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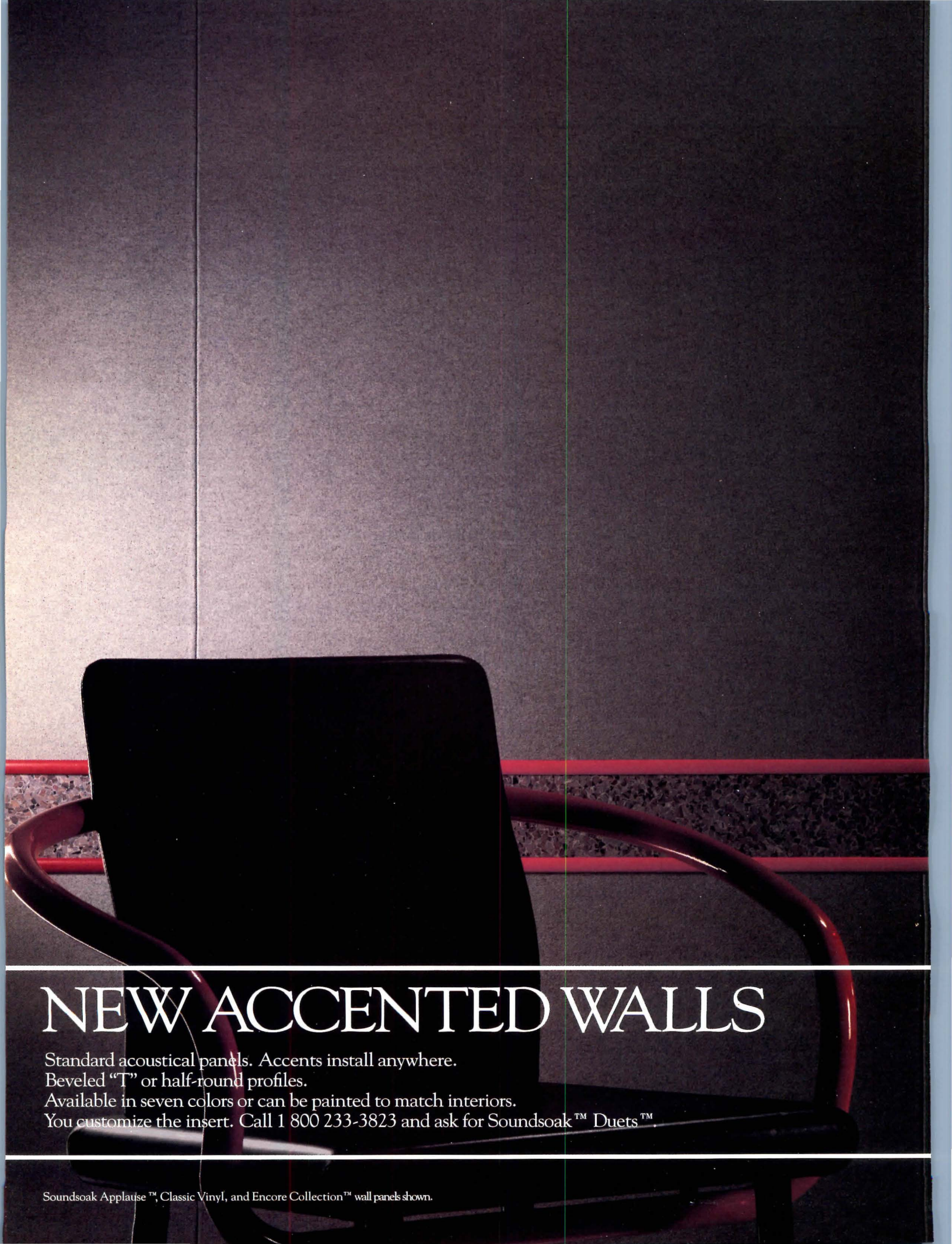

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EVENTS

Nov 29-Dec. 1: Workshop on "Marketing Your Architectural Services," Orlando. Contact: Brenda Henderson at AIA headquarters, (202) 626-7353.
Dec. 1-4: Winter Meeting of the Building Owners and Managers Association, Houston. Contact: Patricia Kosciuszko, BOMA, 1201 New York Ave., NW, Suite 300, Washington, D.C. 20005.
Dec. 4-5: Workshop on Cost Estimating, Analysis, and Control, Ft. Lauderdale. Contact: Brenda Henderson at AIA headquarters, (202) 626-7353.
Dec. 10-15: Annual Meeting of the American Society of Mechanical Engineers. Contact: ASME, 345 East 47th St., New York, N.Y. 10017.

LETTERS

"Dynamic" University of Washington: I attended the University of Washington during the period Contributing Editor John Pastier called "the doldrums" [August, p. 56]. To the contrary, I found it dynamic, chairman Robert Small extremely competent, and the program excellent.

Dean Gordon Varey, my thesis adviser, is an excellent architect and educator, a competent administrator, and a fine human being. He consented to assume the deanship when the university felt it could not afford the price tag of a name brand architect from the East.

I found the remark about the people of eastern Washington not at all humorous. They are generally conservative, which, if one is aware of the demographics of the United States, is typical of a rural agrarian populus.

Jay Dorfer, AIA
Frederick, Md.

Dean Varey's "Dream and Vision": In his August profile of the University of Washington, John Pastier draws observations from questionable sources or from sources that are not identified and are stated in a manner that affords no measure of their importance other than that which Mr. Pastier wishes to claim for them. It must be obvious that in student and professional bodies of the size and diverse nature that we have in Seattle, one can find a few people that will say almost anything that one wants. If Mr. Pastier has a valid point to make, given the public nature of these kinds of situations, it should be possible, even easy, to obtain quotes from unimpeachable sources, and quantified data on group opinions.

I appreciate Mr. Pastier's mention of some of our distinguished graduates, two from "recent years" (but, I might observe, preceding the present chair's tenure). He is observant and to be commended in noting the fine facilities that the department has and its Italian studies program. This program was expanded from one quarter to two, and then to three, under the chairmen who immediately preceded Douglas Kelbaugh. In those years chairmen also instituted a faculty exchange with the University of Liverpool, continued support of faculty exchanges with the Tokyo Institute of Technology, and made arrangements for student exchanges. There were beginnings toward what some faculty saw as a better international outlook toward the Pacific Rim and other countries to our west. It appears from my vantage point that support for this effort, which enjoyed the enthusiastic support of Dean Varey, has been dropped. It is unclear how this situation represents something "old, static, and indifferent," as Mr. Pastier seems to wish to imply with his analogy of two landscape elements.

Short-term results and the attractiveness of a quick fix are seductive. They excite and they can vitalize for a time. But solid progress over the long term is the real issue. If one must evaluate the dean and the chairman for dreams and visions on the basis of the article at hand, it is clear to me that one must commend Doug Kelbaugh for what he has done to add temporary vitality to the department but enthusiastically applaud Dean Gordon Varey for dream and vision.

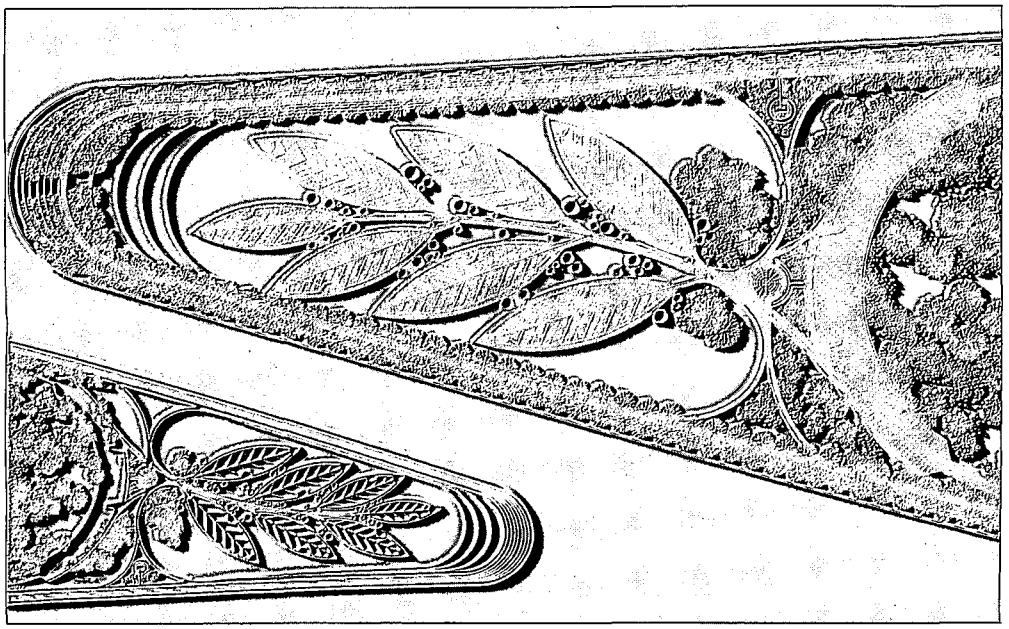
J. William Curtis, AIA
Associate Professor Emeritus
Department of Architecture
University of Washington

John Pastier's response to Jay Dorfer's and William Curtis's letters: Understandably, people involved with an institution may wish to recollect their experience favorably. Yet the fact remains that the University of Washington dean, faculty, and students all saw a strong need to break from the status quo when considering candidates for architecture chair.

Mr. Dorfer's and Mr. Curtis's disagreements seem more with others than with me. The remarks about eastern Washington and Dean Varey were made by people having far greater familiarity with those topics than I do.

Mr. Curtis questions my sources. In doing so, he questions the school itself, since they represent a sampling of students, faculty, administrators, and 16 members of the board of visitors. To imply that they are impeachable seems a bit rash, particularly since he also laments that they are often unidentified. Surely he realizes that everyone, students and faculty alike, is subordinate to a dean and that speaking for attribution would either inhibit frankness or compromise careers. Shielded from those considerations, only one of nine who spoke of the dean was basically positive about his performance, and that opinion was duly noted in my article.

Since Mr. Curtis feels that "it should be . . . easy to obtain quotes from unimpeachable sources and quantified data on group opinions," perhaps he could induce a disinterested social scientist to take on such a project and share the findings with ARCHITECTURE's readers.



Awards & Competitions

Catalano Wins Competition for National Peace Garden

Eduardo Catalano, an architect in Cambridge, Mass., has won a competition to design a National Peace Garden for a 12-acre site in Washington, D.C. The designer of bold structural forms and imposing buildings in the 1950s and '60s, Catalano proposed a subtle memorial with a low, garden landscape molded in the pattern of an olive branch with seven giant leaves sculpted of grass and ground cover plantings.

The site is Hains Point, a wedge-shaped spit of built-up land at the confluence of the Potomac River and Washington Channel, which resulted from dredging projects in the late 19th century. Located almost two miles south of Washington's Mall, the expansive site is in keeping with the traditional scale of the capital's monumental core.

Catalano proposed a large central open space surrounded by a grove of trees. A series of curvilinear paths will lead to the "peace gate," the main entrance, which is defined by a 25-foot-high, hemispherical glass pavilion housing visitor information, a gathering place, and administrative functions. The garden terminates at the southern tip with a 4,000 seat amphitheater carved into the landscape.

In plan, Catalano's design will utilize the image of an olive branch in the sculpted relief of its series of pathways and plantings. The slightly elevated pathways converge alongside the "peace gate" to form the spine of the olive branch and the main circulation through the garden.

Seven large leaf forms, ranging from 150 to 200 feet in length and planted with a variety of low ground covers, will extend from the spine. Each will be bordered by a pathway of perforated pavings elevated approximately one foot. At night the leaf forms will be outlined by lights. Large circular planters with white flowering vegetation will be placed where these leaves are connected to the main spine. Catalano said that his scheme is intended to be "the symbol of peace, woven in a carpet of greens and whites, resting on the grass, sculpturing the earth."

A tree-shaded promenade will enclose the central garden space, which will measure 900 feet north-south and from 450 to 250 feet across. Two existing seawall walkway/ bike paths will be retained. After he was told he won the competition, Catalano described his scheme and his design approach. He said, "All the visual offenses built by man are silenced by the outburst of spring."

Catalano was born in Buenos Aires in 1917 and received architecture degrees from the University of Pennsylvania and Harvard University. He taught at the Architectural Association in London, North Carolina State school of design, and from 1956 to 1977 at M.I.T., where he presently serves as professor emeritus. He maintains a practice in Cambridge, and his book *Structure and Geometry* was published in 1986.

Elizabeth MacKay Ratcliff, a former English school teacher from Berkeley, Calif., originally conceived the idea of a national memorial dedicated to world peace in 1985. Two years later Congress authorized a site for the peace garden.

The National Endowment for the Arts provided a grant of $75,000 to help support the design competition. Open to all American citizens, the competition drew 2,060 registrations and 930 submitted entries, second in number only to the Vietnam Veterans Memorial. The National Peace Garden, estimated to cost $6 million, will be paid for by private contributions. The proposed memorial must be approved by the Commission of Fine Arts, the Secretary of the Interior, and the National Capital Planning Commission.

The competition jury was comprised of Gunnar Birkerts, FAIA; E. Fay Jones, FAIA; landscape architects Hideo Sasaki and Meade Palmer; sculptor Athena Tacha; art historian Peter Selz; and Grady Clay, former editor of *Landscape Architecture.* Paul D. Spreiregen, FAIA, served as the professional adviser.

The team of landscape architect Stephen L. Lloyd of Chester, Conn., and architect Laurie M. Kress of Zurich was awarded the second place prize of $10,000. The third place $5,000 prize was presented to a team headed by landscape architect Randy M. Thueme. Ten projects were cited as honorable mentions, and nine others were presented citations for conception design merit.

An exhibition of selected proposals will be on display through November 30 at the National Building Museum in Washington.

—LYNN NESMITH

News continued on page 22

Cool should whisper.

We don't think you
should hear it.
It's just meant to be *felt.*
To us, noise is more
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Pei Wins International Award

I.M. Pei, FAIA, has won the first annual Praemium Imperiale award for architecture. Established by the Japan Arts Association, the new prize honors lifetime artistic achievement in the categories of painting, sculpture, music, theater/film, as well as architecture. The international prize carries a cash award of $100,000.

The prize comes to Pei at a pivotal juncture in his career. At age 72, he has just announced the name change of his firm to Pei Cobb Freed & Partners, and although for many years considered one of the world's leading architects, Pei seems to be experiencing a renewed appreciation for his brand of modernism.

After nearly a decade of controversy surrounding his pyramid for the Louvre, the $1 billion expansion and renovation has received acclaim within the profession, and the public (both locals and tourists) has embraced the addition as a new symbol of Paris. Pei's first symphony hall, the Morton H. Meyerson Symphony Center, just opened in Dallas. A new science building for the Connecticut preparatory school Choate/Rosemary Hall is nearing completion, serving as counterpoint to Pei's nearby campus arts center of the early '70s. His 70-story Bank of China building in Hong Kong, also nearing completion, will be the tallest building in Asia.

Born in Canton, China, in 1917, Pei came to the U.S. at the age of 18 to study at MIT. He went on to Harvard and studied under Walter Gropius and Marcel Breuer. Beginning in 1948 Pei worked as director of architecture for William Zeckendorf's real estate development firm. Ten years later he founded I.M. Pei & Partners.

In addition to the Praemium Imperiale, Pei was awarded the Pritzker prize in 1983 and the AIA gold medal in 1979.

The five other Praemium Imperiale winners are: Dutch-born abstract expressionist painter Willem de Kooning; British-born David Hockney, known for his stylized paintings of contemporary America; director Marcel Carne of France for theater and film; Umberto Mastroianni of Italy for sculpture; and Pierre Boulez of France, former conductor of the New York Philharmonic, and composer.

The Praemium Imperiale was created last year to demonstrate Japan's commitment to fostering international support of arts and culture. At the announcement of the winners, Hiroaki Shikanai, vice chairman of the Japan Art Association, said that the awards are "our way of saying thank you, and we hope, of also encouraging the efforts of the next generation."

Nominations for the prizes were made by an international panel consisting of David Rockefeller, former prime ministers Jacque Chirac of France, Edward Heath of Great Britain, Amintore Fanfani of Italy, and former chancellor Helmut Schmidt of West Germany. Americans on the committee included Ada Louise Huxtable, former architecture critic of the New York *Times*; Dillon Ripley, secretary emeritus of the Smithsonian Institution; composer Stephen Sondheim; Lloyd Richards, head of the Yale Drama School; Kirk Varnedoe, director of painting and sculptor at MoMA; and Schuyler Chapin, former dean of Columbia University's school of the arts. —LYNN NESMITH

News continued on page 24

Below, I.M. Pei at the recent announcement of his proposal for the Regent of New York Hotel (middle tower in model).

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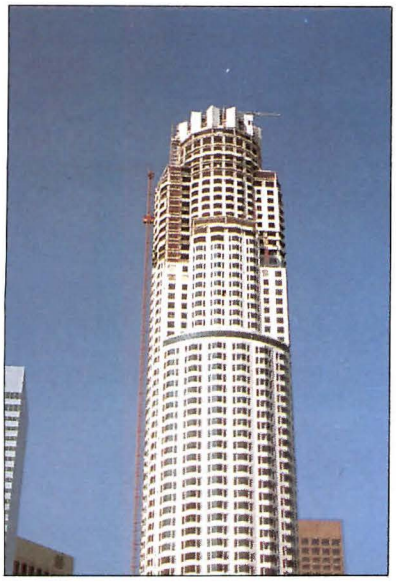
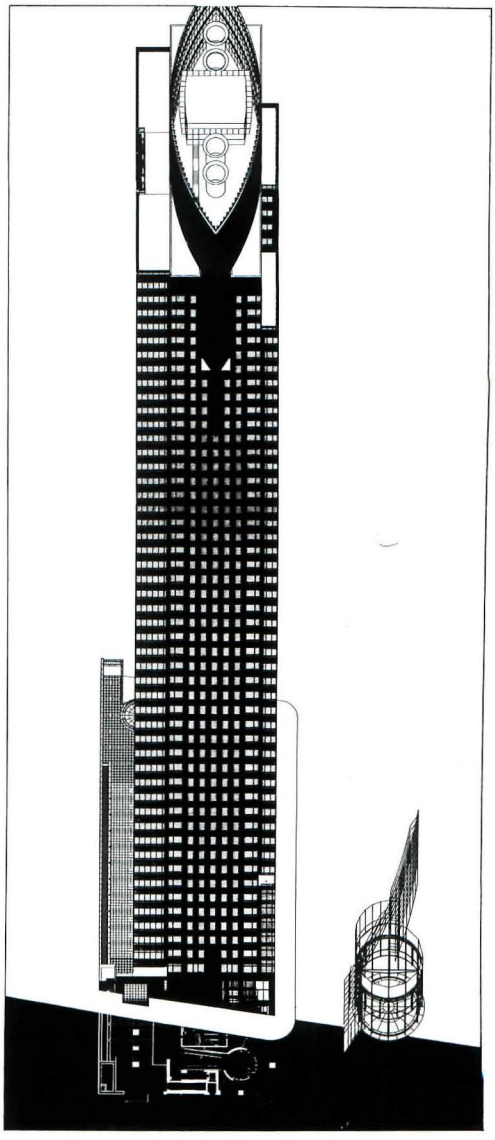
Wayne Thom



Deborah Taylor



Far left, Biltmore Place by The Landau Partnership; left, Pei Cobb Freed's First Interstate Tower; right, California Gas Tower by SOM/Los Angeles; and below, HHPA's Central Library.

Conferences

Critics Debate Four L.A. Projects

In Los Angeles, four big buildings rising at a single crossroads amounts to major urbanism.

The crossroads in question is on Grand Avenue opposite the Public Library, near Pershing Square at the foot of Bunker Hill. Seizing a rare opporunity for discussion of urban design in L.A., a symposium on the buildings was convened on September 16. Symmetrically, it brought the four architects together with four architecture critics.

Called "Critics and Cranes—Building Downtown Los Angeles," the symposium was moderated by Suzanne Stephens, writer and teacher, and by Barbara Goldstein, former editor of *LA Architect*, who co-ordinated the event.

The four critics were Robert Campbell, Diana Ketchum, John Pastier and Michael Sorkin. The buildings were First Interstate Tower by I.M. Pei (now Pei Cobb Freed), the tallest tower west of Chicago, with Henry N. Cobb as partner in charge; Southern California Gas Tower by Richard Keating of Skidmore, Owings & Merrill; an extension to Bertram Goodhue's landmark Public Library by Norman Pfeiffer of Hardy Holzman Pfeiffer; and Biltmore Tower by the Landau Partnership. Only the Biltmore Tower is built; the others are in various stages of construction.

After two helpful introductions—one by Suzanne Stephens, on the history of American architectural criticism, and another by Barton Phelps, on Los Angeles and its history—the four architects presented their work by means of slides and models, and then the critics talked. (Actually no one showed up from the Pei office, its building being presented by a city planner and an engineer. Everyone wondered, but no one knew, whether the absence should be interpreted as a deliberate act of dissociation by the architect).

There not being real buildings to look at, the talk was mostly about issues. No one seemed troubled by the fact the four buildings ranged from picturesque eclecticism (Landau) through historicist contextualism (Pfeiffer) to a sort of geometrically ornamental modernism (Pei and Keating). But there was some concern about whether the buildings and their neighbors would ever add up to a coherent city, at skyline or sidewalk, and whether city planners had things under any sort of control.

There was much discussion, too, of the role of a critic. Sorkin posited that there are different "discourses" in today's criticism—formal, social, political, etc.—that have become largely irrelevant to one another, and he argued that the essential critical act today is choosing which of these autonomous frames of reference is the most significant one for the building being assessed. Later came a panel of both architects and critics, proving that the farmer and the cowboy can be friends. No conclusions were reached, but the day ended with a sense that much had been thought and talked about. —ROBERT CAMPBELL, AIA

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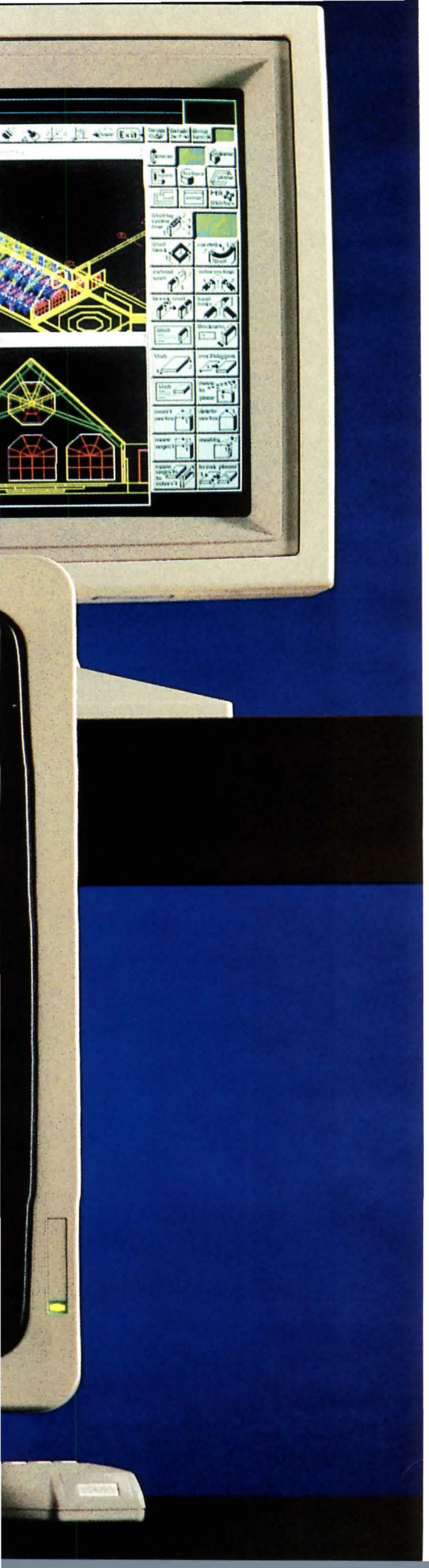

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ModelView image of the Pacific First Center, Seattle, designed by *The Callison Partnership, Ltd., Seattle* and San Diego.

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Government

Legislation Proposes More Stringent Accessibility

Far-reaching changes to building access and use requirements, intended to improve accommodations for disabled people, were recently approved by the Senate as part of a bill that bars discrimination against the handicapped.

Under the legislation proposed by Sen. Tom Harkin (D-Iowa) and titled "The Americans with Disabilities Act," all new and significantly altered public and commercial facilities must meet more stringent requirements for accessibility. The act is expected to have a major effect on architects' designs for new and retrofit projects.

The bill is designed to broaden the antidiscrimination efforts initiated in a 1973 law that currently applies only to the federal government and its contractors. This new measure would apply to virtually all private businesses.

The AIA supports the concept in theory, but has some concerns about wording in the bill. "This type of measure is long overdue, but now the question becomes, is it workable," said AIA president Benjamin E. Brewer, FAIA, when industry leaders met recently with President Bush.

AIA wants clear and reasonably achievable legislation, but, Brewer said, "at the moment, several important terms are ill-defined or undefined, there are few guidelines for compliance, and the bill could create problems for projects whose designs are already underway."

In its present form, new buildings and facilities such as restaurants, shops, offices, theaters, and recreation areas would be required to comply if occupied 30 months or less after the bill is passed by Congress. In light of the two to three years it often takes for work on the boards to be completed, AIA is concerned that projects already designed might have to be substantially redesigned. Alteration projects must comply if they are occupied within one year after enactment.

Appearing before the House Subcommittee on Transportation and Hazardous Materials, architect Scott Fazekas testified for AIA, suggesting that the effective dates in the legislation be retained but that they apply only to projects designed after the act is passed. As small business owners, many architects will be forced to comply if they build or renovate their own buildings. In addition, architects could be faced with a substantial increase in professional liability insurance.

Fazekas asked that the bill be amended to require administration by local building officials, and that they be given certification authority to prevent discrimination suits against architects.

Although the legislation is not precise in many areas—such as defining "major alterations"—changes likely to be required of most projects include access ramps, extra-wide doorways, and modified restrooms. Much more explicit is the mandate for elevators in buildings taller than two stories.

The proposed legislation provides exemptions if, for example, structural changes are impractical or would create a major hardship for a business. But AIA questions how these exemptions will be interpreted. AIA also points out that the word "structural" is used inconsistently, not always referring to actual building structural systems.

Hearings on the bill are currently being held by commmittees in the House of Representatives. The AIA anticipates that the legislation will be approved, but, as Brewer said, it wants the bill done right the first time. — ELENA MARCHESO MORENO

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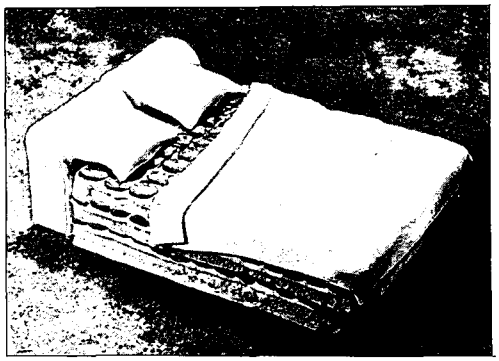
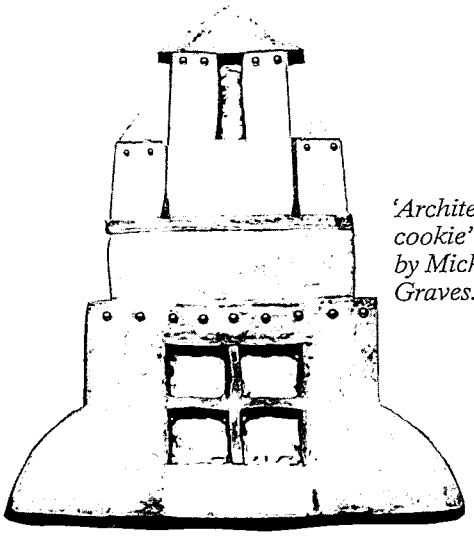
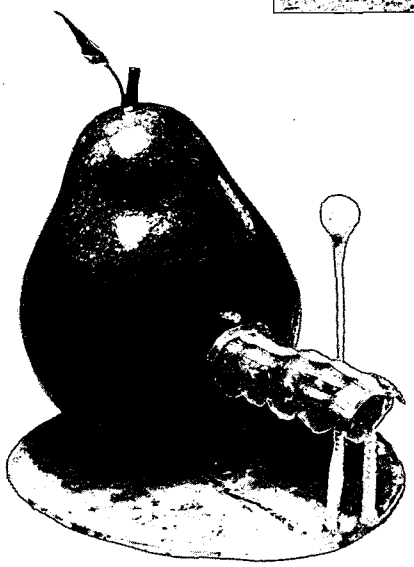


'Strawberry bed' by Gaetano Pease.

Photographs © Dennis Gottlieb



'Architectural cookie' by Michael Graves.



Milton Glaser's 'pear building'.

Exhibitions

Designs Good Enough to Eat

Fifty prominent architects and designers have created a delectible collection of baked and confectionery delights for the exhibition "Edible Architecture—Delicious Designs." A panel of "culinary experts" determined whether the schemes should be three-dimensional cakes or sculptural compositions, two-dimensional reliefs, or ornamental cookies. Final edible works were produced by a group of specialty bakers.

On view November 14 through December 12 at the Steelcase Design Parnership's decorative arts center in New York City, the exhibition was organized to raise money for DIFFA, the Design Industries Foundation for AIDS. At the conclusion of the exhibition, the drawings, models, and edible compositions will be auctioned at Sotheby's. Bloomingdale's will market a collection of the "architectural designer cookies" throughout the holiday season with proceeds going to DIFFA.

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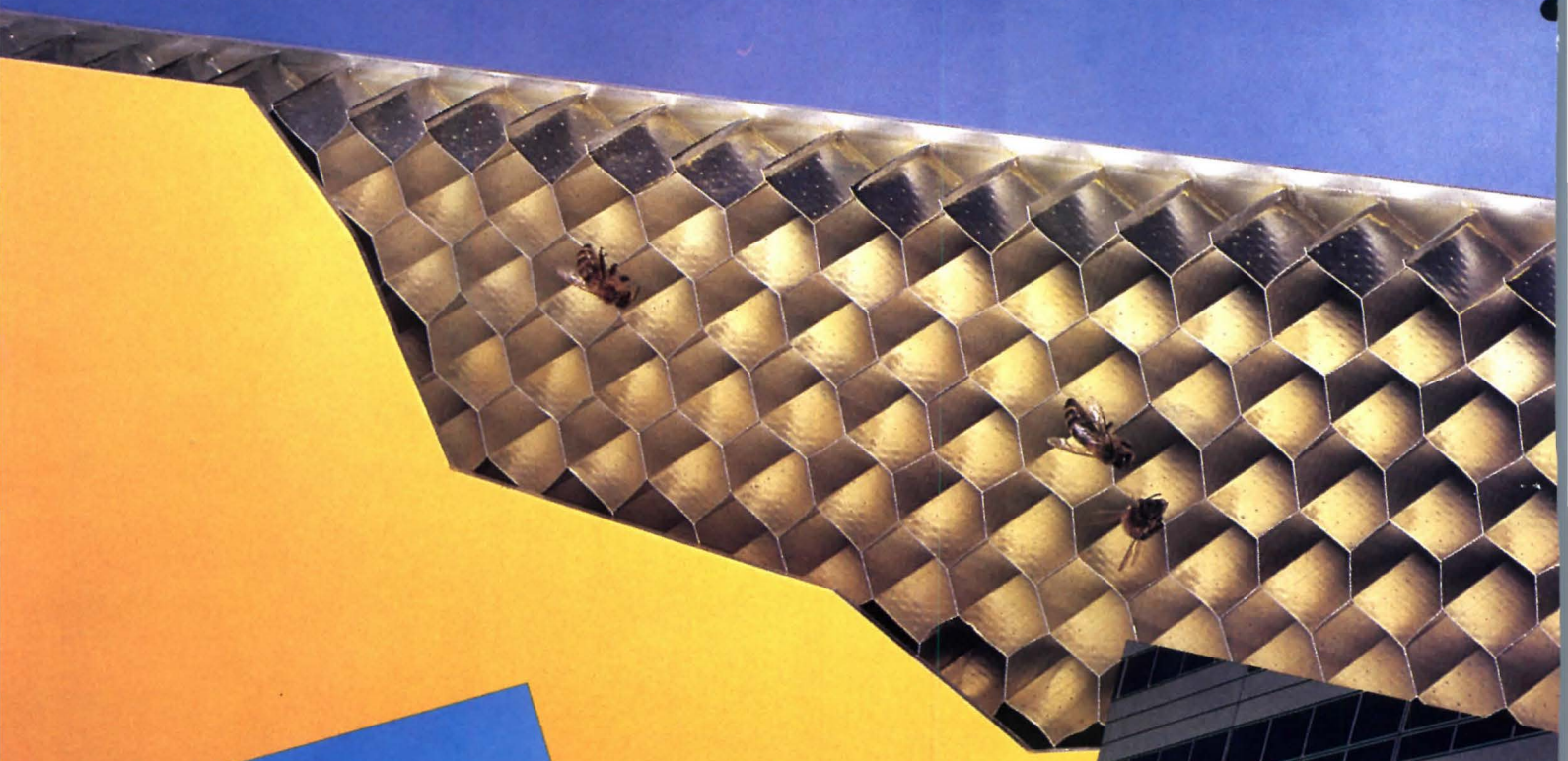
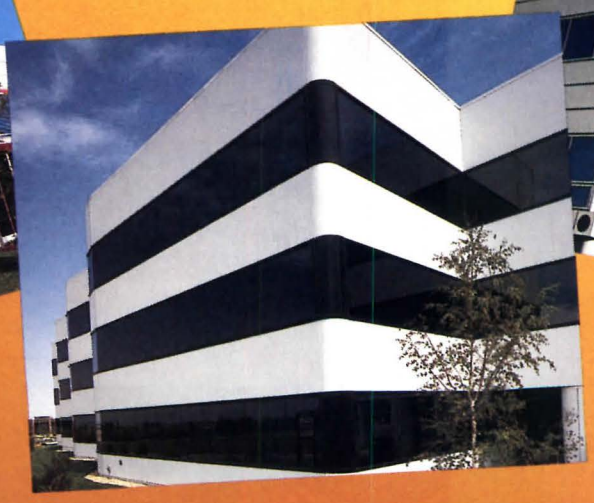
We borrowed one o
from some very





NEW LEADERSHIP AT ARCHITECTURE

Deborah Dietsch, the new Editor-in-Chief of ARCHITECTURE

Last March, as most of our readers know, BPI Communications, Inc., a wholly owned subsidiary of Affiliated Publications, publishers of the Boston *Globe*, acquired the publishing rights to ARCHITECTURE magazine.

After 15 years as Editor-in-Chief, Donald Canty stepped down in August 1989. We wish to take this opportunity to acknowledge his many contributions to the magazine. He is succeeded by Deborah Dietsch, who becomes the magazine's Editor-in-Chief on November 1. Dietsch, who received her undergraduate degree in architecture from the University of East Anglia in Great Britain, has two Masters degrees, in architecture and in historic preservation, from Columbia University, and comes to ARCHITECTURE magazine from *Architectural Record*, where she has served for the last four years, most recently as Executive Editor. She is a well-respected journalist who will have full responsibility for the magazine and its staff.

To further strengthen the company's editorial management, Beverly Russell has been appointed Editorial Director of ARCHITECTURE magazine. A well-known author, lecturer, and journalist in the design field, Russell's most recent honor is a citation from the American Academy in Rome for initiating the current restoration of the Villa Aurelia on the Academy's campus.

BPI is committed to continuing the quality and integrity of ARCHITECTURE magazine under its new leadership. We look forward to a new decade of progress in providing our 67,000 subscribers with the finest publication in the profession.

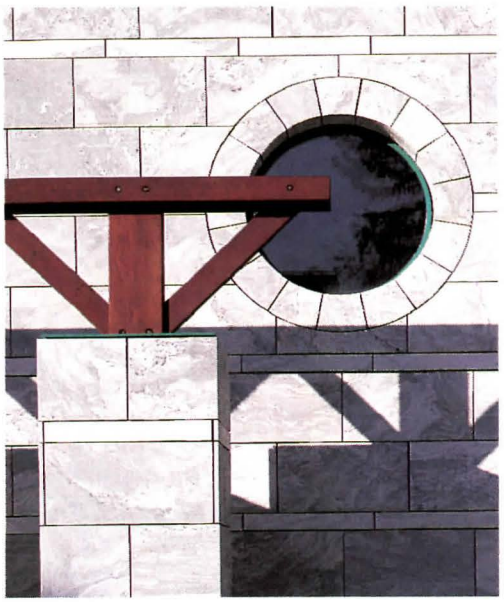
Paul Curran, Senior Vice President
BPI Communications, Inc.

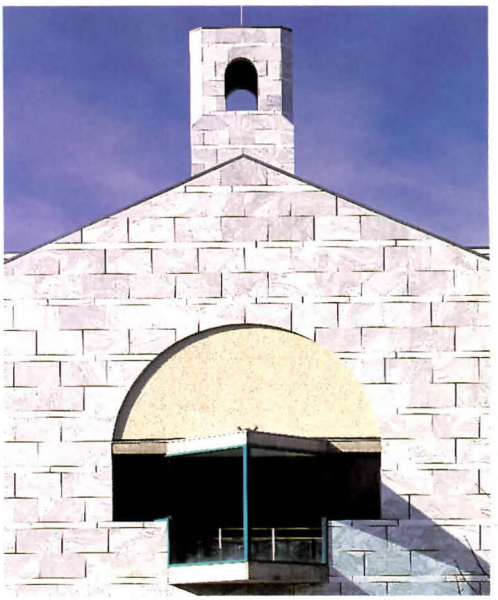
Where Campus Touches Town

Cornell's Performing Arts Center,

James Stirling Michael Wilford & Associates.

By Andrea Oppenheimer Dean





Photographs © Richard Bryant

The Performing Arts Center at Cornell University is James Stirling Michael Wilford & Associates' largest American building to date. Like their two other U.S. buildings—the architecture school at Rice University and the Sackler addition to the Fogg Museum in Cambridge, Mass.—Stirling and Wilford's building in Ithaca, N.Y., is first of all a skillful act of urban design, composed of abstracted historical and industrial images. Conceived as a center for teaching theater and staging performances for the university, city, and region, the Performing Arts Center was prominently sited as a focal point linking gown and town, the campus and Collegetown—a student residential and Main Street-type neighborhood.

Cornell University was founded some 120 years ago as a single building in a muddy field that had little going for it except phenomenal views of deep gorges, waterfalls, pastoral woods, and streams. Stirling and Wilford's new building benefits from a similar drama. Its long side elevation edges and gives spectacular views of the plunging Cascadilla gorge. Too, the building becomes the focus of views from the campus. "I wanted to give the impression of a building looking back at the campus, pretending to gaze," says Stirling. From Cornell's eclectic quads the center appears below as a fresh, bright beacon amid darkish prewar buildings on College Avenue. It brings to mind Le Corbusier's mention of a time "when the cathedrals were white."

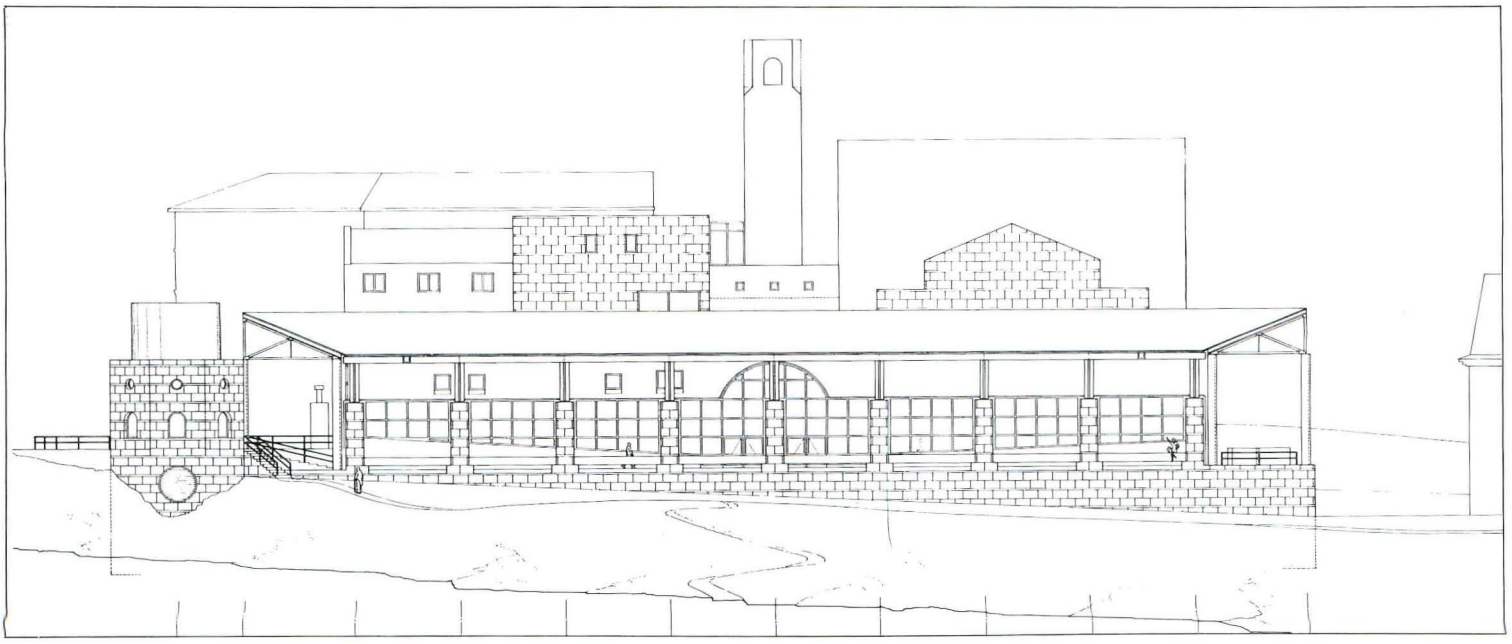
While the oblong building's more formal north elevation parallels the gorge with a colonnaded loggia, its asymmetrical, narrow street facade along College Avenue has become Collegetown's new focus. It is composed of a group of diverse Italianate elements, sheathed in open-jointed white and gray Vermont marble that shows its thinness, and is bound together by the loggia that serves as the building's entry.

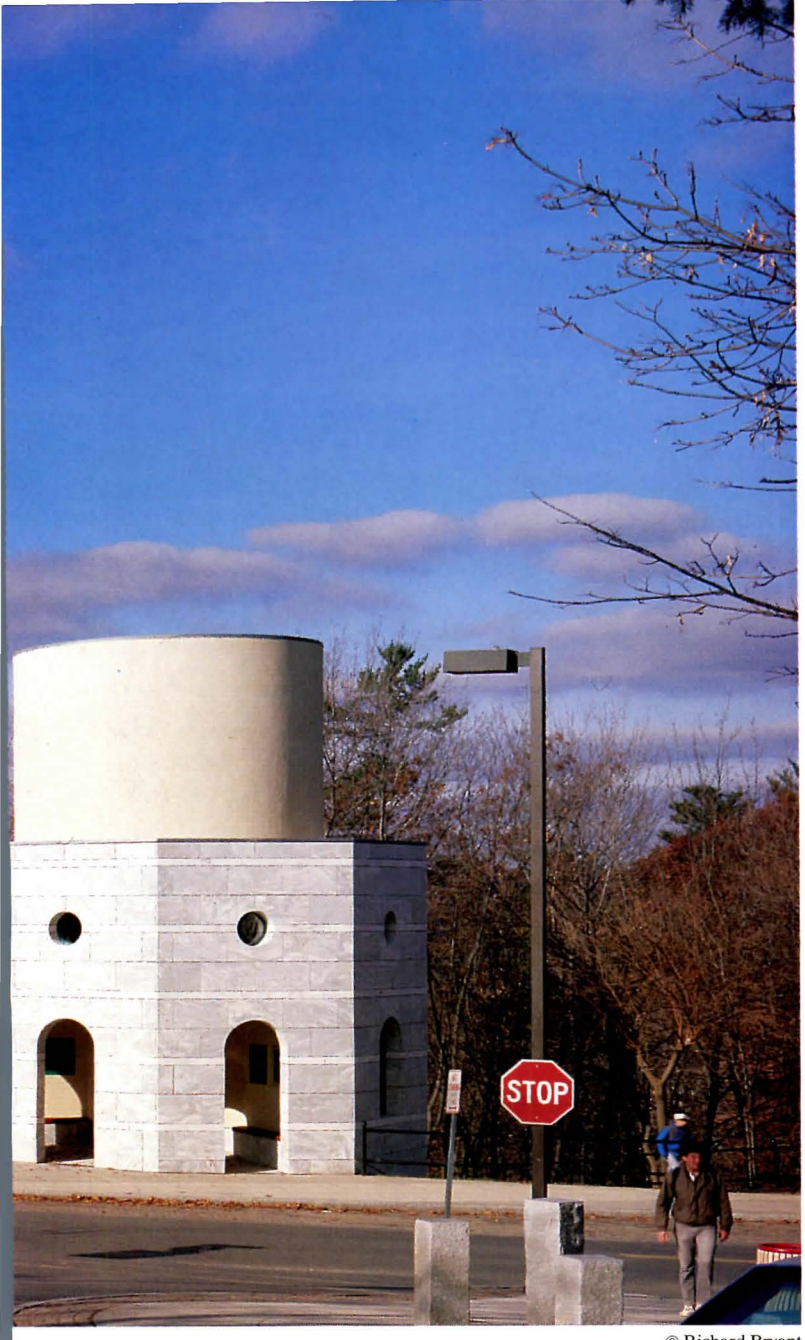
In front of the building's main elevation on College Avenue, basilica-like in character, is a decorative pergola and a nondescript plaza. Stirling hopes the latter will be adapted for outdoor performances; if not, it threatens to be a throwaway. A tower-cum-campanile pokes upward as an extension of the elevator core and an echo for the campus's numerous towers.

Opening the otherwise closed main facade is a protruding triangular window at second-story level. Its green metal borders frame dancers practicing at the barre; the window is, in effect, a big peephole (or a small stage). It adds life. To the building's north, on the other side of the loggia, is an octagonal pavilion that serves as campus information center and bus shelter; its upper story has offices for guest artists.

Facing page, looking down from the campus onto the center, with its Italianate elements piled up as in a hilltown. Above, details show the dance studio's protruding window overlooking the street.


KEEP
RIGHT
STOP





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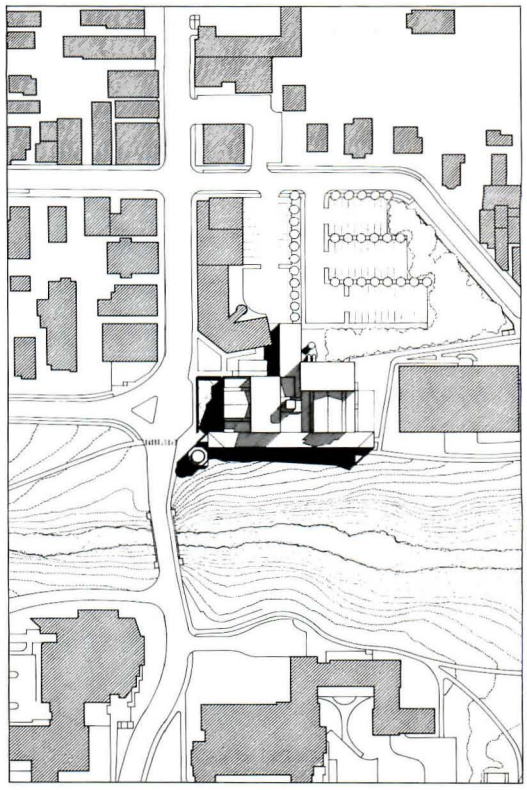
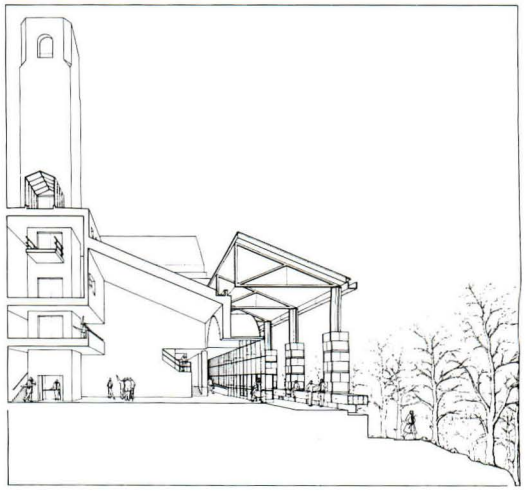




Sited as the focus of Collegtown and its link to the campus, the basillica-like street elevation, with its octagonal bus shelter and colonnaded loggia, usually forms the backdrop for bustling activity. To the right in the photograph is the Cascadilla Gorge and Cornell's wooded campus.

The main reason for the Italian hilltown image, Wilford explained, is to break down the building's mass—a good idea for a 113,000-square-foot building. But attempts to reduce the mass work at least as well on the the building's long side elevation, whose colonnade, topped by a variety of geometric forms, is interrupted about two-thirds way up by painted green metal elements. Unlike the narrow street facade, the side elevation owes more to Viennese than Italian antecedents.

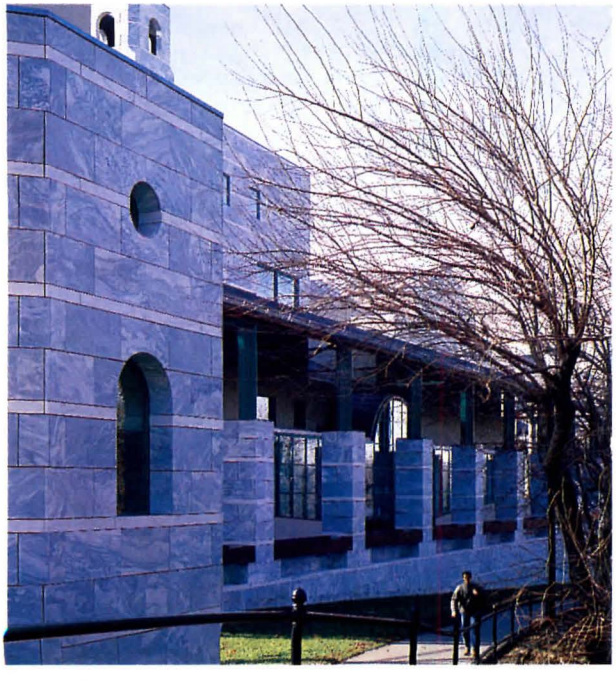
In any case, it isn't the mixed metaphorical origins of the building but its thinness that disturbs. From some angles on College Avenue it begins to look like a paper cutout. A tight budget—$16.8 million, or $148 a square foot—may have been partially at fault. However, like Stirling and Wilford's other two American buildings, the Performing Arts Center generally lacks the surefooted flair and verve of their museum in Stuttgart or of the interior of their addition to the Tate Gallery in London. In comparison, the Performing Arts Center is oddly stiff; it is not a building that moves you.

It does, however, celebrate movement. The building's dominant element, the loggia edging the gorge, serves as a pathway through the site, as a veranda-like overhang, and as a connector to the central, three-story entry foyer that links the building's major spaces. An uninspired modern box with a little neon trim, the foyer is a disappointment—a way station between circulation spaces and theaters. The Performing Arts Center is, in fact, composed mainly of circulation spaces with smashing views on the one hand and functional performance and study spaces on the other. There is no single splendid space; the view's the thing, as is the play, of course.

Opening from the central foyer is, first, an elegant 456-seat proscenium theater, with painted plaster finishes and oak paneling. It is shaped as a horseshoe and has seating on two levels that wraps the room to bring audience and performers together. Also off the foyer is a flexible theater with wood paneled walls, sprung wood floors, and suspended steel-pipe lighting grids. It allows arena, thrust, alley, or proscenium seating. A dance performance studio is beneath the proscenium theater, while a laboratory/black box studio, seating up to 100 people, is below the flexible theater. There is also a film theater with raked seating for 100 under the entry foyer. Additional studios and classrooms are in the block housing the flexible theater.

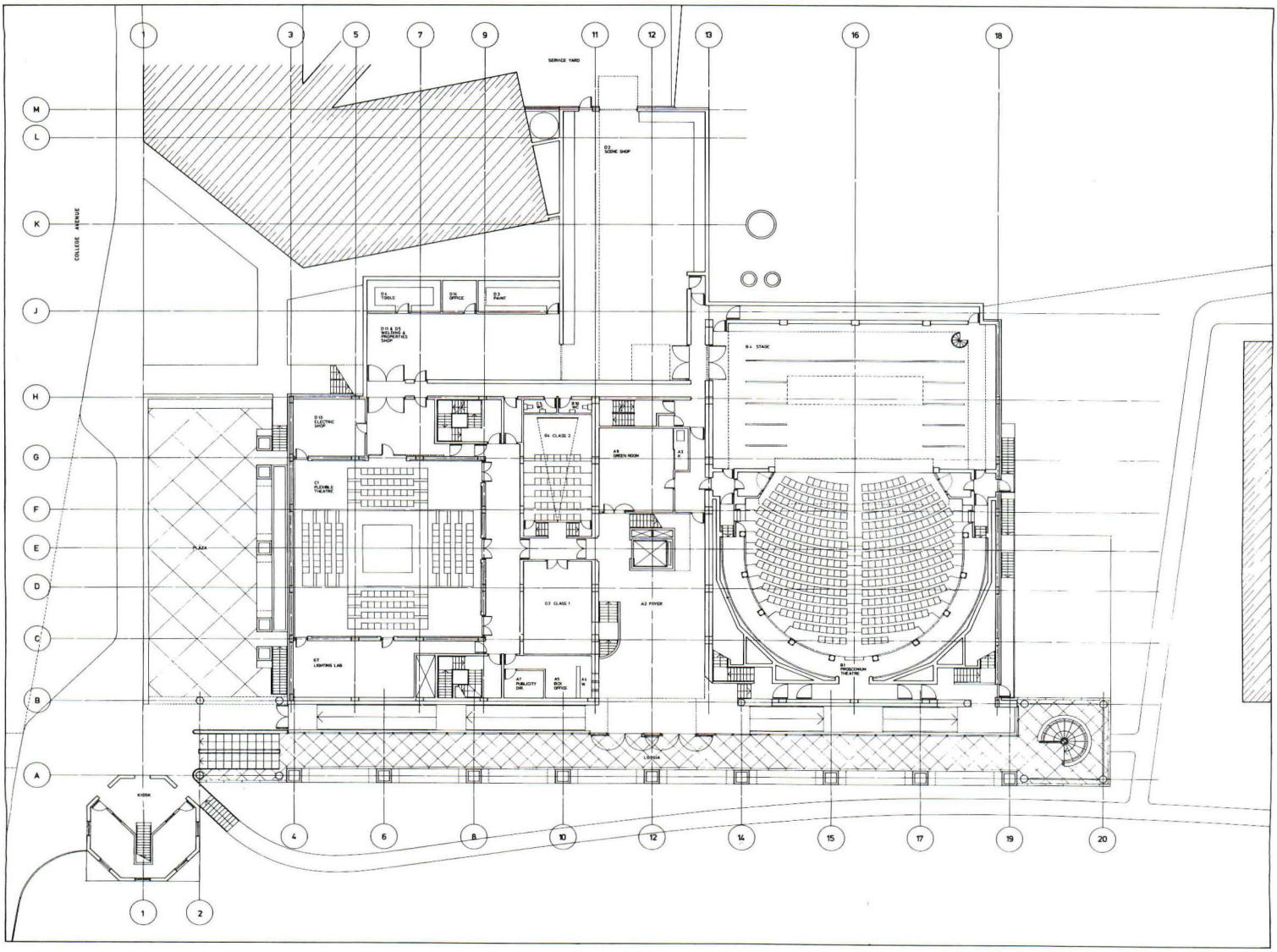
All of the spaces, inside and out, are both serviceable and pleasant. But one wonders, what happens to Britishers Stirling and Wilford when working in America to make their buildings much less controversial, captivating, and ultimately significant than when they are closer to home?

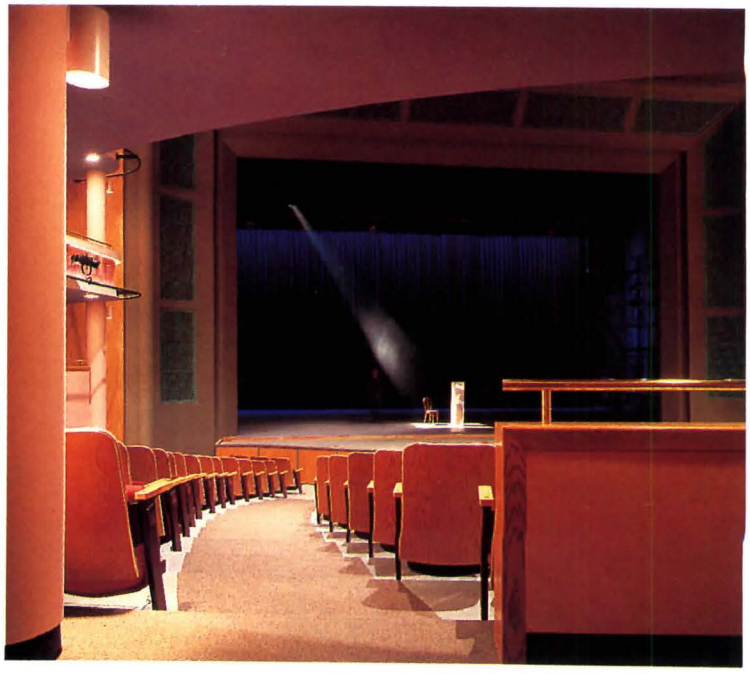
Photographs © Richard Bryant



Above, a view through the loggia to a campus building. Left and right, opposite views of the loggia.

Below left, the dance studio whose window with barre provides a public stage for dancers, spontaneous theater for passersby. Below right, view toward the stage of horseshoe-shaped proscenium theater with fixed, main floor seating in parallel aisles.





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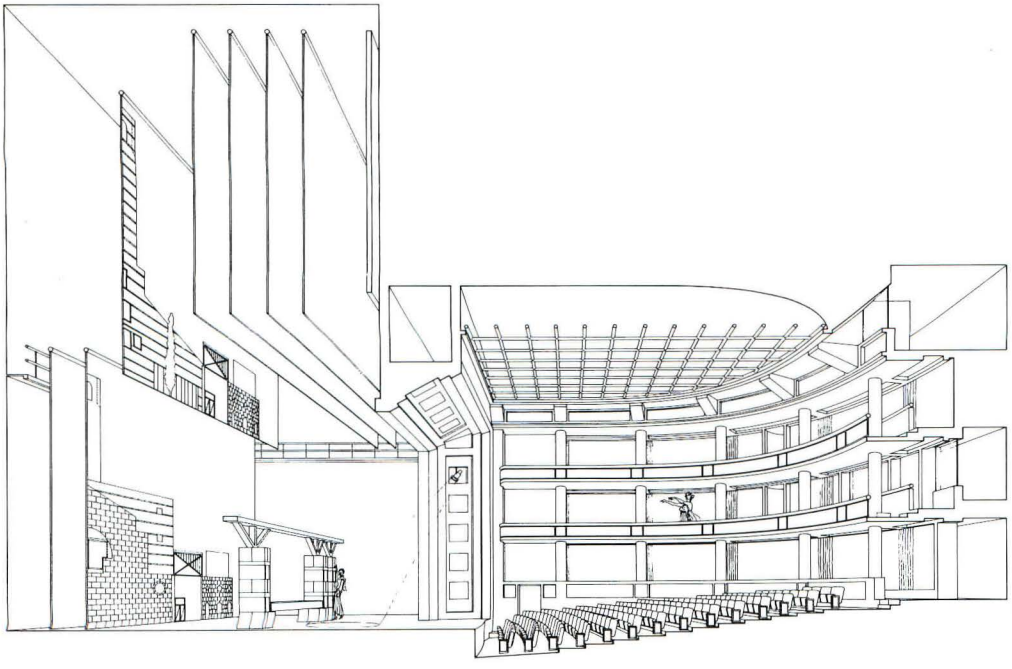

Left, proscenium theater has two balcony levels encircling the theater; atop the second is a technical ledge with a follow-spot room. Above, foyer, whose glazed wall overlooking the gorge has a light crown of neon. Right, plaza, which Stirling hopes will be adapted for outdoor performances. □


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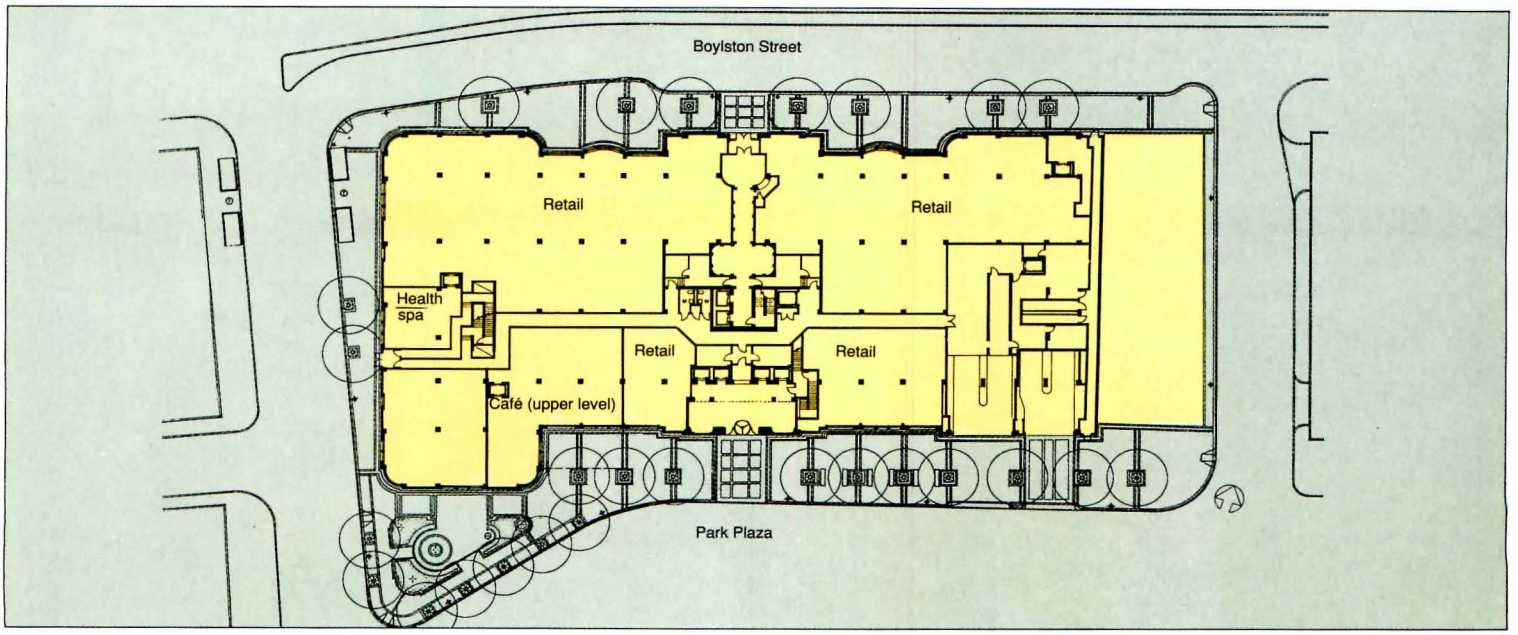
An Urban Prototype

Heritage on the Garden,

TAC's mixed-use complex in Boston.

By Robert Campbell, AIA



The Heritage on the Garden, as much as any building, represents the 1980s in Boston. It is a kind of model urban building type for our time.

Scrupulously, it incorporates the beliefs of practically all the major postmodern urban theorists, from Jane Jacobs to Leon Krier. Consider:

- It is mixed-use, with dwellings on top, offices in the middle, retail at the bottom, and parking underground. It is thus active, in principle, around the clock. The difference in uses makes for variety in architectural expression.
- It is alive to the street, opening itself with pride and trust, as should any true urban building, to the city around it. Windows and doors along the sidewalks invite the passer-by into its shops and restaurants.
- It is low-rise, at least relatively speaking.
- It is a space-shaping, rather than a space-occupying, building, offering a firm wall to enclose the street spaces and park space around it.
- It is contextual, made of red brick with trim that is ostensibly limestone, although most of it is actually precast. These materials symbolize, at least, the notion of old-time craftsmanship. They provide a vaguely Bostonian, vaguely Harvard look. Flattened bowfront shapes in the facade hint at the bolder bays of Beacon Hill and the South End. Like the shopfronts, these bow windows invite you to imagine yourself inside the building, perhaps as the wealthy owner of a posh condo. There's contextualism even in the building's name. "Garden" refers to the lovely Public Garden across the street, and "Heritage" is surely intended to suggest anything and everything that isn't Los Angeles.

Last on this litany of postmodern urban-design precepts, and probably most important, is the fact that the Heritage is the product not of any one designer's brainwave but of a long, slow, agonizing political process that involved many constituencies and took more than a decade to reach fruition.

The Heritage was developed by Ronald Druker of the Druker Company in Boston and designed by The Architects Collaborative (Howard Elkus, principal-in-charge, has since left TAC to form the firm of Elkus-Manfredi). It consists of 85 condominiums, 118,000 square feet of offices, 40,000 square feet of retail, and 175 parking spaces.

For Druker, Heritage was a labor of love. He toured Europe making snapshots of architectural details—light fixtures, doorknobs, storefronts. Working, as he was, at the very height of the Boston boom of the mid-'80s, he was able to afford the best. Some of the condos are hedonistic dreams. One, at the eighth-floor corner, boasts a 30x40-foot front terrace overlooking the Public Garden to the north, a 20x30-foot terrace overlooking Park Square to the south, and a 90-foot-long interior.

Those huge terraces are not merely the whim of the developer. They're also the result of massive setbacks that were mandated by design guidelines for this site. The city created the guidelines after local citizens succeeded, in the early 1970s, in shooting down an earlier proposal by another developer to erect six 40-story towers here. The guidelines required mixed use, they restricted heights, and they stated that the building "should respect the masonry and brick character of the Back Bay and Bay Village." The Heritage, thus, is really a collaboration among its nominal architects and the citizenry of Boston.

As if those constraints weren't enough, the Heritage was also required to contribute about $1 million in linkage fees, to be used for affordable housing, and to pony up $75,000 annually for maintenance of the Public Garden.

The facade of the Heritage, with its many bumps and sizes and shapes of windows, is perhaps a little busy. And there's perhaps a tameness, a lack of daring, in the neo-Georgian expression. But the Heritage remains one of the best recent buildings in Boston. It is a strong argument for a democratic process in urban design. □

Facing page, two views of Heritage on the Garden—with its three stubby towers—as it faces the Public Garden.


THE HERITAGE

Quiet Places Sewn into the City

Two residential complexes in New Haven, Herbert S. Newman, FAIA.

By Michael J. Crosbie

New Haven architect Herbert S. Newman, FAIA, has reconstituted two urban typologies—one common to most cities, the other special to the Elm City—upon which two new downtown residential developments rest. Following the lead of Jane Jacobs, maintaining an active commercial street life has been a staple of good urban design for the past three decades. In New Haven, the pervasive Yale campus (which occupies 40 percent of New Haven's downtown) is dotted with courtyards large and small that offer respite from the noise and disruption of city streets clogged with cars.

In the Whitney Grove and Audubon Court projects, Newman uses street life and courtyards to provide a taste of urbanity with an antidote to cacophony. In Whitney Grove, Newman pays close attention to the vernacular language of 19th-century row houses on Temple Street in his design of new townhouses that use sidewalks, fences, small gardens, front steps, recessed front doors, and bay windows. The 37-unit development is raised above an underground parking garage that delivers residents from their cars via elevators and stairways up to street level and their front doors.

The three-story townhouses that line Temple Street back up to another row of units, between which is a mews with narrow passageways, lattice enclosures, gates, and private decks. The second row of units is accessible from Temple Court, a private courtyard defined by more townhouses to the east and south. These four-story units offer English-style flats at grade level with three-story townhouses above. At the center of Temple Court is a circular drive intended for occasional, short-term use by residents, visitors, and delivery vehicles, although the courtyard was usually lined with cars during my visits to the project.

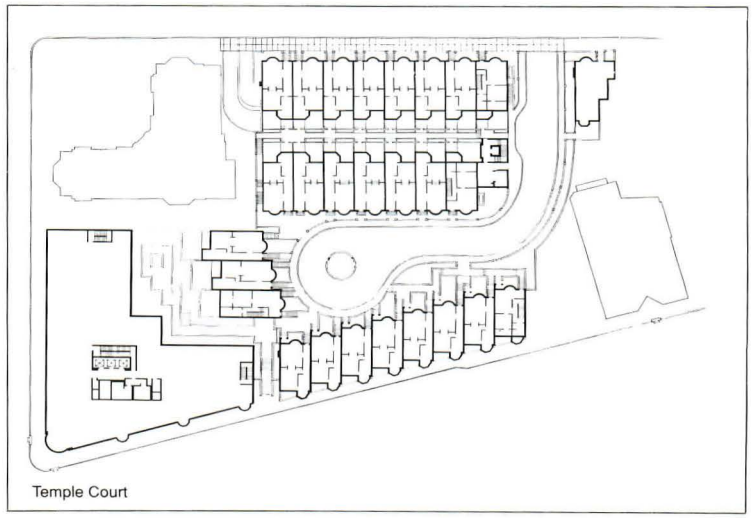
As the project faces Whitney Avenue (a commercial street that runs parallel to Temple a block away) the townhouses march along at second-story height, while retail shops occupy the street level. The townhouses are angled to the grid of New Haven's famous 17th-century nine-square plan, while the Whitney Avenue shops align themselves with the street edge, following a more recent geometry.

Across Whitney is Audubon Court which, at 65 units, packs more housing onto the site but feels far less dense than the Whitney Grove development. The Audubon units are smaller, as is the courtyard onto which all the units face, but there is no vehicular access to the center of Audubon Court, making it a better solution than Whitney Grove to the problem of cars and pedestrians.

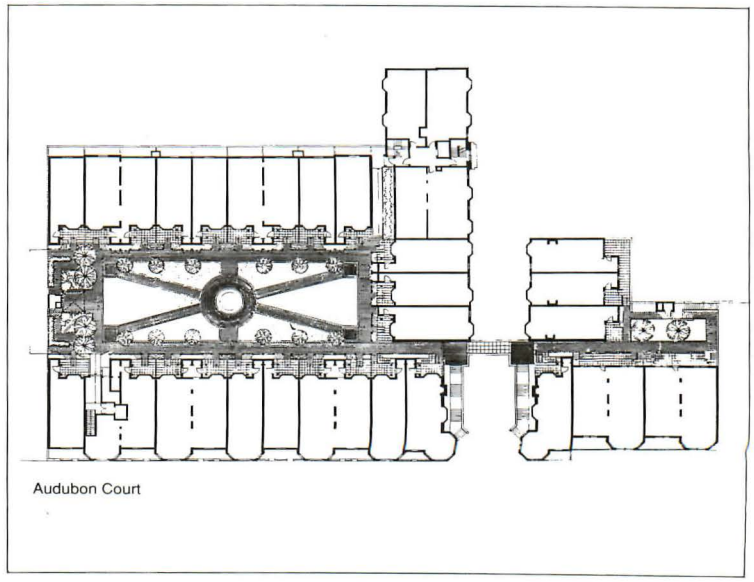
Audubon Court is actually a housing development built entirely atop a one-story parking garage. After parking, residents can take elevators or stairways that deliver them to the corners of the courtyard. The courtyard is sensitively scaled, as are the housing units that define it, taking the form of English basement flats with two-story units above. One story down from the courtyard, at street level, is a row of retail shops and artist studios that serve the arts community in this part of New Haven. Like Whitney Grove, it is an artful blend of street life and residential enclave—a veritable urban oasis. □

Above and far right, courtyard and street elevation of Temple Court. Right, peripheral and interior views of Audubon Court.

Photographs © Steve Rosenthal



Temple Court



Audubon Court

Lively Definition

Steven Ehrlich's three buildings on a circle in Venice, Calif.

By Lynn Nesmith

© Tom Bonner

Utopian communities never seem to turn out the way they are planned. And Venice in California is no exception.

Its founder Abbot Kinney, an Easterner who had emigrated to Los Angeles in the latter part of the 19th century, was a romantic dreamer who envisioned an idyllic beachfront city on the shores of the Pacific. With a fortune he had amassed manufacturing cigarettes, Kinney set out to build a fantastic conurbation out of worthless salt marshes, a city that would embody America's cultural awakening. Architects Norman Marsh and C.H. Russell developed a town plan inspired by the 1893 Columbian Exposition, as well as its namesake in Italy. Major entertainment facilities fronted the ocean, hotels and shops lined Windward Avenue, and houses bordered canals that radiated from Venice Lagoon, now Windward Circle.

Opening with fanfare on July 4, 1905, Venice immediately captured the imagination of the public, who proved more impressed with the amusement park with its sideshow attractions, the dance hall, and the beach, than with Kinney's more refined diversions, such as an opera house, art museum, and theater.

Venice's heyday lasted little more than a decade. But in its decline precipitated by fires, Kinney's death, Prohibition, the Depression, the paving over of the canals, and the razing of the pier in 1946, Venice maintained an almost mythical resiliency and continued to attract the adventurous—beatniks in the '50s and hippies in the '60s. The '70s brought Frank Gehry and other designers, including Steven Erhlich, AIA, who established an office in '78, and soon designed a number of buildings amid Venice's eclectic urban fabric.

Erhlich recently completed three buildings on Windward Circle, the traffic round-about that replaced the Grand Lagoon at the convergence of the network of canals.

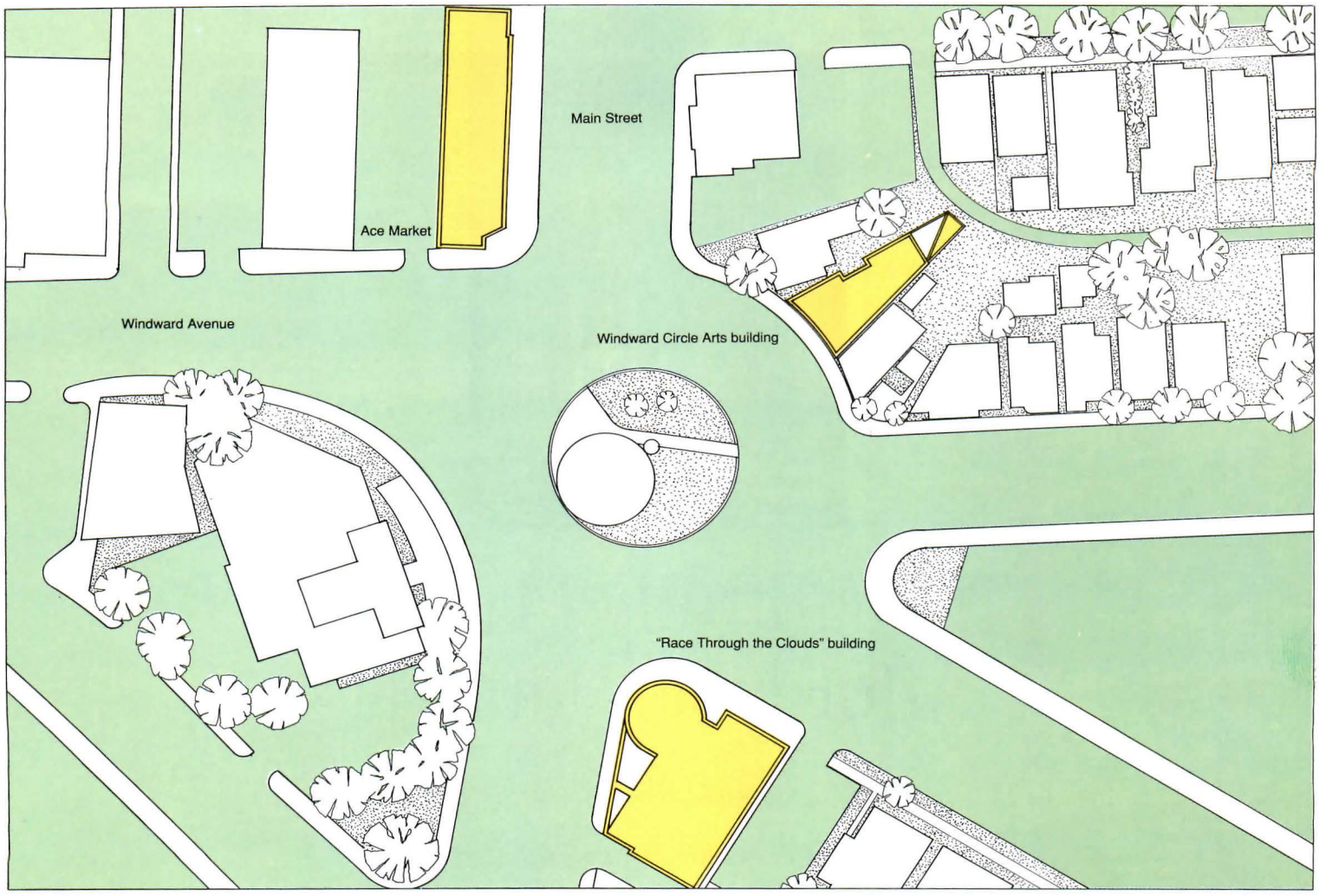
Given the opportunity to reshape the original heart of Venice lost years ago, Ehrlich says he attempted to capture the energy of the past without using cartooned historical quotes. Each of his buildings echos elements of its predecessor on the site.

The first of the trio, the Windward Circle Arts Building, was designed as a three-unit studio and apartment complex but has since been converted into a single residence. Located on a wedge-shaped site, the house fronts the circle with a slightly bowed facade defined by a geometrical pattern of recessed windows and balconies. Three pyramidal "hats" crown the roof.

The second is a retail and office building on the southeastern rim of the circle, called the "Race Through the Clouds." It got its name and imagery from the original giant roller coaster on the site. To recall it, Ehrlich floated bright blue bands of neon along a galvanized steel "track" around the 9,000-square-foot building. The exterior is a raw concrete stucco finish with expansive square windows along the facade rounding the circle and a series of recessed balconies on the second level. The main stairway, open to the street, is screened behind a metal latticework grill. Concrete filled culvert pipes allude to the historic colonades while partially disguising the ground floor parking area.

The most recently completed building is Ace Market Place, a three-story retail center. Ground floor shops open to the sidewalk on Main Street, and two open air stairways draw people to the upper level retail spaces. The main entrance is marked by a large sculptural element with angular metal arms that allude to the steam shovels that once dredged the canals.

Throughout its checkered history, Venice has thrived on this juxtaposition of bizarre personalities, the downtrodden, and the chic. Ehrlich has chosen a vocabulary that seems appropriate for this chaotic mix that keeps Venice alluring. □



© Christopher Dow

Lawrence Manning

Facing page, Windward Circle looking north up Main Street from atop the 'Race Through the Clouds' building. The Ace Market Place (upper left in photo) has a clipped corner with constructivist steel 'marquee' as the building turns the circle. Above right, Windward Circle Arts building with its culvert pipe columns, is a reference to the city's original colonnades. Above, 'Race Through the Clouds' uses the geometrical forms of the circle and square in plan and detailing. Ehrlich's own office is in the second floor loft space visible through the large square window.

Allen Freeman

Thoughtfully Planned Affordable Housing

In Princeton, N.J., Geddes Brecher Qualls Cunningham.

By M. Stephanie Stubbs and Douglas E. Gordon

On a 26-acre construction site a few miles from the stately tree-lined streets of Princeton University, there stands a promise of well-planned residential community and the fulfillment of a social ideal: a promise soon to be delivered in the form of affordable housing. In a tangle of pathways waiting for paving and turned earth ready for planting, the orderly blocks of homes in the last stages of completion seem to be looking forward to the residents who will create a living community.

The 280-unit project, named Griggs Farm, represents a landmark of social responsibility through the offering of half of its units at below market rates for low- and moderate-income buyers and renters. Although its site and its community block arrangement are new, Griggs Farm is comfortably familiar in its vernacular housing style.

Geddes Brecher Qualls Cunningham, the architecture firm for the project, is no stranger to community planning and social architecture. "Griggs Farm is a new social community that called for its equivalent in an architectural community," says design principal Robert Geddes, FAIA, "GBQC gave form and structure to a social idea.

"When we started, it was apparent that the community wanted a small neighborhood that had a wide range of income levels and a rather narrow range of housing types, but at least some variety in that there would be both apartments and houses. Our goal was also to make it profitable for people to enjoy meeting each other, to walk around, jog, or bicycle, and have face-to-face relations, even though it is not in a city.

"From the beginning, we had in mind increasing the face-to-face relationships of houses and front doors in small groups, which would be recognizable in their location. We also have a strong hierarchy of physical relationships, from front door to the group of houses (like a mews), to the central commons in which people will walk around. In Griggs Farm, it would be possible to actually know people in other houses and walk to see them. Our goal was to make the community physically readable, so that, in fact, there also would be a sense of the organization of the entire complex."

Geddes talks about the integration of the automobile into the community design. "We also accepted the automobile as a given and did not, as was done in Radburn, insist on an absolute separation. In fact, the automobile in the front of the house and the garden at the rear of the house, at the kitchen end, is very much an American vernacular. We didn't believe there is a problem in slow-moving automobile and pedestrian mix—the cars add to the sociability because there's a lot of activity of coming and going in cars and washing cars. We believed we had to slow the car down and include it in society."

Griggs Farm is a step and a half beyond the 20 percent affordable units in a development, known as the "builder's remedy" to comply with the New Jersey State Supreme Court's Mount Laurel decision. This 1975 order, which requires all of New Jersey's 567 community jurisdictions to provide low- and moderate-income housing, proved to be a touchstone for a group of dedicated people who were determined to carry on the spirit of the neighborhood legend and project's namesake, Burnett Griggs.

Griggs came to Princeton in 1909 to work as a house man for one of the university clubs, and in 1920 started the Griggs Imperial Restaurant. Griggs, a black man fully aware of the abominations of racial discrimination, opened his restaurant to all people and, history has it, was extremely proud of the success it brought to him and his adopted neighborhood.

By the 1940s, Griggs had made enough money from his restaurant to purchase the nearby parcel that now houses Griggs Farm. Griggs also is remembered in the community for his fight against discrimination during the 1950s, when the Princeton borough declared his neighborhood a blighted area in order to accommo-

date a surge of commercial development. His appeal to the State Supreme Court saved the neighborhood from demolition. Griggs deeded the property to his daughter in 1962, and she continued her father's generosity of spirit in 1988 by selling the property to Princeton Community Housing (PCH) because she shared their goals for the community.

PCH, the current owner of Griggs Farm, was established in 1967, long before the Mount Laurel decision was even a twinkle in the state legislators' eyes. The group was an amalgamation founded on social awareness, not the result of a legal mandate. PCH coordinates most of the educational, religious, and civic organizations in Princeton in their goal of building affordable housing for families and individuals of modest means. PCH built and operates two such projects, both of which consist entirely of rental units.

Griggs Farm is the first PCH project to offer units for sale as well as for rent. The intent is to foster interaction among neighbors.

The 50/50 mix of market-value to affordable houses was, in large part, a fiscal strategy by PCH to create affordable housing without burdening the tax base. An earlier moderate-income rental community PCH established, Princeton Community Village, was financed through a Section 236 mortgage reduction financing from the New Jersey Housing and Mortgage Finance Agency. This type of financing was popular in the mid-'70s, explains Marcy Crimmins, PCH executive director. Elm Court, a senior and handicapped housing development, is a 202, complete Section 8 HUD-financed project.

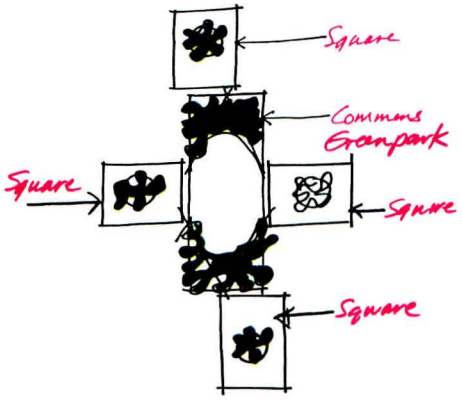
The 236 program no longer exists and the 202 program is drastically cut back, so the PCH approach to Griggs Farm is a way to creatively finance housing within the existing situation, Crimmins says. "PCH wants to meet the Mount Laurel needs without depending on tax dollars," she says. "If this kind of housing can be provided through either the public or the nonprofit sector (which I think is more likely) without creating a tax burden, it is likely to be better received in other communities."

Griggs Farm can offer reasonably priced market-value homes and subsidized housing partly because of its role as a nonprofit group and partly through two state grants, one for rental units and one for affordable for-sale units. "Through public money and private financing every community is mandated to provide a fair share of affordable housing according to the Mount Laurel decision," says William Dix, project manager for GBQC. "If Griggs Farm works well, and at this point there is every reason to believe it will, there will be a lot more of these kinds of communities, especially in New Jersey."

"The market units have to be priced high enough that there is sufficient profit to subsidize the affordable units," adds design principal M. Neville Epstein, AIA. "So if you went to an area where prices on houses were not very high, the profits might be so marginal they could subsidize only a few units, not the numbers we're talking about with Griggs Farm."

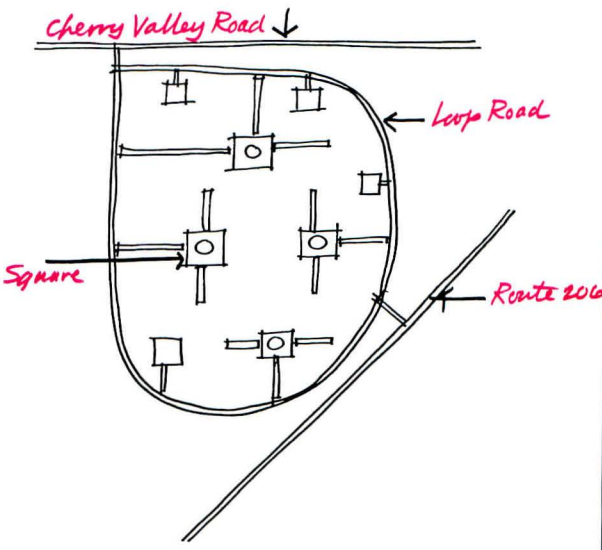
"About one out of 10 market-value purchasers have questions about subsidizing their neighbors' houses," Crimmins says. "We're maintaining a sense of one community under these circumstances by having everyone pay the same condominium fees, subsidized or not. We also hope we've avoided the renter/owner dichotomy by having the renters be members of the condo association, which is not the usual circumstance. In most condominium associations, for example, subletting renters have no vote. At Griggs Farm, they do."

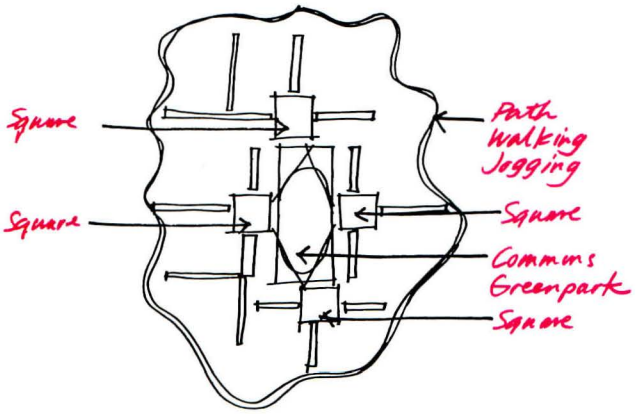
Of the 280 units (164 townhouses and 116 apartments) at Griggs Farm, 140 (all the apartments and 24 townhouses) are affordable. Of those, half (70 units) are for moderate-income people (below $33,350 for a family of four) and the other half are for low-income (below $20,850 for a family of four). In an effort to offer the most assistance to those living in the neighborhood, PCH may



Left, the commons, a green park defined by squares at its perimeter, is the focal point of the community.

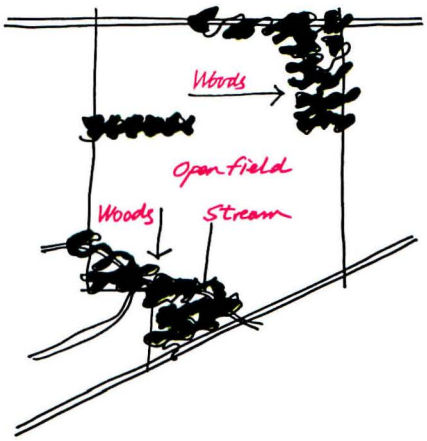
Right, perimeter loop road links to major roads and limits site traffic.





Left, a separate path system makes the entire community accessible to pedestrians.

Right, preserved woodlands and streams define the site's character.



reserve 50 percent of the 140 units for people who live or work in Princeton Township. Currently, 37 percent of the affordable buyers are single and 25 percent of the market-rate sales are to childless couples.

Being a good neighbor is part of the effort toward maintaining good will with the existing adjacent neighborhood. "You can never get enough of that," Crimmins says. Residents of the adjacent existing neighborhood had very immediate concerns, such as drainage and traffic during construction, she says. "We worked with those residents to alleviate the problems as quickly as possible."

One neighbor—a developer putting up $900,000 single-family houses on adjacent property—has been particularly helpful, Crimmins says. "This is the first time that PCH has built a project that was not funded by the government," she says. "It's the first time we've had to go out and sell 140 market units. Jim Unger, of Garden State Land Company, spent a lot of time in the beginning just talking to us about all the process that we would have to go through. His superintendent told us what to look for in a contractor. And his marketing man, who was terrific, helped us successfully redirect our sales effort."

Crimmins thinks that PCH made a good choice in hiring GBQC to design the project. "We had about 15 submissions, and interviewed seven firms. Bob Geddes believed in this project—he was filled with excitement for what he thought this community could be, and he convinced the board totally."

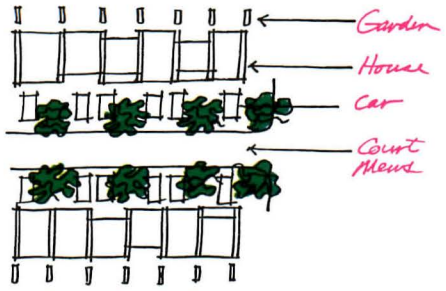
It is interesting to compare Geddes' concepts for the third plan of Philadelphia (see October 1988, page 74) with the planning of Grigg's farm. Although the scales of the two projects are different, both show a strong centralizing element, secondary centers, and a systemized series of linkages.

The site itself, largely flat and open, offered its own hints as to what the community should be. GBQC preserved borders of trees and wooded areas at the north and south property corners, and let a small brook continue its meandering on the southwest. Hedgerows left in place reveal the site's earlier life as a farm. Supplementing the natural landscaping is a generous variety of plantings (designed by landscape architect Louise Schiller), the most interesting of which may be in the center of the four courts, each presenting a different natural ecology.

The architects added a circumferential road just within the bounds of the site to reduce traffic flow through the development. Streets leading from this belt road into each of the neighborhood quadrants do not connect to each other, again to minimize the amount of traffic passing houses. (Codeworthy road underlayment covered by patches of stabilized turf connects the interior roadways, so emergency vehicles can have direct access to all parts of the site.) Resident parking spaces parallel to each unit and tucked-away lots work together to avoid lines of parked cars at curbside, a condition the architects thought would interfere with the sense of neighborhood. The larger units have additional concrete strips a wheel-base distance apart, thus using a minimal amount of paving to allow parking for a second car.

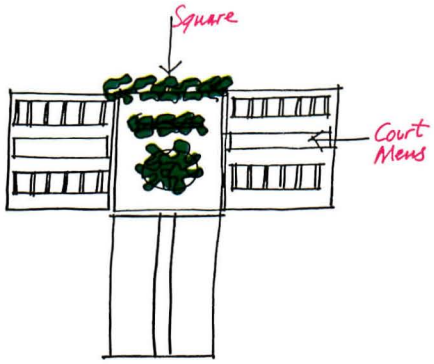
A system of pedestrian paths makes the area safe for the residents, who never have to cross a major road to reach playgrounds, tennis courts, and picnic sites in the preserved woodlands surrounding the community. "All the pieces of the plan work as a whole to the advantage of the residents," says Epstein. He envisions Griggs Farm as a wonderful place for kids to play and for neighbors to meet—at the community house for planned events, walking their dogs (pets are welcomed at Griggs Farm), or strolling around the grounds.

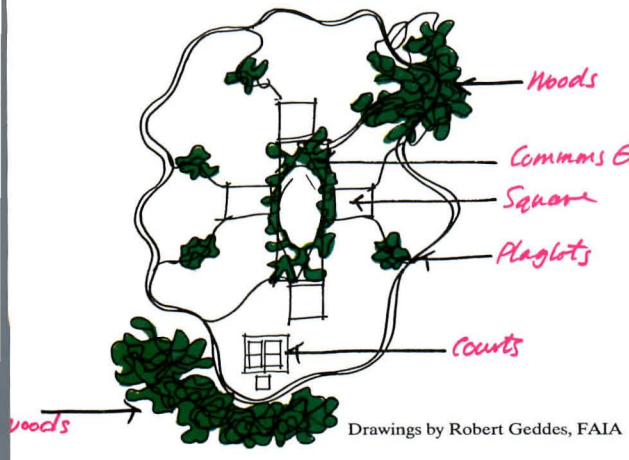
To create a neighborhood of identifiable space, the project makes use of what Geddes terms "defining elements": chimneys, low fences, and front porch pillars, all painted white. The soft blue and dove gray of the housing blocks foil the defining elements,



Left, the basic subgroup of the community design, the court, is created by two facing rows of houses.

Right, the landscaped island plus a grouping of courts forms a square.

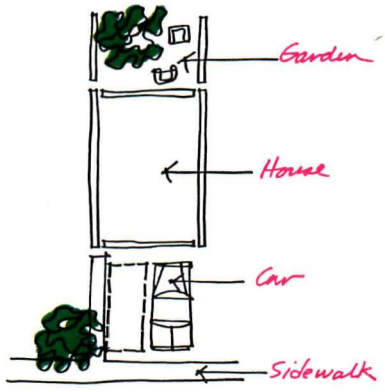




Drawings by Robert Geddes, FAIA

Left, the site offers tennis courts, tot lots, and picnic grounds along its system of paths.

Right, each 20-foot-wide house has a private back garden, an entry garden, parking, and a tree.



increasing their horizontal and vertical readability and presence. The housing is wood frame, standard construction. "We decided to build the buildings in vernacular architecture—there's nothing technically unusual about it," says David Nelson, project architect. "It's the way Levitt and others are building. But we did work hard on the proportions of the windows, the legibility of the windows and porches, the bay windows, the trim around the windows, and the very subtle shift of the two colors. It's both a vernacular building and one to which apparent care is given."

Dix points to a number of built-in energy-conserving features incorporated into the units, including R-19 wall insulation, heat pumps, Thermopane windows, and water-conserving toilets. "We were pleased that PCH accepted, in fact insisted on, these features for the sake of the residents," he says.

Inside, the generously but efficiently spaced units accent the living spaces with little extraneous circulation area. The extra width of the 20-foot-wide squared-off plans, as opposed to a typical row house footprint, add to the feeling of spatial freedom. Five of the ground floor units are wheelchair accessible, and the rest are handicapped adaptable.

The straightforward plans and simple finishes give a clean, open feeling to the units, perfect settings for the Scandinavian modern furnishings that grace one of the model townhouses. There's plenty of daylight throughout the space, even in the middle units. Although the affordable housing is basically identical to the market share housing, buyers have a number of options (for an additional price) including: greenhouse windows for the kitchens; upgraded cabinets, flooring, and carpeting; and self-cleaning ovens.

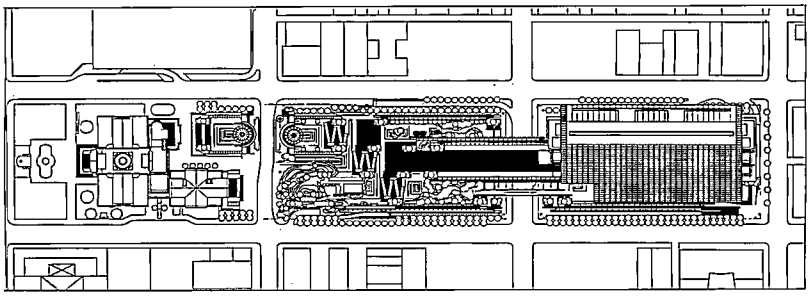
Each unit has a private plot of land extending 15 feet from the back door and fenced on either side for privacy, on which PCH encourages individualized planting. Storage for barbecue grills, bikes, and basketballs also is provided on each plot in sheds made especially for the project by Amish craftsmen. The land beyond the private gardens is landscaped and maintained by the condominium association.

It is clear that in Griggs Farm, GBQC is striving to create a community, not just a development. A major part of the cozy but uncrowded sense of place is the balance between the precisely intertwined geometry of the roads and houses and the more meandering informality of green spaces and foot paths. Maintaining that balance is a part of nurturing this collection of houses into a neighborhood of homes, and PCH planned accordingly.

The condominium association will have a landscape review committee and an architecture review committee to make sure that revisions individual owners want to make accord with what their neighbors want. "We are encouraging individual expression while acknowledging that it must fit within the whole," Crimmins says. A community board of directors—composed of four elected residents, either owners or renters, and one permanent appointee from PCH—will oversee operations, disputes, and resolutions.

Geddes states that it will take a number of years to know if Griggs Farm is an architectural and social success. "I wouldn't judge it too quickly—it's a question of seeing how people relate to each other; whether neighborhood friendships grow into what used to be called 'an ecology of friendship.'

"Another measure of success is, 'is there a pride in the community'? When I go back to the housing we did in Trenton [1979], and see how well maintained it is and how full of pride the residents are, I sense immediately that the place has worked as a community. I believe there is evidence that very simple things in housing make a difference—scale and front porch/front door relationships are certainly two such things. The other contributing factor is management, and I think Princeton Community Housing is very good at that invisible side of the architecture." □



Evaluation: Skyscraper on Its Side

Arthur Erickson's Robson Square, Vancouver.

By John Pastier

Vancouver has been called Canada's playroom; it has a hedonistic, laid-back character that arises from prosperity, glorious scenery, and the country's most benign climate. In some ways it is Canada's San Francisco, and in others its Los Angeles.

The city is clean and orderly and, in many of its older sections, even charming. But rapid growth over the last quarter-century did not produce downtown architecture or urban spaces in keeping with Vancouver's material gifts. Unimaginative and poorly scaled developer-grade office and hotel towers replaced much of the prewar downtown fabric, obstructing views, deadening the streets, and giving back little in return.

About 16 years ago, under a conservative regime, the province of British Columbia intended to consolidate its local offices and law courts in a 55-story tower by Arthur Erickson that would have been by far the city's tallest. This scheme also anticipated tearing down the 1909 stone courthouse once the new courts were in use. But a change in the voting climate produced a more populist administration and a re-evaluation of those plans. Erickson came up with an alternative scheme for a three-block, heavily landscaped, low-rise solution that managed to retain the old courthouse structure for new uses. In effect, the skyscraper had been laid on its side and partly buried in the ground.

On a site extending 1,600 feet from north to south, Erickson envisioned a new law courts building that was also part of a grand public circulation spine, government offices that did double duty as a landscaped public square, a sunken plaza flanked by restaurants and a media center, and transformation of the old courthouse into a cultural center. All these elements were essentially realized as planned, aggregating 1.3 million square feet and costing about $148 million in Canadian dollars. (In current U.S. dollars, this would be roughly $126 million.) The three main components now have been occupied between six and 11 years.

This complicated "urban intervention," conceived in a period that well predated the general use of that expression, cannot be considered a clear success or failure. It is a splendid civic gesture, an excellent example of landscape design, a good piece of adaptive use, and a better than average working environment. But it is also problematic as urban design, variable in architectural quality, disappointingly underused as a pedestrian axis, unclear as a symbol, and definitely not to be held up as a good example of waterproofing.

Left, the three elements of Robson Square: from bottom right in photo, the space frame sheltering the Law Courts, the plaza that roofs the office space, the old courthouse turned museum.

Yet whatever its inconsistencies of execution, this work embodies a generosity and boldness that one rarely finds in a government facilty. Here, Erickson had a powerful vision of reorganizing and beautifying his city. (Or at least one of his cities: he seems to have almost as many offices and homes as that other indefatigably peripatetic architect, Charles Moore.) This one-third-mile-long project dramatically declares that intent, even if it does not always fully realize its aims.

The Law Courts are the first element one encounters approaching downtown from the south, and entering the complex from that direction starts a serendipitous processional sequence. After ascending an outdoor flight of stairs at the southwest corner of the courts building, through the casually expressed, de facto front door, one enters a large skylighted space that serves as lobby and spine. "Skylighted" may be an understatement, for this immense public circulation area is enclosed almost entirely with glass, partly by a low side wall and two large end walls, and mainly by a 33-degree sloping roof supported by a steel space frame that rests on massive concrete bents. The courtrooms and judges' chambers occupy a terraced mass that responds to the roof and defines the form of the concourse's five-level volume.

Lavish in size, heavily carpeted, festooned with hanging plants, bristling with exposed structure, and flooded with natural light, this is not your standard courthouse lobby. Erickson's intention was to create "a major civic space inviting public awareness and involvement in the matters of justice seen not as an area closed off from the streets of the city but open to them and thus vitally involved in the life of the city."

What has been actually achieved is undeniably impressive but not exactly what was sought. The openness to the street is theoretical at best, since the floor of the concourse is a story or two above the sidewalk (the site slopes) and visually disconnected from it. The life of the city seems to be mainly vehicular at this

location; the courts' exterior is pedestrian-unfriendly and the environs are not as well peopled as the heart of downtown two or three blocks to the north.

The character of the concourse space is not so much that of a clear symbol of the judicial system as it is of a discreetly upscale shopping mall or a 1960s or '70s atrium hotel. This second resemblance is reinforced by the devices—balconies, abundant greenery, terracing, a tall and dramatic space, the skylight—associated with John Portman's work of that period. All it lacks is a few glass elevators and water features, and even the latter can be found immediately outside under the northerly roof overhang.

In such a setting, the quaint black robes and oversized split collars of the barristers appear rather out of place, making them seem like oddly costumed bellmen or attendees at a convention of very traditional clerics. Erickson has succeeded in "provid[ing] the necessary areas of public amenity for relation [and] refreshment," but at some cost to the majesty of the law. Much of this demystification is intended, for he has written that "the courts are servants of the society [and] reflect its ideals [yet] often unwittingly intimidate and unnerve an involved participant through their arrangement or architectural ponderousness." The question that arises is whether this humanistic approach may inadvertently symbolize the good life as much as an enlightened legal system. One Montreal architect who has spent time in the building comes to a very different conclusion, saying that "people in court often don't want to be seen, and the lobby puts them very much on display."

There is also a curious stage-set quality to the concourse space; it often seems underused and eerily quiet. Despite its immense size, it makes one wonder if there are not real corridors of justice elsewhere in the building. In fact, there are: judges, defendants, and witnesses have their own high-security circulation network along the eastern edge of the building. This eminently practical arrangement has an unfortunate symbolic connotation, namely that there is a grand and highly visible public face of the law that serves little purpose beyond imagery, while the legal system's real workings occur out of sight. Fortunately, the courtrooms themselves are accessible from the concourse balconies and kept unlocked when in use, so the separation of ceremonial and working spaces is not total.

The Law Courts' unresolved exterior says "convention center" or "transportation terminal" more convincingly than it says "courthouse." The scale is monumental, and at pedestrian level it is a hard, essentially windowless concrete mass divorced from the sidewalk by a buffer of planters.

The project's central element, Robson Square, has stood up better as visual design than the Law Courts. Comprising four stories of terraced government offices, it is also a lavishly planted and waterscaped rooftop garden sprinkled with public sculpture. Here, the sweeping horizontal forms are handled with assurance and nicely softened with landscaping designed by Erickson and consultant Cornelia Hahn Oberlander. The figurative cascade of steps and ramps is paralleled by a literal one: three waterfalls connect pools on four levels. In a tour-de-force of the waterproofer's art, one pool has a glass slab floor that serves as a skylight for a central cafeteria. Although this section seems watertight, there have been interior leaks, stains, and discolored windows caused by adjoining water features. The problem appears to be chronic; one transplanted Houstonian says the architect has been given the nickname Leak Erickson.

While not quite a "structure with 100 percent open space [having] all areas accessible to the public" as claimed by the architect's office, Robson Square is still a commendable integration of building and garden in the vein of Roche & Dinkeloo's Oakland Museum. Not only does it work well in broad terms, but it also exhibits a better command of detail than the Law Courts. Chief among the details is the integration of the broad steps with a zigzagging ramp, providing wheelchair and stroller access while producing a rich sculptural form in the process.

Inside, the government ministries occupy an office landscape, an interesting pun in the light of the treatment of their roofs. Since the building form is complicated, circulation is sometimes indirect, and the layout, combined with a nonsequential room numbering system that was not the architect's doing, can make navigation difficult. "People are always getting lost looking for offices," says a local communications specialist. Despite this inconvenience, the corridors are nicely open in feeling and the offices seem to be pleasant places to work, appearing less bureaucratic (at least visually) than is normal in a government facility.

The roof garden steps down in two stages from the courts' concourse to street level and then into a sunken plaza that ducks beneath Robson Street, one of downtown's main pedestrian thoroughfares, before rising to join the ground floor of the old courthouse to the north. The center of the plaza contains a space that serves as a skating rink in the winter and a dance floor in summer, but this theoretical focal point is diminished by darkness and a low ceiling height that result from its placement under Robson Street. The larger flanking sections of this cavelike space are pleasant places open to the sky, and when Vancouver's bashful sun makes its appearance they become splendid places to sit in or move through. Outdoor cafe tables, benches, and the plaza's wide cascading steps provide ample seating for these areas. The steps of the museum's west wing, facing south, continue the ascent of Erickson's stairs and are also used as bleacher seats on sunny days.

This sequence of outdoor spaces is Erickson's greatest accomplishment within the larger project. His talent has always been best manifested at a relatively small scale and in natural rather than urban environments. Here, the scale was not inherently small, but he skillfully made it so, just as he took a city site and created a metaphorical countryside within it.

Erickson is not usually associated with adaptive use of older buildings, but here too he did well. The technically demanding conversion of Francis Rattenberry's old courthouse into the Vancouver Art Gallery retained a sentimental favorite and gave the community good museum space. Perhaps some of the changes might have been made more in keeping with the spirit of the original, as when the central rotunda was expanded one floor downward, but in general the old building is well treated and the new insertions deftly handled. Notable among them are the muscular juxtaposition of new entry spaces and bookstore with the now-indoor exterior base of the original structure, and an elegant high-tech cafeteria adjoining the new roof terrace. The ultimate architectural success of this building was limited not by Erickson's skill in restoration and adaptive use but by the sad fact that, as old courthouses go, Rattenberry's original was not one of the really great ones.

Whatever its strengths and weaknesses as architecture, Robson Square's main significance resides in its urban design aspects. To its credit, it represents a built alternative to the banal high-rise formula that has come to dominate downtown Vancouver. Yet it does not make the urbanistic case for the low-rise form as convincingly as it might. Since it is in a relatively low-density section of downtown, there is insufficient contrast between the open spaces

© Ezra Stoller/Esto

Above, the Law Courts, an imposing sculptural object but a somewhat unfriendly presence at street level.

and their surrounding frame, and an insufficient number of potential users occupying the adjoining blocks. Had the square been located in the midst of the city's biggest buildings, it would have served as a greater visual relief and been a better used space. Nor, as an artificial hill, does it match the spatial success of the traditional town square typology to which it has often been compared.

Over most of its length, Robson Square is as aloof from the street as any 40-story structure. No stores or even windows face the city's sidewalks, and, by offering an alternate path that is either above or below the street, the square dissipates rather than concentrates pedestrian activity. In this sense, it resembles the climate-controlled skybridges and underground shopping networks that have proliferated in the downtowns of most large Canadian cities.

A more serious shortcoming is that this expensive pedestrian spine seems to serve no strong circulation need, and its users tend disproportionately to be tourists rather than local citizens. Downtown Vancouver's main foot traffic is east-west rather than north-south and is concentrated well north of the site. Granville Street, the one strong north-south artery, is only a block from the project's eastern edge, and Erickson's natural amenities are no match for its strong concentration of shops, entertainment, public transportation, and people. Two connected underground shopping complexes are close by, and they too outdraw Robson Square's gardens and plazas, especially in wet weather. At one time there was talk of joining one with the other, but an intervening truck tunnel was built before the connection was realized.

Similarly, there was talk of a link to a nearby underground light rail station, but that too has been made moot by the blockage posed by the trunk tunnel. This is a major lost opportunity since the sunken plaza would have made a wonderful forecourt for such a station while benefiting greatly from its foot traffic.

Until recently, a British Columbia tourist information center was on the plaza, but it moved to a more conventional storefront location, taking foot traffic and restaurant customers with it. Developments such as these have been the despair of the owner of a continental restaurant on the plaza, 35 steps below street level. "The exposure here is terrible," he says. "My old Robson Street location was much better." (On the other hand, the manager of a similarly placed but less sophisticated eatery likes the location.)

Exploring Vancouver over several days, I found far more life on downtown streets, in outlying public markets, and in the underground shopping center nearby. Writing in the September 1988 issue of Update, a tabloid newsletter of the Royal Institute of Canadian Architects, Detlef Martins asserted that "in less than a decade, Granville Island [an incrementally reclaimed industrial wasteland adjoining downtown] has become the spiritual heart of the city." This claim may be debated, but the mere fact that it could be made underscores how badly Robson Square has fallen short of its goal of becoming downtown's prime public space.

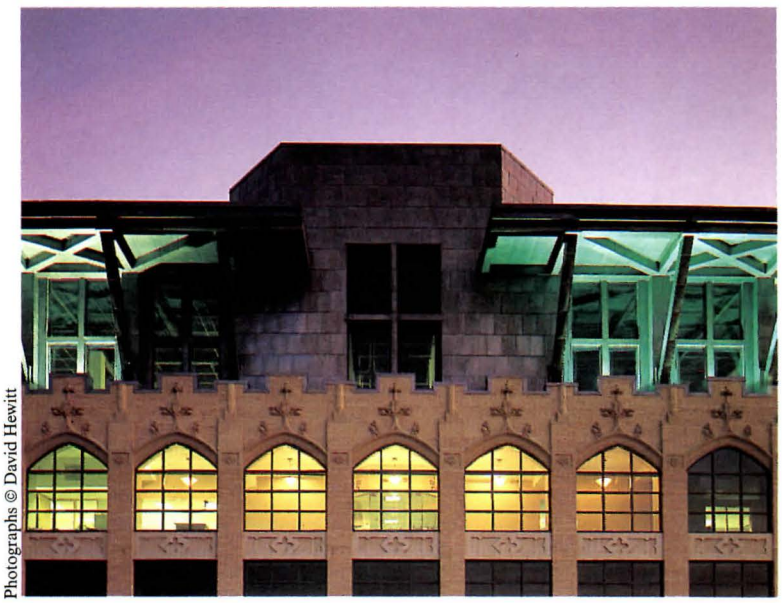
Robson Square's urbanistic failure was predictable, since it is obvious that one cannot improve city centers by suburbanizing them. Nevertheless, this three-block ensemble can still be strengthened over time if there is a resolute public policy to channel high-density development to its edges (the exact opposite of Erickson's adopted zoning strategies) and to make better connections to the city's rail and foot transportation systems. And there are still some things to be said in the project's favor. Although he has not managed to transform urban life, Arthur Erickson has encapsulated the hedonism and ease of life in Vancouver. Better yet, Robson Square metaphorically celebrates the city's most distinctive characteristic—its glorious natural setting. This quality is more or less permanent, and one can always hope that an indigenous and distinguished built form eventually will evolve. □

In Boston, Adding Floors and Flair

Four new rooftops

rejuvenate old downtown buildings.

By Robert Campbell, AIA



Photographs © David Hewitt

The simplest way to gain more floor area on the site of an old building is to demolish it and build something bigger. But in Boston, demolition has become difficult. As a consequence a new generation of rooftop additions has sprouted around the city. Perhaps surprisingly, the results are often handsome and sometimes dramatic.

The reason it's hard to demolish buildings is that many are now landmarked, either individually or as part of historic districts. Also, the city's planning agency, the Boston Redevelopment Authority, believes in a policy of seeding the city with a limited number of new buildings, rather than allowing the new to drive out the old.

From the point of view of either architecture or urbanism, there's no doubt that Frank O. Gehry's stunning renovation at 360 Newbury Street (corner of Massachusetts) is the masterpiece of rooftop additions. Gehry, collaborating with the Boston firm of Schwartz/Silver, was faced with a unique problem. The original, pleasant but undistinguished, was meant to be a background building on a background site. But the construction of the Massachusetts Turnpike sliced away its neighbors and left it exposed—both front and rear—as a prominent object. Gehry's task was not only to enlarge it but to give it the monumental character demanded by its new situation.

To the seven-story original, Gehry has added an eighth floor. The addition looks like a scale model of a Michelangelesque cornice that has been crudely made out of toothpicks and then blown up to giant size. Equally overscaled toothpick canopies hang off the building lower down. In back, where the old building was left

Left and above, 360 Newbury Street, an early-20th century warehouse to which Frank O. Gehry & Associates and Schwartz/Silver added an eighth floor and canopies.

© David Hewitt

Above, the jagged silhouette from the approach down Newbury Street. Right, the building over the Massachusetts Turnpike.

© David Hewitt

unfinished, Gehry has faced everthing in lead-coated copper. That metal also sheaths the toothpick struts.

You'd think Bostonians might mock so free-wheeling, so Californian an intrusion, yet in fact almost everyone likes 360. Its eloquences are manifold. Walking up Newbury Street you see it from afar as a jagged gray silhouette, outlined against the sky above a lower red-brick foreground. The gray lead—the only material you see from this direction—gives the sense of a cut-out or silhouette, like the gray silhouetted buildings you see in the backgrounds of comic-book panels. Up close, the sheathing looks very different, because the copper glimmers through the lead in delicate tones of pink and green.

Viewed from the other side, as you come into town on the turnpike, 360 has an entirely different aspect. The mock-grand cornice, its bold struts set slightly awry, lend it a bold monumentality without pomposity. One corner of the cornice is cut out to form a story-high niche that may or may not some day contain a sculpture by Claes Oldenburg, Gehry's friend and frequent collaborator. The proposal is for a huge tea bag, in homage to the Boston Tea Party. Developer Richard Cohen says the idea is still alive, but Gehry is worried that Cohen may be backing out.

Gehry's is the star of recent Boston rooftop additions. Others fall into two categories: those that are clearly differentiated from the buildings they top, and those that aren't. The National Park Service, in its guidelines for historic structures, favors the first approach, but the Boston Redevelopment Authority encourages the second. In a rooftop guideline, still in draft form, the BRA states:

"The same or similar materials should be used to avoid deliberate contrast. Evoking the spirit of the existing architecture, without

Below, the Marlborough, an apartment house to which Childs Bertman Tseckares & Casendino added the top floor.

Below, 176 Federal Street, to which August Associates added a top floor and mezzanine faced in limestone.

© Cymie Payne

Photographs © David Hewitt

Above and right, 67 Batterymarch St. To the turn-of-the-century brick building, Skidmore, Owings & Merrill added two stories sheathed in glass.

ing building while allowing a contemporary interpretation of historical style at the same time."

A fine example of such "a contemporary interpretation" is at The Marlborough at Marlborough and Massachusetts in the Back Bay. It has been converted from 32 multi-bedroom apartments—filled mostly by students—into 78 smaller luxury condos. Architects Childs Bertman Tseckares & Casendino added a single story, in the form of a mansard with dormers, and restored the original cornice, which had been removed. The result is a great improvement on the building's recent appearance and even on its original flat-topped architecture.

At 176 Federal Street, known as the Weld Building, in the downtown business district, architects August Associates did a similarly sensitive job with an office block designed by Shepley Rutan & Coolidge in 1900. Here a 16-foot, single-story-with-mezzanine addition is faced in pale limestone to contrast with the brick below. Cuts through the original cornice expose the addition, which is otherwise set back.

Finally, at 67 Batterymarch Street, also downtown, the now defunct Boston office of Skidmore, Owings & Merrill took the opposite tack, fitting a handsome tiered two-story hat in faceted green metal and glass onto a building made of red brick. Contrasting utterly with the original, this is nevertheless one of the most pleasing chunks of new Boston roofscape and proves that roof additions can succeed without necessarily blending in.

All four buildings, one feels, have been improved by their additions. The jostling of new and old together adds life, interest and meaning to the city's streetscape. □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Photographs © Walter Smalling

In Washington, Emphasis on Context

Three rooftop additions exemplify conservative approaches.

By Andrea Oppenheimer Dean

Facing page, the Colorado building, to which Kress Cox Architects added two stories and a new visual airiness. Above, the Washington building, crowned by Keyes Condon Florence with a decorous, belted, and lively penthouse.

Once you understand why Washington, D.C.'s architecture tends toward the conservative, you also know why historicist rooftop additions have become a preferred method for expanding downtown buildings.

The influence of a large crop of distinguished downtown buildings, dating from the turn of the century through the late 1920s, in combination with a lean legacy of inferior modern buildings, has resulted in respect for the old and suspicion of the new, plus enactment of tough historic preservation laws. Crucial also are the city's height limitation and its broad diagonal avenues that reveal building tops even from street level. Add an existing stock of older buildings that are lower than the zoning laws allow and skyrocketing land costs, and the result is rooftop additions, respectful of their forebears.

One of the most artful recent examples is Kress Cox Associates' two-story addition to the 1903 Beaux-Arts Colorado building, at 14th and G streets NW, by Ralph S. Townsend. The first issue raised by this and every rooftop addition is proportion. For the Colorado, with its approximately 100-foot-long, square elevations, the effect of adding 30 feet was to give added grace to an originally stumpy presence.

"We wanted the addition to have plasticity and a sense of lightness," explains David Cox, AIA. To that end, the architect designed the 10th story to be less dense and ornate, more permeable and airy-looking than the original. (The 11th story is set back and not visible except from nearby upper floors or from far away.) Atop the original heavy copper cornice, they added a central open porch motif through which you can see the sky from below. The addition maintains the interplay between Roman brick and cast stone with granite inserts of the original.

Kress Cox also added a 150-square-foot curved element around a square courtyard at each floor except the second, where the courtyard had earlier been filled in.

The renovation, additionally, included a radical reconfiguration of the lobby, which had been brutalized into 1960s blandness. When Kress Cox began its work, the lobby was a low space resembling a cheap motel foyer finished in a hodgepodge of dark materials, including a marble disguised as laminate. (That's right.) The architect replicated the ornate original ceiling, which was found under the hung ceiling during demolition, exposed existing columns, unboxed a stair that had been hidden away, developed a curved balcony, opened the lobby vertically by removing a portion of the second floor, and added the building's only arch just inside the new two-story entrance. Kress Cox also covered the floors with inlaid marble and created a number of mahogany-clad postmodern elements with black accent strips. The predominantly horizontal banding undoes attempts to lift the space vertically, and overall the lobby suffers from too many ideas and too little finesse.

Exquisite, by contrast, is the architect's reinterpretation of

Photographs © Walter Smalling

Above, the Car Barn's original third story was boxed in before a new fourth floor was added, above right, which restores gables and tower. Top, the new roof garden from rear elevation. Right, view from the Potomac and the Key Bridge.

the exterior ground-level storefronts, also botched in an earlier remodeling. Here Kress Cox re-created curved glass storefront bays with copper roofs, which the designers found on a 1903 drawing by the original architect.

Just a block away from the Colorado building, at 15th Street and New York Avenue, is Keyes Condon Florance's renovation and addition to a 1920s moderne building, the Washington, by Coolidge, Shepley, Bulfinch & Abbott. In some ways, KCF took the opposite tack from that of Kress Cox. Instead of adding storefronts, KCF stripped recent accretions from the Washington, and instead of trying to make the addition airy and unobtrusive KCF worried about its appearing inconsequential, like an afterthought. The architect wanted it to look integrated with the original but also differentiated from it. Not incidentally, this was a requirement to qualify for tax credits from the U.S. Park Service.

KCF abstracted the Greco-deco details of the original—adding strong, incised, earlike corner elements to bracket the addition and anchor it—and added arched windows that echo those on the ground floor, repeated the coloration of the original, and cinched the addition with a bluish metal belt. This band is probably the project's least convincing element.

As Kress Cox did at the Colorado, Keyes Condon Florance added a small courtyard infill to achieve the allowable floor area ratio, modified the layout of the ground-floor lobby, added new finishes to create a 1920s look, and renovated the office spaces. KCF also restored ornamental bronze elevator doors and wood paneling in elevator lobbies.

The look throughout speaks of conservatism and authenticity, with the shiny metal belt encircling the top floor being the building's only bit of razzle-dazzle.

About a mile from the Washington, in Georgetown, is a recent rooftop addition by Arthur Cotton Moore Associates to the historic Car Barn. Situated at the foot of the Key Bridge, which links Georgetown and Northern Virginia, the Car Barn with its landmark tower once served not only as a trolley station but also as a gateway to Georgetown. The original, highly eclectic, brick and stone building of 1895 was an early work of Washington architect Waddy Wood, who topped its romantic, strongly articulated three stories with tiled dormers and corner pavilions. A renovation in 1911 boxed these in and smoothed over the facade to give maximum space to the third floor.

Moore's addition adds a fourth-floor pavilion, whose dormers and arches echo the original building's roofscape. In addition, the architect cut 5,000 square feet out of the building to provide interior light courts and converted a flat, industrial-type roof into a lively rooftop garden. The only discordant notes are the new, flush windows in a building (and city) of recessed openings.

Like virtually all Washington's recent rooftop additions, Moore's in Georgetown ends in creating a benign confection by piling 1980s eclectic forms onto those of earlier eras. □

Bathed in Light

Bright interior adaptation of an old Memphis building

The Hnedak Bobo Group, a Memphis-based architecture firm, bought light as well as space when it purchased a building on Memphis's historic Front Street. Two roof monitors sat atop the 1871 Allenberg building, scooping north light and filling the interior with cotton-soft, diffuse energy—appropriate for a building formerly devoted to classing and grading cotton fibers. It also was well suited to be a contemporary architectural studio.

Financing the renovation of such a large building was a challenge, so the architects/developers explored every possible economic advantage. The facades held potential for tax credits since the building lay within a designated historic district. The architects gave the exterior a dramatic face-lift, removing peeling paint and decrepitude. The fresh face fits right into the street scene and blends with its neighbors along Cotton Row.

Another opportunity lay in leasing the front. Rental space now brings significant income to the owners, who reserved the less valuable interior of the 20,000-square-foot building for themselves and leased the high rooms with tall windows on Front Street. Roughly one-third of the building is devoted to rental space on three floors: the first houses an interior design company, the mezzanine another commercial enterprise, and the third floor has been converted into a luxury apartment. The architects installed an elevator in case they ever sell the building; basement parking makes the project more valuable to present and future owners.

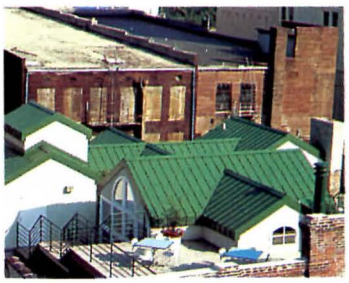
Although the architects leased the best view to others, there is a promising glow deep inside the building. Light floods the main lobby of the architects' offices, dropping 50 feet from the original skylight to the first floor. At the far end of the lobby, a metal stair spirals upward to a mezzanine, the second floor, and into the skylight itself. The space is simultaneously soothing and active.

Offices and conference rooms line the first-floor perimeter, where colors and materials reinforce the industrial nature of the warehouse. Rough brick walls form the outermost layer, crisp white interior walls reinforce sturdy pine columns and beams, bluish-green paint coats metal on stairs, columns, and gridded rails, and strip oak flooring outlines the heart of the floor.

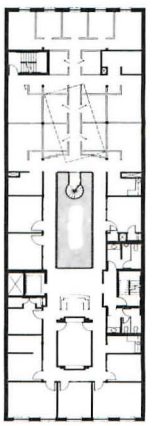
A mezzanine devoted to computer applications and interior design circles the main level, providing gallery space at one end and yielding to the larger second-floor drafting space above. The secondary clerestory, filled with insulated translucent panels and cocked toward true north, curves above the work spaces.

At the top, inside the largest skylight, the spiral stair ends in a bridge. As the floors below recede from view, a new world opens up above. Across the bridge is another staircase, leading farther upward, through a door, and out into a floor-light loggia, surrounded by roof deck, air, light, buildings, the city sounds, and the Mississippi River's broad stretch north. An employee lounge and kitchen terminate the sequence, giving workers a congratulatory tempietto of their own.

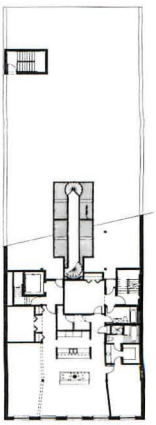
The Allenberg building refutes the old saying that architects design palaces but live in rented rooms. It has texture, place, space, light, scale, and an intangible sense of well-being that is difficult to achieve. Greg Hnedak, AIA, and his associates saw the light and captured its potential.—ROBERT A. IVY JR., AIA



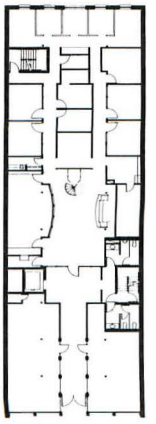
Above, restored front elevation and new rooftop forms. Right and facing page, the skylighted interior space.



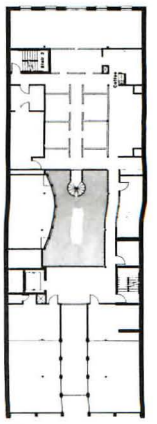
Second floor



Third floor



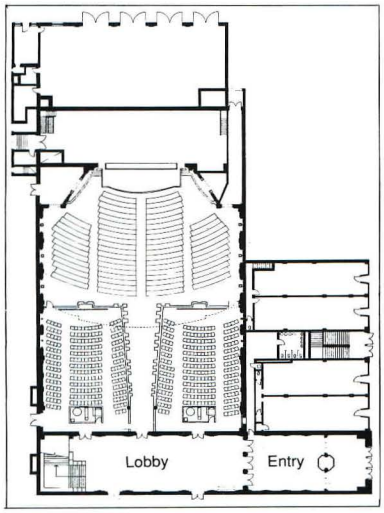
First floor



Mezzanine level

Oriental Triplex

Milwaukee movie palace gains screens, retains flavor



Photographs © George Lambros Photography

The Oriental Theater in Milwaukee is an exotic 1927 example by Milwaukee architects Dick & Bauer, with a 1,200-seat theater and a grand lobby in a mixture of Egyptian, Persian, and Arabian styles. Remodeled by Quinn & Searl Architects of Chicago into a single large theater flanked by a pair of smaller ones under the original balcony, the Oriental still shows off all of its beautiful details and proportions. Most of the pizzazz in the remodeling comes from the expert paint restoration work of Jean Pless, a member of Milwaukee's remarkable community of restoration artisans.

To avoid creating an ordinary-looking central corridor, the architects took the delightful false-perspective vista in Rome's Palazzo Spada and simply turned it around. The angled walls make the hall seem shorter and also correct the proportions and acoustics of the smaller theaters. The pilasters lining the hall were covered with plastic laminates that match some of the original colors. The restoration artisans reused several other finishes in the hall, including a rag-finish scagiola on the vaulted ceiling and a light, silvery gold enamel on the sticking decorating the pilasters.

The low ceiling under the balcony area originally had a long oval lighting-cove, whose semi-circular ends the architects completed with circles, providing light for the new theaters. The sweeping curve of the balcony was the only casualty in the remodeling, although most of the original molded plaster was carefully preserved in the new design. The new theaters had to slide straight out from under the balcony to accommodate their wide screens and seating for 200 in each. The architects detailed the potentially boxy corners as a threshold where the vault of the hall drops back to reveal the vast scale of the main theater above, with its starry dusk for a ceiling. This remodeling is a paradigm for approaching an increasingly common problem, subdividing grand old theaters.

—ANDERS NEREIM

Mr. Nereim, a Chicago architect, teaches interior design and architecture at the School of the Art Institute of Chicago.

Night Life

Pioneering restaurant in Boston's former 'Combat Zone'

Photographs © Warren Jagger Photography, Inc.

When city leaders take a downtown area known as the "combat zone" and rename it the "midtown cultural arts district," can gentrification be far behind?

Over the past two years this section of Boston has witnessed just such a transition. The first completed project in this burgeoning neighborhood is the Hub Club, a restaurant/nightclub designed by the Tamarkin Techler Group of Boston. At present, major development projects are underway on all sides of the Hub Club—a mixed-use complex, a Bloomingdale's, and a pair of office towers are replacing less reputable business enterprises.

Unlike the fortress-like facade of the retail center across the street, the Hub Club's predominantly glass front encourages a lively visual exchange between indoors and out. Set in a century-old, four-story building, the club incorporates the original Gothic-inspired arched windows of the second level and has simple windows on the ground floor that fit the existing mullion pattern. Custom-designed lighting fixtures and colorful oversized banners reinforce this attempt to give vitality to the streetscape.

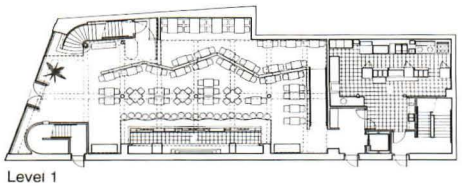
The program called for a literal interpretation of the club's Caribbean theme, but architect Cary Tamarkin recalls telling the client at the outset, "We don't do thatched roofs." Tamarkin and his partner Timothy Techler used a palette of traditional colors and abstracted forms based on the landscape of the Caribbean. They wove these through the building's original structural system of columns, beams, and vaults. The architects also were responsible for a variety of lighting fixtures and furnishings.

On the first floor, a textured copper facing behind a broad archway serves as a backdrop for the 36-foot-long bar. A local artist created an abstract-patterned patina on the crumpled copper by splashing it with acid. A free-form jagged blue wall zigzags through the dining space to define the seating areas. A dark red niche carved into the opposite wall creates a more intimate dining space for four tables, each accented with the architect's light fixtures based on a different phase of the moon.

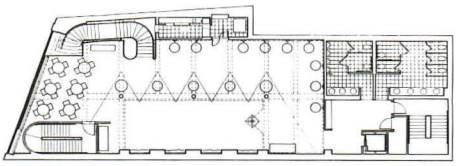
An existing curving stairway with elegant detailing provides a grand approach to the second-level dance floor, which is defined by 25-foot-high fabric wall hangings and a bright red DJ booth that seems to hover in the corner of the double-height space. On the top floor, freestanding yellow fins break up the long narrow space and shield the structural columns.

Out of the $1.7 million budget, only $200,000 was spent on the finishes. Yet it is sculptural details and the painterly quality of the surfaces that give the Hub Club its special character.

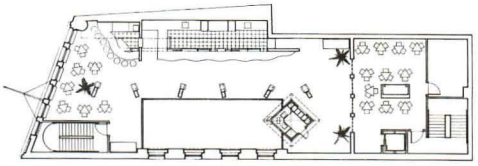
—Lynn Nesmith



Level 1

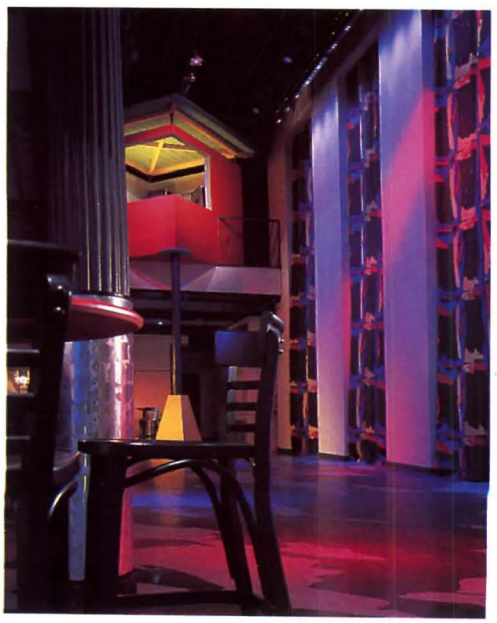


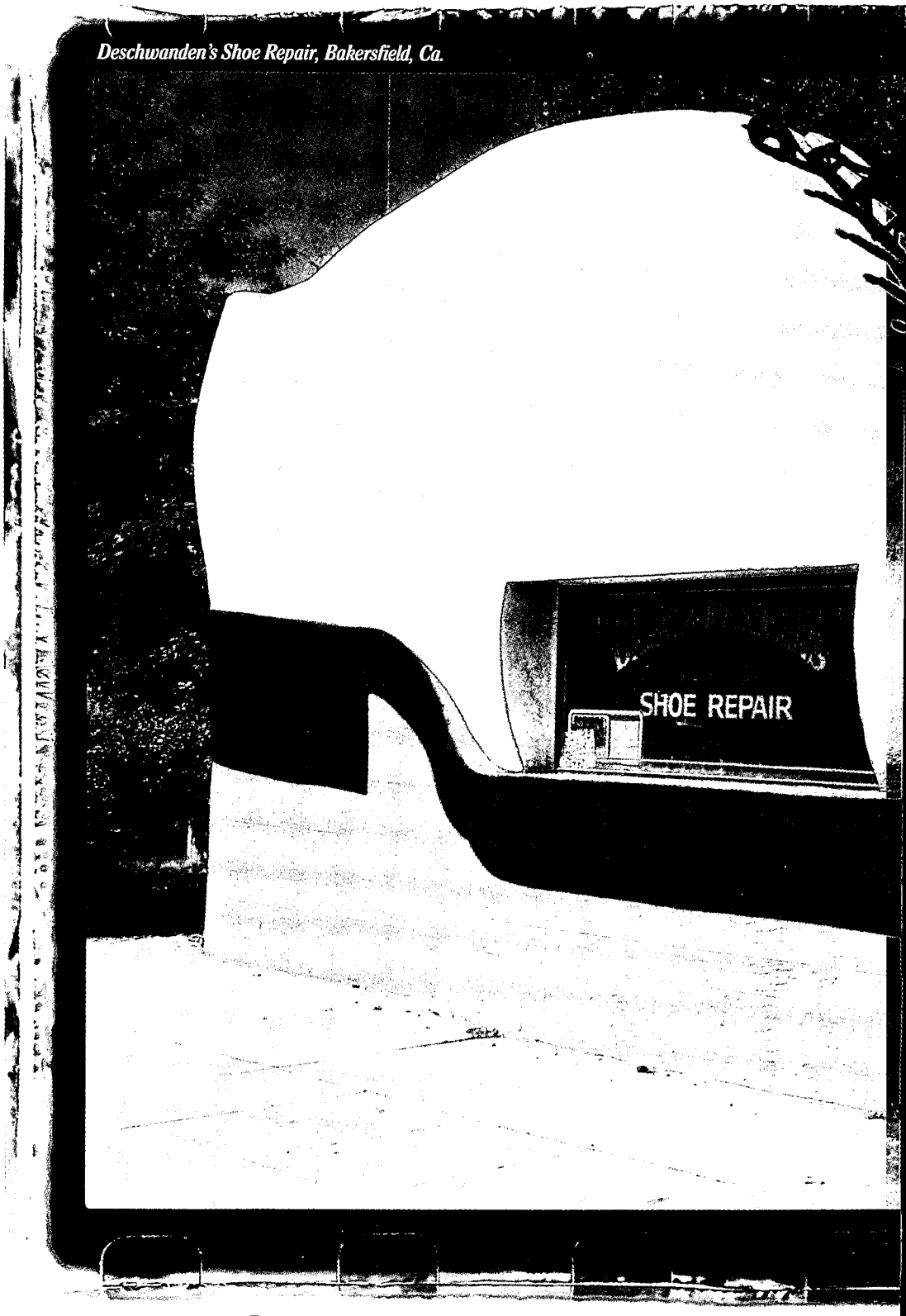
Level 2



Level 3

Facing page, the first floor's main bar and dining area with its original fluted columns and vaulted ceiling. Above, the more intimate third floor bar with its dancing yellow structural elements. Right, elevated, triangular DJ hut looks out over the double-height dance floor, patterned with an abstract painted design. Left, exterior night view.





Deschwanden's Shoe Repair, Bakersfield, Ca.

No matter what they look like outside, bus

In America, businesses come in all shapes and sizes. But there is one thing most of them share: a strong preference for Du Pont Certified Carpets.

Nothing startling there. After all, these carpets offer the kind of tough, unyielding performance that keeps clients satisfied.

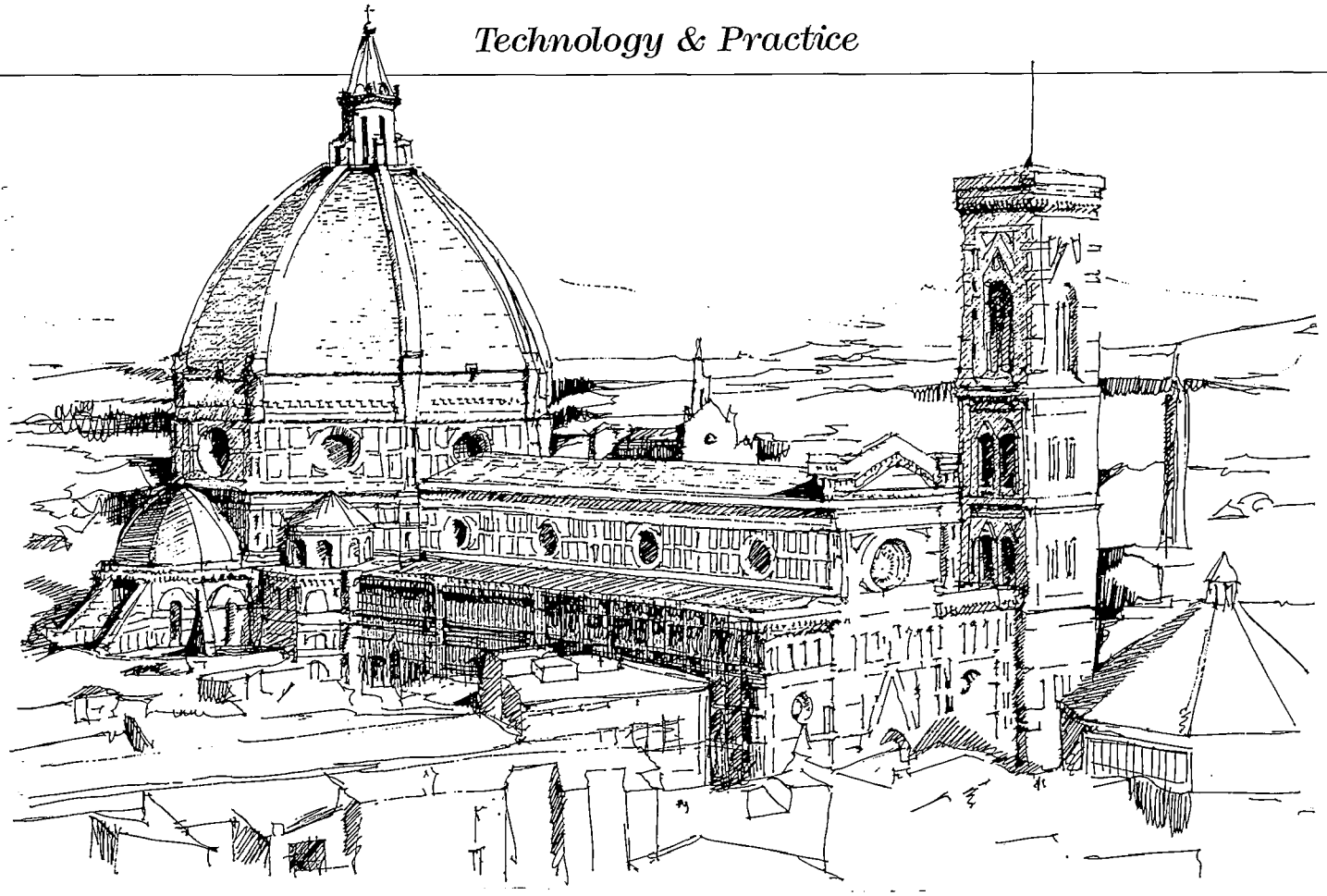


Illustration by Timothy B. McDonald

The Cracks in Brunelleschi's Dome

Is Florentine masterpiece in peril? By Claire Schiffman

"Buildings are by no means inert, immobile things. Even the most solid . . . lead an inevitable and unarrestable inner life that limits, to some degree, their life expectancy." —PIER LUIGI NERVI

When Nervi wrote these words in 1945 in reference to the dome of the cathedral of Florence, he gave the structure another three or four centuries to live. Today, some observers claim that this "unarrestable inner life," with the help of the indefatigable hand of man, is hastening the dome toward an untimely death. This at least is the charge that is never far from the surface in the polemic that has exploded over numerous vertical cracks, centuries old, that run through the structure of the dome.

The cracks now number about 600. The principal ones are four long vertical fissures that stretch from the drum up almost to the base of the lantern, down the middle of every other section of the eight-sided dome or "cupola." Many of the largest fissures extend into the superstructure of the church itself. In the other four sides of the dome and drum there are located a number of various smaller cracks.

It is widely believed that the cracks started to appear during or immediately following the completion of the dome in 1436, although their extent or the degree of concern they caused is hard to gauge. Some experts, however, maintain that the cracks did not appear until about 150 years later, when the cupola received a particularly severe blow from a bolt of lightning that sent pieces of the dome's marble lantern bounding down into the streets below.

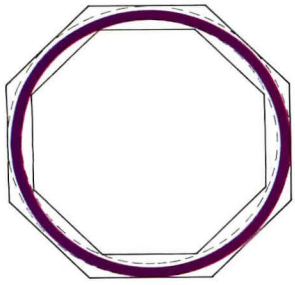
Shortly afterward, in 1639, we have the earliest documentary record of the existence of the fissures. Toward the end of that century, the Medici grand duke appointed a commission to study the problem, but its recommendation, that four great iron chains be installed within the dome, eventually was dropped. In 1934, a commission was created with Nervi as one of the principal members. In the mid-1970s, the most recent commission was created, which was dissolved early this year.

It was Nervi who first demonstrated that the width of the fissures varied with seasonal changes in the temperature of the wall. Quarterly measurement of the principal cracks at the equinoxes and solstices indicated that the cracks expanded when the fabric of the dome contracted with the cold, and that the cracks contracted when the dome wall expanded again. However, there was an infinitesimal difference between the size of the opening at the beginning of a yearly cycle and that at the end, when the cracks had contracted again. Slowly, the absolute width of the cracks was increasing.

Ms. Schiffman is an art historian and freelance writer living in Florence.

The Nervi commission recommended continuous monitoring, which, however, was suspended during World War II and only resumed in 1955. Since that time the care of the dome has followed a "prescription of studied neglect," as it has been termed by Howard Saalman, an American architectural historian and expert on the cupola. In the mid-1970s, "neglect" turned into "tampering," according to Mario Fondelli, professor of engineering at the University of Florence. At that time, the cathedral administration and the government agency that oversees the country's artistic patrimony decided to restore the 16th-century frescoes that decorate the inside of the dome.

In 1981, members of the Rotary Club of Florence saw a movie about painting conservation that showed workers installing scaffolding for work on the cupola frescoes. To support the scaffolding, they were making use of 48 large square holes spaced at regular intervals around the base of the dome. These holes were built into the structure to hold the massive wood beams that supported the original working platforms during construction. In the film, modern day workers were filling the holes with concrete in order to secure the massive beams that would support the temporary scaffolding above.



Plan of circular dome within octagonal dome.

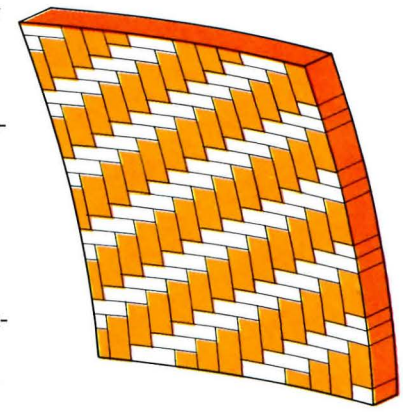
Inquiries revealed that this was contrary to the original plan approved by the ministerial commission appointed to safeguard the dome. The original plan called for a neoprene lining in the holes and metal jacks that would secure the horizontal members from which rises the maze of scaffolding that now fills the inside of the dome. At the last minute, the plans were changed without approval of the full commission, and the holes (24 inches square and about 4 1/2 feet deep) were filled with concrete instead of lined with neoprene.

In 1984, a newly appointed member of the commission, architect Lando Bartoli, raised questions about the then four-year-old concrete. Instigating a new survey of the fissures and analyzing their rate of increase, Bartoli charged that the filling of the holes inhibited the normal "breathing" of the wall, preventing the cracks, some of which pass directly through these holes, from reclosing in warm weather.

The concrete was put in place in February, when the holes and the cracks would have been at their widest (that is, .08 to .12 inches wide for the largest fissures). Hence, the cracks' previous rate of growth, about 3/10 inch every 100 years, was increased by a factor of 50, according to Bartoli. What is more, Bartoli and others maintain, the concrete will expand with heat at a much greater rate than the masonry.

"It's like putting a time bomb inside," says Fondelli, noting that a similar phenomenon already has occurred at the Parthenon, where earlier restorations inserted concrete in the masonry structure. He too has analyzed the variation in the cracks and concurs that they are widening more quickly.

In any case, there seems little doubt that there are more and larger cracks than there were 40 years ago, when Nervi last monitored them. As long ago as 1976 there already was concern about the rapid worsening of the situation. Automobile and bus traffic, often thought to be a contributory cause, had been limited somewhat in the area immediately around the cathedral. Fondelli identifies new cracks by the degree to which the masonry in the exposed inner surface of the fissures has blackened with dirt and age. Unfortunately, there is no way to tell how much newer these cracks are, however.



Brickwork section; lines show spiralling vertical bricks.

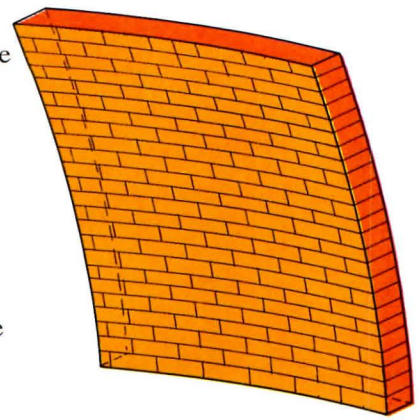
Officially, the commission maintained that the question was too complex to attribute causes or prescribe solutions. Until the statics of the dome are completely understood and the origins of the fissures explained, they reasoned, it would be misguided to propose any measures to intervene. To this end, since 1987 the dome has been equipped with an intricate monitoring system that records every movement in each of its 597 cracks. A structure oscillating "to the rhythm of rock," as the major Florentine daily recently put it, it registers slight movements in almost every direction.

A handful of commission members, of whom Fondelli and Bartoli are the most outspoken, has continued to call for the immediate removal of the concrete. Finally, the commission became such a thorn in the side of the beleaguered ministry that, after five years of heated polemic, it was abruptly dissolved early this year.

But there are many experts who believe that neither the fissures themselves nor the addition of the concrete poses any grave threat to the dome. Salvatore DiPasquale, dean of the faculty of architecture at the University of Florence and former member of the ministerial commission, is perhaps the most knowledgeable source about the structure. He asserts emphatically that the appearance of the cracks is a natural phenomenon of the construction, that the structure has lived with them for centuries, and that it most likely will continue to do so.

On this side of the Atlantic, Professor Saalman also is of this opinion. Concern about the cracks, he points out, follows a timetable of anniversaries and public celebrations. Each round numbered birthday of either Brunelleschi or the dome begins a cycle of concern, polemic, and eventual disregard, until the next renewal of alarm.

Conical lay of bricks in one section of the dome.



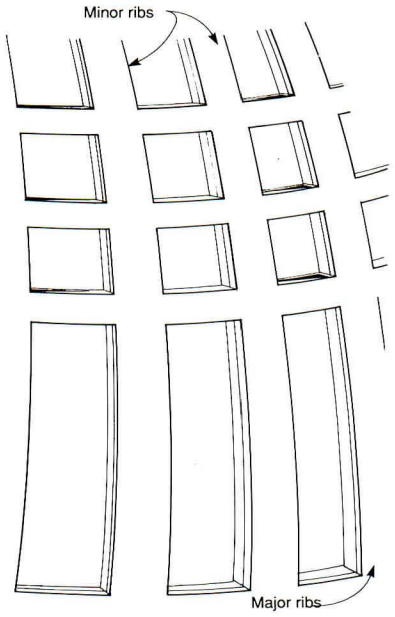
A review of the history of the cupola shows that polemic is no stranger to Brunelleschi's masterpiece. The future profile of the dome was debated by the finest artistic and scientific minds in Florence for at least 50 years before it actually was begun. The final specification, to which Brunelleschi was bound to adhere, posed enormous logistical and structural challenges. It was to be an octagonal groin vault, 103 feet high, with a radius of curvature equal to 4/5 the diameter of the base of the octagon from corner to corner (148 feet), raised on a 35-foot-high drum 138 feet wide and an equal distance above the floor of the church. When responsibility for the cupola was vouchsafed to Brunelleschi, the

church finally was completed up to the top of the huge drum.

Aside from the sheer size of the vault called for, there was the additional problem of how to support it while it was under construction. The centering required for such a structure would have been enormously expensive and would have filled most of the space at the crossing of the church, obstructing the massive movement of people and materials the work would require. Given the tremendous weight of the vault once it started to rise, wood centering also would have been subject to shifting, with serious possible consequences for the dome's stability. Nonetheless, in a climate often tense with competition, Brunelleschi succeeded in producing the cathedral's crowning feature to the specifications promised and without the costly centering.

The broad outlines of his solution are well known. The cupola is constructed of two shells. It is built primarily of brick, except at its base (before the structure divides into two shells), where there are several feet of stone construction, and where the 48 square holes are located. The thicker brick inner shell (between seven and eight feet thick) is joined by eight major and 16 minor ribs to the thinner outer shell. The major ribs are at the eight corners of the octagon; the minor ribs are evenly disposed, two to a side, between the main ribs.

That is the description of the structure as it has more or less been known for centuries. DiPasquale and a British engineer, Rowland Mainstone, working independently of one another, in the last 15 years have arrived at a probable explanation of how the vault was built without centering.



Radial arches between major ribs.

Their theory relies on the observation of some of the less apparent features of the construction, some of which never had been properly explained. These elements are the "conical" brick beds, the radial or "horizontal" arches in the outer shell, and the herringbone-like pattern of brickwork that begins about a third of the way up the cupola.

The most important of these are the conical brick beds. The bricks are laid radially to the vertical center of the dome and follow a course that slopes in two directions: inward toward this vertical center, and also downward at each side of the octagon and upward toward each center rib, describing the line of a string suspended slackly between two ribs.

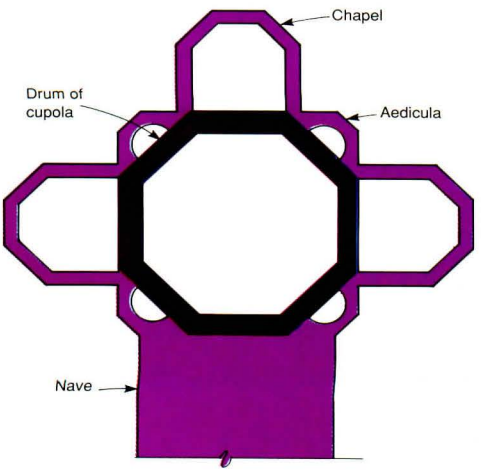
The essential fact that dictated the radial, sloping lay of the brickbeds is this: a vault of circular plan, as is well known, can be erected without centering because each completed course is a self-sustaining circular ring, whereas a vault of octagonal plan does not have this property. Thus Brunelleschi developed a novel technique of constructing the octagonal dome as though it were a circular dome. He did this by establishing a thickness for the inner shell sufficient to contain within its wall the thickness of a hypothetical circular dome of which the inner diameter at the base would be the diagonal distance across the octagon from corner to corner. The bricks themselves were laid as though they were part of such a circular dome. In their disposition they are oriented radially to the central axis of the dome, rather than parallel to the sides of the octagon, as would be expected in a structure of this type using standard brick construction techniques.

Like the brickbeds of a circular vault, the beds of this vault, in between each pair of corner ribs, describe a section of an inverted cone. More precisely, the beds follow the locus of the intersection of the rising wall of the dome with an inverted cone with its central axis along the central axis of the cupola. Hence the inward tilt toward the center of the dome and the sloping beds, which imitate the surface of the beds of the imagined circular dome as it rises toward its summit. Because the bricks are laid radially, there are no abrupt angles between the shells and the ribs. Rather, the sides of the octagon are bound in a continuous circle with eight major supports.

Because a single course of any vault is not self-supporting until the entire ring is complete, the potentially weak moments, even in a circular vault, occur in the bricks of the uppermost course before the course has been completed around the circle. Here the herringbone brickwork provides an added precaution against the sides of the dome falling inward during construction, particularly at the center of each octagonal section where this tendency would be the greatest. The bricks are laid with one brick laid vertically, that is, on its short end, for every four or five bricks laid horizontally, creating parallel lines of vertical bricks that spiral up the surface of the dome.

Because of the sloping course of the masonry, these bricks are laid not exactly vertically, but tilted slightly on edge, directing the slanting course of the masonry as it curves along its conical surface. The periodic vertical bricks of the herringbone pattern bind a given course to the three courses below it and divide the beds into shorter stretches of unsupported bricks. In addition, because the bricks are laid radially, the bed of each course between two corner ribs describes a flat arch, which by its nature is self-supporting.

In the outer shell, radial or "horizontal" arches, connecting each major rib horizontally to the minor ones on either side of it, are spaced evenly at nine different levels up the dome. These, as the early documents record, serve to "complete the circle" in the outer dome. This is because the outer shell, unlike the inner one, is not sufficiently thick to contain within it the hypothetical circular dome. Thus these arches span the corners of the octagon to approximate the circular lines of a true vault. They "round off" the eight corners, helping to transfer the thrust from the sides to the main ribs.



East end plan with footprint of drum.

As DiPasquale points out, a close look at a photo-

graph of the dome confirms its secret. Whereas the line where the base of the dome meets the drum describes the straight side of an octagon, the scalloped line where the dome and lantern meet follows the radial courses between each rib.

Thus, bringing to bear any existing knowledge about the static behavior of vaults to the situation of the Florentine cupola requires first being able to classify a structure that seems to be unclassifiable. Is it a circle or an octagon? Is it a "true vault" or a groin vault? There is little or no precedent on which to base any hypothesis, so structural analysis logically must precede from the monument itself.

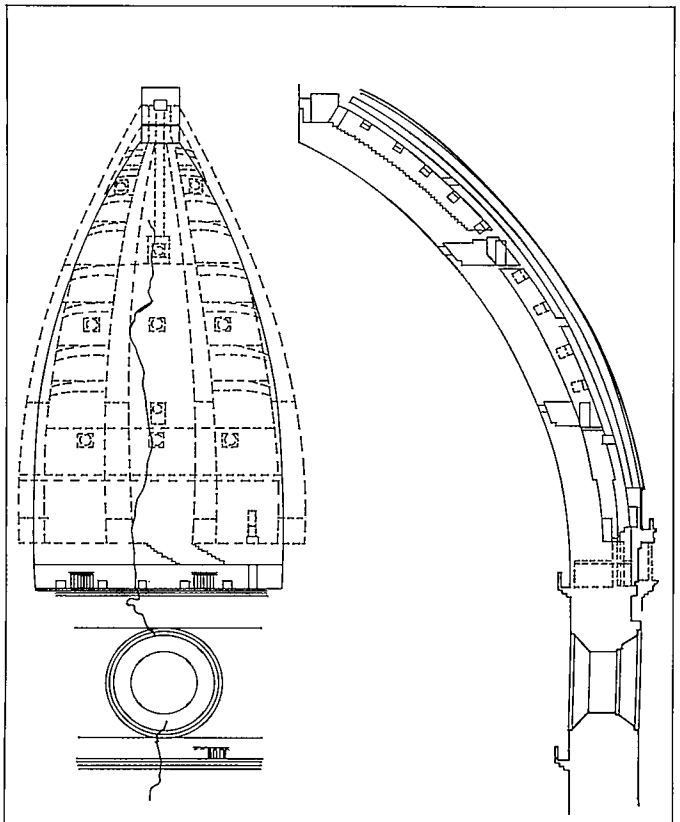
The principal lesions occur in the center of the sides, where the wall is thinnest and where, in an octagonal vault, there is the least support from the corner ribs. The sections where these large cracks occur are those where there is the greatest expanse of unbuttressed wall beneath the dome and the drum. That is, from three of the eight sides of the octagonal crossing radiate large, domed side chapels and from a fourth extend the high walls of the nave. On the remaining four sides are smaller semicircular blind chapels, or "aediculae," that Brunelleschi added after the dome was built.

Thus, the worst cracks occur in the sides with these aediculae, where there are no radiating chapels to absorb any of the thrust of the vault. It sometimes is speculated that Brunelleschi added the semicircular aediculae at a later date to buttress the walls below the drum at alternate sides of the octagon for precisely this reason.

In the past, the largest cracks have reached .08 to .12 inches in winter, their widest period. While they start in the center of the sides, they eventually begin to follow the lines of vertical bricks of the herringbone, presumably because these vertical bonds are less resistant to tensile or "hoop" stresses. Various types of encircling restraints have been suggested, similar to those recommended back in the 17th century, which would pass between the two shells to counteract the outward thrust. But none of these solutions has been seriously entertained. It is conceivable that counteracting one perceived thrust by creating an opposing one could have unlooked-for and undesirable consequences for the structure.

Professor Fondelli, rather than seeing an internal structural explanation for the fissures, suspects that their behavior is due to the movement of the ground below. He criticizes the current monitoring system because he says it measures only the movement of the building, without measuring shifts in the ground itself. He has found similar behavior in cracks in the baptistry that sits across the square from the cathedral. Fondelli notes in particular that seasonal changes in the level of the water table in the area could be responsible for a great deal of movement occurring throughout the structure.

The prognosis for the cupola is rendered at once more hopeful and more dire by the monument's notoriety. Given the intensely proprietary feelings it evokes among so many people—the citizens of Florence, the researchers whose careers have been spent studying it, and the international architectural community as a whole—it doesn't take long for any debate to reach volcanic intensity. Understandably, the reaction to this within the bureaucracy that has ultimate responsibility for the care of the country's architectural monuments has been for the most part to avoid any definitive action. This, however, gives rise to a quite legitimate fear that the present phase of "monitoring and studying" could continue indefinitely, and that it is not, at bottom, a search for data but a means of maintaining a neutral position in the face of acrimonious debate.



DiPasquale's drawing of typical section with fissures.

The only public intimation so far as to the results of the readings from the monitoring equipment has been an official statement that the cupola is still "breathing." This, of course, is not only uninformative, it further suggests that no formal analysis is being made from the instrument readings at all. This reinforces the impression that the installation of the monitoring equipment was offered as a placebo with the hope, on the part of the ministry, that the patient would be satisfied and go away. This is the growing suspicion now in Florence, where one of the members of the city council has made a formal request that some of the results of the monitoring project be made public. The director of the project was unavailable for any comment on the progress of the investigations.

To anyone who has followed the arguments of those who condemn the use of the concrete in the existing square holes to install the scaffolding, it is clear that to say that the cupola is still "breathing" begs the more pertinent question of "how much and more particularly how much as compared to measurements before 1980 and the advent of the concrete?" For, as Professor Fondelli wryly remarks, "A patient may be breathing, but that doesn't mean he isn't dying." □

[*Ed. note: For another account of the Dome, see Mario Salvadori's* Why Buildings Stand Up (New York: McGraw-Hill, 1980).]

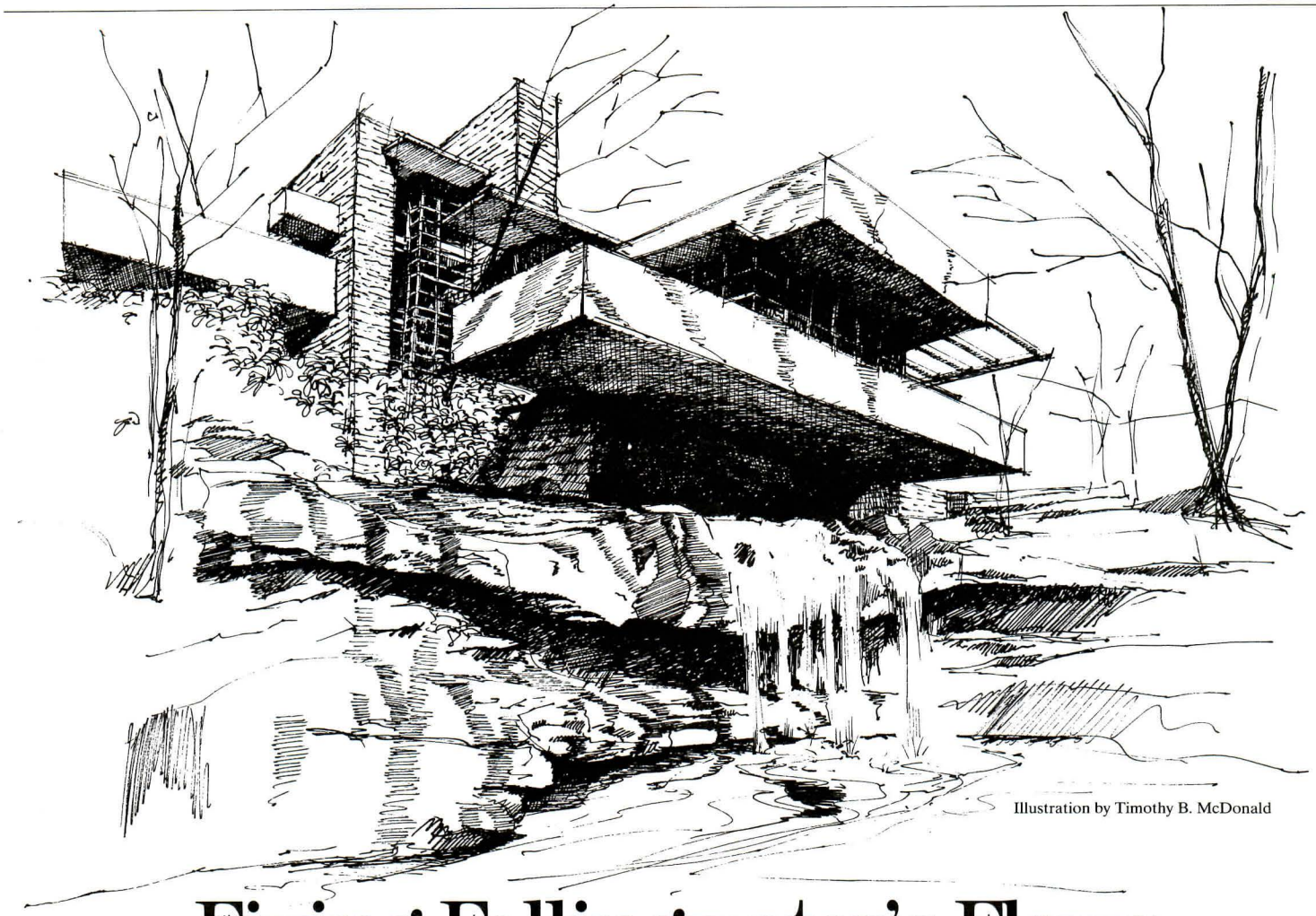


Illustration by Timothy B. McDonald

Fixing Fallingwater's Flaws

The leaks and deteriorating concrete. By Judith Donohue

Restoring a national landmark is a challenging and often intimidating task for an architect. How much more so when the landmark has been dubbed "the most famous house in the world"?

When Louis Astorino, AIA, Dennis Astorino, AIA, and their colleagues at L.D. Astorino Associates in Pittsburgh were commissioned to restore Fallingwater, Frank Lloyd Wright's residential masterpiece, they had mixed feelings. "Of course we were thrilled to have the opportunity to work on what many regard as Wright's greatest work, but there also was a sense of trepidation," says Dennis Astorino.

The firm was selected by the Western Pennsylvania Conservancy to repair structural defects caused by leaks that have plagued the house for decades and to design the proper roof replacements to correct those leaks. The Conservancy has operated Fallingwater since 1963, when the Kaufmann family of Pittsburgh donated their woodland retreat to a public trust.

Nestled deep in Pennsylvania's Laurel Highlands, on a 3,000-acre tract thick with ancient oaks, maples, hemlocks, and giant rhododendrons, Fallingwater is a woodland wonder. Perched on giant boulders, it seems to grow out of the outcrop of rock and float in mid-air over the roaring Bear Run waterfall.

"It is an incredible blending of stone, glass, wood, and concrete," says Dennis Astorino, whose fascination with the Wright house began in 1969 when he visited Fallingwater on a high school trip. "Every element had be tied together to create a uniform structure—a structure that is truly one with its environment."

Built in 1936 at a cost of $140,000—$100,000 more than initially planned—Fallingwater is a relative youngster as historic landmarks go. And unlike most landmarks, it was immediately recognized and preserved as a national treasure, not only because of its dramatic design but also because it helped rekindle Wright's declining career. Like a Phoenix rising out of its ashes, Wright, by then in his seventies, went on to create some of his most exciting and dramatic buildings, including the Guggenheim Museum, Pfeiffer Chapel on the campus of Southern Florida University in Lakeland, and his first Usonian home, the Jacobs House in Madison, Wis.

Fallingwater was constructed on three planes, with the lower level rising up from the stream bed on four stone and concrete pillars that Wright called "bolsters." The second sits on concrete

Ms. Donohue, with 20 years experience as a freelance writer and newspaper reporter, is based in McMurray, Pa., and is a regular contributor to business, trade, and technical publications.

Photographs courtesy of L.D. Astorino

beams and the third is a cantilevered slab supported by a large reinforced concrete beam on its long axis and a series of transverse beams on its short axis. The main beam is anchored into the huge chimney mass, the lesser ones to a nearby boulder.

The house probably is Wright's most dramatic use of the cantilever. Ignoring the advice of engineers and contractors, he designed terraces with two-thirds of the span unsupported. The effect is a startling series of horizontal concrete slashes jutting out of the rock into the Appalachian wilderness. The planes are connected at different levels, with interesting, sometimes whimsical staircases, bridges, and passageways. The south wall facing the view is almost entirely glass, while the north walls are hewn of rough sandstone. Fallingwater is a brilliant adaption of materials to topography, but the same materials and topography that make the house an architectural triumph have created significant problems.

The owners of the house have been correcting flaws at Fallingwater since it was built. The defects fall into two major categories: those relating to the deteriorating concrete slabs and those resulting from leaks and accumulation of water.

Today, architects and contractors who build with cantilevers anticipate some deflection due to settling and to changes in weather. Wright, or his contractor, apparently did not anticipate the inevitable movement that would occur. At Fallingwater the problem was exacerbated by the fact that the main floor beams were overloaded with extra-heavy reinforcing rods, and possibly by the fact that heavy bags of cement had been piled on the upper level during construction (reportedly over the objections of Wright's representative).

Two major cracks in the east and west parapets of the main bedroom terrace occurred almost immediately after construction was completed and still cause problems some 50 years later. "Unfortunately, construction technology has not advanced to a degree where those cracks can be completely patched and sealed without the end products being visually unacceptable," says Dennis Astorino.

Two cantilevered overhangs have failed: the roof over the eastern terrace, due to incorrect placement of reinforcing rods, and a trellis over a corner of the living room, because a heavy tree fell on it during a storm. Both have been replaced.

The slight but constant shifting of the slabs has opened up cracks and strained the flashing on the building joints. To date, the architects have uncovered and repaired 18 leaks and their work still is not done. But leaks are a given in any Wright house. Indeed, the architect has been notorious not only for his leaks but also for his flippant dismissal of client complaints. He reportedly asserted that, "If the roof doesn't leak, the architect hasn't been creative enough." His stock response to clients who complained of leaking roofs was, "That's how you can tell it's a roof."

Probably the most famous "leak" anecdote involved Herbert Johnson of Johnson's Wax, who commissioned Wright to build a sumptuous country house in Wisconsin at about the same time

Photos on the facing page show various areas where repairs have been undertaken. The photos on the far left show the damaged trellis over the driveway. Upper right photo indicates the typical condition of moisture-damaged brick in the bedrooms. Lower right, the flagstones on the terrace were removed, a rubber roof was installed, and then the stones were put back into place.

This page, right, Wright's 1935 shop drawings for the window fabrication had been retained by the supplier, Hope Architectural Products. Although lacking the amount of detail normally specified today, they were helpful to Astorino's reconstructions.

as Fallingwater. Johnson reportedly called Wright during Thanksgiving dinner to complain that the skylight was leaking onto the dining room table. Wright's cavalier response: "Move the table!"

Most of the damage at Fallingwater has resulted from buildup of water on the roofs and terraces and seepage at the key junctures of the structure. (Wright avoided the use of gutters and downspouts, as well as screens and storm windows, viewing them as eyesores that interfered with a house's free-flowing lines.) Terraces have simple holes, two to four inches in diameter, to carry runoff water back into the stream below. But these holes have not done the job, and water has accumulated within the substructure, sometimes rotting the substructure and insulation beneath.

"The challenge is to correct the leaks without making any discernible changes to the structure," says Dennis Astorino. "If this were not Fallingwater, we would have used all the latest techniques and technologies available to repair the roofs and protect them against future leaking. But because we are dealing with a national landmark, and because we don't want to compromise a single detail in Wright's plan, we are limited in our approach. We go as far as we can with today's technology, stopping at the point where we might interfere esthetically with Wright's intention."

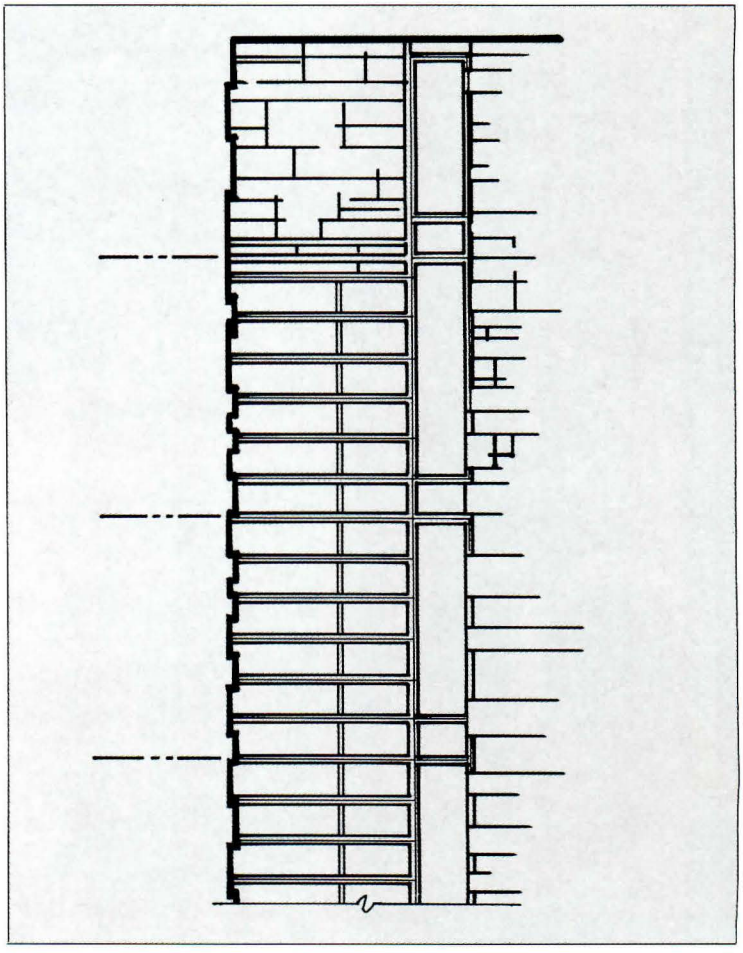
For example, in repairing the roofs, the architects topped their materials at the same point that Wright did, even though the exposed concrete below could eventually suffer the same water penetration as it has before.

To correct the terrace drainage problems, hundreds of stones from the seven terraces were removed by hand, numbered, and set aside. A rubber membrane was then installed over the existing wood subdeck and the original stones (quarried from the site more than 50 years ago) were replaced. Corroded flashings at the juncture of each exterior wall and fireplace were replaced with lead.

Leaks around the windows were especially difficult to locate and repair, particularly around the famous three-story corner windows. Built with horizontal frames and without corner posts, the windows can be opened to allow an extraordinary unobstructed view through the glass corner wall. "Because there were no detailed drawings of the windows, we had to work backwards," recalls architect William W. Hartlep, a vice president with Astorino. "We took them apart piece by piece to learn how to repair them, and then put them back together, replacing the defective pieces."

Fortunately, Hope's Architectural Products, the original window supplier, still has their 1935 fabrication drawings for Fallingwater. New replacement frame sections, glazing beads, and thresholds were able to be reproduced from the original details.

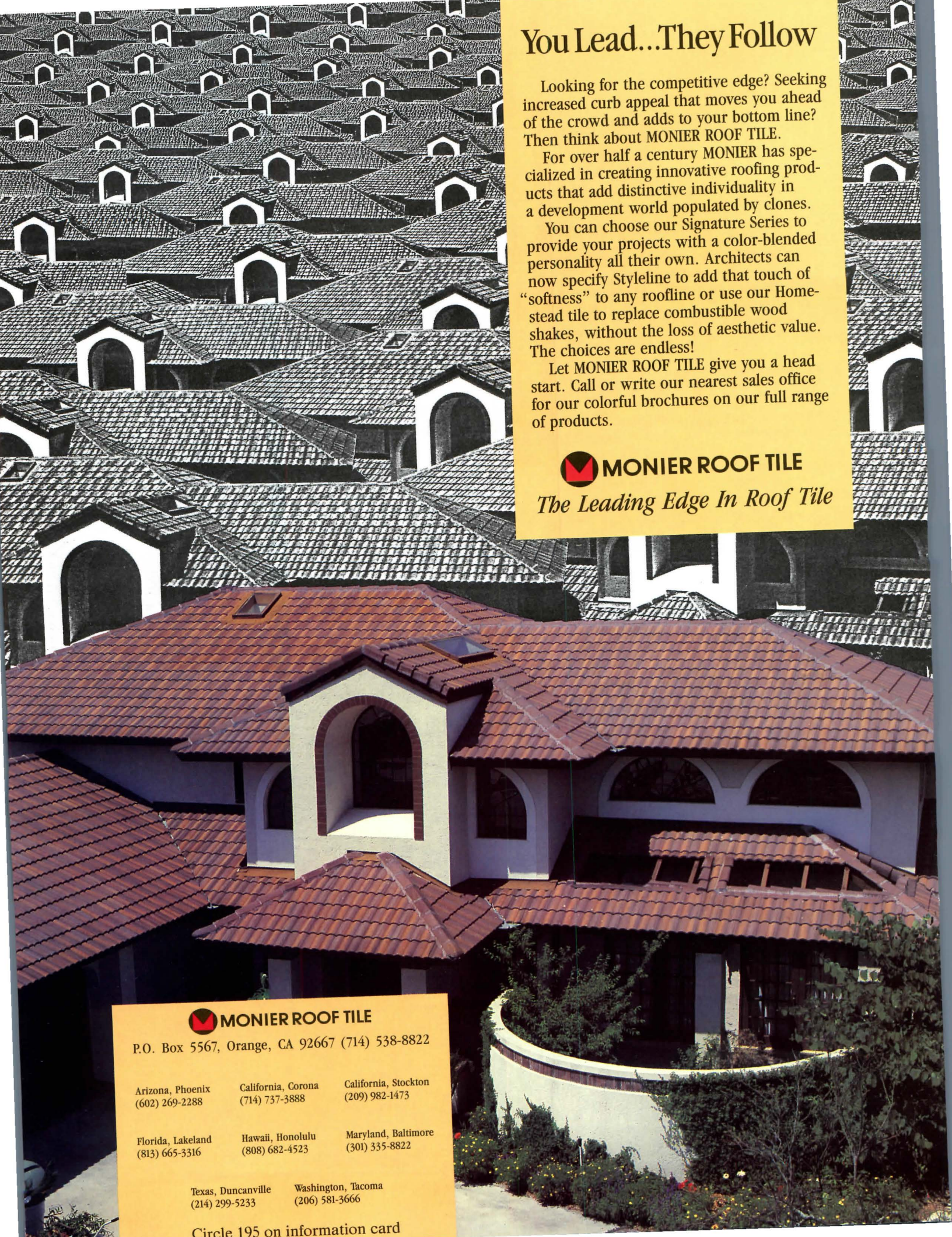
Recognizing the importance of having accurate records for future renovations, the Conservancy commissioned the Astorino firm to create the first measured drawings of Fallingwater. "It's not that Wright left inadequate drawings," says Hartlep. "But his drawings do not have the level of detail that we include today."



Also, it was characteristic of Wright to alter plans in midstream without recording the changes on the drawings. "There were some surprises," says Dennis Astorino. For example, the original drawings show a connecting hall and staircase one level higher than they actually were built.

Despite the sketchy drawings, the final product is a brilliant meshing of thousands of perfectly interwoven details, inside and out. Wright brought the outdoors in with his bold use of natural elements and spectacular views that bring sky, water, and greenery into every room. The focal point of the home is an enormous stone hearth in the living room, which is actually the top of a rock that the Kaufmanns had once used for sunbathing. In this, and other clever features (including stone floors waxed to resemble a wet stream bed and a glass hatchway leading from the living room into the stream) he created an integrated outdoor feeling. "It's like a giant Rubik's Cube," says Hartlep. "It seems complicated at first, but after a little study, you see that it all fits together perfectly."

Despite its extensive repairs, Fallingwater will never be perfect, Dennis Astorino says. "Because of the unusual topography, the nature of the waterfall, the texture and composition of the materials, and the erratic climate of the Pennsylvania highlands, there always will be changes at Fallingwater. Our goal it to preserve Fallingwater as its owner and its creator intended, so that many more generations will be able to experience and appreciate the genius of Frank Lloyd Wright." □



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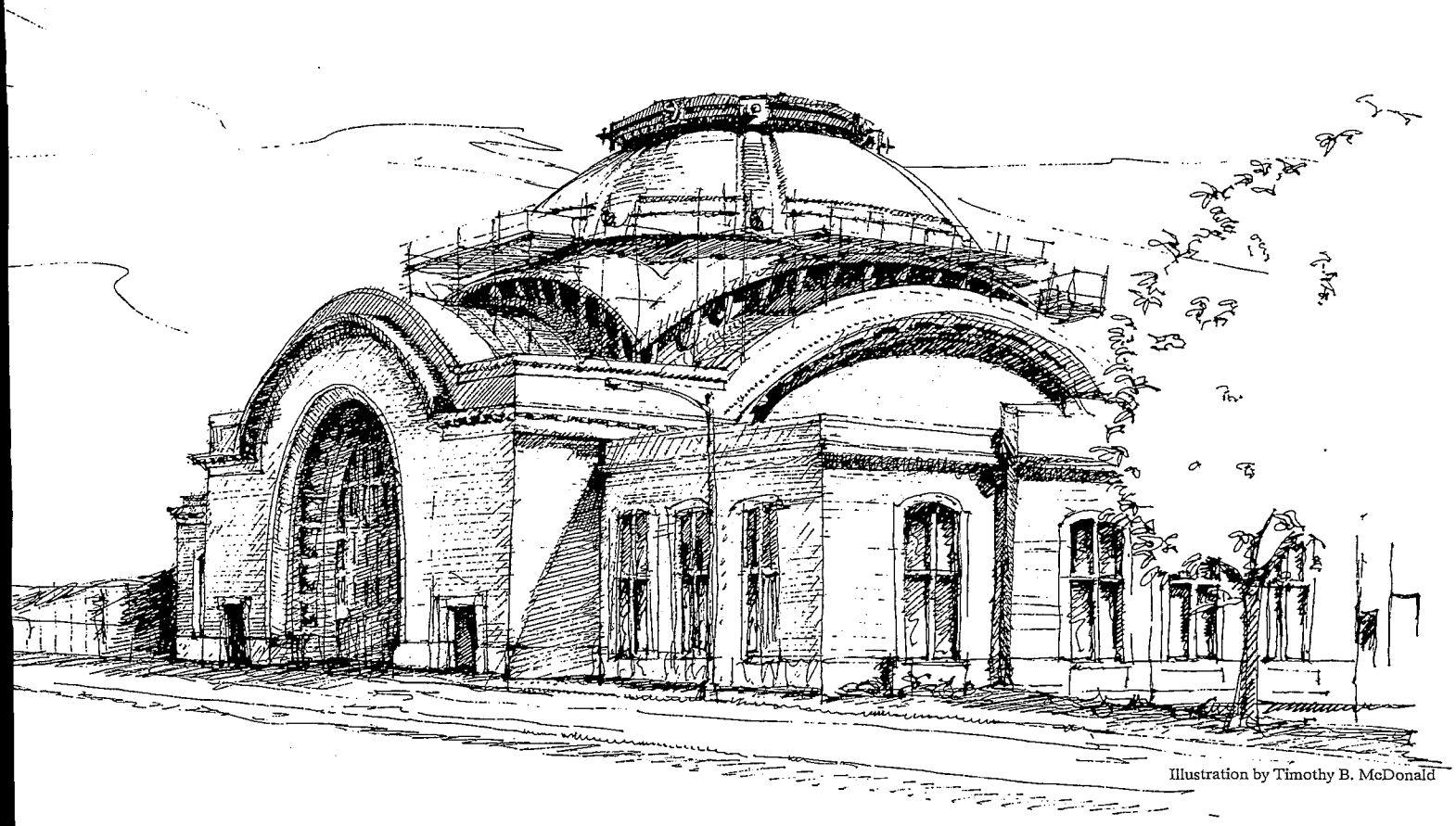


Illustration by Timothy B. McDonald

'Everything That Can Go Wrong'

Repairing Tacoma's Union Station roof. By Valerie Sivinski and Lisa Barry

A Magnificent Monument, But the Roof Leaks," proclaimed a Tacoma, Wash. newspaper headline on Jan. 19, 1981. The accompanying article explained why Amtrak had decided to relocate from its historic Union Station train depot in downtown Tacoma.

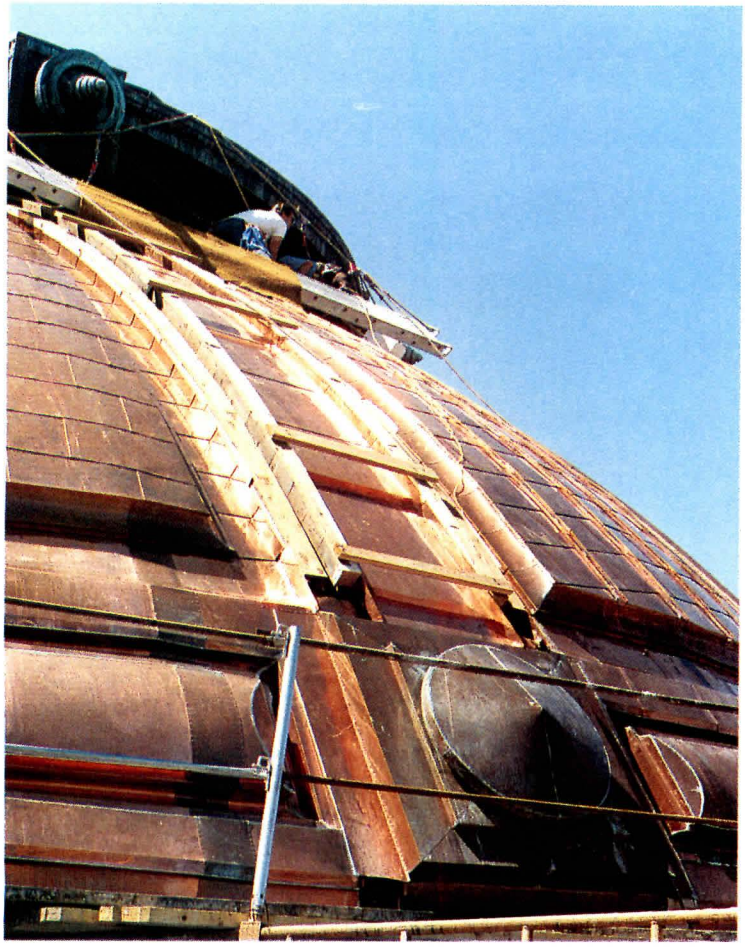
These were no ordinary leaks, because the station has no ordinary roof: it is topped by a copper-clad dome that rises 123 feet above street level. Every time it rained, workers hauled buckets of water up and down from the catwalk between the roof deck and the coffered plaster ceiling inside. Amtrak officials had had enough. Not long after the newspaper article appeared, the last railway workers at Tacoma Union Station boarded up the windows, locked the doors, and abandoned the striking, but quickly decaying, train depot for smaller, less expensive quarters. The depot went up for sale, and the City of Tacoma bought it for $1.

In 1987 and 1988, the architectural team of Merritt + Pardini Architects and TRA directed a series of design workshops with representatives of the City of Tacoma, the U. S. federal courts, and the Washington State Historical Society to devise a mutually acceptable restoration concept. The courts and the museum agreed to share the central rotunda as a "grand entrance" and to build themselves separate wings at opposite ends of the building. This arrangement pleased the city, because it assured public access to the historic station.

The potential effects of the project are difficult to overstate. The old depot is at the heart of a historic warehouse district in downtown Tacoma. Although revitalization of the district is under way, the return of the station to functional use undoubtedly will spur development. Union Station also is the first building motorists see when they approach the city center via the freeway. Downtown businesses, sensitive to the city's poor image after the economic depression that struck the region in the mid-1970s, understandably are pleased that the station's metamorphosis will provide the city with an impressive new gateway. A pedestrian walkway may one day connect the station site with the City Waterway, where planners foresee mixed use development.

In February of this year, construction workers began the tedious and costly effort of returning Union Station to its original elegance. Exterior restoration work is expected to continue through January of 1990 and to cost just under $2.5 million. Interior restoration

Ms. Sivinski, a preservation architect, is Merritt + Pardini's project manager for the Tacoma Union Station project, and Ms. Barry is the firm's marketing coordinator.



Photographs by Jeff Ryan

Left, rebuilding the copper ladders ascending the dome.

and the addition for the new courts complex are in schematic design, and the entire project is estimated to cost $28 million.

For the architects in charge of the station's restoration, the dome repair has been a study in practically everything that can go wrong with a metal roof. Specialists under the direction of Merritt + Pardini/TRA spent more than a year developing the restoration plan. Jim Merritt and Lee Pardini, of Merritt + Pardini Architects of Tacoma, are commanding the entire effort; Jerome Ernst and Gary Schaefer of TRA, a Seattle-based architecture and engineering firm, will take the lead on the new courts additions.

Tacoma's Union Station was designed by Reed & Stem of St. Paul, Minn., an architecture firm both nationally prominent and remarkably prolific. In 1911, the year the station was completed, Reed & Stem referred to the station's style as "Modern French Renaissance," but architects today generally term it Beaux Arts.

The station occupies three levels, with a total of 86,500 square feet. The central rotunda is 105 feet across and rises 60 feet above the main floor. (Despite the rotunda's immense volume, the hall's acoustics allowed the stationmaster to announce trains without raising his voice.) Wings flanked the central building on three sides; the east wing, which housed the concourse, was removed in 1984. The superstructure originally contained 1 million common and 144,000 face brick; at the time of its construction, the 42-foot arch over the main entrance was one of the largest of its type in the United States. More than 500,000 cubic yards of soil were excavated from the site to allow the station's lower floors to rest below street level. Coffered plaster ceilings, eight-foot-high marble wainscoting, terrazzo floors, ornamental iron work, and electric lights dazzled the travelers who passed through.

The original domed roof consisted of flat, 16-ounce copper sheets nailed to a two-inch-thick, ship-lap wood deck with a paper slip sheet separating the two layers. This copper sheathing was intended to be waterproof.

A web of steel trusses supports the dome, which rests on four barrel vaults that form a square. Although the dome appears to be circular, it is in fact polygonal; the wood deck spanning the vertical trusses is flat. The dome also is slightly elliptical in plan, and its crown is a little off center. It may be that the framework was erected inaccurately, or perhaps the irregularity results from one of the two earthquakes experienced since 1911. Whatever the cause, this discrepancy made it difficult to reposition the ornamentation accurately.

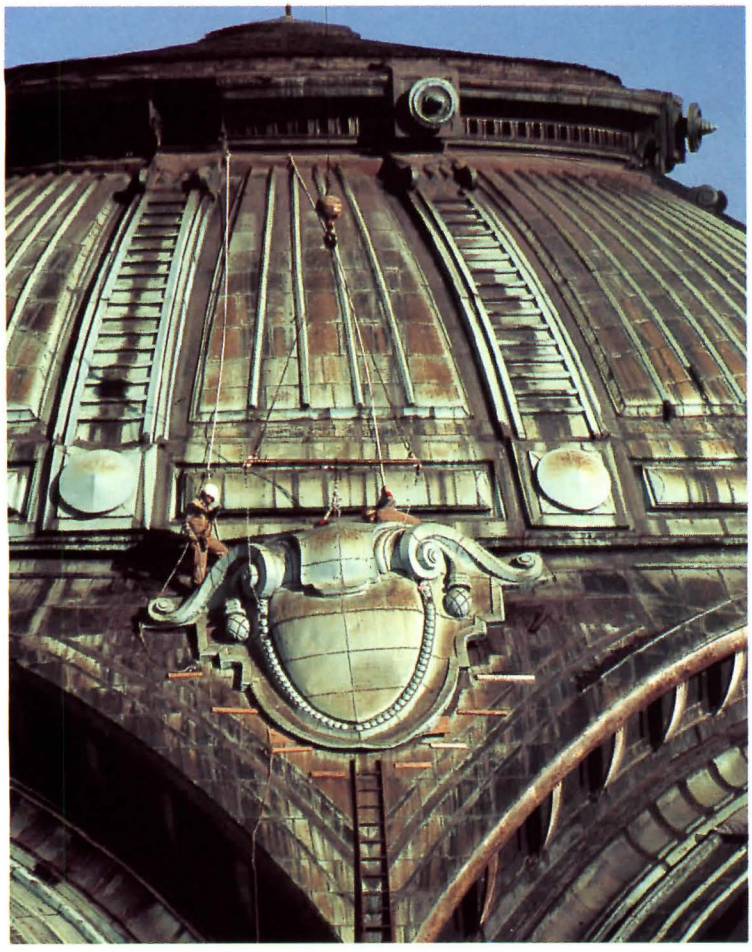
Arched skylights over the barrel vaults helped make the interior a light, airy space. A steel and copper skylight, 37 feet in diameter, originally surmounted the dome and bathed the interior rotunda, with its magnificent coffered plaster ceiling, in natural daylight. A three-foot-tall decorative copper crown enclosed the skylight's steel support frame and disguised a series of ventilator openings along its perimeter. Decorative copper caps were attached to the crown with steel wire.

The smooth sheathing of the dome's copper was broken by an assortment of three-dimensional ornaments, most of them constructed from sheets of 16-ounce copper. Vertical battens radiated downward from the crown. The dome was divided into eight sections by ribbed, ladder-like strips that end in circular medallions. On each of the dome's pendentives was mounted a huge copper cartouche. Both medallions and cartouches were fabricated from 16-ounce copper, crimped to make it more rigid. The accordion effect created by crimping also increased the copper's ability to expand and contract with changing temperature.

The copper-clad domed roof, although elegant and impressively massive, did not work. The skylight leaked from the start, and repair crews were forced to board it over shortly after the station opened. Moreover, the copper sheathing proved not to be waterproof at all. Poorly detailed or constructed joints between the copper panels were an unending source of trouble. Some joints were simple overlaps, a construction that does not perform in areas with insufficient pitch (e.g., near the top of the dome or barrel vaults), and allowed water to seep through the seams. Inadequate seam overlap, in some cases only an eighth of an inch, made the problem worse.

The flat copper panels were folded along the edge to create hooked joints. Such joints typically perform well, but the inadequate overlap caused these too to fail. Solder joints—particularly common on the copper ornaments—did not fare much better, as the solder was more rigid than copper and broke with the stress of weather and temperature changes. None of the butt and overlap joints of the ornamentation was strengthened with backing angles. Water also penetrated the copper roof panels along the battens, both structural and decorative.

The false battens of the dome were created by nailing wood strips through the roofing into the deck and covering them with pitched copper covers. The wood strips and their covers were attached with steel nails, which eventually corroded through galvanic action. With no seal between the covers and the copper roofing below, water seeped freely into the battens, which promptly



Left, an original cartouche, constructed of 16-ounce copper, crimped to improve its rigidity.

rotted, and went through nail punctures into the wood deck.

The barrel vaults were roofed with functional battens, with a long, copper cover installed over each batten. There was no mechanical joint connecting the cover and the roof panels; instead, batten covers were nailed through the turned-up edges of the roof pans and into the sides of the wood battens. The contrasting lengths of roof panels and batten covers created a significant differential in expansion. Rigid attachment of the long batten covers to the wood strips they were supposed to protect reduced flexibility and increased stress.

Steel fasteners and structural members combined with copper roofing also added to the problem because the two metals interact strongly in the presence of water. Copper, the nobler of the two metals, suffers no damage from the combination; steel, however, corrodes more rapidly in the presence of copper. Wherever steel fasteners attached copper panels, for example on batten covers, their corrosion led to the connection's failure and made water penetration even more likely. Moreover, some products of the copper's patina are water-soluble, and when they were released into runoff water they caused galvanic corrosion in steel members not direcly in contact with the copper panels.

The dome's design channeled runoff toward four drains, one set in a section of flat roof at each of the building's corners. The roof's designers placed a decorative steel splash at each corner to break the force of the water pummeling the flat roof areas. By 1989, however, there was not enough left of the steel splashes to salvage. The roof's steel frame was partially exposed at these points, and, because its paint film failed, the copper-laden roof water caused severe corrosion.

Galvanic action contributed to other areas of failure as well. Deterioration of the skylight's steel frame was exacerbated by runoff from the copper cap at its center. Inside the crown, steel wires that held the decorative vent covers in place corroded away and left the huge copper decorations hanging. One was entirely lost in a storm; the rest show damage from rough weather.

Our fine feathered friends also have been hard on the roof. Pigeons found the crown's dome a comfortable and safe nesting ground, but their droppings are both corrosive and unsanitary, and their combined weight damaged parts of the fragile copper decorations. And, once the vent cover had fallen, pigeons found easy access to the space between the exterior dome and the interior coffered ceiling. The resulting pigeon excrement deposits were as much as 4 1/2 feet deep in some places. When sections of the ceiling eventually collapsed from water seepage, the pigeons were left free to roam the abandoned station.

Of course, the roof failures occurred over time, and continued in spite of the best attempts of the railroad repair crews. However, weakness inherent in the original installation made repair of the copper itself virtually impossible. Dozens of asphalt patches secured temporary (if highly unesthetic) relief from water penetration. But the asphalt hardened and eventually broke, and some areas were repatched several times.

Ironically, this patching may have caused more harm than good. The sheet-metal workers who are restoring the roof compare the copper dome to an eggshell; rigid but fragile. The original roofers intended the copper sheath to be waterproof and never anticipated that workers would scale it regularly to make repairs. Consequently, they didn't make it strong enough to resist foot traffic, and workers repairing a leak occasionally damaged surrounding sections and made the problem worse.

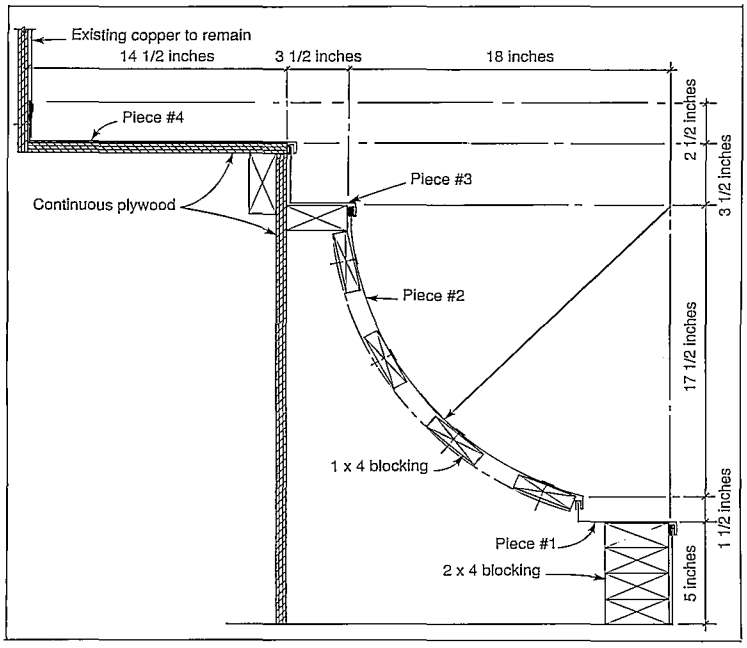
The rotunda's coffered plaster ceiling showed considerable water damage when restoration began. Other portions of plaster ceiling, especially beneath the barrel vaults, have collapsed completely, breaking marble counter tops and porcelain fixtures below.

Three major goals directed the exterior restoration project. The roof obviously had to be functional; the city's seismic code required that the dome and vaults be strengthened; and the Landmarks Preservation Commission wanted the roof to retain its historic integrity. The architects concluded that the only way to meet all three requirements was to start over. They decided to remove and replace the bulk of the smooth copper sheathing and to salvage the ornamental pieces that had survived.

Compilation of construction documents took nearly a year. Architects, engineers, and roofing specialists, outfitted in rock-climbing gear, made a complete survey of the dome—photographing, measuring, and sketching pertinent details and noting typical sources of failure to ensure their resolution in the new roof.

The Union Station project also faced its share of natural interference. Start-up was delayed by a blast of arctic weather that pushed down into the Pacific Northwest early in February. Workers were hampered by high winds, bitter cold, and falling snow, all relatively uncommon in Tacoma.

When the cold weather let up in mid-February, workers removed the flat sheathing and the decorative elements and began repairing and replacing damaged portions of the wood deck. As



expected, the flattest areas of the roof, the upper levels of the dome, and the barrel vaults were in the worst condition. The design team had estimated that no more that 10 percent of the deck would require replacement; this estimate proved far too optimistic. The deck of the dome itself required little replacement, but one barrel had to be redecked completely. Diagonal panels of 3/8-inch plywood, nailed at 10 inches on center, provided the roof's seismic reinforcement.

The new copper sheath was designed and detailed to be more watertight than its predecessor. As a second line of defense, however, the architects opted to install a waterproof membrane of rubberized asphalt between the copper sheath and the wood deck. Not only is this membrane impermeable to water, it also "heals" around penetrations.

Installation didn't progress as smoothly as hoped. The contractor's workers, unfamiliar with the particular type of underlayment specified, applied a sizable area with the peel-off liner still attached. Then an unexpected dose of summer sun raised heat blisters on the membrane. The blisters subsided—apparently without damage—along with the unusually sunny weather.

The roof's detailing was altered significantly. A slip sheet was inserted between the sticky rubberized membrane and the new copper sheathing; overlap joints in areas with a slope of less than one-in-three were soldered; all seams were detailed to be watertight without sealant; mechanical joints were specified wherever possible; and upward-opening joints were minimized. The dome's compound curves complicated detailing—not all joints for compound curves can be fabricated from sheet metal. Any modified joints that seemed vulnerable to water penetration were soldered.

The architects were especially sensitive to the dangers of galvanic action, having witnessed its destructiveness firsthand. Non-copper elements were removed wherever possible, and epoxy paint or an underlayment were used where contact between incompatible metals was unavoidable. The dangers of water-borne copper also were resolved as much as possible; epoxy paint will protect the roof's steel supports from water runoff, and, because the replacement skylight has an aluminum frame, its center cap also will be of aluminum.

In the interest of preserving the dome's historical appearance, initial plans called for restoring the surviving ornamentation and fabricating necessary replacement pieces from 24-ounce copper to match the existing decorations. The four cartouches and the central crown have been restored, but fewer pieces than expected have proved to be salvageable.

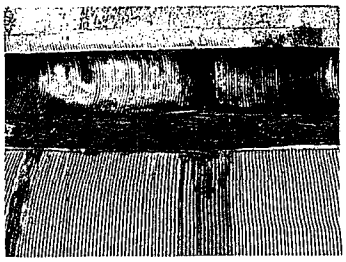
One disappointment concerned the series of copper "ladders" that curved up the dome, which the architects had hoped to restore by resoldering the joints and attaching small pieces of copper (soldered from behind) to fill the holes. But the ladders were too severely damaged, and their detailing was such that continued deterioration was inevitable. Early repairs on the ladders had included hammering down the center of each step to drain the rainwater that tended to collect there, especially near the top of the dome where the ladders sloped inward. In addition, the rigidity of the many soldered joints had caused the copper to tear in even more places than the surveyors had realized.

Replacement ladders have been designed to be more resistant to traffic and to leaking. The new steps are supported by a treated plywood base to prevent heavy feet crushing the form. A slight design modification tips the uppermost steps forward to provide drainage. Each step is bent from a single sheet of copper that is clipped (not soldered) to the next. A continuous metal pan runs beneath each ladder from the crown of the dome to its foot, providing a leakproof base for the entire series of steps.

The medallions, one below each ladder, also had to be replaced. As the new copper roofing went up, it became apparent that the simple round shields surrounded by a broad field of brilliant reddish copper would look like big green polka dots. New medallions were fabricated to match the new roofing.

The historic aspect that has generated more public comment than any other is the dome's soft green patina. As construction start-up approached, concerned citizens expressed a fondness for the station's weathered beauty and urged the city to preserve the patina or to re-create it in the new copper. But because the copper roofing industry has yet to discover a foolproof, long-term means of artificial patination, the city, acting on the advice of the architects, decided to let nature handle the task.

Below, galvanic corrosion from steel nails in contact with copper; bottom, water damage.



As soon as the new copper panels began to appear on the roof, however, a contingent of less historical-minded citizens proclaimed their preference for the scintillating beauty of the new copper. Since the industry also has yet to discover an effective means of preventing patination, the city, again on the advice of the architects, stuck by its decision to let nature weather the copper naturally in its own time.

Neither side of the controversy is likely to be satisfied for some time. The brilliance of the coppery red has already tarnished to a dull brown, but the green patina won't be noticeable for several years. □

How CADD Helped Restorations

Documentation and design for a California town. By Thomas K. Butt, AIA

Courtesy of Interactive Resources, Inc.

Photos new and old, such as this 1920s view down Montgomery St., provide key data for computer-aided Oroville restoration.

When our firm faced the prospect of restoring a historic district within a small California town, one of our early questions was where our CADD system might be more helpful. We decided to try one of the more labor-intensive opportunities for automation, the tedious task of creating measured drawings.

Although we found that creating simple elevations to scale from site photographs takes just about the same amount of time on the computer as the process would have manually, we serendipitously discovered a major time savings—using the computer for phase scheduling. With CADD, we were able to organize our project data in a way that allowed us to follow each component of each building through the client's three planned phases of renovation.

California's Gold Rush communities in the foothills of the Sierra Nevada Mountains have retained many buildings from the mid- and late -19th Century. Predictably, many of these buildings have suffered from "modernization" over the decades.

A few years ago the Redevelopment Agency of Oroville, population 10,500, 160 miles northeast of San Francisco, recognized an opportunity to renovate the town's historic commercial district. The district's 15 buildings, now mostly vacant, were placed on the National Register in 1981. The agency believed that renovation would attract tourists and rejuvenate commercial activity in the depressed section of town. The city took the opportunity, at the same time, to improve sidewalks, streets, street plantings, and lighting in the area.

Built between 1856 and 1900, the district provides an excellent example of Gold Rush storefronts, although it is apparent that over the years the buildings had been remodeled with little regard to their original style. Fortunately, however, research uncovered

Mr. Butt is president of Interactive Resources Inc.

Related building elements are grouped in layers. Recopying all layers for each phase of restoration helps team track changes.

photographs documenting the early appearance of the facades and formed the basis for the restoration.

The Redevelopment Agency hired Interactive Resources, Inc., a 60-person architecture and engineering firm in Richmond, Calif., to develop a three-phase restoration program for the 15 buildings in the district. The phases respond to limitations on local and state funding for construction. Funding from the California Office of Historic Preservation has been approved for Phase I, which consists of removing inaccurate or inappropriate additions to facades; reconstructing historic elements such as window ledges, doorways, inset moldings, cornices, and other decorative trim; installing mechanical hardware for canvas awnings; and repainting the buildings with historically accurate colors. In addition, two buildings require complete structural renovation.

The subsequent phase, to be implemented as funding becomes available, will include replacement of structural elements as well as the original turrets, and the reconstruction of major parapets and elaborate cornices. A final phase will consist of adding awnings to unify all 15 buildings.

We decided to use computers for the development of all plans for this project because of its complexity and the large volume of repetitive information required to produce construction drawings for 15 storefronts. We used Cadvance software and IBM-compatible desktop computers linked by a network to a central printing, storage, and plotting system, both to document the existing buildings and develop a preservation program. Although we've recently added 3-D capability on our system, we used 2-D exclusively on this project and concentrated on developing facade elevations.

To document the existing conditions and develop a basis for restoration, we used relatively simple and labor-intensive CADD technology to transfer photographs into the computer. At the initial site visit the design team measured the buildings as extensively and carefully as we normally would (as a supplement and backup to the CADD data base we would later develop), and took two sets of photos, recording both the specific store fronts and the overall facade of the buildings.

We shot one set of photographs with a perspective-correcting lens, to get as flat an image as possible, and shot another set with a 55 mm lens. Both sets of photos were taken from an identical station across the street from each building. The composite set of photos illustrated the relationship of the buildings to one another and their relative scale.

Back in the office, team members commenced with what turned out to be a rather time-consuming process of transferring photographs to the CADD screen. Using the tip of an electronic stylus, they traced the outlines and prominent profiles of the buildings from photos directly onto a computer file. After each data entry, the architects confirmed the accuracy of their drawings by a system of check measures and notes taken in the field. They made corrective adjustments and added further details to each drawing.

Although seemingly rapid and convenient, digitizing from a photo of an existing building does not permit precise recording due to slight variations in photos. As it turned out, checking the precision of the photo tracings consumed the time that computerized tracing saved. On the Oroville project, the time required to record one structure ranged from two hours for a simple, unadorned facade to 15 hours for a facade with ornate details. Once project data was stored in the computer's memory, however, we found that organizing and revising it was much simpler than with the more traditional hand-recorded methods.

After the Oroville photo digitizing had been completed, the architects catalogued all facade elements, organizing them by what was to be removed, replaced, or designed new. The design team began the restoration planning by creating a system of data layers within each computer drawing for each building facade. For example, all the window mullions for one building are addressed on one layer, all doors another, columns another, and so on. This project required us to identify more than 100 such layers.

With building elements (layers) identified by code or name, they could be added or removed in any combination and the changes readily documented. For example, for the facade of Gray Nurse Building, the architects documented existing conditions on the first 15 layers. They then duplicated those layers and used them to develop demolition drawings. This second set of 15 layers of demolition drawings then were duplicated, creating a third set, from which the dashed lines indicating elements to be demolished were removed easily. This third set, with the inappropriate elements removed, became the basis for developing the design drawings.

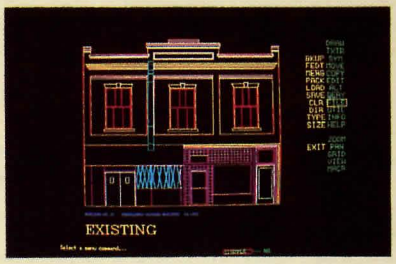
Similarly, as the design team created "new" design elements (again on appropriate layers), these elements were merged with specific drawings and moved or changed as needed. For example, the Oroville program calls for restoring or introducing awnings on all buildings as the final phase of restoration. Upon command, the "awning layer" can be combined with other design layers and called up onto the screen allowing for immediate test comparisons of one scheme to another on side-by-side terminals. A variety of design schemes was then output to a plotter for client presentation and review.

Repetition is the computer's forte, and we used that capability whenever we could. Although often rich in custom millwork and unusual details, historic preservation and renovation projects also include repetition. A cornice detail, such as a dentil, can be drawn once and repeated at intervals along the cornice. For the Oroville project, once an element such as an ornamental window detail was drawn, it was labeled and stored as a symbol. The CADD system then allowed the user to retrieve a symbol and place the symbol as needed, taking less time than it would have to repeat the same detail manually. And, of course, changes were made quickly to contract documents once the base drawings had been entered.

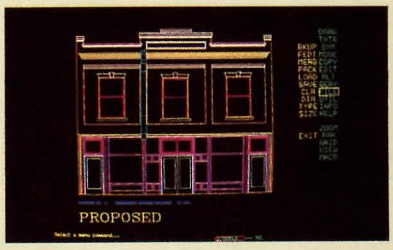
We recently acquired the capability with our CADD system to generate schedules of information by tying attributes to elements on the CADD drawing. Because it was rather new to our operators, we didn't use that data management function on the Oroville project. But it's likely we'll use it in future projects. Preservation projects and new design projects alike require data management — for example, schedules for elements such as finishes, doors, and windows; specifications for common procedures; and lists of manufacturers.

Our CADD program—like most—can assign any number of attributes to objects or groups of objects. In the future, we will use these features to generate schedules and data lists more quickly. We foresee being able to make major changes simply and with more confidence that the changes will appear correctly throughout the drawings. All materials, finishes, and paints can be stored within the attribute definitions and applied to, or moved from one to another of the restoration phases, as well as from building to building.

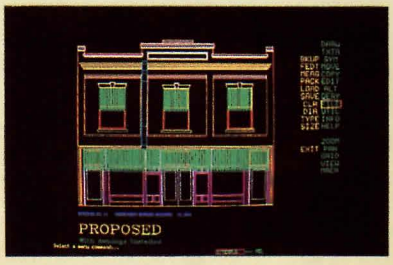
We also found our computers useful for applying large amounts of text to architectural drawings. Large amounts of text can be entered into a word processing program—we use WordPerfect—by someone not familiar with CADD. A utility program translates these WordPerfect files into the standard text file language, ASCII, which we import into our CADD files.



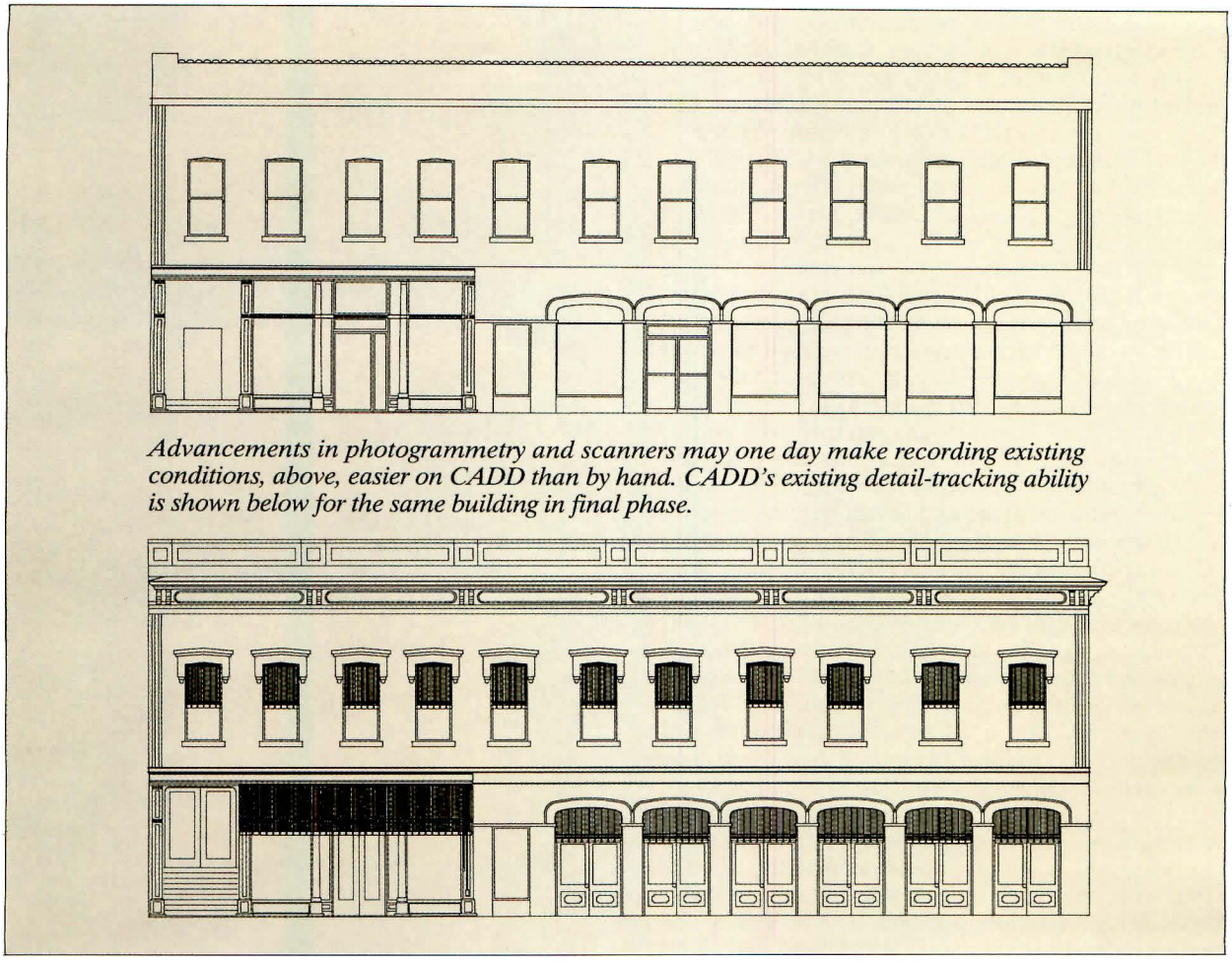
The design team collects site data for CADD storage.



Research indicates streetscape elements needing renovation.



Storing awnings on one layer isolates data for that phase.



Advancements in photogrammetry and scanners may one day make recording existing conditions, above, easier on CADD than by hand. CADD's existing detail-tracking ability is shown below for the same building in final phase.

Conversely, CADD architectural drawings can be translated into word processing programs to support the text in written reports describing the restoration program. For example, the historic structure report and other written documentation of the restoration program for the Oroville project included CADD-generated drawings that were merged into the word-processed text. This merge was accomplished by translating the Cadvance documents into the Autocad file translator language, DXF. We then translated the DXF file into WordPerfect Graphics Format and incorporated it into the text.

Ideally, document conversion will allow separately created word processing files to be readily incorporated with graphics, a useful step in historic structure reporting because drawings can be printed below the description and permit direct comparisons.

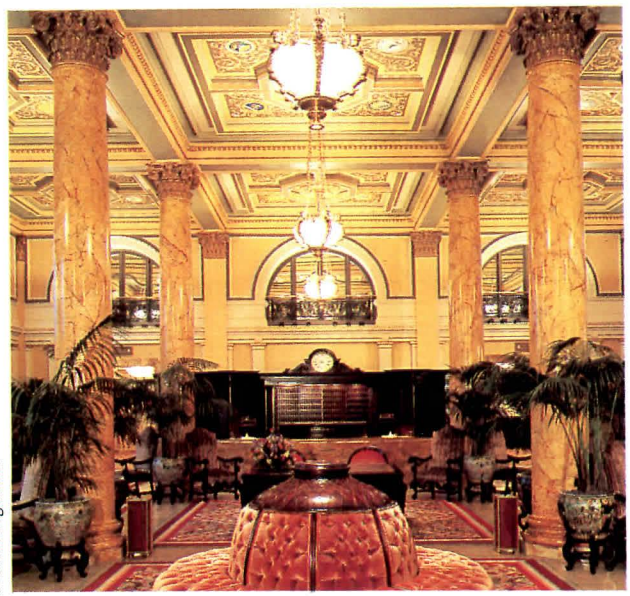
Clearly, CADD expedites repetitive drafting; what previously required additional drafting from scratch now can be accomplished by simply calling up an attribute or symbol. As of now, however, digitizing is an inefficient and comparatively inaccurate process. Though establishing scale is simple on a CADD system, some architects find the manual process of "drawing" lines with an electronic stylus to be tedious and time consuming.

Our firm anticipates that in the future a cost-effective scanning technology will replace the digitizing process. A scanner reads documents (as-built drawings or photographs, for example) directly into memory. A utility program quickly converts the document to electronic information. In the Oroville project, all photos of the buildings in present condition would have been transferred to memory in much less time (although we still would have had to correct the scanned CADD drawings using field measurements to compensate for photographic inaccuracies).

The main drawback to scanners is the expense. Even though prices are dropping, it will be a couple of years before scanners are both feasible and efficient for smaller architecture firms. Presently, outside scanning services are available. But since the fees are high, document conversion for our project would have cost about the same as our in-house digitizing procedure.

Eventually, we hope, computers will be linked to perform rectified photography, carrying scanning one step further. Not only will the computer input the necessary data, but it also will be able to evaluate depth and perspective as well as scale (unlike present-day scanning, which only works on a single plane).

The advent of such technology, including 3-D CADD, will not only expedite the work, but also will enable historic architects to produce more detailed and accurate restorations and reconstructions. For the time being, though, we're finding we can do quite well with what we can get affordably on today's market. □



Analyzing Old Paint

What restoration architects need to know.

By Timothy B. McDonald

Paint always has played a dual role as a finish material. When playing its practical part, it is the sacrificial coating that protects the substrate from its environment. Equally important is the esthetic part it plays in decoration.

Although most architectural offices, even those actively engaged in restoration, often are not equipped to do paint analysis work, they should be familiar with the process, know when a specialist is needed and what is included in the scope of work, and be able to explain the procedures to the client.

One useful source of information, developed by the North Atlantic Historic Preservation Center in Boston, is a set of guidelines the Center uses in gathering and recording paint samples for study. Although some of its techniques of "material science" go beyond the range required of most restoration projects, these guidelines are adaptable to many situations.

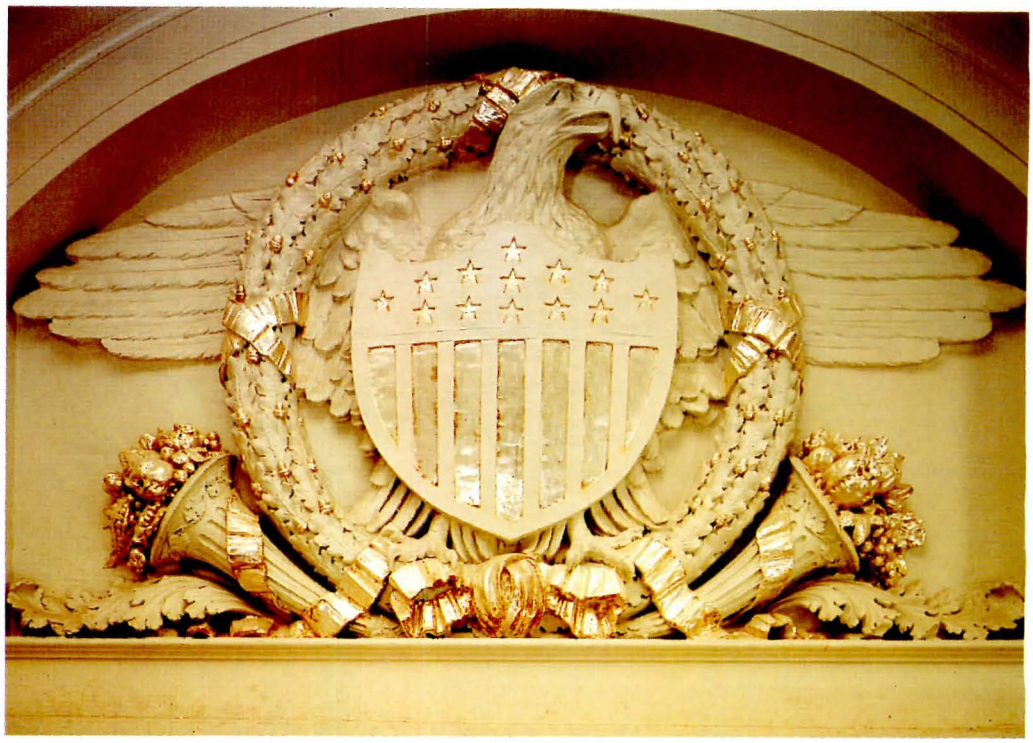
One of the three methods of gathering information for paint analysis is simply to scrape away successive layers of paint with a scalpel or x-acto knife, and is used when decorative layers are suspected. The second, and most accurate, method for determining paint composition extracts sections of the paint surface, along with portions of the substrate, for laboratory analysis. The final method, called cratering or surface polishing, involves cutting a craterlike cavity into the painted surface, exposing each layer in sequence. These three methods are not mutually exclusive, and one method should be used to confirm the findings of the others.

Determining where to take samples will depend on the scope of the project, the amount of decorative finishes suspected, and the necessity of obtaining a full sequence of samples. Whatever the scope of the sampling, care must be taken to protect the architectural fabric. Samples just few millimeters in length are long enough for initial analysis.

For a final restoration, it also is important to carefully examine the surface characteristics. Thus, a large area of the original surface may have to be exposed so that types of finishes, paints, and application processes can be determined. For instance, earlier painted surfaces were sometimes handrubbed with linseed oil, using pumice or rottenstone covered with a soft cloth to achieve a surface where brush marks are nonexistent. Often, a small laboratory sample is not large enough to determine whether the surface was indeed handrubbed. Instead, analysts shine a raking light over a large area of newly exposed surface.

A record of the substrate's present condition can be a valuable clue to its original condition. For example, if the wood substrate appears weathered, it may have been unfinished originally. Likewise, a layer of dirt between a plaster substrate and the first layer of paint may indicate that the plaster wall originally was unfinished for some period of time.

Documenting the history of each colored layer, called chromochronology, gives the architect a general understanding of the evolution of an entire building or a single room. It is accomplished



The photos in this story show historic paint techniques on restoration projects in Washington, D.C. Preceding page is the Willard Hotel lobby, with giltwork ceilings and scagliola columns; this page, details from Union Station's East Room.

by recording each layer in sequence, including dirt, wall paper, varnishes, glazes, gilding, and any other visual characteristics.

After the chromochronology of several samples is recorded, a comparative analysis can be done, and selected samples slated for more extensive examination in order to make specific recommendations for restoration. This comparative analysis consists of examining the chemical and physical character of a number of samples—noting and comparing, among other things, each layer's color and relative thickness, as well as specific paint types and finishes. Comparative analysis employs several tests and tools. The first is photomicroscopy, in which photo transparencies are taken of the samples through a microscope. This tool eliminates hours of work because several tranparencies can easily be compared at one time, eliminating the laborious task of comparing samples one at a time under a microscope.

Once the samples have undergone comparative visual analysis, portions can be selected for chemical analysis that can supply the architect with additional information about the painted surface. For example, testing pigment isolated from the paint chip with sodium sulfide can provide clues to the relative date of paint layers. Sodium sulfide reacts by turning varying shades of gray to black, depending on the amounts of lead, oil, and other pigments in the paint layer. Thus, it identifies the older paint layers applied when lead was the principal pigment in oil-based house paints. A lack of a reaction means no lead, which would lead to other possible conclusions. For example, a paint layer that doesn't react to sodium sulfide and is brilliant white and thicker than earlier layers could be a zinc oxide paint, a whitewash, or a distemper.

Often, certain physical characteristics of the paint layer will provide clues to the medium that was used. Calcimine paints are often chalky and porous. A layer with a sheen could be an oil-based paint. Once it has been determined visually that a particular finish may be present, chemical testing confirms the speculation. If a sample is suspected to be latex, methylene chloride (a chemical used in paint removers) is applied. Methylene chloride reacts with the latex quickly, making it curl. Oil-based paint also curls when methylene chloride is applied, but not as rapidly as latex. Each chemical produces a different reaction. For instance, hydrochloric acid bubbles and fizzes when it reacts with lime, a reaction that indicates the possible presence of whitewash and calcimine paints.

Each pigment fluoresces differently when placed under ultraviolet light. This provides clues to the composition of the coloring agent. However, ultraviolet light is a comparatively new tool and primarily is used to verify conclusion.

All these chemical and visual tests are necessary to narrow the field of possibilities. However, research into the tastes and building practices of the period also will help. Documentary research should include the architect's drawings and records if they are still available. Also, letters between the architect and the owner or contractor could be full of clues.

The next step—after determining the kind of paint used, the medium, pigment, and application technique—is to identify colors. In the past, this is where all scientific procedures came to a screeching halt. In the past few years, however, paint analysts have paid a great deal of attention to the historically accurate selection of colors. The newer processes try to limit the amount of human subjectivity. Samples and color swatches often are examined under a microscope illuminated by filtered and unfiltered simulated daylight. The areas of both the swatch and samples have to be approximately the same size and exposed at the same angle to the lighting source for the reading to be accurate.

A spectrophotometer with a reflectance attachment is helpful in an examination of color finishes. Placed in an isolated environment that eliminates both light variations, and subjective human

Photographs © Carol Highsmith

judgment, readings are taken of the color sample under various wavelengths of light. From the resulting spectral curve, one calculates the exact color trichromatic coefficients.

For everyday restoration, this sort of elaborate scientific study isn't necessary to match colors. Reliable results can be obtained by a person with a good color sense in a well-lighted environment (bearing in mind that many people have varying levels of color-blindness).

With the growing interest in preservation and restoration in recent years, many "old time" painting techniques have been revived. They are specialty crafts, however, best handled by trained individuals. For many of these special painting techniques only normal surface preparation is required, but if there are variations, the architect should include them in the specifications. For example, wood sealers and high-quality, non-shrink fillers are required for marbleizing wood details. Gilding applications also require special grounds, depending on the desired effect. For the most part, decorative painting techniques rely on the skillful handling of the paint.

Glazing and *scumbling* are terms often used synonymously. However, glazes are transparent or semitransparent paints, while scumble is opaque paint. While glazing has been around for a while, scumbling only really became popular in the 1920s and 1930s. At the same time, multiple-colored glazes often were blended into one another (where none of the colors dominate) in a paint style referred to as a "jazz" finish. A similarly blended glazing style was referred to as a "tiffany" finish.

Rag-rolling, sponging, and *stippling* are all similar techniques that are often combined. They start simply with a scumbling or glazing color applied over an opaque ground of a similar or different color. The glazing is partially removed using a sponge, brush, or rag. *Dragging* is another glaze technique that became popular in the 1930s. A brush was dragged through the glazing that had been applied in 18-inch stripes, creating lines: horizontal, vertical, or wavy through a single glaze. Dragging techniques and glazes often were combined.

Color washing produces a soft, dappled effect by using layers of very thin glazes or distemper wash. Each was applied in a loose, horizontal manner that allowed the overall effect to vary in intensity. Another loose technique is the *splatter finish*, in which paint was splattered over an opaque ground.

Stencilling is a series of patterns created by painting through cutout templates, a technique that reached peak complexity and sophistication by the late 19th century. By contrast, *striping* is a simple decorative painting technique; often just a stripe or number of stripes, applied by hand with a small brush. Striping is often a means of defining or accenting small details.

Graining, marbleizing and *tortoiseshelling* are all imitative finishes, often used when the actual material wasn't available or too expensive. Marbleizing, often referred to as *faux marbre*, can either be an exact imitation of marble or simply an impressionistic study. Most often, tinted glazes are applied over a white ground and sponged. Once dried, a small brush is used to paint the "veins" of the marble, which are then blurred with a dry brush. Often found on doors, graining (referred to as *faux bois*) is a method of simulating wood. A wet paint glaze is manipulated with a variety of tools to create grains, knots, and heartlines. Finally, tortoiseshelling is an imitative pattern created by brushing a varnish that has been tinted brown over a yellow ground. Umbers and blacks are painted diagonally into the varnish and the entire surface is then dry-brushed, resulting in a mottled pattern much like tortoiseshell. Over these finishes, a lacquer sometimes can be applied to create a deep rich shine. However the wall substrate must be as close to perfect as possible, because lacquer finishes will bring out all the imperfections. □

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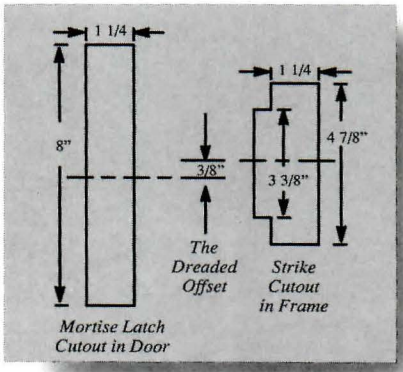

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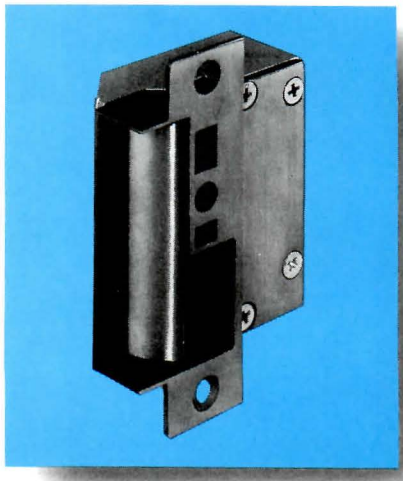

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Solving the problem.

Street & Lundgren, an Aberdeen, Washington architectural firm, was hired to design a fire station for a nearby town. The project was completed, there was a grand opening celebration, and Street & Lundgren received the "keys to the city."

Almost six years later, the town filed a suit against Street & Lundgren. There was water leakage into the fire house and some hairline cracking of exterior masonry. The town was afraid the building might not be structurally sound.

Roy Lundgren called Dale Currie, DPIC's regional claims manager in San Francisco, and described the situation. The leakage appeared to be due to the town's failure to waterproof the structure on a regular basis. The cracking was almost certainly cosmetic, due to expansion during freezing.

Dale believed the problem was solvable.

He made two trips to Washington during the next few months; first, to meet with the town and hear its grievances and second, to conduct a roundtable discussion to mediate the dispute. It was a delicate situation. The town's building inspector was convinced the structure had serious problems. Street & Lundgren and the project's structural engineer were confident the building had been well-designed.

Dale managed to keep the dialogue open. Ultimately, the town hired a consulting structural engineer to assess the situation. This engineer's opinion fully supported Street & Lundgren, and convinced the town its fire station *was* structurally sound. Now, all that was left to be done was help the town resolve the existing problems. In the conciliatory environment established by Dale, Street & Lundgren provided maintenance guidelines for the fire station as well as advice on how to repair the cracked masonry.

Dale continued to work with the town's attorney. A year and a half after the initial action, the town agreed to a *dismissal with prejudice*, meaning it was satisfied no further litigation was necessary.

R. Dale Currie

Richard Dale Currie is an assistant vice president and manager of DPIC's regional claims office in San Francisco. He is a graduate of the University of California at Berkeley and the John F. Kennedy University School of Law and a member of the California bar. He has over a dozen years of experience in construction-related claims management.

Claims happen. It's what you do when they happen that shows the stuff you're made of.

"I liked Dale Currie immediately for his grasp of the situation, his concern about our welfare, his willingness to come up promptly and talk the situation over.

Dale was very skillful in seeking a solution to the city's doubts about the building—a difficult job based on the evidence that had been presented by their home-grown people, whom they know and trust. He showed a willingness to understand their problems, and to come to a resolution that satisfied them. He showed his concern for them in a way that made them very comfortable. And they responded very positively to him.

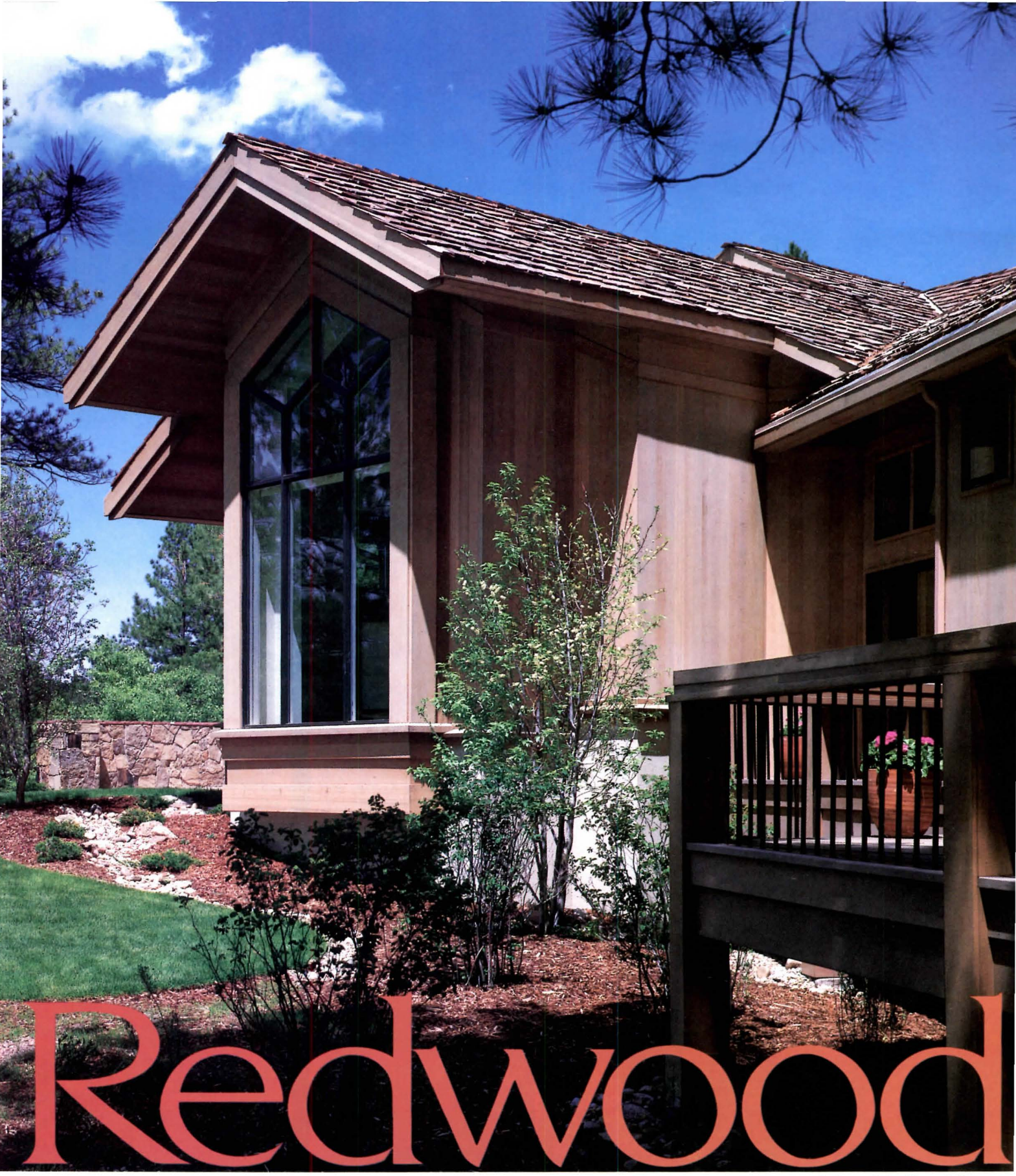
Roy E. Lundgren

The idea of the roundtable was his. And he mediated and orchestrated it. He suggested what we should do to allay the fears of the city and we did it. And everything worked.

In essence, what Dale Currie and DPIC did was put out a fire before it really got started.

And you realize, from a business standpoint, all this cost us was our time."

Roy Lundgren is a principal in the firm of Street, Lundgren & Foster, a 39-year-old architectural firm based in Aberdeen, Washington. He is a past director of the Southwest Washington chapter of the AIA and former building code commissioner for the city of Aberdeen. We value our relationship with his firm and thank him for his generosity in talking about an important subject for design professionals.



Architects: Richard Jessup & Associates

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Circle 209 on information card

Protecting Cedar-Faced Plywood

The effects of weather on siding.

By Timothy B. McDonald

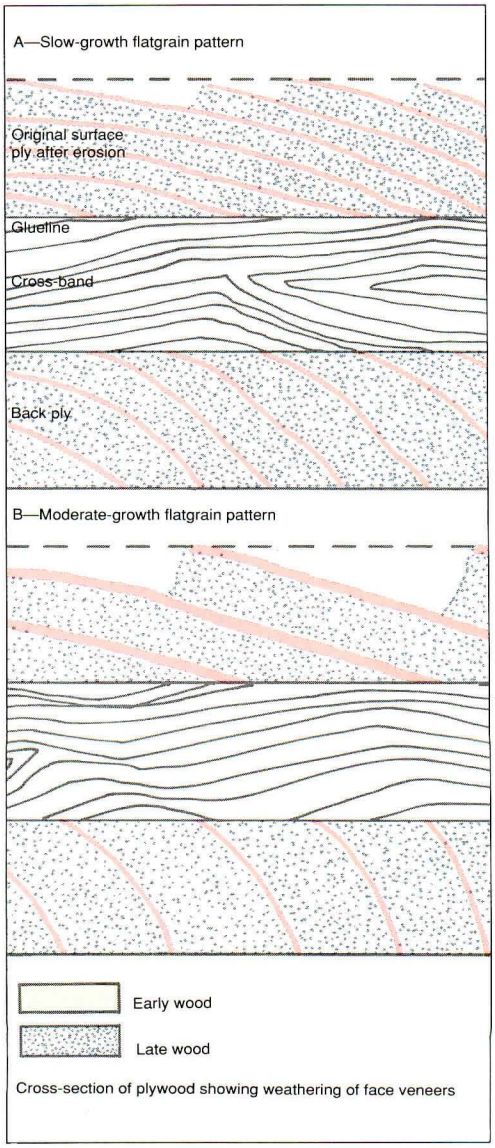
New York architect David K. Specter, AIA, was concerned when he noticed deterioration of the exterior wood siding on the south and east sides of his weekend home in Connecticut. The siding was cedar-faced plywood, Texture 1-11. Specter had wanted a natural finish and before construction began had contacted a plywood sales representative in his area. He was assured that no stain, oil, or paint was necessary on cedar-faced "T 1-11."

The siding, installed in 1977, had in less than 10 years deteriorated to the point where no cedar veneer was left. Specter re-sided his house, this time with 3/4-inch cedar boards. The solid boards were a good choice, he discovered, after reading a report from the American Plywood Association entitled, "Weathering and Erosion of Plywood." It seemed clear to him, after reading the APA report, that he had been given some untimely advice.

The APA report, dated August 10, 1978 (a year after Specter had installed his T 1-11 siding), documents the deterioration process of exterior plywoods in general and cedar-faced plywood in particular. One observation in the report states: "...unfortunately, those wood species which offer the most potential for erosion problems, namely western red cedar and redwood, are also those species which are most often promoted for use with 'natural' finishes."

That silver-gray "natural finish" desired by many architects and clients actually is the product of wood deterioration. The wood deteriorates because its lignin, which acts like a glue for the cellulosic material and cells, absorbs ultraviolet rays. The macromolecule units of lignin, made up of polmers and phenylpropane, are activated by ultraviolet radiation, which promotes their oxidation and depolymerization. Broken into smaller and smaller units, the lignin molecules are leached away easily by water. What is left is the silver-gray cellulosic material that is more resistant to ultraviolet deterioration.

Once the lignin is gone, however, there is no glue to hold the cellulosic material together. It is easily worn away by wind and water, eventually exposing the underlying cells. Furthermore, the shrink and swell caused when the wood is periodically wetted and then allowed to dry checks the wood, exposing the underlying cells to ultraviolet deterioration. As the checks become larger, they can expose the glue line between the plywood layers.



Cross-section of plywood showing weathering of face veneers

This deterioration process of plywood is visible almost from the beginning. The weathering process initially appears as small cracks that are barely visible on the plywood surface. The cracks progressively become larger, to the point where the individual wood cells are separated. As the cell material breaks down, the wood becomes vulnerable to erosion from water and wind and its surface takes on a pitted appearance. Later, the checks also become larger and wider as weathering along their edges progresses.

Wood usually does not deteriorate evenly; density and chemistry play important roles in the rate of erosion. Generally, in soft wood species, the earlywood, because it is less dense that the latewood, tends to weather more quickly. This kind of action results in a raised appearance of the wood grain. The APA report states, "It is important to realize that the latewood also erodes away though weathering, although the erosion rates for most softwood species are very slow (cedar and, to some extent, redwood being notable exceptions)."

The report states further that wood weathers away at a rate of 0.25 inches per century. That, on average, may not seem like much, but all woods are not created equal. Even within a single species, the weathering rate can vary broadly between the earlywood and latewood. However, averaging the early and latewood, the report cites findings of erosion rates for western red cedar as high as 0.65 inches per century. With face veneers of 0.1 inch, erosion to the glueline can take only 15 years. Additionally, if half the veneer has been removed by rough-sawing, it will take only seven years before erosion reaches the glueline.

It should be noted that the grain pattern and the growth rate of the timber used in the face veneers both can have a significant effect on its rate of weathering. Vertical grain patterns aren't recommended, because they expose the largest area of earlywood grain to weathering. Today, most plywood has a flat-grained pattern that is a result of the rotary peeling process. Flat-grained face veneer that

Chosen correctly, finishes can protect plywood from early demise.

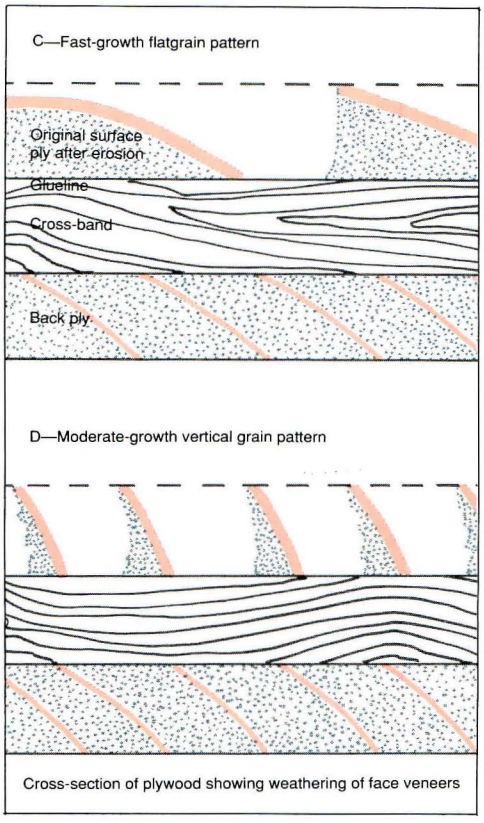
is relatively thick and is made of slow-growth timber has a denser, more closely-spaced latewood that helps protect the earlywood. Conversely, fast-growth timber has greater spacing between the rings of dense latewood, and if coupled with a thinner face veneer, more earlywood will be exposed. Although the ideal plywood face veneer comes from slow-growth timber with dense, flat grain, that kind of veneer is becoming increasingly hard to find.

The cell structure of the wood also plays a key role in the rate of deterioration. Wood species with relatively large cells and thick walls tend to erode more slowly than wood species with small cells and thinner walls. Research indicates that this happens because the wood species with smaller, thinner cells usually contain more lignin per cell and less cellulosic material (that would act as a shield for the degradable lignin), than the larger, thick-walled species. Western red cedar earlywood has relatively small cells with delicate, thin walls. In addition, compared with other soft wood species, western red cedar latewood has a low density.

According to the APA report: "The weathering process should be of primary concern to plywood siding manufacturers since the face veneer of unprotected plywood can completely erode away, thus exposing the crossband. This potential problem is especially important to those manufacturers who produce siding with a western red cedar face-ply, since both the earlywood and latewood zones of this particular species erode relatively quickly. If the face-veneer is relatively thin, unprotected cedar plywood can erode to the glue line at an alarming rate on exposures with full sunlight."

One could argue that this problem is just as important to architects, and many are not aware of it. David Specter sent the APA report to "the best-informed specification writer" he knew. "I thought I was the last one to hear about this problem," he says. "However, the specifications writer was unaware of any information that had been disseminated by the plywood industry describing this serious problem."

The bright side of the story is that current APA literature is very clear about methods of preventing deterioration of plywood siding.



Cross-section of plywood showing weathering of face veneers

The amount of wood erosion will greatly depend on the exposure environment. "The amount of ultraviolet radiation, water and mechanical force (wind, rain, etc.) which is received by the wood surface are especially important. Thus, weathering and subsequent erosion is normally most severe in the northern hemisphere, on wood which faces south and is periodically wetted," the APA report goes on to say. "Erosion through weathering can be halted by protecting the wood with a finish which screens out ultraviolet light."

APA technical note #M335A "Finishing Plywood 303 Siding for Protection and Appearance," dated December 1988, states clearly: "All plywood siding used outdoors should be finished." The 1978 report, as well as current APA literature, outline recommended finishes for protecting against wood erosion. At the top of the list is latex paint, which, according to APA, gives the best and the most durable protection for plywood siding. Latex paint also remains flexible even as it ages. A tradeoff of latex is that it hides the surface texture of the siding, unlike solid-color stains, And, like all paints on siding, latex paints must be maintained.

Solid-color stains have less pigment than paint but more than the semi-transparent stains. Like all compromises, they have their good and bad points. They are more durable than the semi-transparent stains and give the wood better protection. They hide the wood grain, but also hide surface repairs. Unlike paint, solid-color stains do not hide the wood's texture.

Light, solid-colored latex stains should be applied over a compatible stain-blocking primer thereby protecting the finish from extractives in the wood. Compared to semi-transparent stains, solid-color stains require a good deal of surface preparation when refinishing because they form a continuous film that can flake or peel.

Many manufacturers recommend only latex solid-color stains. Other manufacturers recommend only oil-base stains on certain grades of exterior plywood siding. On their 303 siding, the APA recommends only oil-based, solid-color stains, because they require less surface preparation than the semi-transparent stains often preferred by architects or clients. It should be noted that the semi-transparent stains give the least amount of protection to the wood. Only if the client is willing to maintain the finish and renew it regularly will a semi-transparent stain gradually build up a degree of protection. However, if the stain is applied too often, the finish can become opaque, approaching the appearance of solid-color stains.

Chosen and applied correctly, finishes can protect plywood veneer from an early demise. However, if you or your client want a "natural" finished wood siding, particularly cedar or redwood, that will last more than a few years, take a hint from David Specter's experience. Use standard, solid-wood siding, not plywood veneers. □

1

PRODUCTS

Graves Objectives

Frank Petronio © 1989

2

3

4

New designs

by Michael Graves

in glass and ceramic

While Steuben representatives were touring Michael Graves's office last year, considering the architect for some design work, their design director was struck by some trace drawings of archaic vases Graves had sketched out and left lying around. The results are these three crystal Steuben vessels. During the winter of 1988/1989 Graves commuted regularly from his Princeton office to Steuben's upstate New York factory to apprentice under the tutelage of master "gaffer" Harry Phillips.

Graves is intrigued by the romanticism of the large-scale vessels, which he loosely designed in homage to classical Etruscan artifacts he has collected since he first bought a vase at a flea market in Rome in the early 1960s. Each piece is encircled by a footed bronze ring, or armature, with the heavy crystal resting upon it.

A decidedly different product interpretation is his play on art deco with a nod toward classicism in the form of the two vases and candy dish he designed for Swid Powell. The ceramic vases resemble abstracted fleurs-de-lis with a vaguely anthropomorphic form, while the silver-plated candy dish is reminiscent of the past but features a modern shape and proportion with its scalloped bowl and enlarged rim.

Products continued on page 142

Products *is written by Amy Gray Light*

1. Graves at work in Steuben's factory in Corning, N.Y.
2. The Archaic Vessel Collection: Bowl, Vase, and Tall Vase. Steuben. Circle 401 on information card.
3. Candy dish.
4. *White and Cobalt* Vases. The Swid Powell Collection. Circle 402 on information card.

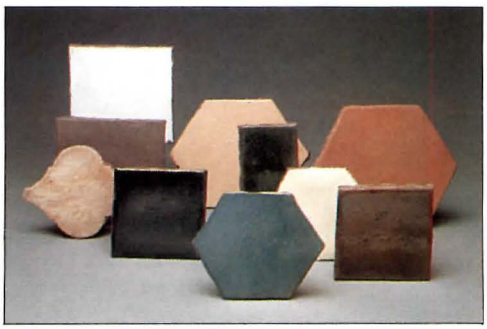
PRODUCTS

Back to Basics

1

2

Demand for traditional building materials generates new techniques and textures in brick and tile



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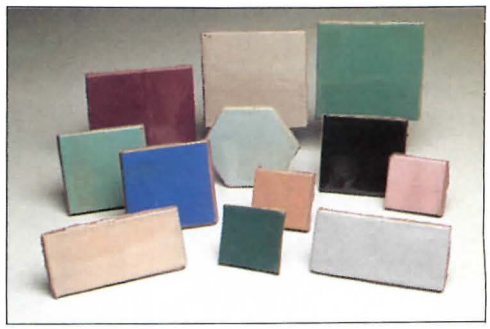

4

5

Genuine, rich-looking brick is becoming increasingly popular as a result of the increasing amount of restoration work being done in the country. Victor Cushwa & Sons, Inc., located in Maryland, has manufactured sand-molded colonial brick since 1872. The Calvert line of either handmade or machine-molded brick is one of Cushwa's most popular lines, which produces 67 million machine-molded bricks per year and 5.8 million handmade bricks. The handmade, or "hand-thrown," oversized bricks are the result of a slow and laborious process. A pre-cut amount of raw material called a "slug" is rolled, covered with the appropriate color of sand, and pressed by hand into a wooden mold. After the material is pressed into the corners of each mold the raw brick is fired. Since this process is time-consuming and only comparatively small quantities can be produced, as opposed to machine-molded brick, a line called the Antique Collection resembles the handmade in appearance and texture but can be produced in greater quantity and more colors.

Epro Tile Inc., in Ohio, has manufactured handcrafted ceramic tile since 1963, offering an impressive array of sizes, colors, and special effects for a variety of commercial and residential, interior and exterior projects. The tile is made from shale dug from company-owned pits. Because the tiles are made entirely by hand, they vary slightly in size, color, texture, and character to assure a distinctive look.

Products continued on page 144

1. Process of making hand-thrown bricks.
2. Machine-molded Antique Collection bricks closely resemble handmade. Victor Cushwa & Sons, Inc. Circle 405 on information card.
3. Antique look of Heritage Collection replicates the old or creates a new look.
4. Bold, drama of Gallery Collection comes in standard or colors.
5. Special effects, color, and texture of the Sandstone Collection are enhanced by modulating texture of sand. All three tile lines are offered from Epro Tile, Inc. Circle 406 on information card.

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PRODUCTS

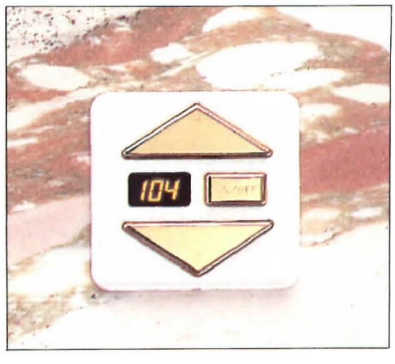
Shower Tech

Digital water-control system provides comfort in bathrooms

Showering always has warranted some work adjusting and re-adjusting to maintain a constant water temperature and to compensate for fluctuations in the temperature due to sudden drops of pressure. The Ultravalve system is designed to eliminate this problem.

Ultravalve allows the user to control water temperature from 70 degrees Fahrenheit to 112 degrees F with the touch of a button. Water pressure is automatically balanced. The electronic push-button microcomputer-based system automatically starts with a set temperature of 98 degrees F, reverts to a normal discharge temperature after a two-second delay, and climbs back and levels off to 98 degrees F. By pushing the hot or cold buttons up or down, the user then adjusts the temperature within two-second increments. A digital temperature display provides a highly visible readout. The system shuts down water flow if water climbs above 112 degrees F. The device has barrier-free applications in that it can be placed anywhere in the bathroom and requires no knobs or control valves where they would normally be installed.

Products continued on page 146



With Ultravalve, no knobs or levers are necessary and the valves and controls don't have to be located adjacent to the fixture. Designed for the remodeling and new construction market, the system comes in a variety of finishes. Memry Plumbing Products Corp. Circle 403 on information card.

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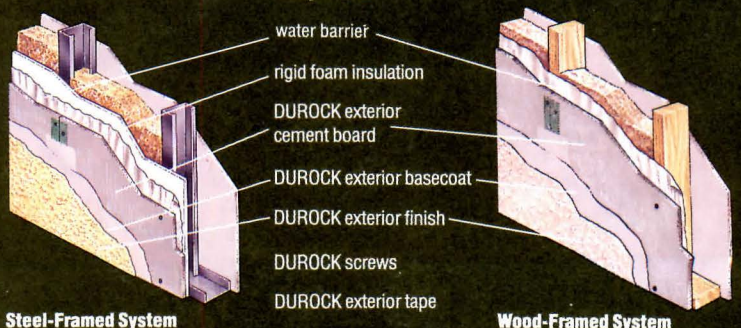


United States Gypsum Company

USG

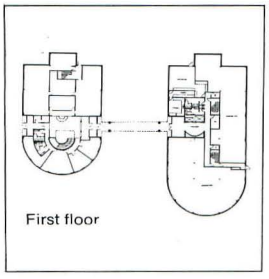
Circle 223 on information card

PRODUCTS

Red, White, and Blue

1

1. Back of building shows integrated colors blended for grid-like effect. Modulated spandrel windows with bottom halves painted coordinating color of opposite building creates homogeneous effect of building skins; red banding at top warms and accents building.
2. Plan shows first floors of the two buildings joined by a second-story bridge.
3. Approach from drive. Spectra-Glaze and Spectra-Glaze Mortar Mates from The Burns & Russell Co. Circle 404 on information card.



2

3

The use of Spectra-Glaze ceramic-faced concrete masonry units by the Baltimore firm Meyers & D'Aleo for this Maritime Center complex, located within the Fort Holabird Industrial Park in Baltimore, has resulted in a striking counter-part to the all brick-clad buildings in the vicinity and garnered an award for the firm. In presenting the 1988 masonry design & craftsmanship award of excellence in Maryland for the project, the awards committee cited the "care and craftsmanship" that went into the design and construction of the complex, and stated that honoring a project clad in a finished masonry unit other than brick was a departure from the norm, but that they had been impressed by the range and versatility the use of masonry offered.

Designer Bill Chan had been faced with several design challenges due to the site plan, which is an irregular boot-shaped site at the end of a cul-de-sac. He chose Spectra-Glaze for its ability to achieve the tight curve he desired for the esthetic forms of the complex, and for the product's color range and value.

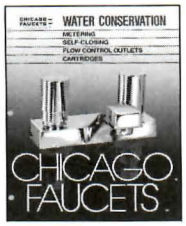
Chan decided to create two buildings, 50 feet apart and connected by a bridge walkway, to satisfy the building code while also permitting a lower fire hazard classification. Chan rounded the corners of the two buildings to break down their scale. In doing so the complex relates to the surrounding buildings, and one's eye is drawn to the landscaped entrance court while approaching from the road. Chan applied the ying-yang principle to the complex's design, grafting two different colors to accentuate the color of the smaller building and to tie both buildings together visually while also "balancing" them. He then created an integrated look by using Spectra-Glaze Mortar Mates to let the mortar joints accentuate the color of the opposite building, thereby producing a grid-like affect with contrasting colors.

The property is owned by the Steamship Trade Association/International Longshoremen's Association.

Products continued on page 151

PRODUCTS

Water Conservation Brochure



The Chicago Faucet Co. has issued a new catalog of water conservation products. Included is the new MVP metering valve, as well as the company's self-closing faucets, flow control outlet fittings, and cartridges. Twelve faucet models are shown, with a brief list of the features of each. Also shown are other water-conserving devices from Chicago faucets.
Chicago Faucet Company
Circle 424 on information card

Wood Floor Care Brochure

Bruce Hardwood floors announces a new wood floor care brochure. The brochure details the types of finishes available and provides tips on initial, routine, and preventive care.
Bruce Hardwood Floors
Circle 423 on information card

Sta-Smooth Drywall System Guide
Gold Bond Building Products offers the "Sta-Smooth" construction guide that provides technical information, recommended uses, and applications procedures on their Sta-Smooth drywall systems. The system is designed to produce nearly flawless surfaces by eliminating the beading and ridging typical of conventional drywall.
Gold Bond Building Products
Circle 418 on information card

Roof Management Program Brochure

Manville Roofing Systems Division announces a new color brochure detailing its Roof Construction Management Program, a roof service contract for continued roof maintenance. The program covers interior and consequential damages in the event of non-response to leak complaints. The program applies to commercial, industrial, and institutional roofing systems, and unifies the usually separate functions of design and specification, contractor qualification, application, guarantees, and annual maintenance inspections.
Manville, Roofing Systems division
Circle 417 on information card

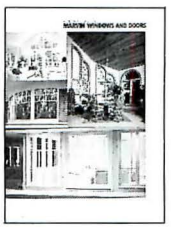
Architectural Lighting Catalog
Capri's Architectural Lighting catalog contains an extensive presentation of the firm's newest incandescent, H.I.D., and

Products continued on page 152

Products *from page 151*

low-voltage recessed downlights.The catalog highlights a wide range of reflector systems and features new 6- and 8-inch diameter multipliers for use with H.Q.I. lamps. New reflector options for incandescent and H.I.D. models also are shown, and listings are given of lamp wattages for incandescent recessed and accent lights.
Capri Lighting
Circle 421 on information card

Catalog on Residential Line of Windows



Marvin Windows' new residential catalog contains information on its complete line of wood and wood-clad patio doors and made-to-order windows. Also featured are the manufacturer's newest products, curved glass windows. The 92-page, color catalog demonstrates the product styles and standard features of the windows and outlines how customers can select window styles and accessories to suit their needs.
Marvin Windows
Circle 409 on information card

Catalog Outlines Lines of Column Covers
A catalog details the complete line of aluminum, colored stainless steel, and vinyl/acrylic covered column covers from Conspec Systems Inc. C/S Colored Stainless Steel Column Covers come in 48 color and texture combinations, offering a wide range of design possiblities. They can be highlighted for even greater dimension and special effects.
Construction Specialties Inc.
Circle 420 on information card

Latest Edition of *The WoodBook*
The 1990 edition of *TheWoodBook* contains reference data and application reports, from lumber span tables by species and panel span-load tables to technical data on new engineered products and reports on architecture projects. Pre-publication cost is $9.97 from the publisher.
Hatton-Brown Publishers
Circle 410 on information card

CREDITS

Arts Center/Audubon Court, New Haven, Conn., (page 56). *Architect: Herbert S. Newman Associates, New Haven.* Architect in charge: Herbert S. Newman, FAIA. Project manager: William P. Newhall, AIA. Job captain: Carl H. Wies, AIA. Design team: David Epstein, George Barnes, Bret Sleeper, Nathan Topf, John Virostek, Howard Hebel, Stephen Starr. Structural engineers: Spiegel & Zamecnik, Inc. Principal in charge: Vladimir Tussman. Mechanical and electrical engineers: Helenski- Zimmer, Inc. Principal in charge: Bob Aube. Landscape architect: Rolland/Towers. Principal in charge: Shavaun Towers. Project manager: Schuyler Coulter. Lighting consultant: Francis Krahe Associates.

Whitney Grove Square, New Haven, Conn., (page 56). *Architect: Herbert S. Newman Associates, New Haven.* Architect in charge: Herbert S. Newman, FAIA. Project manager: Joseph Schiffer. Job captains: John Carruth & Carl Wies. Design team: Howard Hebel, John Hocker, Bret Sleeper. Structural engineers: Spiegel & Zamecnik. Principal in charge: Vladimir Tussman. Mechanical and electrical engineer: John Altieri. Landscape architects: Rolland/Towers. Principal in charge: Shavaun Towers. Project manager: Schuyler Coulter. Owner/Developer: Herbert Pearce Co. Realtors.

Ace Market Place, Venice, Calif., (page 58). *Architect: Steven Ehrlich AIA Architects, Venice.* Project architect: Christian Allaire. Assistants: Andy Rovelstad, Bruce Morrison, Gloria Bonner, Richard Katkov, Karen Thornton. Historical

Credits continued on page 156

For colors in rubber flooring, take your cue from Endura.

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Circle [illegible] on information card

Credits *from page 152*
consultants: Tom Sewell, Jeffrey Stanton. Contractor: Andrew Gillespie. Structural engineer: Gary Karinen. Mechanical engineer: Mel Bilow, MB&A. Electrical engineer: Moses Allen, Electrical Building Systems. Owner: Perloff & Webster.

Race Through the Clouds, Venice, Calif., (page 58). *Architect: Steven Ehrlich AIA Architects, Venice.* Project architect: Andrew Rovelstad. Assistants: Christian Allaire, Zazu Faure, Bruce Morrison, Karen Thornton, Matthew Miller. Historical consultants: Tom Sewell, Jeffrey Stanton. Structural engineer: Ken Wilkinson. Consultants: Tagawa-Smith. Contractor: Westpark Building Corp. Owner: David Botfeld & Co.

Windward Circle Arts Building, Venice, Calif., (page 58). *Architect: Steven Ehrlich AIA.* Project coordinator: Richard Katkov. Assistants: Christian Allaire, Gloria Bonner, Steven Karolyl, Tom Jimmerson, Hans Osterman, Zazu Faure, Lisa Weeks, Bruce Morrison, Andy Rovelstad. Structural engineer: Joseph A. Perazzelli. Mechanical engineer: Mel Bilow, MB&A. Electrical engineer: John E. Silver & Associates. Historical consultants: Tom Sewell, Jeffrey Stanton. General contractor: Andrew Gillespie.

Griggs Farm Housing, Princeton, N.J., (60). *Architect: Geddes Brecher Qualls Cunningham, Princeton.* Structural engineer: Geddes Brecher Qualls Cunningham. Civil engineer: Van Note Harvey. Landscape architect: Louise Schiller Associates. Owner: Princeton Community Housing.

Allenberg Building, Memphis, (page 78). *Architect: Hnedak Bobo Group, Memphis.* Principal in charge: Gregory O. Hnedak, AIA. Project architect: Mark Weaver, AIA. Project designers: Mark Weaver, AIA, Barry Marshall, AIA. Project team: Larry Paine, AIA, Aniza Ashaarl, Luke Mahmood, Dennis C. Elrod, AIA, Jerry Durham, CSI, Valli Wiggins. Owner: Allenberg Building Partners.

Oriental Theater, Milwaukee, (page 80). *Architect: Quinn & Searl, Architects, Chicago.* Partner in charge: Linda Shearl, AIA. Project architect: Debra McQueen and Valerio Associates.

The Hub Club, Boston, (page 82). *Architect: Tamarkin Techler Group, Boston.* Structural engineer: Zaldastani Associates Inc. Electrical engineer: Weber Associates. Mechanical engineer: Reardon and Turner Inc. Plumbing and fire protection: Duross Design Consultants. Lighting consultants: Ripman Lighting Consultants. Custom metal finishes: Tin-Chee Patterson. Custom paint finishes: Blossom Mako Design. General contractor: Shawmut Design & Construction. □

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A marvelous renovation project that captured America's imagination. The Union Station in St. Louis, truly one of the country's finest historical landmarks, is returned to its stately splendor. Inside and out. From bottom to roof line.

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materials, and color. A scaled-down version was then submitted—a somewhat smaller footprint with only 49 stories. This, too, was rejected by the commission after extensive hearings. But St. Barts' rector and his vestrymen would not take no for an answer. They sued the commission, and the case is now before the Federal District Court of New York. It is clear that they propose to carry the case all the way to the Supreme Court, where, obviously, they hope that Reagan's new right-wing majority will rule in their favor.

Preservationists should not be accused of paranoia for suspecting that St. Barts is being egged on by New York's powerful real estate and development interests. They have always been opposed to the commission and must see this case as a truly miraculous opportunity, under the banner of religion, to overturn the Warren court's splendid Grand Central Terminal decision of the 1970s.

Brolin here presents us with a first-rate account of this battle. It is a sad but in some ways comical picture that he gives us—of a fine old congregation in a fine old building, hitherto exemplary in all respects, becoming involved a whirling civil war of connivance and chicanery by a multimillion dollar lure that it doesn't need. He has obviously researched his story carefully and presents his findings fairly; but there is little doubt where his sentiments lie—against the Babbitt-like minister of the flock and with the people, both inside and outside the church, who are still fighting to save it, morally as well as physically, from its own worst instincts.

It is impossible not to smile at the crocodile tears of St. Barts, with its wealthy congregation and multimillion-dollar endowment. With its exemption from most taxes (*all* real estate taxes), the church already enjoys prerogatives that many strict constructionists would argue to be unconstitutional. And to claim, as St. Barts' spokesmen have done, that control over the exploitation of church properties for purely commercial ends is an infringement on the freedom of religious worship, strikes many people—including many in the congregation—as a grotesque misreading of these same constitutional rights. Yet Bowers' spokesmen have appeared at Landmarks Commission sessions, speaking very much as though they were the actual vicars of Christ on earth; and the same group, in a full-page newspaper ad, wrote that "faithfulness to our Lord leads to a moral and Christian imperative to seize upon the extraordinary opportunity before us" to go forward with the deal with the developers.

Nevertheless, despite the transparency of St. Barts' plea of disastrous hardship, the fact is that hundreds of other churches less wealthy or less significant artistically than St. Barts do find themselves in positions agonizingly more difficult. Faced with dwindling congregations on the one

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hand and rising property values as the center cities begin to stage a comeback on the other, these churches are increasingly tempted to sell out and move. It is a measure of the moral bankruptcy to which eight years of Reaganism have reduced us that we cannot even conceive of (much less implement!) a national response to what is clearly a national problem: to establish a funding process for the protection of the national architectural heritage of which these churches are such a prominent part.

There are paradigms aplenty for such actions, if we but chose to look for them. In atheistic Czechoslovakia all historic churches have long enjoyed a wide range of assistance, from grands-in-aid to interest-free loans to technical consultants. Historic churches have had such protection in France since the days of Viollet-le-Duc. At Notre Dame in Paris not only conservation of the fabric of the church itself but the rehabilitation of its environs are funded by municipal and national agencies. And Chartres—far from advocating a 59-story skyscraper in its side yard, as St. Barts proposes—is protected by zoning that prohibits anything taller than its towers within a 20-mile radius.

And where do architects stand on issues like this? They either stand on the sidelines, strangely mute, or, when they are themselves involved in a project to replace an old building with one of their own creations, they defend their actions by claiming that their new building is better—like poor Marcel Breuer, when he proposed to put a skyscraper where the Grand Central Terminal was standing, or Edward Stone Jr., who plans to replace Goodhue's modest little rectory with a 49-story giant in mirrored glass. Both Breuer's and Stone's towers are perfectly innocent, good-looking artifacts. The issue was never what either looked like but *what it would look like standing precisely there,* in a space currently occupied by a structure of great artistic and historic significance.

In cases like these, the architects usually occupy a position of moral (or, as many preservationists would argue, immoral) neutrality. This is the ethical problem that Bernd Foerster, FAIA long-time head of the preservation program at Kansas State, confronts when he asks each graduating class to take a sort of Hippocratic Oath. Foerster asks his students to vow to respect *all* buildings, irrespective of style, age, size, or physical condition, just as the young doctor vows to treat all patients who knock on his or her door.

It is not that Foerster thinks that all old buildings could or should be saved, any more than doctors could vow to keep all patients alive forever. It is rather that he wants to create a climate of opinion in which the whole built world is viewed as a cultural resource whose protection is the professional responsibility of the architect.

Foerster's position could easily be dismissed as hopelessly idealistic, were it not for the fact that it corresponds so closely to our understanding of the interconnectedness of the whole built world. The fact is that ever since the Renaissance, the Western architect has been trained to think like a creator, pure and simple. More and more, architects are going to be compelled to redefine their role, to become *both* creator and curator.

—JAMES MARSTON FITCH, HON. AIA

An historian and preservationist, Mr. Fitch is also a partner with the New York City firm Beyer Blinder Belle.

Florentine New Towns: Urban Design in the late Middle Ages. David Friedman. (Architectural History Foundation/MIT Press, $45.)

Nowhere is architecture more closely linked with public policy than in the new towns built by the city of Florence in the early 14th century. As part of a concerted effort to destroy the influence of the landed nobility and gain the allegiance of the rural populace, the Florentine merchant commune established five new towns on the main roads out of the city—San Giovanni, Castelfranco, and Terranuova, on the southern road leading through the Chianti hills to Arezzo and on to Rome, and Scarperia and Firenzuola, on the northern road leading through the Appennines to Germany and Switzerland. In a book remarkable both for its beauty and for its fine writing, David Friedman presents the

story of these towns as the story of urban aspirations defined by architectural form.

The merchant commune came to power in Florence in 1282. At once the communal government set about the task of securing its trade routes, and access to its hinterland, known as the *contado*. Although the villagers of the countryside sought Florentine protection from the feuding nobles whom they served, they were not expected to move voluntarily into the new towns. The policy was to resettle them *en masse* within the fortified walls of each town, often moving rural parish churches into the towns along with the people. The policy thus aimed to change the character of the countryside and to forge strong bonds between the outpost communities and Florence.

Within a short time, a new urban order emerged in these rustic, often war-torn areas. According to Friedman, it was the orthogonal and symmetrical town plans that were largely responsible for the society that evolved there. Unlike the maze-like street patterns associated with medieval towns, where powerful noble families controlled fortified and inaccessible precincts, streets in the new towns ran straight and crossed at right angles. Through the pattern of open streets, the communal government asserted its authority over the territory and its inhabitants.

Planners sited each town so that its principal axis was the existing main road. A cross-axis perpendicular to the main road defined a central open plaza, focus of the town's life. Friedman is careful to avoid the term "grid" because new town plans reveal a design sophistication that goes beyond a simple grid composed of evenly spaced elements. Through an analysis that is solidly documented and draws from varied sources, Friedman meticulously uncovers the geometry that underlies the plans and makes a strong case for the role of design professionals, not just city officials or military experts, in the planning process.

"The Florentine new towns were works of art in the literal sense that their designers were artists," Friedman says. The designers were mason-architects associated with major buildings projects in Florence, including the construction of the new cathedral and the monumental town hall—projects initiated by the merchant commune soon after it came to power. While Friedman cites numerous examples of other medieval European new towns, he says that none, aside from those founded by Florence, left evidence that esthetic considerations played a role in their design.

In Florence, at the time of the new town expansion, there was increased appreciation for straight, smooth, paved streets, what Friedman calls "the basic unit in the new urbanism." Civic leaders saw beauty in properly arranged streets and also in the closely controlled wall of building facades enclosing the streets. With the power of eminent domain and extensive design control devices, Florence began to straighten its streets and unify the city with a regularized system of public spaces even before Renaissance ideals were widely recognized in Italy. If the city encountered obstacles in its efforts to rationalize the pre-existing plan, already sprawling and intricate, it was able to realize an ideal order in the new towns that it created and controlled.

Between 1299 and 1350, the new towns showed a gradual trend toward more regular street schemes and a more regularized arrangement of lots. Viewed as egalitarian places, the towns were designed to accommodate few distinctions in class or income. A new building type emerged at the same time in Florence, the large private palace oriented to the public street rather than to a privately controlled enclave. But no such landmarks appeared in the new towns or even just outside of them, because wealthy magnates were prevented from buying land in or near the towns.

Friedman tells us that the uprooted villagers eagerly sought the sanctuary of the new towns. He says that there is little evidence that they resisted resettlement and the subsequent obliteration of their villages. But how could people's lives be so completely changed without a noticeable impact? Leaving behind feudal servitude and being exempt from all taxes as they constructed the new towns for Florence, the new city dwellers must have found the rel-

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Books *from page 161*
ative security of town life far superior to isolated country living, but it is hard to believe the transition was a smooth or easy one.

In an attempt to maintain former village ties, the urban immigrants defined districts for themselves within the first new towns, generally gathering around their churches. But fragmentation of the population led to civil disturbances. Designers moved quickly to alter the street and lot plans. Aspects of Terranuova's 1337 plan that supported neighborhood identity are absent from the 1350 plan for Giglio Fiorentino, where there is only one church sited on a single central square, and other features of the town layout that supported separate neighborhood identities are absent. The plan for the unrealized town of Giglio is so regular and so ordered by precise proportions that it resembles a building plan by Mies van der Rohe.

As planners eliminated more and more of the eccentricity of organic growth from the layout of these environments, did the towns really achieve a greater sense of popular unity? Or is it possible that they showed less public spirit as the scale of the neighborhood increased and the sectional identity decreased? There is no way to answer these puzzling questions from available evidence, but they are no less relevant today than they were 600 years ago.

Friedman teaches architectural history at MIT, and MIT published the book in association with the Architectural History Foundation. It is no surprise, therefore, to find the book a beautiful collection of black-and-white photographs, elegantly drawn plans, and many other fine illustrations. Even the cover, a 1584 view of Florence reproduced in sienna, with blue and black titles, is handsome and worth noting.

It is due to the richness of the material in the Florentine archives that Friedman was able to reconstruct this chapter of medieval history. This study combines the art historian's painstaking attention to artistic detail with the urban historian's keen awareness of interrelationships among social and political phenomena. Only because Friedman's perspective is so broad is he able to make such a convincing case for the Florentine new towns as purposeful works of art. Had he limited his purview to the appearance of the towns and to their architectural organization, his arguments would never have been as persuasive. It is his discovery of artistic intent and the subtle and not so subtle ways Florentine planners incorporated that intent into urban public policy that makes Friedman's book so unusual and satisfying. As a case study in urban design history, this book will appeal to architects, planners, historians, and all the fortunate travelers who have explored the Tuscan landscape or would like to do so.—JANE LOEFFLER

Ms. Loeffler is a city planner in Washington, D.C.

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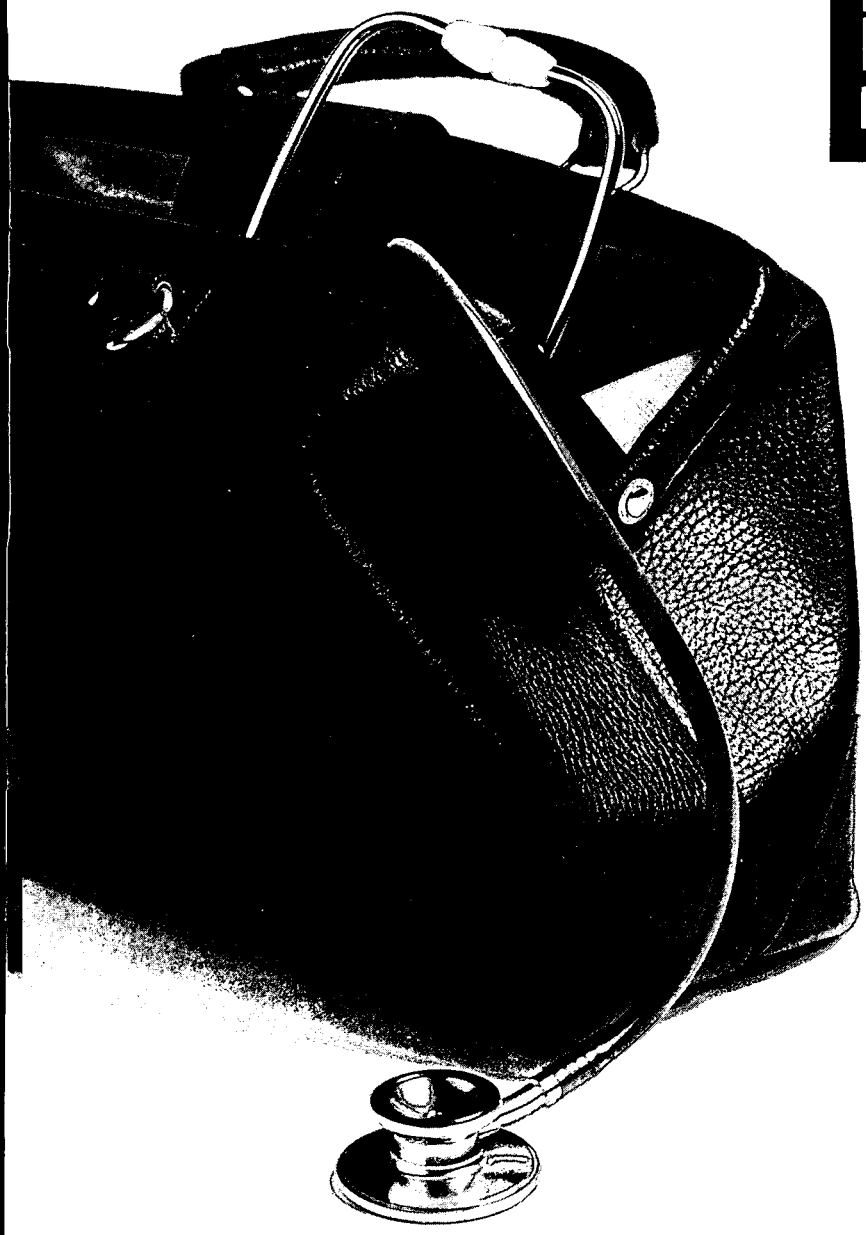

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But in the long run, it's the reliable performance that will pay off for you, in quality assurance that you pass on to your customers. G-P Summit III Shingles are premium quality laminated fiberglass shingles, tough enough to be backed by a 35-year limited warranty.

G-P Summit and Summit III come in a wide selection of colors; also available in fungus and algae resistant.

Ask for the top of the line: Georgia-Pacific Summit Shingles.

For more information on Summit and Summit III, including specifications and physical properties, call Georgia-Pacific: **1-800-447-2882**, Operator #2. Look for us in Sweet's, Section #9390 GEO.

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