past, diagonal braces had been spiked into the sides of the original trusses to keep the chord from slipping off of the building. A secondary doorway into the northeast corner of the attic room was likely added during this historic attempt at repair. In 2006, the historic repair was found to be in failure, the diagonal braces were removed, and replaced by horizontal tie beams, drilled through the historic framing members at the floor level (Figure 38). The southeast eaves were also inspected (though a regular-sized historic opening at the southeast corner of the attic) in 2006, but no changes were made to the framing in these areas (Figure 39).

Bell Tower/Belfry:

A stair from the third-floor stair hall leads up into the tower (Figure 40). This stair has winders at the base and a square post and railing. The underside of the stair is plastered, with a delicate curved base at the bottom, tying in behind the baseboard trim. The interior of the New England Masonic Charitable Institute tower is unfinished with the structure's framing exposed. The corner posts of the tower are all hand hewn with the secondary members of the framing made from sawn dimensional lumber. Ladders from the tower base lead to two more floors within the tower, then out through a heavy trap-door onto the bell platform. Additional cedar poles were added in ca. 1908 to each corner of the tower in an effort to stiffen the structure (Figure 41). The interior floors of the tower were replaced during late 20th century renovations in an effort to stiffen the tower under wind loads. As previously stated, the historic quatrefoil windows of the upper room of the tower were removed in the mid-20th century and replaced by the present square plexiglass units.

Figure 40: Stairs from attic-level to tower

Figure 41: Tower framing

The belfry of the tower was restored in 2006. At this time the asphalt roll roofing of the flat bell platform was removed and replaced with sheet copper. The belfry was lifted to the ground level so that it could be restored, and the historic iron and gold leaf weathervane was also refurbished.

Character-Defining Features of the Building's Interior		
Primary Interior Spaces	***Secondary Interior Spaces***	
Vestibule/Stair Hall *West Room* *Masonic Lodge* *Meeting Room*	*Children's Room* *Ante Rooms* *Attic*	
Primary Features	***Secondary Features***	***Non-Historic Features***
• *Historic interior doors* • *Window and door surrounds* • *Open spiral stairwell and associated ornamentation* • *Proscenium in West Room* • *Bead-board trim in East Room* • *Paintings in Masonic Hall* • *Unobstructed space in Masonic Hall & Meeting Room*	• *Plaster finishes outside of lodge* • *Wood floors* • *1930s light fixtures* • *Attic graffiti*	• *Modern interior dividing walls at first floor* • *Suspended acoustic ceilings*

Assessment of Condition

Foundation

The foundation of the New England Masonic Charitable Institute is unique in its use of vertically placed granite piers supporting a building's timber sills. Early photos of the building show brick masonry between the piers, but at some point this brick was removed and replaced (from the exterior) with a masonry assembly consisting of a brick veneer course laid with a cast concrete block backer course infilling between the stone piers. The replacement brickwork was laid at an unknown point of time and frequently exhibits a gap above the masonry, likely related to seasonal frost action occurring under the apparently shallow footings of the

Figure 13: Unique Building Foundation – Granite posts at perimeter of building with non-structural brick infill masonry

infill construction. The relative success of this foundation system to limit movement of the frame is thought to be due to the depth of the granite piers being sufficient to bring the bottoms of the piers below the frost line. The foundation excavation being hand dug, placing piers this way would have required substantially less effort than excavating a continuous trench at the same depth. At the north corner of the building, a small concrete block basement mechanical space has been added under the building, altering the original foundation in this area.

Figure 41 – Infill masonry does not contact building timber sill above, sparing the building frame from frost related damage.

It appears that this granite pier assembly has worked to keep the building relatively stable over the nearly 160 years since the stone piers were originally installed. This is important, as movement of the frame combined with poor keying of interior plaster would put rare and highly detailed murals painted on the walls of the Masonic Hall at risk. The building has experienced some movement and will likely continue to do so until several foundation issues are resolved.

The depth of the granite piers below grade is unknown, but the limited movement of the building over time indicates that they are likely bearing below frost level most winter seasons. No records exist of the depth of the previously removed northeastern pier. To understand the existing condition, it is recommended that a single foundation pier near the west corner of the building (farthest from the murals) be hand excavated at the northeast gable wall to determine the depth of the pier. The sill and the infill masonry adjacent should be supported during the excavation. Excavation should stop if the pier base is deeper than five feet below grade and then a second pier on the southeast side of the building north of the entry should be hand excavated in the same way. If any pier shifts during the excavation, the stone should be re-set and cast into a poured concrete footing placed on undisturbed soil no less than five feet below grade. If the bottoms of the piers are found to be less than five feet below grade, then the entire foundation should be protected from frost through the installation of a skirt of rigid insulation extending out from the foundation below grade approximately a foot above the elevation of the bottoms of the piers.

The brick face of the infill masonry is generally in fair to good condition on the east facades of the building. Mortar work between the bricks is generally clean and sound, but substantial gapping commonly occurs where the brickwork meets the masonry piers. These openings should be closed with an appropriate masonry caulk rather than additional mortar, which has not worked in the past. The infill masonry is not structural and should not be made so by filling open gaps at the building frame or piers with non-flexible materials. At an area of concern at the southwest façade, the infill brick walls are in poor shape with missing mortar and some entire sections of these very short walls overturning. It is surprising to find this kind of movement isolated to a gable end wall and this indicates that the movement is likely the result of forces other than splashback, the common cause of mortar washout at the base of walls. At this

Figure 42 – Overturning infill masonry with extreme mortar wash-out at southwest facade.

building, the challenge appears to be a combination of movement of the shallow foundation footings nearer to the west building corner (perhaps related to of previous excavation of the crawl space behind these short walls) combined with a site condition that directs stormwater runoff along this face of the building. This flow of water allows washout of the mortar in and possibly through the wall. A perimeter drain set in well-draining gravel should be installed around the building to remove bulk water. This will require the removal of some amount of asphalt parking surface, which will be healthy for the building. At the northwest façade, the building foundation is almost completely hidden by a combination of modern entry porches and high site grading very near the top of the foundation wall. This condition is very concerning for the health of the wooden sills, which should be inspected for water damage and replaced as necessary.

Figure 43 – Original granite pier at north building corner remains. Original masonry has been removed and a small basement space is accessed via bulkhead in need of repair.

A concrete block foundation at the building's northeast façade, near the north corner, is a full height basement space with a narrow shed style bulkhead. The foundation block is in good condition but the absence of a concrete floor slab or a vapor barrier inside the mechanical space should be addressed. There is clear evidence of excessive moisture in the space, a condition which is a threat to the building structure as well as to the already rusty mechanical equipment in the space. A vapor barrier and a sump should be also installed to address water problems in the space and the perimeter drain around the building should drop lower in this corner to dry out adjoining damp soils.

The height of the crawlspace under the building was increased in 2007 when the crawl space was hand excavated to be a minimum of 18" high with a vapor barrier installed throughout and rigid insulation added to the exterior walls. Here some historic granite piers remain, and new timber piers sit on concrete footings. A large cast concrete foundation block which apparently once supported the Town Clerk's vault and/or the now abandoned chimney should remain in the crawl space but loose stones should be removed as required to extend the existing vapor barrier over the whole of the crawlspace area. The existing vapor barrier should be extended over any area where it has not been previously able to be installed. A new concrete pier and timber post should be installed under the unsupported column in the children's room above, similar to the manner other posts have been set on new footings in the crawlspace. This particular pier will be in the backfill area of the added basement wall and will require deeper hand excavation to set the footing on undisturbed soil rather than back-fill material near the basement wall.

Once all foundation modifications are complete, consideration might be given to adding a layer of rigid insulation to the floor of the crawl space and protecting it with a thin concrete "rat slab". This would both improve both the energy performance and achievable comfort levels in the library above the crawl space. Insulation should not be placed within the floor framing of the first floor platform above the crawl space unless the crawl space is otherwise conditioned. It is recommended that no consideration be given to adding any vapor retarder to the underside of the floor frame. Crawl space vents intended to be closed seasonally were found to be open during the inspections. These should be regularly closed in winter and summer, and opened again only in the spring and fall drying seasons. The southeastern vent south of the building entry has an interior screen which

needs to be securely reinstalled to keep rodents and small mammals from having access to the crawl space. Insulated covers should be made for closing the vents in the heating season.

Exterior Envelope

The New England Masonic Charitable Institute is clad in painted clapboard and dressed with an elaborate set of wooden Italianate details, all needing to be painted. The tower and belfry were last painted at the time of the belfry repair in 2007 and the remainder of the building was painted in 2008. Paint can provide a sound, weathertight finish on a building, but the surfaces must be properly prepared and the finish regularly maintained. The town of Effingham should establish a schedule of inspecting and maintaining the finishes on this important town structure. A regular part of this effort should be the maintenance of the paint and roofing finishes.

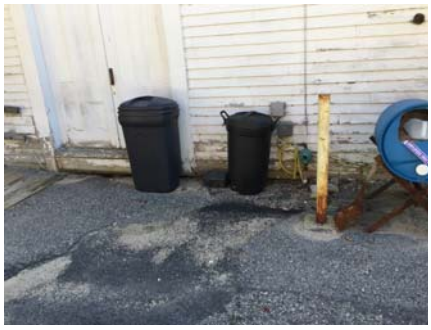


Figure 44 – Wood Clapboard siding (with timber sill behind it) in direct contact with pavement. Investigate for sill damage.

The clapboard finish is exposed 3 ½" to the weather. Clapboards around the building are generally good condition with localized damage typical where water splash back has made its way behind the paint finishes such that the clapboards have been regularly wetted. This condition allows for deterioration of the wood itself. At the area near the original northwest facing doors, the clapboard finish is in direct contact with paving adjacent to the building. The paving should be removed from contact with building and the grade should be adjusted so that it meets the foundation no closer than 8" below the siding (and the sill behind it). Water damaged clapboards near the building's sills should be removed and replaced. The sills, once uncovered, should be carefully inspected and replaced if/as necessary. This likely includes the entire length of the sills between the porches on the southwest façade. Other areas where clapboards are damaged include the tops of the western porch roofs where the roofing meets the siding and at several locations above the window crowns all around the building. Copper head flashing could be readily installed at the window pediments at this time. All remaining clapboard finishes on the building should be hand scraped and sanded in a lead-safe manner and prepared for re-painting, including priming for all unpainted surfaces. The southwest façade has some of the worst paint failures on the building with dramatic levels of peeling paint and, but the northwest façade has several areas of wood damage by long term wetting.

The elaborate detailing on the NE Masonic Charitable Institute make the building much more time-consuming to re-paint, but it is important to retain the original materials wherever possible. Wooden quoins at the building corners frequently exhibit paint failures, especially near their top surfaces. At the west building corner, the bottom quoin(s) has been broken, perhaps by a combination of water based decay and/or the impact of an automobile bumper. The sheathing behind the missing quoin should be inspected and replaced if necessary prior to the installation of new quoin(s) fabricated to match the original intent. The relatively flat tops of the pedimented crowns above the windows are in several locations entirely devoid of paint, which without flashing had previously been tasked with performing as roofing for the pediment. A better solution would be to fabricate full size copper drip caps over every window crown on the building, beginning with those that already require repairs to the siding adjacent to the window crowns as discussed above and proceeding through the rest of the list of windows, starting with those nearest the ground.

Brackets, drops, dentils, and moldings are generally better protected on building's exterior because of their large surface areas providing good drying potential as well as their relatively sheltered locations under the building's eave, rakes, and window crowns. Most of the shutters are in poor to fair condition. Loose paint should be removed and the shutters reinstalled after being repainted.

Tower and Belfry

The three stage tower was last painted in 2007 when the belfry was lifted from the building and restored along with its weather vane. The tower is approximately eighty feet tall to the base of the weathervane and 68' tall to the tower roof that supports the bell cradle. Visual inspection from the ground reveals the paint finish to be in fair condition with paint adhesion on the tower better in most places than other paint finishes on the building. After more than a decade of exposure to New Hampshire's weather, all of the tower needs to be repainted. On the lowest portion of the tower, the walls are built-out over horizontal furring to visually form a base for the tower. Where the vertical siding boards meet the roof of the gabled entry, they are discolored at their bases. This discoloration may be related to a suspected roofing problem which will be discussed in the roofing section of this report. All four sides of the base of the tower should be scraped and painted.

The middle section of the tower is also constructed with a vertical board finish, in this area built to create an ornamented, recessed panel visually set within a thicker frame. The tower walls step inward at the base of the second stage and the cap on this shelf has an irregular appearance that indicates it may be water damaged, especially on the west façade. This cap should be inspected and the flashing replaced or new flashing installed over the first stage cap and behind the second stage siding. A drip cap should also be installed where vertical boards of the recessed finish meet the flush horizontal member at their base. New cap flashing should be installed over the decorative horizontal band which bisects each recessed panel around the second stage. Composed of a flat band with cut-out symbols with an extending horizontal cap and base, these three piece bands are generally well painted but are likely places for damaged wood and paint adhesion problems. Damaged woodwork should be repaired with an epoxy consolidant as part of the repainting process.

Below the bisecting horizontal band, at the northeast face of the second stage, a round, applied molding encircles a painted version of the compass and square symbol of the Masons. The black paint is in fair to good condition but will need to be repainted with a skilled hand. On the other three sides of the tower at the same level, a painted clock face with painted hands will also need to be repainted, each with their own different time as existing. The reason for the discrepancy between the different times on the three faces is unknown but should be preserved. Above the bisecting band, each face of the tower has a fixed plexiglass panel which replaced the quatrefoil windows seen in historic photos of the building. Above the windows, a wide frieze board wraps the the tower to which regularly spaced brackets support wide eaves appointed with crown moldings and dentals similar to those of the building's eaves, all painted and in fair condition. From top to bottom, the middle stage of the tower should be repainted. The uniform finish should be carefully repainted in conjunction with the restoration of the painted clock faces and masonic symbols.

The open belfry stands atop the enclosed tower with paint in fair condition. The wide overhang of the eight sided belfry roof gives good cover to the painted open arches at each belfry face as well as the bracketed eave construction that is similar to that of the belfry platform extension. Horizontal surfaces and the joints where the arches meet the corner posts may require additional prep work

prior to re-painting. The cradle supporting the bell experiences less drying than the open work above and the simple timber elements should be hand scraped and consolidated prior to painting.

Building and Tower Timber Frames

Constructed ca. 1858, the NE Masonic Charitable Institute building built with a five bay timber frame clear spanning the second level of the building. Where accessible to view, the building's structure and its organization have been documented in drawings prepared as part of structural repair project undertaken in 2007.

The first floor frame is composed of hewn timber primary beams generally spanning across the narrow dimension of the building. These hewn beams are let into the perimeter sill beams and bear along their lengths on various posts in the crawlspace. Between the primary members, floor joists cut from raw logs and with their bark still on, are cut with tenons let into the primary structural members. The frame is thought to be in generally good condition. Additional piers in the crawl space have been used to reduce the original spans of some timbers, resulting in additional capacity and less flexure in the main level floor, which is not reported to be over-flexing. No structural evaluation of load capacity of the floor has been made as part of this report. The sills of the building are an area of particular concern as it appears that the paved grade to the northwest of the building is in direct or close contact with wood siding on the face of the timber sills. Eight inches is the prescribed separation between the grade and the nearest elements of wood construction according to the New Hampshire Building Code, set specifically to prevent decay of wood. It is likely that the timber sills on this side of the building may be deteriorating as a result of contact of bulk water with the timber sills, as well as wicking of dampness through the foundation wall.

The exterior wall and second floor construction is hidden behind the interior building finishes and is undocumented. It is anticipated that the corridor walls and two lines of posts running through the original classrooms support beams spanning the short dimension of the building, with sawn floor joists spanning between the primary carrying members. Any effort to stiffen the second floor in the future will require investigation of the framing. The third floor framing can be readily observed and it is thought that the second floor frame is likely to have been framed similarly with hewn primary beams and sawn floor joists let into the primary members with locking tenon joints. The primary floor beams are all sized identically regardless whether they clear span building width or pass over partitions in the space below. The walls below, therefore, are not considered to be structural.

The roof frame is also composed of hewn primary members with sawn roof purlins let into the primary structural frame. The original construction had these roof purlins bearing on the ends of the floor beams, a detail that led to failures as the ends of the primary rafters slid toward the ends of those beams. Attempts at repairs were made twice to stop this movement. In the first repair, 2x framing materials was installed to attempt to tie the rafters to the floor beams and spiked in place. This worked more effectively on the northeastern side of the building where the spans of the flying rafters are shortened by the intersecting entry gable. At the southwest eave line, the original repairs were inadequate and a second set of repairs was made in 2007 which allowed for the bases of the primary rafters to be not only secured but also pulled inward nearer to their original position. Since the time of those repairs, technology has improved and the structural engineer now recommends protecting the previously untouched roof purlins from splitting at their bearing tenons by driving two screws at each end of each purlin, an inexpensive insurance against a very common

problem. As repaired, the roof faming is in good condition. The roof frame should be inspected every three years with a record kept of observations and noted changes.

The tower is built with hewn corner timbers and sawn secondary wall and bracing materials. It stands on a pair of timber spanning between the front wall of the center gabled entry and the top plate of the northeastern eave wall of the building's main block. The floor (4th floor) within the bottom stage of the tower is framed with sawn floor joists and finished on its bottom side with a plaster finish. The two floors above, both within the tower's middle stage, are framed with round poles. Apparently as an attempt to stabilize the tower in the wind resulted in the installation of additional long cedar poles forming cross bracing within the tower and pegged to the tower framing. All of the tower framing described thus far is in good condition. Several feet below the top of the closed tower, horizontal girts spanning across the tower corners in turn support two legs each of the belfry above the roof. Three of four of these beams were replaced in 2007. In the interim, the installed timbers have diminished in size because of drying and the bolts, which hold the belfry down to the timbers, have become loose. The bolts should be removed and reinstalled with washers inserted to remove the play in the connection. As with the roof purlins, the Structural Engineer recommends that the corner beams be reinforced with screws at the shoulders of the tenons. Above the roof, the belfry legs are wrapped on five sides with finished boards and the remainder of the belfry structure is hidden behind the exterior finish. The belfry seems to be sitting straight and true and is not suspected of having developed any structural issues since it was last repaired.

Roofing

The roofing on the NE Masonic Charitable Institute is primarily asphaltic architectural shingles. The shingle roof of the belfry was not inspected. These shingles are believed to be three tab flat shingles with a copper cap at the base of the weather vane located at the pinnacle of the eight side roof. The roof below this on the top of the enclosed middle stage of the tower is a soldered copper roof installed in 2007 upon which rests the cradle of the bell, installed when the building was used as a school. The copper roof is integrally flashed with the belfry corner posts behind their board finishes. There is no sign of any water penetration through or around this copper roof, and it should last another forty years. Historical photos show a short decorative balustrade around the perimeter of this roof and an interested community member has fabricated a collection of turned balusters for a replacement railing. These balusters, now stored on the building's third floor, have all been sawn in half lengthwise to double the count available for the railing installation. The found historical photos in which the railing appears are taken from too great a distance to clearly see either the railings or the corner posts. There is a railing seemingly constructed with the same half balusters already installed on the entrance hood over the front door and this railing includes paneled faux corner posts at its exterior corners. Any installation of a new railing on the copper roof

Figure 45 – Unvented architectural asphalt shingles on building main block (as seen from tower window)

must be detailed to prevent water entry through the roof while securing the railing to the roof adequately to resist the high winds at the top of the tower.

Figure 46 – Staining at tower connection to roof may be related to headwall flashing at double wall

The roofing of the main block of the building is of architectural asphaltic shingles, in fair condition but with an area near the back (southwest) side of the tower apparently having been stripped of the shingles in a recent wind storm. It has been reported that water has been making its way past the tower has gone on to stain the ceiling tiles in the Mason's area. This area should be repaired with shingles to match the existing in color and texture as soon as possible. Where the vertical siding boards meet the roof of the gabled entry, they are discolored at their bases. This discoloration may be due to a suspected roofing problem related to the double wall construction of the tower at the lower stage where it meets the roof. The base of this wall should be inspected to verify that the roofing is flashed to the interior of the interior wall. .

In considering the staining at the bottoms of the siding on the each side of the tower, there may be a headwall flashing problem at the joint of the tower's double wall and the roofing. The vertical wood siding does not shed water as well as many other siding types because of the vertical joints which may open and close seasonally. It may be that wind driven water is getting through the outer wall finish and then running down the face of the interior sheathing until it reaches the point where the inner wall meets the entry gable roof. It seems likely that the vertical siding is wicking water upward from where each board's end touches the roof. The eave flashings seem to be doing their job well at the perimeter of the main block, but not at the drip line of the porch roof at the northerly ramped porch. Here, water infiltration seems the likely cause of damage to the eave fascia. At the top of this porch roof, no headwall flashing appears to have been installed.

Figure 47– Water damage at porch fascia related to improper drip edge

Figure 48– false corner posts at balustrade on entry canopy roof limit penetrations through EPDM roofing

The roof on the entry canopy is of EPDM reportedly without problems. A low balustrade with false corner posts extends around the nearly flat surface which pitches away from the building to the front eave line. The balustrade has flat top and bottom rails all in need of painting and actually bears on a 3"x3' or smaller mounting block at the corners. The lowest and most poorly installed roofing on the building is that on the bulkhead door covering the basement stair. This trap door is hinged at its top edge and was once faced with exposed asphalt roll roofing, now covered over with tongue and groove painted pine. The earlier roofing is visible were the western most board has been pulled off. The door does a fair job of keeping precipitation from getting into the basement, but it's more important job is keeping snow from out of stairwell, into which the door of the basement opens.

Figure 49 – Asphalt roll roofing on bulkhead covered with failing v-groove pine.

Entries and Windows

The intended primary entry of the NE Masonic Charitable Institute is the through the double doors at the center of the two-story centered gabled entry supporting the building's tower. The outward swinging, strikingly tall four panel doors have a low lock rail above which is mounted push bar exit hardware on the interior. The thick doors are heavily molded with relatively thin flat panels, three of which are splitting on the more southerly door. The low panel abutting the lock stile should be replaced as the split has become an open gap. The other panels may remain but should be repainted soon. The doors are well worn at their bottom edges and should be repaired with new weatherstripping to better maintain internal comfort levels in the building. The painted common wood sill should be stripped and repaired with epoxy consolidant and then repainted. The rusting hinges should be cleaned, oiled and reinstalled or replaced with new bronze hinges. The aluminum astragal applied to the meeting stile of the active door should be replaced with one of painted wood. The ten lite sidelights at either side of the doors and the ten light transom above are in fair condition and should be properly painted and then protected with exterior fixed storm panels. The decorative hood above the entry doors exhibits large and small scale versions of the same brackets seen at the building's eave line. These are in fair condition and in need of cleaning and painting. The balustrade above the hood should be carefully prepped and re-painted. The entry steps are inexpensively built replacements of the the side-walled steps appearing in historical photos, with 2x pressure treated decking and open railings which don't meet current code driven safety requirements for fall prevention. At minimum, the railings should be replaced or augmented, and the entry porch repainted

At the northwest side of the building directly opposite the primary entry doors is a nearly identical set of entry doors abandoned during a previous renovation. At that time the doors were fixed in place and hidden with new wall finishes at the building interior. As long as these doors remain part of of the weather envelope, their exterior finishes should be maintained to protect the doors until a time they can hopefully be put back in use. Like the doors at the primary façade of the building,

these doors and their shared sill should be properly prepped and repainted. To improve energy performance, the doors could be caulked at the jambs and at their meeting rails. Do not caulk the gap at the sill as this is a drainage path for any water that gets behind the doors. The one cracked flat panel at the lower meeting stile of the southerly door should just be painted. The six lite transom window has had a very sloppy paint job at some point and the overpainting on the glass should be cleaned off and the window repainted again. A fixed storm window at the exterior of the transom window would increase the thermal performance of this window. When the doors are put back in service in the future, the interior faces of the doors can be repaired and repainted. At that time, the locking hardware will need to be replaced and weatherstripping will need to added to the doors and frame. The interior molded casings on this entry door may have been removed and reused at the modern entry door to the south of the fixed historic doors. New casings should be cut if the old casings are found to be missing when the interior finish is removed.

The new entry doors to the north and south of the fixed doors are modern insulated pressed six panel metal entry doors in fair to poor condition. Rust damaging the bottoms of the doors likely related to the use of salt substitute to keep ice off the entry ramps that serve the doors. Each "new" entry door on this façade is located where a historic six over six double hung window was removed. The decorative bracketed pediment above the old window locations remains, though largely hidden by the porch roofs that cover the wooden ramps leading to each door. If the center doors in this façade are put back in service, these doors could be removed and replaced again with windows. The original windows, now removed, have not been found in the building. All of the doors on this façade have exterior flat casings without the shallow reveals typical of the original window and door casings around the building. Wood transom panels fill the space between the top of the short modern door and the underside of the original window pediment above.

The final access point to the building from the exterior is through the unlocked bulkhead which leads to an unlocked hollow core door which opens outward from the small basement area under the bathrooms. This door should be replaced with an insulated door and the unused through-wall ventilation fan removed so that this basement space can be better conditioned.

The typical windows of the NE Masonic Lodge building are large, lightly constructed six over six double hung windows with older aluminum storms. The paint on the windows is generally poor, with many windows exhibiting peeling, crazing, and once painted surfaces with very little paint remaining. These windows are significant character-defining features of the building. The historic windows should be refurbished, repainted, and returned to operability. Funds for such work can be found through NH state grant programs. At a minimum, all of the windows should be protected with working operable storm windows mounted on the exterior of the building. Placing the storm windows outside protects the historic windows from both vandalism and damage from condensation, which tends to form in winter on the inside surface of the outermost pane of glass. The attic level windows are smaller than the historic windows on the lower floors of the building and are installed in pairs at each roof gable with four over four sashes. Window sills, like the tops of the bracketed crowns above each window are commonly weathered to the point that significant paint failure has already occurred, leaving paint that is cracked, peeling, or gone. The casings and sills should be cleaned of damaged paint finishes and repainted. The single modern window onto the northern porch is an insulated 8/8 unit that does not need a storm window.

At the upper portion of the mid-stage of the tower, the clover leaf windows that appear in early photos were at some point replaced with fixed rectangular plexiglas units. Modifications in the tower wall framing seem to indicate that the quatrefoil windows were a change as the original tower wall framing had to be cut to allow for the window installation, but the oldest photos of the building show these windows in place. With substantial pieces of two examples of the previous windows in the attic, it would be possible to reinstall reproduction cloverleaf windows in the upper reaches of the enclosed tower. The replacement windows must be built to withstand the extreme positive and negative wind pressures that probably challenged the original windows, perhaps by using a single sheet of fixed Plexiglas in a monolithic frame rather than four pieces of glass in literal replica of the original complicated assembly though this option is available. Two halves of separate quatrefoil windows are stored in the attic and can be used to inform the fabrication of replacement windows. Prior to the installation of any new windows, portions of the tower walls should be re-framed to stiffen the wall with continuous studs at either side of the tower windows. If the existing plexiglas windows are to remain in the tower more than a short period of time, these windows, and especially their sills, should be prepped and re-painted.

Figure 50 – Rectangular plexiglass windows have replaced original quatrefoil tower windows

Site Issues

The small, hillside site on which the building sits gives the NE Masonic Charitable Institute an even greater sense of grandeur when seen from the village below. The central portion of the property has been paved with asphalt paving encircling the historic building and extending on three sides of the building all the way to the face of granite and brick foundation. On either side of the center gable primary entry on the southeastern side of the building, small landscape areas provide for plantings. The high ground at the northwest side of the site has not been developed apart from the placement of a small shed and a buried propane tank at the north corner of the parking area. There is hope in the community of developing a park-like space in this area away from the building.

The paving in the parking area is not graded appropriately to direct stormwater away from the building, and at the uphill (western) sides of the building storm water gathers at the building face and runs around the building along the foundation face. The pavement should be cut back at least three feet from the building and a drainage system installed around foundation to remove stormwater and discharge it on the downhill side of the pavement. This pavement removal should not affect parking on the site which is organized by habit in the non-striped lot with cars parked away from the building on the far side of the pavement. The designated handicapped spaces would need to be relocated, but the non-compliant pitch of these spaces is driving a similar move. Ideally the parking to the west of the building would be entirely re-graded so that surface water from the

site and the building roof would flow away from the building and at least eight inches of foundation would be exposed along the building's northwest and southwest façades where currently the grade rises in places to meet the building at the sill level.

During the installation of a French drain / perimeter drain, other work recommended in this report such as increasing the frost protection of the footings, replacing damaged timber sills, and repairing the infill masonry between the piers, and even re-opening the historic northwestern entry could be undertaken simultaneously. Redesign of the parking area could also include a new ramp to these refurbished historic doors.

Interior Finishes and Features

The primary entry doors open into a high entry vestibule with a delicate, curved, open stair to the levels above. The stair is quite steep with a low railing and climbs clockwise with the space beneath the stair open to the vestibule. The railing on the stair is comfortable but low with turned balusters in a dark finish. Two of the balusters at the second level have been painted, perhaps as part of a baluster repair project. The wood floor, stair treads, curved wainscot and the plaster walls and ceiling are in good condition with an apparent recent paint finish in very good condition. At the second floor, the open stair continues past the open stair hall more gradually upward to a low door, also freshly painted, beyond which a straight section of stair climbs the rest of the way to the attic. The second floor of the stairhall is also in good repair with intact original base mouldings and door and window casings in good condition, better than in the vestibule below, which is subject to greater use. A paneled, boxed chase in the second level room corner conceals electrical conduit runs and not a clock weight, as might be suspected. The clock hands on the faces of the tower are painted on the building. There is no mechanical clock in the clock tower

Figure 51 – Stairway in centered entry gable open to Vestibule below

Figure 52 – double doors from vestibule to original hall match fixed exterior doors at northwest facade

A closet at the southwestern side of the entry level vestibule has been adopted as a sort of utility closet with primary electrical and fire/ security alarm panels mounted on the original plaster walls. The running of conduit and wires has caused damage to the plaster and in several spots the plaster has been completely removed from the split lath that originally held it. These holes should be repaired for fire safety reasons. The electrical closet is being used for storage, which represents some amount of risk and would not be allowed in new construction in a closet in a stairway. Across the entry vestibule from the primary entry doors are a pair of four panel doors with a six lite transom which as a set match the exterior entrance at the other end of the original central hall and now hidden from view from the building's interior. The vestibule doors are not exposed to the weather and are in good condition.

Beyond the doors, a large central corridor once bisected the building. This corridor has been divided by two partitions, creating three connected rooms. The first, just inside the vestibule doors, serves as a hallway with four panel doors leading into former classrooms on the left and right, and a flush wood door serving the room at the center of the building. The hallway's wood floors are in fair condition and original baseboard trim and door casings remain on the three original walls which have plaster finishes in good condition. The wall to the northwest is finished with vertically applied edge and center beadboard in fair condition on the hall side and with drywall on the opposite, inside the librarian's office. The door in this location previously was taller than the existing door in place. The Librarian's office has gypsum board finishes on all the four walls, painted wood floors in fair condition, and a suspended acoustic ceiling. This ceiling is uniformly in fair to good condition throughout all of the remaining rooms of the first floor of the building. The acoustic ceiling supports a layer of fiberglass batt insulation which is the primary insulation in the building. At the far end of the original corridor, bookcases in a makeshift reading room stand before walls of painted sheet paneling with 1x3 baseboards and clamshell trim in fair condition. Daylight enters the room through the transom above the original door. To facilitate this, a light well has been constructed with acoustic tile above the newer ceiling.

Figure 53– Lay-in acoustical tile ceiling throughout main level supports layer of fiberglass insulation

The large original classroom at the southwest end of the building once had two doors into the central corridor, one of which has been removed from its frame, the other one used to access the entry hall. This door is closed in winter and has splits in three of the four door panels. The doorless cased opening that now accesses the small reading room retains its original moulded blocks with the exception of two missing moulding blocks removed from the base of the door casings, which should be reinstalled or replaced with new materials which match the original intent. Centered between the original door locations, an arched proscenium marks the previous location of a single step raised platform. The proscenium is in good condition, though likely modified in unknown way at the time the acoustic tile ceiling was hung in the space. A picture molding that wraps the room just below the acoustic ceiling terminates at short lengths of symmetrical denticulated moldings applied to each side of the proscenium arch trim. The wood floor reveals the previous stage location, but no specific information has been related about the time of the stage's appearance and/or removal. The recessed wall which closes the proscenium arch is fitted with a sliding window which now provides daylight to the central enclosed office but which might once have also served as a service window for town business.

At the northwest side of the room, an original window was removed and replaced with an insulated six panel metal door. Interior trim around the door is reused, likely from the now closed double doors, as the height of the door is marginally taller than the window it replaced. The trim seen today then would have been required to be longer than that removed with the previous window but could have been cut from the trim around the abandoned double door. The trim around the double door is either removed or completely hidden from view. A transom window above this metal door was apparently recently removed to allow for the installation of a new closer on the door. Priming and painting the wood infill materials and extension jambs should be completed as soon as possible.

On the other side of the original central corridor, a pair of smaller classrooms are also repurposed as part of the Effingham Public Library. In the eastern corner of the building, one former classroom has been slightly remodeled with carpeting and maple base cabinets to serve as the library's Meeting Room. This room was for an extended period the entire Effingham Town Library. The beaded board wainscot unique to this room is in good condition as are the original decorative casework and base moldings. The smallest sized classroom at the north corner of the building has been divided into multiple spaces and has the least integrity of the building's original construction. Two narrow restrooms occupy the extreme north corner with outward swinging flush wood doors. Each has vinyl composition tile (VCT) floors with flat baseboards and flat casings with applied moldings at their sides. The trim should be spot primed and repainted to hide the knots in the wood that are telescoping through the trim paint. The remaining portion of the original room would have no daylight without the addition of the modern double hung window in the northwest wall. An entry door with a false transom at the location of an original window having eliminated the one window that was in this space. Near the south corner, an abandoned two flu chimney occupies a portion of the room. The doorway to the small reading room located at the covered northwest entry doors is finished with flat casings, as is the new entry doorway to the exterior.

Perhaps no longer a critical space now that the library has had a chance to expand, there may be ways to reorganize the area currently used for the Children's room to allow for the construction of a new egress stairway to the attic and a small elevator to access the second floor as well as provide restrooms that meet the requirements of the ADA. Previous design discussions on how to provide this necessary vertical circulation has focused on an addition to the building's exterior, an approach which will be more expensive and likely more impactful on the character defining features of the NE Masonic Charitable Institute. This type of renovation has been deemed too far out in the future to consider further at this time, but it may be helpful to know that this option might be possible at this location within the building as renovations to the restrooms are being considered.

Today, the only way to get to the second floor is to climb the steep winding stairs in the Entry Vestibule at the center gable extension off the building's southeast façade. A tall doorway on the second floor leads to a connected set of small anterooms providing access to the private Masonic Hall and to a more public Meeting Room. The wood doors, trim, moldings, and flooring on this level maintain a high degree of integrity and are very good condition. The plaster work is generally in good condition with the exception of the ceilings, which have been challenged by a combination of inadequate keying to the original split lath, building movement, and occasional water leaks. Most of the plaster finishes have been addressed.

Figure 55– Mason's Meeting Room showing abandoned chimney and extent of damaged ceiling plaster

Figure 54 – Delicate open stair with low, curved railing.

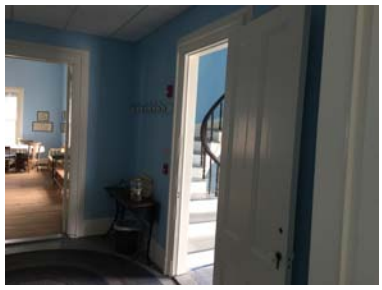


Figure 56– Vestibule, meeting room, and second floor of stairwell beyond.

In the anterooms, lay-in acoustical ceilings have been installed, which would serve to hide the distressed plaster ceiling above. A recent leak related to a blow-off of shingles on the center gable roof behind the tower has reportedly resulted in a leak which has stained several of the ceiling tiles and these should be replaced as soon as the roofing can be addressed. The plaster in the meeting room is generally secure, but a careful plaster patch should be made in the ceiling at the west corner of the room. Work on these repairs should be done carefully to avoid vibration of the ceiling in the Masonic Hall adjacent.

A major restoration project in 2004 partially funded by an LCHIP grant secured the original plaster ceiling in the Masonic Hall to the original lath with an adhesive injected through thousands of holes drilled through the lath from above. Portions of this painted ceiling were buckling and falling before a series of events related to a rainstorm during a roof replacement project subjected the rather amazing trompe l'oeil mural work to substantial water damage. After the plaster was re-secured and the murals were hand-cleaned, the voids in the plaster were repaired and the lost artwork painted-in. The restoration focused on restoration of the ca 1860 work and not on re-establishing the work as new. The ceiling seems more cracked a dozen years after the work and should be watched for further movement and watched for additional damage. A review with the structural engineer draws the conclusion that any further building movement in the intervening years is most likely related to crushing of the degrading sills along the southwest and northwest facades of the building. The condition of these sills should be investigated and shortcomings addressed as soon as possible to avoid further damage.

Figure 57 – North corner of Masonic Hall had heavily damaged plaster, now repaired and re-painted

Figure 58 – Steep, enclosed stair at top of open stairway leads to 3rd floor

At the top of the curved entry stair, a short beadboard batten door opens to reveal a steep stair leading to the third floor. From the third floor stair hall, a stair with winders at its base turns and rises to provide access to the tower above. The stair hall also connects through a short passage to the long attic room that runs from one end of the building to the other within the roof structure, terminating at each end at a pair of 4/4 double hung windows. All of the rooms of the attic level were once finished with plaster walls with flat or simply molded trims at the doors and windows. The two doors that once served this level have been removed. The unpainted plaster throughout the floor is in poor condition with failed areas of flat plaster ceiling materials very common over substantial areas of the ceilings. A large quantity of graffiti, mostly in pencil, adorns the space, which has perhaps been unused since the 1920s and little used before that if the graffiti is to offer the strongest clues. The attic has become a repository of stuff, though all of these treasures have been repeatedly relocated within the room as a result of the ceiling repairs to the Masonic Hall which required pulling up the rough sawn floor boards. Any sense of organization of these materials has thus been lost. There is not harm in these items remaining where they are indefinitely. Cleaning should be limited to vacuuming and dusting only until an inventory can be made of the contents and shared with the Town Government, the Masons, the Library, and the local historical society. All these groups would likely appreciate the chance to evaluate any contents for their use or continued storage. This space should be regularly inspected for water damage.

Figure 59 – Attic room has become a town repository and a de facto graffiti museum

On either side of the attic space, the unfinished eave aisles allow for inspection of the building's timber roof construction. A full sized door, now removed, provides access to the southern eave aisle which is used by the Masons for storage. Small, low openings near the chimney, and at the opposite end of the long attic room provide access to the long western eave aisle and the eave space at the building's east corner respectively. Repair work at the western eaves has resulted in a very clean and walkable space. The repaired connections should be inspected every three years for signs of any additional movement. The structural engineer has recommended that all of the roof purlins, which are cut with tenons extending at their top sides, should receive reinforcing screws at the shoulders of the tenons. Please see the Building and Tower Frame section of this report for more information. Three levels of the tower and the roof under the belfry are all accessed via the stair from the 3rd floor stair hall. The eave spaces and all of the tower floors above the attic are unfinished utility spaces unsafe for the public to use and access. Steps should be taken to prevent uninvited access to the attic such as the installation of a keyed lock on the attic door able to be operated with a thumb latch when descending the stair. Access to the attic space above the third floor rooms is available from the first unfinished level of the tower (4th floor). The tower and this attic level area just behind it should be inspected quarterly for any water infiltration.

Energy Issues

The NE Masonic Charitable Institute is an under-insulated building. Above the first floor, there is no insulation whatsoever and the masons use their dedicated spaces only in the summer and shoulder seasons. The Effingham Library, however, is open several days a week all year long. This space needs to be able to be economically heated and cooled to comfortable levels all year round with the additional need to control moisture levels appropriately for the maintenance of the library's book collection as well as for the comfort of the patrons and staff. The ability to condition the library space economically will be heavily dependent on the building's insulation and the cost of the energy produced with the mechanical equipment.

Figure 60 – Typical through-wall propane heater

Currently, a layer of fiberglass insulation is laid down over the suspended acoustic ceiling installed throughout the first floor of the building. It is unknown how extensive or how variable this ad-hoc system of insulation is or how successful the application of a vapor retarder has been made given the wires which are necessary to support the ceiling. A better way to insulate the first floor rooms might be to remove the suspended ceilings and install layer(s) of rigid insulation on the underside of what remains of the original ceiling. This would both form a more complete vapor barrier and allow the town to target substantially higher R values, while allowing for future removal should the second floor ever be renovated into conditioned space. The suspended ceilings could then be re-hung, or new hard or acoustical ceilings installed higher up within each of the spaces.

Exterior wall insulation could be enhanced during the period of siding repairs. Blown-in insulation of unknown manufacture or extent has been previously placed in the exterior walls, likely as part of efforts to address the building's energy issues when the town offices occupied most of the main floor spaces. A thermal scan of the building combined with a carefully selected area of limited demolition should reveal where there is insulation in the wall, what that insulation is, and how well it was installed. A plan should then be made to enhance the wall insulation or add new to get the maximum performance enhancement without compromising the integrity of the building's interior and exterior finishes.

Figure 61 – louvered vents in crawl space should be fitted with insulated covers for use in the heating season

Finally, the improvements previously made to manage moisture and curtail air movement under the building have made an impact, but have not solved all these energy problems. Once the site issues related to the foundation have been resolved, steps should be taken to better insulate the interior of the building's sill. Once moisture around the foundation is shown to be under control, an insulated concrete slab should be placed under the entire building. All of the operable vents in the crawlspace should be fitted with insulated covers during the heating season to provide for closure of the vents.

The second focus for energy management is the equipment used to provide heating and cooling. A single propane fired heater at the northeastern side of the Mason's meeting room provides some heat in this space. This unit is fed from a dedicated freestanding propane tank at the east corner of the building. The main level Library spaces are heated with a collection of through-wall vented propane heaters, all fueled via an underground line from a buried propane tank near the shed at the north corner of the parking lot. This type of heat is acceptable for the Masons, who use their space irregularly and don't need to heat it at all when the rooms are not in use. The town needs to keep the Library spaces warm all the time and would benefit from a more efficient heating and cooling system based on a two-stage air source heat pump. Because heat pumps move heat from one volume of air to another rather than actually producing heat, they can produce efficiencies of up to 300% for the electricity they consume. If the town is going to lose heat because of insulation that has not been improved (or even installed) yet, it would be better if that lost heat was comparatively inexpensive. Heat pump units could be placed in the same locations as the existing propane fired units, with an extra unit in the ceiling of the central space (whether open or closed) and ducted to the ends of the original corridor. These units also provide air conditioning which means that the window units now seasonally in use could be retired, reducing the damage their annual installation and removal do to the historic wood windows. This new equipment should have a positive impact on humidity levels in the library, but there may still be a need to add humidification or dehumidification (or both) to the tightened building depending on usage and ventilation. The space below the plumbing in the bathrooms should continue to be conditioned to avoid freezing of the pipes. Once the Town's propane heaters are removed from service, the dedicated underground tank and the propane line should be transferred to the Masons for their use so that their above-grade propane tank can be removed from an area where an errant car or plow could accidentally hit it.

Figure 62– Replace propane fueled heaters with heat pumps for efficiency, cooling, and moisture control

Figure 63– make modifications to basement space to control high humidity

Life Safety

The independent uses of the NE Masonic Charitable Institute by the Effingham Public Library and the Charter Oak Lodge of the Masons is highly relevant to any consideration of life safety issues within the building. On a basic level, the public library space is quite safe from a life-safety perspective, with easy at-grade egress available to almost every significant space in the library and multiple ways to exit every other room. Basic fire safety is much more challenging to achieve for the Masons who exclusively use the second floor, which has only a single exit down a steep winding stair. Safe use of the building requires limiting usage or investing in systems to improve safety.

There is no automatic sprinkler system in the building. There is a working automatic fire alarm system with smoke detectors in the heated spaces and rate of rise detectors in the unheated eave aisles

Figure 64 – Fire alarm panel located in Vestibule

but not the tower. Emergency lighting is provided at selected locations but seem inadequate by code and exit signs are not provided at sufficient locations. No standby generator is provided. Battery powered exit signs / emergency lights can be expensive to maintain because of the need to regularly change the batteries, but with the difficulty of wiring in this building, may be more cost effective in both the medium and the short term than re-wiring the building with emergency power circuitry. Investing in a new sprinkler system will be expensive, but will make the people in the building much safer and will improve the likelihood of this important building surviving a fire. Challenges for a sprinkler system include the large amount of unheated space and the need to have adequate water flow, which may mean the necessity for a water storage tank, a generator to run a well, or both.

For calculating occupancy based on the 2009 IBC Table 1004.1.1, the design occupancy of the building should be 111 people on the main level and an additional 76 people on the upper level.

Building Occupancy Analysis:
Building Size 2340 net s.f. = 47 people/floor at 1/50 net
Library (Floor 1): Meeting Room as Assembly 515 s.f./7 net = 74
plus (2340-515)/50 net = 37 Total Floor 1 = 111
Masons (Floor 2): Meeting Room as Assembly 913 s.f./15 net = 61
plus Masonic Hall used by subset of Meeting Room = 0
plus (2340-913)/100 net = 15 Total Floor 2 = 76

The two exit doors on the northeast side of the building more than meet the egress requirements of the first floor without taking into consideration the availability of the primary entrance doors as an additional egress path. The New Hampshire Building code includes by reference several independent codes published by the International Code Council (ICC) and by the National Fire Protection Association. (NFPA). These codes seem to draw conflicting conclusions on the capacity of the existing inswinging doors which provide and opening of 30.25". Both the NFPA and the ICC recognize that both the existing doors and the stairway are important to the historical character of the building and may therefore remain in service. It is good that the vestibule doors do not swing out in front of the stairs.

The codes are more clear about the use of spaces for assembly purposes when they are served by only a single exit, especially when that exit is a stair. Until such time as a second access is provided to the second floor, members of the public should not be allowed above the main floor. The Masons, as members of a club, may choose to continue to use the space, but consideration should be made by the Fire Department to posting limits on the occupancy of the upper floor, at least to something like a maximum of 49 people, a common limit for single access spaces. Other considerations that have improved the acceptability of usage of non-compliant spaces by local fire officials include the installation of a fully automatic sprinkler system or even the posting of a watchman during events to provide early active warnings to an assembled group. A solution to add a new code compliant second stair to the building should be pursued as soon as possible, but the unique


Figure 66 – Raise existing low railing at open stairs to reduce risk of falls

building ownership and the limited resources available for undertaking such work have put this challenge on the back burner for decades.

Figure 65 – Penetrations where pipes and wiring pass through corridor walls should be firestopped.

With recent improvements in the electrical system, the building is safer than it was a decade ago. Some fabric jacketed wiring is still in service on the upper floors. Outlets at the library level seem to have all been upgraded to grounded outlets. At the upper floors, electrical upgrades have not included the installation of additional outlets, resulting in an elaborate system of extension cords running around the perimeters of most rooms. These should be eliminated; especially those that cross the top step of the open stair and those which involve extension cords plugged into other extension cords. Replacing the electric candles in the windows with battery powered models seemingly would eliminate much of the need for these extension cords, but a program of adding convenience outlets would be advisable as well. Repairs should be made to the ceiling of the electrical room and all wires and conduit passing through it should be firestopped.

The removal of the cord taped across the top of the stair in the stair hall would also eliminate a serious trip hazard, especially important because of the extremely low height of the railing on these stairs. This railing is historic, and beautiful, but the steepness of the stairway and the open plan of the stair increase the threat of any stumble on the stair. If no plan is being actively considered to add a code compliant egress stair to the second floor, changes should be considered to increase the safety of the existing stairs in the short term. Raising the railing on the historic stair should be considered. By incorporating a new base on the existing newel at the bottom of the stairs and replacing the balusters with similarly turned, but taller balusters, the original railing and newel could be reinstalled at a height of 34" above the stair nosings. Though still low by commercial code these would be significantly safer than the existing. The entry stairway outside the primary entrance also has unsafe railings that should be replaced or modified to both prevent falls through the area under the railing and to provide a graspable handrail per the requirements of code and the ADA.

Accessibility

The NE Masonic Charitable Institute was not built to be accessible. While previous renovations helped to make the building's main level more so, the requirements of the ADA have not yet been met. Access to the second floor space used by the Charter Oak Lodge is not provided, but could be readily achieved if the building was provided with a lift or elevator to access the second floor. There is no active use of the third floor, and no obvious need to bring an elevator to this level without a change of use.

Two accessible parking spaces are provided on the southwest side of the building near to the bottom of the handicapped ramp. Painted on pavement, these spaces are pitched irregularly and exceed the 2% max slope in places. They are also located in an area that will be reduced in size when the asphalt is sawn and removed from close proximity to the building to create better drainage. These spots would be better located across the parking area from the ramp where the pavement is

smoother and flatter. The extra travel distance to the ramp(s) is not as important as the spaces each being safe and easy to use.

Though well intended, the ramps at the entry doors do not provide railings per the requirements of the ADA, or more problematically, the required 5'-0" by 5'-0" clear landing at the top of the ramp with a minimum 24" of side clearance at the latch side of each door. The ADA is civil law and not a building code, with civil action the primary means of enforcement. Because of the building historic status, it may be exempt from portions of the requirements of the ADA if those requirements impact the historic nature of the building, but at least one entrance must fully meet the requirements. At least one of the ramps will need to be modified to provide a bigger landing at the top and the appropriate hand rails. The best opportunity to do this renovation would be at the time that sill repairs are made (or explored if ramp disassembly is required for access). It may not be necessary to alter the shed roofs above the ramps to make this ramp modification. Adding a push button activated door operator could eliminate the side clearance required adjacent to the door but not the larger landing. If both ramp doors are in active use, it is recommended that both ramps be modified. At the door to the children's room, this work would require moving the book return off of the top landing to a new location.

Figure 67– Entry ramp lacks adequately-sized top landing and proper handrails

Neither of the two bathrooms on the main level of the Library are accessible because they are too narrow to provide the five foot turning radius required. There is no way to reconfigure the fixtures within either restroom to provide this required turning radius. Approximately 18" of the children's room would be consumed by making both bathrooms wide enough to meet this standard. Because of the historic nature of the building, only one accessible restroom is required. An alternate solution to making both bathrooms bigger, would be to reorganize them so one is accessible and the other is made smaller. Both restrooms could be designated as unisex rather than making either gender specific. New fixtures should be provided for each accessible restroom

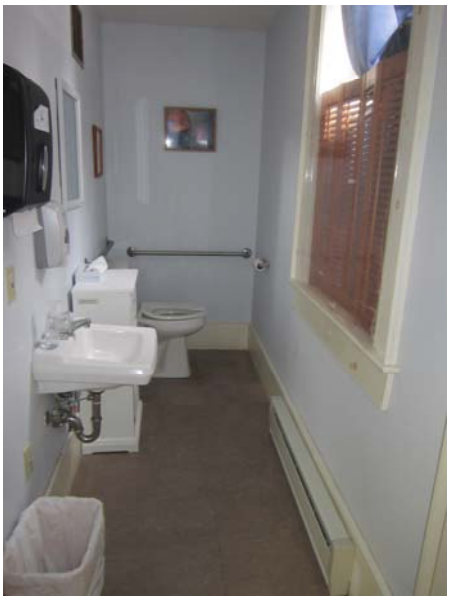


Figure 68– Existing restrooms are too narrow to meet ADA requirements for turning

The bookshelves in the Effingham Public Library are primarily along the perimeter walls of each space, and the others are arranged into aisle ways with no dead ends. The consideration of how a library patron in a wheelchair moves through the arranged furniture will need to continue to be a part of determining furniture placement in the stack spaces and reading areas. The limited height that such a patron can reach should also be a part of the organization of the library. If library staff are committed to being both willing and available to assist in material retrieval, an active catalog system that allows those with mobility impairments to browse out-of-reach materials may create opportunities to house additional resources.

Recommended Rehabilitation Approach

Standards for Rehabilitation

The recommendations of this report are made in conformance with the Standards of Rehabilitation, outlined by the U.S. Secretary of the Interior. This published standard acknowledges the need to alter or add to a historic property to meet continuing or changing uses while retaining the property's historic character. There is no obligation upon the Town of Effingham to follow these standards, but doing so is a requirement of some external sources of available government and private grant funding supporting preservation of historic buildings. More importantly, the Standards for Rehabilitation are a practical standard of good construction practice for any work on a historic building to ensure that work undertaken does not cause the building to lose its historic nature. According to the National Park Service website for the Secretary's Standards for Rehabilitation, the Standards "are applied to projects in a reasonable manner, taking into consideration economic and technical feasibility." These are the Secretary of the Interior's Standards for Rehabilitation:

1. **A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.**

2. **The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.**

3. **Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.**

4. **Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.**

5. **Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.**

6. **Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.**

7. **Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.**

8. **Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.**

9. **New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.**

10. **New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.**

All design and construction work on the building will be also be required to follow state and local building codes and standards. The New Hampshire Building Code currently includes the 2009 International Existing Building Code (IEBC) and the NFPA Life Safety Code. The IEBC gives significant leeway to improve the safety and durability of recognized historic properties during renovation work without requiring literal compliance with standards which are applied to new construction.

Repaired and perhaps renovated, the historic NE Masonic Charitable Institute will serve the same purposes and populations the Library and the Masonic Hall serve today, and will be inherently safer for the occupants. It is important that the local Code Official and Fire Officials' appreciation for the historical significance of the building be well-informed and that these authorities be invited and encouraged to be involved early in the design process of any renovations. Renovations of historic public properties require the support of the both the community and its code authorities, and without balance the process may falter and the buildings will remain as they are: without the improvements that will make them both safer and better. Education regarding the value of preservation is a key component that will affect the integrity of this historic building as it is renovated to continue in the service of the Effingham community.

In an effort to provide the Town of Effingham, the Masons, and the Trustees of the Effingham Public Library with information to help understand and prioritize their efforts to preserve the Historic Town Hall / NE Masonic Charitable Institute and to maintain it in useful service, pricing information is provided below. It is important to remember that these figures are drawn from nationally published average construction pricing and from the experience of the architect preparing this report. These figures are for construction costs only and are presented primarily to establish an order of magnitude sense of the work. These are not bids, and the project size and details of each final design solution may have a significant impact on the actual pricing of future work. It is recommended that a reasonable contingency be established for any project drawn from these estimates to account for unforeseen circumstances, scope creep, and inflation.

Hazard Mitigation

For the purpose of assisting the Effingham Board of Selectmen and the Officers of the Charter Oak Lodge, the work effort for the building has been broken out into several phases, which may be done one at a time or grouped together depending on the anticipated resources at each step of the project. The first phase consists of work which is recommended to be undertaken immediately to stop ongoing damage or protect the building from several conditions identified as potentially hazardous during the investigation.

Asbestos abatement by others - preliminary testing	$1,400.00
Tighten Tower anchor rods in belfry legs	$1,440.00
Install new reinforcing screws to prevent tower dragon beam splitting	$720.00
Install permenant screens at basement vents	$900.00
Improve smoke detection	$2,740.00
Improve emergency exit lighting	$2,220.00
Post occupancy limits in upper level assembly rooms	$350.00
Replace ungrounded outlets and wiring with new.	$3,200.00
Reorganize furniture to make library more accessible.	$800.00
Estimate of Items to be done immediately	*$13,770.00*

Deferred Maintenance

A second grouping of tasks focuses on maintenance tasks that can be undertaken at any time and that need not necessarily all be done at once. Some of these projects are smaller in nature and some could also conceivably be done by skilled volunteers. It is important that all of the work done on the NE Masonic Charitable Institute be completed according to the Secretary of the Interior's Standards for Rehabilitation. A copy of these standards is included at the beginning of this section of this report. Every person who works on the building should be familiar with these standards before working, organizing the work, or bidding on any work on the building, as following the Standards for Rehabilitation may result in different solutions to various aspects of the project. Additionally, the National Park Service has published a number of Preservation Briefs to aid in the understanding of appropriate methods to identify and treat historic properties in keeping with the Standards. Preservation Brief (#10) Exterior Paint Problems on Historic Woodwork is included in the appendix of this report for painters to read before undertaking any work on the exterior. Other relevant topics are available without charge at www.nps.gov/tps/how-to-preserve/briefs, including (#9) on repairing historic wooden windows and (#21) on repairing historic flat plaster.

Open and close the foundation vents twice seasonally	$25.00
Historic Wood Windows – refurbish and reinstall existing	$12,960.00
Storm Windows - re-furbish existing to working condition.	$2,880.00
Install copper drip caps at window hoods and tower steps	$6,000.00
Shutters – refurbish or fabricate replacement shutters	$4,320.00
Air Conditioners - remove units seasonally until replaced	$200.00
Wood Siding- replace low moisture damaged clapboards	$10,500.00
Wood Trim – prep and repaint exterior wood trim	$8,000.00
Wood Trim repair replace broken quoins and clapboards	$5,000.00
Install new cloverleaf windows and make wall repairs	$9,200.00
Repaint entire building	$35,000.00
Clean-up mechanical room – remove defunct equipment.	$1,200.00
Remove mechanical room exhaust fan and insulate wall	$1,000.00
Repair / replace insulated crawl space access door.	$200.00
Replace sections of undermined infill foundation brick	$13,500.00
Raise the railing in the historic stair hall	$6,800.00

Add an automatic sprinkler system	$53,720.00
Get lights in tower working conveniently from a switch	$200.00
Replace water damaged ceiling tiles in Lodge Anterooms	$350.00
Miscellaneous electrical concerns old vs. new	$4,400.00
Make cosmetic plaster repairs on second floor level	$2,600.00
Add dehumidifier and automatic drains in mech room	$2,400.00
Estimate of Maintenance Items	*$180,455.00*

Environmental and Structural Stabilization

A third grouping of tasks to complete relates to the need to protect against deterioration of the building and its components due to forces of nature including gravity and moisture movement (including frost action) within and under the building. As long as these tasks go undone, more and more of the historic fabric of the building will be lost and more and more work will eventually be required to faithfully repair the building. These projects should be undertaken as soon as possible. Some will require additional design work prior to their undertaking.

Sawcut existing pavement adjacent to building	$2,240.00
Install perimeter foundation drains around building	$16,088.00
Install perimeter insulation	$3,000.00
Backfill perimeter drains	$750.00
Replace damaged wood sills	$71,600.00
Landscape at exist paved areas	$10,290.00
Investigate second floor frame	$1,000.00
Investigate existing insulation in exterior walls	$2,200.00
Investigate ceiling insulation above suspended ceiling	$2,000.00
Improve and add new insulation at 2nd floor platform	$29,376.00
Improve existing and add new insulation in crawl space	$33,840.00
Demo the exist. distributed propane fired heating system	$1,526.00
Replace the building HVAC system with heat pumps	$49,938.00
Repurpose buried propane tank for use of Masons	$1,800.00
Estimate of Stabilization Efforts	*$224,448.00*

Future and Optional Projects

There are a couple of circumstances unique to the NE Masonic Charitable Institute building in its current configuration that challenge typical preservation approaches. Handicapped accessibility to the building and safe access and egress to the upper levels of the building are made more challenging because the better solutions for preservation represent significant extra expense to the community and users who have finite resources to spend on the building. The town has determined that since only the Masons use the upper floor, the town does not need to provide public access. Expenses aside, the Masons can not modify the building to provide the access without the towns participation and willingness to make changes to the site or lower level.

Few buildings have original entry doors abandoned in place adjacent to the renovated or new entries. In recognizing that the handicapped ramps in place don't meet the technical requirements of the ADA, it is a logical conclusion to consider there might be a way to put the historic doors back in service while working to design a new ADA compliant entry. While the the Library could be readily redesigned with the circulation counter at the center of the building to take advantage of the excellent supervision potential of such a redesign, there is at this point a recognition that the expense of such a renovation will push that project far into the future. Knowing that many suggested repairs and renovations will make it even more expensive to make these unrequested changes later, pricing is included here for the Town's interest but not with any expectation that such work will actually be undertaken. The town is encouraged to explore this design option.

Adding an egress stairway and an elevator to an existing building is an expensive proposition and has been ruled out by the town because of the non-public nature of the spaces on the second floor of the building. The Masons do not have a desire, and perhaps not the ability to cover the expense of such a project either. There may come a time in the future when such a project can be undertaken. At that future moment, it will be known what organization and location would be best for the new or renovated restrooms that already are a recommendation of this report. These should be located to maximize the potential for the Library to provide access to the building's meeting room(s) and restrooms when the library is closed. Unfortunately, committing to a project that may not be pursued for generation likely means a lot of compromise in the meantime. Again, pricing is included here for the Town's interest but not with any expectation that such work will actually be undertaken. If there is unexpected interest in getting a second egress stair in the building, or an elevator, now would be a great time to hear about it. To inform that decision, estimated pricing for the construction of such a project is included for reference:

Demo existing porches	$2,500.00
Install new sidewalks	$7,200.00
Install at-grade entry	$17,000.00
Entry – refurbish abandoned entry door	$8,500.00
Install a new handicapped accessible restroom	$11,350.00
Install a second handicapped accessible restroom	$11,350.00
Demo unused chimney	$5,000.00
Install a building addition with LU/LA and fire stair	$230,013.00
Replace southeast porch with new closer to original	$15,050.00
Create a new pedestrian park on grounds	$12,000.00
Estimate for Future and Optional Projects	*$319,963.00*

Summary of Estimated Costs

Hazard Mitigation	$13,770.00
Deferred Maintenance	$180,455.00
Environmental and Structural Stabilization	$224,448.00
Future and Optional Projects	$319,963.00
	$738,636.00

Conclusion

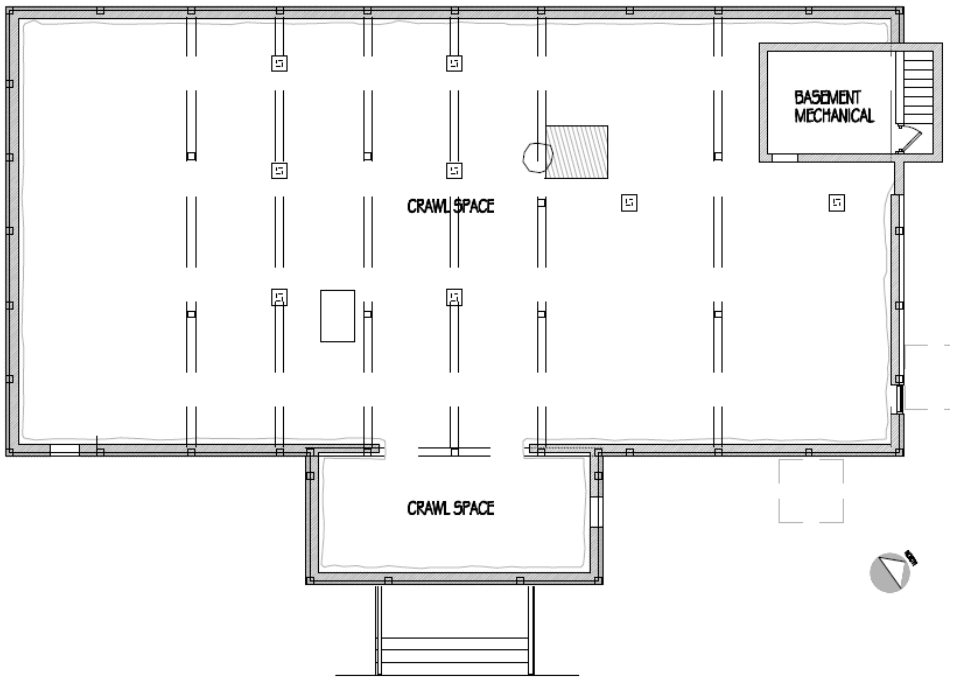
The New England Masonic Charitable Institute retains a high degree of integrity to the days of its original ca. 1860 construction as a Masonic Lodge and private academy. Serving as the Town Hall of Effingham since 1891 following the closure of the school, the main floor spaces were divided but little altered. Changes to the exterior to increase accessibility and operability were essentially limited to the rear (northwest) side of the building only. The two and a half story building with a center gabled entry upon which sits a three stage tower with an open octagonal belfry overlooks the village of Center Effingham. A striking example of the Italianate style, the building is marked with wide overhanging ornamented eaves supported by decorative paired brackets, tall windows in singles and pairs with bracketed and pedimented crowns, an elaborate entry hood over the paired entry doors, and a tower featuring similar eaves, painted Masonic symbols and clock faces, and an eight-sided ornate belfry with weathervane. When the Mason's sold the building to the town of Effingham for $1, they retained the perpetual right of usage of their hall and ancillary spaces on the second floor and these are still in use today. The Masonic Hall was painted in 1859 and 1860 with trompe l'oeil murals which are in good condition today, in part because of an LCHIP funded restoration project undergone in 2004.

The building is in generally in good condition in the interior and the first floor now serves as the town of Effingham's Public Library. Heating in the building is challenging because of a combination of a lack of insulation and the lack of any central heating system. The building exterior is long overdue for what should be regular painting and at this point the maintenance too long deferred has created repair work which would have been unnecessary. This report has endeavored to identify aspects of the building condition that require attention and repair and make recommendations for necessary work broken down by order of priority. It is understood that the town of Effingham will undertake the suggested efforts in affordably sized pieces over time.

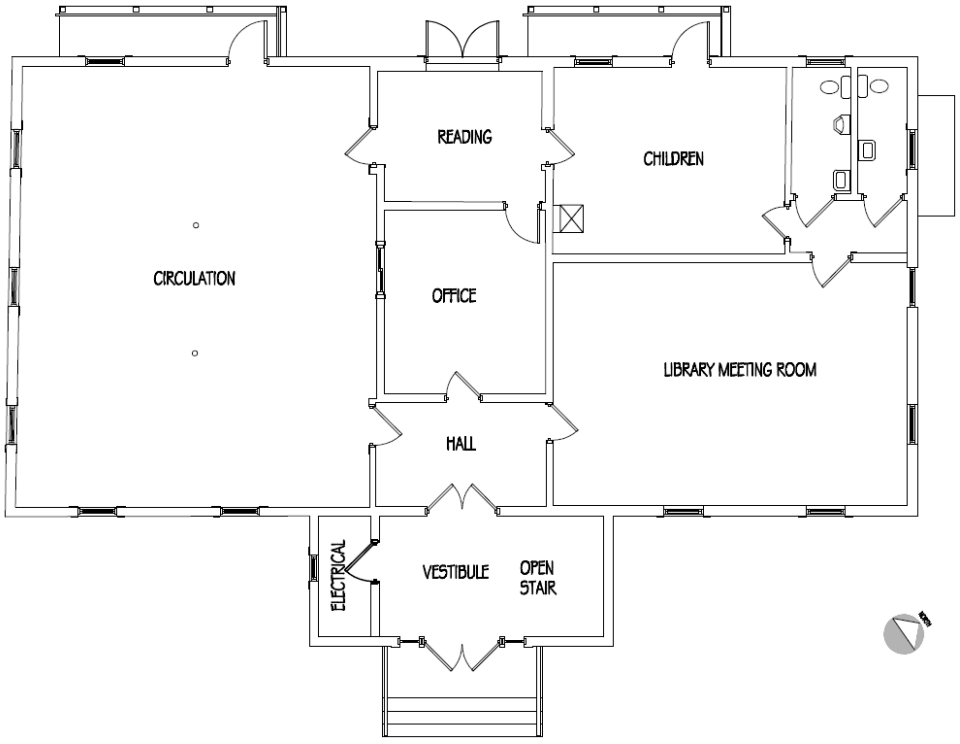
Handicapped Accessibility is addressed, and will require reorganizing the existing restroom area with new rooms. Opportunities to address future access to the building through the historic northwest entry doors (now fixed in place) and to access the second floor via an elevator and stair addition or interior renovation should be considered as part of the design process for a new accessible bathroom solution. With repairs made and regular care, the NE Masonic Charitable Institute serving as both the Effingham Public Library and the Charter Oak Masonic Lodge should continue to serve its community for generations to come.

Drawings and Photographs:

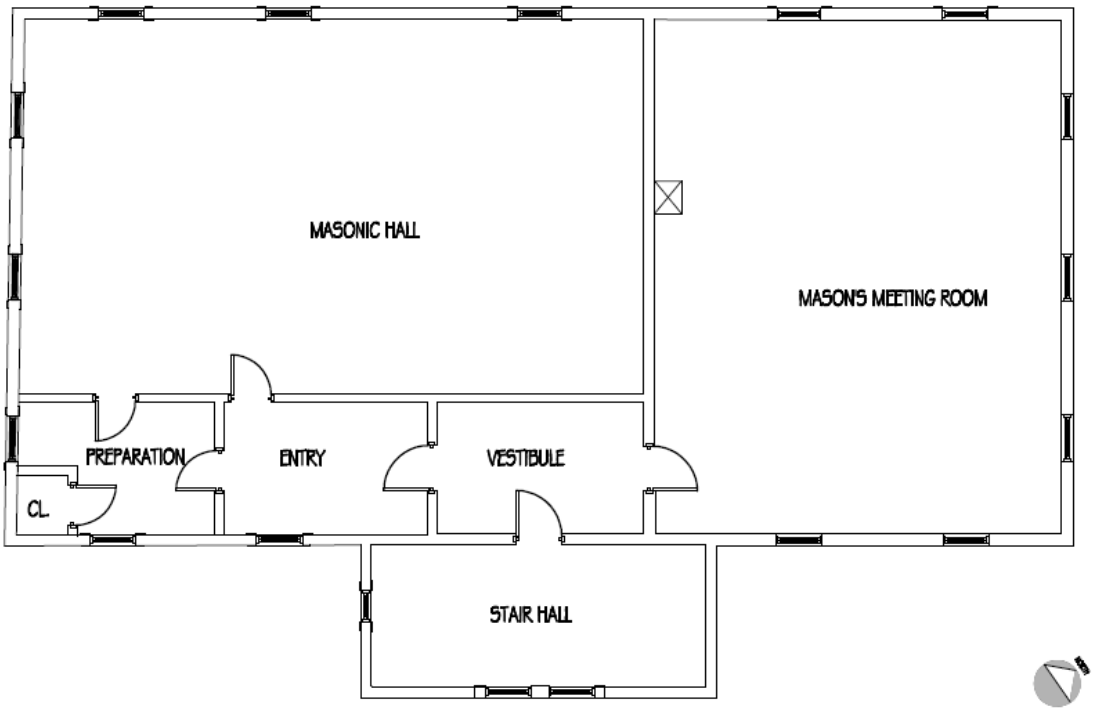
Plans of Existing Conditions



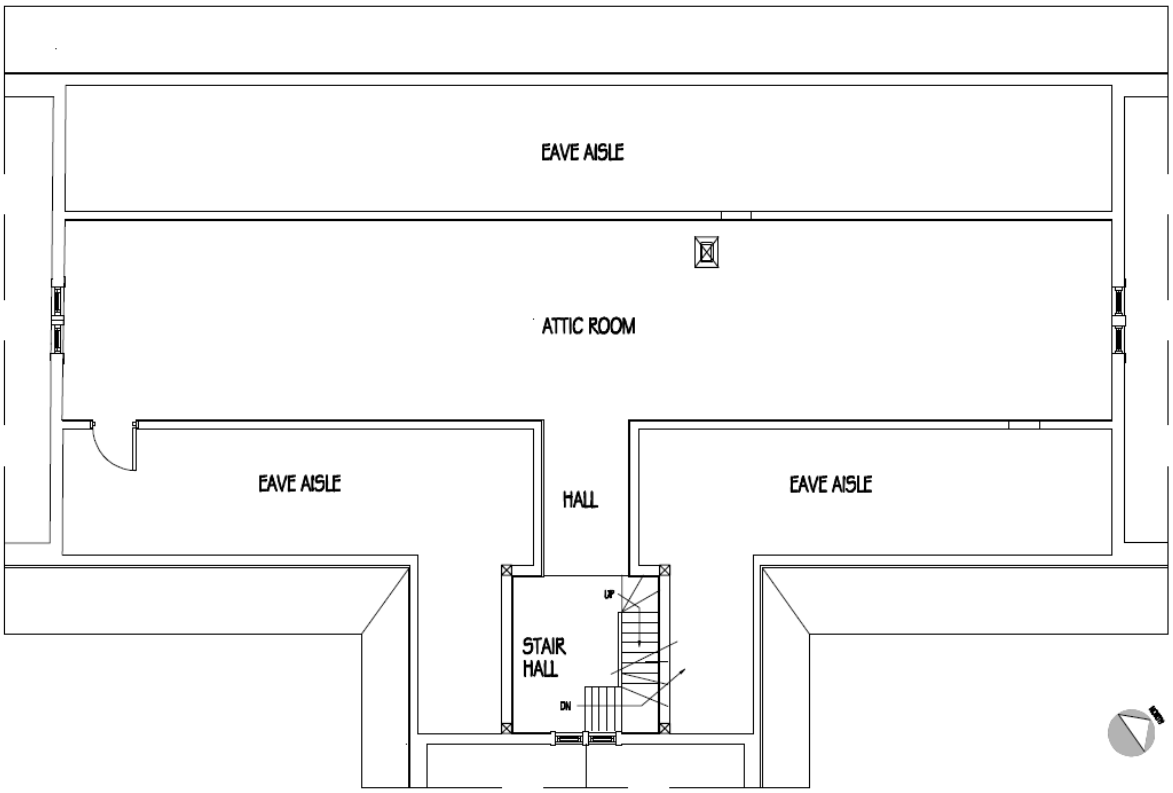
Basement / Crawl Space Plan



Main Floor (Library) Plan

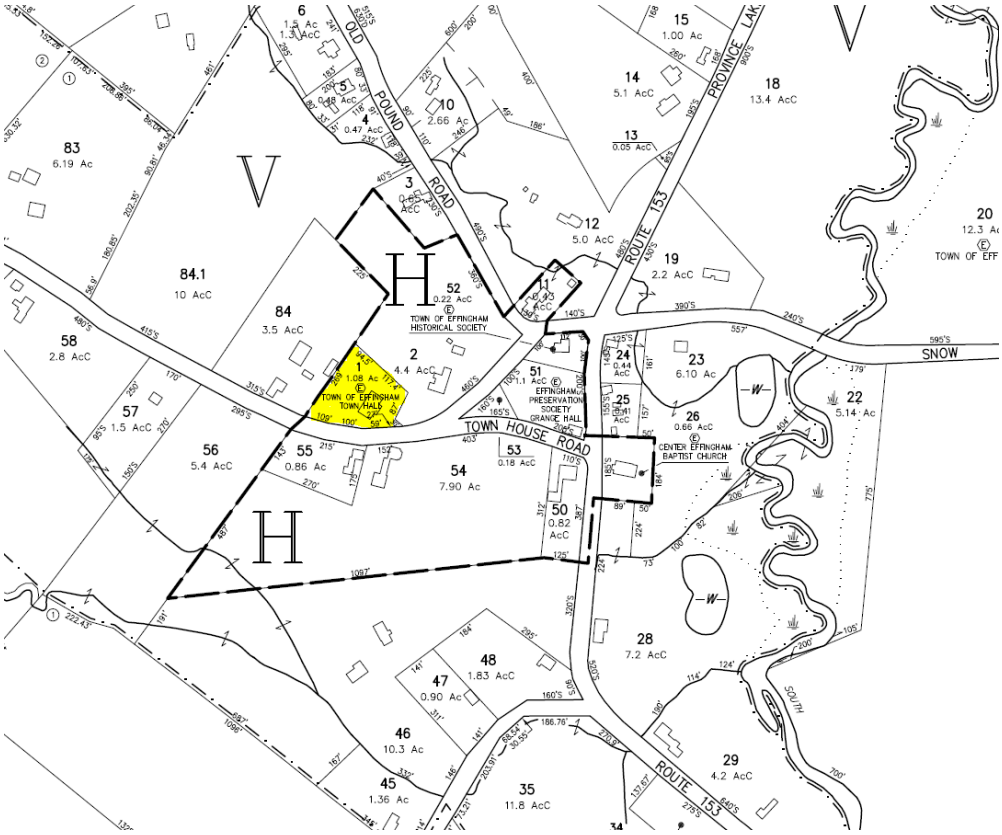


Second Floor (Masonic Lodge) Plan



Third Floor (Attic) Plan

Tax Map Plan of Center Effingham (aka Drakesville)



Satellite Image of NE Masonic Charitable Institute property

Photographs of Existing Building

The NE Masonic Charitable Institute as seen from the Southeast

The NE Masonic Charitable Institute as seen from the North

The back (southwest) facade of the NE Masonic Charitable Institute

The northeast face of the three stage tower

The Centered Gable Entry at the Southeast façade of the NE Masonic Charitable Institute

The Entry Hood over the Primary Entrance of the NE Masonic Charitable Institute

The delicate open stair in the Centered Gable Stair Hall (Second Floor)

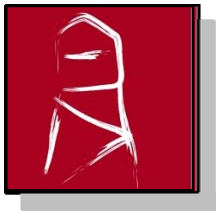
Four panel doors at Vestibule end or original Central Corridor match Exterior doors at other end now covered over at the interior but visible from the exterior

Mason's Meeting room showing Plaster Failures at Ceiling

Restored Trompe l'oeil murals painted ca. 1860 on flat plaster of Masonic Hall

Appendix i

Review of Structural Conditions
Robert (Ben) L. Brungraber, Ph.D., P.E.
Fire Tower Engineered Timber, Inc.



Fire Tower Engineered Timber, Inc.

07-Nov-18

Norman E. Larson, AIA, LEED AP
Christopher P. Williams, Architects
4 Stevens Avenue / P.O. Box 703
Meredith, NH 03253
nlarson@cpwarchitects.com

Re: Findings from 5OCT18 visit to Effingham, NH Town Library

Dear Norman,

I surely enjoyed our re-rendezvous at the magnificent Effingham Town Library. A fine building, largely unmucked-up by past remodels, and pretty well maintained, over its run. We were there, at the request of the Town Selectmen, to assess priorities on maintaining the building and establishing some longer-term maintenance plans and goals.

The superstructure is in pretty good shape. The tower framing repairs were done with some care and thought. There are a few details, though, that ought to be addressed up there. The eight vertical steel rods that anchor the octagonal part down to the square section need to be tightened. All eight are loose, even the two that pass through the remaining one (of four) diagonal "dragon beams." The other six rods are a bit loose, almost certainly because the three replacement timbers have shrunk as they dried out in-situ. This is not terribly complex, nor inaccessible, work. I would expect a two-man crew to spend a day or two, loosening the nuts and spacing them tight, using washers between the bottoms of the four beams and the fixed nuts on the bottoms of the rods. I would suggest their using heavy cast iron washers, to spread the load and to be original. But I suspect that they will need to augment these with thinner, steel, washers. The available adjustment on the hardware simply is not sufficient for using all cast iron washers.

While they are up there, they ought to install some reinforcing, fully-threaded, self-drilling screws in the four diagonal beams. Two vertical SIMPSON SDWC6500's at each end of each timber [16 total], driven from below and vertically, crossing the potential splitting plane at the bottom of the supporting tenon is an effective – and cost effective – way to reduce the chance of splitting. These new screws were developed in Europe and have remade the timber structure world; and all since we had those beams replaced a decade ago.

27 Sims Avenue, Unit 2R
Providence, RI 02909
(401) 654-4600 ext. 201
ben@ftet.com

While the crew is up there, armed with impact drivers and those screws, they might do well to walk the length of both eave aisles. The principal purlins, that span from truss to truss, are also hung on their tenons and are prone to the same splitting tendency. Again, a couple screws are cheap insurance against this brittle and sudden failure mode.

We considered the framing around the windows and louvers openings in the tower. The fenestration has evolved over the years, with the current openings representing enlargements of the original framing. In fitting the larger units, some original studs were cut off, weakening the framing against wind pressure. If the narrower originals were restored, the framing could also be reinforced back to its original and stronger version. Above this level, we only peeked through the hatch at the cupola. The vulnerable post penetrations through that roof level seemed sound. The cupola itself sits reasonable plumb, as viewed from the ground – a good sign.

We enjoyed yet another of our treks through the cobwebs, as we went from end-to-end in the crawl space. While this building really does have a crawlspace, we have surely endured worse. The Town had removed a lot of dirt and lined the ground with a carefully installed vapor barrier. I know that I, for one, appreciated their efforts. While we were down there, we noted the new posts and footings and the generally good condition of the framing. The venting program seems to be working, keeping the space dryer than I recall.

We did seem to determine that one pier is missing down there. There is a round post in the northeast corner (middle of the children's' reading room) that seems to support a girder in the second-floor framing. But we seemed not to find the continuation of this post down into the crawl space. The new pier would be fairly close to the new masonry wall at the mechanical room, so perhaps the builder was loathe to apply a new load so close to the new wall – but it really deserves to be better supported. I remain ready to review more precise measurements and proposals on this relatively easily remedied matter. Whether the new CMU wall may require some further reinforcement against pressure from this new pier will depend on how close it will be to the wall – and to how aggressively we expect load to be transferred onto the new pier.

Finally, you and I walked the perimeter of the building a few times, looking at the pointing in the in-fill bricks between the granite piers. The south/front face and the eastern side seem to be freshly repointed and in fine shape. The bricks on the west end gable side, though, are nearly falling out, seeming not to have repointed in decades. They ought to be repointed and the first couple rows of clapboards lifted or removed, to check on the condition of the timber sills along that gable end.

Which brings us to the north eave side (the ramped entry side). The brick foundation is nearly completely hidden, by the ramps and paving. This really does not bode well for the

27 Sims Avenue. Unit 2R
Providence, RI 02909
(401) 654-4600 ext. 201
ben@ftet.com

timber sills along that wall, but we need to know. And the drainage needs to be improved, to keep the building framing dry. I would rank these foundation issues as being as pressing as tightening the restraining rods up in the tower.

While my specialization is timber structures, I certainly have spent time studying interior plaster surfaces – if only as eloquent indicators of relative displacements in their underlying and supporting structures. We spent some time in the second floor Masonic Meeting Room, studying some of the cracks and loosened plaster – in the walls and the ceilings. We also went into the attic, to see some of those surfaces from the lathe side of matters. I understand that some repair efforts have been made, but know very little of the particulars. This means that it can be hard to establish patterns of ongoing distress in the keys that hold the plaster surface interlocked with the wood lathe strips beneath. The wall cracks we did note were mostly on the south/gable end wall, and around the corners of the window openings – classic reflections of minor distortions. Plaster normally is a very unforgiving material, when it comes to even minor racking movements. While the cracking on that south wall is noteworthy, I did not find it alarming – from my structural viewpoint.

Why does plaster crack and even break free of its supports? How much cracking is innate to the mix and installation of the plaster, and how much is due to more global movements in the structure. There are many plausible sources for structural movement sufficient to have broken some of the keys: kids running around in the attic above, wind gusts on that high and exposed site, normal timber shrinkage with drying, rotting sills allowing one wall to settle relative to another, and even settling foundations. Given the light current usage, I expect that only sill decay is the major source of any ongoing distressing deflections.

I appreciate the opportunity to revisit this striking building and encourage you to reach me with any questions that you may have, concerning the structural concerns or this letter.

Sincerely,

Robert (Ben) L. Brungraber, Ph.D., P.E.

27 Sims Avenue. Unit 2R
Providence, RI 02909
(401) 654-4600 ext. 201
ben@ftet.com

Appendix ii

Preservation Brief #10 – Exterior Paint Problems
National Park Service

10 PRESERVATION BRIEFS

Exterior Paint Problems on Historic Woodwork

Kay D. Weeks and David W. Look, AIA

U.S. Department of the Interior
National Park Service
Cultural Resources

Heritage Preservation Services

A cautionary approach to paint removal is included in the guidelines to "The Secretary of the Interior Standards for Historic Preservation Projects." Removing paints down to bare wood surfaces using harsh methods can permanently damage those surfaces; therefore such methods are not recommended. Also, total removal obliterates evidence of the historical paints and their sequence and architectural context.

This Brief expands on that advice for the architect, building manager, contractor, or homeowner by identifying and describing common types of paint surface conditions and failures, then recommending appropriate treatments for preparing exterior wood surfaces for repainting[1] to assure the best adhesion and greatest durability of the new paint. Although the Brief focuses on responsible methods of "paint removal," several paint surface conditions will be described which do not require any paint removal, and still others which can be successfully handled by limited paint removal. In all cases, the information is intended to address the concerns related to *exterior wood.* It will also be generally assumed that, because houses built before 1950 involve one or more layers of lead-base paint,[2] the majority of conditions warranting paint removal will mean dealing with this toxic substance along with the dangers of the paint removal tools and chemical strippers themselves.

Purposes of Exterior Paint

Paint[3] applied to exterior wood must withstand yearly extremes of both temperature and humidity. While never expected to be more than a temporary physical shield—requiring re-application every 5-8 years—its importance should not be minimized. Because one of the main causes of wood deterioration is moisture penetration, a primary purpose for painting wood is to exclude such moisture, thereby slowing deterioration not only of a building's exterior siding and decorative features but, ultimately, its underlying structural members. Another important purpose for painting wood is, of course, to define and accent architectural features and to improve appearance.

Treating Paint Problems in Historic Buildings

Exterior paint is constantly deteriorating through the processes of weathering, but in a program of regular maintenance—assuming all other building systems are functioning properly—surfaces can be cleaned, lightly scraped, and hand sanded in preparation for a new finish coat. Unfortunately, these are ideal conditions. More often, complex maintenance problems are inherited by owners of historic buildings, including areas of paint that have failed[4] beyond the point of mere cleaning, scraping, and hand sanding (although much so-called "paint failure" is attributable to interior or exterior moisture problems or surface preparation and application mistakes with previous coats).

Although paint problems are by no means unique to historic buildings, treating multiple layers of hardened, brittle paint on complex, ornamental—and possibly fragile—exterior wood surfaces necessarily requires an extremely cautious approach (see figure 1). In the case of recent construction, this level of concern is not needed because the wood is generally less detailed and, in addition, retention of the sequence of paint layers as a partial record of the building's history is not an issue.

When historic buildings are involved, however, a special set of problems arises—varying in complexity depending upon their age, architectural style, historical importance, and physical soundness of the wood—which must be carefully evaluated so that decisions can be made that are sensitive to the longevity of the resource.

Justification for Paint Removal

At the outset of this Brief, it must be emphasized that removing paint from historic buildings—with the exception of cleaning, light scraping, and hand sanding as part of routine maintenance—should be avoided unless absolutely essential. *Once conditions warranting removal have*

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[1] General paint type recommendations will be made, but paint color recommendations are beyond the scope of this Brief.

[2] Douglas R. Shier and William Hall, *Analysis of Housing Data Collected in a Lead-Based Paint Survey in Pittsburgh, Pennsylvania, Part 1,* National Bureau of Standards, Inter-Report 77-1250, May 1977.

[3] Any pigmented liquid, liquefiable, or mastic composition designed for application to a substrate in a thin layer which is converted to an opaque solid film after application. *Paint and Coatings Dictionary,* 1978. Federation of Societies for Coatings and Technology.

[4] For purposes of the Brief, this includes any area of painted exterior woodwork displaying signs of peeling, cracking, or alligatoring to bare wood. See descriptions of these and other paint surface conditions as well as recommended treatments on pp. 5-10.

Fig. 1 *Excessive paint build-up on architectural details such as this ornamental bracket does not in itself justify total paint removal. If paint is cracked and peeling down to bare wood, however, it should be removed using the gentlest means possible. Photo: David W. Look, AIA.*

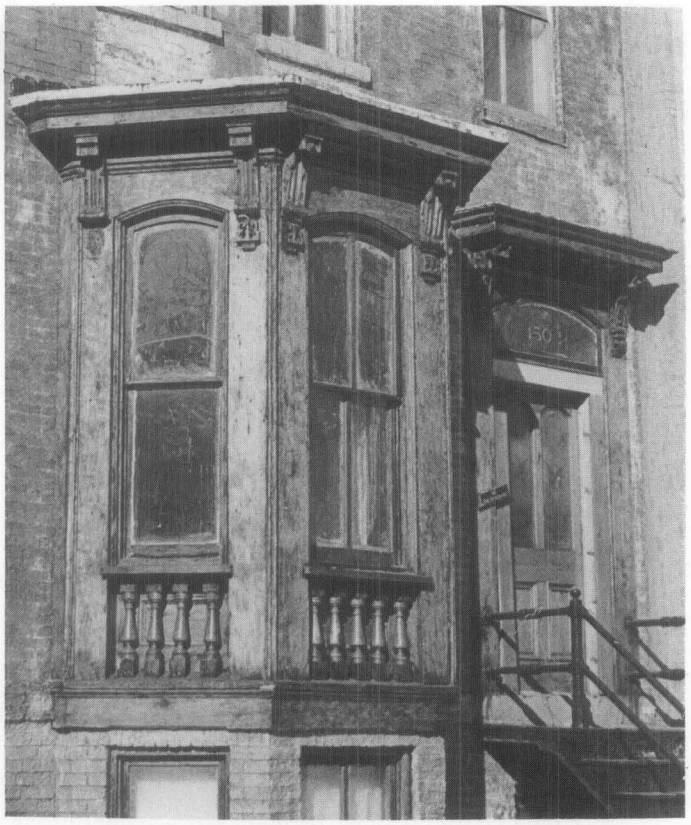

Fig. 2 *A traditionally painted bay window has been stripped to bare wood, then varnished. In addition to being historically inaccurate, the varnish will break down faster as a result of the sun's ultraviolet rays than would primer and finish coats of paint. Photo: David W. Look, AIA.*

been identified, the general approach should be to remove paint to the next sound layer using the gentlest means possible, then to repaint (see figure 2). Practically speaking as well, paint can adhere just as effectively to existing paint as to bare wood, providing the previous coats of paint are also adhering uniformly and tightly to the wood and the surface is properly prepared for repainting—cleaned of dirt and chalk and dulled by sanding. But, if painted exterior wood surfaces display continuous patterns of deep cracks or if they are extensively blistering and peeling so that bare wood is visible, then the old paint should be completely removed before repainting. The only other justification for removing all previous layers of paint is if doors, shutters, or windows have literally been "painted shut," or if new wood is being pieced-in adjacent to old painted wood and a smooth transition is desired (see figure 3).

Paint Removal Precautions

Because paint removal is a difficult and painstaking process, a number of costly, regrettable experiences have occurred—and continue to occur—for both the historic building and the building owner. Historic buildings have been set on fire with blow torches; wood irreversibly scarred by sandblasting or by harsh mechanical devices such as rotary sanders and rotary wire strippers; and layers of historic paint inadvertently and unnecessarily removed. In addition, property owners, using techniques that substitute speed for safety, have been injured by toxic lead vapors or dust from the paint they were trying to remove or by misuse of the paint removers themselves.

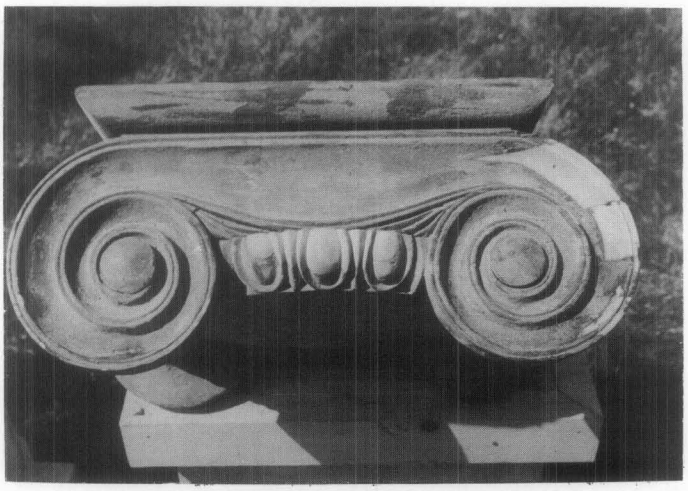

Fig. 3 *If damage to parts of a wooden element is severe, new sections of wood will need to be pieced-in. When such piecing is required, paint on the adjacent woodwork should be removed so that the old and new woods will make a smooth profile when joined. After repainting, the repair should be virtually impossible to detect. Photo: Morgan W. Phillips.*

Owners of historic properties considering paint removal should also be aware of the amount of time and labor involved. While removing damaged layers of paint from a door or porch railing might be readily accomplished within a reasonable period of time by one or two people, removing paint from larger areas of a building can, with-

out professional assistance, easily become unmanageable and produce less than satisfactory results. The amount of work involved in any paint removal project must therefore be analyzed on a case-by-case basis. Hiring qualified professionals will often be a cost-effective decision due to the expense of materials, the special equipment required, and the amount of time involved. Further, paint removal companies experienced in dealing with the inherent health and safety dangers of paint removal should have purchased such protective devices as are needed to mitigate any dangers and should also be aware of State or local environmental and/or health regulations for hazardous waste disposal.

All in all, paint removal is a messy, expensive, and potentially dangerous aspect of rehabilitating or restoring historic buildings and should not be undertaken without careful thought concerning first, its necessity, and second, which of the available recommended methods is the safest and most appropriate for the job at hand.

Repainting Historic Buildings for Cosmetic Reasons

If existing exterior paint on wood siding, eaves, window sills, sash, and shutters, doors, and decorative features shows no evidence of paint deterioration such as chalking, blistering, peeling, or cracking, then there is no *physical reason* to repaint, much less remove paint! Nor is color fading, of itself, sufficient justification to repaint a historic building.

The decision to repaint may not be based altogether on paint failure. Where there is a new owner, or even where ownership has remained constant through the years, taste in colors often changes. Therefore, if repainting is primarily to alter a building's primary and accent colors, a technical factor of paint accumulation should be taken into consideration. When paint builds up to a thickness of approximately 1/16" (approximately 16-30 layers), one or more extra coats of paint may be enough to trigger cracking and peeling in limited or even widespread areas of the building's surface. This results because excessively thick paint is less able to withstand the shrinkage or pull of an additional coat as it dries and is also less able to tolerate thermal stresses. Thick paint invariably fails at the weakest point of adhesion—the oldest layers next to the wood. Cracking and peeling follow. Therefore, if there are no signs of paint failure, it may be somewhat risky to add still another layer of unneeded paint simply for color's sake (extreme changes in color may also require more than one coat to provide proper hiding power and full color). When paint appears to be nearing the critical thickness, a change of accent colors (that is, just to limited portions of the trim) might be an acceptable compromise without chancing cracking and peeling of paint on wooden siding.

If the decision to repaint is nonetheless made, the "new" color or colors should, at a minimum, be appropriate to the style and setting of the building. On the other hand, where the intent is to restore or accurately reproduce the colors originally used or those from a significant period in the building's evolution, they should be based on the results of a paint analysis.[5]

Identification of Exterior Paint Surface Conditions/Recommended Treatments

It is assumed that a preliminary check will already have been made to determine, first, that the painted exterior surfaces are indeed wood—and not stucco, metal, or other wood substitutes—and second, that the wood has not decayed so that repainting would be superfluous. For example, if any area of bare wood such as window sills has been exposed for a long period of time to standing water, wood rot is a strong possibility (see figure 4). Repair or replacement of deteriorated wood should take place before repainting. After these two basic issues have been resolved, the surface condition identification process may commence.

The historic building will undoubtedly exhibit a variety of exterior paint surface conditions. For example, paint on the wooden siding and doors may be adhering firmly; paint on the eaves peeling; and paint on the porch balusters and window sills cracking and alligatoring. The accurate identification of each paint problem is therefore the first step in planning an appropriate overall solution.

Paint surface conditions can be grouped according to their relative severity: CLASS I conditions include minor blemishes or dirt collection and generally require *no* paint removal; CLASS II conditions include failure of the top layer or layers of paint and generally require *limited* paint removal; and CLASS III conditions include substantial or multiple-layer failure and generally require *total* paint removal. It is precisely because conditions will vary at different points on the building that a careful inspection is critical. Each item of painted exterior woodwork (i.e., siding, doors, windows, eaves, shutters, and decorative elements) should be examined early in the planning phase and surface conditions noted.

CLASS I Exterior Surface Conditions Generally Requiring No Paint Removal

- **Dirt, Soot, Pollution, Cobwebs, Insect Cocoons, etc.**

Cause of Condition

Environmental "grime" or organic matter that tends to cling to painted exterior surfaces and, in particular, protected surfaces such as eaves, do not constitute a paint problem unless painted over rather than removed prior to repainting. If not removed, the surface deposits can be a barrier to proper adhesion and cause peeling.

Recommended Treatment

Most surface matter can be loosened by a strong, direct stream of water from the nozzle of a garden hose. Stubborn dirt and soot will need to be scrubbed off using ½ cup of household detergent in a gallon of water with a medium soft bristle brush. The cleaned surface should then be rinsed thoroughly, and permitted to dry before further inspection to determine if repainting is necessary. Quite often, cleaning provides a satisfactory enough result to postpone repainting.

[5] See the Reading List for paint research and documentation information. See also *The Secretary of the Interior's Standards for Historic Preservation Projects with Guidelines for Applying the Standards* for recommended approaches on paints and finishes within various types of project work treatments.

- **Mildew**

Cause of Condition

Mildew is caused by fungi feeding on nutrients contained in the paint film or on dirt adhering to any surface. Because moisture is the single most important factor in its growth, mildew tends to thrive in areas where dampness and lack of sunshine are problems such as window sills, under eaves, around gutters and downspouts, on the north side of buildings, or in shaded areas near shrubbery. It may sometimes be difficult to distinguish mildew from dirt, but there is a simple test to differentiate: if a drop of household bleach is placed on the suspected surface, mildew will immediately turn white whereas dirt will continue to look like dirt.

Recommended Treatment

Because mildew can only exist in shady, warm, moist areas, attention should be given to altering the environment that is conducive to fungal growth. The area in question may be shaded by trees which need to be pruned back to allow sunlight to strike the building; or may lack rain gutters or proper drainage at the base of the building. If the shady or moist conditions can be altered, the mildew is less likely to reappear. A recommend solution for removing mildew consists of one cup non-ammoniated detergent, one quart household bleach, and one gallon water. When the surface is scrubbed with this solution using a medium soft brush, the mildew should disappear; however, for particularly stubborn spots, an additional quart of bleach may be added. After the area is mildew-free, it should then be rinsed with a direct stream of water from the nozzle of a garden hose, and permitted to dry thoroughly. When repainting, specially formulated "mildew-resistant" primer and finish coats should be used.

- **Excessive Chalking**

Cause of Condition

Chalking—or powdering of the paint surface—is caused by the gradual disintegration of the resin in the paint film. (The amount of chalking is determined both by the formulation of the paint and the amount of ultraviolet light to which the paint is exposed.) In moderation, chalking is the ideal way for a paint to "age," because the chalk, when rinsed by rainwater, carries discoloration and dirt away with it and thus provides an ideal surface for repainting. In excess, however, it is not desirable because the chalk can wash down onto a surface of a different color beneath the painted area and cause streaking as well as rapid disintegration of the paint film itself. Also, if a paint contains too much pigment for the amount of binder (as the old white lead carbonate/oil paints often did), excessive chalking can result.

Recommended Treatment

The chalk should be cleaned off with a solution of ½ cup household detergent to one gallon water, using a medium soft bristle brush. After scrubbing to remove the chalk, the surface should be rinsed with a direct stream of water from the nozzle of a garden hose, allowed to dry thoroughly, (but not long enough for the chalking process to recur) and repainted, using a non-chalking paint.

- **Staining**

Cause of Condition

Staining of paint coatings usually results from excess moisture reacting with materials within the wood substrate. There are two common types of staining, neither of which requires paint removal. The most prevalent type of stain is due to the oxidation or rusting of iron nails or metal (iron, steel, or copper) anchorage devices. A second type of stain is caused by a chemical reaction between moisture and natural extractives in certain woods (red cedar or redwood) which results in a surface deposit of colored matter. This is most apt to occur in new replacement wood within the first 10-15 years.

Fig. 4 *Paint films wear unevenly depending on exposure and location. Exterior locations which are susceptible to accelerated deterioration are horizontal surfaces such as window sills. These and similar areas will require repainting more often than less vulnerable surfaces. In the case of this window sill where paint has peeled off and adjacent areas have cracked and alligatored, the paint should be totally removed. Prior to repainting, any weathered wood should be rejuvenated using a solution of 3 cups exterior varnish, 1 oz. paraffin wax, and mineral spirits/paint thinner/or turpentine to make 1 gallon. Liberal brush application should be made. This formula was tested over a 20-year period by the U.S. Department of Agriculture's Forest Products Laboratory and proved to be just as effective as water-repellent preservatives containing pentachlorophenol. After the surface has thoroughly dried (2-3 days of warm weather), the treated surface can be painted. A high quality oil-base primer followed by two top coats of a semi-gloss oil-enamel or latex-enamel paint is recommended. Photo: Baird M. Smith, AIA.*

Recommended Treatment

In both cases, the source of the stain should first be located and the moisture problem corrected.

When stains are caused by rusting of the heads of nails used to attach shingles or siding to an exterior wall or by rusting or oxidizing iron, steel, or copper anchorage devices adjacent to a painted surface, the metal objects themselves should be hand sanded and coated with a rust-inhibitive primer followed by two finish coats. (Exposed nail heads should ideally be countersunk, spot primed, and the holes filled with a high quality wood filler except where exposure of the nail head was part of the original construction system or the wood is too fragile to withstand the countersinking procedure.)

Discoloration due to color extractives in replacement wood can usually be cleaned with a solution of equal parts denatured alcohol and water. After the affected area

has been rinsed and permitted to dry, a "stain-blocking primer" especially developed for preventing this type of stain should be applied (two primer coats are recommended for severe cases of bleeding prior to the finish coat). Each primer coat should be allowed to dry at least 48 hours.

CLASS II Exterior Surface Conditions Generally Requiring Limited Paint Removal

- **Crazing**

Cause of Condition

Crazing—fine, jagged interconnected breaks in the top layer of paint—results when paint that is several layers thick becomes excessively hard and brittle with age and is consequently no longer able to expand and contract with the wood in response to changes in temperature and humidity (see figure 5). As the wood swells, the bond between paint layers is broken and hairline cracks appear. Although somewhat more difficult to detect as opposed to other more obvious paint problems, it is well worth the time to scrutinize all surfaces for crazing. If not corrected, exterior moisture will enter the crazed surface, resulting in further swelling of the wood and, eventually, deep cracking and alligatoring, a Class III condition which requires total paint removal.

Recommended Treatment

Crazing can be treated by hand or mechanically sanding the surface, then repainting. Although the hairline cracks may tend to show through the new paint, the surface will be protected against exterior moisture penetration.

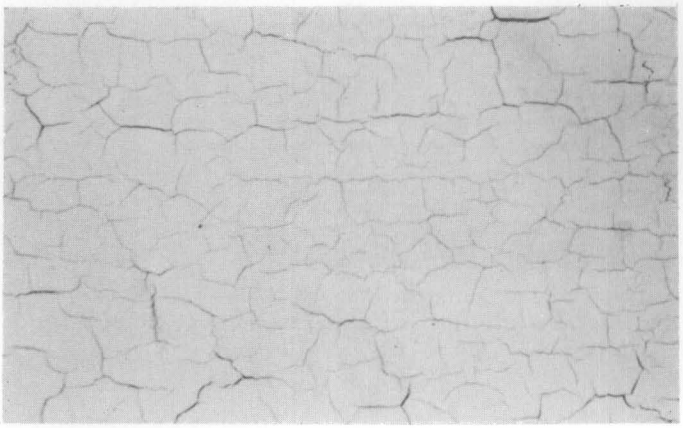

Fig. 5 *Crazing—or surface cracking—is an exterior surface condition which can be successfully treated by sanding and painting. Photo: Courtesy, National Decorating Products Association.*

- **Intercoat Peeling**

Cause of Condition

Intercoat peeling can be the result of improper surface preparation prior to the last repainting. This most often occurs in protected areas such as eaves and covered porches because these surfaces do not receive a regular rinsing from rainfall, and salts from air-borne pollutants thus accumulate on the surface. If not cleaned off, the new paint coat will not adhere properly and that layer will peel.

Another common cause of intercoat peeling is incompatibility between paint types (see figure 6). For example, if oil paint is applied over latex paint, peeling of the top coat can sometimes result since, upon aging, the oil paint becomes harder and less elastic than the latex paint. If latex paint is applied over old, chalking oil paint, peeling can also occur because the latex paint is unable to penetrate the chalky surface and adhere.

Recommended Treatment

First, where salts or impurities have caused the peeling, the affected area should be washed down thoroughly after scraping, then wiped dry. Finally, the surface should be hand or mechanically sanded, then repainted.

Where peeling was the result of using incompatible paints, the peeling top coat should be scraped and hand or mechanically sanded. Application of a high quality oil type exterior primer will provide a surface over which either an oil or a latex topcoat can be successfully used.

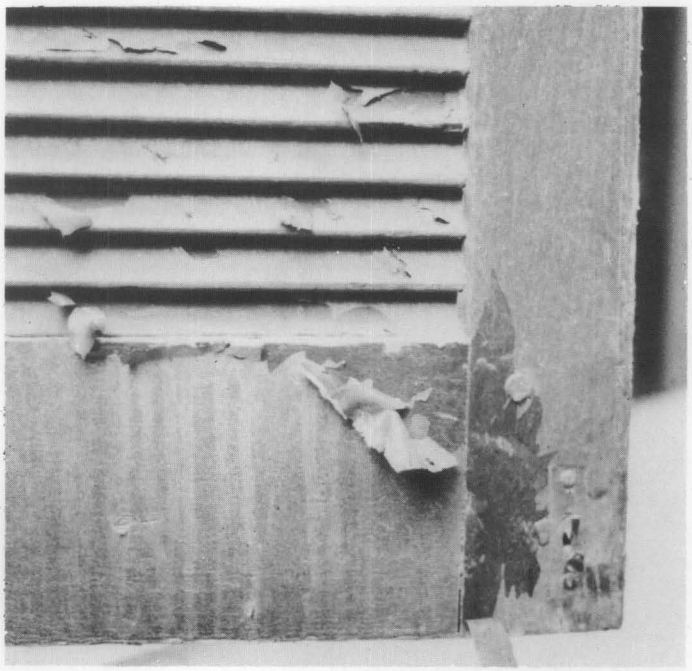

Fig. 6 *This is an example of intercoat peeling. A latex top coat was applied directly over old oil paint and, as a result, the latex paint was unable to adhere. If latex is being used over oil, an oil-base primer should be applied first. Although much of the peeling latex paint can be scraped off, in this case, the best solution may be to chemically dip strip the entire shutter to remove all of the paint down to bare wood, rinse thoroughly, then repaint. Photo: Mary L. Oehrlein, AIA.*

- **Solvent Blistering**

Cause of Condition

Solvent blistering, the result of a less common application error, is not caused by moisture, but by the action of ambient heat on paint solvent or thinners in the paint film. If solvent-rich paint is applied in direct sunlight, the top surface can dry too quickly and, as a result, solvents become trapped beneath the dried paint film. When the solvent vaporizes, it forces its way through the paint film, resulting in surface blisters. This problem occurs more often with dark colored paints because darker colors absorb more heat than lighter ones. To distinguish between solvent blistering and blistering caused by moisture, a blister should be cut open. If another layer of paint is visible, then solvent blistering is likely the problem whereas if bare wood is revealed, moisture is probably to blame. Solvent blisters are generally small.

Recommended Treatment

Solvent-blistered areas can be scraped, hand or mechanically sanded to the next sound layer, then repainted. In order to prevent blistering of painted surfaces, paint should not be applied in direct sunlight.

- **Wrinkling**

Cause of Condition

Another error in application that can easily be avoided is wrinkling (see figure 7). This occurs when the top layer of paint dries before the layer underneath. The top layer of paint actually moves as the paint underneath (a primer, for example) is drying. Specific causes of wrinkling include: (1) applying paint too thick; (2) applying a second coat before the first one dries; (3) inadequate brushing out; and (4) painting in temperatures higher than recommended by the manufacturer.

Recommended Treatment

The wrinkled layer can be removed by scraping followed by hand or mechanical sanding to provide as even a surface as possible, then repainted following manufacturer's application instructions.

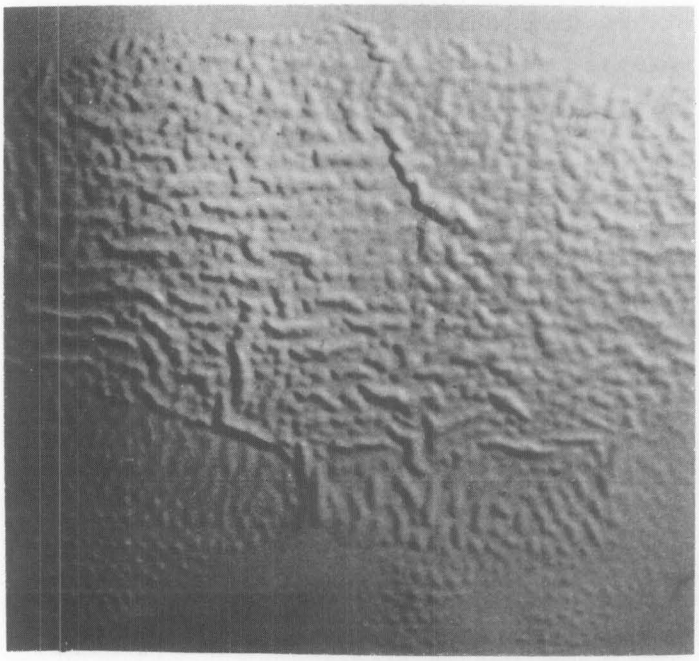

Fig. 7 *Wrinkled layers can generally be removed by scraping and sanding as opposed to total paint removal. Following manufacturers' application instructions is the best way to avoid this surface condition. Photo: Courtesy, National Decorating Products Association.*

CLASS III Exterior Surface Conditions Generally Requiring Total Paint Removal

If surface conditions are such that the majority of paint will have to be removed prior to repainting, it is suggested that a small sample of intact paint be left in an inconspicuous area either by covering the area with a metal plate, or by marking the area and identifying it in some way. (When repainting does take place, the sample should not be painted over). This will enable future investigators to have a record of the building's paint history.

- **Peeling**

Cause of Condition

Peeling to bare wood is most often caused by excess interior or exterior moisture that collects behind the paint film, thus impairing adhesion (see figure 8). Generally beginning as blisters, cracking and peeling occur as moisture causes the wood to swell, breaking the adhesion of the bottom layer.

Recommended Treatment

There is no sense in repainting before dealing with the moisture problems because new paint will simply fail. Therefore, the first step in treating peeling is to locate and remove the source or sources of the moisture, not only because moisture will jeopardize the protective coating of paint but because, if left unattended, it can ultimately cause permanent damage to the wood. Excess interior moisture should be removed from the building through installation of exhaust fans and vents. Exterior moisture should be eliminated by correcting the following conditions prior to repainting: faulty flashing; leaking gutters; defective roof shingles; cracks and holes in siding and trim; deteriorated caulking in joints and seams; and shrubbery growing too close to painted wood. After the moisture problems have been solved, the wood must be permitted to dry out thoroughly. The damaged paint can then be scraped off with a putty knife, hand or mechanically sanded, primed, and repainted.

Fig. 8 *Peeling to bare wood—one of the most common types of paint failure—is usually caused by an interior or exterior moisture problem. Photo: Anne E. Grimmer.*

- **Cracking/Alligatoring**

Cause of Condition

Cracking and alligatoring are advanced stages of crazing (see figure 9). Once the bond between layers has been broken due to intercoat paint failure, exterior moisture is able to penetrate the surface cracks, causing the wood to swell and deeper cracking to take place. This process continues until cracking, which forms parallel to grain, extends to bare wood. Ultimately, the cracking becomes an overall pattern of horizontal and vertical breaks in the paint layers that looks like reptile skin; hence, "alligatoring." In advanced stages of cracking and alligatoring, the surfaces will also flake badly.

Recommended Treatment

If cracking and alligatoring are present only in the top layers they can probably be scraped, hand or mechanically sanded to the next sound layer, then repainted. However, if cracking and/or alligatoring have progressed to

bare wood and the paint has begun to flake, it will need to be totally removed. Methods include scraping or paint removal with the electric heat plate, electric heat gun, or chemical strippers, depending on the particular area involved. Bare wood should be primed within 48 hours, then repainted.

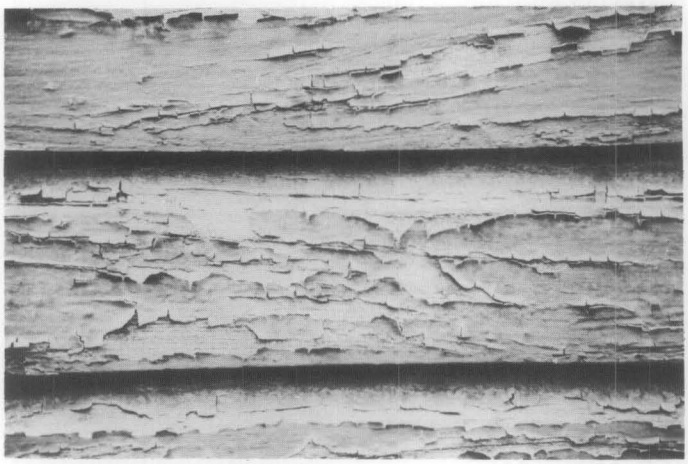

Fig. 9 *Cracking, alligatoring, and flaking are evidence of long-term neglect of painted surfaces. The remaining paint on the clapboard shown here can be removed with an electric heat plate and wide-bladed scraper. In addition, unsound wood should be replaced and moisture problems corrected before primer and top coats of paint are applied. Photo: David W. Look, AIA.*

Selecting the Appropriate/Safest Method to Remove Paint

After having presented the "hierarchy" of exterior paint surface conditions—from a mild condition such as mildewing which simply requires cleaning prior to repainting to serious conditions such as peeling and alligatoring which require total paint removal—one important thought bears repeating: if a paint problem has been identified that warrants either limited or total paint removal, the gentlest method possible for the particular wooden element of the historic building should be selected from the many available methods.

The treatments recommended—based upon field testing as well as onsite monitoring of Department of Interior grant-in-aid and certification of rehabilitation projects—are therefore those which take three over-riding issues into consideration (1) the continued protection and preservation of the historic exterior woodwork; (2) the retention of the sequence of historic paint layers; and (3) the health and safety of those individuals performing the paint removal. By applying these criteria, it will be seen that no paint removal method is without its drawbacks and all recommendations are qualified in varying degrees.

Methods for Removing Paint

After a particular exterior paint surface condition has been identified, the next step in planning for repainting—if paint removal is required—is selecting an appropriate method for such removal.

The method or methods selected should be suitable for the specific paint problem as well as the particular wooden element of the building. Methods for paint removal can be divided into three categories (frequently, however, a combination of the three methods is used). Each method is defined below, then discussed further and specific recommendations made:

Abrasive—"Abrading" the painted surface by manual and/or mechanical means such as scraping and sanding. Generally used for surface preparation and limited paint removal.

Thermal—Softening and raising the paint layers by applying heat followed by scraping and sanding. Generally used for total paint removal.

Chemical—Softening of the paint layers with chemical strippers followed by scraping and sanding. Generally used for total paint removal.

- **Abrasive Methods (Manual)**

If conditions have been identified that require limited paint removal such as crazing, intercoat peeling, solvent blistering, and wrinkling, scraping and hand sanding should be the first methods employed before using mechanical means. Even in the case of more serious conditions such as peeling—where the damaged paint is weak and already sufficiently loosened from the wood surface—scraping and hand sanding may be all that is needed prior to repainting.

Recommended Abrasive Methods (Manual)

Putty Knife/Paint Scraper: Scraping is usually accomplished with either a putty knife or a paint scraper, or both. Putty knives range in width from one to six inches and have a beveled edge. A putty knife is used in a pushing motion going under the paint and working from an area of loose paint toward the edge where the paint is still firmly adhered and, in effect, "beveling" the remaining layers so that as smooth a transition as possible is made between damaged and undamaged areas (see figure 10).

Paint scrapers are commonly available in $1\frac{5}{16}$, $2\frac{1}{2}$, and $3\frac{1}{2}$ inch widths and have replaceable blades. In addition, profiled scrapers can be made specifically for use on moldings. As opposed to the putty knife, the paint scraper is used in a pulling motion and works by raking the damaged areas of paint away.

The obvious goal in using the putty knife or the paint scraper is to selectively remove the affected layer or layers of paint; however, both of these tools, particularly the paint scraper with its hooked edge, must be used with care to properly prepare the surface and to avoid gouging the wood.

Sandpaper/Sanding Block/Sanding sponge: After manually removing the damaged layer or layers by scraping, the uneven surface (due to the almost inevitable removal of varying numbers of paint layers in a given area) will need to be smoothed or "feathered out" prior to repainting. As stated before, hand sanding, as opposed to harsher mechanical sanding, is recommended if the area is relatively limited. A coarse grit, open-coat flint sandpaper—the least expensive kind—is useful for this purpose because, as the sandpaper clogs with paint it must be discarded and this process repeated until all layers adhere uniformly.

Blocks made of wood or hard rubber and covered with sandpaper are useful for handsanding flat surfaces. Sanding sponges—rectangular sponges with an abrasive aggregate on their surfaces—are also available for detail work that requires reaching into grooves because the sponge easily conforms to curves and irregular surfaces. All sanding should be done with the grain.

Summary of Abrasive Methods (Manual)

Recommended: Putty knife, paint scraper, sandpaper, sanding block, sanding sponge.
Applicable areas of building: All areas.
For use on: Class I, Class II, and Class III conditions.
Health/Safety factors: Take precautions against lead dust, eye damage; dispose of lead paint residue properly.

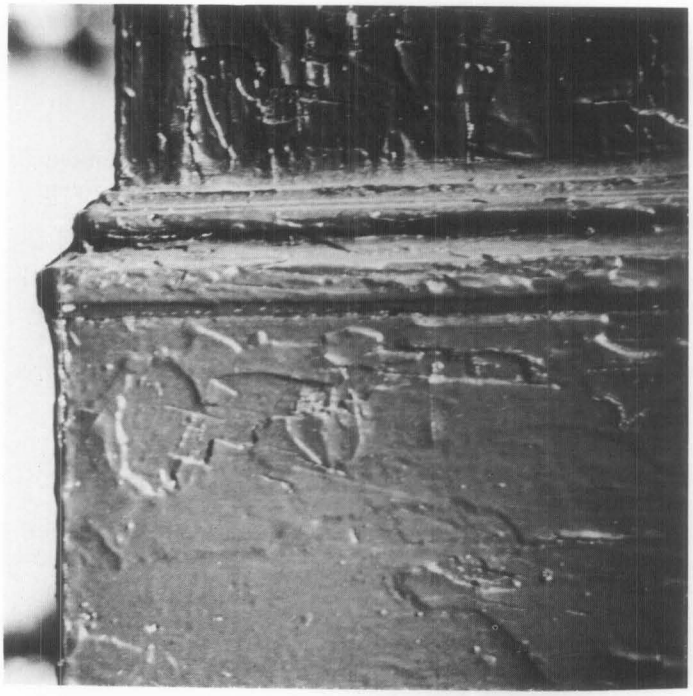

Fig. 10 *An excellent example of inadequate scraping before repainting, the problems here are far more than cosmetic. This improperly prepared surface will permit moisture to get behind the paint film which, in turn, will result in chipping and peeling. Photo: Baird M. Smith, AIA.*

- **Abrasive Methods (Mechanical)**

If hand sanding for purposes of surface preparation has not been productive or if the affected area is too large to consider hand sanding by itself, mechanical abrasive methods, i.e., power-operated tools may need to be employed; however, it should be noted that the majority of tools available for paint removal can cause damage to fragile wood and must be used with great care.

Recommended Abrasive Methods (Mechanical)

Orbital sander: Designed as a finishing or smoothing tool—not for the removal of multiple layers of paint—the oribital sander is thus recommended when limited paint removal is required prior to repainting. Because it sands in a small diameter circular motion (some models can also be switched to a back-and-forth vibrating action), this tool is particularly effective for "feathering" areas where paint has first been scraped (see figure 11). The abrasive surface varies from about 3×7 inches to 4×9 inches and sandpaper is attached either by clamps or sliding clips. A medium grit, open-coat aluminum oxide sandpaper should be used; fine sandpaper clogs up so quickly that it is ineffective for smoothing paint.

Belt sander: A second type of power tool—the belt sander—can also be used for removing limited layers of paint but, in this case, the abrasive surface is a continuous belt of sandpaper that travels at high speeds and consequently offers much less control than the orbital sander. Because of the potential for more damage to the paint or the wood, use of the belt sander (also with a medium grit sandpaper) should be limited to flat surfaces and only skilled operators should be permitted to operate it within a historic preservation project.

Fig. 11 *The orbital sander can be used for limited paint removal, i.e., for smoothing flat surfaces after the majority of deteriorated paint has already been scraped off. Photo: Charles E. Fisher, III.*

Not Recommended

Rotary Drill Attachments: Rotary drill attachments such as the rotary sanding disc and the rotary wire stripper should be avoided. The disc sander—usually a disc of sandpaper about 5 inches in diameter secured to a rubber based attachment which is in turn connected to an electric drill or other motorized housing—can easily leave visible circular depressions in the wood which are difficult to hide, even with repainting. The rotary wire stripper—clusters of metals wires similarly attached to an electric drill-type unit—can actually shred a wooden surface and is thus to be used exclusively for removing corrosion and paint from metals.

Waterblasting: Waterblasting above 600 p.s.i. to remove paint is not recommended because it can force water into the woodwork rather than cleaning loose paint and grime from the surface; at worst, high pressure waterblasting causes the water to penetrate exterior sheathing and damages interior finishes. A detergent solution, a medium soft bristle brush, and a garden hose for purposes of rinsing, is the gentlest method involving water and is recommended when cleaning exterior surfaces prior to repainting.

Sandblasting: Finally—and undoubtedly most vehemently "not recommended"—sandblasting painted exterior woodwork will indeed remove paint, but at the same time can scar wooden elements beyond recognition. As with rotary wire strippers, sandblasting erodes the soft porous fibers (spring wood) faster than the hard, dense fibers (summer wood), leaving a pitted surface with ridges and valleys. Sandblasting will also erode projecting areas of carvings and moldings before it removes paint from concave areas (see figure 12). Hence, this abrasive method is potentially the most damaging of all possibilities, even if a contractor promises that blast pressure can be controlled so that the paint is removed without harming the historic exterior woodwork. (For Additional Information, See Presevation Briefs 6, "Dangers of Abrasive Cleaning to Historic Buildings".)

Fig. 12 *Sandblasting has permanently damaged this ornamental bracket. Even paint will not be able to hide the deep erosion of the wood. Photo: David W. Look, AIA.*

Summary of Abrasive Methods (Mechanical)

Recommended: Orbital sander, belt sander (skilled operator only).
Applicable areas of building: Flat surfaces, i.e., siding, eaves, doors, window sills.
For use on: Class II and Class III conditions.
Health/Safety factors: Take precautions against lead dust and eye damage; dispose of lead paint residue properly.
Not Recommended: Rotary drill attachments, high pressure waterblasting, sandblasting.

- **Thermal Methods**

Where exterior surface conditions have been identified that warrant total paint removal such as peeling, cracking, or alligatoring, two thermal devices—the electric heat plate and the electric heat gun—have proven to be quite successful for use on different wooden elements of the historic building. One thermal method—the blow torch—is not recommended because it can scorch the wood or even burn the building down!

Recommended Thermal Methods

Electric heat plate: The electric heat plate (see figure 13) operates between 500 and 800 degrees Fahrenheit (not hot enough to vaporize lead paint), using about 15 amps of power. The plate is held close to the painted exterior surface until the layers of paint begin to soften and blister, then moved to an adjacent location on the wood while the softened paint is scraped off with a putty knife (it should be noted that the heat plate is most successful when the paint is very thick!). With practice, the operator can successfully move the heat plate evenly across a flat surface such as wooden siding or a window sill or door in a continuous motion, thus lessening the risk of scorching the wood in an attempt to reheat the edge of the paint sufficiently for effective removal. Since the electric heat plate's coil is "red hot," extreme caution should be taken to avoid igniting clothing or burning the skin. If an extension cord is used, it should be a heavy-duty cord (with 3-prong grounded plugs). A heat plate could overload a circuit or, even worse, cause an electrical fire; therefore, it is recommended that this implement be used with a single circuit and that a fire extinguisher always be kept close at hand.

Fig. 13 *The electric heat plate (with paint scraper) is particularly useful for removing paint down to bare wood on flat surfaces such as doors, window frames, and siding. After scraping, some light sanding will probably be necessary to smooth the surface prior to application of primer and top coats. Photo: David W. Look, AIA.*

Electric heat gun: The electric heat gun (electric hot-air gun) looks like a hand-held hairdryer with a heavy-duty metal case (see figure 14). It has an electrical resistance coil that typically heats between 500 and 750 degrees Fahrenheit and, again, uses about 15 amps of power which requires a heavy-duty extension cord. There are some heat guns that operate at higher temperatures but they should not be purchased for removing old paint

because of the danger of lead paint vapors. The temperature is controlled by a vent on the side of the heat gun. When the vent is closed, the heat increases. A fan forces a stream of hot air against the painted woodwork, causing a blister to form. At that point, the softened paint can be peeled back with a putty knife. It can be used to best advantage when a paneled door was originally varnished, then painted a number of times. In this case, the paint will come off quite easily, often leaving an almost pristine varnished surface behind. Like the heat plate, the heat gun works best on a heavy paint build-up. (It is, however, not very successful on only one or two layers of paint or on surfaces that have only been varnished. The varnish simply becomes sticky and the wood scorches.)

Although the heat gun is heavier and more tiring to use than the heat plate, it is particularly effective for removing paint from detail work because the nozzle can be directed at curved and intricate surfaces. Its use is thus more limited than the heat plate, and most successfully used in conjunction *with* the heat plate. For example, it takes about two to three hours to strip a paneled door with a heat gun, but if used in combination with a heat plate for the large, flat area, the time can usually be cut in half. Although a heat gun seldom scorches wood, it can cause fires (like the blow torch) if aimed at the dusty cavity between the exterior sheathing and siding and interior lath and plaster. A fire may smolder for hours before flames break through to the surface. Therefore, this thermal device is best suited for use on solid decorative elements, such as molding, balusters, fretwork, or "gingerbread."

Fig. 14 *The nozzle on the electric heat gun permits hot air to be aimed into cavities on solid decorative elements such as this applied column. After the paint has been sufficiently softened, it can be removed with a profiled scraper. Photo: Charles E. Fisher, III.*

Not Recommended

Blow Torch: Blow torches, such as hand-held propane or butane torches, were widely used in the past for paint removal because other thermal devices were not available. With this technique, the flame is directed toward the paint until it begins to bubble and loosen from the surface. Then the paint is scraped off with a putty knife. Although this is a relatively fast process, at temperatures between 3200 and 3800 degrees Fahrenheit the open flame is not only capable of burning a careless operator and causing severe damage to eyes or skin, it can easily scorch or ignite the wood. The other fire hazard is more insidious. Most frame buildings have an air space between the exterior sheathing and siding and interior lath and plaster. This cavity usually has an accumulation of dust which is also easily ignited by the open flame of a blow torch. Finally, lead-base paints will vaporize at high temperatures, releasing toxic fumes that can be unknowingly inhaled. Therefore, because both the heat plate and the heat gun are generally safer to use—that is, the risks are much more controllable—the blow torch should definitely be avoided!

Summary of Thermal Methods

Recommended: Electric heat plate, electric heat gun.
Applicable areas of building: Electric heat plate—flat surfaces such as siding, eaves, sash, sills, doors. Electric heat gun—solid decorative molding, balusters, fretwork, or "gingerbread."
For use on: Class III conditions.
Health/Safety factors: Take precautions against eye damage and fire. Dispose of lead paint residue properly.
Not Recommended: Blow torch.

- **Chemical Methods**

With the availability of effective thermal methods for total paint removal, the need for chemical methods—in the context of preparing historic exterior woodwork for repainting—becomes quite limited. Solvent-base or caustic strippers may, however, play a supplemental role in a number of situations, including:

- Removing paint residue from intricate decorative features, or in cracks or hard to reach areas if a heat gun has not been completely effective;
- Removing paint on window muntins because heat devices can easily break the glass;
- Removing varnish on exterior doors after all layers of paint have been removed by a heat plate/heat gun if the original varnish finish is being restored;
- Removing paint from detachable wooden elements such as exterior shutters, balusters, columns, and doors by dip-stripping when other methods are too laborious.

Recommended Chemical Methods
(Use With Extreme Caution)

Because all chemical paint removers can involve potential health and safety hazards, no wholehearted recommendations can be made from that standpoint. Commonly known as "paint removers" or "strippers," both solvent-base or caustic products are commercially available that, when poured, brushed, or sprayed on painted exterior woodwork are capable of softening several layers of paint at a time so that the resulting "sludge"—which should be remembered is nothing less than the sequence of historic

paint layers—can be removed with a putty knife. Detachable wood elements such as exterior shutters can also be "dip-stripped."

Solvent-base Strippers: The formulas tend to vary, but generally consist of combinations of organic solvents such as methylene chloride, isopropanol, toluol, xylol, and methanol; thickeners such as methyl cellulose; and various additives such as paraffin wax used to prevent the volatile solvents from evaporating before they have time to soak through multiple layers of paint. Thus, while some solvent-base strippers are quite thin and therefore unsuitable for use on vertical surfaces, others, called "semi-paste" strippers, are formulated for use on vertical surfaces or the underside of horizontal surfaces.

However, whether liquid or semi-paste, there are two important points to stress when using any solvent-base stripper: First, the vapors from the organic chemicals can be highly toxic if inhaled; skin contact is equally dangerous because the solvents can be absorbed; second, many solvent-base strippers are flammable. Even though application out-of-doors may somewhat mitigate health and safety hazards, a respirator with special filters for organic solvents is recommended and, of course, solvent-base strippers should never be used around open flames, lighted cigarettes, or with steel wool around electrical outlets.

Although appearing to be the simplest for exterior use, a particular type of solvent-base stripper needs to be mentioned here because it can actually cause the most problems. Known as "water-rinsable," such products have a high proportion of methylene chloride together with emulsifiers. Although the dissolved paint can be rinsed off with water with a minimum of scraping, this ultimately creates more of a problem in cleaning up and properly disposing of the sludge. In addition, these strippers can leave a gummy residue on the wood that requires removal with solvents. Finally, water-rinsable strippers tend to raise the grain of the wood more than regular strippers.

On balance, then, the regular strippers would seem to work just as well for exterior purposes and are perhaps even better from the standpoint of proper lead sludge disposal because they must be hand scraped as opposed to rinsed off (a coffee-can with a wire stretched across the top is one effective way to collect the sludge; when the putty knife is run across the wire, the sludge simply falls into the can. Then, when the can is filled, the wire is removed, the can capped, and the lead paint sludge disposed of according to local health regulations).

Caustic Strippers: Until the advent of solvent-base strippers, caustic strippers were used exclusively when a chemical method was deemed appropriate for total paint removal prior to repainting or refinishing. Now, it is more difficult to find commercially prepared caustic solutions in hardware and paint stores for home-owner use with the exception of lye (caustic soda) because solvent-base strippers packaged in small quantities tend to dominate the market.

Most commercial dip stripping companies, however, continue to use variations of the caustic bath process because it is still the cheapest method available for removing paint. Generally, dip stripping should be left to professional companies because caustic solutions can dissolve skin and permanently damage eyes as well as present serious disposal problems in large quantities.

If exterior shutters or other detachable elements are being sent out[6] for stripping in a caustic solution, it is wise to see samples of the company's finished work. While some companies do a first-rate job, others can leave a residue of paint in carvings and grooves. Wooden elements may also be soaked too long so that the wood grain is raised and roughened, requiring extensive hand sanding later. In addition, assurances should be given by these companies that caustic paint removers will be neutralized with a mild acid solution or at least thoroughly rinsed with water after dipping (a caustic residue makes the wood feel slippery). If this is not done, the lye residue will cause new paint to fail.

Summary of Chemical Methods

Recommended, with extreme caution: Solvent-base strippers, caustic strippers.
Applicable areas of buildings: decorative features, window muntins, doors, exterior shutters, columns, balusters, and railings.
For use on: Class III Conditions.
Health/Safety factors: Take precautions against inhaling toxic vapors; fire; eye damage; and chemical poisoning from skin contact. Dispose of lead residue properly

General Paint Type Recommendations

Based on the assumption that the exterior wood has been painted with oil paint many times in the past and the existing top coat is therefore also an oil paint,* it is recommended that for CLASS I and CLASS II paint surface conditions, a top coat of high quality oil paint be applied when repainting. The reason for recommending oil rather than latex paints is that a coat of latex paint applied directly over old oil paint is more apt to fail. The considerations are twofold. First, because oil paints continue to harden with age, the old surface is sensitive to the added stress of shrinkage which occurs as a new coat of paint dries. Oil paints shrink less upon drying than latex paints and thus do not have as great a tendency to pull the old paint loose. Second, when exterior oil paints age, the binder releases pigment particles, causing a chalky surface. Although for best results, the chalk (or dirt, etc.) should *always* be cleaned off prior to repainting, a coat of new oil paint is more able to penetrate a chalky residue and adhere than is latex paint. Therefore, unless it is possible to thoroughly clean a heavy chalked surface, oil paints—on balance—give better adhesion.

If however, a latex top coat is going to be applied over several layers of old oil paint, an oil primer should be applied first (the oil primer creates a flat, porous surface to which the latex can adhere). After the primer has thoroughly dried, a latex top coat may be applied. In the long run, changing paint types is more time consuming and expensive. An application of a new oil-type top coat on the old oil paint is, thus, the preferred course of action.

[6] Marking the original location of the shutter by number (either by stamping numbers into the end grain with metal numeral dies or cutting numbers into the end with a pen knife) will minimize difficulties when rehanging them.

* If the top coat is latex paint (when viewed by the naked eye or, preferably, with a magnifying glass, it looks like a series of tiny craters) it may either be repainted with new latex paint or with oil paint. Normal surface preparation should precede any repainting.

If **CLASS III** conditions have necessitated total paint removal, there are two options, both of which assure protection of the exterior wood: (1) an oil primer may be applied followed by an oil-type top coat, preferably by the same manufacturer; or (2) an oil primer may be applied followed by a latex top coat, again using the same brand of paint. It should also be noted that primers were never intended to withstand the effects of weathering; therefore, the top coat should be applied as soon as possible after the primer has dried.

Conclusion

The recommendations outlined in this Brief are cautious because at present there is no completely safe and effective method of removing old paint from exterior woodwork. This has necessarily eliminated descriptions of several methods still in a developmental or experimental stage, which can therefore neither be recommended nor precluded from future recommendation. With the ever-increasing number of buildings being rehabilitated, however, paint removal technology should be stimulated and, in consequence, existing methods refined and new methods developed which will respect both the historic wood and the health and safety of the operator.

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Special thanks go to Baird M. Smith, AIA (formerly Chief, Preservation Technology Branch, TPS) for providing general direction in the development of the manuscript. In addition, the following individuals are to be thanked for their contributions as technical experts in the field: Royal T. Brown, National Paint and Coatings Association, Washington, D.C.; Dr. Judith E. Selwyn, Preservation Technology Associates, Boston, Massachusetts; and Dennis R. Vacca, Pratt & Lambert Co., Carlstadt, New Jersey. Finally, thanks go to several National Park Service staff members whose valuable comments were incorporated into the text and who contributed to the production of the brief: James A. Caufield, Anne E. Grimmer, Jean E. Travers, David G. Battle, Sharon C. Park, AIA, Charles E. Fisher III, Sara K. Blumenthal, and Martha A. Gutrick.

This publication has been prepared pursuant to The Economic Recovery Tax Act of 1981, which directs the Secretary of the Interior to certify rehabilitations of historic buildings that are consistent with their historic character; the advice and guidance in this brief will assist property owners in complying with the requirements of this law.

Preservation Briefs 10 has been developed under the technical editorship of Lee H. Nelson, AIA, Chief, Preservation Assistance Division, National Park Service, U.S. Department of the Interior, Washington, D.C. 20240. Comments on the usefulness of this information are welcomed and can be sent to Mr. Nelson at the above address.

September 1982

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