
New Lives for Industrial Buildings: Merging Preservation and Sustainability

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I beams, concrete patches on an aged brick wall, paint layered on a timber frame: these signs mark time when juxtaposed with aluminum siding, bamboo floors, and illuminated glass panels. Neglected and derelict buildings from the industrial past retain character that new construction alone does not have. The industrial real estate market in the United States is 12.7 billion square feet, statistically describing whole blocks and individual buildings – warehouses, plants, mills, and factories – some of which wait abandoned in a variety of urban and rural landscapes.¹ Many reclaimed industrial buildings transformed to accommodate contemporary functions are not designed to continually evolve and adjust to the rapidly changing needs of a fast paced society.

The authenticity of existing materials and structural members adjacent to sustainable or green materials and technologies charmingly suggests that new buildings are not always better. Architecture, like a language, powerfully communicates a message to the public and heavily influences decisions made by designers' in the future. This paper explores architects' and developers' responsibility to transform existing industrial buildings in coordination with preservation and sustainable practices.

Even though the definitions and objectives of preservation and sustainability travel along similar lines, they resist close connections within the practice of architecture. The Oxford English Dictionary defines preservation as the "action of preserving from damage, decay, or destruction" in a similar spirit, sustainable means "avoiding the long-term depletion" or "to ensure continued conservation" of natural resources.² The common thread between the definitions is adaptive reuse or lengthening the lifetime of buildings and re-

sources. In the field of architecture professionals and designers maintain a separation between the two branches; preservation practices carefully fix particular types of buildings in time, while many economically driven sustainable trends focus on developing new materials and advancing technologies. A considerable portion of architectural design concentrates on either preserving the past or preparing for the future, neglecting to establish a strong relationship between the two.

Metrics have been established to evaluate both preservation and sustainable projects that aim to be recognized. The National Park Service has set parameters defined in the Secretary of the Interior's *Standards for Rehabilitation*. These standards identify categories for treatment including preservation, rehabilitation, restoration or reconstruction. More recently contemporary thinkers have challenges these standards.

After the United Nations met in 1987 and identified environmental issues in what became to be known as the Brundtland Report it was apparent that standards for environmental health and sustainable practices needed to be established.³ A few of the most commonly referenced standards for sustainability are the Green Building Council's rating system known as LEED, and the BREEAM method developed in the United Kingdom.

Unfortunately, abandoned industrial buildings are not a common building type at the top of preservationists' lists nor are they at the core of sustainability efforts. During industrialization in the United States and elsewhere, entire cities developed around factories, warehouses, mills, and plants. As technology advanced and industrial production slowed down during the early to mid-twentieth

century it became evident that many structures frequently connected to major waterways or railroads producing textiles, processing grain, and generating power would soon become obsolete. The inherent characteristics of industrial buildings such as contamination with toxic materials, accessibility challenges, and atypical forms make them difficult to reuse. However, the unique spaces (such as round silos), construction with thick walls, unfinished materials and stable structural elements give them flexibility and the potential for adaptive reuse.

Reusing industrial buildings further facilitates discussion about the stewardship of preservation and sustainability in the design of built environments. Architectural critic of the New York Times, Ada Louise Huxtable, touches upon issues from preservation and sustainability in her writing. She examines and criticizes the contemporary urban fabric and architectural practice over topics ranging from authentic reproduction to social and cultural continuums of buildings, and hallmarks of time.⁴ In a similar vein, this paper divides the discussion of preservation and sustainability into three categories: authenticity of materials, community identity, and dynamic representations of time and transformation in architecture.

AUTHENTICITY OF MATERIALS

Every year significant quantities of natural resources are extracted from the earth, transported thousands of miles, combined with dozens of chemicals, and assembled into suburban homes and chain stores. Extraction of natural resources for new construction overlooks the predicted conditions humanity will face in the near future, such as global warming. Meanwhile, industrial buildings are neglected or torn down and replaced.

Generally, preservation efforts safeguard historic integrity and composition of structures and materials, while sustainable efforts continually improve and advance reusable and recyclable materials. When the two approaches are brought together into one design they create an aesthetic break between the past and the present. This visual and tactile contrast in materials raises community awareness about the potential for buildings to accommodate radically different functions and change over time.⁵

Preservationists restricted by historicity follow conservative guidelines to reduce the intervention of new materials. William Murtagh, in *Keeping Time* writes, "integrity is at the heart of adaptive reuse."⁶ Although the term integrity has different connotations in different disciplines, for preservationists it refers to the qualities of a building that have meaning and value, and therefore must be preserved.⁷ Guidelines set forth in the Secretary of Interior's *Standards for Rehabilitation* explain basic rules for treatment of buildings with historical significance. A few of the guidelines state: "properties should be minimally changed, historic character shall be retained, deteriorated historic features shall be repaired rather than replaced, and new construction shall not destroy historic materials."⁸ Many of these guidelines are conservatively followed – they embalm existing buildings and reduce visible alterations.

Ada Huxtable critiques these stringent standards and likens historic preservation to the term "authentic reproduction." The word authentic implies the real thing, whereas the word reproduction implies a copy of the original. Preservationists commonly create replicas that camouflage contemporary adaptations into the original context. Huxtable believes that the oxymoron "authentic reproduction," "cheapens and renders meaningless its true age and provenance."⁹ One strategy is to differentiate between the irreplaceable qualities that buildings gather over time and the new materials that are necessary to make the building operational once again.

With rapid technological advancements many buildings are no longer functional in their original state, which is one explanation for the variety of abandoned industrial structures littering the landscape. To restore an industrial building to its original state is not economically feasible nor will it meet changing demands of society. Preservationists have the opportunity to implement new sustainable design trends in industrial buildings with a less conservative renovation approach that perhaps maintains the authentic patina and juxtaposes it against sustainable construction techniques and materials.

Compared to historic preservation, sustainable design practices are fairly young. Over the last decade environmentalists, designers, consumers,

and government officials propagated an ever-changing green wave that began to reassess common construction practices. The recent increased interest in sustainability throughout the construction industry has prompted an economically driven market for the development of attractive new materials and new construction techniques. Sadly, the process of creating many of these green products only focuses on the end result, ignoring sustainable steps along the way.¹⁰ For example, a photovoltaic cell, marketed as an energy saving device, may take between four and eight years to save the amount of energy it costs to produce.¹¹

Sustainable designers still have a lot to learn from preservationists. Instead of sustainable efforts developing new technology for new construction, they should focus on materials already in circulation. Fearful of a future restricted by available resources some designs today integrate embodied energy with renewable, recyclable, and reusable materials. The transformation of industrial buildings inherently saves a tremendous amount of natural resources by utilizing embodied energy. It is inevitable in building reuse that new materials will be brought in to supplement or replace parts of the existing building, and architects should choose these for their sustainable properties.

The Media Centre in Hamburg, Germany best exemplifies the juxtaposition of new and old materials. Between 1983 and 1992 Me Di Um Architekten transformed the Zeise naval propeller factory into shops, offices, flats, and cinemas. The patched and crumbling brick walls are authentic backdrops for new lightweight, brightly colored structural members and glazing. The existing factory complex provides a template to organize the new programs, which do not attempt to match or fade behind the original building. "The existing fabric demanded retention and respect, but formed a context for new work which is non-differential – indeed, forceful – in its impact on the old."¹² The design very clearly communicates to the public the richness of the factory's history and the ability for design to accommodate a technologically advanced society with sustainable goals.

Community Identity

Preservation and sustainability of the landscape within local neighborhoods both involve restor-



Fig. 1. 1869 Zeise Factory (Architecture Reborn)

ing and integrating placemaking in the community, such as Gas Works Park in Seattle or Duisburg-Nord Country Park in Germany. On the one hand, preservation is not only the conservation and maintenance of buildings; but preservation is intertwined with the social fabric and historically grounded identity of neighborhoods. On the other hand, the nature of sustainability within a community includes rehabilitating contaminated voids and physically restoring them to public green space.

In 1961 Jane Jacobs argued that cities need old buildings; they should be preserved and gain value in the community by becoming a sense of place for individuals.¹³ Similarly, Ada Louise Huxtable, suggested a comparable notion of preservation. By 1997 Huxtable clearly established her position on the importance of architecture in the community, and clarified that preservation is a part of "larger urban and environmental issues."¹⁴ Furthermore, she stated:

Continuity can be achieved only if the past is integrated into the contemporary context in a way that works and matters. Our awareness and appreciation of historic buildings and neighborhoods must be coupled with their sensitivity to and desire for their continued relevance and use, for their "connectedness," for the way they bridge the years and the continuum of social, cultural, urban, and architectural history. It is their recycling and adaptation that will keep them as a living part of today's cities and communities.¹⁵

The defining characteristics of industrial buildings, such as their massive scale, iconic grandeur, and their connection to the working class, makes them

a valued part of a community's identity. Unlike museums and institutions, extreme transformations of industrial structures are welcomed and integral to creating relevant and functional space.

In the 1950's modernists' careless attitude towards existing structures, environmentalism, and communities resulted in the demolition of many buildings. Historian Charles Fracchia scrutinized the ruthless attitude of destruction when he wrote that replacing old buildings with new construction, a common practice in Western Europe and the United States, contributes to disrupted community life.¹⁶ Even during their operational lives, the privately owned and operated factories remained inaccessible to the public living around them. Over time these exclusive environments were neglected and abandoned. Eventually many embraced countercultures that took ownership of the space for self-expression. Delinquents and homeless use the empty spaces for spray paint and graffiti, makeshift beds and fires for cooking, or meeting places.

A new sustainable agenda connecting industrial architecture to a community's values is a reminder of history and acknowledges the changing worldwide attitude about the environment. Rather than dramatic variations in rural and urban fabric the balance between sustainable technology and historic buildings maintains continuity across the landscape. Sustainable efforts are linked to preserving natural resources and habitats. Many brownfields are voids in communities and have 'no trespassing' signs warning people to stay away from the contaminated site. To sustain an environmentally healthy planet these lifeless properties should be cleaned up and restored to parks, playgrounds, bike paths, and trails where the community can socialize. Industrial buildings and sites that successfully address what the building used to be and transform it into a welcoming public space encourages similar local redevelopment, attracts tourists, and restores vitality to the community.

The proposal for the 1954 Moran Electric Plant in Burlington, Vermont is an exemplary example of facilitating public involvement and generating community space. The program for the proposal was directly generated from numerous public surveys and forums. Full realization of the proposal



Fig. 2. Moran Plant Proposal (SAS Architects)¹⁷

for this abandoned steel and brick plant will include a range of activities from an ice climbing facility, a sailing center, a children's museum, a community center, a restaurant, and a café, to public gardens, boat access to the lake, and an ice rink in the winter months. In addition to maintaining the plant's defining historic elements the proposal calls for the design to uphold the highest standards of sustainability.

TIME AND TRANSFORMATION

Perhaps the greatest challenge for preservationists and sustainable designers is time. Well-known architect David Chipperfield explains his philosophy addressing the topic of architecture and time,

We should not live in a bright shining new future, any more than we should hide in a comfortable pastiche of the past. We must inhabit an ever-evolving present, motivated by the possibilities of change, restricted by the baggage of memory and experience.¹⁸

Chipperfield's statement strengthens the theory that abandoned buildings represent more than a static image of the industrialized past, but rather the patina of a copper roof, the exposed rebar, the shattered window are all reminders of a building that is still very much alive. Within different fields of architecture, the focus of designers vary from many architects that are concerned with present ideology, to preservationists maintaining valued buildings from the past, and sustainable designers projecting and reacting to the conditions that will define the design of buildings in the future. The combination of each of these attitudes is a powerful design approach. Buildings must not be considered to exist in one moment in time; they

change and respond to the physical, social, and economic evolution around them. Over time as resources diminish and land increases in value, rather than contributing to urban decay, these industrial buildings will be recognized as valuable resources.

Preservationists have strong theories about time. The National Park Services activities and goals are directly related to the registration, maintenance, and integrity of historically significant buildings – without their efforts many historic buildings would be demolished. Huxtable's appreciation for patina and aged surfaces on buildings is obvious as she describes the mute and hollow restoration of old buildings. "What the perfect fake or impeccable restoration lacks are the hallmarks of time and place. They deny imperfections, alterations, and accommodations; they wipe out all the incidents of life and change."¹⁹ Preservationists lack appreciation for significant moments in time when they conceal and repair a building's scars and restore it to its original state; they are erasing the very moments that make the historic buildings worth saving.

In contrast to preservation, sustainability efforts seek to raze old buildings in an attempt to replace old building stock with newer technologies. At the root of sustainability are considerations for life cycle energy consumption, future reuse, and materials adaptability. However, current efforts still assess time as linear, unlike leading environmentalists and designer William McDonough, who proposes time as a circular concept. In *Cradle to Cradle*, he introduces the eco-effective idea of "waste equals food;" at the end of a material's useful life it becomes nourishment for something new.²⁰ Time is a pressing issue for sustainability; it is widely recognized that materials, fossil fuels, open land, and natural resources are quickly dwindling.

Designing in and around existing structures not only acknowledges the need for evolution over time, but also results in shorter construction periods and quicker time to occupancy.²¹ The attitude that buildings are constantly changing is slowly becoming more common in the United States. Unfortunately, many contemporary design approaches focus on the moment brushing aside the past without accepting accountability for the building's future. In reference to common prac-

tices of design and construction, Stewart Brand in *How Buildings Learn* writes, "The race for finality undermines the whole process. In reality finishing is never really finished."²² Sadly, many architects maintain a static design mentality and strive to "finish" a building after initial construction is complete. As a result, buildings are designed to specifically meet the needs of the current owner without anticipating change. Accepting that buildings are not final, even after the punch list is checked off, demonstrates responsibility for the building's future.

The Old Jameson Distillery in Dublin, Ireland transforms space with respect for a rich local heritage that began in 1780. In 2006 the old distillery underwent a €5 million refurbishment to change the manufacturing plant into a tourist experience. The inclusion of a restaurant, gift shop, and bars exemplifies how adaptive reuse can interject public space into a once private factory. Approaching from the street, glass and aluminum paneled additions creep over the roof and down the old masonry façade hinting at the changes within. Upon entering the distillery's original stone foundations are artfully framed by the fritted glass floors. In the same spirit, the simple new copper entry vestibule does not detract from the aesthetic experience of the existing stone walls and heavy timber framing. Rather these new design statements create dialogue with the existing structure that illuminates the narrative of the building's changing uses. The distillery now serves as a historic public space for Dubliners and visitors from around the world.

AMERICAN CAN FACTORY

More frequently developers and architects today are looking for exciting new projects that revitalize communities' identities and benefit the environment. They are less concerned with their reputations as they are with benefiting others and saving the natural landscape. Instead of using the form of a new building to make stunning impressions and unique statements about architecture, designers are recognized for innovatively reusing existing buildings. One project currently underway that demonstrates the merging of sustainability and preservation is Factory Square in Cincinnati, Ohio.

The vacant American Can Factory, located in a

proud community north of Cincinnati, anticipates revitalization. The site was once busy with activity when the factory housed the nation's largest can manufacturer in the 1920s, a time of blues music, economic prosperity, and industrialization. For over a century the factory was at the center of a vibrant industrial, commercial, and residential neighborhood. Today the factory remains abandoned sharing the 8.5-acre brownfield site with a bowling alley and lumber company.

In 2005, developers Steve Bloomfield and Kenneth



Fig. 3. The Old Jameson Distillery

Schon identified the property and envisioned a master plan for revitalization, having achieved prior success with the 2003 renovation of the historic Cincinnati Ford Factory.²³ The five-story American Can Factory is 180,000 square feet, mostly vacant with a small portion occupied by machines, sheet metal shops, and artists. After its initial closing in 1950 it was only occupied briefly by the Cleveland Wrecking Company in the 1960's. The developers collaborated with architect José García to devise a mixed use adaptive rehabilitation strategy for the factory that will include lofts, commercial, and retail space.

Two challenges for Bloomfield/Schon and Partners included securing finances to purchase the property and the cleanup of the contaminants that soaked into the concrete floors over time. In addition to the \$500,000 loan from the City of Cincinnati and a \$750,000 grant from the Clean Ohio

Fund, the project seeks other state and federal financial packages that are dependent on the sites designation as a historic landmark.²⁴ Sadly, the funding that supports revitalization and cleanup also restricts the design process to preservationists' standards. As a result, the application of some sustainable techniques may be limited to maintain much of the building's original appearance.

García stated the existing building would be complimented by very simple new construction; this will give the site a new image and attract attention from the community.²⁵ In coordination with preservationist's standards for rehabilitation, new additions to the site will "respect and respond" to the height and massing of the adjacent buildings. However, original materials, such as bricks and concrete, will be reused in new applications throughout the design. In contrast, new construction on the interior will be contemporary and take advantage of the buildings features such as high ceilings and natural light, often a feature present in many new industrial lofts around the world.

The current building's condition creating a void in the neighborhood will be transformed into spaces that serve the community in several ways. In the meeting with the Historic Conservation Board, Bloomfield expressed that the project had the support of the Northside Community Council and the Business Association.²⁶ The new design will invigorate and economically revitalize the community by inviting several hundred new residents to the area, improve the visual appearance, and encourage small business development. In addition to the project proposal including an adjacent park and community green space, the city is taking an initiative to develop the park system and bike paths that should connect the community to greater Cincinnati.

The redesign of the American Can Factory addresses time but does not focus on nostalgic identity or portraying past use in future reincarnation. Contemporary design moves will highlight change over time and be tastefully juxtaposed against the respected structure and shell. Nate Sunderhaus – architect from José García Design – wrote in an email conversation that it is essential to reconceptualize industrial sites to not only eliminate detractors to neighborhoods, but also to "re-infuse unique, diverse, and historically significant

development into existing urban developments.” Although the American Can Factory design does not focus on preparing the building for continual long-term reuse the commercial spaces will possess the natural ability to frequently change with new commercial enterprises.

Differences between preservation and sustainability, permanence and flexibility can be resolved when the stringent standards of preservationists adapt to accept sustainable design techniques. Carefully blending the two design approaches allow for the old to maintain integrity over time but evolve with changing demands. The desire that preservationists have for permanence in architecture can be achievable with designs that allow for flexibility and adaptation. A flexible and sustainable building ensures permanence by its ability to accommodate social, cultural, and economic changes rather than becoming obsolete.

Murtagh wrote, “the distinction which Americans have traditionally made between conservation of the natural environment and preservation of the built environment may of necessity, erode in the future.”²⁷ The separation between preservation and sustainability in the practice of architecture will likely disappear, especially with projects such as the Moran Center and the American Can Factory. As supplies of natural resources decrease and the demand of energy and manufactured materials increase, adaptive reuse will be a necessity in the future. The strategies for redesign will have precedence in the metrics established by both the preservation and sustainable movements in architecture. Bloomfield/Schon and Partners, and other architects and developers, have discovered that characteristics of industrial buildings make them excellent targets for new uses.

Architects and developers have a responsibility towards new and old buildings. The genuine quality of a building that merges the past and the future to accommodating contemporary functions, revitalizes public space in communities and neighborhoods, and allows transformations to tastefully express time. Designs should demonstrate responsibility for existing materials as well as natural resources, community and environment, and time and transformation. Architects and developers should breathe new lives into neglected industrial buildings with respect for preserving the past and a vision for a sustainable future.



Fig. 4. Existing American Can Factory (available www.bloomfieldschon.com)



Fig. 5. American Can Factory Site Plan (available www.josegarciadesign.com)

ENDNOTES

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