

The Evergreens Carriage House: A Case Study of Sustainable Reconstruction

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Fig. 1. The Evergreens, built ca. 1856, and its newly reconstructed carriage house, Emily Dickinson Museum, 280 Main Street, Amherst, Massachusetts. Photograph courtesy of Preservation Strategies, 2025.



Would Emily Dickinson recognize the new outbuilding now standing in the landscape she viewed from her bedroom, toward her brother's neighboring house?

In the world of historic preservation and cultural resource stewardship, routine maintenance and occasional capital projects are ongoing struggles for most historic building owners; undertaking a project to recreate a previously existing historic building is especially rare. The recent project that reconstructed a historic carriage barn at the Emily Dickinson Museum is a significant contribution to historic preservation and possibly a unique accomplishment: a reconstruction that meets *The Secretary of the Interior's Standards for the Treatment of Historic Properties* and certification by the Passive House Institute US (Phius), a US-based nonprofit organization “committed to decarbonizing the built environment” (Fig. 1).¹

The Emily Dickinson Museum is located in the center of Amherst, Massachusetts, 90 miles west of Boston. The three-acre property and its two historic buildings now comprise a historic site owned by

Amherst College and operated as the Emily Dickinson Museum; Amherst College has long associations with the Dickinson family. The historic buildings, which include the Dickinson Homestead (ca. 1813/1855) and The Evergreens (ca. 1856), are both deeply associated with the poet Emily Dickinson; her family built and occupied the houses in the nineteenth century (Fig. 2). The poet was born and lived in the Homestead for most of her life, including her most productive working years between 1858 and 1865. Her brother Austin, his wife Susan, and their three children lived next door at The Evergreens, which became a social and intellectual anchor in the Amherst community. The Homestead was sold out of Dickinson ownership in 1916. Fifty years later, with growing recognition of the poet's influence, it was purchased by Amherst College to serve as faculty housing, with occasional public tours offered. The Evergreens was occupied until 1988 by Dickinson family heirs who maintained the house virtually unchanged from its late-nineteenth-



Fig. 2. The Evergreens (left) and the Dickinson Homestead (right), built ca. 1813, view to the northeast along Main Street. Photograph courtesy of Preservation Strategies, 2024.

century condition, and by the late 1990s, it had been opened to the public by the Martha Dickinson Bianchi Trust (named in honor of Emily Dickinson's niece). In 2003, the Emily Dickinson Museum was formed by the merger of these two historic Dickinson houses.

Historic designations and controls for this historic site and its two historic buildings abound. The Homestead was individually listed in the National Register of Historic Places and further designated a National Historic Landmark in 1966; the entire site was listed as a contributing property to the Dickinson National Register Historic District in 1977; and in 2012, the properties were included in the Dickinson Local Historic District enacted by the Town of Amherst. Both buildings are also subject to perpetual historic preservation restrictions protecting their interior and exterior features. These restrictions are administered by the Commonwealth of Massachusetts through the Massachusetts Historical Commission, the state historic preservation office.

In 2019, a substantial financial bequest from Amherst College alumnus William McCall Vickery enabled the Emily Dickinson Museum to undertake several major strategic capital preservation and restoration projects long envisioned as part of the museum's master plan. Between 2021 and 2023, much of the Homestead's original Federal-style main block was meticulously restored, and sensitive mechanical systems upgrades were made. Between 2023 and 2024, The Evergreens' long-failing plaster ceilings were stabilized (or replaced in kind if needed), and HVAC systems were upgraded for museum-grade temperature and humidity control. The museum also determined that there was sufficient evidence pertaining to historical location, general appearance, and overall dimensions to design a new building, The Evergreens Carriage House, that would reproduce one of the site's two lost outbuildings, adding to the museum's interpretive infrastructure.²

The Carriage House

The museum's motivation for reestablishing this small outbuilding on what is now a publicly accessible

and interpreted historic site was multifaceted. As the museum matured, the need for programs, education, collections, and other institutional uses had grown. Importantly, the museum's master plan had long envisioned reconstructing two missing outbuildings to better represent the buildings and landscape Emily Dickinson would have experienced. By reconstructing these outbuildings, the museum would reestablish the site's spatial arrangement while relocating highly consumptive functions (including ticket sales, gift shop, restrooms, and offices) from the site's significant historic buildings to new structures.

From the mid-nineteenth century until the mid-twentieth century, the small outbuilding known as the Carriage House stood just east of The Evergreens, visible from Emily's second-story bedroom at the Homestead (Fig. 3). Demolished in the mid-1950s, this building's location and general appearance are known from documentary and archival evidence, as well as from scant physical evidence (e.g., several foundation stones and

artifactual remains) recovered during the museum's archeological investigations.³ Early twentieth-century Sanborn Fire Insurance maps confirmed that the building was a two-story structure with a metal roof and an approximate footprint of 30 feet by 24 feet.⁴ Several artistic and photographic depictions documented the structure's east-to-west gable ends, wood framing, and one-and-a-half- to two-story height.⁵ In an 1870 illustration, the building's siding appeared as board-and-batten; other details, such as the materials and styles of the roofing and decorative elements, were not shown.⁶ Enough evidence was assembled, however, to serve as the basis for design decisions that would result in an exterior appearance compatibly reestablishing the outbuilding that previously existed at this location.

Due to the absence of physical remains that could be preserved, restored, or rehabilitated, reconstruction was clearly the only applicable treatment approach for the museum's carriage house project. Under *The Secretary of the Interior's Standards for the Treatment of Historic Properties*, reconstruction is defined as "the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location."⁷ The carriage house project was designed to meet all six reconstruction standards articulated in the *Standards*:

1. It is based on both physical and documentary evidence, and the newly reconstructed building closely replicates a long-gone property.
2. It contributes to the interpretation and the public's understanding of Emily Dickinson's experience of the property.
3. Archeological investigations preceded the project, and their findings contributed to a more accurate reestablishment of the historic building on its historic site.
4. The historic spatial relationship between The Evergreens and its only outbuilding was maintained by the placement of the new building on the site.
5. It duplicates the appearance of its historic predecessor as closely as possible in materials, design, color, and texture, with minimal conjecture.
6. Finally, it is interpreted and celebrated as a modern reproduction of one of the property's two missing outbuildings.⁸



Fig. 3. The Evergreens, viewed from the south, with its original carriage house (right) by Charles Prouty, 1870. Photograph courtesy of the Jones Library, Inc., Amherst, Massachusetts.



Fig. 4. The Carriage House, showing modern wood structural framing with cellulose insulation within the sidewalls. Photograph courtesy of Teagno Construction, Inc., 2025.

Reconstruction and Authenticity

Reconstruction of lost buildings is not without controversy, and although the practice has evolved, there is still no universally accepted approach to reestablishing a missing historic resource. The 1964 Venice Charter discouraged reconstruction, but by 2013, the Burra Charter defined reconstruction as "returning a place to a known earlier state" and asserted that "reconstruction should be identifiable on close inspection or through

additional interpretation.”⁹ In the US, the impulse to reconstruct is guided by *The Secretary of the Interior’s Standards*, which allow for the use of modern materials and result in a treatment approach that diverges from the other three—preservation, restoration, and rehabilitation—in the arena of authenticity, specifically material authenticity.¹⁰

Like reconstruction, authenticity in preservation practice has evolved over time. By 1994, the Nara Document on Authenticity provided a helpful context for considering authenticity, stating that “authenticity judgements may be linked to the worth of a great variety of information...aspects of the sources may include form and design, materials and substance, use and function, traditions and techniques, location and setting, and spirit and feeling,” and that “use of these sources permits elaboration of the specific artistic, historic, social, and scientific dimensions of the cultural heritage being examined.”¹¹ In the case of the reconstruction of the carriage house, archival documentation and archeological evidence supported the museum’s approach to reconstructing this outbuilding.

The museum developed a wide range of goals for the appearance and use of this proposed building. It would need to recreate the exterior appearance of the earlier building as closely as possible while providing a flexible, functional modern interior. Interpretative and presentation needs were also considered: the building would need to serve as the museum’s tour center for at least four years, until the site’s other lost historic building (the Homestead Barn) could be reconstructed and ultimately used for that purpose.¹² At that point, the reconstructed carriage house would become the museum’s primary education and program space. Until then, the amenities required for its short-term use as a tour center—as well as those needed for long-term use, such as program and office spaces—comprised restroom facilities; shelving; storage for folding chairs, tables, and other furnishings

and supplies; museum shop and display furniture that could be dismantled or repurposed; and audio-visual equipment, including a drop-down screen, hardwired cameras, and microphones.

Passive House

The museum, in line with Amherst College’s stated sustainability goals, strongly desired that the new building be as sustainable and energy-efficient as possible.¹³ The 2022 *International Charter for Cultural Heritage Tourism* encourages organizations to “integrate climate action and sustainability measures in the management of cultural tourism and cultural heritage” and further states that “all cultural tourism stakeholders must take action to mitigate, reduce and manage climate impacts.”¹⁴ Thus, a decision was made to develop the proposed reconstruction as a so-called Passive House—that is, a building designed to achieve a high level of energy efficiency while also ensuring interior comfort.

The Emily Dickinson Museum’s approach to increasing energy efficiency in this new building was based on decarbonization—that is, reducing, to the greatest extent possible, reliance on fossil fuels for power generation, which still largely dominate the US energy system because fully renewable energy sources remain limited. The museum did not undertake a life-cycle analysis or any other assessments related to embodied energy or carbon, or to the post-construction operational energy of the new building. Rather, the museum focused on reducing its energy consumption by creating a building that would retain winter heating and summer cooling, powered by electric mechanical systems rather than fossil-fuel-driven systems. Ideally, the electricity powering the HVAC system would be obtained from carbon-free sources (solar, geothermal, hydroelectric, or wind, for example), which help to reduce greenhouse gas emissions. Geothermal had been considered by the museum for an earlier systems project, but the intrusion of the numerous wells required

by geothermal installations was deemed too damaging to the historic landscape.

So, how would this level of energy efficiency and interior comfort be accomplished in the reconstructed carriage house? The museum’s project team included executive staff, architects (an architecture and planning firm and an Amherst College architect), a historic preservation consultant, and a well-established local contracting firm that had undertaken several past projects at the site. For almost a year, the team worked through each aspect of Passive House design to identify whether a relatively authentic reconstruction of a historic building could be achieved. Once the decision was made that the new building could be a sustainable and energy-efficient construction that appeared historic on the landscape and in the context of the Homestead, a National Historic Landmark, the museum’s team decided to design it to meet the rigorous Phius certification rather than simply creating a building that relied less on fossil fuels by switching to alternative energy sources. This decision required substantial third-party verification throughout the process, handled by a consultant versed in Passive House construction and certification.

Phius passive building projects are designed to mitigate and adapt to the climate crisis. Mitigation takes the form of energy-efficiency measures, including the use of electrical mechanical systems, renewable energy, and other strategies. Phius buildings use between 40 and 60 percent less energy than conventional buildings, significantly reducing their carbon footprint.¹⁵ Phius-certified products meet rigorous performance standards and allow professionals to make informed, data-based choices. Currently, Phius product certifications include windows, skylights, doors, and prefabricated panel systems.¹⁶ Phius undertakes to “train and certify professionals, maintain and update the Phius climate-specific passive building standard, certify and quality assure passive buildings, certify high-performance building products, and

conduct research to advance high-performance building.”¹⁷

The design principles that ensure that Phius’s standards are met in new construction are well established:

- Employ continuous insulation throughout the entire envelope without thermal bridging.
- Create an extremely airtight building envelope that prevents infiltration of outside air and exfiltration of conditioned air.
- Install high-performance windows (double- or triple-paned) and doors that manage solar gain to exploit the sun’s energy for heating during the heating season and minimize overheating during the cooling season.
- Employ balanced heat- and moisture-recovery ventilation to provide fresh air and maintain indoor air quality.
- Reduce the need for and use of active heating and cooling systems to condition the space.¹⁸

The most important element in achieving the required energy efficiency to meet Phius certification is thermal control, ensuring a warm interior during cold weather and a cool interior during hot weather. The creation of a high-performance enclosure, or the use of continuous insulation across the entire building envelope, reduces the building’s heating and cooling needs. As part of this, thermal bridges are eliminated, reducing “cold corners” and minimizing the risk of mold growth. Passive buildings control air by sealing the enclosure and providing balanced mechanical ventilation to achieve superior indoor air quality. Airtightness minimizes infiltration of outdoor air and the escape of interior conditioned air; with an airtight envelope, balanced ventilation is essential to ensure that interior air, especially moist air from bathroom and kitchen areas, is continually exhausted from the building and replaced with an ongoing supply of filtered fresh air. Additionally, controlling moisture in passive buildings is essential, and is accomplished through



Fig. 5. The Carriage House, exterior walls, showing vertical nickel-gap shiplap siding made of polymers and fly ash, replicating the original building’s wood board siding. Photograph courtesy of Teagno Construction, Inc., 2025.

effective vapor- and moisture-control measures at the building envelope. This requires careful selection of mechanical equipment and appropriate system commissioning at the end of the project. Finally, the use of high-performance windows and doors contributes significantly to the energy efficiency of Phius-certified buildings.

Challenges

Choosing to reconstruct The Evergreens Carriage House using this approach had

considerable implications for material choices; these challenges, however, were surmountable because of the flexibility built into the reconstruction treatment guidelines outlined in *The Secretary of the Interior’s Standards*. The building was constructed with modern wood structural framing set on a concrete slab with a 12-inch vertical exposure, anticipating that the surrounding grade would ultimately obscure the use of a modern foundation material. The slab was insulated with lightweight, closed-cell, resilient,



Fig. 6. The Carriage House, east sidewall, showing the juncture between the first and second stories of the gable-end walls that was subtly recreated. Photograph courtesy of Preservation Strategies, 2025.

moisture-resistant expanded polystyrene. At the roof, using a metal standing-seam construction was a relatively easy decision because it was based on insurance map documentation and the known historic (and current) appearance of the nearby Evergreens, with which the historic carriage house was most closely associated. The energy efficiency of the roofing system was ensured through the use of a closed-cell polyisocyanurate foam core and Igloo cellulose insulation, which are well concealed within the building's interior and therefore not visible from the exterior.

Like the roof, the building's sidewall cavities were infilled with cellulose insulation, an approach that made the walls exceedingly energy efficient while maintaining an exterior appearance consistent with photographic evidence and compatible with the surrounding historic buildings. The museum initially preferred a historically accurate and time-tested material such as wood for the exterior siding; however, a durable, inorganic modern material—combining polymers and fly ash and capable of effectively replicating the appearance of historic wood board siding with vertical nickel-gap shiplap—was ultimately chosen for the building's sidewalls



Fig. 7. The Carriage House, south façade, featuring a modern entry door system concealed by traditional sliding "barn" doors when not in use. Photograph courtesy of Preservation Strategies, 2025.

(Figs. 4 and 5). One small but critically important detail was added at the east and west gable-end walls: the siding was constructed to flare out slightly between the first and second stories to represent a clear distinction that is evident in one archival image of the historic building (Fig. 6). Finally, the flat-stock trim boards at the doors and windows were made from the same material as the siding. All exterior surfaces of the building were then primed and painted with acrylic-latex paint in a color determined through paint analysis of the historic fence (now reproduced) fronting the property on Main Street.

The choice of doors (a visitors' entry on the south façade and a staff entry at the west wall facing The Evergreens) was more challenging because of the need to balance historic compatibility with high energy efficiency. Documentation confirms that the historic building's south façade featured double barn doors. The problem of concealing the modern, energy-efficient, fiber-reinforced PVC door that was required to meet the Phius certification energy goals was solved by using a time-tested historic preservation approach: slightly recessing the modern glass door unit from the façade wall and installing a

set of sliding "barn doors" to cover the exterior face of the opening (Fig. 7), effectively reproducing a known historic appearance. At the west elevation, a single-entry door in a two-panel configuration, constructed with modern materials (polyurethane core encased in steel), leads to The Evergreens' east yard and rear shed.

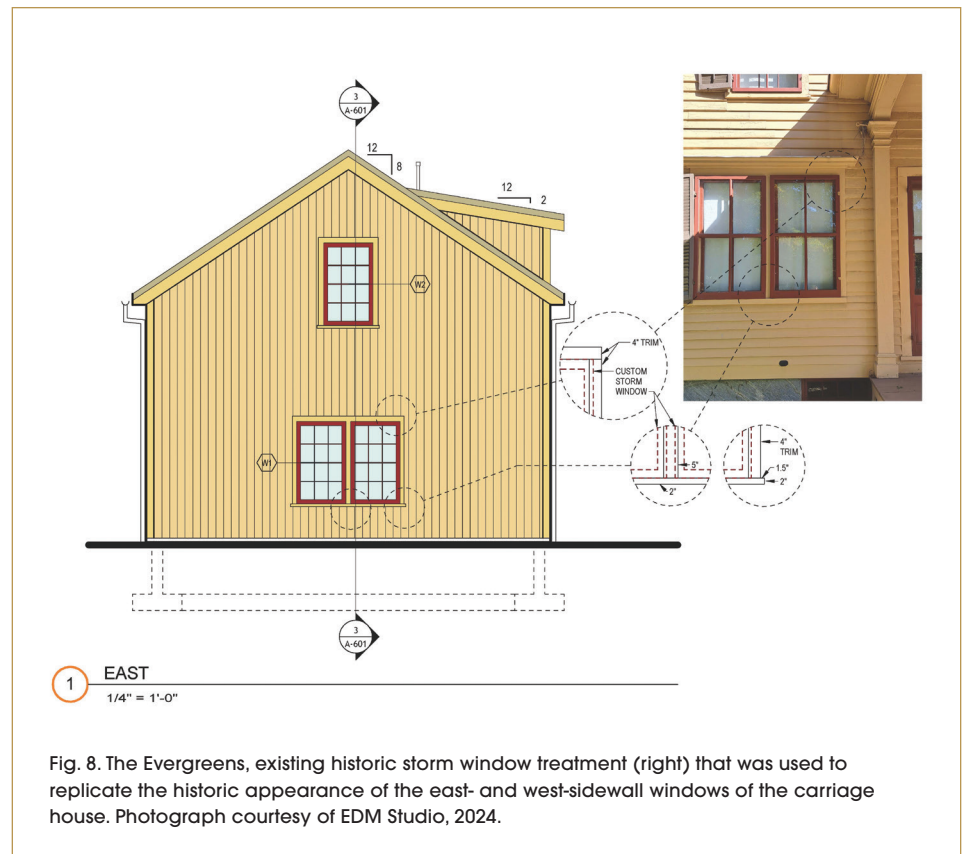
The biggest challenge in the design process was developing window systems that met both *The Secretary of the Interior's Standards* for compatibility with the two significant historic buildings flanking the reconstructed building and the Phius certification standards. To be Phius-certified, the windows had to be airtight, which is not possible with an "in-kind" approach—that is, using historic design configurations and materials such as single- or double-hung wood sash with single-pane glass.

At the rear of the building, which is minimally visible for most of the year, fiberglass awning windows were chosen as a Phius-certified option for the second-story dormer windows. The east and west exterior sidewalls of the building, however, would both be highly visible from Main Street and surrounding parcels, as well as from The Evergreens and the Homestead. At these walls, the finished appearance of the carriage house needed to be more closely aligned with what likely existed on a mid-nineteenth-century building of this type and to be compatible with the historic windows found at the two historic buildings on the site. After months of investigation and deliberation—including consideration of traditional wood sash and storms, as well as both vinyl and fiberglass alternatives—the museum team landed on a creative solution for the four window openings at the east and west sidewalls. To achieve the airtightness required by Phius, a fixed plate-glass window (with a wood interior and aluminum-clad exterior) was installed. To ensure the historic appearance and compatibility with surrounding buildings, a custom-made twelve-

light wood storm window, matching the historic storm windows found throughout The Evergreens, was mounted on the exterior of each plate-glass window. The installation of the wood storm windows at the exterior required careful attention because any punctures would compromise not only the ability of the plate-glass window to prevent air intrusion but would also void those windows' warranties (Figs. 8–10). Other design details included half-round metal gutters and downspouts installed at the south and north roof edges and, for heating and cooling, one exterior heat pump unit installed at the rear of the building.

Once the design development process, including final material choices, was completed, the project required two levels of historic preservation review and approval beyond the usual building and systems permitting required for any new construction—the Town of Amherst's local historic district commission and the Massachusetts Historical Commission. Both regulatory bodies considered the museum's background research, architectural drawings, and proposed design, including new materials, and approved the proposed reconstruction of the building without comment, concern, or design revisions.

The reconstruction project was not without other challenges, including the need to engage a contracting firm that had been trained and certified by Phius, or could become so. Consequently, the already selected and preferred contractor undertook months of rigorous training in Passive House principles and details to become a Phius Certified Builder. Another unanticipated challenge was that, as designed, the building did not fit neatly into the usual Phius certification categories and occupancy uses. The carriage house straddles multiple uses (commercial, museum, etc.), resulting in higher occupancy than a typical building of this size (1,300 square feet). Commercial projects require verification and documentation from the ENERGY STAR and US Department of Energy's Zero Energy Ready Home programs, which are primarily focused on



residential construction. Essentially, the greater the building's occupancy, the higher the internal heat gains, resulting in better heating performance—the most difficult metric to achieve when seeking Phius certification. Being a relatively atypical project for Phius, calculating the carriage house's variable occupancy led to a more collaborative, performance-based understanding of how this building would ultimately function.

Interestingly, the project coincided with changes to the Massachusetts energy code enacted in January 2025. The updated code requires higher insulation and performance values than the previous ninth edition, as well as increased energy modeling and testing. Among the options for compliance was Passive House; thus, the Town of Amherst's adoption of the municipal opt-in for the specialized stretch code made Phius certification one of the few approaches capable of meeting the code's energy-efficiency standards for new buildings.

Conclusion

The reconstruction of The Evergreens Carriage House was informed by archival documentation, which provided details on appearance, dimensions, and materials, and by archeological investigation, which established the building's location. Early in the planning process, the museum explored the feasibility of reconstructing the carriage house as an energy-efficient, highly sustainable building that meets historic preservation standards and guidelines. Ultimately, the team achieved an extraordinary outcome with this \$1.2 million Phius-certified building, which, at its exterior, is compatible with the historic setting and surrounding historic buildings and, at its interior, provides space for essential contemporary functional uses.

Reconstruction is the least-used of the *Secretary of the Interior's Standards for the Treatment of Historic Properties*. The Emily Dickinson Museum's recent carriage house project clearly



Fig. 9. The Evergreens, north elevation, showing a storm window treatment that served as the design basis for several window openings at the new carriage house. Photograph courtesy of Preservation Strategies, 2024.



Fig. 10. The Carriage House, interior, showing Pella plate-glass windows used to meet the energy-efficiency requirements of Phius certification, with traditional wooden storm windows applied at the exterior. Photograph courtesy of Teagno Construction, Inc., 2025.

demonstrates that, in the US, it is possible to successfully reconstruct a historic building in a manner that is both historically compatible and highly energy-efficient—even in New England’s harsh climate.¹⁹

Shantia Anderheggen has over 35 years of experience in historic preservation, holding staff and leadership positions at local, regional, and national nonprofit organizations, including *Historic New England*, the *National Trust for Historic Preservation*, and the *Newport Restoration Foundation*. Shantia was the 1992 recipient of APT’s *Keeper Fund*. She is currently the principal of *Preservation Strategies* and can be reached at shantia@preservation-strategies.com.

Notes

1. “Phius Mission / Vision,” *Phius*, accessed Dec. 10, 2025, Phius.org/about-us/missionvision.
2. International Council on Monuments and Sites (ICOMOS), *Charter on the Interpretation and Presentation of Cultural Heritage Sites* (2022). “Interpretative infrastructure” is defined as “...physical installations, facilities, and areas at, or connected with a cultural heritage site that may be specifically utilized for the purposes of interpretation and presentation including those supporting interpretation via new and existing technologies.”
3. Emily Dickinson Museum, archeological investigations, 2004–2023.
4. *Sanborn Fire Insurance Map from Amherst, Hampshire County, Massachusetts* (Sanborn Map Company, Aug. 1902), loc.gov/item/sanborn03674_004/; *Sanborn Fire Insurance Map from Amherst, Hampshire County, Massachusetts* (Sanborn Map Company, Aug. 1910), loc.gov/item/sanborn03674_005/; *Sanborn Fire Insurance Map from Amherst, Hampshire County, Massachusetts* (Sanborn Map Company, Jan. 1916), loc.gov/item/sanborn03674_006/.
5. Charles Prouty, “Evergreens in Winter,” *Digital Amherst*, accessed Dec. 10, 2025, digitalamherst.org/items/show/733; L. R. Burleigh, *Amherst, Mass.* (Troy, NY: L. R. Burleigh, 1886), loc.gov/item/75694543/; *Sanborn Fire Insurance Maps*, 1910 and 1916.
6. L. R. Burleigh, *Map of Amherst* (1886).
7. “The Secretary of the Interior’s Standards for the Treatment of Historic Properties: Reconstruction as a Treatment and Standards for Reconstruction,” *National Park Service*, accessed Dec. 10, 2025, nps.gov/articles/000/treatment-standards-reconstruction.htm.
8. National Park Service, “Reconstruction as a Treatment and Standards for Reconstruction.”
9. ICOMOS, *International Charter for the Conservation and Restoration of Monuments*

and Sites (Venice Charter) (1964); Australia ICOMOS, *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* (2013).

10. Stephen J. Kelley, Donald Friedman, Kyle Normandin, and Pamela Jerome, “The Paradox and Dilemma of Reconstruction,” *APT Bulletin: The Journal of Preservation Technology* 51, no. 1 (2020): 49–55.
11. ICOMOS, *Nara Document on Authenticity* (Nara Conference, Nara, Japan, 1994).
12. ICOMOS, *Charter for the Interpretation and Presentation of Cultural Heritage Sites* (2008).
13. “Amherst College Sustainability,” *Amherst College*, accessed Feb. 10, 2026, amherst.edu/about/sustainability.
14. ICOMOS, *International Charter for Cultural Heritage Tourism* (2022).
15. “The Phius Difference,” *Phius*, accessed Dec. 10, 2025, Phius.org/Phius-difference.
16. “Products,” *Phius*, accessed Dec. 10, 2025, Phius.org/certifications/products.
17. “About Us,” *Phius*, accessed Dec. 10, 2025, Phius.org/about-us.
18. “What Is Passive Building?,” *Phius*, accessed Dec. 10, 2025, Phius.org/passive-building/what-passive-building.
19. “Emily Dickinson Museum Carriage House,” *Phius*, accessed Dec. 10, 2025, Phius.org/certified-project-database/emily-dickinson-museum-carriage-house.



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