



There has been a resurgence of interest in the renovation and repurposing of historic buildings. The focus now goes beyond the preservation of history and the innate architectural character and craftsmanship found in many of these buildings. Not only is there a growing expectation for sustainable practices associated with the reuse of an existing structure, but there is also community interest in retaining assets that engage, maintain, improve, or possibly kickstart change for the local character of a community.

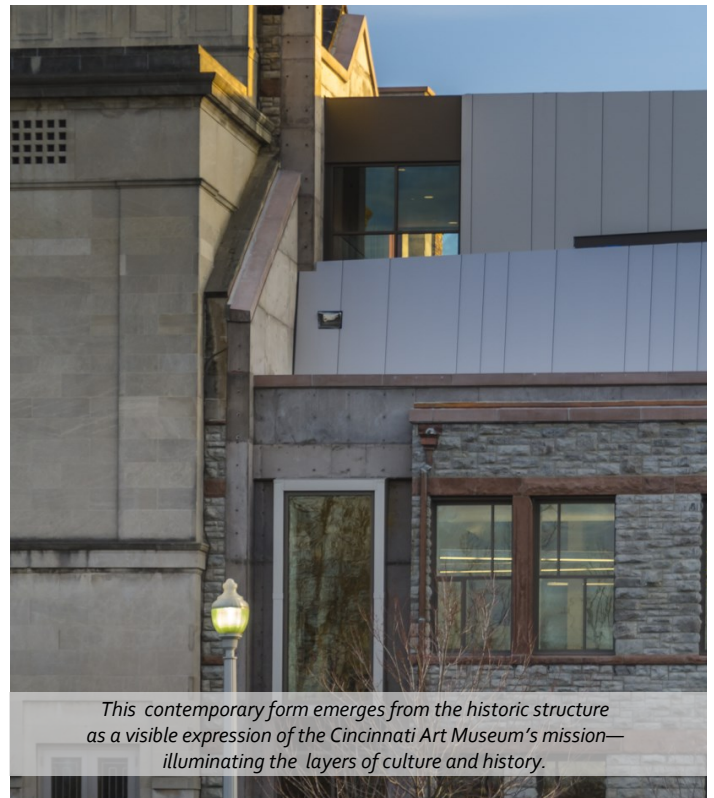
Most historic renovations take the form of repurposing the building from its original use to a new, current program with expanded functions.

Challenges with Historic Renovations

Before beginning the design and construction effort associated with the renovation of a historic structure, it is imperative that challenges and opportunities associated with repurposing the building are evaluated and understood. Many of these buildings have been abandoned or underutilized resulting in lengthy periods of little or no ongoing maintenance.

General considerations will often include:

- Assessment of the overall building condition, particularly the exterior building envelope.
- Limitations and/or requirements to maintain historic features of the building.
- Ability to accommodate the repurposed building use.
- Ability to incorporate infrastructure and technology upgrades.



This contemporary form emerges from the historic structure as a visible expression of the Cincinnati Art Museum's mission—illuminating the layers of culture and history.

- Current accessibility code requirements.
- Structural code and use considerations.
- Zoning requirements.
- Operations and maintenance.

Importance of Pre-Planning

Understanding the organization and its strategic goals and objectives are important elements when assessing a historic structure's ability to meet current and future needs. The facility's strategic goals, should determine short and long-term plans, including prioritization of, and funding for annual facility needs.

The unique nature of a historic renovation makes it particularly critical to include a thorough planning effort to create an efficient, cost-effective facility that maximizes workflow, space economy, flexibility for future growth, and change.

The *National Park Service, Secretary of the Interior's Standards for Rehabilitation & Illustrated Guidelines for Rehabilitating Historic Buildings* provides a wealth of information as a planning resource for the restoration, renovation, and rehabilitation of historic buildings.¹

Critical Planning Steps

Funding

Funding sources will play an important role in the planning, design, and construction process. This is particularly the case if the project is seeking state and national historic tax credits, local or state funding sources, or private investment grant contributions. Each of these potential funding sources will have specific obligations that must be met to receive funds.

The benefit of grant funds offered in consideration of requirements or restrictions imposed must be evaluated before beginning the planning process. Once the capital stack is determined and grant funding decisions have been made, the planning process can begin with a clear understanding of the project compliance parameters to be included.

Research & Investigation

Due diligence research and investigation should include:

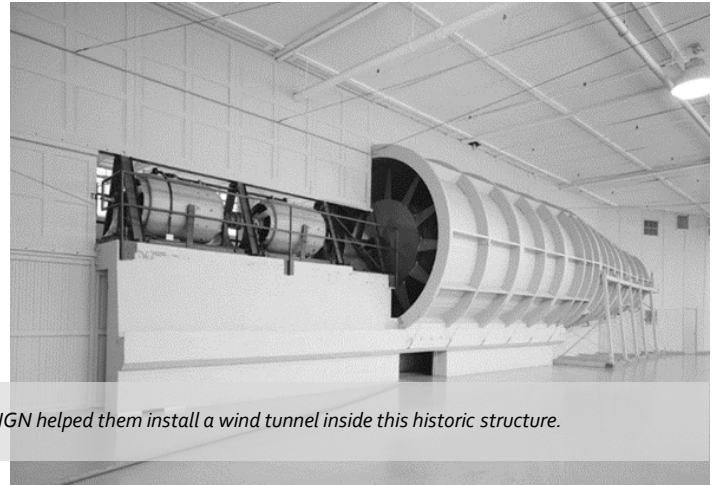
- Review of existing building plans.
- On-site building condition investigation and assessment to include repair / replacement recommendations and a preliminary cost assessment.
- Environmental investigation, assessment, and abatement cost estimate.
- Determine if the building is on the historic registry, or in a historic overlay district.
- Determine if the building is subject to local historic preservation oversight and / or requirements.
- Historic building materials assessment of the features to be retained, restored, and / or replaced.
- Early engagement of the State Historic Preservation Office (SHPO) (*where applicable*).
- Zoning requirements.
- Preliminary regulatory and code assessment.
- Community engagement (*where applicable*).



The renovation and addition of Longworth Wing now houses the Mary R. Schiff Library, an inviting, modern space open to the public.



Wright Patterson Air Force Base continues to innovate. emersion DESIGN helped them install a wind tunnel inside this historic structure.



Repair Strategy

Upon completion of the initial research and investigation, a strategy for the restoration and repair of existing building materials and features should be developed. In general, the objective should mitigate the long-term deterioration of the materials and features to be retained. The on-site building condition assessment should provide the basis for prioritizing the restoration and repairs required and establish a planned implementation approach.

Effective repair requires a fundamental understanding of how the building works and the nature of why materials are failing. Solutions are always site-specific and should employ a two-stage approach. First, is the development of an overall building condition repair strategy. Second, the overall building repair strategy will provide the basis for detailed, specific strategies and options that minimize damage and preserve the repaired materials for continued performance.

Key features of the repair strategy include:

- Diagnosis of deterioration and cause.
- Prioritize the work.
- Establish steps to mitigate damage.
- Outline repair options.
- Evaluate resources available to execute repairs.
- Sourcing of appropriate repair materials.
- Coordination with State (SHPO) and local historic preservation organizations (*where applicable*).

Replacement Strategy

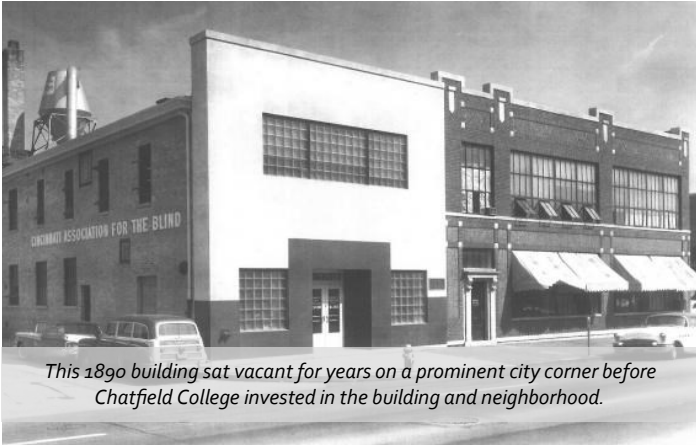
When the replacement of materials / features is warranted due to the unavailability of repair materials or deterioration beyond repair, the development of a specific replacement strategy is required. The replacement of materials should match visually and cause no further deterioration.

Key features of a replacement strategy in lieu of repair include:

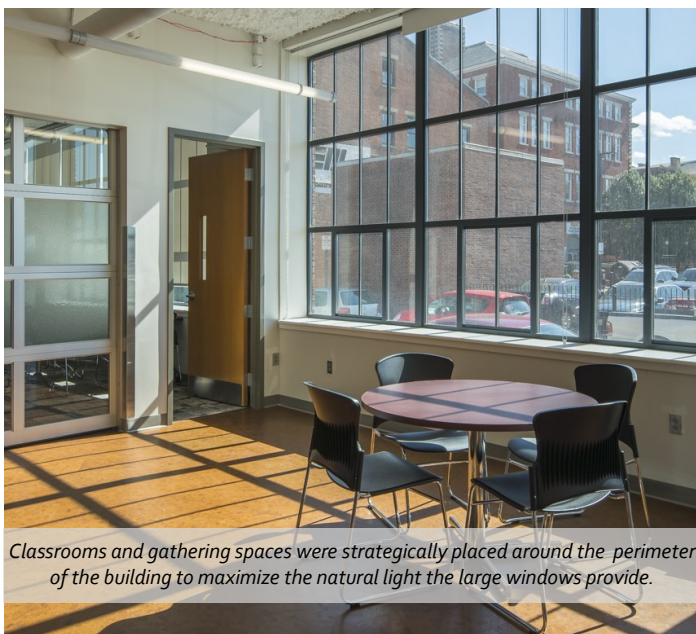
- Photographic and written documentation of materials and features to be replaced.
- Coordination with and approval by SHPO and local historic preservation organizations (*where applicable*).
- Consider replacement in the least visible areas of the building when possible.
- Poor original building materials. Evaluate inherent flaws in the original material(s) and replace accordingly.
- Unavailability of historic materials.
- Documentation of code-related issues that dictate replacement vs. repair.
- Lack of skilled craft or artisans to undertake repair.
- Installation should avoid damage to other building materials or features.

Key criteria for selection of replacement materials:

- Compatibility with historic materials in appearance.
- Similarity in physical properties.
- Selection based on required performance criteria.



This 1890 building sat vacant for years on a prominent city corner before Chatfield College invested in the building and neighborhood.



Classrooms and gathering spaces were strategically placed around the perimeter of the building to maximize the natural light the large windows provide.

Performance Metrics for Historic Buildings

Historic buildings can offer sustainability opportunities in the form of performance metrics that make the best use of an existing structure and place it back in active service. Layering historical preservation grants with other funding sources for sustainable and healthy buildings can make an economically challenging project more approachable.

Drivers to improve energy efficiency include reducing carbon emissions, improving comfort levels, and compliance with regulatory requirements. Design strategies include efficient HVAC systems, improved building envelope, selection of energy-efficient equipment and appliances, and LED lighting.

In a comprehensive building performance approach, the first step is to understand and consider the baseline *Energy Use Intensity* (EUI) for the building's use. This baseline will provide a standard upon which building performance improvements can be measured. Understanding your baseline EUI, combined with a comprehensive building energy audit, will provide the foundation for establishing informed building performance metrics.

Common features typically found in historic buildings that contribute to energy efficiency and are an asset when establishing performance metrics include:

- Thick, heat-retaining masonry walls.
- Wide overhangs (balconies, porches, awnings, etc.).
- The installation of windows only in locations that contribute to lighting and ventilation.

Major building performance considerations include:

- Air infiltration and air barrier design.
- Wall and roof insulation.
- Window and door repair or replacement.
- Vestibules.
- Energy-efficient HVAC systems.
- HVAC strategies coupled with a Geothermal system.
- Use of solar panels.

Developing performance metrics goals early in the planning and design process provides a road map for creating a sustainable, high-performance building. The careful development of performance metrics will establish a path towards LEED, WELL, Passive House, and other sustainability certifications without undue cost or effort in the process.

Accessibility

It is often necessary to make modifications to a historic structure in order to comply with accessibility code requirements. Compliance to provide barrier free access should be undertaken in a manner that preserves the historic character, features, and finishes of the building. The most common features of accessibility in and through a building include ramps, elevators or lifts, pathways, and bathrooms.

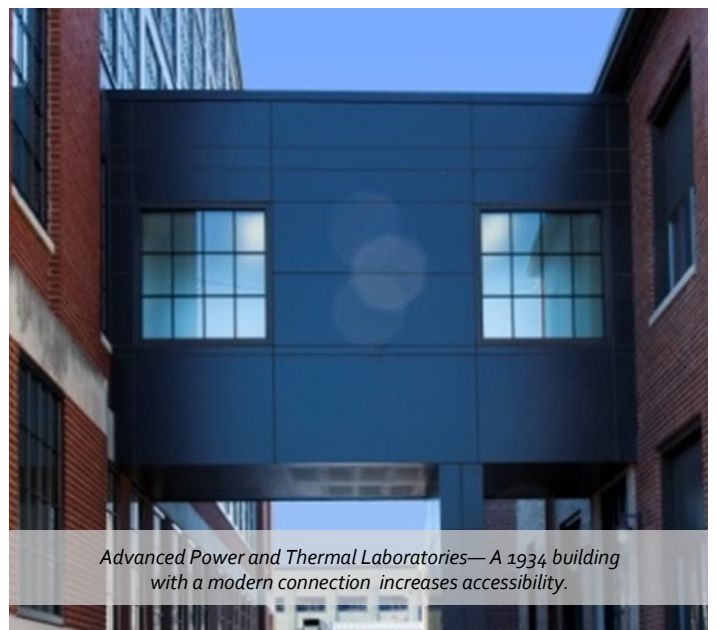
When assessing a building's accessibility requirements and to understand where issues exist, the design strategy should evaluate exterior access and interior pathways. Once the issues are identified, a strategy can be employed to address accessibility requirements in a manner that has the least impact on preservation of the building's historic character.

Community Identity

The initial use of a building matched the needs of the community at that time. However, when approaching historic preservation and renovation, new demands and outcomes may be heavily influenced by changing, or desired attributes in an evolving community. What once was a manufacturing district, may now be identified for a new use to transform the character of a location. Careful review of land use plans, along with early and ongoing engagement with the local municipality and community groups can take a project beyond "cleaning up an eyesore" to becoming an anchor for community revitalization.

Key reasons why sustainable historic renovations are important include:

- Historic structures demonstrate the culture, history, and foundational strength of the local community.
- The adaptive reuse of historic structures incorporates the sustainable reuse of buildings that are resilient and long lasting.
- Historic buildings feature many of the highest quality materials that are often not found in modern construction.
- The renovation and reuse of a historic building is often significant in establishing the context and unique aspects of a community district.
- When conserving or renovating an old building, for all intents and purposes, you are recycling it.
- The positive aspect of embodied carbon associated with reinventing existing historic structures is fundamental to sustainability.



Advanced Power and Thermal Laboratories— A 1934 building with a modern connection increases accessibility.



Project Example

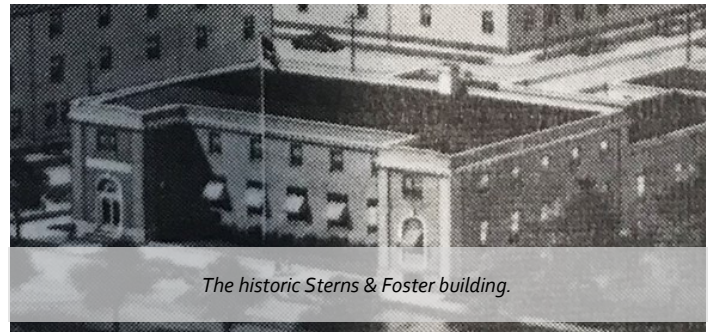
Stearns & Foster was founded in Cincinnati, Ohio in 1846. In 1912, they started construction on a new headquarters building in a flat-roofed brick, second renaissance revival style. More than a century later, another Cincinnati company with historic roots is bringing the forgotten landmark back to life.

Established in 1920, Pepper Construction has grown into a construction giant with \$1 Billion in annual revenue and five Midwest locations. When their growth forced a move to a new office building, they didn't have to look far before finding a new home at 100 Williams Avenue in Lockland, OH, a suburb of Cincinnati.

The 23,000 sf Stearns & Foster headquarters building, abandoned for many years, will become Pepper Construction's Cincinnati Headquarters through an \$11 million rehabilitation and renovation. The project involves a 3rd story addition built in 1956, and three outbuildings (a garage and two sheds). While the entire building is clad in brick, there are variations in structure, materials, and finishes.

State and Federal Historic Preservation Grants totaling \$4.5 million support the extensive scope of work that includes a complete rehabilitation of the office building with the addition of a new, compatible entrance pavilion on the south side, the rehabilitation of a garage and the demolition of the two sheds.

Interior work includes plaster repair; new insulation; a plaster-like finish on the perimeter walls; new hardwood flooring to match the existing floors; ceiling repairs; new acoustic tile ceilings in the 1956 and 1964 additions; new HVAC, plumbing, sprinkler, electrical, technology and data cabling systems; and new restrooms. The interior spaces are to be mostly maintained as is, with new, limited partitions.



The historic Stearns & Foster building.



The new, concept design for Pepper Construction Headquarters.



Preserving the original front doors and as much of the brick as possible was integrated into the design of Pepper's new headquarters..



From a historical perspective, the most sensitive details to preserve are:

- **Brick Masonry** - The exterior masonry is a consistently variegated red-purple brick in Flemish bond, but slight variations are visible in the joints and brick color. The rehabilitation includes tuckpointing a significant percentage of joints to match color, texture, and hardness of the existing masonry.
- **Terra Cotta** - A terra cotta cornice as well as a plaque above the door announcing the name of the original company.
- **Bronze** - A bronze plaque to the right of the main entrance must be retained.
- **Doors** - One original wood exterior door on East Wyoming Avenue with 8 lights in the top.
- **Windows** - An assortment of windows, most are original with wood double-hung sashes. Historical wood interior window trim from 1912 is also throughout.
- **Columns and capitals** - In the original section, steel beams are supported by steel columns encased in plaster with elaborate molded plaster capitals.
- **Wood floors** - Wood floors under layers of tile throughout, as well as historic baseboards in the original section and in some of the additions.
- **Fireplaces** - Two brick fireplaces in the original 1912 section.
- **Vaults** - There are two vaults on the second floor with decoratively painted safe doors.
- **Stairs** - Original wood treads and risers, a handsome wood railing and newel posts, and wood baseboards.
- **Garage** - Located to the east of the office building, the brick garage dates from 1912 and its design is similar, with corner quoins and dentil molding at the cornice. The garage bays retains multi-light wood transoms.
- **Wrought iron fencing** - This consists of a low, wrought-iron fence on a stone curb along the building's street elevation, and an ornamental fence and gate at the entrance to the yard between the office building and brick garage.

Documenting all the details in your application to the State Historic Preservation Office can maximize your return on investment through tax credits. This three part application may appear tedious, but with the right team, your project can reap many benefits.

"I have truly enjoyed working with emersion DESIGN and Pepper's entire team throughout my review of the Stearns & Foster project. I have consistently stated that I believe that my SHPO review of the Stearns & Foster project – and the collaboration that it has entailed – is an example of the SHPO process at its best. I greatly appreciate all that you have done to facilitate that!"

*~Justin Cook | Technical Preservation Services Manager,
Ohio State Historic Preservation Office*



In addition to historic preservation efforts, Pepper's new office will incorporate sustainable and healthy design and construction. The outbuilding shed structures will be repurposed and reinforced to support a solar array and will create covered parking. In addition, geothermal opportunities and an outdoor plaza environment will be incorporated. The new building is designed to meet net zero energy, WELL®, and LEED® certifications, with strategies focusing on improved indoor air quality, thermal comfort, and reduced operating costs.



About the Author:



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Steve has over 40 years' experience with business leadership and project management. Prior to co-founding emersion DESIGN, he was the President and CEO for a 100-person architectural – engineering firm with offices in Ohio and Florida. He has an extensive 30-year history of managing projects such as campus master plans, office buildings, computer centers, research and testing facilities, healthcare facilities, labs, university academic buildings, and engineering centers. He has been the lead Project Manager and Principal for projects ranging from \$100,000 to \$250 million and has managed the design of over \$1 billion in construction.

emersion DESIGN, located in Cincinnati, OH is a collaborative architecture, interior design, planning, structural engineering and sustainable design firm driven by a passion for exceptional designs that advance clients and society.

References:

¹ <https://www.nps.gov/orgs/1739/upload/treatment-guidelines-2017-part2-reconstruction-restoration.pdf>