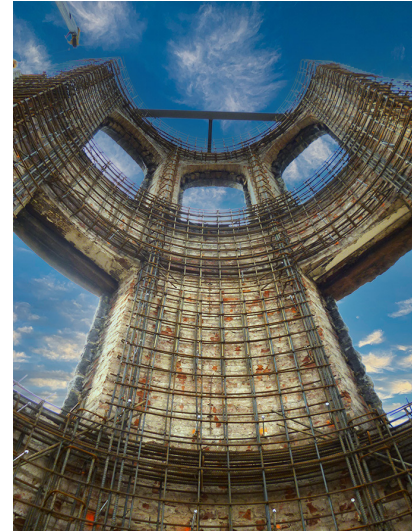


historic renovations with growing expectations

THE EXPANDED PROCESS

by Steve Kimball



There is a renewed interest in renovating and repurposing historic buildings. The focus has expanded beyond preserving history and architectural character to include growing expectations for sustainable practices through the adaptive reuse of existing structures. At the same time, communities are increasingly invested in retaining assets that engage residents, enhance local character, and help maintain, improve, or even spark positive change within their neighborhoods.

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.

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

the importance of pre-planning

Understanding the organization's or business' 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.

critical planning steps

FUNDING

Funding sources 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 funding sources has specific obligations that must be met in order to receive the funds.

Prior to beginning the planning process, a thorough review of the grant funds' requirements and restrictions is necessary. Once the capital stack is determined and grant funding decisions have been made, the planning process can move forward with the clear understanding of project's compliance parameters.



RESEARCH AND INVESTIGATION

Due diligence should include:

- Review of existing building plans.
- On-site building condition assessment, repair and replacement recommendations, and a preliminary cost assessment.
- Environmental investigation and 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.
- Materials assessment list of features to be retained, restored and/or replaced.
- Early State Historic Preservation Office (SHPO) Engagement.
- Zoning requirements.
- Preliminary regulatory and code assessment.
- Community engagement (where applicable).

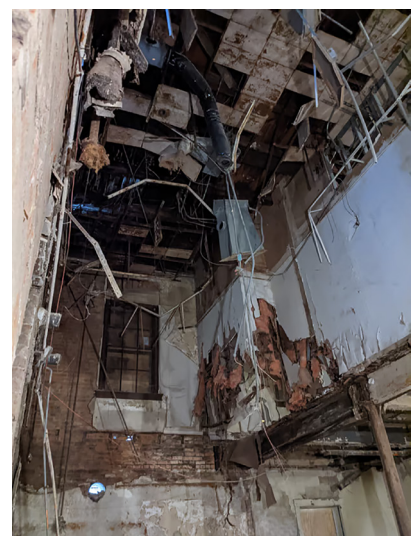
REPAIR STRATEGY

Once the initial investigation is completed, a strategy for the restoration and repair of existing materials and features is developed with the objective of mitigating the materials and features to be retained. The on-site building condition assessment is the basis for prioritizing the required restoration and repairs and establishes an implementation approach.

An effective repair strategy starts with a fundamental understanding of how the building functions and why its materials are failing. Because every project is site specific, repairs should follow a two-stage approach. First, develop an overall building condition repair strategy. Second, use that strategy to guide detailed options that minimize damage and preserve the repaired materials for continued performance.

Key features of the repair strategy include:

- Diagnosis of the deterioration and the cause.
- Prioritizing the work.
- Establishing steps to mitigate damage.
- Outlining the repair options.
- Evaluating the resources available to execute the repairs.
- Sourcing the appropriate repair materials.
- Coordination with state and local historic preservation organizations.



REPLACEMENT STRATEGY

When materials or features must be replaced due to unavailability or irreparable deterioration, a tailored strategy must be developed for each replacement. The replacement materials should match visually and inhibit further deterioration.

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

- Photographic and written documentation of the materials and features to be replaced.
- Coordination with and approval by SHPO and local historic preservation organizations (where applicable).
- Consideration of the 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 them accordingly.
- Unavailability of historic materials.
- Code-related issues that dictate replacement vs. repair.
- Lack of skilled craftsmen or artisans to undertake repair.
- Installation should avoid damage to other materials or features.

Key criteria for selection of replacement materials:

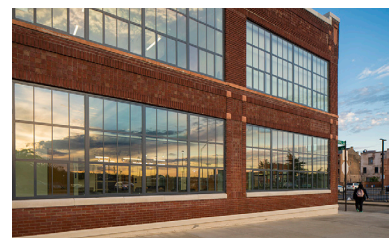
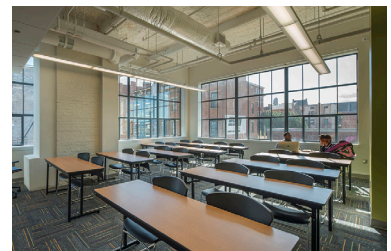
- Compatibility with historic materials in appearance.
- Similarity in physical properties.
- Selection based on required performance criteria.

PERFORMANCE METRICS FOR HISTORIC BUILDINGS

Historic buildings offer sustainability opportunities in the form of performance metrics, which makes the best use of an existing structure and places 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 involve efficient HVAC systems, an improved building envelope, the selection of energy efficient equipment, and LED lighting.

In a comprehensive building performance approach, the first step is to understand the baseline Energy Use Intensity (EUI) for the building use under consideration. This baseline provides a standard upon which building performance improvements are measured. Understanding your baseline EUI, combined with a comprehensive building energy audit, provides the foundation for establishing informed building performance metrics.



Common energy-efficient features found in historic buildings also serve as valuable assets when establishing performance metrics. These include:

- Thick, heat retaining masonry walls.
- Wide overhangs (balconies, porches, awnings, etc.).
- Windows installed 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 repairs or replacements.
- Vestibules.
- Energy-efficient HVAC systems.
- HVAC strategies coupled with a Geothermal system.
- Use of solar panels.

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

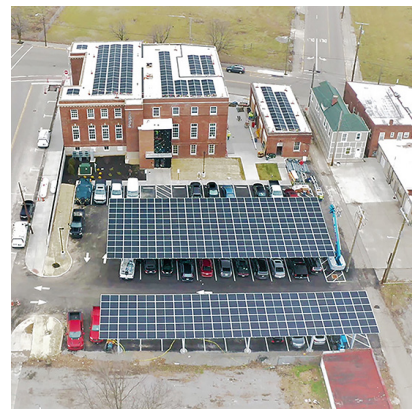
ACCESSIBILITY

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

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

COMMUNITY IDENTITY

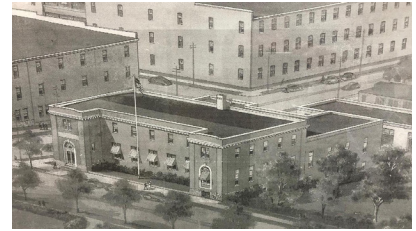
The building's original use reflected the community's needs at the time. In historic preservation and renovation, however, evolving priorities often shape new demands and outcomes. For example, a former manufacturing district may be reimagined for uses that transform the site's character. Reviewing land use plans and engaging early with municipalities and community groups can elevate a project from simply "cleaning up an eyesore" to becoming a catalyst for community revitalization.



Historic buildings offer sustainability opportunities in the form of performance metrics, which makes the best use of an existing structure and places it back in active service.

why is sustainable historic renovation important?

- Historic structures demonstrate the culture, history, and foundational strength of the local community.
- 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 often not found in modern construction.
- Renovation and reuse of historic buildings can often establish the context and unique aspects of a community district.
- When conserving or renovating an old building, you are, for all intents and purposes, recycling it.
- The positive aspect of embodied carbon associated with reinventing existing historic structures is fundamental to sustainability.



case study: pepper construction cincinnati hq

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.

The 23,000 square foot Stearns & Foster headquarters building, abandoned for many years, will become Pepper Construction's Cincinnati Headquarters through an \$11 million rehabilitation and renovation. The project includes a 3rd story addition from 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 that includes a complete rehabilitation of the office building with the addition of a compatible new entrance pavilion on the south side, a rehabilitation of the garage, and demolition of the two sheds.

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



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

- **Brick Masonry** - The exterior masonry is 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 existing.
- **Terra Cotta** - A terra cotta cornice and a plaque above the door announcing the name of the original company.
- **Bronze** - A bronze plaque to the right of the main entrance, which must be retained.
- **Doors** - One original, wood exterior door on East Wyoming Avenue with 8 lights on top.
- **Windows** - An assortment of windows, most of which 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** - There are 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 beautiful 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 retain multi-light wood transoms.
- **Wrought Iron Fencing** - This consists of low wrought-iron fence on a stone curb along the building's street elevations and an ornamental fence and gate at the entrance to the yard between the office building and brick garage.

In addition to historic preservation efforts, the new office incorporates sustainable and healthy design and construction. The outbuilding shed structures are repurposed and reinforced to support covered parking with solar arrays. In addition, there are geothermal opportunities and an outdoor plaza environment. The new building is Net-Zero, WELL®, and LEED® Gold certified, with a focus on improved indoor air quality, thermal comfort, and reduced operating costs.

about the author



steve kimball
PMP, LEED AP

Steve Kimball, a co-founder of emersion DESIGN, is the Science & Technology Client Leader. His leadership propels emersion to fulfill its mission— to advance clients who advance society. Connect with Steve for your planning or design needs.

steve.kimball@emersiondesign.com