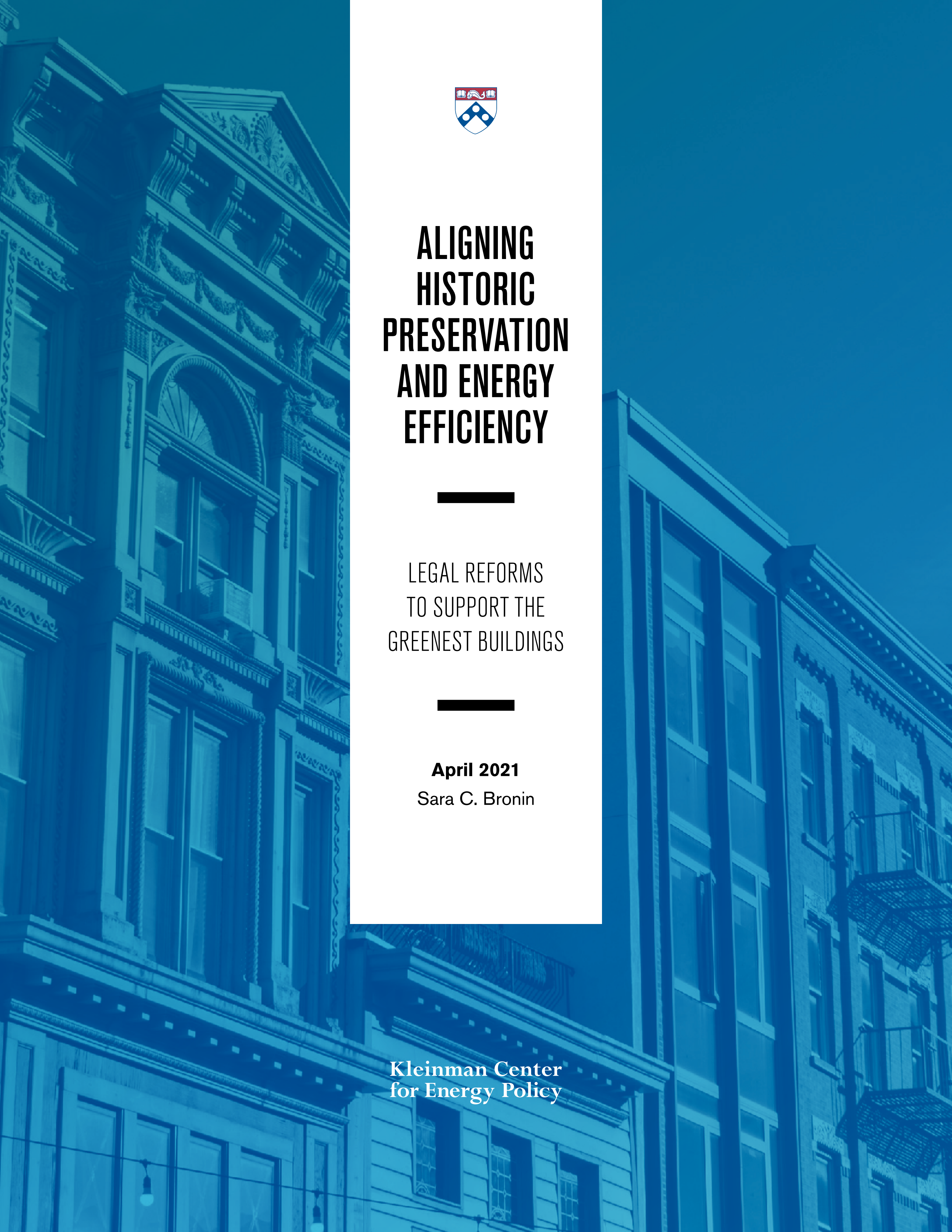

ALIGNING HISTORIC PRESERVATION AND ENERGY EFFICIENCY

LEGAL REFORMS TO SUPPORT THE GREENEST BUILDINGS

April 2021

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Sara C. Bronin April 2021 kleinmanenergy.upenn.edu

INTRODUCTION

Since the 1950s, United States energy policy has incorporated efficiency as a central strategy. Buildings have been a major area of focus, which makes sense as residential and commercial buildings account for 40 percent of energy consumption in the United States (U.S. Energy Information Administration 2021).[1]

Despite the breadth of these efforts, we have overlooked an important resource: historic buildings. These buildings, typically over 50 years old, are "designated" historic—that is, listed on local, state, and national registers of historic places. Often dismissed as drafty and outdated, historic buildings are sometimes viewed as a lost cause—a barrier to, rather than a vehicle for, efficiency gains. It may also be that historic buildings are viewed as too expensive to bring up to code.

Perhaps for these reasons, most are exempt from energy conservation codes that apply to new construction. What's worse, laws intended to protect their historic features make it harder for us to retrofit them at all.

Rethinking the regulatory framework for historic places may help us harmonize the goals of environmentalists and preservationists. For behind the facades of old buildings may very well be the secret to accelerating climate progress.

THE GREENEST BUILDINGS

Older buildings more than 50 years old may present opportunities to capture real efficiency gains. Architect Carl Elefante coined a phrase that reflects this opportunity: "the greenest building is one that is already built" (2007).

These buildings are greener in part because they rely on passive design, which takes advantage of daylighting, solar orientation, and ventilation to reduce the need for heating and cooling, and passive survivability, which ensures conditions are maintained in the event of a power or fuel outage (Preservation Green Lab 2011; Washington State Department of Archaeology and Historic Preservation 2011).

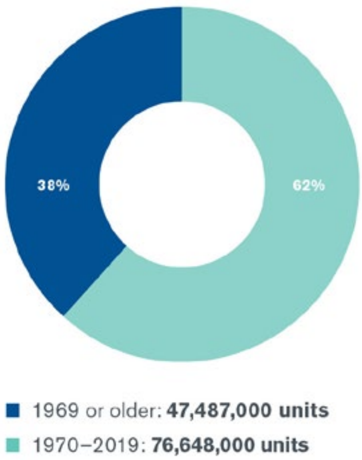
Older buildings that remain today were often constructed using more durable and longer-lasting traditional materials, which correspond to the natural environment. And they are more compact than the same uses today. For example, between 1970 and 2015, home sizes increased on average by 57 percent—wiping out efficiency gains resulting from decreased energy use per square foot (Pew Research 2015).

Using a life cycle assessment approach that analyzes the material life of a building (from construction to demolition), studies have shown that remodeling historic buildings uses less energy than new construction, across a variety of building types and climates (Preservation Green Lab 2011). New construction is resource intensive because of the amount of building

1 Heating, cooling, ventilation, and lighting account for 46 percent of that consumption (U.S. Department of Energy).

material created, and the energy needed to transport and install the materials. Even if a new building operates 30 percent more efficiently than the building it replaces, it takes up to 80 years to overcome the negative climate impacts of construction (Preservation Green Lab 2011).

FIGURE 1: HOUSING UNITS OVER 50 YEARS OLD



Source: Author-created graphic from U.S. Census Data 2019 American Housing Survey, General Housing Data for All Occupied Units.

SCOPE OF HISTORIC DESIGNATION

Historic buildings are a subset of older buildings. Usually, designation criteria require the buildings to be at least 50 years old. According to the 2019 American Community Survey, the number of housing units over 50 years old constitutes about 38 percent of the housing stock. This number is likely the same for non-residential buildings.

Not all 50-plus-year-old buildings will satisfy the criteria for historic designation, nor will all of those that satisfy the criteria for designation actually be designated. The exact number is anyone's guess. The National Park Service estimates that "more than 1.4 million" buildings, sites, districts, structures, and objects are listed on the National Register of Historic Places (National Park Service Database, n.d.).

No one has developed a similar estimate of the number of buildings listed on local and state registers of historic places. However, there are at least 4,000 local governments across the United States with local historic district regulation of some kind (Bronin and Avery). Some cities regulate historic places that encompass thousands of buildings each, such as the French Quarter in New Orleans, Beacon Hill in Boston, downtown Charleston, or the adobe neighborhoods of Tucson. Other cities and towns may only designate and regulate a few blocks.

Even without knowing the specific number of historic places in the country, we know that they often play an outsized role in the economic and social life of a community. Our ability to maintain them has tremendous value beyond just bricks and mortar.

REGULATORY FRAMEWORK FOR REHABBING

The value of historic places and their potential impact on energy use have been recognized at the highest levels of government. In 1966, when Congress passed the National Historic Preservation Act, it formally declared that "the preservation of this irreplaceable heritage is in the public interest so that its… energy benefits will be maintained and enriched for future generations of Americans" (16 U.S.C. § 470(b)).[2]

Despite this express congressional intent, the modern regulatory framework for historic places fails to take the energy benefits of historic buildings into account. We turn next to two relevant laws affecting the rehabilitation of historic places: building codes and a set of federal standards specific to historic properties.

2 Note that this provision was eliminated in the recent recodification of the National Historic Preservation Act.

BUILDING CODES

Since 1975,[3] energy conservation codes (a type of building code) have required that new construction satisfy performance benchmarks for energy-efficient building envelopes, mechanical systems, and electrical systems, among other things. Forty-seven states have adopted the International Energy Conservation Code (IECC) for single-family homes and low-rise buildings, and 42 states have adopted the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Standard 90.1 for commercial and larger residential buildings (International Code Council, n.d.; Energy Codes Program 2021).

These codes do not necessarily fully apply to historic places. Properties listed on a local or state register of historic places, or listed or eligible for the National Register of Historic Places, need not comply with the IECC if compliance "would threaten, degrade or destroy the historic form, fabric or function of the building" (International Code Council 2018). The IECC imposes minimal requirements on exemption requests, simply stating that the request be signed by a registered design professional or a state or local preservation regulator.

Similarly, ASHRAE provides an easy path for exemption of historic properties and a 2019 standard specifically created for historic buildings has not been widely adopted (ASHRAE).

The rationale for exempting historic properties may have been that doing so somehow helped them maintain their historic value—or that requiring them to comply to an overly high standard would result in their not being rehabbed at all. But the end result is that these codes do not contemplate historic buildings as important to energy efficiency.

THE SECRETARY'S STANDARDS

Beyond building codes are a second set of standards relevant to historic building rehabilitation: the Secretary of the Interior's Standards for the Treatment of Historic Properties (the "Standards") (36 C.F.R. § 68.3). The Standards offer rules for four different treatments of historic places: restoration, preservation, reconstruction, and rehabilitation.

FOUR TREATMENTS

Restoration usually applies to museums or highly significant buildings and is meant to restore the building to a specific time period. This includes repairing rather than replacing features, removing materials from outside the time period, and staying only within the existing design of the building.

Preservation focuses on retaining the historic fabric. It allows only historical use or use that maximizes historic preservation, but standards allow subsequent changes to the structure to remain if they have acquired their own significance.

Reconstruction allows new construction, but only to replicate a historic property, or part thereof, that has disappeared. However, there must be sufficient evidence or documentation of the missing part, and the reconstruction must reveal that it is new in some way.

Finally, rehabilitation is the most flexible, and therefore, the most relevant to building reuse. This applies to projects where fidelity to the historic fabric is important, but not paramount. Under this treatment, the property can have a new use, with only minimal change to the historic features.

3 These energy conservation codes came about during a flurry of U.S. regulatory activity in the area of energy after an oil embargo tripled oil prices in the preceding two years.

ADDITIONAL GUIDELINES FOR INTERPRETATION

The four treatments are supplemented by guidelines issued by the National Park Service (NPS), which is the entity inside the Department of the Interior that administers the National Register. The guidelines are elaborate manuals that determine the materials and techniques that are allowed under each standard (U.S. Department of the Interior 2017). Worth noting, the Standards do not explicitly mention energy efficiency, nor do the guidelines issued by the NPS treat the topic in any great depth, other than emphasizing the retention of historic features.[4]

THE BROAD REACH OF THE STANDARDS

The Standards have far-reaching effects, influencing public, tribal, and private action. At the federal level, they apply to certain projects receiving federal funding, certain federal agency actions that may affect historic properties, and projects receiving a federal rehabilitation tax credit (36 C.F.R. §§ 67.7(b), 68.1; 54 U.S.C. § 306108; I.R.C. § 47).

In addition, state and tribal governments usually incorporate or adopt the Standards into their own regulations. And local historic regulation is often, either explicitly or implicitly, tied to the Standards (Wells and Stiefel 2019; National Alliance of Preservation Commissions). Private parties may also be bound by preservation and conservation restrictions that reference the Standards as the benchmark for future alterations to a historic property.

Accordingly, the Standards, and not energy conservation building codes, govern the majority of historic-building construction activity in the United States.

ENERGY EFFICIENCY AND THE STANDARDS

To illustrate how the application of the Standards sometimes thwarts energy efficiency, I will provide three recent examples from Connecticut, where I live.

THE SWIFT FACTORY

The Swift Factory, a long-abandoned 1887 gold leaf factory in a predominantly Black neighborhood in Hartford, suffered from disinvestment for decades before undergoing a recent $34 million rehabilitation. The rehabilitation was possible only with federal and state historic tax credits—which triggered compliance with the Standards.

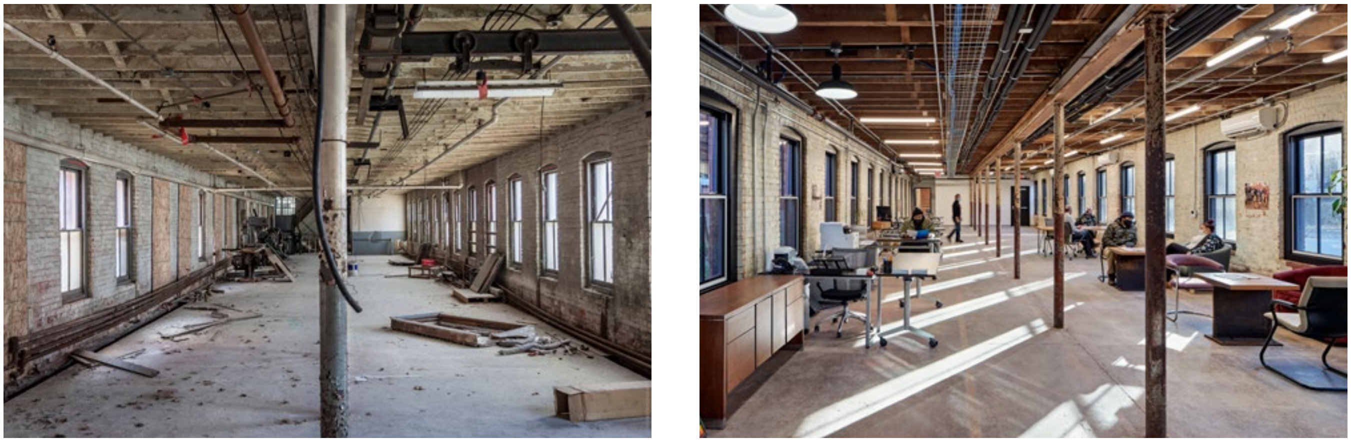
Before starting the rehabilitation, the developer, nonprofit Community Solutions, submitted plans to the National Park Service (NPS), which reviews such plans for compliance with the tax credits. In its initial submission, the developer requested that it be allowed to insulate and put drywall on the interior of the existing exterior walls—just two to four wythes of brick, without a cavity.

The developer was not proposing to use a material potentially damaging to the historic fabric, such as spray foam insulation. Moreover, interior insulation would have no visual impact on the exterior of the building, which is usually the primary concern of preservation law. Yet, the NPS rejected the proposal, because it claimed the interior insulation would detract from the historic character of the interior.

The developer had another proposal relevant to energy efficiency: to rebuild the concrete sills by using precast pieces, which would accommodate a thermal break. Thermal breaks help slow the flow of energy between conductive materials. This proposal, too, was rejected as being inconsistent with the Standards, even though there would have been virtually no visual difference. Instead, the developer had to use poured-in-place

4 This policy digest is focused on energy efficiency, but it is also worth noting how difficult it can be to incorporate renewable energy into historic buildings. For example, the Sustainability Guidelines specifically limit how solar energy, wind energy, and green roofs can be incorporated into rehabilitations.

FIGURE 2: THE SWIFT FACTORY, BEFORE AND AFTER REHABILITATION



Source: Images Courtesy Community Solutions, Inc. "Before" picture © Michael Vale Garner 2010. "After" picture © Robert Benson 2019.

concrete sills, adding $250,000 to the project and reducing energy efficiency.

The only way the project could receive tax credits was if the developer abandoned these two energy efficiency proposals. And so the developer did. Today, especially during the recent chilly winter, energy bills paid by the developer, nonprofit Community Solutions, are sky-high. The building—which houses or is slated to house an alternative school, commercial kitchens, office space, and craftsman-type manufacturing—provides less comfortable spaces to its tenants than they would have enjoyed if the interior had been properly insulated.

THE COLT BUILDING

The $14 million conversion of the North Armory of Hartford's Colt Building provides another example of the application of the Standards to a federal rehabilitation tax credit project. The building was originally part of the industrial complex of the Colt Patent Fire Arms Manufacturing Company, famous for popularizing the revolver. After sitting derelict for decades, the building has been renovated for residential purposes.

Like the developer of the Swift Factory, the Colt developer had to submit plans for pre-construction review by NPS to determine consistency with the Standards. Like Swift, the Colt developer was required to keep the external walls bare, with no interior insulation, a decision that maintained the exact look of the interiors historically. Going further, the NPS rejected the use of windows that would have made the building more energy-efficient.

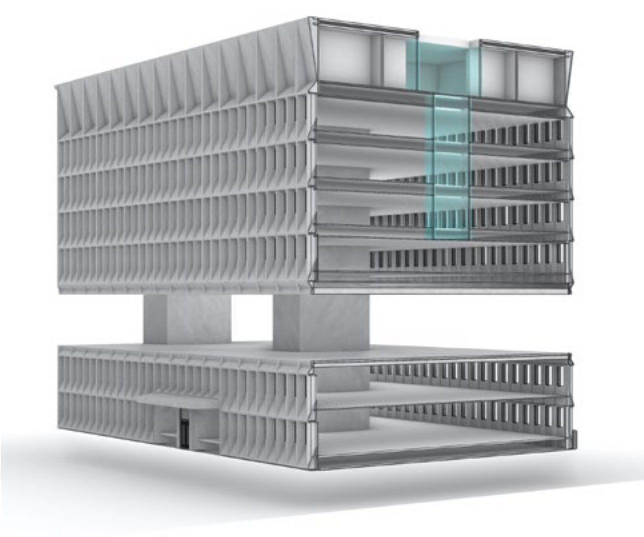
The existing metal-frame historic windows were beyond repair, so the developer proposed double-paned windows with operable sashes. But the NPS deemed operable sashes unacceptable for the two facades of the building visible from the street, reasoning that faux sashes would be more authentic-looking because the mullion profiles for operable sashes are thicker. The irony in the denial was that originally, the North Armory of the Colt Building had operable windows on all sides, to help naturally regulate the ventilation and temperature of the interior spaces.

The merits of this decision are apparent from the end results. The new windows are totally indistinguishable now that they have been installed.

THE HOTEL MARCEL

Finally, consider a $50 million rehabilitation of a long-vacant New Haven building designed by international brutalist Marcel Breuer. Early in the project, developer-architect Bruce Becker decided that the building would be built to "net-zero" standards and be the first "Passive House" certified hotel in the country. The decision was logical: unlike a residential or commercial building, where tenants usually bear the direct burden of energy costs, a hotel's energy costs are directly borne by the owner or operator.

FIGURE 3: THE HOTEL MARCEL, CROSS-SECTION SHOWING PROPOSED LIGHT WELL



Source: © Bruce R. Becker 2020.

To reduce energy consumption, Becker installed high-efficiency air-source heat pumps, environmentally-friendly thermal insulation within building voids, and low-voltage LED lighting. When Becker proposed replacing the inefficient existing windows with triple-glazed windows, initially he was stymied. Over the course of fourteen months, he installed three different window prototypes for NPS approval.

Eventually, the third design for proposed windows was approved, but only because the original drawings clearly depicted interior storm windows that created the same overall depth of inside surface to outside surface of the exterior window, which was the same as the triple-glazed windows.

The process of approval added considerable costs and delays to the project, and the resulting approval is disappointingly rare in historic preservation projects. The Colt Building example—denials of window replacements—is far more typical.

There was, however, an issue that arose at the Hotel Marcel. The developer petitioned the NPS to convert top-story mechanical courtyards to light wells for the guest rooms below, and to let the light spill into corridors to reduce the lighting load. Approval would have created no visual impact on the exterior. Yet the NPS rejected the design to the extent the light would spill into the corridors, limiting the light wells to the guest rooms only.

The rejection of the light wells did not prevent the developer from achieving Passive House standards, and Hotel Marcel uses 80 percent less energy than the average hotel. Nonetheless, the decision unnecessarily undermined energy efficiency goals, with no apparent preservation-related benefit.

CONSEQUENCES OF OUR LAWS

The three Connecticut examples illustrate how the Secretary's Standards can needlessly deter energy efficiency. Combined with the fact that historic buildings are exempt from energy building codes, it is easy to see why historic buildings have a difficult time shaking "old and drafty" reputations. The law seems to dictate that result.

No less important, prohibitions on energy efficient techniques and materials can add to both short-term construction costs and long-term operation costs. In the aggregate, these costs result in *fewer* historic rehabilitations and less money going into restoring historic fabric or building maintenance.

POSSIBLE SOLUTIONS

It's time to harmonize the goals of historic preservationists and the climate movement by taking a closer look at the law. As noted above, historic buildings have a running start on efficiency because they tend to be built more compactly for the same use and because tearing them down and replacing them would inherently waste more energy than a rehabilitation. But we must do more.

The Standards, and the formal NPS guidelines interpreting them, must be reviewed and updated, with the goal of better promoting energy efficiency. The Standards, originally enacted in 1978, have been amended before. In 1995, the NPS underwent the rulemaking process to clarify and modernize them (43 Fed. Reg. 57,250; 60 Fed. Reg. 3,599; 60 Fed. Reg. 35,843).

Amendments could explicitly legalize:

- Replacements of interior features that do not compromise historic fabric, like the window wells rejected at the Hotel Marcel
- Window replacements that offer improved thermal efficiency, like the double-paned windows rejected on two facades at the Colt Building
- Sill assemblies that allow for thermal breaks, like the one rejected at the Swift Factory
- Interior insulation not affecting historic materials or the exterior appearance, like proposals at both Colt and Swift

Going beyond efficiency, a thorough review of the Standards could ensure they respond to other important matters like renewable energy, resilience, disaster response, and even diverse cultural representation—without compromising their preservation goals (Bronin, *Integrity as a Legal Concept*, forthcoming 2021; Bronin, *Adapting National Preservation Standards*, forthcoming 2021). Our response to all of these matters together could be highly complementary.

Beyond the Standards, the two common energy conservation codes should be modified to set a higher standard for exemptions from compliance for historic properties. For example, they could adopt the conceptual framework provided by the four treatments in the Standards, and only allow exemptions in the case of restorations, where fidelity to historic fabric is paramount.

CONCLUSION

Historic buildings could be vital to combatting climate change—if only the law would allow it. The climate goals of the Biden administration could trigger new thinking on this topic. As a candidate, Biden pledged to upgrade 4 million buildings and weatherize 2 million homes over the next four years (Biden, Harris, n.d.). Historic buildings must be part of this count.

We know they can be. The Hotel Marcel illustrates how smart upgrades can ensure a historic building exceeds energy codes and can even reach net-zero. Another example is the 1807 Fay House at Harvard University, which is the oldest building in the United States that has been successfully renovated to meet the LEED[5] standards of the U.S. Green Building Council. That renovation maintained 85 percent of the building's historic fabric (Davis 2013; Trimble 2013). Similarly, Casa Pasiva, a project to retrofit nine older buildings in the Bushwick neighborhood of New York to Passive House Standards, is making headlines for its combination of sustainability and affordability (Sisson 2020).

These examples illustrate how old buildings can become more cost-efficient to maintain and more comfortable for modern use. Why not ensure all buildings have a chance at new life?

5 LEED, or Leadership in Energy and Environmental Design, is the most widely used green building certification program, awarding points for various green building strategies.

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