



Journal of architectural technology published by Hoffmann Architects, Inc., specialists in the rehabilitation of building exteriors.

Journal

The Existing Plaza: Considerations for Repair or Replacement

Lawrence E. Keenan, AIA, PE and Margaret A. Molnar-Ryan, AIA, LEED AP

A well-designed plaza is an invaluable feature. By adding functional space to the building exterior, plazas provide inviting areas that extend building use throughout the day and evening. As the needs of the owner and occupants change, plaza rehabilitation can incorporate new amenities and landscape elements to adapt to building use, with site features that anticipate and respond to the demands of management and tenants. In some cases, owners looking to maximize the value of their plaza may

choose to undertake a major reconfiguration, incorporating amenities that create a striking appearance and improve functionality.

Plazas are often public spaces, and they form a significant part of the building's impact. Landmark buildings and well-trafficked thoroughfares need to respond not only to the demands of occupants, but also to the larger interests of the community. A plaza

restoration must therefore consider the historic significance of the design, if applicable, along with the functional requirements of the space, the maintenance demands on building staff, the cost, and the longevity of the materials and systems selected. With the right balance of sensitivity to surrounding structures and consideration for public use, the prudent owner can achieve a plaza rehabilitation that is as eye-catching as it is practical.

Restoring a Landmark Plaza

Preservation, restoration, rehabilitation, or renovation: depending upon the design intent, plaza projects fall within one of these categories. The choice of how to approach a plaza overhaul affects the scope, construction, use, and cost of the project, so it's important to identify the limitations and opportunities inherent to each of these strategies. For a plaza with historic or landmark status, proper stewardship may dictate preservation, and, if necessary, restoration to promote the longevity of what is likely an important community asset.

According to *The Secretary of the Interior's Standards for the Treatment of Historic Properties*, "preservation" is the process of sustaining the form, integrity, and materials that define the overall historic character of a property.



▲ A plaza project offers the opportunity to enhance the stature of a property and raise its value to the community.

Lawrence E. Keenan, AIA, PE is director of engineering with Hoffmann Architects. He develops plaza solutions that range from historic preservation to green roof engineering. Margaret A. Molnar-Ryan, AIA, LEED AP, project architect, provides rehabilitation designs that consider form, function, and sustainability.

This may include elements such as walkways and paths, lighting, vegetation, and water features. *Restoration* builds upon this idea by reconstructing missing historic features and removing those elements that are historically inaccurate or were added at a later time. The scope of such projects is generally dictated by the plaza condition; extensively deteriorated elements are afforded isolated replacement, while the plaza is preserved and protected as a whole.

Strict adherence to the tenets of preservation and restoration, however, often gives way to the realities of modern life. Compromises may need to be made to accommodate code compliance, current design standards, and the well-being of the public.

The ability of a historic plaza to meet the needs of its users safely and effectively must be considered. A plaza is a prominent feature that can serve as the main entrance to a building, as a courtyard linking one building to the next, or as a destination in and

of itself. In all of these cases, a plaza must be designed to accommodate the movement of people. As such, safety and liability are important considerations for any property owner. Modernization of certain elements is therefore unavoidable, particularly where accessibility is concerned. Older structures frequently lack the most basic of handicap access provisions. Most notably, ramps are generally absent from older plazas and must be constructed as a counterpoint to the original stairs. Without artful detailing and placement, adding ramps—large and prominently located structures—can adversely impact the character of an existing plaza.

Other concerns for historic and landmark plaza restoration include availability of original materials, slip



▲ Code-compliant accessibility features, like ramps and handrails, can be added to historic plazas without compromising aesthetics.

resistance, waterproofing and drainage design, and energy performance and illumination output of existing lighting units.

Responding to Code Requirements

A review of even a relatively young plaza can reveal an array of deficiencies with respect to current building codes and design standards. Walking surfaces, for instance, need to be slip-resistant with not too great a slope, stairs require code-compliant handrails, and changes in level demand appropriate guardrails. Accordingly, paving systems, lighting, railings, and stairs are among elements commonly improved through *rehabilitation*—next on our list of plaza strategies.

Rehabilitation can improve and enhance a plaza through repair, alterations, and additions, while preserving those portions or features which convey cultural and architectural value. Rehabilitating select elements provides the owner latitude to upgrade features of the plaza affecting safety, accessibility, durability, upkeep, and cost while maintaining—or enhancing—utility and architectural appeal.

Redefining the Plaza Space

Why limit the scope to repair or compliance-oriented upgrades? A plaza

Rehabilitation Design Considerations

Rehabilitation presents an occasion for improvements. The following is a list of common features or elements that are typically considered as part of a plaza project, with design considerations for each.

Accessibility: Ramps, railings, handrails, tactile paving.

Cost: Construction, operating, maintenance, life cycle.

Drainage: Reduced puddles/ice.

Insulation: Lower utility costs, condensation.

Materials: Condition, durability, maintenance, slip resistance, cost.

Nuisance: Skateboard deterrents, bird control.

Plantings: Maintenance, irrigation, leaf removal.

Security: Lighting, cameras, fencing.

Snow/Ice Treatment: Chemical, hydronic/electric heat, snow storage or disposal.

Stairs: Code requirements, handrails.

Sustainability: Materials, operations, embodied energy, durable design, longevity.

Waterproofing: Membranes, subsurface drainage, leak detection/vector mapping.

is an important asset and provides a clean canvas on which to compose a seemingly endless array of possibilities. Through *renovation*, the most far-reaching of the approaches to plaza projects, a plaza can be transformed into a vibrant community center or an intimate outdoor living room; it can provide program space for events or an efficient and attractive pedestrian traffic route, an open park or a formal grove. Ultimately, plaza renovation provides an opportunity to increase both the stature of the property within the community and the value of the property to the owner.

Renovation projects begin with identification of program requirements. How will the space be used? Will it be public or private? What type of image is being portrayed? What level of maintenance is acceptable? What is the budget? These are just some of the considerations that must be examined in order to realize the full potential of a plaza.

Program space, or plaza areas that serve specific functions, should be considered early, such that planned activity forms a seamless and integral part of the plaza design. Program space can be used for public

“ Plaza renovation provides an opportunity to increase the value of the property. ”

gatherings ranging from “Taste of the City”-type dining to announcements and ceremonies, to fundraisers, performances, assemblies, or any number of events, whether intimate or sizable. Visibility from the street, access, lighting, electrical outlets, audio-visual connections, tent tie-downs, and even provision for discretely located port-o-lets are assets during large events and major oversights when omitted.

When configuring plaza areas and selecting plantings and lighting, the design professional should consider shade and sunlight, as well as the plaza’s location relative to the building, all of which affect the climate of the space. To manage pedestrian traffic, arrangement of planters, permanent seating, and other hardscape and landscape

features can be used to encourage movement from one area to the next, creating inviting spaces for people to congregate as well as corridors for passage. Seating can also be removable to respond to changing functional requirements and accommodate special events.

Lighting extends the use of the plaza into evening, when illumination is necessary for safety and security. Low-radiance, low-angle light fixtures may be selected to limit light pollution, where feasible.

Plaza renovation also affords the chance to reconfigure the space to reduce maintenance demands. With fewer large, featureless pavement areas, a well-designed plaza can minimize the work of snow removal and the liability of slippery surfaces.

Plazas as Green Roofs

For plazas over occupied space, an important design option is the green roof. In retrofit applications, adding a green roof—a large area of vegetation installed atop the waterproofing system—offers many benefits:

- **Cooler climate.** In cities, green roofs reduce the “heat island effect,” keeping buildings and their



▲ Before: The under-used plaza at this public university showed signs of age and wear.



▲ After: Renovation provides varied program space that incorporates plantings, solar lighting, and durable materials.

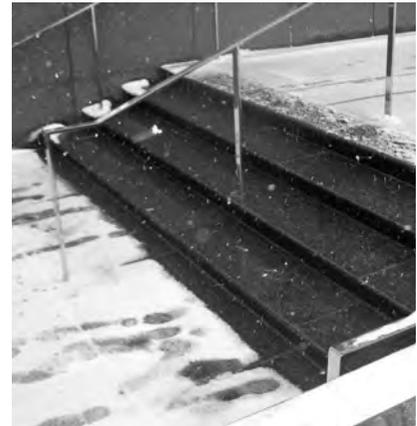
surroundings cooler and cutting down on energy consumption.

- **Storm water control.** Plants and growing media filter pollutants and reduce storm water runoff, decreasing loads on drains and sewers and cutting down on flooding.
- **Noise reduction.** In addition to providing a thermal buffer, the insulating properties of plants and growing media tend to reduce ambient noise within the building.
- **Aesthetics.** By limiting pavement and hardscape, vegetation at the plaza level enhances and softens the view, providing a pleasant environment for building users and others in the community.
- **Snow and ice management.** In cold climates, converting portions of a plaza to a green roof reduces the total area that requires snow removal in the winter, saving maintenance costs and reducing liability.
- **Corporate or institutional image.** Perhaps just as important as the environmental benefits themselves, a green roof visibly affirms the owner's commitment to sustainable design.

There are two types of green roofs, *intensive* and *extensive*, the choice of which is usually dictated by the weight-bearing limitations of the structure. Intensive roofs are thicker, heavier, and generally higher-maintenance; they can include lawn grasses, larger shrubs, and even small trees. Even with the advent of light engineered growing media, the weight of these systems can be substantial. Extensive roofing systems, in contrast, are thin and relatively lightweight; however, these systems usually sustain only small hardy plants, such as sedum and mosses.

Before adding vegetated areas over occupied space, there are many considerations to evaluate, the most immediate and limiting typically being the load-carrying capacity of the plaza deck. In terms of structural considerations, though, green roofs in a plaza setting have significant advantages over their counterparts on the rooftop. Green roofs—even extensive ones—are heavy compared with traditional roof assemblies, and this extra weight can limit their use in roofing projects on existing buildings.

Typically, this limitation is not a problem for plazas. Because the weight of extensive green roofs is comparable to that of many plaza paving systems, ounce-for-ounce replacement of pavers with plants and growing media is often possible. In addition, plazas must be designed for large potential live loads from vehicles and crowds; once converted to a green roof, that area must sustain only



▲ A snowmelt system can ease winter storm management and improve safety.

the occasional gardener or two. By restricting access, the design professional may convert the excess live load-bearing capacity into additional support capability for plantings.

The benefit of a green roof on top of a building is that, being several stories off the ground, it can be designed to be more or less self-sustaining. Requiring only occasional weeding and fertilizing, an extensive green roof is low-maintenance, but it can become an unattractive jumble of desiccated plant matter during the drier summer months. To avoid having a plaza that looks more brown than green, irrigation must be incorporated into most plaza landscape designs.

The most attractive plaza green roofs employ a combination of both intensive and extensive roofing systems. Taller, decorative intensive plants and grasses can be strategically located within a mosaic carpet of extensive plantings to provide the appearance of a lush and vibrant meadow.

Waterproofing and Drainage

Whether preservation, restoration, rehabilitation, or renovation, all plaza projects need to consider water management. Water is the single largest source of plaza deterioration and



▲ Plan ahead for planter care and upkeep by installing linear fall protection lines for safety harness tie-ins.

Loaded in Your Favor: Plaza Green Roofs and Code Requirements

With careful planning, owners of existing plazas can use code requirements to their advantage in incorporating sophisticated planting designs that would not be possible on an ordinary roof.

Code requirements for live load are different for plazas than for roofs. Regardless of a plaza's actual use, current code anticipates the potential for large loads, due to crowds or events, and requires a high live load capacity for the structure (typically 100 psf). Roofs, conversely, are not expected to receive such loading, so the code stipulates a far smaller live load capacity (typically 20-30 psf).

If a plaza area is converted to a green roof, the reduction

in live load may be used advantageously to permit a more robust planting assembly, provided that people are kept off the vegetated areas. Heavier, more substantial plantings and decorative features not possible on a roof may be employed in a plaza installation, thanks to the structural capacity inherent to the existing plaza deck.

Note, however, that such repurposing of plaza space requires that the new planting beds be protected from incidental use that could bring the total load above structural capacity. Installation of fences, railings, and/or gates must clearly indicate to pedestrians that green roof areas are off-limits. ■



▲ Existing plaza.



▲ After renovation of plaza to a green roof system.

premature failure, and without appropriate provision for water protection and drainage, even the most visually arresting of plazas becomes a source of ongoing problems.

Adequate pitch to drains is necessary for the integrity and longevity of a plaza. Without sufficient slope, water ponds, causing staining, deterioration, safety concerns, and maintenance issues. Depending on the climate, porous paving materials without adequate drainage can retain water and undergo freeze-thaw damage, including heaving, cracking, and displacement. Installation of bi-level drains facilitates removal of water at the plaza level, as well as at the surface of the waterproofing membrane.

There are many different waterproofing systems available, including loose-laid and self-adhered membrane assemblies. Self-adhered systems, which are bonded to the structure below, include cold-applied membrane waterproofing, urethane systems, and hot-applied membrane systems. Loose-laid waterproofing offers the advantage of ease of installation and is forgiving of surface preparation deficiencies; however, a properly installed, fully adhered system prevents moisture from traveling beneath the membrane. Provided the membrane is applied at the minimum thickness recommended by the manufacturer, hot-applied systems may be preferable for continuous plaza waterproofing,

due to their resiliency.

For large plaza areas, expansion joints are necessary to absorb expansion and contraction of paving materials and prevent cracking. The design professional should position these flexible joints at the high point on the plaza deck. A watertight connection keeps moisture intrusion from causing building component deterioration and leaks into occupied spaces.

Fixed site features, such as planters or fountains, present additional challenges to drainage and waterproofing. These features may make the drainage pattern more complex; double-checking slope and proper detailing of the system can prevent problems with safety and maintenance.

Anticipating Maintenance Needs

When redesigning an existing plaza, consider maintenance demands as part of the design process, rather than as an afterthought. With advance planning, owners and facility managers can streamline plaza upkeep and reduce the time and expense of future repairs.

In northern climates, snow removal can be a major challenge. Manpower, equipment, and materials like deicing chemicals and sand represent a significant expense. Installing a snow melt system as part of a plaza rehabilitation project can decrease the effort of snow and ice management over the life of the plaza.

Planting beds add to the plaza aesthetic, but they require thought and care. Selection of plantings should consider the plaza climate, location, and orientation if plants are to thrive. Consider, too, the cost and labor involved to trim and maintain plants, and to supplement beds with annual flowers, as desired. Each fall, irrigation systems will need to be winterized and inspected.

Periodically, lighting fixtures will need attention and light bulbs will need to be replaced, so fixtures should be accessible to maintenance personnel. As days get shorter, timer systems will need to be monitored to ensure lighting is on and adequate for safety.

Debris, whether plant matter, litter, or accumulated sand and salt, will inevitably collect in certain locations and need to be removed. Drains must be cleaned and inspected routinely, and displaced and damaged pavers should be reset or replaced as needed.

A maintenance plan can help keep all of these tasks in order. Have a master list of items for staff which should be done daily, weekly, monthly, seasonally,

Skateboard Deterrence

Your new plaza is not a skate park! Skateboard use on plaza fixtures, including benches and pavers, causes damage and poses safety concerns. Fortunately, there are products and design elements that can be incorporated into the plaza to discourage unwelcome skateboarding activity.

Wide joints in the paving system, along with rough pavement sets, deter skateboarders by creating ruts in the surface. Rather than long, smooth edges, opt for faceted sitting walls, or install edge-applied brackets and obstructions to eliminate clear runs. The configuration of plaza elements may also be arranged to remove potential locations for jumps, a further deterrent.

Remedial measures for existing plazas need to be undertaken with consideration for aesthetics, as well as compliance with building code and with the Americans with Disabilities Act (ADA). For instance, protruding knobs or blocks installed on handrails may pose a danger to those using the stairs, as loose handbag straps can become entangled in the projecting elements. Before taking action to stop skateboard use, check with a design professional or local building official for guidance.

With proactive measures, the broken concrete, skid marks, and crumbling masonry that are the hallmarks of skateboard activity can become a thing of the past, without compromising safety or appearance. ■



▲ Wide, faceted joints and grooves in sitting walls prevent skateboarding along the edge.

and annually. For a restored or renovated plaza, the design professional can tailor a maintenance program to meet the demands of specific features, fixtures, and landscape elements.

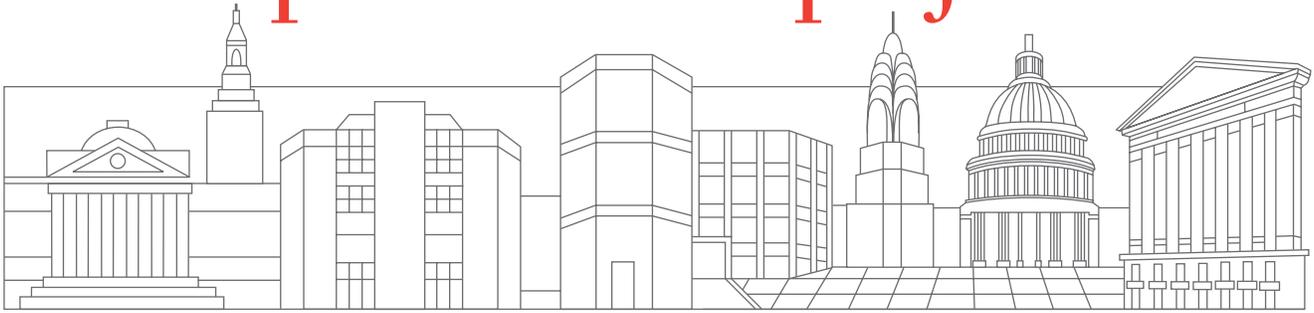
Aesthetics and Performance

Whether restoring a landmark plaza to its original grandeur or reconfiguring an outdated design to meet changing needs, a plaza project presents an opportunity to make a statement. The experience of plaza users acts as a prelude to their encounter with adjacent buildings, and the features and ambiance of the plaza should complement the character of the facility, while responding to the needs of occupants and of the larger community.

By providing accessible, convenient ramps, stairs, and passageways, the owner underscores a commitment to civic responsibility, while safe and code-compliant pedestrian traffic management brings piece of mind. Beyond the basics, landscape features like green roof areas, planters, and fountains add interest and encourage appropriate use of plaza spaces.

An attractive plaza is a valuable amenity, one which acts as a showpiece for the building. With the right design approach and attention to detail, a well-planned plaza project can create a functional and appealing space that provides dependable performance well into the future. ■

representative projects



Plaza Design

Whether maintaining the existing aesthetic or revamping the design, plaza rehabilitation demands a holistic approach that balances practical considerations, such as maintenance, waterproofing, and safety, with the qualities that make for a pleasing and useful building amenity. When Hoffmann Architects designs a plaza renovation, we listen to the owner's vision, incorporating as much or as little change to the program space as is appropriate for the structure, situation, and functional objectives.

Since 1977, Hoffmann Architects has developed plaza design solutions for diverse structures, including:

BMW of North America Headquarters

Woodcliff Lake, New Jersey
Plaza Waterproofing and Structural Repair



▲ **Gracie Mews** in New York, New York. *Plaza Rehabilitation.*

**New Jersey City University
Michael B. Gilligan Student Union**
Jersey City, New Jersey
Plaza Redesign and Reconstruction

M&T Bank Headquarters
Buffalo, New York
Plaza Rehabilitation and Entrance Vestibule Renovation

1166 Avenue of the Americas
New York, New York
Plaza Rehabilitation and 9-11 Memorial Installation

**University of Connecticut
Homer Babbidge Library**
Storrs, Connecticut
Plaza Investigation

**The George Washington University
Funger Hall**
Washington, District of Columbia
Plaza Rehabilitation

Citibank Elmhurst Financial Center
Elmhurst, New York
Plaza Waterproofing Rehabilitation



▲ **Travelers Plaza** in Hartford, Connecticut. *Plaza Redesign and Reconstruction.*

**Smithsonian Institution National
Museum of the American Indian**
Washington, District of Columbia
Exterior Water Feature Rehabilitation

One East River Place
New York, New York
Plaza Rehabilitation

Phoenix Companies Headquarters
Hartford, Connecticut
Plaza Renovation and Green Roof Installation

Columbia University
New York, New York
College Walk Rehabilitation

Connecticut Superior Courthouse
Stamford, Connecticut
Plaza Waterproofing Rehabilitation

**State University of New York
Purchase College**
Purchase, New York
Campus Center South Plaza Rehabilitation

Lever House
New York, New York
Terrace Garden Restoration

Hoffmann Architects, Inc.
2321 Whitney Avenue
Hamden, CT 06518

ADDRESS SERVICE REQUESTED



Tips for Fountains and Planters

1. Protect planter waterproofing with a concrete or masonry lining where frequent planting replacement is anticipated.
2. Position fountain drains such they are readily accessible to maintenance personnel.
3. Place electrical outlets and panels in a convenient location, where maintenance staff won't need to trudge through plantings or stretch around barriers to reach them.
4. Include appropriate fall protection for maintenance activity. Planters at the edges of an elevated plaza may look nice, but if safety harness tie-ins and other provisions aren't included in the design, the beds won't be maintained—or they will require the added expense of rental equipment.
5. Consider the location of plaza features relative to areas below. Fountains and planting beds should not be positioned above mechanical or electrical rooms, and drain clean-outs should not be located in occupied spaces.
6. Mark pavers over elements that will need to be accessed with a discrete, water-jetted symbol for easy identification by maintenance personnel.
7. Locate planters and fountains away from expansion joints. An expansion joint crossing through a planter or fountain not only is apt to leak; it makes maintenance and upkeep even more complicated.

JOURNAL is a publication of Hoffmann Architects, Inc., specialists in the rehabilitation of building exteriors. The firm's work focuses on existing structures, diagnosing and resolving problems within roofs, facades, windows, waterproofing materials, structural systems, plazas/terraces, parking garages, and historic and landmark structures. We also provide consulting services for new building construction, as well as litigation and claim support.

For address changes, free subscriptions, or information on the topics discussed in this issue, contact our Marketing Department at 800-239-6665, news@hoffarch.com, or:

2321 Whitney Avenue
Hamden, CT 06518
203-239-6660

1040 Avenue of the Americas, Ste. 14C
New York, NY 10018
212-789-9915

2611 Jefferson Davis Highway, Ste. 200
Arlington, VA 22202
703-253-9800

www.hoffarch.com

Editor: Alison Hoffmann
Production: Cari Tate



JOURNAL offers AIA/CES Learning Units

Earn Health, Safety, and Welfare (HSW) continuing education credit for reading the JOURNAL.

To learn more, visit www.hoffarch.com.