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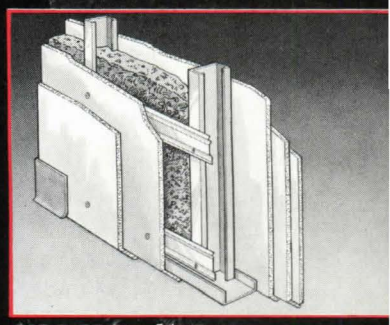

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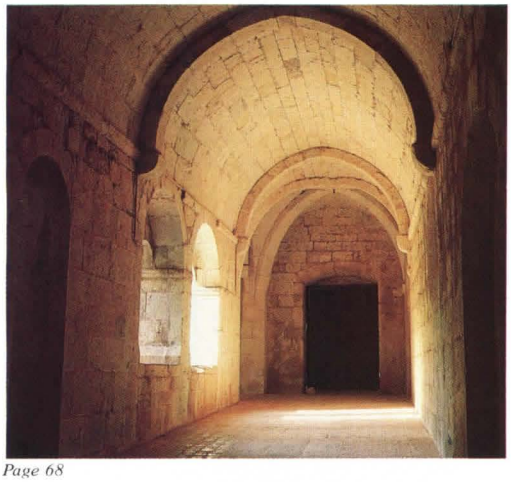

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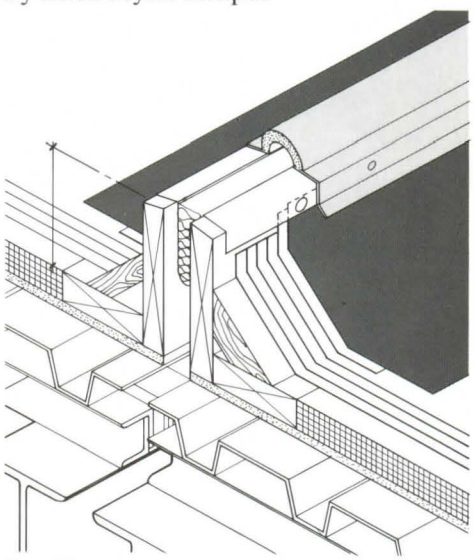
Cover
Le Corbusier's Carpenter Center at Harvard University (see page 36.) Photograph by Steve Rosenthal.

News

Technology & Practice



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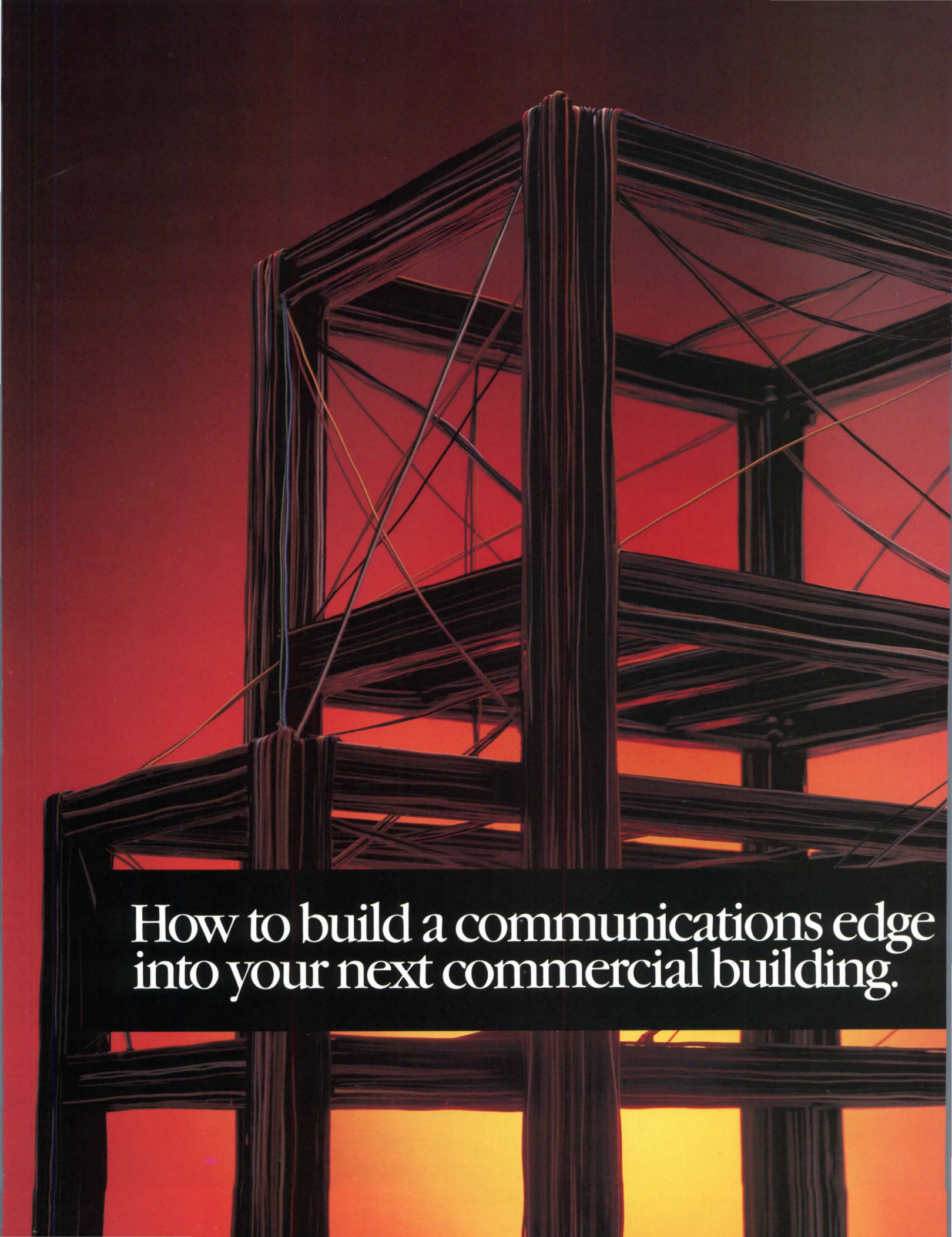
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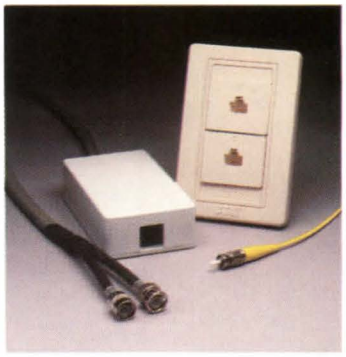

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EVENTS

Nov. 1-3: Conference on Energy Efficient Lighting, Boston. Contact: Larry Sherwood, NESEA, P.O. Box 541, Brattleboro, Vt. 05301.
Nov. 1-3: International Ceramic Tile Exposition, Orlando, Fla. Contact: Marvin Park & Associates, 600 Talcott Rd., Park Ridge, Ill. 60068.
Nov. 2-6: Course on the Application of Infrared Scanners to Detect Building Energy Losses, San Diego. Contact: Paul Grover, Infraspection Institute, 33 Juniper Ridge, Shelburne, Vt. 05482.
Nov. 3-5: Conference entitled "Housing Technology/2020," Columbus, Ohio. Contact: Conni Morse, National Institute of Building Sciences, 1015 15th St. N.W., Suite 700, Washington, D.C. 20005.
Nov. 3-7: International Show of New Technologies and Innovations, Turin, Italy. Contact: Ernest Lotito, 1615 M St. N.W., #220, Washington, D.C. 20036.
Nov. 5-6: AIA Corporate Architects Committee and AIA Practice Committee joint conference on "The Architect and the Corporate Client: Getting Down to Business," New Orleans. Contact: Charlotte Franklin at Institute headquarters, (202) 626-7410.
Nov. 5-6: Seminar on Design Implications of the Physical and Psychological Changes Experienced by the Elderly, Orlando, Fla. Contact: Alexander Shaw or Karen Smith, ACSA, (202) 785-2324.
Nov. 5-6: Conference on the Preservation and Maintenance of Historic University Properties, Charlottesville, Va. Contact: Murray Howard, AIA, University of Virginia, 575 Alderman Rd., Charlottesville, Va. 22903.
Nov. 5-7: AIA Housing Committee conference on "How to Meet Future Housing Needs and Preserve Human Scale," Newport Beach, Calif. Contact: Maurice Payne at Institute headquarters, (202) 626-7429.
Nov. 6-7: Conference entitled "How We Build: The Relationships that Shape Our Environment," Charlottesville, Va. Contact: John Hatch, University of Virginia, School of Architecture, Campbell Hall, Charlottesville, Va. 22903.
Nov. 9-10: National Computer Graphics Association Conference and Exposition, San Diego. Contact: NCGA, 2722 Merrilee Dr., Suite 200, Fairfax, Va. 22031.
Nov. 10-Jan. 10: Exhibition on "Robert Adam and Kedleston: The Making of a Neoclassical Masterpiece," The Octagon Museum, Washington, D.C. Contact: Ann Carper at Institute headquarters, (202) 626-7467.
Nov. 12: Lecture entitled "The Architect in Society: Nazi Holocaust and Nuclear Genocide," New York City. Contact: Madga Salvesen, Executive Administrator, Architects Designers Planners for Social Responsibility, 225 Lafayette St., New York, N.Y. 10012.
Nov. 21: AIA Women in Architecture, San Francisco Chapter/AIA, and the Organization of Women in Architecture workshop entitled "Communications Strategies for Architects," San Francisco. Contact: Therese Ildefonso at Institute headquarters, (202) 626-7346.
Nov. 22-28: INTERBUILD—International Building and Construction Exhibition, Birmingham, England. Contact: Sandra Paul, British Information Services, 845 Third Ave., New York, N.Y. 10022.

LETTERS

Landscape Students at Virginia: I would like very much to clear the air about a quote taken out of context in Marguerite Villecco's article "Steeped in History, Shaped by Urbanism" on the University of Virginia school of architecture [Aug., page 42]. The quote in question claims I said, "It's difficult to tell landscape students that they need to appreciate architecture and cities—it's almost antithetical for some. They think about nature and art, doing gardens and preserving the environment. Urban design is much broader and we don't yet have the sophistication of the architects." Definitely a "quote" looking to cause trouble. Two things disturb me greatly about this "quote." The first is that it implies our students (in landscape) don't have the interest or abilities ("sophistication") that architecture students have. Wrong. A majority of our students come here *because* of an interest in cities, in urban design, and in the strength of connections between the various programs here at the university. Our students do collaborate with their fellow architectural students on projects both within an academic context and outside of class. There is *considerable* sharing of ideas and critique between the architecture and landscape disciplines here at the university on both a formal basis (juries, classes, etc.) and an informal basis.

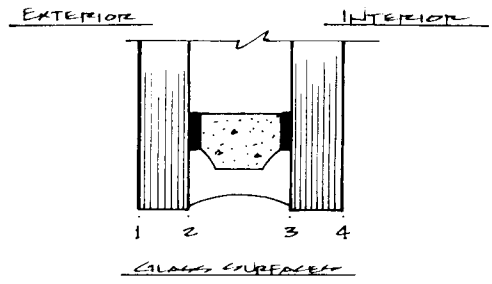
Warren T. Byrd Jr., Chairman,
Division of Landscape Architecture
University of Virginia

Collegiate Kudos: I've been out of school for nearly 10 years, and, on occasion, when the practice gets stagnant, I rush to the closest collegiate architectural studio for some fresh air; more so [in August] with regard to the schools/students/faculty you chose to feature this year—an uplifting piece! They're all to be commended, especially students: Young, Renfro, Wall, and Pryse; and critics: Sherman, Waldman, Dripps, and Abbey (by way of his studio's facade reinterpretations).

Also, hail to the dean of the school of architecture at the University of Virginia for his efforts to bridge the gaps between varying architectural disciplines. So too is ARCHITECTURE to be saluted for similarly facilitating the passage between the enthusiasms of academia and pragmatisms of the profession (which can be just as lustrous). *Christopher P. Morris*
New York City

Glazing Surfaces II: In the Letters section of your August issue [page 6], Stephen J. Sawyer asked for clarification as to which is the No. 1 surface of an insulating glass unit and you advised that either the inboard or outboard light can be considered the No. 1 surface. This is incorrect. For architectural glass materials the glass surfaces are counted from the outside-in (as detailed below). Therefore, the No. 1 surface is to the exterior of the building.

C. Gregory Carney
Spectrum Glass Products
Clinton, N.C.



Architecture School Libraries: The school of architecture at Rice seems to have a lot of financial funding from the RDA/endowment [see Aug., page 36]. More focus on a bigger architectural library and auditorium seem to be the main objectives, as well as a more organized staff/council. The school has the pen at hand; now it needs the drawing board.

As an architectural student who has attended New York Institute of Technology, University of Miami, and the University of New Mexico, I find that a weak spot is present in architecture schools. There is a lack of communication, organization, and evaluation of student priorities. At NYIT, there is a small architectural library, well organized and material easily found. At the University of Miami, with the exception of the law and medical schools, all others share one library. When looking up architectural sources, none could be found. A new school is being designed by Aldo Rossi that, one hopes, will include a library and an auditorium. At the University of New Mexico, the architecture school has a small resource room open during limited hours and a large periodical section in the fine arts library that also houses books very often unavailable elsewhere. The school also has a lecture series that is housed in the university theater.

How can students expand their knowledge when the most important source isn't provided? Studio gives us immediate feedback into design solutions, but that's only 25 percent of school. The rest comes from outside sources, mainly libraries, lectures, and the experience of working in an office. In my opinion, every architectural school or department should have its own architectural library, which should be open 24 hours a day. *Francine Pilgreen, AIAS*
University of New Mexico
Albuquerque

Cities

San Francisco 'Beauty Contest' Produces Its First Three Winners

Barring last-minute appeals, the first winners are emerging from San Francisco's two-year-old competition for major office building developers. The prizes, rations of the city's annual 475,000-square-foot office quota, will enable developers to construct three moderate-sized towers:

- A 19-story headquarters building for the San Francisco Federal Home Loan Bank. Designed by Kohn Pedersen Fox of New York City, it will be allotted 381,030 square feet of the annual quota. The bank had threatened to leave town if it did not receive a cut of this year's quota.
- A 25-story speculative office building for London & Edinburgh Trust of London. Designed by Skidmore, Owings & Merrill/ San Francisco, it will consume 147,500 square feet of the quota. The project had been denied approval in the 1986 contest.
- A 15-story speculative office building proposed by Gerald D. Hines of Houston. Designed by John Burgee Architects of New York City (with Philip Johnson as design consultant), it would contain 160,499 square feet subject to the quota. Wells Fargo Bank, a local institution, would occupy about 50,000 square feet.

They are the first major office projects to receive planning approval in San Francisco since September 1985.

Although the office rationing system has been touted as a means of bringing livelier architecture to San Francisco through heightened competition, none of the contest winners is architecturally distinguished. Each is designed in postmodern style, fashioned to fit in context with the Financial District's mostly early-century Beaux-Arts buildings rather than with such neighboring monuments of the post-World War II era as the 52-story Bank of America tower by Wurster, Bernardi & Emmons; Anshen & Allen's International Building; or SOM's Hartford Building.

All the new developments will be located within a two-block radius of the Financial District's core intersection of California and Montgomery streets. Their sites became an issue prior to the planning commission's vote when, in full-page newspaper advertisements, one developer who had failed to win the planning director's preliminary endorsement claimed that the sites were at odds with the city's new downtown plan. The plan, he contended, prescribed shunting future office development to the South of Market District, outside the Financial District.

The two developers on the losing side of this year's competition were:

- Markborough, a subsidiary of the Hudson Bay Co., which proposed the most imposing design in the 1987 contest—a 32-story tower and visually striking greenhouse by SOM. Space subject to the quota would have totaled 377,525 square feet.
- Deringer Development Co., a San Francisco concern, which put forth a Kaplan/ McLaughlin/Diaz-designed back-office building of seven stories. The Deringer project, using a different architect, had been City Planning Director Dean Macris's nomination to win the 1986 contest. As the only project of the five to be located outside the downtown commercial zone, it was not subject to the guidelines.

Both losing candidates were speculative projects, as is one of the successful candidates, London & Edinburgh. Their failure to show documented evidence of signing up a major tenant with economic appeal at City Hall was a factor in their being bypassed.

San Francisco's office rationing system and contest were established by a narrow (6 to 5) vote of the city-county's board of supervisors in September 1985 as a supplement to the same ordinance that enacted the San Francisco downtown plan. The plan was hailed nationally as the most restrictive city center planning document in the country, but its vague promise to slow development proved unconvincing to the city's powerful slow-growth lobby. The downtown plan pertained only to the commercial office district; the lobby persuaded the board of supervisors to add a citywide growth cap. The ordinance provided for an annual limit of 950,000 square feet for all new office buildings over 50,000 square feet. Any building under 50,000 square feet could escape both the developer competition and the quota.

In November 1986, however, the legislated quota was superseded by voter approval of Proposition M, an initiative that reduces the downtown plan's 950,000-square-foot limit to 475,000 and makes buildings under 50,000 square feet subject to the quota. The initiative does, however, permit the city to carry forward any square footage of the quota not allotted in a year.

According to the judging criteria, a candidate in the development "beauty contest" should demonstrate: that it embodies design quality in its architecture, open space, and public art; that it does not block views, create shadows or wind, or displace housing or small businesses; that

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Below, SOM's scheme. Right, Burgee/ Johnson's proposal. (Federal Home Loan asked KPF not to release its scheme.)

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it neither destroys historic architecture nor conflicts with transit, traffic, or freight loading; that it maintains "a balance between economic growth and housing, transportation and public services"; that it suits its location; that it is seismically safe; that it offers job opportunities to local residents; that it promises to house a single entity (for example, the San Francisco Federal Home Loan Bank); and that its developer intends to buy transferred development rights from sites of buildings the city wants preserved.

Public actions and statements by the city planning director and the planning commission seemed to indicate that architectural quality would be emphasized over other criteria in the contest.

In both years, Macris established a design review committee to rate the contestants. This year the judges were Richard Bender, dean of the college of environmental design at the University of California, Berkeley; Robert Campbell, AIA, architecture critic for the Boston *Globe;* and Robert Geddes, FAIA, Princeton University architecture professor. In 1986, the judges were Bender, Harvard architecture chairman Gerald McCue, and University of Southern California professor Thomas Vreeland, FAIA.

Nonetheless, when the planning commission prepared to ratify Macris's three nominations to win the 1987 contest, commissioners criticized the designs of two of them and found satisfaction in only the London & Edinburgh project. Commission President Toby Rosenblatt said, "I would not rate any of them excellent." And, according to Commissioner Yoshio Nakashima, "They were O.K., nothing to brag about."

The planning commissioners reacted similarly to the architecture in 1986, and they rejected all that year's "beauty contest" candidates. Citing their lack of enthusiasm for any of the designs and noting a 16 percent vacancy rate in city offices, commissioners declared that San Francisco did not need any new buildings and voted denials of all three contestants.

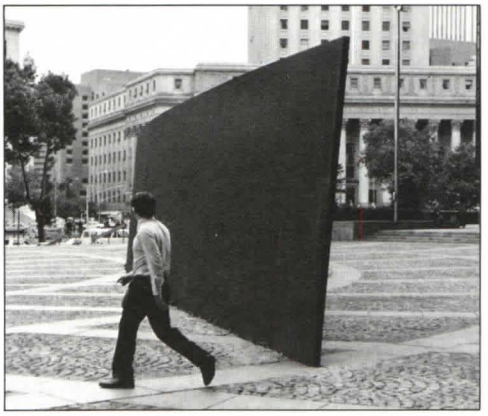
This year, however, with the vacancy rate at 17 percent, the commissioners approved three of the five but displayed little enthusiasm for their designs.

Clearly, in the 1987 contest, tenancy was a more important criterion than design quality in the judging. Two of the winning projects promised to house companies that maintain headquarters in San Francisco. As to why the London & Edinburgh project also won, observers assume it was because no one had anything uncomplimentary to say about the project, which will be small and relatively inconspicuous on a midblock site. Moreover, despite the lack of rave reviews by commissioners for its architecture, its design was rated "excellent" by the architects on the review panel.

In addition, some news reports suggested that the commission's vote may have been a face-saving gesture, for both the planning director and the contest itself, which, after two years, needed to produce something.

As to the future of the "beauty contest," it has the legislative right to continue indefinitely. The yearly ration will double, city planners estimate, by about the year 2000; by that time all projects now in the bureaucratic processing pipeline are expected to be built or under construction. But in the meantime, with office vacancy rates remaining at an all-time high, there is no rush of developers to join the competition. Nor is there likely to be. San Francisco's future office growth is expected to take place in redevelopment areas that either enjoy an exemption from the contest or will seek one from the same electorate that enacted the 475,000-square-foot annual cap.—GERALD D. ADAMS

Mr. Adams writes about urban planning issues for the San Francisco Examiner.



Allen Freeman

Richard Serra's "Tilted Arc" sculpture (above) may be removed from a New York City plaza by the General Services Administration without violating the artist's constitutional rights, a federal judge has ruled in a suit brought by Serra.

Judge Milton Pollack of the U.S. District Court in Manhattan ruled in late August that Serra had been deprived of neither his First Amendment right of speech nor his Fifth Amendment right of due process. Serra had sought $30 million in damages.

"Tilted Arc," a sheath of Cor-Ten steel 12 feet high and 120 feet long, sweeps across a plaza bordered by a federal office building and a U.S courts building in lower Manhattan. GSA commissioned the $175,000 work in 1979, erected it in 1981, and announced intentions to relocate it in 1985 (see July '85, page 11).

But in his decision this summer, Judge Pollack wrote that GSA "was within its authority when it found that the sheer size of the sculpture, wholly apart from its message, rendered the plaza physically impractical for use as a site for major events and public hearings." Of Serra's claim that GSA breached the artist's contract by proposing removal, Pollack said the court had no jurisdiction because of the federal government's immunity.

Congress Approves Scheme For Federal Triangle

In late August Congress gave final approval and the President signed a bill authorizing a building program to complete Washington's Federal Triangle, the massive Beaux-Arts office complex never finished after construction was halted during the Great Depression. The site is the last remaining undeveloped major parcel of land along Pennsylvania Avenue.

The legislation provides for a $362 million mixed-use project that could be a maximum of 3.1 million square feet. The complex will house the newly created, quasi-public International Cultural and Trade Center and provide office space for the Justice and State departments, as well as shops, restaurants, and exhibition space. The 500,000 square feet of space alloted for the ICTC is designed to house foreign missions and organizations concerned with trade.

The trade center will be located on an L-shaped site facing Pennsylvania Avenue and 14th Street N.W. Now a 1,300-car parking lot, the site is defined by the government buildings of the Federal Triangle built between 1928 and '38 and wraps around the highly detailed and eccentric 1908 Beaux-Arts District Building.

The legislation authorizes the Pennsylvania Avenue Development Corp. (working with the General Services Administration and a 15-member International and Cultural Trade Commission to be appointed by the President) to create the program and development plan and to oversee an open architect/developer competition. The complex will be built under an intricate federal building program whereby a private developer will construct the building and own it for the life of the lease, in this case 30 years.

M. Jay Brodie, AIA, executive director of PADC, said the corporation hopes to issue a prospectus on a formal design competition in about a year. Although the legislation is very detailed in setting the terms of the role of the trade center and the financing of the proposal, PADC is charged with establishing the development plan package and creating conceptual studies. "The site is virtually surrounded by buildings of a very particular character," said Brodie, "so in creating the criteria for the design competition we will attempt to give some guidance, but leave opportunity for creativity."

Brodie credits a number of people and groups for working to gain approval of the current proposal—GSA; the Federal City Council, a local business group that was the catalyst in creating the international trade center; and Sen. Daniel Patrick Moynihan (D-N.Y.), who has been a prime mover in the renaissance of Pennsylvania Avenue.—LYNN NESMITH

News continued on page 16

Preservation

Organizations Debate Addition To Texas Schoolbook Depository

There is no such thing as a minor alteration to the Texas Schoolbook Depository. Images of the Kennedy assassination are engraved so deeply into the national memory that any change, even one that will be invisible from the "grassy knoll," seems to threaten whatever tenuous understanding we may have of the tragedy.

On Aug. 11 the Dallas Landmark Commission approved construction of a 60-foot elevator tower for the north, or back, side of the Depository. The elevator is to serve a proposed sixth-floor exhibit on the events surrounding the assassination and will be the first new structure on that site.

The approval came over the objections of city planning staff and a historic district committee, and re-ignited a smoldering controversy that pitted county against city, city against state, planners against Landmark Commission, and preservationists against one another.

Advocates of the tower, mainly the private Dallas County Historical Foundation, argue that for better or worse the Depository has become an international landmark and that Dallas has an obligation to accommodate the tens of thousands of people who visit it each year. "There is a great need and public demand for something to be here," said Foundation President Lindalan Adams.

Opponents see the proposed museum and tower as a morbid reminder of a tragic event and an unseemly way to commemorate a slain president. "It's a disgrace, like the city is exploiting Kennedy's death," said Frances James, one of two dissenting votes on the Landmark Commission. "It's blood and gore and distasteful."

Preservationists object mainly to the height and massing of the tower, saying that it is incompatible with the architecture of the adjacent West End Historic District, a warren of turn-of-the-century warehouses that has become a popular restaurant and entertainment area.

Several architects have proposed locating the elevator inside the Depository, a suggestion opposed by Dallas County, the building's owners, on the grounds that it would disrupt daily business in the Depository's offices and courts.

The controversy over the proposed elevator tower is only the latest upheaval in the tortuous history of the assassination exhibit. The idea was first proposed in the late 1970s by a handful of Dallas preservationists who believed the time had come for the city to face the past that hurt. Their campaign got a boost when the Dallas County Commissioners purchased the Depository in 1977 and renovated it extensively. But public support was meager, especially among the Dallas business community, which has been badly scarred by the worldwide condemnation of the city following the assassination. Supporters could raise only enough money for an occasional workshop or seminar on the proposed exhibit.

In 1983 the tower finally received conceptual approval from both the Dallas Landmark Commission and the Texas Historical Commission. While neither group was enthusiastic about the design—done by James Hendricks, FAIA, the architect who had renovated the Depository—neither wanted to reopen old wounds by clamorous public debate. All criticism was sotto voce.

In the meantime supporters of the project reorganized themselves as the Dallas County Historical Foundation, commissioned a promotional film called One November Day, and hired the Washington, D.C., firm of Staples &

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Preservation *from page 21*

Charles to design the exhibit. The model shows photographs and videotapes of the assassination, together with newspaper and magazine articles, and a glassed-in reconstruction of Oswald's sniper's perch. No artifacts will be included.

In 1987, newly elected County Judge Lee Jackson pledged $2.2 million in county bond funds to complete the project by November 1988, the 25th anniversary of the assassination. The remaining $800,000 will be raised privately.

The project sailed quietly along until late spring this year, when the Historical Foundation returned to the Landmark Commission for what it assumed would be a routine final review. Commissioners responded by criticizing the size and detailing of the tower and the visitor pavilion at its base. A commission subcommittee for the West End Historic District recommended that the entire design be scrapped. So did the city planning staff.

The Dallas Landmark Commission ultimately approved the project by a vote of 8 to 2, using as its rationale its perceived "moral obligation" to follow through on the conceptual approval of 1983. Substantive critical discussion of the design was avoided once again.

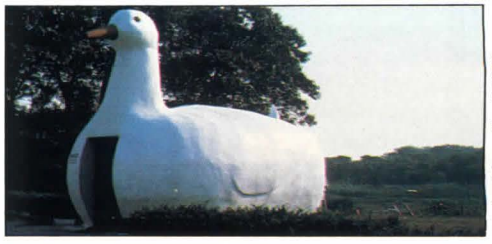
At this point it's difficult to separate design issues from broader psychological and philosophical issues. Hendricks's tower is a reasonable response to a difficult problem of getting thousands of tourists in and out of a building that wasn't made for them. Its major drawback is that it's the only proposal being considered. Given the sensitivity of the site, some people believe that a more comprehensive study of the problem is called for. Whether the elevator should be located inside or outside the building also involves a subjective judgment about whether the interior or the exterior of the Depository is more historically significant. Supporters of the elevator tower insist that the sixth floor is sacred; those who favor internalizing the elevator make contextual concerns paramount.

Coloring the entire debate, of course, is Dallas's lingering guilt over the Kennedy assassination and the related issue of whether, or how, to commemorate that event. The Landmark Commission decision did not resolve the matter. Just as America refought the Vietnam War over the Vietnam Memorial, so is Dallas quietly reliving the most agonizing moment in its history over the elevator tower. Like Frederick Hart's statue of the three infantrymen, the tower has become a lightning rod for comment and criticism. It is obviously more than a public convenience. It is a bridge to the sixth floor—a monumental marker for a tragic event and a symbolic statement about how the city wants the event to be viewed. After 24 years, Dallas still doesn't have an answer to that question.—David Dillon

'Big Duck' to Be Preserved as Symbol of Roadside Architecture

The "Big Duck," a local Long Island landmark made famous by Robert Venturi, FAIA, will be preserved as a symbol of America's roadside architecture. Efforts to save the pop icon intensified recently after the 11-acre site on which the duck sits was purchased by a builder for possible residential development. In late August, Suffolk County officials announced plans to raise money for the duck's restoration and to find it an appropriate home.

For over 20 years the duck has been a symbol in theoretical debate on the nature, purpose, and failures of contemporary architecture. First discussed in 1964 in Peter Blake's *God's Own Junkyard,* the duck gained prominence with the publication of *Learning from Las Vegas,* Venturi's and Denise Scott Brown's treatise on symbolism in architecture. Writing in 1972, they defined two manifestations of image over process or form—the "decorated shed," where space and structure directly serve



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a program and ornament is applied independently of them, and "the 'duck' in honor of the duck shaped drive-in, 'The Long Island Duckling,' . . . where the architectural systems of space, structure, and program are submerged and distorted by an overall symbolic form."

The idea of the duck-shaped building was conceived in 1931 by Martin Mauer, a commercial duck producer, as a gimmick to increase retail sales. In 1941 the building was moved to its present site on a well traveled rural road that connects New York City with the Hamptons.

Oblivious to its fame in architectural debate, the duck continued to function as a roadside stand selling ducks and duck eggs as it had since the 1930s. For the last three years the duck has stood vacant. It measures 20 x 30 feet, and, although its interior has deteriorated and its white stucco exterior is showing signs of wear, its orange beak and black eyes are still bright.

Suffolk County Executive Michael A. LoGrande said the local government is negotiating to obtain the duck and to find a permanent site, "preferably on a landscaped roadside setting to maintain the original character." Support for preserving the duck has been overwhelming from both the New York City architectural community and local residents who have come to love the duck as a symbol of Long Island. —Lynn Nesmith

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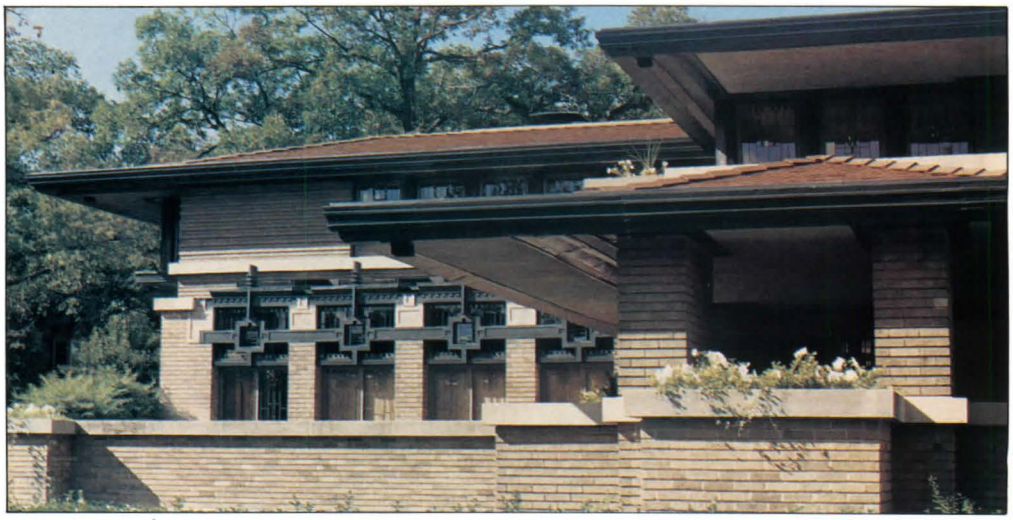

David P. Schaap

Steelcase Inc. has just finished restoring Frank Lloyd Wright's Meyer May residence, built in 1909 in Grand Rapids, Mich. Located in Heritage Hill, a national historic district of 1,300 residences, and just two blocks from Wright's only other Grand Rapids work, the May residence had been extensively altered over the years with a 2,200-square-foot addition and a carport. The restoration removed the additions and returned the residence to its 1915 appearance. Steelcase will use the house for small corporate functions and will open it for public tours.

When Steelcase purchased the May residence, a tattered sofa was the only original piece of furniture that came with the house. During the restoration Steelcase managed to purchase more than 30 pieces of the original furniture, all of which have been restored. Using original drawings and early photos, the architect reconstructed the missing furniture and restored all the oak wall details, leaded windows, and copper-sheathed window detailing. All structural elements of the building, including the supports for the cantilevered roofs, were replaced with steel members.

John Tilton of Chicago was the principal restoration architect. Carla Lind, former executive director of the Frank Lloyd Wright Home and Studio, was Steelcase's coordinator, and David Hanks acted as consultant for furnishings. —David P. Schaap

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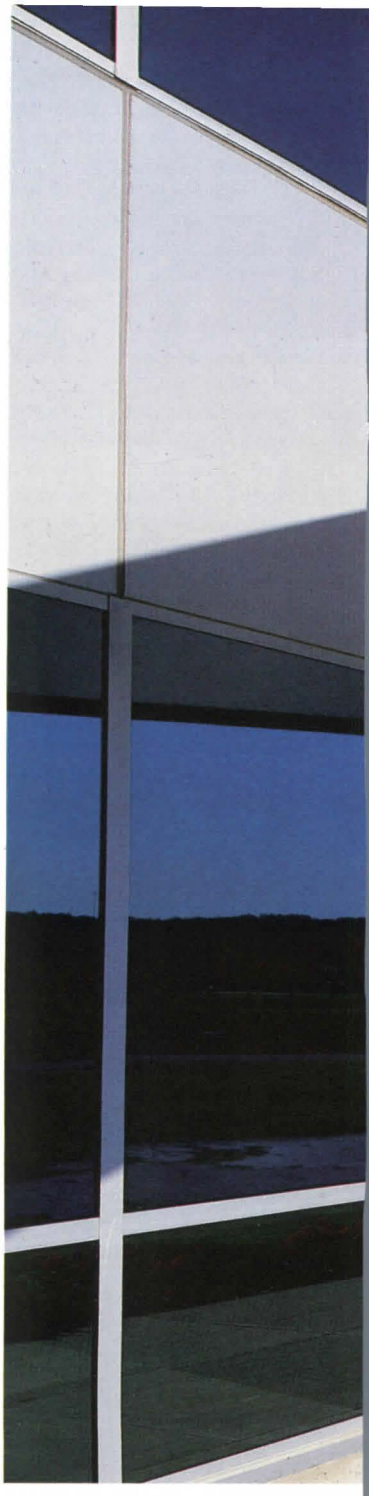

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DEATHS

Albert O. Bumgardner, FAIA, founder of The Bumgardner Architects in Seattle, died at age 64 after a long illness. He was a visiting professor in the schools of architecture at Montana State University and the University of Washington. He graduated from the University of Illinois school of architecture and early on was widely recognized for his innovative designs of houses. Bumgardner's firm has been responsible for the design of many of Seattle's buildings, including the six-block Waterfront Place redevelopment.

George Dahl, FAIA, a prominent Dallas architect, was an organizer and then supervising architect for the 1936 Texas Centennial Exposition at Fair Park. In addition to overseeing a team of architects and artists who designed 26 buildings, Dahl designed the centennial and transportation buildings and the master plan of the fairgrounds, in a style he termed "Texanic."

His career spanned over 50 years, during which he designed the United States' first drive-in bank, for Hillcrest State Bank in University Park, Tex., the original Titche-Goettinger and Neiman-Marcus department stores, the Dallas Public Library, and RFK Stadium in Washington, D.C. Dahl received his bachelor's degree in architecture from the University of Minnesota and his master's degree from Harvard. He died in July at age 93.

Michael S. Diamond, AIA, was a founding member of the Staten Island Chapter/AIA and served as its president from 1955 to '59. He designed and supervised construction of more than 1,000 buildings. He attended Cornell and Columbia universities; Columbia honored him with its first medal for excellence in design. Diamond was 96 when he died in July.

Howard H. Mackey Sr., FAIA, founder and former dean of the school of architecture and city planning at Howard University in Washington, D.C., died of pneumonia in August. He was 85. A specialist in the architecture of the tropics, Mackey designed buildings in British Guyana and Surinam. He earned his master's degree in architecture from the University of Pennsylvania. Mackey was also an artist, and his paintings were exhibited at the Corcoran Gallery in Washington, D.C., the Howard University Gallery of Art, and the Chicago Art Institute.

Howard W. Phillips, AIA, founder of Phillips & Associates in Scottsdale, Ariz., died in July. Phillips received his B.S. in architectural engineering from the University of Illinois.

Hugo V. Neuhaus, FAIA, was an architect of commercial and industrial buildings. His firm, Neuhaus & Cowell, later Neuhaus Associates Architects, was located in Houston. Neuhaus was a graduate of Yale University and received his degree in architecture from Harvard. He was 72 when he died in July.

Wilhelm Viggo von Moltke, FAIA, former professor of urban design at Harvard, died in August at age 76. Von Moltke received his architecture degree from the Technische Hochshule in Berlin, and his master's degree in architecture from Harvard. He was on the heralded planning team that in 1961 unveiled the blueprint for restoring downtown Philadelphia.

BRIEFS

Presidential Design Awards

The National Endowment for the Arts, through its Design Arts Program, is announcing a call for entries for Presidential Design Awards. The program is open to past and present federal employees, non-government individuals, and organizations that have designed works for the federal government completed between Jan. 1, 1977, and Jan. 1, 1987. The awards recognize excellence in the following federal design fields: architecture, engineering design, graphic design, interior design, landscape architecture, product/industrial design, urban design, historic preservation, and planning. The deadline for submissions is Dec. 17. For more information, contact Thomas Grooms, PDA, NEA, 1100 Pennsylvania Ave. N.W., Room 625, Washington, D.C. 20506. *Briefs continued on page 28*

SOM Traveling Fellowship Awards
The Skidmore, Owings & Merrill Foundation has announced the winners of the 1987 architectural traveling fellowship awards for travel and study: first prize of $12,000 to David Black, University of Michigan; $10,000 to Richard Lee, Columbia University; second prize of $8,000 to Douglas Garofal, Yale University, and Mark O'Bryan, Cornell University; and $5,000 to Aric Andrew, University of Kentucky, David Yama, Virginia Polytechnic Institute and State University, and Christopher Young, Boston Architectural Center.

Historic Documents Needed
The Center for Historic Resources at Texas A&M University is seeking any photographs, drawings, maps, and artifacts relating to the history of the built environment in Texas. Anyone who has knowledge of such material or would like more information should contact: Joan Rabins, Center for Historic Resources, College of Architecture & Environmental Design, Texas A&M University, College Station, Tex. 77843.

Design Competition Winners
Richard Alan Yeager II, a student at the University of Virginia, and Yvan-Pier Cazabon, of Carleton University, have both won first place and $3,000 in an energy design competition sponsored by the Association of Collegiate Schools of Architecture.

Student Award Winners
A team from Lawrence Institute of Technology, Southfield, Mich., has won first place in an architectural and engineering competition to design a "21st-century manufacturing facility." Cosponsored by General Motors and the Association of Collegiate Schools of Architecture, the competition was intended to develop interdisciplinary teamwork and communication and to focus on industrial facilities as a building type.

The winning team from Lawrence was made up of students John Biggars, Robert Radecki, and Paul Matelic. A team from Pennsylvania State University earned second place and students from the University of Arizona won third place. Three teams were cited with honorable mention: Illinois Institute of Technology, the University of Kentucky, and the University of Maryland.

Concrete Design Awards
The Concrete Reinforcing Steel Institute is seeking entries for its awards in site-cast reinforced concrete design. Projects must be located in the United States and completed after Jan. 1, 1985. The entry deadline is Nov. 7. For more information, contact CRSI, 1800 E. Northwest Hwy., Arlington Heights, Ill. 60004.

American Culture Fellowships
UCLA's Institute of American Culture is offering graduate and postdoctoral fellowships to support study of Afro-Americans, Asian Americans, Chicanos, and American Indians. The fellowships range from $20,000 to $25,000 per year. The stipend is adjusted to the length of the award and can be used to supplement sabbatical salaries. Application deadline is Dec. 31. For more information, contact Norris C. Hudley, UCLA, Institute of American Cultures, Los Angeles, Calif. 90024.

New NCARB President
Walter T. Carry, AIA, principal in the firm of Cooper Carry & Associates, Atlanta, was installed as president of the National Council of Architectural Registration Boards. Carry will hold the office until July 1988.

Call for Papers
The World Congress II on asbestos abatement is requesting technical papers on asbestos-related topics. The deadline for submittals is Nov. 15. For further information, contact the Asbestos Abatement World Congress, Association of the Wall and Ceiling Industries, 25 K St. N.E., Suite 300, Washington, D.C. 20002.

Delta Faucet Design Competition
Four designers and an architecture student won a design competition sponsored by Delta Faucet for water delivery devices. The winners are Laird Robertson and Jeff Latto, Toronto, Ontario; Nicholas Tsakiris, Providence, R.I.; William Rees Morrish, Beverly Hills, Calif.; and Dennis Dressel, a senior at the University of Washington.

News continued on page 31

The Arts

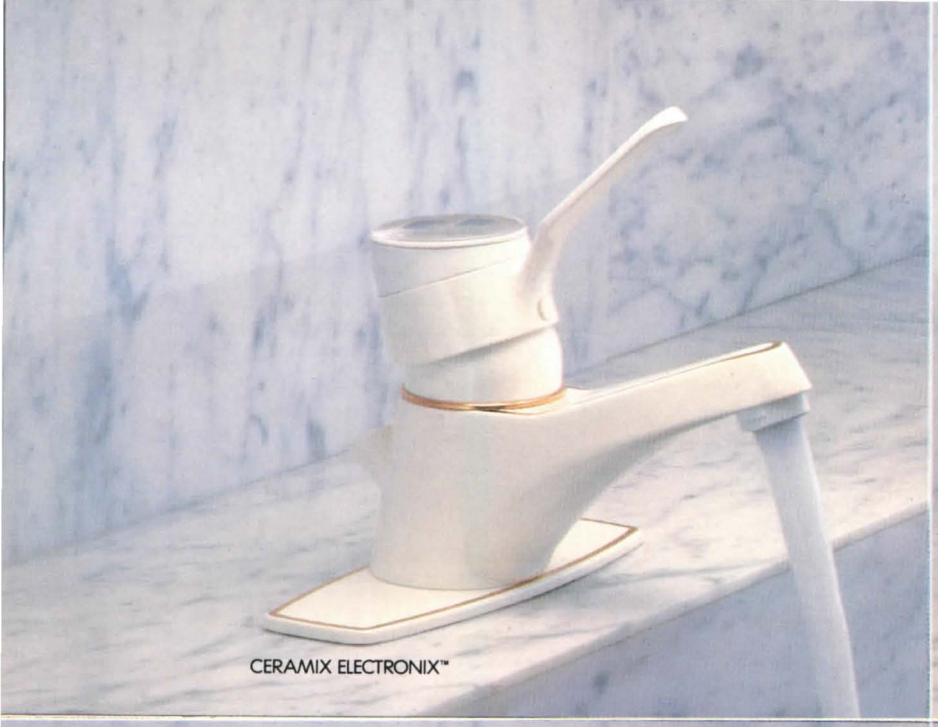
Corbu As Artist

Le Corbusier's standard form of opprobrium for those he considered philistine was to accuse them of having "eyes which do not see," and these words also form a chapter heading in *Towards a New Architecture.* Indeed, his intellectual understanding of the world was largely visual. He paid the greatest compliment to himself with the words, *"Others* stood indifferent—but you *saw."*

Late in life, Le Corbusier wrote: "I have not stopped painting daily since [1918], extracting from wherever I could the secrets of form and developing a spirit of invention in the same manner that the acrobat trains his muscles every day and achieves control. I believe that if people are going to see something in my work as an architect, it is to this private labor that one should attribute its deepest quality."

Le Corbusier saw painting, sculpture, and architecture as a trinity. To underscore this integrity, last spring a centennial exhibit of his art at Carpenter Center at Harvard University—Le Corbusier's only building for teaching and producing art (see page 37)—displayed works dating from the same era as the building (built in 1961-64), some of which are shown here.

By the late '40s and early '50s, Le Corbusier's rigorously intellectual purism—impersonal, geometric evocations of such everyday objects as bottles and pipes—had been softened and enriched by objects suggesting a more poetic reaction—women, rocks, shells, and the like. His curved shapes of the period bring to mind Ronchamp and the Carpenter Center itself, though he retained the purist priority of contour and profile over color and shading. His bold, full forms sometimes look wrenched into a sort of harmony that has a spare, aloof, but sensual and calm feeling about it. Le Corbusier described his work of this period as characterized by "ineffable space," where objects exist in an exact, tense balance, fully evolved in relation to the whole.—ANDREA OPPENHEIMER DEAN



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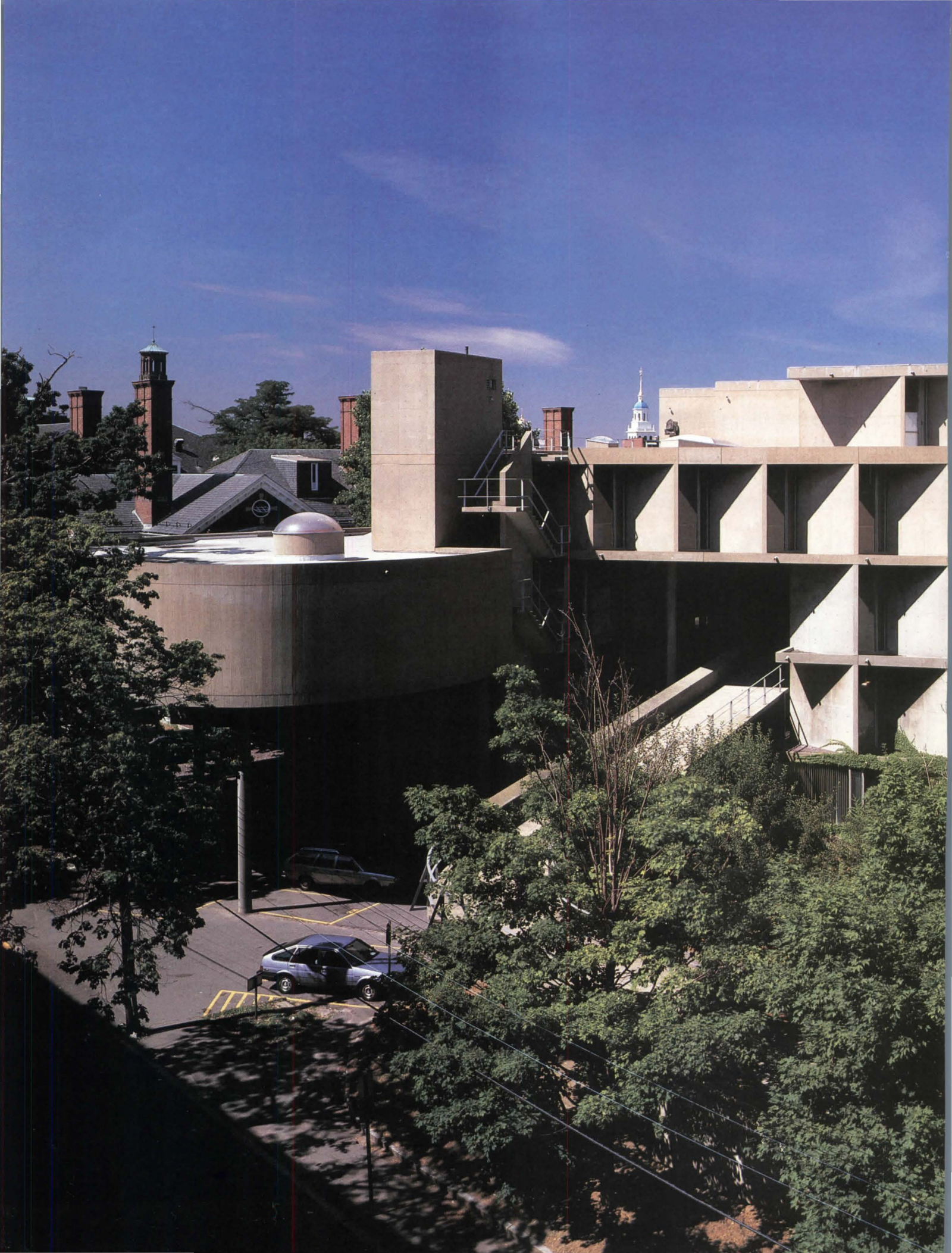
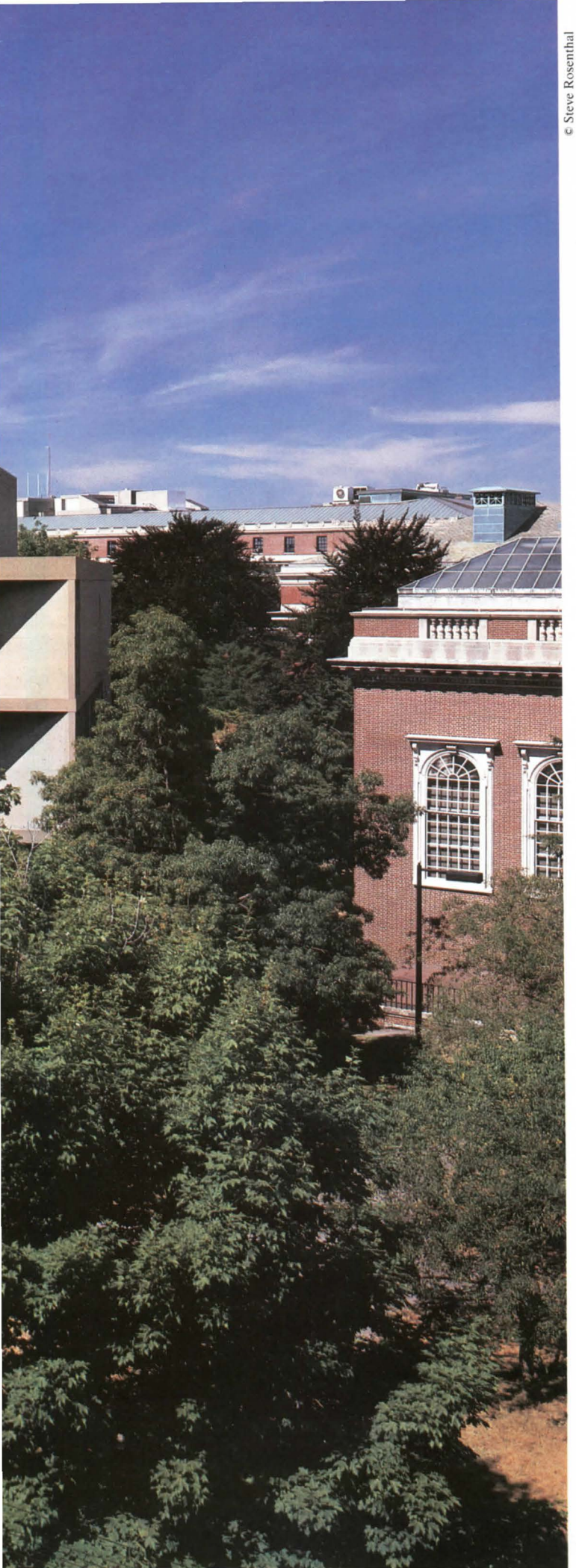
ARCHITECTURE

This month we observe the 100th anniversary of the birth of the wondrous Le Corbusier in three ways: with a sampling of a show of his paintings and sculpture; with an evaluation of his only American building; and with a display of his mastery of light, part of a photo essay on that basic ingredient of architecture.

In between the last two is a kaleidoscope of buildings modest in size, cost, and/or aspiration, but not in quality. Our call for submissions of such works produced a most gratifying response. We could have easily and proudly published twice the number. We'll do it again one of these months.

This month marks another anniversary: the first of the merger of ARCHITECTURE and ARCHITECTURAL TECHNOLOGY. We are increasingly delighted with the results of the merger, and surveys show that our readers are too. Special recognition is due those who produce the Technology & Practice segment of the magazine, which has given us such additional dimension; they are, principally, M. Stephanie Stubbs, Douglas E. Gordon, Forrest Wilson, Elena Marcheso Moreno, and Amy Gray Light. In our opinion their output gets better and better all the time.—*D.C.*





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Evaluation: Corbu's Only U.S. Building

Carpenter Center was a deliberate effort to influence American architecture.
By Robert Campbell, AIA

Perhaps no other building in history was designed more self-consciously than the Carpenter Center at Harvard by Le Corbusier.

He intended it from the first as a public demonstration of his architecture. Jullian de la Fuente, the young associate he placed in day-to-day charge of the project, later recalled: "He told me that the visual arts center was to be his only American building, and that he would therefore put all his architectural elements in it."

Later, when the final schematic drawings were being prepared, Corbu told Jullian (rather pathetically, one may feel): "Do these plans so that they will think I am a real architect." He felt himself to be on trial before the world and especially before America.

Corbu engaged in a lifelong love affair with his personal myth of America, beginning with the famous photographs of grain silos (borrowed from Walter Gropius) in *Towards a New Architecture.* At one time he hoped America might be the scene of Corbusian triumphs, but the hope was dashed when he felt he was passed over as architect for the United Nations in New York. When the commission for the Carpenter Center arrived in 1959, he set out with all the energy of his sometimes paranoid personality to make this small building a final, career-summing proof to the Americans and to the world of himself and his architectural language. William Curtis—whose superb book, *Le Corbusier at Work,* is the indispensable source on the Carpenter Center—believes Corbu saw his role toward America as one of "saviour and redeemer."

The Carpenter Center thus simply bristles with its architect's messages and intentions, with pugnacity and propaganda. It struts and frets on its prominent stage, just across the street from historic Harvard Yard, breathing fire at its audience. It has to be understood as a sermon about architecture or it can't be understood at all.

The Carpenter Center for the Visual Arts is a five-story chunk of concrete between the Fogg Museum and the Faculty Club on Quincy Street in Cambridge. Its program was unusual for the late 1950s, when it was conceived: an undergraduate arts center with studios for hands-on work in painting, sculpture, and film, plus backup spaces in the form of a gallery, machine shop, lecture hall, offices, and seminar rooms. These functions are placed in a richly sculpted building that is dominated by two curved studios, one thrusting east and the other west around an anchoring stair tower. "It looks like a drunk being taken to the station by two burly policemen," said Josep Lluis Sert, the Corbu disciple and former dean of the Harvard Graduate School

The east, rear, elevation from Prescott Street (lower left in photo), with Faculty Club roofs at left and Fogg Museum at right.

Photograph © Steve Rosenthal

Two views from Quincy Street. Above, curved studio with vertical concrete mullions hovers over dank ground space. Right, stair tower with glass brick inserts is prominent.

of Design who obtained the Carpenter commission for his old friend.

The first thing you notice about the Carpenter Center is how deliberately out of character it is from everything around it. Quincy Street is a series of neo-Georgian buildings clearly expressing the WASP nostalgia that arose in response to non-WASP immigrations in the early years of the century. The Carpenter obviously wants to have no part in this self-satisfied orgy of red brick. It stands among its staid neighbors, in Dylan Thomas's phrase, like a dog among the fairies. Like the Guggenheim in New York, another curvy concrete soloist on a street of well-mannered palaces, the Carpenter is a deliberate criticism of its neighbors, a billboard announcing the presence of modernism, of Corbu, and of Art.

Although set on a site that is a little too small, the Carpenter is not compact but instead explodes outward, taking up as much volume as possible by means of big gaps of empty air interspersed among its solid elements. In scale, however, it fits suprisingly well. Its cornice and setback approximate those of its neighbors. As time passes and ivy grows, the Carpenter appears less and less the rude gesture it once seemed. Perhaps a building, like a person, cannot remain a revolutionary.

The second thing you are likely to notice is the ramp. It starts at Quincy Street, curves up to the third floor where it splits the building, then slopes down toward Prescott Street at the building's rear and terminates at a meaningless point behind the Fogg Museum. Nobody ever uses the ramp except to walk up to the third-floor public exhibition space, the Sert Gallery. Corbu's intentions for the ramp were more ambitious. In his original scheme, the ramp served not only the third but also the second level. The building's main entrance and administrative offices opened directly off it. When Harvard insisted on lowering the entrance and offices to the ground, the ramp became largely pointless. But the architect never considered omitting it because it was an integral part of the language of architecture he was demonstrating. Rather than connecting things, as intended, the ramp now tends to divide the center's functions from one another.

Several people remember a moment during Corbu's visit to the site in November 1959. He happened to be looking down from an upper-floor window at Harvard Yard at the moment when bells rang and classes changed. The diagonal paths that crisscrossed the snow were suddenly filled with students changing classes. Corbu was struck by the vitality of this diagonal parade; his ramp is a failed attempt to extend it into the building itself.

Perhaps the third thing you notice is the foliage. The Carpenter Center, from some points of view, is half immersed in greenery. Even some of its roofs sport spinachy growths. You are reminded of the chapter on American colleges in Corbu's *When the Cathedrals Were White* (quoted in Curtis's book), entitled "Everyone an Athlete," which says: "Each college or university is an urban unit in itself, a small or large city. But a *green* city."

A green city, for Corbu, meant green on the roof and green on the ground. Two of his early Five Points of architecture are, of course, the roof garden and the free ground plane. The Carpenter is full of opportunities for roof gardens in the sense that interior rooms look out onto roofs. But only one roof, outside the Sert Gallery, has much planting on it and even this garden is unused. Having no parapets, the Carpenter's roofs are unsafe and the doors to them are therefore locked. Security, too, is a concern that argues against accessible roofs.

As for the principle of the free ground plane, the Carpenter responds by hovering heavily in the air on its columns, or *pilotis.* But the result is hard to admire. The relation to the ground is not this building's strength. At virtually every single point where it meets the earth, the Carpenter is a complete disaster. It's as if the building had been designed in midair without consideration of a site and then dropped, like the helicopter it somewhat resembles, onto a random spot of ground. All conditions at grade are more or less unfortunate accidents.

On Quincy Street, for instance, one of the two curved studios, which jabs forward toward Harvard Yard and was known in Corbu's office as "the punch," creates a horrible condition at grade. Elevated only a few feet off the ground, it covers a dank outdoor cave that students sometimes call the "snake pit," a place where you expect to see mushrooms growing and rats sniffing. Street people or partying high-school students are its only occupants, now and then breaking a window.

In an earlier scheme this studio was a whole floor higher and you might think that would have made things better, but back on Prescott Street—where a similar curving studio is one floor higher—things are, if anything, worse. The Prescott Street frontage of the Carpenter looks like nothing so much as a tangle of concrete columns and freeway ramps; the ground beneath is steep and feels residual, useful only for parking cars.

And in the middle of the site, on a sharply dipping asphalt path that passes under part of the building, is the gloomy main entrance, impossible to see from the street. Harvard's then-President Nathan Pusey wanted it here, opposite a door to the Faculty Club, to encourage interaction between arts and academics. No one, it is safe to say, has ever so interacted across the Carpenter's ugly concrete retaining wall, which needlessly separates the buildings.

Both the ground conditions and the roof conditions—like the ramp—raise serious doubts about the rationality, at least for a New England climate, of the Corbusian concepts they embody. As Sert once said in a symposium on the building, "Let's face it, the buildings it most resembles are those at Ahmedabad [India], a very different climate; that's why the ramp never worked." The architect's desire for a universal language of architecture led him to ignore the imperatives of a specific place. Not only that, but there's a sense that Corbu failed to accept the feedback a competent architect should have received from the site conditions. Anyone should have been able to deal better, for instance, with the Faculty Club relationship.

Also visible from the outside are other elements of what Corbu intended as the demonstration of the universal language of architecture. These are the sunshades, or *brisesoleils*; the *ondulatoires,* thin concrete struts or mullions in wavy ribbonlike

Photographs © Steve Rosenthal

Above, lobby with pilotis visible through glass wall. Right, sunshaded third-floor studio, a seemingly indeterminate space.

patterns; and the *aerateurs,* narrow pivoting ventilator panels. Like everything else about the Carpenter Center, all these are dimensioned according to the Modulor, Corbu's proportional system based on the Golden Section and the Fibonacci series. All three elements work to enrich the building, creating a chiaroscuro of shadow and an enlivening rhythm of accents—although the brightly painted *aerateurs* fail as bright spots of color because mosquito screening grays them out. No one but Corbu, traumatized by India, thought screens were necessary in Cambridge.

Looking at the Carpenter Center from the exterior, you are overwhelmed by the extraordinary mastery of sculptural form. It's almost as if Corbu had set himself a formal challenge: how in the world to resolve in one building all these intersections of curved slabs, *ondulatoires,* sunshades, flat and curved walls, ramps, and columns—without ever an awkward joint. As architectural sculpture the Carpenter is a triumph.

Inside, the sun control devices are on the whole a success. Light in the major studio spaces is good, helped a lot by the windows along the interior ramp. The sunshades frame the views in squares of light and green, and the *ondulatoires* present a filmstrip image of life: both devices tend to distance and abstract the real world. There's little glare, and the occasional skylight—a cone, a rhomboid—relieves monotony. Unaccountably, at the topmost floor, where a sculptor-in-residence has a studio, large sheets of glass facing west are left unshaded; the sculptor has put up curtains but in summer his rooms roast.

The major studios are probably what is best about the Carpenter Center. The space here can only be described as Corbusian: a wide horizontal slice of air caught between a flat white surface above and a flat gray one below, measured by a grid of columns and bounded by an exterior wall that is alive with light. The spatial sense in these studios is like that of a shady forest grove. The columns are the tree trunks, the ceiling is a dense canopy of leaves, and at the edge of the grove light penetrates from the open fields beyond.

Most of the surfaces in the studios are concrete except for a bit of oak paneling here and there. Air circulates invisibly within the concrete floor. The esthetic is that of a warehouse: bare surfaces, exposed light tracks, pipes visible here and there. The only decor is the ribbon of *ondulatoires* or grid of sunshades, the latter sometimes painted in primary yellow, red, blue, or green. These are cool, spacious rooms in which you feel you can work. They are underfurnished, underdetailed, and loftlike—spaces in which the architect has not imposed on you nor overdetermined your world. For all the sculptural form-making of the Carpenter's exterior, its interiors are surprisingly relaxed and indeterminate.

Parts of the Carpenter were designed not by Le Corbusier but by his collaborating firm, Sert, Jackson & Gourley, which did all the drawings after schematics and supervised construction. The basement lecture hall, a prototypically Corbusian double-height space with overlooking balcony, was Sert's suggestion. Its mysteriously undulating west wall is the contribution of the acoustician. In recent years the lecture hall has been altered by the addition of banked seating and a movie

screen—the only room at Carpenter to have undergone any significant change—but with its angled walls and acoustic canopy it retains a constructivist sensibility and remains a small masterpiece.

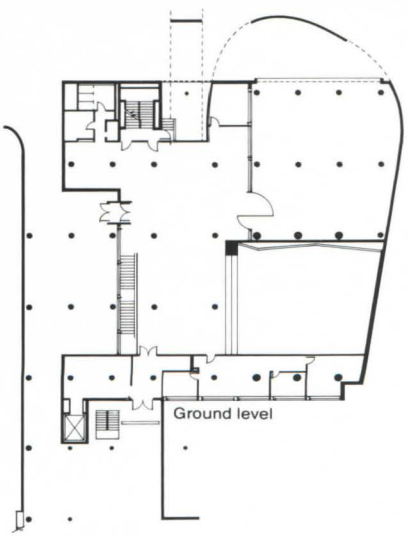
Besides the studios, the Sert gallery, and the lecture hall, the only significant space at Carpenter is the lobby, used as a social space and locus for small exhibitions. Though it looks out on the "snake pit" and is itself dark, the space works well. The basement is largely given over to a maze of windowless film workshops, and there are offices and a couple of private faculty studios peppered throughout the building in available corners.

Another space must be mentioned, although it is not an interior. This is the vertical outdoor cut through the building formed by the ramp. What makes the experience of this space so remarkable—in some ways, the most remarkable thing about the whole building—is the system of reflections it sets up among the surfaces of glass that line it on both sides or are perpendicular to it. At different times of day and night these different surfaces of glass become more opaque or less so, more reflective or less, creating an endless richness of semitransparency that reminds you of the cubist and collagist in Corbu.

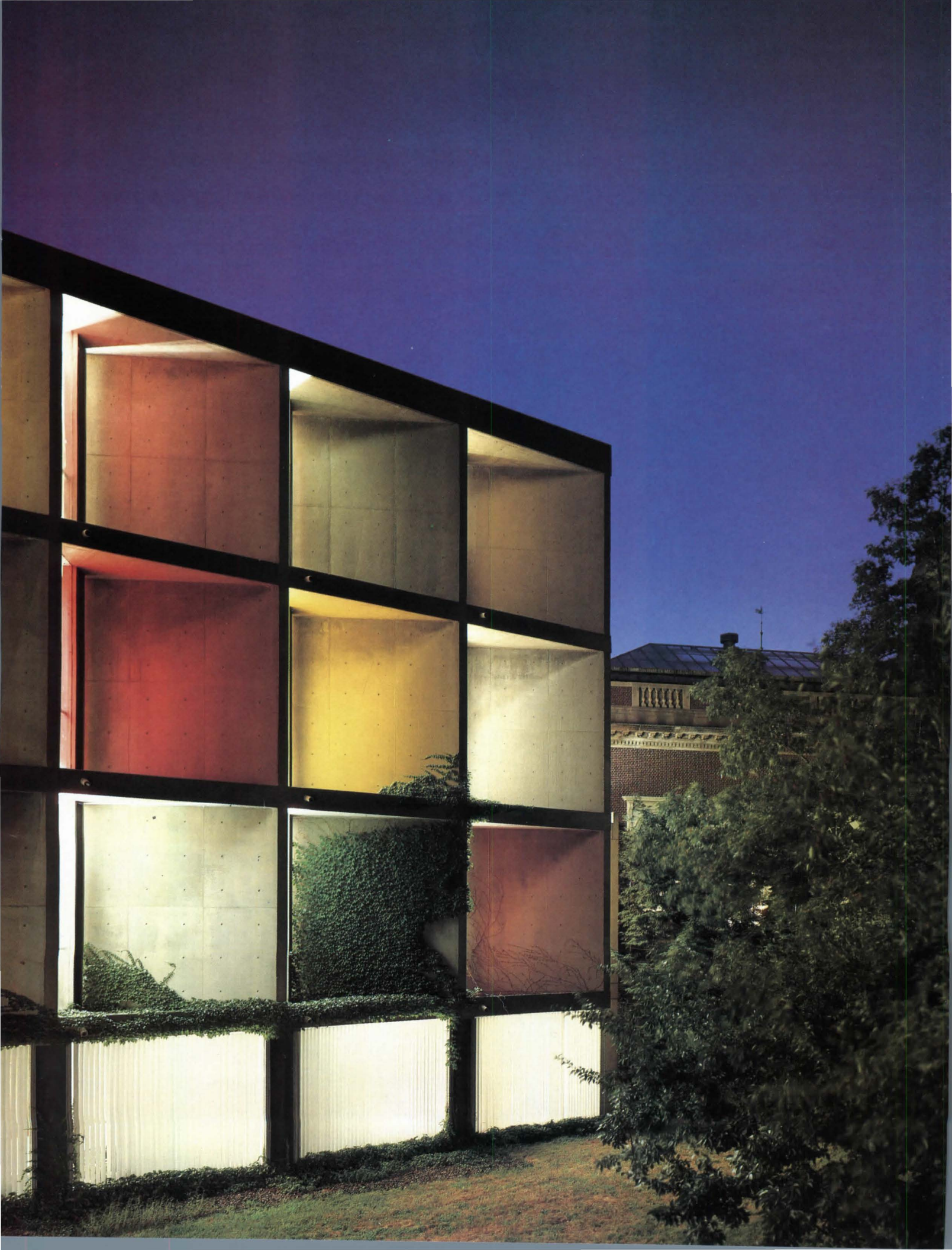
From the point of view of construction, Carpenter is largely a pseudorationalist fiction. Column diameters are determined by the number of stories the column supports (thicker for more floors), leaving out of account the buckling forces that become critical in long columns. As a result, the apparently rational columns are filled with radically different amounts of steel. And although the columns seem not to have capitals and to meet the slabs directly, there are actually capitals hidden within the depth of the air-circulation layer of the floor. In one place, a slab that appears to be raised on *pilotis* is actually hung from a concrete wall above, the wall being cantilevered. Slab cantilevers are constantly varying in depth yet had to be controlled by reinforcement for uniform deflection.

For all its industrial imagery, the Carpenter Center is largely a handcrafted building. Even the sonotubes that formed the columns had to be specially made to achieve the "rational" diameters. Forms for the walls were reused only sparingly because of Corbu's insistence on an unstained, utterly smooth concrete surface ("like a woman's thigh," as he put it). Yet it's pleasant to report that despite its idiosyncracies the building has given Harvard little maintenance trouble. The concrete mullions—the *ondulatoires*—were the most serious problem, too thin to be practical and subject to bowing. In locations where they also serve as frames for the *aerateurs,* they have been braced by horizontal pipe railings. And, of course, like so many of its generation, the building is an energy hog. But Harvard's maintenance department rates it as neither more nor less trouble on the whole than other buildings.

The final impression of the Carpenter is unquestionably positive. Its insouciance, its willingness to violate norms and to revel in creation, and its mastery of sculptural form are disarming and at times thrilling. The whole building has about it an air of joyous improvisation, of incompleteness that suits the creative arts it houses. It's the kind of building that only a Le Corbusier could hope to get away with, but for all its willful faults, one is grateful that it exists.



Above, a characteristically cluttered studio space. Left, the lecture hall on basement level, the building's only renovated space. Right, the sunshades colored by reflected light and, beyond trees, a glimpse of the Fogg Museum. □



Kaleidoscope

Strikingly Simple String of Utility Buildings in a Tiny Town

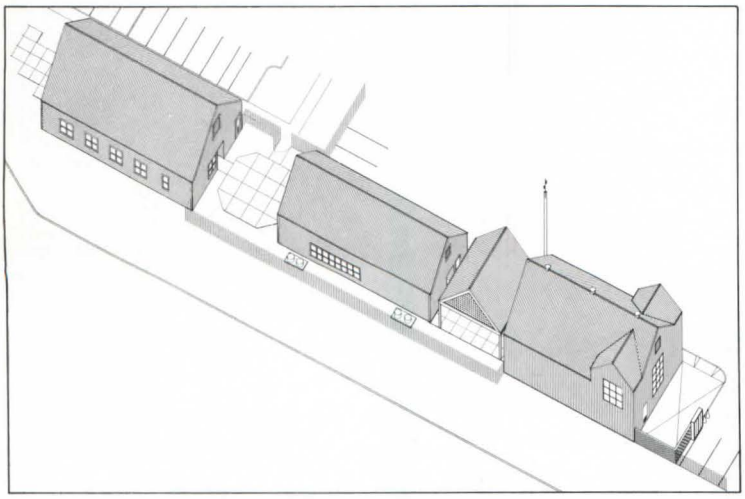
This Pacific Gas & Electric Co. service center was the first new facility built in 40 years in central Geyserville, Calif., a town of 750 in the beautiful but sparsely populated Redwood Empire area north of San Francisco. Its four-acre site was, according to the architect, Roland Miller Associates, "one and a half blocks from Mick's Fountain and the auto body shop and a mile from the Grange Hall." A floodplain traverses the eastern portion of the site, so it was used for parking and a corporation yard for equipment and materials. The building was placed along a highway at the site's western edge.

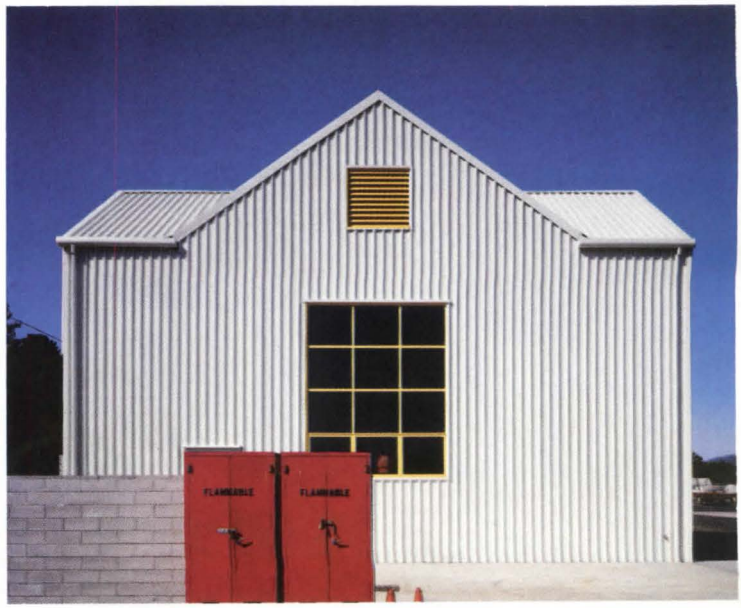
Actually, it is a series of three buildings "lined up nose to tail," again to quote the architects (who actually aren't quite that bucolic, coming from relatively cosmopolitan Santa Rosa and before that San Francisco). The utility's northernmost element is a customer service center; next to it is an operations office, then a pert little pavilion that serves as a covered work area, then a garage and storage building. The enclosed area is 7,450 square feet, the covered work area 900.

Modesty was part of the program. The utility, the architects say, "wanted to slip into town with a minimum of fanfare and go about their business, which is the servicing of local customers and the dispatching of work crews to repair gas and power lines along the Highway 101 corridor." The neighborhood is comprised of a somewhat haphazard mixture of small bungalows, warehouses, and metal outbuildings.

The customer service and operations buildings were given gabled metal roofs, clapboard siding, a cheerful yellow and white paint job, and somewhat residential windows to help them fit in. The garage with storage shed is taller and has larger openings and component metal siding. The yard is open to view, but where it abuts the main street there are white pickets in the fence. "All this was just fine with the locals who reviewed the design before we proceeded," say the architects.

They provided the photos above of some typical Geyserville facades. The utility's facility clearly echoes them without condescension. It is a happy composition, at home in its small-scale setting but with a definite presence and highly sophisticated in its simplicity.—Donald Canty, Hon. AIA



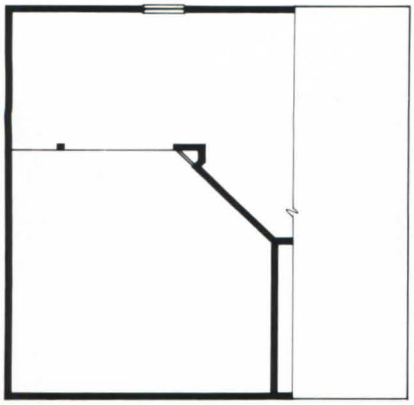


Top, some characteristic Geyserville facades. Center, facility comprises three buildings; below, from left, end wall of the shed, covered work area, and service center interior.

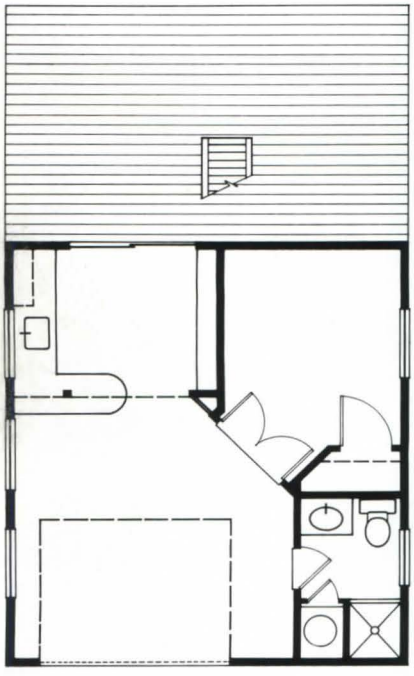
Photographs © Tom Rider


SANDBERG WHOLESALE LUMBER CO.

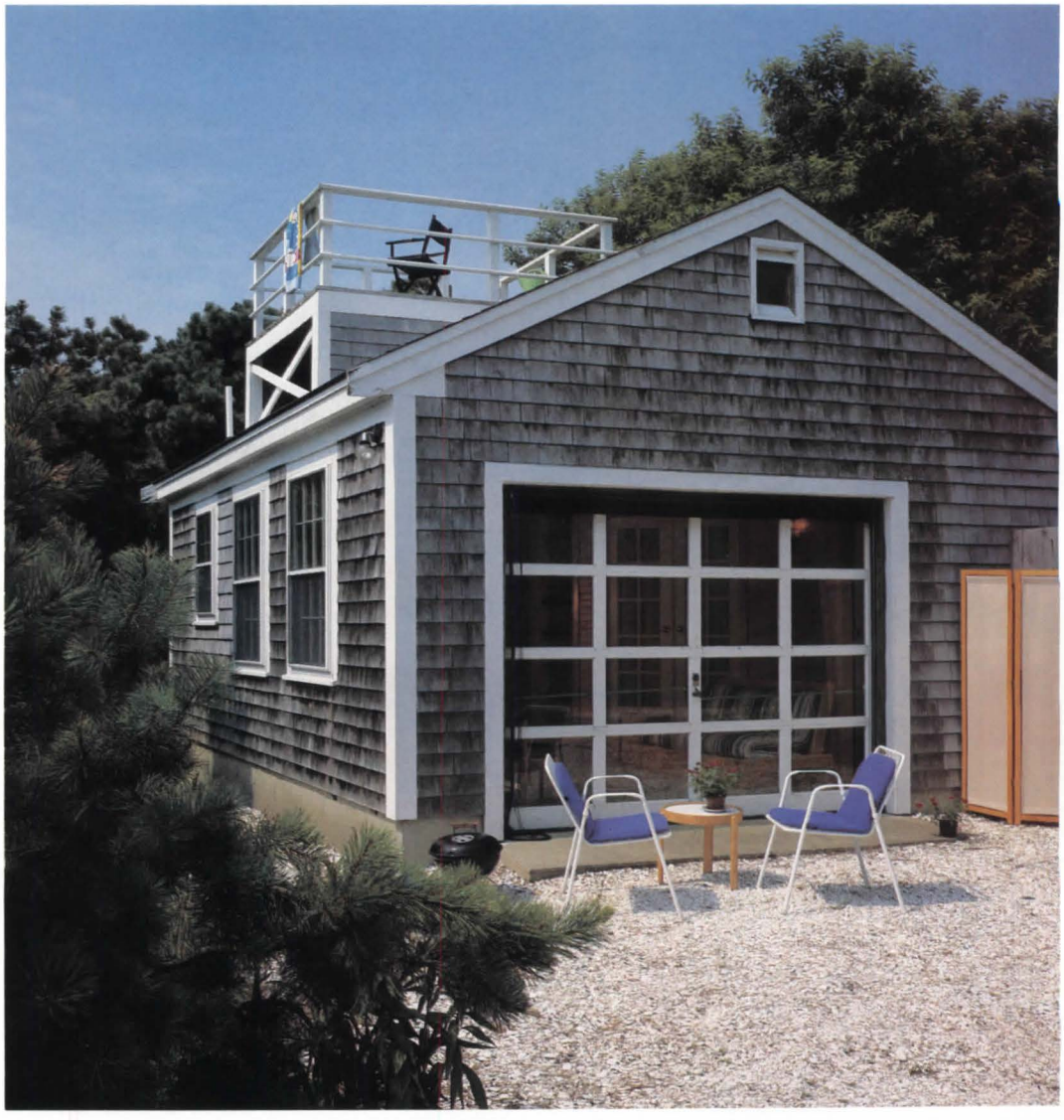
Garage Converted into a Crisp And Compact Vacation Cottage



Loft



First floor



Photographs by Joanne Devereaux

This modest Cape Cod summer cottage, resurrected from an unused 400-square-foot garage, sits amid a grove of tall pines and looks out to a commanding view of both the Atlantic Ocean and the salt marshes.

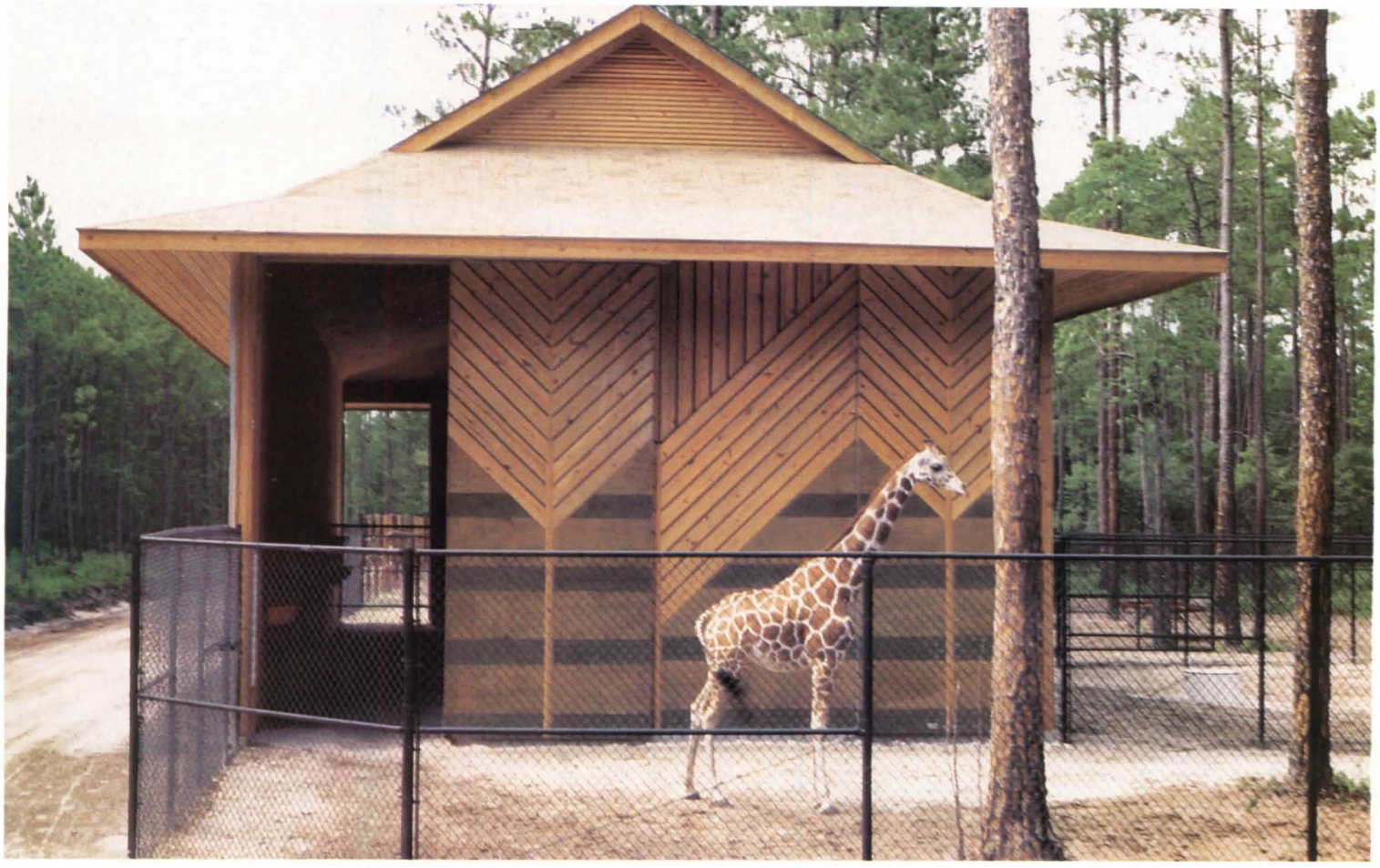
Working with a budget of $20,000 including architectural fees, Chad Floyd, AIA, and J. Whitney Huber, AIA, of Centerbrook Architects retained the cedar shingles and many of the original garage elements. The existing overhead door was adapted with glass panes in the wooden panels to create a large, operable window. On warm days the garage door can be fully raised, opening the living room to the outdoors, while a roll-up screen keeps insects out. On the west side of the house, a 200-square-foot wooden deck was added, and a ship's ladder leads to an abstracted widow's walk.

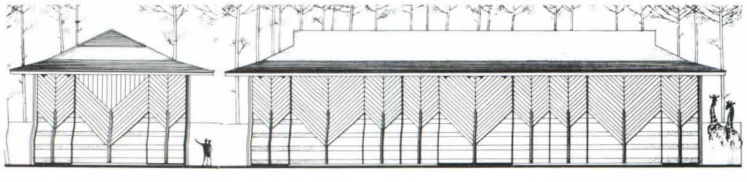
The interior walls, detailing, and built-in kitchen bench are pine beadboard and recall the inside of a boat. Wall-mounted marine utility sconces and the kitchen cabinets and trim in bright colors further contribute to the spirit of a summer place.

Five-foot-wide French doors lead to the only bedroom. "You may be going into a tiny room," says Floyd, "but you are doing it in a grand way." A loft for two over the kitchen is reached by a built-in ladder of rungs notched into the angled wall, and a small window in the gable wall provides light and ventilation.

—Lynn Nesmith

Mural-like Pattern of Wood Decorates a Shelter for Giraffes





White Oak Plantation is a privately owned, 7,500-acre wildlife preserve straddling the St. Marys River on the Georgia/Florida border. In addition to providing refuge for native animals, the plantation is involved in an ambitious program of breeding and raising more than two dozen rare and endangered exotic animal species. One of the preserve's most recent acquisitions is a small herd of *Giraffa camelopardalis reticulata* (commonly known as reticulated giraffes), and this 3,000-square-foot box wrapped in its own forest is their new home.

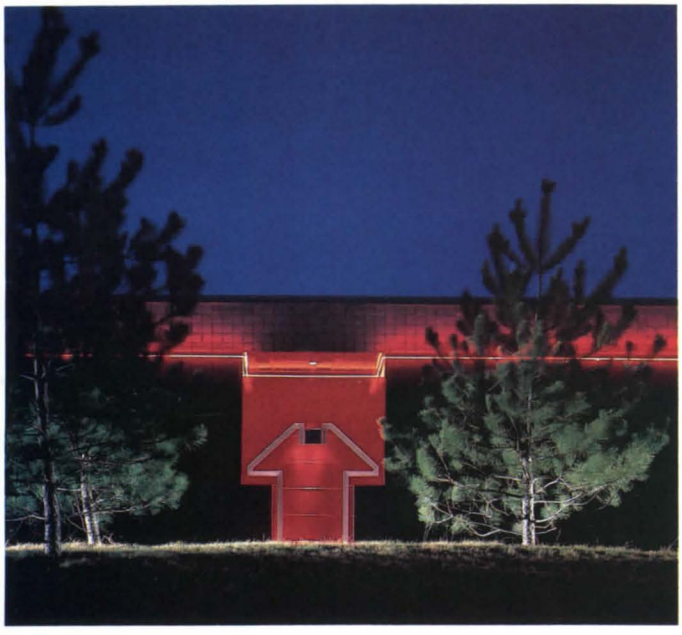
To relieve the bulky, 96x32-foot wood frame building, New York architect Anthony R. Moody, AIA, used a herringbone pattern of rough pine boards played against alternating light and dark stained bands of plywood. He repeated this treelike design on the 20-foot-tall barn doors, which are set on horizontal rollers and balanced to allow operation by one person.

The interior is a 30-foot-high space, unbroken by columns, with natural-finished plywood walls and an earthen floor. The giraffe house was built entirely by the preserve's staff construction crew in less than 90 days; materials cost less than $100,000.

The program called for, in Moody's words, a "big, dumb barn of a space," but he created a big, smart space perfectly scaled for the leggy, long-necked occupants and the peaceful wooded setting.—Lynn Nesmith

Neon, Entries, Plaques Enliven Prototype Warehouse Design

© Peter Vanderwarker



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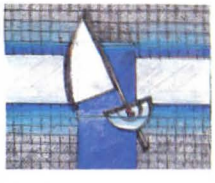
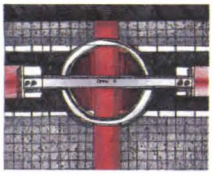




Many young architects start out with commissions as mundane as a warehouse. But this warehouse, designed by Ahearn Schopfer & Associates of Boston, is anything but mundane—an alien in the land of Butler buildings. The Omni Spacecenter in the Wareham, Mass., industrial park is a 10,000-square-foot prototype for a chain of warehouses that could be built anywhere in the country.

The client wanted something that was a cut above the run-of-the-mill sheet metal warehouse for about the same cost as a Butler building. "The idea was to make a very common building uncommon—so startlingly different that it would be inescapable to anyone who could get this space for the same price," explains Kevin Schopfer, AIA, adding that the cost of the Omni Spacecenter was about $30 per square foot.

The construction is simple—a concrete block shell with steel joists and a metal deck roof. The difference is the bright band of eye-catching color (achieved with color-impregnated and painted block) and, of course, the zippy neon keyed to the band, which acts as a floating cornice and frames the distinctive entrances to the building's subdivided spaces.

The neon also gives the warehouse a regional signature. For the Wareham building, the portals are abstracted colonial pediments. Schopfer's sketches for warehouses in other locales include a cactus for Arizona, a Florida palm tree, Texas longhorns, and a Maine lobster. A neon design for a specific client, such as a foundry, might take the form of molten metal.

—Michael J. Crosbie

Top, detailed entryways punctuate the facade. Above left, neon ornament at night. Left, three abstracted portal details.

Playground for Preschoolers As a 'Collection of Follies'

Karl A. Backus

This is the first of many phases of a children's playground in Ritter Park, Huntington, W.Va. The playground will occupy a grassy, oval-shaped hollow surrounded by mature trees.

The first phase is for preschool children and is on one edge of the hollow beneath a small cluster of evergreens, set apart from what will be the more active and boisterous play of older children toward the center of the sunlit site.

The architect, Bohlin Powell Larkin Cywinski (Peter Q. Bohlin, FAIA, project designer) says they thought of the playground as a "henge or collection of follies. The play structures have been designed to be reminiscent of both children's blocks from the early part of the century and mysterious ruins."

Actually, the first phase is more like a single structure, affording along its course a variety of events and experiences. It is built of solid limestone and sandstone for the sake of maintenance and to impart a sense of timelessness. It is embedded in the bank of the hollow and its gables, pyramids, canopies, steps, and other forms and shapes too numerous to catalog are unified by a meandering wall. The whole could be viewed as a single, syncopated sculpture, an assemblage of very large construction toys, or a miniaturized, cheerfully postmodern village.

Along the way are three stainless steel slides, a crawl tunnel, an inglenook with a seat, a small stone version of a hollow, and an amphitheater behind a kind of patterned patio-stage. The whole lends itself to a full range of play including climbing, sliding, crawling, sitting, and swinging (on separate but axially related structures).

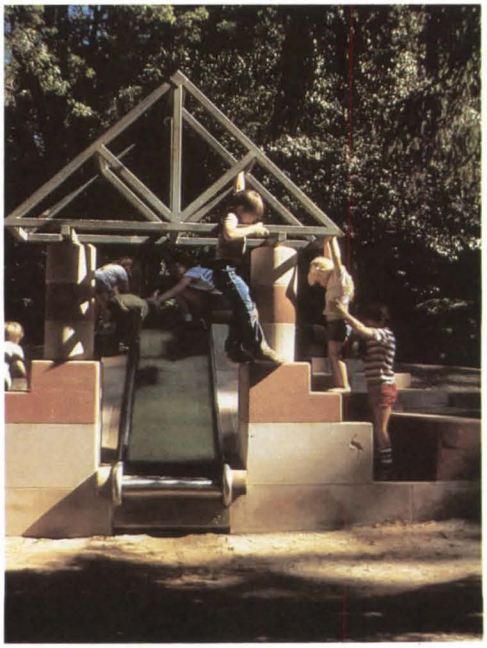
The elements are visually orchestrated so that they compose themselves in interestingly varied ways from different vantage points. Lest the eye be rested, petroglyph designs have been sandblasted into the stone faces, referring to mythical creatures and to the life and history of the Ohio River Valley, of which the community and its remarkable playground are a part.

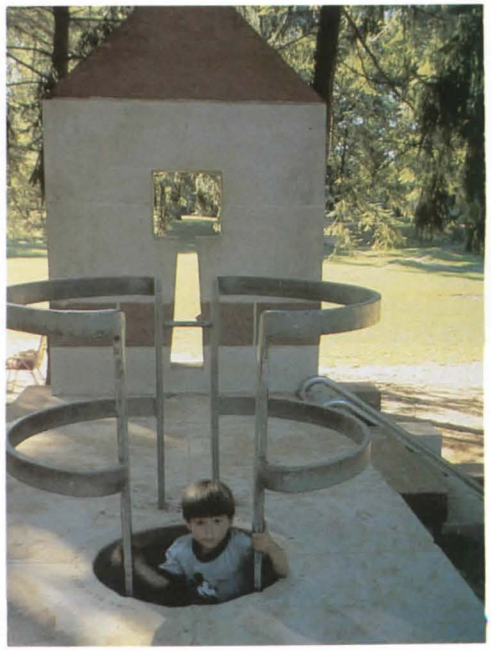
—Donald Canty, Hon. AIA

Left, an overview of the preschool playground. Below, a petroglyph.

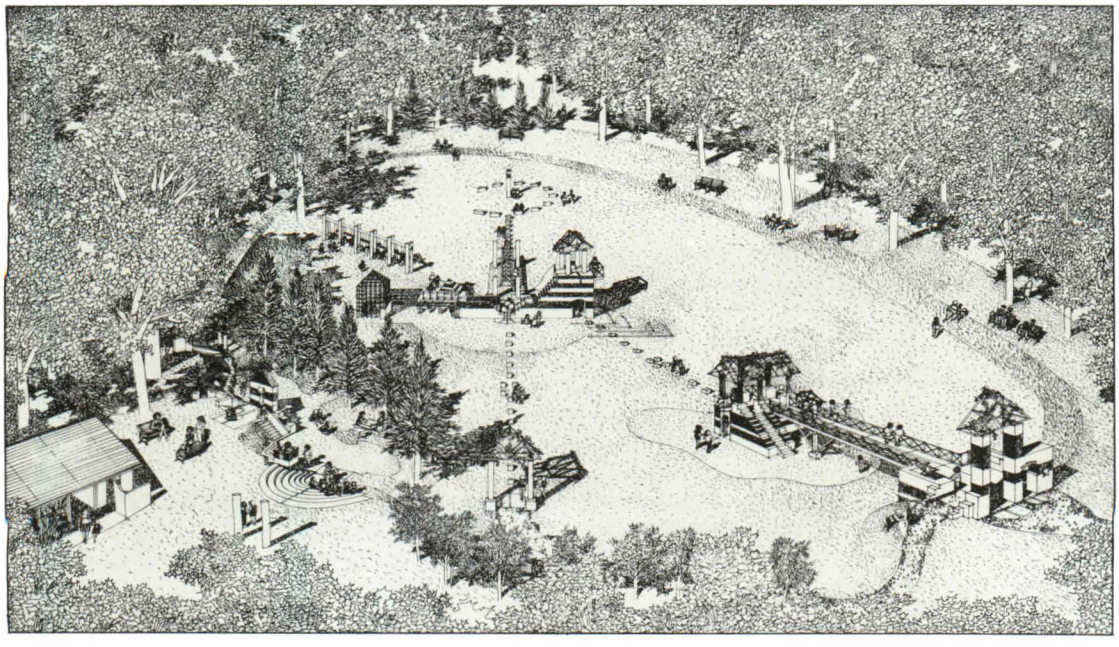
Karl A. Backus

Amphitheater, above, bears petroglyphs of Peter Pan. Structure's slides, canopies, steps, etc., offer almost endless opportunities for exploration and play. Boy in second photo at right is emerging via 'ship's ladder' from a concrete chamber with a sand floor and storytelling glass blocks by a local artist. Drawing is of the master plan for the playground. First-stage preschool area is at its lower left.

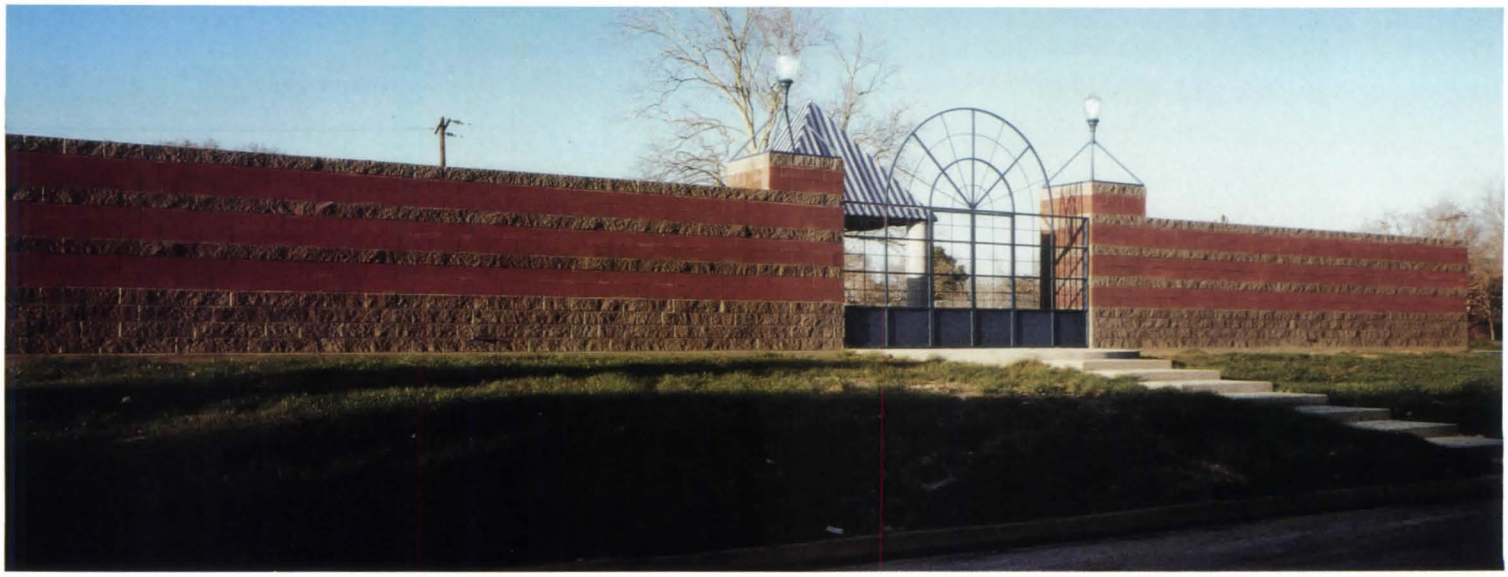


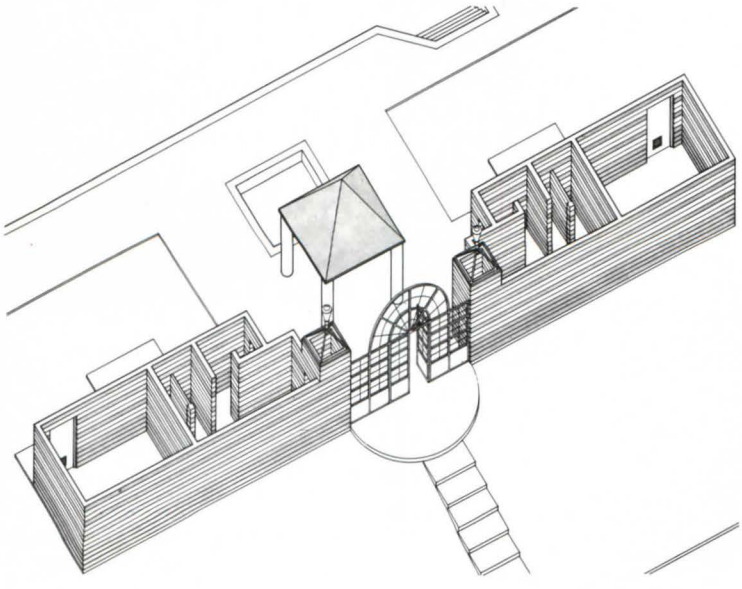


Karl A. Backus



Bathhouse and Pool Entry Given a Sense of Ceremony



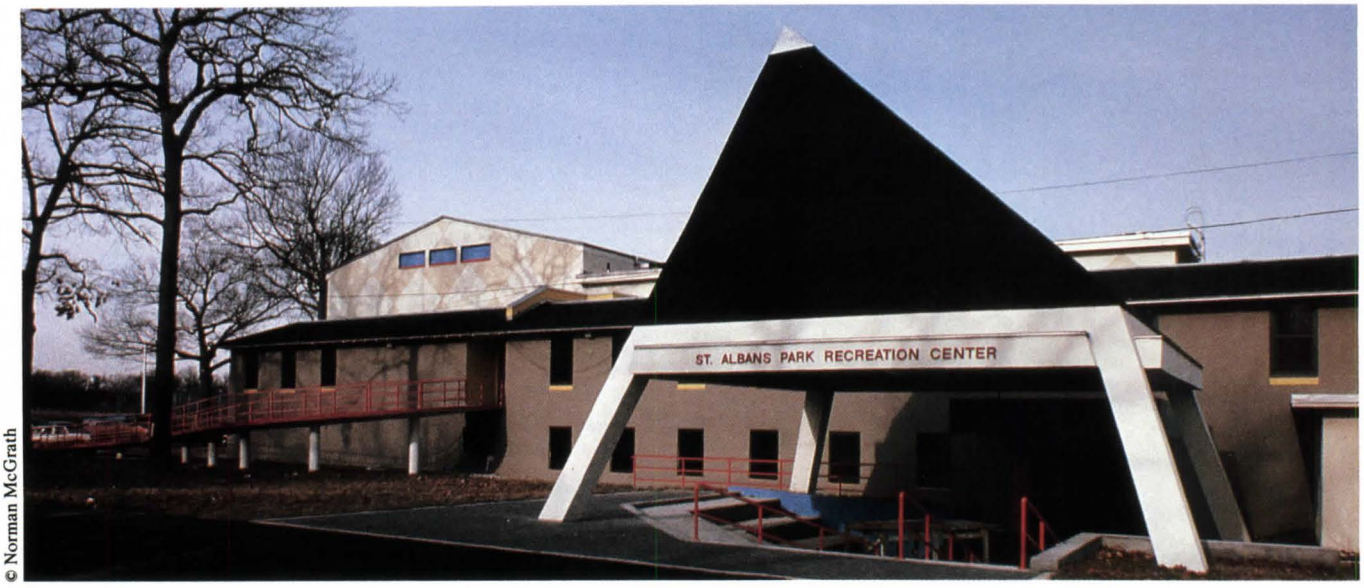


In designing a bathhouse for a neighborhood swimming pool in Houston, Taft Architects used simple, inexpensive materials to create a sportive formality. The Houston-based architects began by placing a banded concrete wall along one side of the pool. Concrete steps lead up to the wall's portal, a steel garden gate with a circular apex (above). Oversized lanterns on either side of the portal add to its formality. Set at each side of the entrance behind the wall are the roofless bathhouses, each containing a dressing room, shower, and toilet facilities. Farthest from the entry gate, behind the banded concrete wall, are storage and equipment spaces. Beyond the portal, a pavilion meant to recall those at seaside resorts offers shelter from the sun. It sits in front of a children's pool identical in size to the footprint of the pavilion. The shallow end of the main swimming pool comes next in the progression.

While the symmetry of parts establishes formality, the Southside Place Bath House is enlivened by color, as in the wall's strips of split-face gray and smooth red concrete blocks, with the pavilion's blue and white striped canvas top and concrete columns as counterpoint. Tying it all together is the blue entry gate.

—Nora Richter Greer

Decrepit Building Made into A Colorful Community Center



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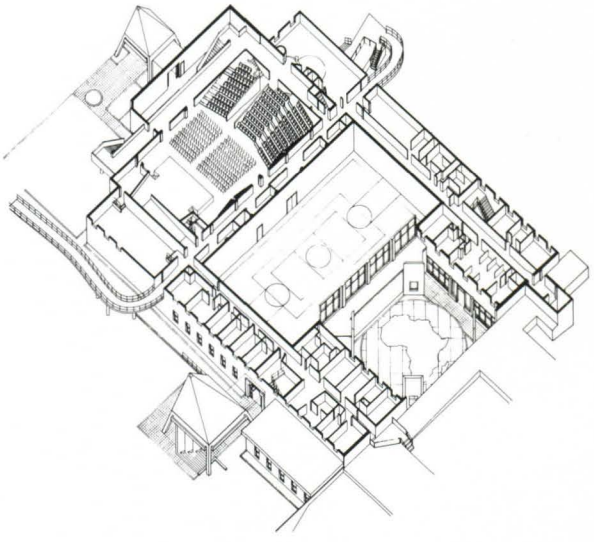


The genesis of St. Albans Park Center in the Jamaica part of Queens evokes the grassroots activist days of the 1960s. The federal government ceded an abandoned 1940s Navy hospital and 53 surrounding acres to New York City in 1973, and soon the Southern Queens Park Association sprang up, proposed an ambitious program for the disused land, and with a park master plan by Medhat Salam Associates got the land made a city park. Next, Salam adapted the 50,000-square-foot, structurally sound hospital. When the remake was complete, South Queens had a new home for an established theater troupe, a gym, indoor pool, cafeteria, seniors' center, and health center.

The old hospital (right) was organized into three main side-by-side areas: ballroom over swimming pool, gym, and courtyard. Salam made the ballroom the theater, landscaped the court, and emphasized new main entrances with intriguing distorted concrete pyramids (top). With economy a mandate, he had to retain serviceable but unbeautiful parts of the old building. For instance, in the Africa Court (above), he employed brightly colored corner screens to draw your eye from institutional windows. As a measure of his success, this courtyard has been the scene of two weddings.—Allen Freeman

A Trio of Designs for a Very Special Group of Clients

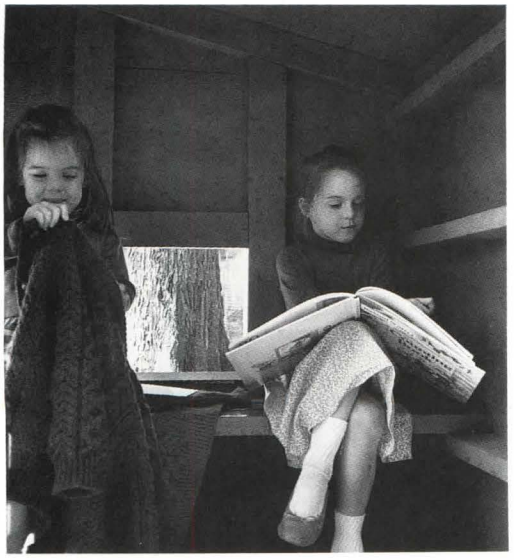
These pages present three different projects for similar clients: children of architects. At left is a backyard play structure by Albert Skiles of Goshen, Ark., who used the idea of a watch tower as a theme. It is approached via a ramp up to a cantilevered deck, up a pipe ladder to the top, where you can slide down a pole. Most of the lumber and the tin roof were salvaged from local construction sites, and the sand pit is ringed with sections of a walnut tree. The total cost was under $200.

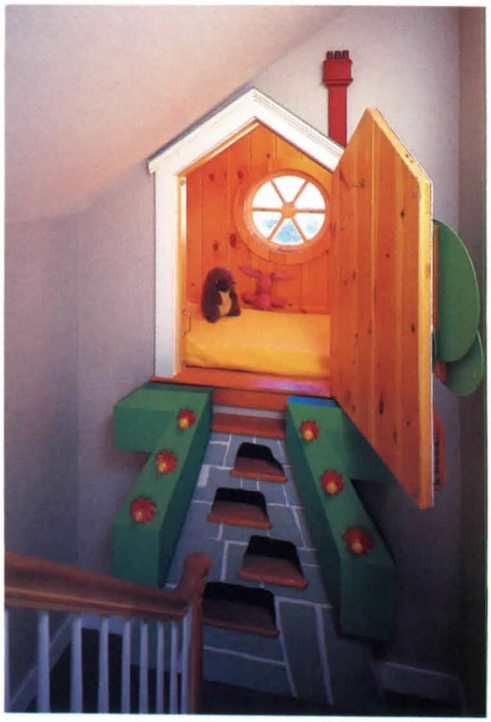
Below is the "¼ House" designed by Houston architect Thomas Colbert for "the gang"—offspring and their friends. Colbert laments the fact that the "design purity" of the little structure of scrap wood and lattice—"purified by having nothing to do with anything outside itself, or possibly anything at all," says Colbert—was compromised by client demands for a bigger imaginary kitchen, a view of the garbage man, and completion by Christmas. The clients, however, appear satisfied.

The little house of 24 square feet, at right, is the product of a collaboration between architect Steven Foote and his daughter, who was 10 when it was designed and built two years ago. "You know how kids draw houses," comments Foote. "It's always the little gable end with smoke coming out of the chimney, and a path. It's such a strong image—a prototypical symbol for kids." Foote's daughter had produced such a drawing after perusing her dad's plans for his own house in Maine. It was being framed when his daughter discovered a small, cozy nook behind a stairwell that was destined to be a closet. "I was working in the house, sawing wood, and the next time I turned around she was sitting up in there. One thing led to another, and we started to work it out."

Foote admits to following his client's lead. "She picked out all the colors. I cut out the pieces and put them in place." The facade is made up of scrap pieces of molding and plywood, with a tree whose trunk is a handle that opens the house front. You pull yourself up the ladder/walk by grasping the flowers along the hedge. The interior, furnished with a mattress, is paneled in pine with a round window for light and lookout.

Cost of the house: $88.50 for materials; labor gratis. Architect's fee: two cheeseburgers and a Coke.—Michael J. Crosbie

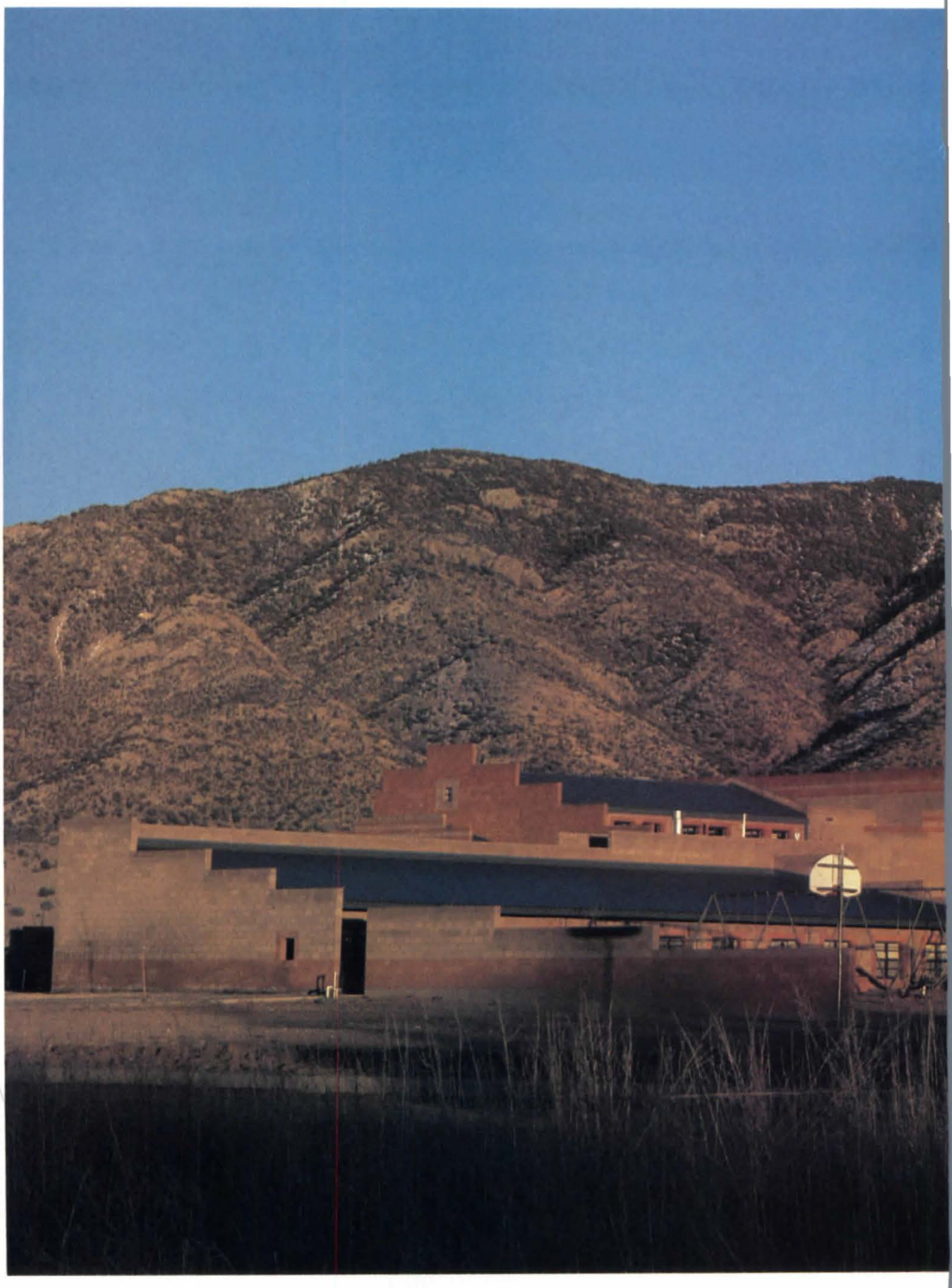




© Brian Vanden Brink

© Brian Vanden Brink

Rugged but Sophisticated Additions to a Desert School

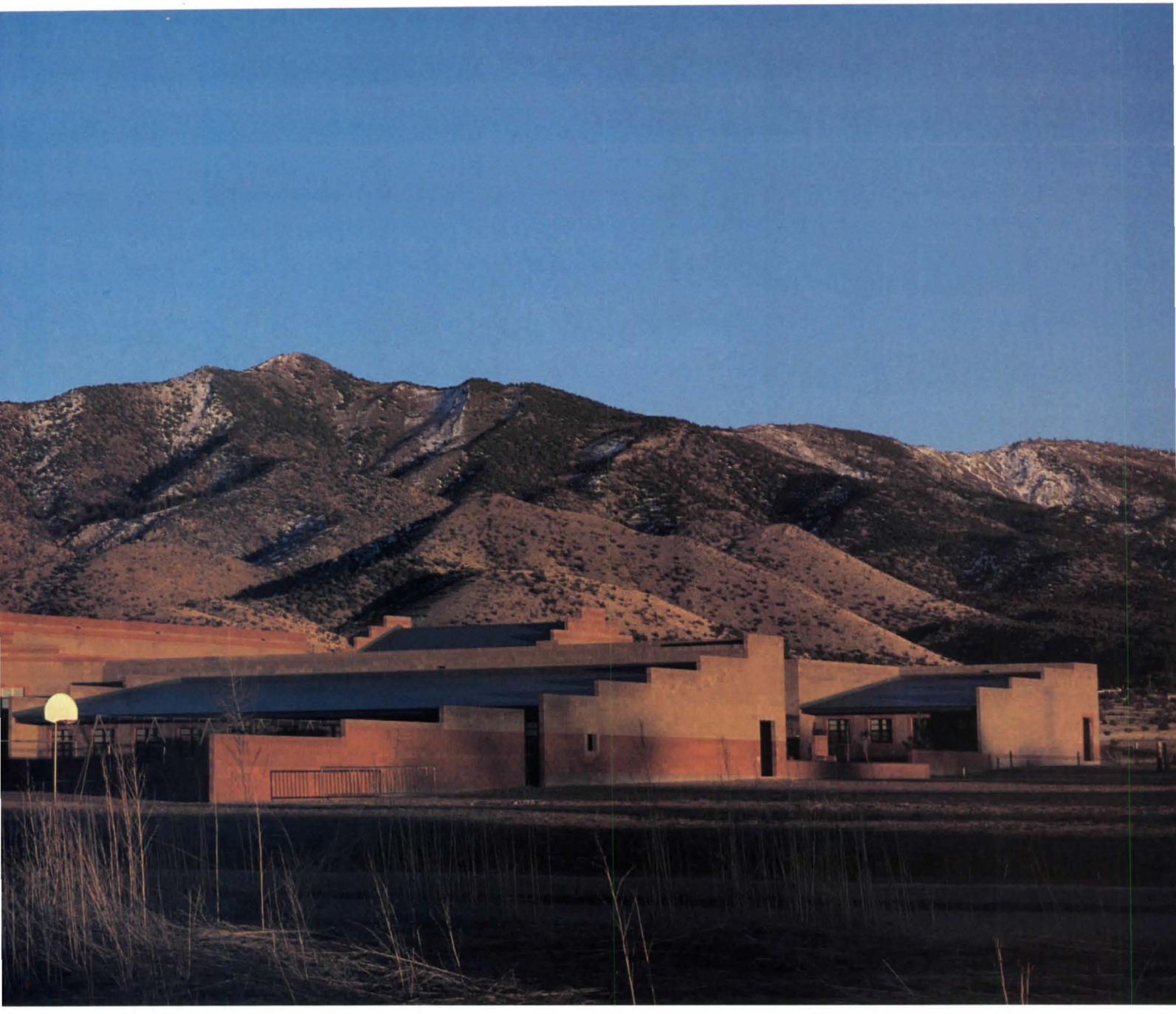


Photographs by Marc Diament

Additions to the public school complex in Magdalena, N.M., by Marc Diament are remarkably sympathetic to the community's terrain and character. At the same time, each piece of the complex distinctively and graciously welcomes its users.

As an employee of James N. Rowland Partners, Albuquerque, Diament (who now lives in Denver) was asked to design 35,000 square feet of enclosed, connected space—kitchen and dining facilities, administrative offices, kindergarten, and elementary and middle school. Prior to this, a gymnasium had been built and a master plan undertaken. A high school, library, and other facilities are still to be built.

Diament began his task with these requirements: maintain internal relationships, circulation patterns, and overall site relationships set forth by the master plan; provide visual continuity with the gymnasium; and allow for the future additions.

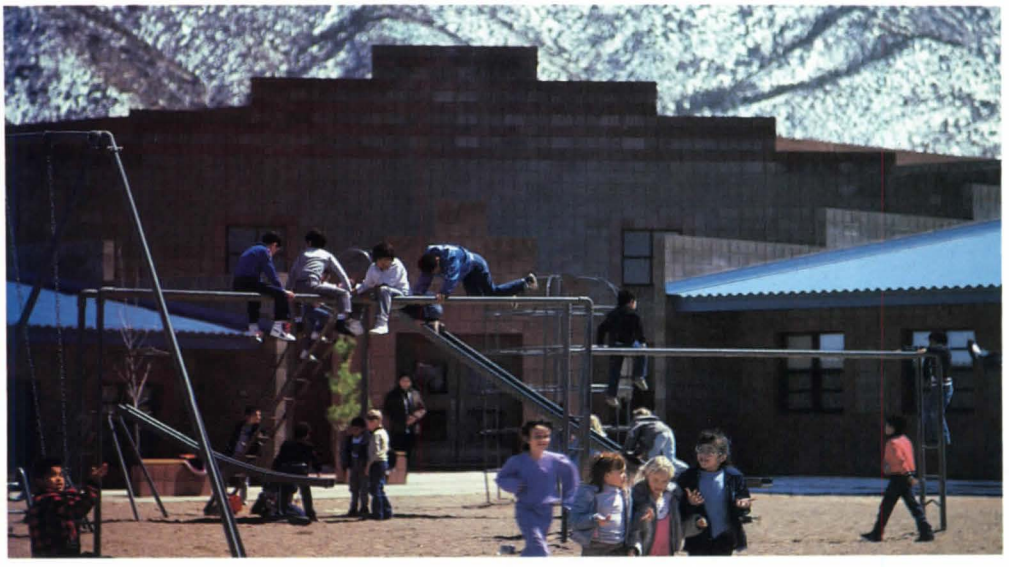


Above, the stepped facades of the Magdalena school complex echo the form of the mountains beyond. Facing page, a pavilion marks the path to the middle-school entrance.

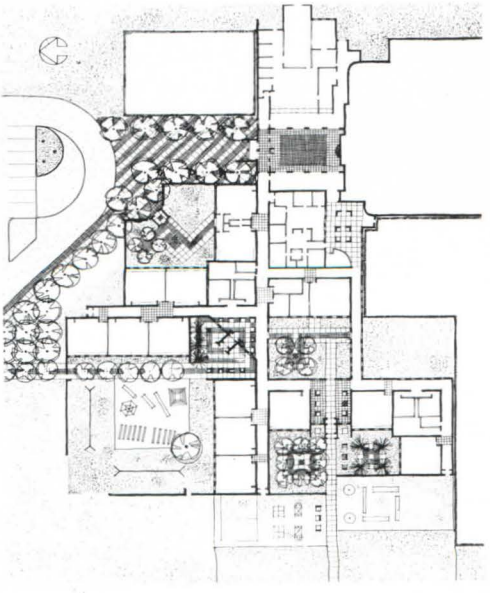
Diament gave each element of the complex identity by varying the entrances. The middle-school entry is protected by windscreens at each side and is announced across a field at curbside by a portal echoing its gable. The kindergarten is likewise announced by a pavilion across a courtyard from its entry. The elementary-school entry is set diagonally in a small, protected courtyard. The main public entry is reached via a circular driveway. As these entries vary, so do the corresponding courtyards, thus ultimately creating what appears to be a cluster of separate buildings.

Yet, all entry designs revolve around Magdalena's dramatic terrain—mountains rising sharply out of the plains. "The stepped facades of the building relate to the mountains. The flat paved areas, flat landscaped areas, and flat parking areas evoke the plains. The meeting between flat and mountain is done very starkly in the building," says Diament. Exterior materials—beige and rose scored concrete block—match those of the gymnasium. The patterning is varied on entries and facades and in the courtyard's paving. Trees are planted to resemble the "clusterings of green where streams occur in the desert," Diament says. Also influential were the flat-front, stepped facades found in Magdalena.

Diament says that "the idea is to let the formality/ceremony of the entries arise from the bigness of the surrounding mountains. This happens gradually by moving from the periphery of the site in toward each entrance with increasingly developed definition of space."—Nora Richter Greer

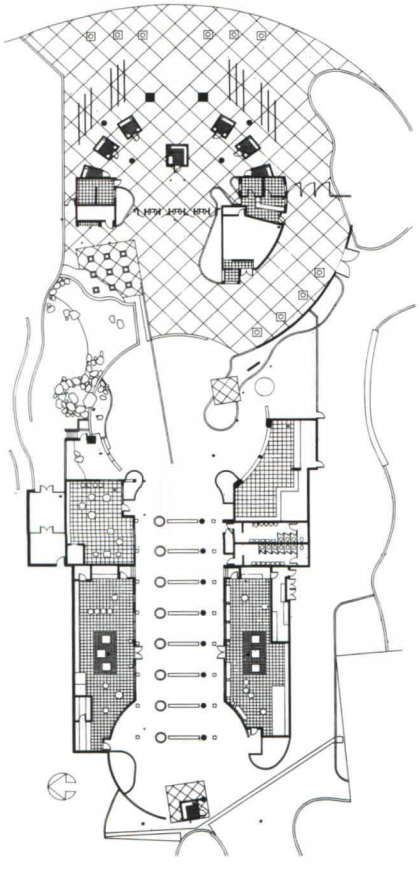


Left, from top: the kindergarten, elementary, and middle-school courtyards and entrances. Each has a different look, but a basic esthetic theme provides continuity among the parts. Right, below, the interior courtyard; above, the multipurpose room where banners act as sunlight baffles.



Photographs by Marc Diament

Zoo Entrance Design Draws on Some Early Modern Precedents



The Greater Los Angeles Zoo in Griffith Park is about 20 years old and lacks clarity and character. As its landscaping has matured it has slowly improved, and now, thanks to a modest building project, it also affords a better reception to patrons.

Its former entrance was some distance inside and uphill from its borders, and even farther from its parking lot. Since this is Los Angeles, and since the park is huge and hilly, all access is by car or charter bus, and thus the entry gate was largely hidden from the view of arriving patrons.

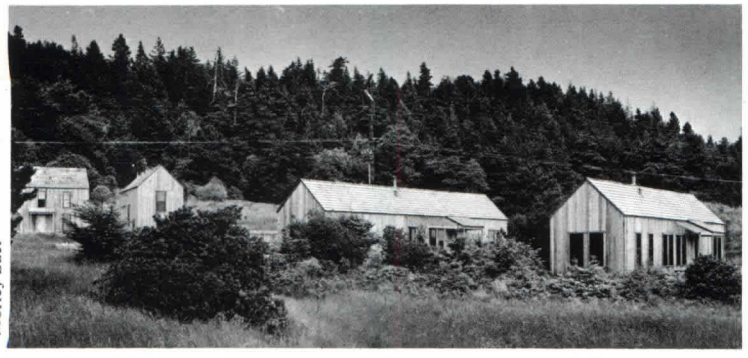
To solve this problem, the zoo retained John Aleksich Associates to design a new entry complex of ticket booths, a membership office, a flamingo habitat, gift shops, rest rooms, lockers, a refreshment stand, and an information booth, all sited the length of a football field closer to the de facto arrival point of the parking lot. Aleksich had been involved in the design of the 1984 Olympics, so he knew a thing or two about crowds, circulation, and creating a festive atmosphere.

He designed not just an entrance, but an entrance sequence about 310 feet long. Aligning his structures with an existing axis of a central parking lot walkway and a humpbacked bridge, Aleksich created a sloping midway flanked by long structures and anchored at the lower end by the entry gate and ticket windows and at the upper end by a jaunty information booth.

The entry pavilion recalls 1930s world's fairs and late period Frank Lloyd Wright. The long buildings synthesize constructivism and R.M. Schindler, and the *de Stijl* information booth pays homage to Gerrit Reitveld. The buildings' ocher stucco walls are set off by red and blue accents. Construction costs for this witty and cheerful welcome to an otherwise ordinary place were $1.2 million, and most of that paid for grading and landscaping. The buildings cost just $45 per square foot.—John Pastier

Photographs © Tom Bonner

Vernacular Village of Low-Income Houses at Sea Ranch



© Morley Baer

The site is rolling meadowland at the edge of Bishop pine and Douglas fir groves five miles north of the first-built section of The Sea Ranch in Northern California. William Turnbull, FAIA, one of the original Sea Ranch architects, has returned after two decades to design houses for low-income residents.

Sea Ranch, located 90 miles above San Francisco on land cleared a century ago for construction of the city, is the largest planned-unit development in the state. Its developer, Oceanic Properties, agreed to provide low-income housing after Californians approved Proposition 20, a coastline protectionist initiative, in 1972.

Turnbull won the commission in a competition, and the unfortunate site plan was a given. It is three cul-de-sacs lined

© Alan Karchmer

Above, a two-story single-family model in profile and a back-to-back duplex. Only 15 of 45 units on site plan (left) are built.

with parsimonious lots, most of them 60 feet wide; it seems a mockery of Lawrence Halprin's carefully executed original section. But Turnbull has mitigated the mindlessness by scattering and twisting the houses and backing them to the edge of their lots, while eliminating back doors.

There are five straightforward plans: two two-story houses, one of them a duplex that fuses two freestanding units back-to-back, and three one-story variants. All have heavy timber framing and are clad in vertical unfinished redwood siding, like the original condominiums, clustered demonstration units, and barn houses designed by Joseph Esherick, FAIA, and Moore, Lyndon, Turnbull & Whitaker in the early 1960s. But here, instead of shed roofs, Turnbull employs gables, giving the houses West Coast vernacular forms that, with the indigenous materials and random-seeming siting, make the houses collectively resemble an early coastal village. To enhance that image, Turnbull screened automobiles with five-and-a-half-foot redwood fences and minimized pavement with gravel driveways and wood chip paths. (The developer has built the first 15 of a planned 45 units on the western ends of the fingers, near the access road.)

Inside, Turnbull exposed the structures—including handsome scissor roof trusses—paneled perimeter walls, and sheetrocked interior partitions.—Allen Freeman

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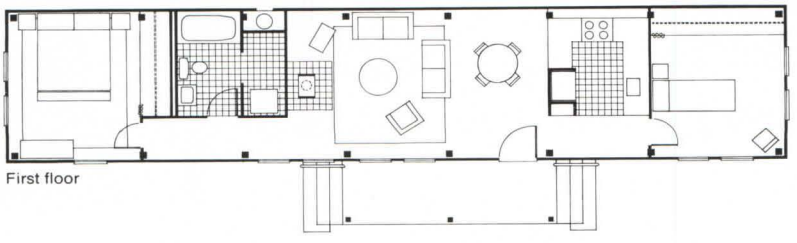
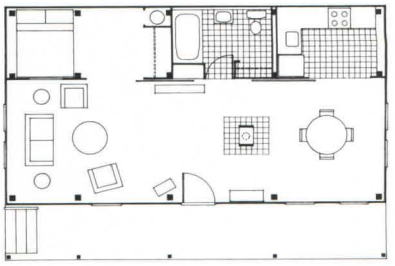
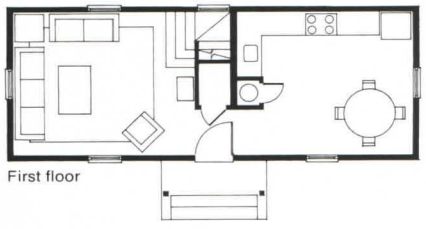


First floor



First floor

Second floor



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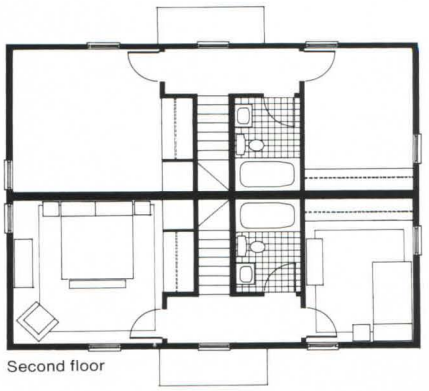
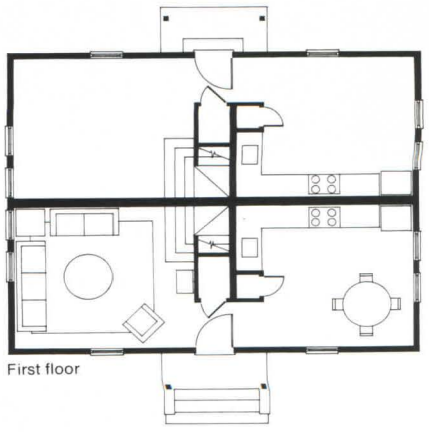
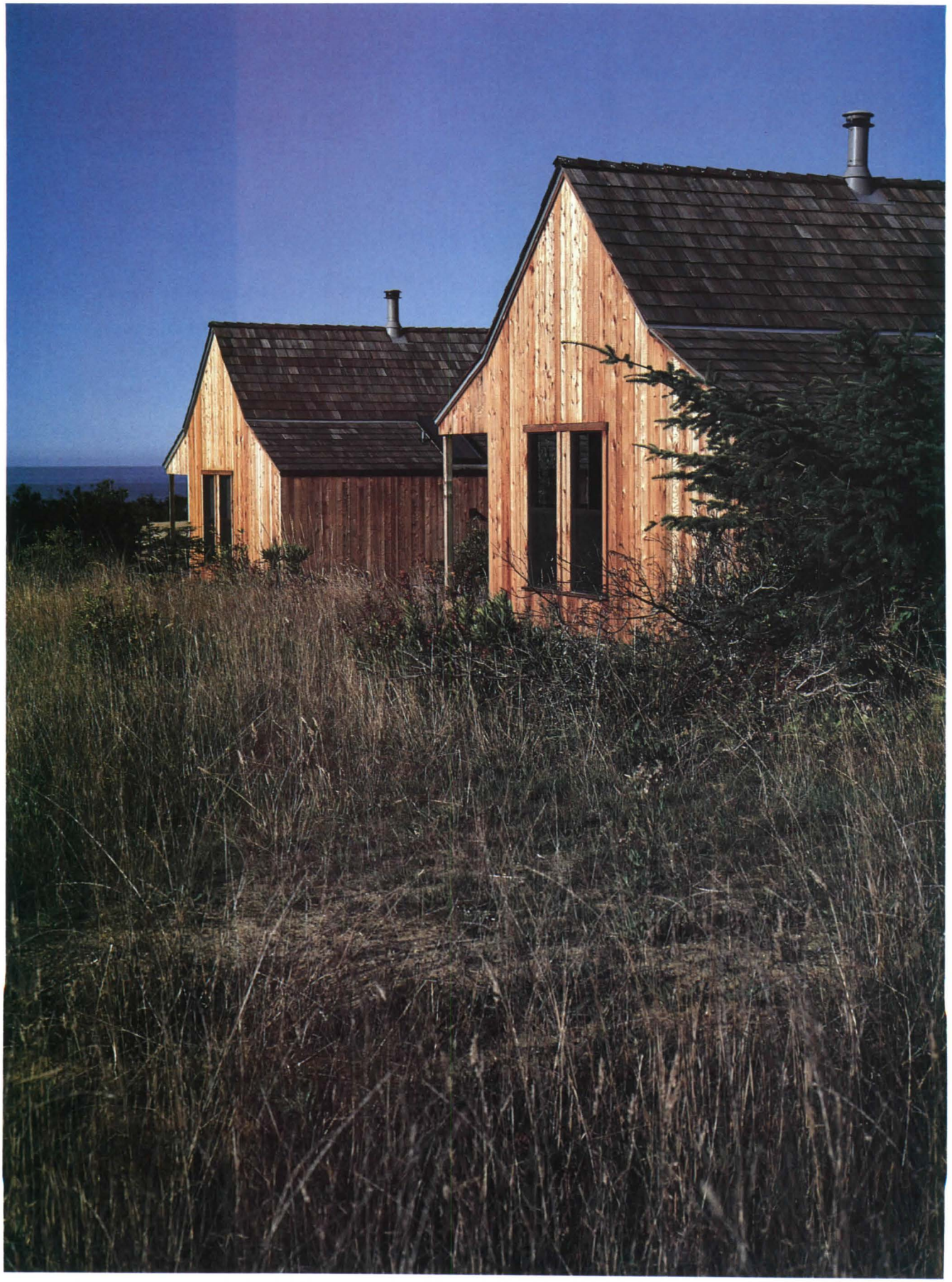


Second floor



First floor

On this page, four of five plans, which range in size from 600 to 950 square feet. Interior is living room of the long house whose plan is immediately above. One-story plan at bottom of page is house with wide porch, top and facing page.



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'The Strange Rejuvenating Beauty of Radiant Things'

Natural light as an esthetic medium. Photos and text by Henry Plummer, AIA

Since the beginnings of architecture, natural light has been a central artistic medium for builders. The fluctuating sea of light in the air provided a magnificent plastic substance, evanescent yet magical in effects, which could be freely molded and guided to breathe life into the most static edifice of walls and openings, vaults and pavements.

The timeless urge to make buildings glimmer and grow bright reflects a more general human fascination with the strange rejuvenating beauty of radiant things. Daylight continues to be the physiological and psychological catalyst for modern man that it was intuitively recognized to be for primitive man, the very spark and motivating force of life. Dawning light sets off a surge of activity, as well as the consciousness of being fully incarnate. Yet even at its simplest, light is the most spectacular experience of the senses—its restless intensity causing physical forms to leap to life at a perceptual level.

Forms that glow are seen to be more optically inspirited, whereas dimness marks a loss of active properties and vital signs. Our ancestors acknowledged the many dazzling powers of light through elaborate mythopoeic traditions. All that was lustrously vibrant was celebrated and worshiped, woven into primordial symbols and legends; and in churches and temples, cathedrals and synagogues, was handled as a miraculous substance.

Although frequently taken for granted in buildings as a servant of form, its powers reduced to a passive illuminant and clarifier, and lately a commodity of consumable energy, light has been consciously sought out for its own expressive value by our most sublime artists. Examples abound as well of anonymous builders who, perhaps less knowingly but with equally exuberant skill, brought a wonderfully ever-changing splendor to the streets of folk villages and cities. They all used simple modulating devices to transmute ethereal light into a substantial atmosphere, enticing errant rays to become a tangible ingredient of buildings and a space-filling presence in the air.

Materials and forms were deftly wielded, like optical instruments, to give body to an invisible traffic of electromagnetic waves, carefully guiding and collecting, converging and scattering, coloring and bleaching the incident rays in order to sculpt stationary and mobile shapes of brightness. The distinguishing factor in these works is that light assumes a poetic dimension over and beyond its useful functions.

Among the enduring modes of handling light, the oldest and most basic involve a fusion of light with matter. In developing building methods to trap and lock inside the light falling upon a surface, held there in suspension like some precious elixir, architects have been able to impregnate forms with the vital energy of life. Portions of buildings were turned luminescent, their surfaces tremendously aroused by swelling optical vibrations, their masses clothed in a wealth of glowing colors.

Ingenious methods of sensitizing solid material to light have been passed down to us as a legacy from millenia of experimental craftsmanship. Opaque materials such as polished wood and ceramic tile, the glass-sandwiched leaf of gold mosaic, and plaster turned silken by glue and pulverized marble, were endowed with glazed lattices that light could seep into and inhabit, brightening them so from within that they give off a deep rich glow. Opulent hues of stained glass in the great cathedrals were never left shallowly translucid, but were forged to sift and coagulate their refracted light, like exquisite jewels, through air bubbles and pittings, flaws and impurities, and thinly applied stains of ruby and gold that could be selectively removed.

Where matter was inherently dim, often in the humblest of materials, craftsmen worked harder to obtain an intensely living surface. Textures were masterfully hewn and chiseled, moldings pleated and rippled, and envelopes hollowed through by deep openings and canals, so as to invest the mass with an indwelling tonal play of highlights and penumbras. The most drab fabric could be induced to undulate and flicker, its stiff surface excited by chiaroscuric tremors and luminous pulsations, its dry solidity inundated with shadowy tides and phosphorescent pools.

Light has also played a vivid role in the modeling of architectural space. Beyond the more objective aims of augmenting perceptibility and clarifying the anatomy of a volume, light has been the primary factor that equips a space with subjectivity, that gives it a capacity for human identification. The way light enters and washes a cavity, accenting and fleshing out particular features, sketching a character that is sunny or gloomy, dreamy or mysterious, will decisively transform the entire temperament of a room. The space within is imbued with what is almost a living personality, its absolute boundaries opened up to varied personal impressions.

In addition to the feelings of life, spatial forms have been endowed with some of the movement of life by skillful distributions of daylight. Since humans are so phototropic in nature, lighted zones set amidst darkness exert powerful optical attractions that will galvanize a spatial cavity. This magnetic charge is basic to the upward pull of a starry cupola and the focusing influence of a sun-drenched atrium. It also underlies the mesmerizing trail of lights in an arcade, and the lure of a glowing piazza sighted through shadowy alleys. The lighted darkness quickens space through its optical stresses and strains, tendencies and drifts, inflections and deflections, consciousness and slumber. Its currents lift our gaze, tug upon our movements, beckon seductively in the distance, and generally stimulate our imaginations. Through the dynamics of light and shade, an architectural cavity is able to rise above its physical limitations, and engage us as an energetic field alive with forces and impulses.

Perhaps the most stirring power of daylight comes with its painting of time. Awakening change is inscribed upon buildings that can graphically reveal and move in concert with an arcing sun, the slow march of seasons, and vacillating moods of weather. Buildings from ancient Egyptian temples to the chapel at Ronchamp have been able to catch hold of passing time, overcoming the deadening inertia of fixed form through structures choreographed to lyrically mutate under flights of sun.

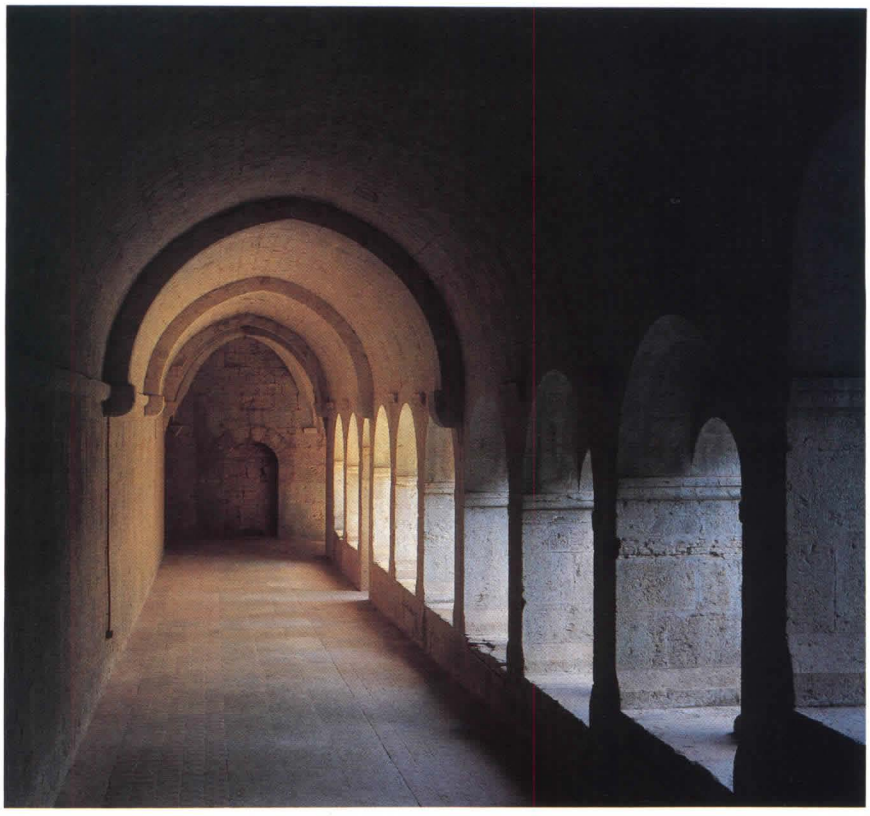
Textures are hardened and softened by shifting angles of rays, shadows lengthen and brush across surfaces, while colored beams lance into the darkness. Rooms oriented to blaze up and transfigure at specific solar junctures belong to a narrow slice of sky, beating into existence at a similar time each day, or perhaps only once a year, coming awake and falling asleep as the sun revolves. Volumes aimed east or west participate in the sun's most fiery passages, taking on the spectral colors and wild shadows of twilight. Longer strains of unfurling light, where spatial forms have been orchestrated to evolve through a succession of lighted figures, turn cinematic in their fleeting appearances, and tell us something of the rolling earth and circling heavens.

Right, blends of complementary colored lights in the wall openings of Notre Dame du Haut, Ronchamp, by Le Corbusier.

Mr. Plummer is an architect and professor of architecture at the University of Illinois, Urbana-Champaign. This article is drawn from his book, Poetics of Light, *published by A+U, Tokyo, and is based on research funded by the Graham Foundation.*

Above, splashes of sky in the blue chapel of Ronchamp. Left, at Le Corbusier's Monastery of La Tourette at Eveux-sur-l'Arbresle, angled light canals are sliced into the deep wall. Right, whitewash on plastic volumes in Ostuni, Italy.

Right, tiered clerestories and sun-streaked chimney tower in the living room of Frank Lloyd Wright's Wingspread in Racine, Wis. Below, streaming rays in the lavabo and royal cloister at the Monastery of Batalha in Portugal. Facing page, brilliant white light in the organ loft of the abbey church of Neresheim, West Germany, by Balthazar Neumann.



Right, yellow and violet tints in the cloister, Abbey of Le Thoronet, France. Below, skylit chapel with windows of thinly sliced marble in Brion-Vega Cemetery, S. Vito d'Altivole, by Carlo Scarpa. Facing page, dapples of color on the aisle piers of Rouen Cathedral, France. □

Now GE simplifies the whole difficult business of ordering built-in appliances.

Cost Vs. Value

There are other measures of economy than dollars.
By Forrest Wilson

Design defines itself through the act of making value judgments. Since before the Middle Ages, designers have set standards of value by the intrinsic worth of building materials, based on durability. Stone proved more durable than wood or metal—the wood rotted and the metal, if it did not corrode, was stolen by barbarians. Now, the cost of a project may be determined by estimators or quantity surveyors, but durability is no longer an indication of material worth. The relationship between cost and value in building has changed markedly, especially over the last 20 years. Why are costing formulas that worked for so long no longer applicable for determining a building's worth?

A comparison of Sigfried Giedion's description of medieval space with today's reality serves as a starting point in seeking an answer. "The satisfaction and delight that were medieval comfort have their source in the configuration of space," Giedion wrote. "Comfort is the atmosphere with which man surrounds himself and in which he lives. Like the medieval Kingdom of God, it is something that eludes the grasp of hands. Medieval comfort is the comfort of space."

The comfort of an automated office is in the reconfiguration of space, now surrounded by the invisible signals of electronic space. Walls, floors, and ceilings have electrical ears, mechanical ducts, plumbing, coaxial cables, and microwaves. They are the skin of the veins and arteries that supply life-sustaining light, air, and temperature regulation. These elude the "grasp of hands" because they are controlled by microprocessors.

"A medieval room appears finished even when it contains no furniture," Giedion continued. "It is never bare. Whether a cathedral, a refectory, or a burgher chamber, it lives in its proportions, its materials, its forms."

A room with electronic equipment never appears finished. It never is. At ticket counter, bank, or restaurant, the ubiquitous keyboard and cyclops-eyed cathode-ray tube mark the kingdom of the microprocessor, tabulating credit card virtues and vices for monthly resurrection.

Do any of us know the square-foot cost of Chartres Cathedral, and would its value change if we did?

Changing standards of value

Francis Duffy, ARIBA, a partner of Duffy, Eley, Giffone, Worthington of London and organizer of the Orbit 1 office planning study, has codified a method of breaking down building costs. Duffy divides the building into shell, services, scenery, and set. The *shell* consists of the structure, roof, and perimeter walls, which are expected to endure for many decades and to accommodate many generations of user organizations. *Services* are major elements such as elevators, airconditioning plants (chillers and main ducts), and the main ducting for power, electronic data, and telecommunications. Services are generally expected to last no longer than two decades, and to be replaced two or three times over the lifetime of a major office building. *Scenery* describes the shorter-lived elements of interior fitting out—partitions, furniture, lighting, the more adaptable parts of airconditioning, as well as finishes and decorations, considered unimportant and often designed to last no longer than a lease of five to seven years. The *set* is the arrangement of the parts.

Today, a typical high-quality British office building, Duffy says, costs about 50 percent more to build than 20 years ago. Of far greater interest, he points out, is how these costs are apportioned. In 1965, 70 percent of the cost was spent on the shell, 20 percent on services, and very little, about 10 percent, on scenery. Today the proportions are quite different: 40 percent on the shell, 40 percent on services, and 20 percent on scenery. In other words, "good old-fashioned architecture," as Duffy puts it, is diminishing in importance. Services and scenery are absorbing a growing percentage of ever larger budgets.

Expenditures examined in the context of the office building today show that the shell, Giedion's "medieval space," is relatively insignificant. More money is spent on services, which are replaced every 15 to 20 years, as many as three times during the life of the building. More is spent on scenery, which is replaced six or seven times. The change is even more pronounced in North America, influenced by different tax laws, incentives, and zoning ordinances. Because technology is adopted more rapidly in U.S. offices, the rate of change is faster.

For example, design in Washington, D.C., is squeezed by a city planning ordinance that mandates that no building rise higher than the national Capitol. The result is speculative space compressed to shoehorn in another floor within the height limit. While 11.5 feet floor-to-floor is considered tight, and 12 feet is considered civilized, the prevailing height in the nation's capital is 10.5 feet. The result is low cost, low ceilings, and some of the most ingenious economics of interior design to be found this side of NASA's space program.

The problem is most commonly the client's understanding of the space, says Alvin O'Konski, director of computer services for Leo Daly and Associates. Clients feel they should put more people in and more work out. They also need space for computers with characteristics unknown to the designer. "We can no longer sacrifice a building interior to sculpture its unique exterior configurations," says William Lenyk, an architect with Daly. Lenyk feels that architectural design has been turned "inside out" in this respect.

To clients, low cost means increasing worker productivity, says O'Konski. Today, designers are not asked to create low-cost interiors as often as they are to design more productive environments. For example, the Daly firm was commissioned to redesign interior spaces in one of the most prestigious and desirable spaces in the Washington, D.C., area. The building made a striking architectural statement; views of the Potomac River were emphasized, but irregular column spacing made space layouts a nightmare. The perimeter mechanical system consisted of heat pumps similar to those used in cheap motels. Extending into the rooms and above the windowsills, the pumps enjoyed the finest river views in Washington and the clients paid prime leasing rates for the privilege.

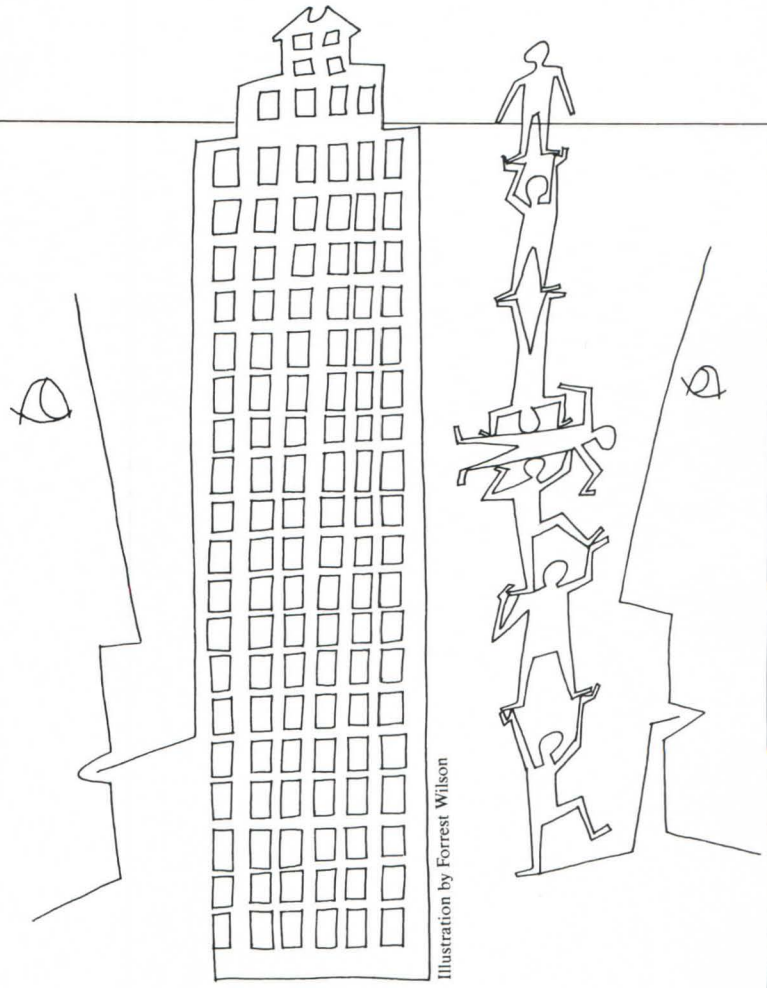


Illustration by Forrest Wilson

The clients' major concern was facility in moving furniture and electricity. Their ideal low-cost office would allow them to move workstations and their connecting power, electrical equipment, and data over a weekend, and adjust the climatic systems to accommodate the new layout. The redesign also reflected today's changing lighting requirements in new fixtures with more efficient lumen/watt ratios. (Footcandle requirements are half what they were, but task lighting is more demanding.) Slimmer, thinner fixtures are a necessity, because every fixture reduced in height frees more space for ductwork, and to win inches is to win flexibility.

The project also demonstrated that electricals and mechanicals can be tied too closely together. Where the airconditioning ran over fluorescent fixtures in light coves, there was marked light discoloration, which was not improved by relamping. The architects finally identified temperature variation caused by the airconditioning as the cause of the light discoloration, and corrected the problem with plastic diffusers. In systems from mechanical to computer, Daly now tends to seek redundancy and separation rather than integration.

'Intelligent' building materials

The introduction of microprocessors into products is resulting in "information-enhanced" products. For the designer, however, "information enhanced" may also mean multiple use. For

example, a posttensioned concrete spanning member with large openings running along its long direction can vary in span from 25 to 50 feet without increasing depth by changing post-tensioning cables and camber. Posttensioned ceilings and floors offer an efficient combination of mechanical ducts and heat distribution by using the building cores for air delivery and return. The planks also make effective radiant heating elements. And by accommodating both structural flooring and duct passage, the clear ceiling allows light to be reflected down for indirect lighting of computer terminals, and thereby allows reduction of building perimeter height.

Walls also can be intelligent. Recently the National Concrete Masonry Association announced that Jorge Pardo, director of innovative design and research, had developed a "Bi-X Block" system to create intelligent walls similar to the plank floors described above. The block has vertical and horizontal ports to integrate power and communication wiring, pipework, and heating and ventilating systems. The wall becomes intelligent because of its ability to do things other than create a visual, thermal, and sound barrier between two spaces.

Carpet tiles, another product of the information age, are removed to allow rearrangement of the underlying flat cable power system over a week's time. The carpet tiles are color coded to mark major circulation routes. The medium is the message.

If information-enhanced products mean more ways of thinking about a solution, economy is therefore an architectural design decision. In choosing how to use what is available more intelligently, cost is clearly a factor. Low cost is a measure of reward for design thinking.

Sets and scenery in office buildings

Traditionally, offices received power by direct access to the building distribution system. The power system adapted itself to structural and architectural systems. Today the reverse is true. As offices plug into technology, they need more and more flexible wiring and cabling. Blocking a client's easy access to power locks a firm out of the office business.The computer is at the heart of corporate telecommunications, mail and message delivery, and data and information transmission.

Core design determines power distribution, and structural design and architectural features must accommodate it. Vertical core space limits the power that can be transmitted through the electrical system from the utility's main feeder line to the floors. If structural components limit power access by blocking distribution conduits, the structure must be redesigned.

A PLEC (power, lighting, electronic, and communication) distribution system can deliver only the kind and amount of power permitted by the core system design. Horizontal ceiling distribution systems run wires and cables through the plenum space between the ceiling and the floor above it. Wires and cables then are routed to workstations through hollow power poles or flexible infeed cables. Ceiling distribution can also incorporate a standard poke-through by which access to the floor above is gained from the plenum below. As much as possible of the building is activated or capable of activation. Furniture panels and components act as the means of distributing wires and cables through the space to each equipment location. Some furniture surfaces and panels come from the factory already electrically wired.

Spatially speaking, a typical office plant 25 years ago consisted of closed rooms furnished with freestanding file cabinets, desks, and chairs. There was optimum security and little flexibility. In contrast, the majority of today's offices are open, with only the exterior walls fixed. Partitions of various heights provide spatial separation and support work surfaces and other office furnishings. Where 60 to 75 square feet per secretarial worker was common in the past, now it is 100 to 150 square feet.

Today's business organizations are increasingly dynamic: on the average, an organization will relocate 40 to 50 percent of its microcomputers and office furniture per year. Some report up to 110 percent annual move rate. An office in a state of constant flux relies heavily on equipment that cannot easily function in a setting where power outlets and cable access are fixed and limited. The cost of change is an initial design decision.

Axioms of cost and change

The designer can formulate a set of axioms to guide design cost decisions:

- Building changes must take place with minimal disruption in the workplace. The design is not low cost if simple tasks such as moving wire, partitions, or light fixtures involve the interruption of daily work.
- Change is essential if the building is to retain its economic value. Unless change is low cost, which means easily facilitated, it will not be made. Neglected minor changes become major building problems, making operation economically prohibitive. A fascinating paradox is that the more expensive, durable building materials, such as bronze and marble, are more difficult and costly to change. The majestic carved columns of Pennsylvania Station in New York City were thrown on a junk heap in New Jersey. Their spaces now are filled by plastic-coated countertops and acoustic tile ceilings.
- On-site manufacture is more costly and less efficient than factory production. The controlled environment, heavy machinery, and assembly-line techniques reduce costs of factory-made products. Maximum use of factory-made products and minimum use of on-site construction reduces cost.
- The building's mechanical systems are kinetic parts constantly responding to climatic changes, numbers of occupants, and varying amounts of energy consumed by machines. Because mechanical equipment is subject to frequent maintenance, repair, and improvement, it must be sited for easy removal and replacement of large, heavy, awkward pieces.
- Mechanical equipment must be constantly upgraded, and if the cost of upgrading is too high the entire building will be too expensive to operate. Fortunately, the major distribution system of ducts and pipes may not change as frequently as the mechanical plant, but may have upgraded units attached.
- Minor mechanical distribution systems servicing individual rooms are in a constant state of flux, since the sizes and purposes of rooms are constantly altered. Those parts of the system that require constant maintenance and tuning should be located in public spaces so that mechanics need not enter building function zones and disrupt workers.
- Each system, component, and element that can be designed to plug in and out or bolt on and off lessens the danger of obsolescence. The ability to change is the governing factor. Timelessness is determined not by how long a building stands but by how long it remains useful. □

Software for 'Financial Management'

A team of evaluators looks at seven systems.
By Oliver Witte

Bookkeeping lends itself to computerization more than most other functions in an architectural office. Surveys consistently show that only word processing and specifications are more likely to be done on a computer. Some 40 percent of all architecture firms that own computers use them to keep the books and another 15 percent say they are shopping for an accounting program.

Although the computer will not relieve a busy partner or owner from responsibility for managing the firm's finances, it will make available information that is at once more complete, more succinct, more accurate, and more timely than that obtained by manual methods. And it will do a better job of recording time sheets, preparing the payroll, getting out invoices, and tracking cash flow. Outside bookkeeping services are available, of course, but by the time the transactions are compiled for their use, the firm might as well have entered the data into its own computer and avoided waiting weeks or months for a rigidly structured set of reports.

To most managers today, the question is no longer whether to computerize the firm's accounting but which program to buy. The options range from generic software that starts at $69.95 to architect-specific systems priced from roughly $1,000 to $7,000.

The following are reviews of seven such systems by architects in private practice who volunteered to serve as evaluators. The software was furnished to most of them for evaluation purposes, but they had to purchase their own computer equipment. A few had previously purchased the programs.

The evaluators generally worked in teams of two, each team agreeing to convert its bookkeeping system to the software assigned for evaluation. The evaluators understood they were to be surrogates for the profession, not advocates for any product. In their reviews, they were encouraged to comment on all pertinent programs, not just the one they were using.

The culmination of the evaluation was a meeting in July, at the Illinois Institute of Technology in Chicago, at which each of the system vendors made a one-hour presentation to the assembled evaluators. For the presentations, which used a specified series of transactions by a mythical architecture firm, all IBM-compatible programs were run on standardized hardware consisting of an IBM-AT computer with 640K of RAM and no fixed disk, an Iomega Bernoulli Box with dual 10-megabyte cartridges for data storage, and a Verticom 2Page display system with a resolution of 1,280 by 960 pixels on a 19-inch monochrome monitor. One program, Overlays A.M.S., for Apple computers, was shown on a Macintosh Plus.

After the presentations, the vendors answered questions for an hour and a half. Then they were excused while the evaluators discussed their systems. The biggest disappointment to most evaluators was that none of the programs delivered on the promise that they were "financial management systems." Bookkeeping, yes; accounting, maybe; but financial management, not really. Financial management implies a foward-looking perspective that helps a firm forecast, plan, and anticipate. What the seven programs do best is record, summarize, report, and compare.

A hefty market share awaits the system that will build on its ability to marshal historical data to help the architect chart a course to the future, the evaluators say. Some of the vendors aren't so sure. If the demand were there, the tools would have been developed, they say. But effective forecasting implies that the firm is doing a thorough job of budgeting, and the vendors have not observed a major trend in that direction.

On the surface, all the programs—from the cheapest to the most expensive—performed the same basic functions, produced the same basic reports, and followed AIA accounting guidelines. A program typically is divided into modules, which, although they can be purchased separately, work most efficiently when used together in an integrated system. Terminology varies, but vendors offer these functions in separate modules:

- Job costing—also called project management or project control. Time sheet entries are made here.
- Accounts receivable—also called billing or invoicing. Some programs split accounts receivable and invoicing into separate modules.
- Accounts payable.
- Payroll.
- General ledger.

None of the evaluators who had tried an inexpensive generic program was satisfied with its results. However, further investigation is needed before all generics can be dismissed.

ACCI Business Systems PMAS

Project Management Accounting System (PMAS) by ACCI Business Systems shares a common heritage with Micro Mode's Integrated Financial Management/General Accounting. They marketed identical versions of the software under a licensing agreement with the original programmer. The two companies split up a year ago, but under the terms of the divorce they each acquired the rights to the program code as it existed then (Version 4.02). Since going separate ways, each has done its best to distance itself from its former partner.

Already there are significant differences. ACCI has taken a giant step toward true financial management with the inclusion of its manpower scheduling module. It was created to show the total number of hours required to complete projects in hand, known future projects, and possible future projects. It permits the user to evaluate present and future work load in several ways, including by employee, by project, and by employee classification. Manpower scheduling promises to be a valuable management tool to aid in staff planning and work distribution.

Another addition by ACCI is the cash account module. It provides a continuous update of the status of the firm's cash account and simplifies reconciling of bank statements.

ACCI has separated general ledger transactions from the general ledger master file. This permits a printout for the fiscal year to date. Also, any two fiscal periods can be compared and each fiscal period can be budgeted for each account.

Other distinctive and useful features include the ability to print the net multiplier for both hourly and fixed-fee jobs on the office earnings report. The program also can show the composite overhead factor for each job.

Each job can have a unique billing rate table and a unique overhead factor. ACCI also offers the user the ability to set up a new phase/task list and transfer old transactions from previous months to the new list.

We were particularly pleased to discover that the program works well with Sidekick and other memory-resident utilities. Service and support is excellent. The company listens carefully and continuously to its users. Reasonably priced updates seem to incorporate the entire user group's wish list, which is good. However, the additive approach appears unstructured and gives the modules a moss-covered look.

For instance, the June 1987 update includes the ability to report 50 business ratios. After the first eight, the value of the others gets a bit esoteric. The program's range of reports, especially invoices, is remarkable. But as fields have been added to implement these capabilities, the operator is required to respond to field prompts that may be irrelevant. At times, using ACCI is like working simultaneously for all the firms that have ever used the program. Still, the manual is thorough, weighing almost seven pounds. It contains some good examples but no graphics, road maps, or diagrams.

Despite ACCI's impressive breadth and depth, it did appear to have some limitations compared with the other six programs in the evaluation. ACCI's screens lack graphics and color. Compared with other programs, its monochrome presentation can be downright boring. The use of uppercase letters makes the program look old-fashioned and detracts from readability. Even though graphics and color contribute little to fundamental accounting, architects and designers are graphically oriented.

The program has a somewhat annoying start. It asks for data that should be remembered, such as the name of the company or division and the terminal in use, even in single-user application. Only the largest firms might appreciate having to reply to questions about changing companies and listing other companies. And no firm wealthy enough to own a computer with a built-in clock will appreciate having to enter the date.

Other annoyances: Because the modules are not smoothly integrated, the program cannot remember printer information from module to module. In fact, it can't remember the date or even how to figure it out. And unless the user links the modules in the proper sequence, monthly closeouts can be fouled up.

Furthermore, offering options but not displaying them on screen menus is a clever way to encourage customers to read the manual but it doesn't do much for those with short memories.

The escape key backs up by menu levels. It cannot be used as an "undo" or even to escape from a dubious or perilous action. If the key is held too long, the program is gone and replaced by your friendly DOS prompt.

Some of the menu selection criteria appear irrational. It takes a while to get used to the idea that "PJ" means project management and "RP" means project reporting.

The program contains more than 300 files, all in one subdirectory. Why do we see or even need to know about them?

The security system leaves something to be desired. There is only one password per module and the user gets only one shot at typing it correctly. Type it wrong and it's goodbye ACCI, hello DOS.

Perhaps the most important limitation of the program is its price. Although it is possible to spend less, all modules, 20 hours of on-site training and travel expense for the trainer, and telephone support come to about $9,000. The complete program alone costs $7,000, making it the most expensive of the financial management programs under evaluation.

—Walter J. Foran, AIA, and John C. Voosen, AIA

Overlays A.M.S.

Based on value, I'd have to rank Overlays A.M.S. for the Apple Macintosh at the top. It actually stacks up pretty well when compared with the other, more expensive packages. Its only real disadvantages are its speed and, if you listen to the other evaluators, the fact that it runs on a Macintosh. The Macintosh might not be for everyone, but it seemed that the low price and casual presentation for Overlays promoted the perception among other evaluators that it was not a "serious" piece of software.

To the contrary, for principals of design practices with fewer than 10 employees, Overlays presents numerous opportunities to automate bookkeeping and financial reporting. For about the same price as one of the DOS-compatible programs, an architecture firm could purchase Overlays, the data-base program on which it runs, a Macintosh Plus computer, and a laser printer.

Overlays was written as a template for the data-base program Overview. Even the combined list price, $494, is less than half the next least expensive program in the evaluation. Using Overlays also gives the architect an opportunity to learn the data-base program on which it runs, and therefore to develop many other applications quickly and easily.

We found Overlays very comprehensive, flexible, easy to learn, and easy to understand. With the standard Macintosh user interface, learning one program teaches the basics for the operation of all other programs. Financial information maintained by the program can be exported easily to any Macintosh graphics programs. Through the PIC file format, for example, data can be charted readily with MacDraw.

Unlike any other accounting program that runs on the Macintosh, Overlays follows the standard AIA chart of accounts. Because Overlays was designed for the small firm, some of the sophisticated accounting techniques are not required. If an entry error is made, the operator can go directly into the data base and correct it without the need for adjusting entries and the creation of audit trails. Direct correction is not recommended by accountants because it risks unbalancing the books in ways that are difficult to track down.

One concern with Overlays is the newness of the program: commercial production is just beginning. No matter how careful

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Walter J. Foran, AIA, is chief executive officer of the 21-person Gelick Foran Associates, Chicago, which has been using computers for five years, although prior to this evaluation it maintained its books manually.

John C. Voosen, AIA, heads his own, six-member architecture firm in Chicago. Voosen has worked with computers since 1978. Prior to this evaluation the firm kept its books with a combination of manual and data-base methods.

a software developer may be, Version 1.0 rarely has all the bugs worked out, documentation fine-tuned, or technical support firmly in place. On the other hand, early buyers of a new program usually get red-carpet treatment directly from the program developer. Their opportunity to influence the development of the program is much greater than that of buyers of a mature program.

Another concern is speed. Some routines, such as posting ledger transactions, seem to run frustratingly slow. But for the smaller office it may be worth the wait. And with the introduction of the Macintosh SE and the Macintosh II, it seems likely that the speed of operation will improve. Both Overlays A.M.S. and Overview support the new Macintosh models.

—David J. Johnson, AIA

Data-Basics AEMAS

Data-Basics' master accounting system for architects and engineers (AEMAS) abounds with unusual features that add value to a program already strong on fundamentals. Like most of the programs evaluated, it allows users to choose between cash and accrual accounting. Under cash accounting, revenues and expenses are recognized when received or paid. Under accrual accounting they are recognized when earned or incurred. Data-Basics permits the firm to use both methods at the same time for different parts of the business.

No separate posting steps are required. All posting is done automatically at the time the information is entered (except time sheets), saving time and improving error checking. Thus reports always show the status of the firm up to the moment.

Automated invoicing is another special strength. Only Wind-2 competes with Data-Basics in the freedom it offers users to mix billing methods and formats, add text, and create new formats on the fly. If this still doesn't produce the desired results, the invoice can be sent conveniently to a file for further enhancement with a word processor. The program also allows for partial deferral of labor and expenses of on-line item charges.

Although all programs in this evaluation can send data to a word processor or spreadsheet for further analysis or manipulation, none does it as easily as Data-Basics because a spreadsheet was built into the program. It works smoothly with the general ledger and job costing, the two functions that generate the greatest demand for customized reporting capabilities.

Data-Basics not only maintains an unusual amount of detail but makes it particularly easy to look up. For example, if an employee works 200 hours over two months, the program can report the number of hours worked on each job and the dates they were worked. Some government jobs require this type of information.

Few other programs offer such a wide range of power and price. A firm with fewer than eight employees can get started for $995. At the upper end, large firms can get a multi-user version of the program that runs on a computer using an 80386 microchip under the Xenix operating system for $12,640.

Setting up the program is relatively easy. The help screens and manual have allowed us to get into the program without much help. Nonetheless, the process is time consuming. Just organizing the accounts and entering data for a client base of 100 takes weeks. The cost of implementing the system is much higher than the cost of the software.

We like the way Data-Basics permits reports to be viewed on the screen before being printed. Unlike some other systems, the user can scroll up or down through the reports. In fact, the entire program is easy to move around in. From entering time cards, the operator can easily switch over and create a new job if required or pull up a list of code numbers for reference. All entries are checked against known data and sums are checked against totals to ensure accurate entry.

On the negative side, we have found several features we would like to change. Bonus checks, where standard deductions are not taken, are difficult to produce. It would be nice to be able to put a hold on these deductions instead of removing them and then re-entering them later. With a large number of employees, this takes a considerable amount of time.

Once a payroll check is issued, time card entries cannot be changed without voiding the check. We understand the reason, but we would prefer a simpler way to correct the mistake, especially if the total number of hours was not involved.

We have discovered one printed column in the payroll register that is not formatted large enough for the figure generated. Instead of printing asterisks, it gives a negative number, which produces some alarm.

The multi-entry time card screen only takes up to nine jobs, after which the operator has to divide up the hours and create subtotals. This defeats the automatic checking of total hours against job hours.

Another unique feature of Data-Basics that is not so favorable is the annual fee. For the unrestricted, single-user system, the fee is currently $250 a year. If you don't pay it and receive the updated version each year, the system becomes unusable. The reason for the fee is to improve technical support and keep all users current with changes in tax laws. If all users have the current version, technicians do not have to be trained in obsolete procedures.

Time sheet data entry has the ability to stop and look up information, as well as enter it, without leaving the original function. This is an excellent feature that all programs should have. The ability to continue on to the new year or month without closing the general ledger adds great flexibility.

—Gary A. Ruck, AIA, and William J. Waldorf

Harper and Shuman CFMS

The evolving use of financial management software at our firm has paralleled the growth of our business. Our accounting initially was done by hand using AIA forms. In early 1985, we switched to Harper and Shuman's Micro/CFMS Level 1 with all six modules. It is one of three programs employed in the financial management of our firm.

Financial management consists of three functions: planning, measurement, and analysis. We use Timeline, a project management/scheduling program, for planning individual project schedules and manpower budgets. Once a project schedule is completed, it becomes part of our master schedule that tracks all projects. The master schedule is used to plan future staff requirements and project cash flow. Supercalc 4, a spreadsheet program, is used for financial projections and analysis of operations. Micro/CFMS provides the financial and project accounting functions—the measurement leg of the financial management triangle.

No program presented for these evaluations should be labeled financial management. Only ACCI provided any facility for

projecting worker-hour requirements on a firmwide basis. And only Semaphore and Micro Mode exhibited any extended abilities to analyze data.

Micro/CFMS is project based, with all information entered by project number to regular, promotional, or overhead projects. Therefore, project control must be implemented before other components are added. The system tracks actual versus budgeted labor hours and costs, overhead, direct costs, and reimbursable costs.

Getting started with any new program requires a commitment of time and effort. Harper and Shuman eased my transition in two ways: Micro/CFMS closely parallels AIA's accounting guidelines and the documentation clearly explains each step. Setup for each module is organized through an extensively detailed checklist.

The Micro/CFMS forms for data entry are the simplest to use and require filling out the fewest data fields—normally just date, project number, account number, and amount. Some programs require responses to a full screen of data fields just to enter an invoice for $5 worth of bluelines. And who checks the accuracy of all those entries? This is a serious consideration for small and medium-size firms.

Data is posted through a specific step that produces a copy of all posting transactions. This log, along with the general ledger account analysis, provides a clear audit trail. This system has saved us enough in accountant fees in one year to pay for the program.

CFMS is by far the most widely sold accounting system for architects and engineers. Of its 1,500 sales, 1,200 have been for microcomputers. The other 300 customers are divided about evenly between those running it on a Digital Equipment VAX computer and those using it under a service bureau arrangement. The program was developed by the largest company of the seven under evaluation and it has the longest history. Harper and Shuman, with 90 employees, has served the design community exclusively since 1973.

Like other programs, Micro/CFMS has its limitations. Reports are preformatted for 8½x11-inch paper, with no capacity to customize the format or type of information contained in the report. The program operates rather slowly.

Micro/CFMS keeps information in two categories: current month and year to date. The current month has the details of all transactions. But this detail is lost to a more general level when a new month is begun. If Micro/CFMS has a major flaw, it is the time constraints underlying this structure.

Quarterly reports cannot be generated. If the printed copy of detailed monthly reports is lost, a backup disk must be available.

Furthermore, the underlying assumption is timely entry of data. While this is good practice and the goal of every firm, reality does not always permit it. Thus care has to be taken regarding the order and time of posting. This is especially true of payroll. Even though the program prompts for a period ending date, it will calculate hourly payroll on all hours posted. It does not recognize that some hours may be outside the pay period, so it may calculate payroll on the incorrect number of hours.

These constraints are felt severely in the billing module. The reality of practice does not allow monthly billing. Micro/CFMS recognizes this in the accounting module with recommendations for posting unbilled services. Yet when the billing module calculates invoices it cannot pick up invoiced hours or reimbursables from prior months. That must be done manually.

—James C. Jankowski, AIA

Micro Mode IFM/GA

As Foran and Voosen mentioned, Micro Mode developed Integrated Financial Management/General Accounting from the same roots as ACCI Business Systems' Project Management Accounting System (PMAS) and the firms now are competing to develop their own new features for the original program.

Most notable among Micro Mode's is an I.Q. module, a powerful and flexible report writer with graphics capabilities that gives users more freedom to control the way data is organized and presented. It removes all need for custom programming to get tailored reports. The module also creates a WKS file, which provides a convenient bridge to the Lotus 1-2-3 spreadsheet. The I.Q. module makes Micro Mode one of the few (perhaps the only) accounting programs with graphic reporting capabilities. It comes with 12 sample graphs, including bar graphs depicting professonal fees, net profit, and overhead.

The I.Q. module is necessary to break down the payroll register and facsimile Form 941 by states, which otherwise cannot readily be done. This is important if the firm has employees residing in more than one state.

Because the report writer can only read data, not write data, the I.Q. user cannot change or delete accounting records. This is especially useful in firms where principals who are semiliterate with computers still want to check how often employees with less than two years service have taken more than five personal days and 10 sick days but less than their allotted vacation time.

The biggest problem with I.Q. is not its fault. I.Q. assumes that you, the end user, created the data base it is operating on, so you know exactly the meaning of "J0301-AR-KEY" and that it's the correct field to use if you want to get a list of unpaid invoices. Better documentation of the variables would make I.Q. more useful.

Color has been added to the screens through drivers for an Enhanced Graphics Adapter board. Unfortunately, the colors that Micro Mode has chosen are difficult to read and difficult to change. Time sheets can now be entered on a multi-user network. The password security system has been improved. And time-sensitive project reporting is now permitted; users can specify what periods they want to cover. For other reports, however, the system is tied to monthly posting periods.

Included in the cost of the software are two unrelated but quite useful programs: Preliminary Cost Estimating (which uses Means and Dodge data) and Income Property Analysis.

David J. Johnson, AIA, is a project architect for Kent Associates, Chicago, which has used computers for two and a half years, but prior to this evaluation kept its books manually. It currently has eight Macintosh computers and one IBM.

Gary A. Ruck, AIA, is president of the 24-person Ruck, Pate & Associates, Barrington, Ill., which has had computers for three years. Bookkeeping was computerized a year and a half ago with a generic accounting program.

William J. Waldorf is an architectural engineer for Larson and Darby, Rockford, Ill. The firm, with 55 employees, emphasizes commercial and industrial building design. The firm purchased a minicomputer for financial management eight years ago and switched to a micro last year.

James C. Jankowski, AIA, is executive vice president of Carol Ross Barney Architects, Chicago. The firm has four years experience with computers and three years with Micro CFMS.

System checklist

SYSTEM/VERSION	TOTAL SYSTEM COST FOR ONE USER	OPERATING SYSTEM	TECHNICAL SUPPORT COST (FREE PERIOD)	SALES TO DATE
Project Management Accounting System/5.2	$7,000	DOS; Xenix	$195/yr. (60 days)	320
Overlays AMS/1.0	$ 494	Apple Macintosh	$75/yr. (90 days)	0
AE Master Accounting System/2.14	$5,390	DOS; Xenix	$45/hr. (4 hours)	600
Computer-based Financial Management System/6.0	$5,370	DOS	$195/yr. (30 days)	1,200
Integrated Financial Management/General Accounting/5.09	$6,230	DOS	$30/mo. (none)	325
Sema4 Professional Accounting Series/2.7	$1,195	DOS	$250/yr. (30 days)	300
Wind-2 One Plus/4.0	$4,790	DOS	$60/hr. (30 days)	850

Unlike some other vendors, such as Data-Basics, Micro Mode does not integrate its modules in real time. It requires a separate step to transfer time sheet information to the projects. This is not necessarily a disadvantage; it provides a useful way to detect errors. The problem is Micro Mode's inability to transfer transactions to the general ledger, once they have been edited, more than once a month. Since transactions can be posted from payroll and payables to projects more than once a month, it would seem like a minor step to add the same capability to transfers into the general ledger.

To begin a new month, the previous month must be closed out. This is inconvenient since the payroll generally comes before the end-of-month adjustments are completed. Data-Basics does it better.

Statement and invoice generation can be automatic and allows for customization. Moreover, a user can output an automatically created invoice to a text file for further editing by a word processor. It would be better to allow more control over the format of the invoice from within the program. Having to go to a separate word processor takes too much time.

Permitting English names for vendors and clients is quite handy. When paying rent, some firms prefer to call it "rent" rather than Vendor No. 15732.

Micro Mode does not provide up-to-date cash status information, as does Data-Basics, so a separate spreadsheet must be maintained. The modules do not post automatically to the cash account; thus it is accurate only after such a transfer. This is not adequate for most businesses without a separate method of tracking cash on hand.

Micro Mode could be easier to install, but the documentation is good and the "hot line" provides fairly prompt service.

Data entry looks very easy, but if a mistake is made it is not possible to back up and make the correction. The user must exit that portion and start again. This is a real problem.

Time sheets require an unusual amount of information, which must be entered manually for each task on each project. The system does fill in the information if it is the same as the previous entry, but most other programs pull this information automatically from other files. Having to enter the extra information might add a little flexibility, but it at least doubles preparation time for data entry. Furthermore, the program does not proof individual time sheets during entry.

One very troublesome problem is the expectation that the user will revise the federal and state tax tables. Most of the other programs supply the new tables on a yearly update, which is preferable.

On the other hand, Micro Mode is not copy protected, nor does it have a date-dependent "poison pill" like Data-Basics to make the program cease to function past a specified date without an update issued for a fee.

—Kevin S. Campbell, AIA, David J. Engelke, AIA, and Charles R. Newman, AIA

Semaphore

Sema4 by Semaphore generated the most excitement of any program in the evaluation because of its low cost and unlimited numbers of employees and projects. Most other programs of comparable price will not accept more than a few employees or a few projects or both.

The only significant missing piece is a payroll module. Like the other evaluators, we disagreed about the significance of that omission. Some considered it disqualifying; others saw it as having little significance because their payroll system was already in place and working well.

Two unique features attracted particular interest—and controversy. The most interesting was a feature that permits a multi-

user network through a simple cable attached to the computers' serial ports. All cabling and software switches cost no more than $300, while conventional networks cost $4,000 or more. Sema4 is truly the "poor firm's" network. It even supports dumb terminals, available for $300 each, instead of computers with microprocessors.

The other, more controversial feature involves a support technique that requires the user to have a modem—a $500 device that permits two-way communication between computers over telephone lines. But instead of simple communication, a Semaphore support representative uses the modem to take over operation of the user's computer and actually show him how to solve some problem. On another phone line, the technician explains the process verbally. It's like having an expert sitting behind the computer in our office without the travel expense. Some evaluators objected to turning their books over to a stranger, but Semaphore probably has only a technical interest and the data is in no danger if you back up the disk before making the call for help.

Other features reflect some of the best features of other programs. Autoposting permits financial statements to be generated at midmonth (or any other time). The custom report generator responds to simple, English language queries. And a CADD system can be treated for billing purposes as a machine, not as an employee named Mr. Cadd.

One of the most admired features of Sema4 was its speed. Written in the C language, the program executes quickly and takes up only one megabyte of disk space, which is less than most other programs.

So far, the program seems easy to understand, use, and adapt. It appears capable of producing all the information a small firm might need. Most PC-based accounting software has more functionality than we need anyhow.

The program is well designed, with a logical layout and flexible formats. The vendor's enthusiasm turned off some evaluators, but reassured us.

Of the negative reports from other evaluators, the most common was that some of the reports were hard to read. Too many lines make reports look extremely busy and graphically unacceptable for invoicing clients. Some evaluators found that reports do not include tasks. The fact that there was no dealer network caused some concern. Local dealers are important for setting up the program because the many problems must be solved quickly, and that often requires on-site assistance.

—Charles Grant Pedersen, AIA, Francisco Restrepo, AIA, and John Squiers

Wind-2 One Plus

Ease of use, flexibility, and versatility are the key advantages of Wind-2 One Plus by Wind-2 Research. Every software vendor pays lip service to ease of use, but Wind-2 has made it a program design criterion.

A bracketed field on the screen makes it possible to look up information in another file without leaving the original function. This avoids the need for a pile of printouts on the desk when entering time sheets, expenses, and similar data.

The touch of a function key puts context-sensitive help on the screen to explain the options at that point. Flexibility was built into the program because each design firm has different management needs. The program provides multiple project organization levels. It uses the names "department," "phase," and "task," but they can be renamed.

Versatility is provided through the best custom report generator in the field. If the numerous built-in reports do not suffice, the user can ask Wind-2 to program the report. The company charges a fee but then includes the report in a catalog of special reports. If one matches someone else's need, that user can buy it and Wind-2 will pay the original user a royalty of as much as 20 percent over what Wind-2 charged to generate the report.

To make the software affordable to small firms, Wind-2 offers four levels of power and pricing—more than any other vendor in the evaluation.

Wind-2 has concise and esthetic menus. They are more concise than those of Micro/CFMS. Only Data-Basic's screen appearance is as good.

Technical support is excellent—delivered via phone, local dealers, frequent training seminars, specialized consulting, and a bimonthly newsletter. The manual has been rewritten and is much easier to use than before.

One evaluator commented that, although his firm was unable to dedicate much time for getting started, Wind-2's backup and support allowed the firm to be up and running with nine months worth of data in just over one month.

Evaluators differed on whether it is a detriment or an asset that the program was developed from data-base management software. On the one hand the program has excellent project management capabilities and extracts information readily. However, some evaluators questioned the program's ability to handle accounting functions. Its data-base management heritage might hinder development when new options don't fit into the master program format, one evaluator commented.

—John H. Hanson, AIA, and David I. Mangurten

Kevin S. Campbell, AIA, is a vice president of the 23-person Wendell Campbell Associates, Chicago, which computerized its bookkeeping 10 years ago.

David J. Engelke, AIA, is vice president of the 35-person Potter Lawson & Pawlowsky, Madison, Wis., which computerized its bookkeeping two years ago.

Charles R. Newman, AIA, heads his own seven-person architecture firm in Naperville, Ill. The firm has been computerized since it was formed in 1982, and kept the books on a generic accounting program.

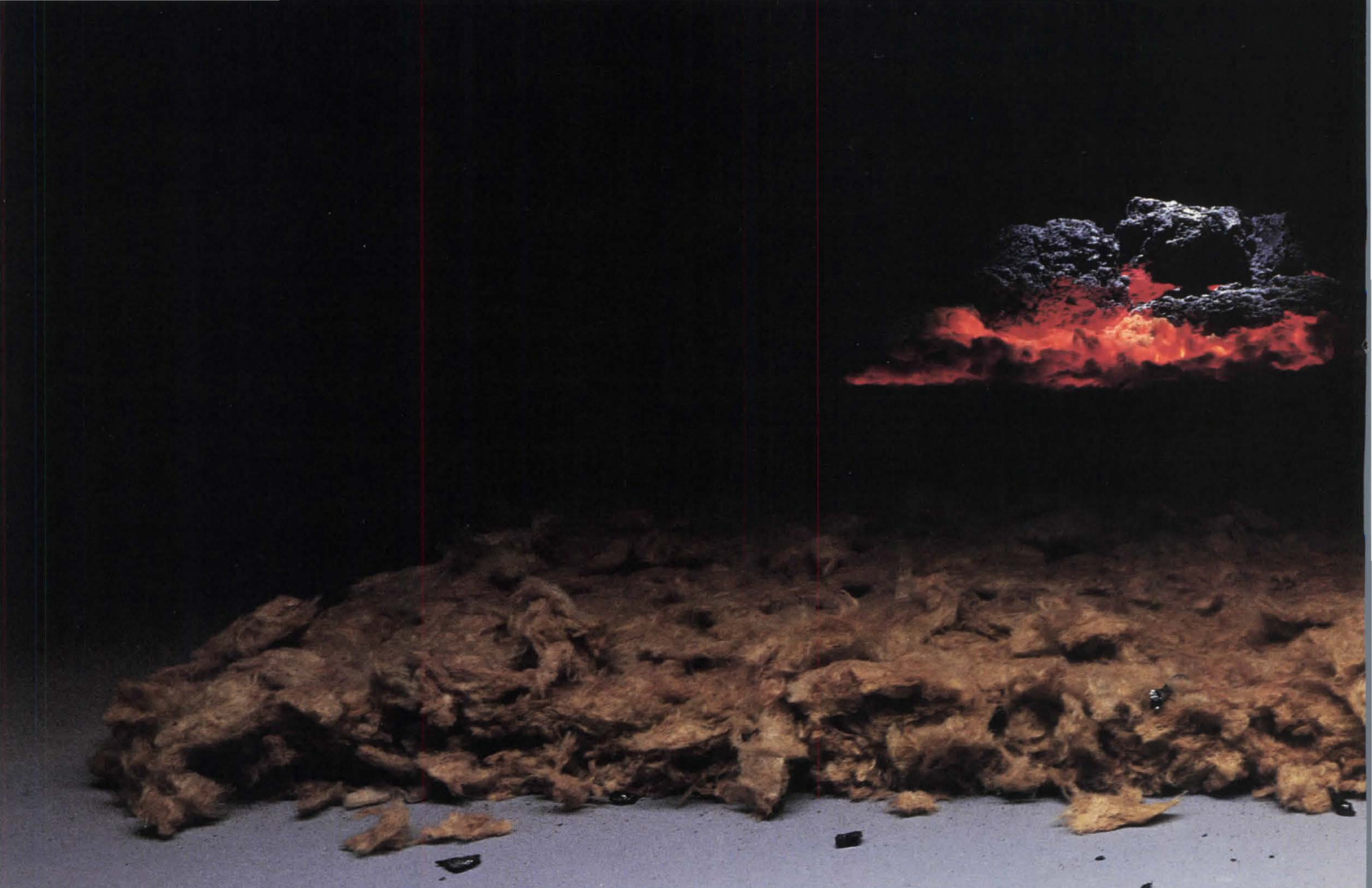
Charles Grant Pedersen, AIA, heads his own four-person architecture firm in Hillside, Ill. The firm has been using computers for five years but prior to this evaluation kept its books manually.

Francisco Restrepo, AIA, is principal of the 13-person Restrepro Group, architects, planners, and interior designers, which has been using computers for over two years although its bookkeeping has been done by an outside consultant.

John Squiers is an architect for the 15-person Hasbrouck Peterson Associates, architects, engineers, and conservators, Chicago. The firm purchased its first computers three years ago. Prior to the evaluation invoices were generated with a generic accounting system; the rest of the bookkeeping was done manually.

John H. Hanson, AIA, is president of the 12-person Stenbro Associates, Chicago. Though Hanson had CADD experience, his firm kept its books manually before this evaluation.

David I. Mangurten is a partner in the seven-person Kaplan Mangurten Architects, Deerfield, Ill., which purchased its first computer in March 1986 for word processing and financial management. □



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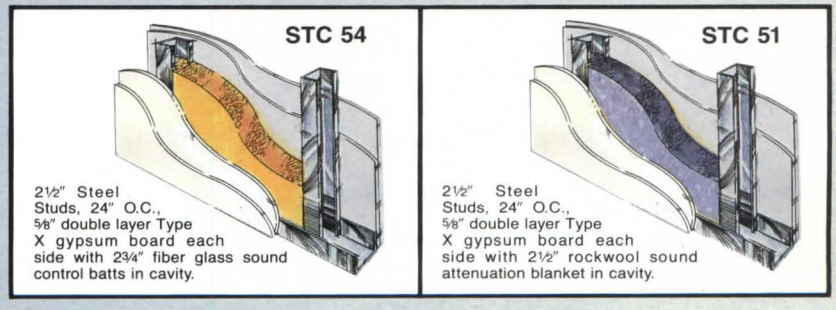

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Manville Sound Control Batts effectively reduce sound transmission through steel stud wall constructions. In the examples shown above, fiber glass batts offer equal or even improved STC ratings even though the density of the rockwool is significantly more.

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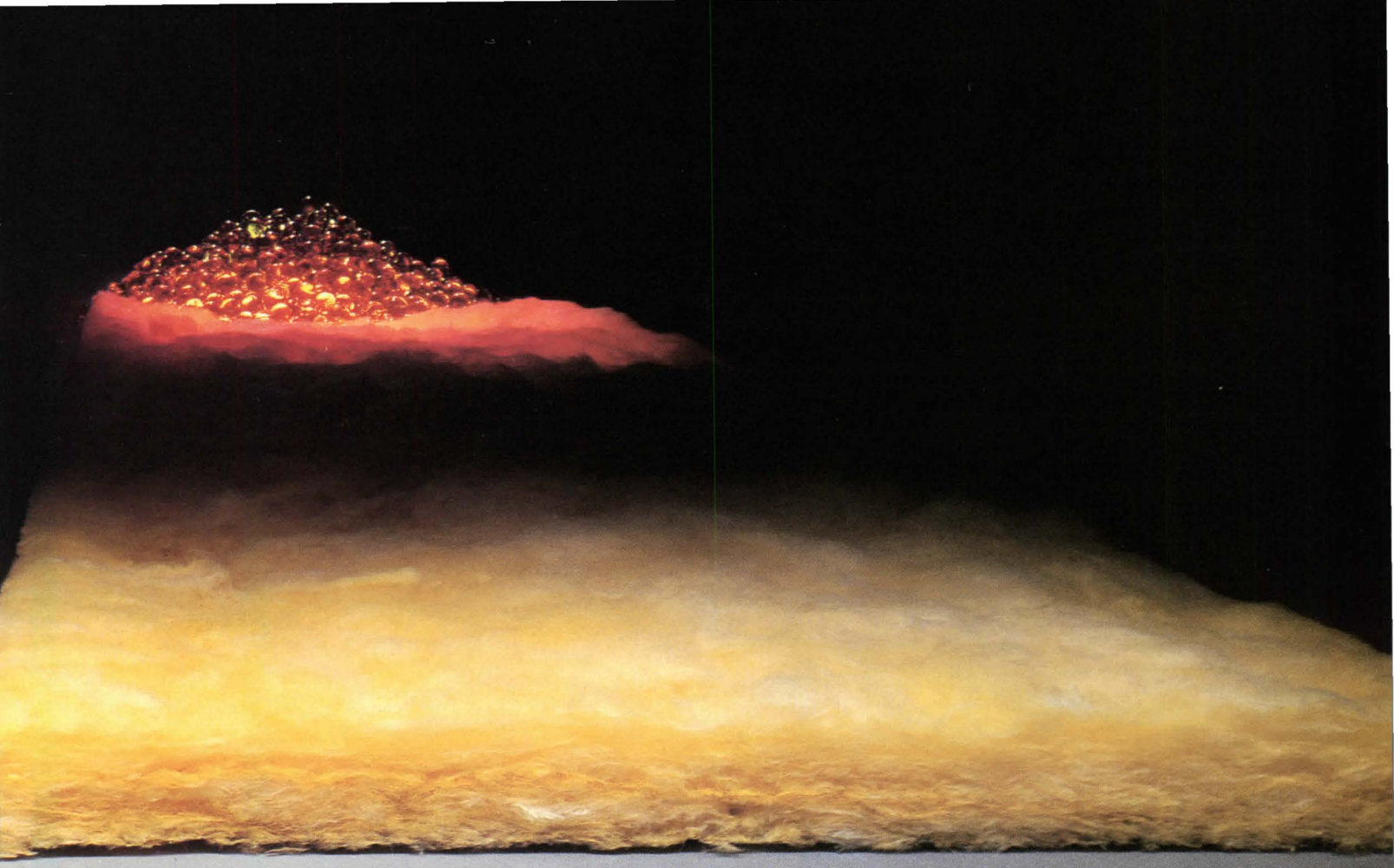

to the Golden Age.

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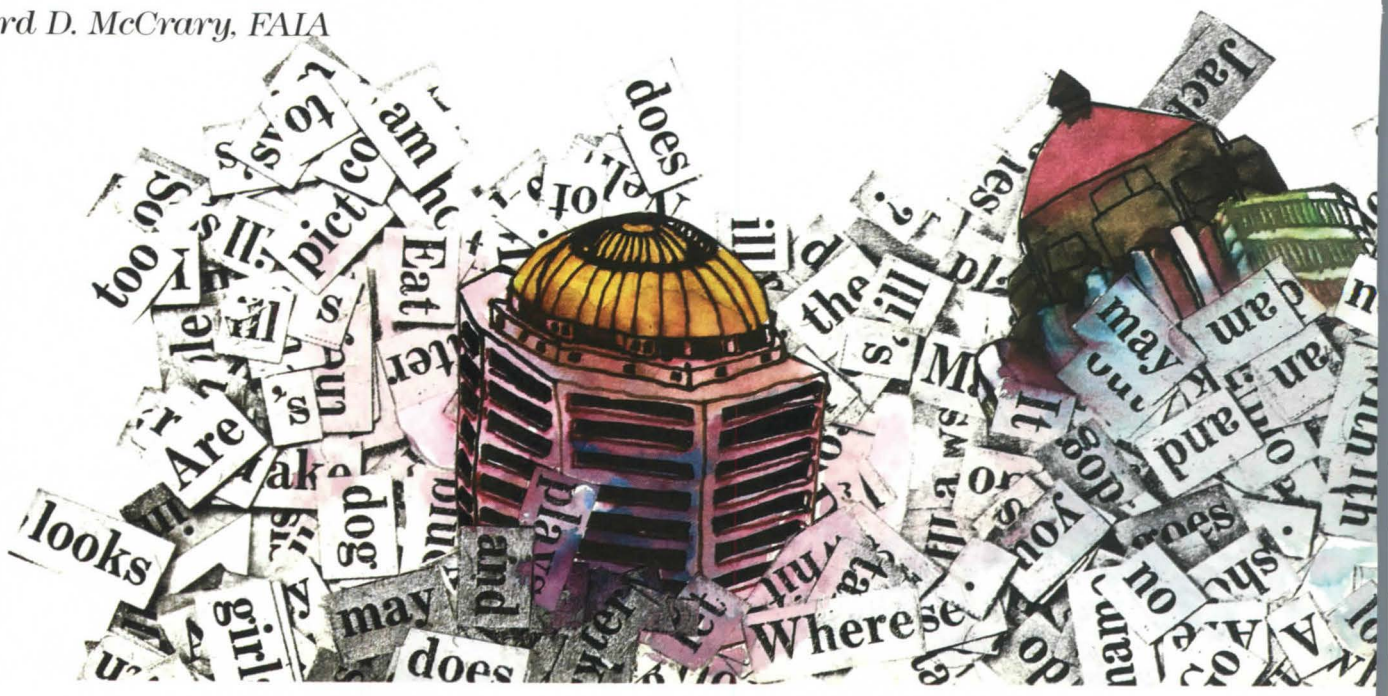
Manville

Today's Insulations

Circle 27 on information card

An Individual Look at the New A201

By Edward D. McCrary, FAIA



Contractors have always had to do the work per the contract documents, inspect their own work, and meet their own schedule. But how many of us using the AIA general conditions have been able to find the specific language to get contractors to comply? The language is now part of the new 1987 edition of AIA's A201 General Conditions of the Contract for Construction.

It's surprising that a document that has been around as long as A201 (since 1911) didn't already cover some of the very basic obligations of the contractor. Maybe early editions did, but revisions over the years blurred them to a point where some of the simplest ideas were missing. The AIA committee that developed the new document made an effort to explicitly cover many basic issues that owners, contractors, and architects deal with every day in the construction process.

For instance, whenever a problem of construction quality comes up, the architect shows the contractor subparagraph 3.2.3: "The contractor shall perform the work in accordance with the contract documents and submittals approved. . . ."

How about when the contractor says, "I didn't look at that sub's work before the next sub started. That's their problem." Well, now it's the contractor's problem also, as it should be. Subparagraph 3.3.4 now says: "The contractor shall be responsible for inspection of portions of work already performed under this contract to determine that such portions are in proper condition to receive subsequent work."

Time of performance by the contractor was covered only minimally in the previous edition. The old subparagraph 4.10.1 said that the contractor was to prepare a schedule. It never stated that it be a reasonable schedule or that the contractor should or would meet it. Nor did it mention revising the schedule once the job was under way or when conditions changed. Subparagraph 8.2.1 now states that the ". . . contractor confirms that the contract time is a reasonable period for performing the work." Two separate sections deal with meeting schedules.

Other new provisions provide that the contractor will revise the schedule ". . . at appropriate intervals as required by the conditions of the work and project" (subparagraph 3.10.1) and will prepare a schedule of submittals coordinated with the construction schedule (subparagraph 3.10.2). Subparagraph 3.10.3 says simply, "The contractor shall conform to the most recent schedule." Subparagraph 8.2.3 says the contractor shall ". . . proceed expeditiously with adequate forces and shall achieve substantial completion within the contract time." These are all basic issues that are valuable additions to the time and schedule provision of A201.

Several major additions to the document reflect the changing practices of the construction industry. Because the general conditions are updated only every 10 years or so, many architects are used to dealing with certain of these changing issues in the supplemental conditions or on the job site through the preconstruction meeting and project procedures. It will now be easier with some changes in the basic language of A201.

AIA has introduced a new term, "construction change directive," in this edition as well as a somewhat redefined definition of a change order. A change order now will require the approval of the contractor (not previously required) as well as the owner and the architect. The new construction change directive (paragraph 7.3), which only requires the owner and architect signatures, is generally used to authorize revisions to the work when there is an ". . . absence of total agreement on the terms of a change order" (subparagraph 7.3.2). The construction

Mr. McCrary, of Skidmore, Owings & Merrill, San Francisco, was a member of the AIA documents committee from 1973 to 1983, serving as chairman in 1975 and 1976 when the prior edition of A201 was issued. He also worked on early development of the 1987 edition.

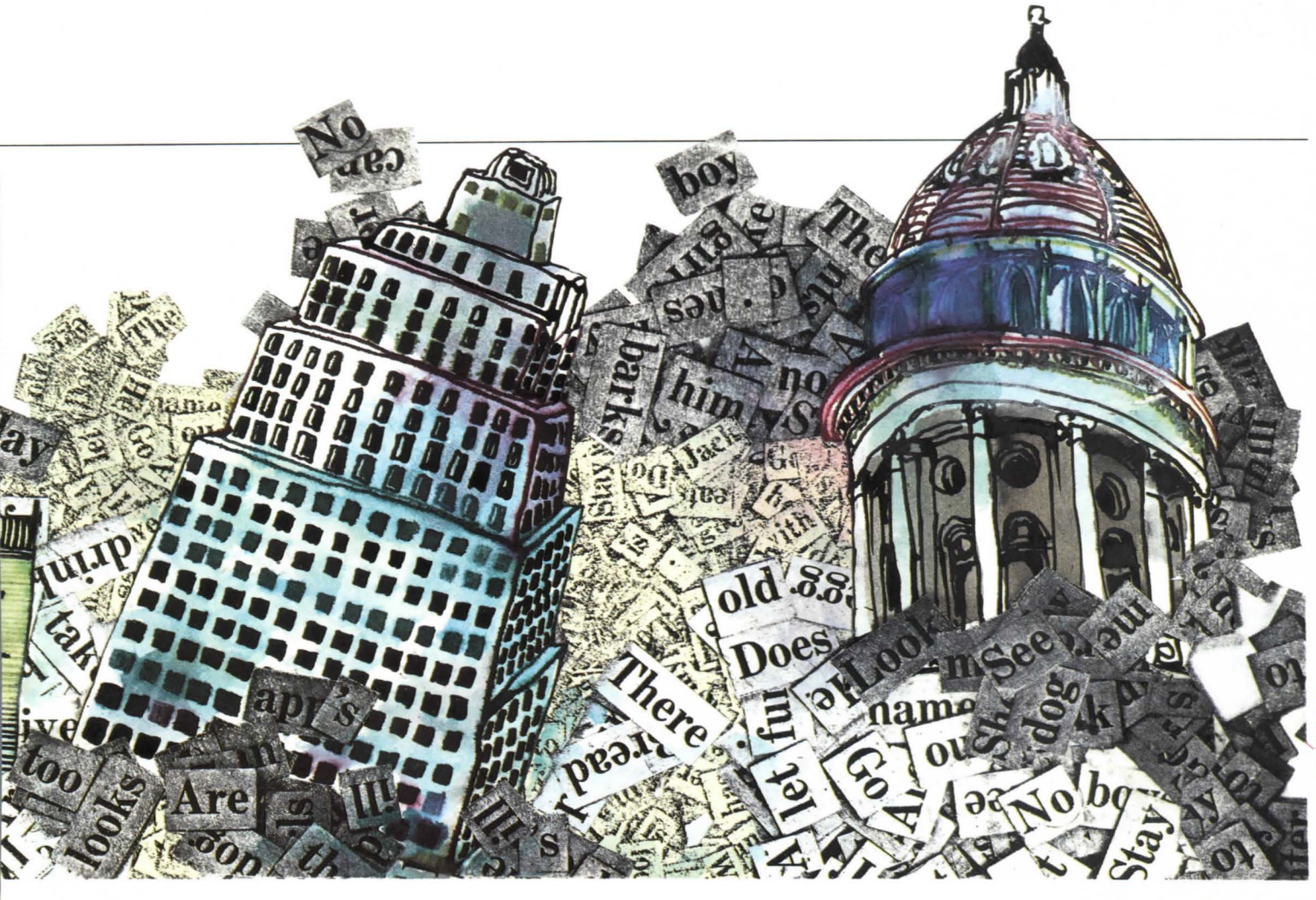


Illustration by Brian McCall

change directive states ". . . a proposed basis for adjustment, if any, in the contract sum or contract time or both . . ." (subparagraph 7.3.1). It appears to work very much like a contractor's field order, field work order, field work authorization, or whatever term a particular contractor uses to obtain immediate authorization to proceed with revised work. AIA's Construction Change Authorization (G713) published in 1979 was intended to accomplish the same end with the assumption that the agreement ultimately be incorporated into the contract by a formal change order.

Some confusion may develop as a result of these revisions. In previous editions, the contract included "modifications," defined to include change orders, interpretations, and minor changes (subparagraph 1.1.1). Although this definition remains similar with the inclusion of the construction change directive, a new term, "changes," introduced in subparagraph 7.1.1, now includes change orders, construction change directives, and "minor changes in the work" authorized by the architect.

The difference between the two definitions—"modifications" and "changes"—is unclear. Minor changes fall in both categories but do not involve ". . . adjustments in contract sum or extensions of contract time . . ." (paragraph 7.4). As noted, a construction change directive can modify the contract sum or contract time in absence of the contractor's approval (subparagraph 7.3.2), while a change order contains all three signatures (subparagraph 7.2.1). This will require a very careful tracking of current contract sum, which will include all executed change orders, as well as tracking construction change directives in progress. Progress payments can also be made on construction change directives while final costs are being developed. If a contractor later signs an agreement on the pricing of a construction change directive, it ". . . shall be recorded as a change order" (subparagraph 7.3.5).

The way subparagraph 7.3.9 is written assumes that, sooner or later, the architect will determine a final cost for the construction change directive (implied apparently under subparagraph 7.3.6) on which the owner and contractor sooner or later agree (subparagraph 7.3.9) and that it then becomes recorded as a change order. What isn't said is what happens to a construction change directive where final costs are never totally resolved and the parties don't wish to arbitrate their differences. Since the definition of both modifications and changes in the work includes construction change directives, it can only be assumed that all construction change directives do not have to become change orders. It isn't clear in reading article 7, nor will it be clear to architects, contractors, or owners trying to accurately track project costs.

Another major change reflecting present concerns is the introduction of provisions relating to asbestos and polychlorinated biphenyl (PCB). Subparagraph 10.1.2 notes that contractors may stop work if they discover material they believe contains asbestos or PCB that has not been rendered harmless. Contractors do not have to proceed and perform any work until this material has been rendered harmless (subparagraph 10.1.2), nor can they be made to do any work relating to the asbestos or PCB (subparagraph 10.2.3). In addition, owners must indemnify contractors as well as architects and their consultants, agents, etc. ". . . from performance of the work in affected areas if in fact the material is asbestos or polychlorinated biphenyl and has not been rendered harmless . . ." (subparagraph 10.1.4).

Although this is a very good and proper addition to the A201 General Conditions, one is curious to know why A201 refers only to asbestos and PCB while the new, parallel edition of the Owner-Architect Agreement (B141) provides protective language for the architect relating to a much broader list: ". . . hazardous materials in any form on the project site, including but not limited to, asbestos, asbestos products, polychlorinated biphenyl (PCB) or other toxic substances" (B141, paragraph 9.8).

There are three new areas in the contract document that relate to problem projects. A new paragraph 13.7, "Commencement of Statutory Limitations Period," has been added not to facilitate construction but for use by the courts and attorneys as claims develop many years after construction is completed. Article 14 has been expanded to include suspension of work at the owner's convenience, for whatever reason the owner has, with provisions of equitable adjustments for the contractor upon restart of the work (paragraph 14.3). The contractor retains the right to terminate if the suspensions exceed certain specified periods (clause 14.1.1.4). Finally, there is a provision for the "Contingent Assignment of Subcontracts" (paragraph 5.4). Under this paragraph, the contractor contingently assigns all subcontractors to the owner but only in the event the owner terminates the contractor's services for cause. The owner must then specifically accept the subcontracts. This new provision will permit the owner more ease in taking over a project and its subcontractors after termination of the general contractor.

There are many simple language revisions in the new edition that greatly clarify or improve provisions that have been troublesome in the past. The most significant for architects is the removal of their role as ". . . judge of performance . . ." of the owner and contractor (old subparagraph 2.2.7 and 2.2.10). The specific term "judge" had caused problems and irritated both owners and contractors, since it implied the architect had this "exalted, holier than thou" role. The new language (subparagraph 4.2.11) says the architect now will ". . . interpret and decide matters concerning performance under and requirements of the contract documents. . . ." However, there is now a time limit imposed on such response by the architect, who must reply within 15 calendar days, after which time a delay may be recognized.

The architect's role relative to shop drawings has been modified in a number of significant ways in subparagraph 4.2.7. The architect's actions are now ". . . for the limited purpose of checking for conformance with information given and design concept expressed in the contract documents." The subparagraph goes on to limit the review further by stating that "review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the contractor. . . ."

This same subparagraph also adds language relative to the timing of shop drawing review. It now says submittals will be made ". . . allowing sufficient time in the architect's professional judgment to permit adequate review" (subparagraph 4.2.7). The intent of this subparagraph is vague. Does it mean the time allowed the architect is only the review time itself without considering other work in the architect's office? If a submittal requires only one day's review, must it be returned within two days of receipt? This is an addition to the previous language, which states that the review ". . . shall be taken with such reasonable promptness as to cause no delay . . ." and implies that the time involved includes time to do other work and still process the shop drawings within the contract limits. Since the additional language is intended to limit the contractor's demand for immediate turnaround so as "not to delay," it appears overall to be a helpful addition.

Other simple revisions (1) move all language about communication channels into one place (subparagraph 4.2.4) rather than small references scattered through various sections; (2) continue the architect's role past the time final payment is due (subparagraph 4.2.1) if the owner concurs and, under the new B141, the owner compensates the architect; and, (3) in subparagraph 4.2.13, make the architect's decision final on "aesthetic effect" rather than the prior version's "artistic effect."

The owner's section has one small language change that is significant. Under the owner's right to stop work, the action can now be initiated "if the contractor fails to correct the work which is not in accordance with the requirements of the contract documents . . ." (subparagraph 2.3.1). It used to say ". . . correct defective work . . . ," which was hard to enforce if the work wasn't defective, just not done per contract documents.

There are a number of simple adjustments in the contractor's section that will clarify areas that have caused confusion or inequalities. The warranty paragraph (3.5) has been clarified to justifiably exclude from the contractor's responsibilities ". . . remedy for damage or defect caused by abuse, modifications not executed by the contractor, improper or insufficient maintenance, improper operation, or normal wear and tear under normal usage." There have been several major changes in the contractor's shop drawing paragraph. A new subparagraph 3.12.4 now specifically states that "shop drawings, product data, samples and similar submittals are not contract documents," which clarifies they are not a product of or part of documents provided by the architect. It goes on to define that they are to show how ". . . the contractor proposes to conform with the information given. . . ." In subparagraph 3.12.5, the statement, "Submittals made by the contractor which are not required by the contract documents may be returned without action," permits the return of unwanted submittals, always a problem to architects who get unrequested submittals from contractors wanting the architect's stamp on them. The matter of informational submittals, which are needed for proper documentation but not intended to require a response by the architect, are now covered under a new subparagraph 3.12.10. If professional certification of materials, systems, or equipment is required and furnished, the architect is now ". . . entitled to rely upon the accuracy and completeness of such calculations and certifications" (subparagraph 3.12.11). This is important with the growing use of design-build provisions.

There are several improvements in article 9 on payments. Under clause 9.3.1.2, a contractor cannot apply for payment of funds related to a subcontractor's or supplier's work if the contractor does not intend to pay the sub or supplier because of a dispute or other reasons; thus the contractor is prevented from holding these funds rather than paying when due. Subparagraph 9.4.2 should help architects when they get applications for payment with reams of backup the owner has requested. Since the architect does not normally have the capability, or the obligation, to properly review this material, the certification now clearly states there is no representation regarding it.

One last change in article 9 occurs in paragraph 9.8, "Substantial Completion." Although the basic addition is an improvement, the wording may cause confusion. It acknowledges that the architect will prepare a list of deficiencies (punch list) and states that the contractor shall complete or correct them (subparagraph 9.8.2). The confusion may result because it says that this completion or correction shall be done ". . . before issuance of the certificate of substantial completion . . . ," but elsewhere in the same subparagraph it notes that a list of items yet to be finished should be attached to the certificate of substantial completion. This list assumes that not every last item must be done for substantial completion, which has historically been the normal

situation and assumption in practice. The new wording may lead to arguments that all items must be completed before substantial completion, which has not been the intent of the concept of "substantial completion."

Despite the many positive additions and changes in the documents, there are unfortunately a number of revisions that may become points of conflict or areas of increased exposure for all parties involved. The first is in the redefinition of the "Work" under subparagraph 1.1.3. The 1976 edition defined capital-W "Work" as ". . . the completed construction required by the contract document and all labor necessary to produce such construction, and all materials and equipment incorporated or to be incorporated in such construction." Clearly and intentionally, it was meant to exclude all temporary facilities such as shoring, bracing, formwork, etc. The 1986 edition has apparently reversed this position. The new definition includes ". . . the construction and services required by the contract documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the contractor to fulfill the contractor's obligations. . . ." Thus it appears to encompass everything the contractor does, including temporary shoring, formwork, etc.

Where this change gets sticky is in its reference through the document to other obligations related to the "Work." In the new definitions of drawings, specifications, and project manual (1.1.5, 1.1.6, and 1.1.7), the term "Work" is used in a way that might imply inclusion of these temporary facilities. Of much greater concern is the effect of this change on the owner's and architect's roles in inspection or rejection of work. Under subparagraph 2.3.1, the owner has the right to stop ". . . Work which is not in accordance with the requirements of the contract documents. . . ." Under subparagraph 4.2.4, the site visits by the architect include the purpose ". . . to determine in general if the Work is being performed in a manner indicating that the Work, when completed, will be in accordance with the contract documents. . . ." Finally, the architect ". . . will have authority to reject Work which does not conform to the contract documents" (subparagraph 4.2.6). What happens under these three subparagraphs when the temporary shoring, bracing, or formwork (now apparently a part of the work) appears to be grossly inadequate or fails to comply with laws or safety requirements that are referred to elsewhere in the contract documents? Since a major portion of construction site injury claims relate to temporary facility failures (formwork, shoring, trench bracing, etc.), this redefinition may make it easier for plaintiff attorneys to bring architects into litigation through the various obligations related to the "Work." There are numerous other areas where this revised definition of "Work," if it now includes temporary facilities, will have to be carefully viewed in its application.

Although the reorganization of all language relating to claims, disputes, and arbitration into one section under "Administration of the Contract" in article 4 certainly helps the organization of A201, the section unfortunately has been expanded and complicated. It now takes up over twice as much space as all of the architect's responsibilities. Among the changes are a definition of a claim (subparagraph 4.3.1), expanded basis for claims (subparagraph 4.3.7), and an obligation of the contractor for documentation on an adverse weather claim, including its effect on the scheduled construction (clause 4.3.8.2).

The subparagraph entitled "Decisions of the Architect" (4.3.2) now includes the first reference ever in an AIA document to "errors or omissions." It states that the "claims, including those alleging an error or omission by the architects, shall be referred initially to the architect for action. . . ." This at least will bring such allegations initially into the normal claims process rather than some other route.

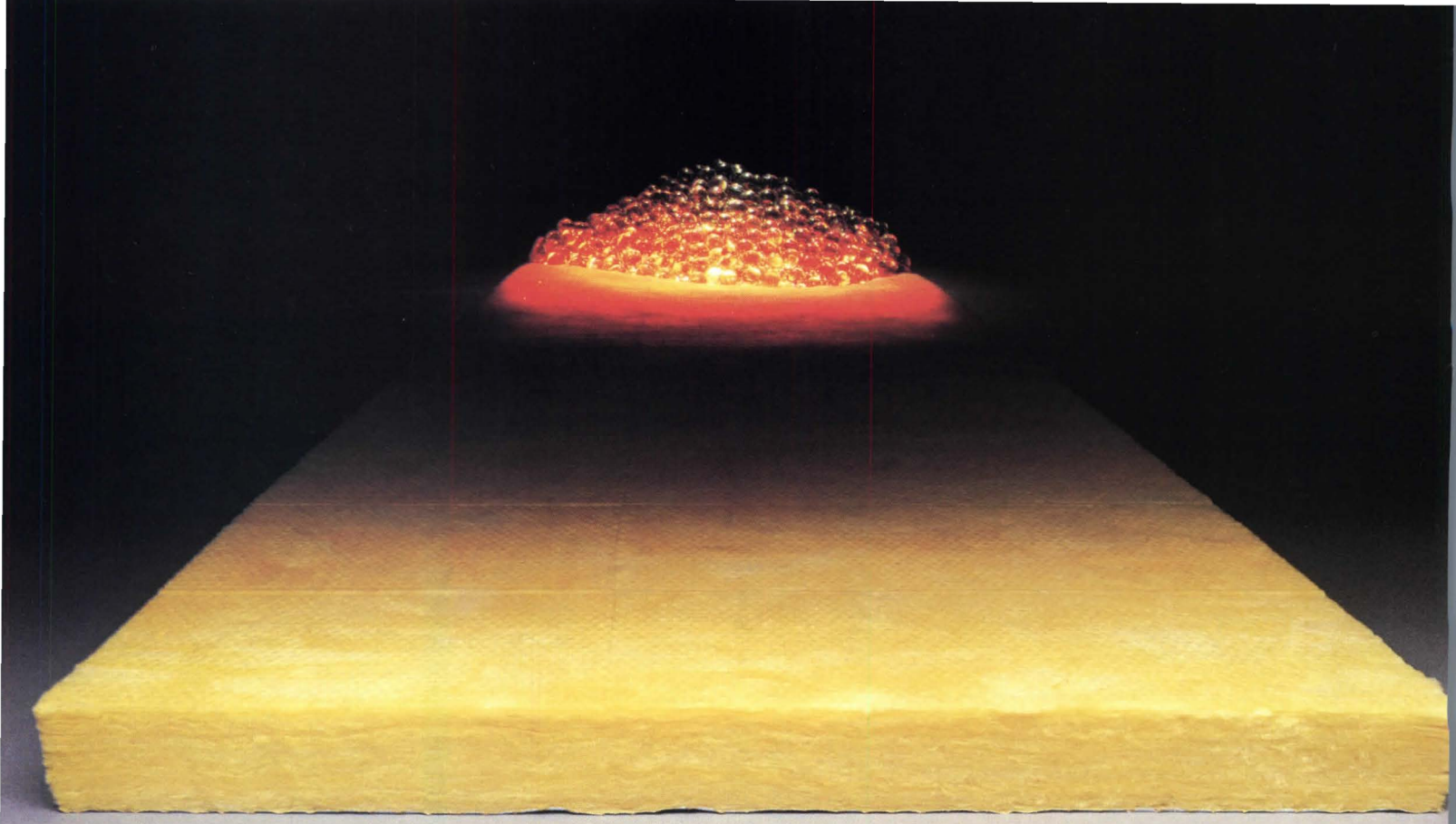
A change in procedures for claims for concealed or unknown conditions could have a major effect on bidding and project costs. Previous edition language permitted the contractor a right to claim additions for more costly conditions discovered after the fact but was silent on what happened if simpler or easier conditions were found. This is no longer the case. Once a changed condition is observed, the architect will ". . . investigate such conditions and, if they differ materially and cause an increase or decrease in the contractor's cost of, or time required for, performance . . . will recommend an equitable adjustment . . ." (subparagraph 4.3.6). Will this new language push owners into a position of wanting credits whenever a condition is slightly simpler or easier than assumed during bidding, or will it cause contractors to bid higher to cover potential credits? How is "materially" defined, and by whom?

The contractor article also contains several revisions where the real effect on projects can be assessed only over a period of time. The contractor now retains "appropriate responsibility" for proceeding with work if there are errors, inconsistencies, or omissions in the documents and the "contractor recognized such error, inconsistency or omission and knowingly failed to report it to the architect" (subparagraph 3.2.1). How one determines "appropriate responsibility" will surely lead to many discussions.

Under "Correction of Work" (subparagraph 12.2.2), the following sentence has been added: "This period of one year shall be extended with respect to portions of work first performed after substantial completion by the period of time between substantial completions and actual performance of the work." It is unclear what the intent of this really is. Is it to extend the one-year corrective period for all minor "punch list" items completed after substantial completion? (That would be a real record-keeping nightmare.) Is it intended to have the corrective period run a full year after corrective action is taken on discovered defective work? If so, what does "first performed" mean? Unfortunately, we may have to wait and see how this one is interpreted.

There are two major revisions to "Miscellaneous Provisions" (now article 13). Buried in the middle of paragraph 13.5, "Tests and Inspections," is a new provision that states that, unless provided otherwise, the contractor shall make arrangements for all required testing inspections and approvals with an independent testing laboratory and the contractor shall bear all costs associated with this activity (subparagraph 13.5.1). Although this may have been the normal practice in much of the country, it was not a part of the basic document until now. Architects must be careful now to clearly identify testing and inspection scope in their bid documents, especially if codes and ordinances are vague or if the architects wish more than the code minimum testing or inspection. Also of interest is that the testing agencies are now being employed by the contractor, not the owner. Does all of their communication now have to go through the contractor (subject to edit?) to the owner and architect, as stated in subparagraph 4.2.4?

The AIA documents are clearly the guidelines by which all construction industry documents (public as well as private) are judged. The 1976 edition has proved to be a fair and equitable document over the past 10 years. It appears that the 1987 edition will perform equally well even though some of the new language questioned above may take some testing over time. □



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The Ins and Outs of Specialization

Drawn from firms' experiences.
By Douglas E. Gordon

"You can only stay in business so long as a generalist. Before long, you find your firm developing special areas of expertise that set you apart from other firms. You direct more attention to that expertise, and before you know it—and maybe without even realizing it—you're a design specialist."

That is how John Belle, FAIA, describes the path Beyer Blinder Belle took in its metamorphosis from a young New York City firm in 1968 that happened to be doing a lot of rehabilitation work into a specialist in historic contextualism and restoration.

Belle and his two founding partners, John Beyer, FAIA, and Richard Blinder, FAIA, were all urban architects who believed design begins with the history and context of the site, Belle says. Working from that viewpoint, the three built a reputation as well as experience in historically sensitive design. When historic restoration gained popularity in the '70s, Beyer Blinder Belle took the opportunity to start a historic preservation department within the firm, and the specialization was formalized.

"The formal, systematic approach to research that BBB brings to almost every project we design is what sets us apart," Belle says, noting that their research section is headed by James Marston Fitch, Hon. AIA, who started the first historic preservation education program in the United States, at Columbia University in 1964, and has been working with BBB since 1979.

"The trend we saw of more and more postmodern designs incorporating arbitrary historic allusions was so completely against what we believe in as a firm that we made the historic research section part of almost every project we design," Belle says. "It's firmwide policy now to research the history of a project site thoroughly before design development begins, whether it's new construction or restoration."

Beyer Blinder Belle was fortunate to have developed an expertise just as the market for that expertise was mushrooming. But, as their experience indicates, picking a design specialty must go much deeper than "I've done that before, and I can do it again even better." Whether the design specialty is schools, churches, warehouses, retail boutiques, or horse stables, critical factors beyond experience include the number of people who want the design service and how strongly they want it, whether client emphasis is on a high level of service or efficient design delivery, the level of experience of competing design firms, the rate at which the design technology is changing, and the likelihood that the specialty will remain strong in the market long enough to sustain long-range plans.

To see how a few firms manage the changing marketplace, ARCHITECTURE talked with firm principals specializing in six markets at varying points of evolution to see how the firms work with clients, deliver design, and hire and develop design talent.

Health care design is one of the more stable specialty types. It has seen continual, though occasionally sporadic, growth since World War II. It isn't an easy market to break into, however, because many of the larger architecture firms that specialize in health care facilities date their involvement back to the postwar years, when the population boom created a demand for regional hospitals throughout the country. Developments in optimum adjacencies, circulation, mechanical systems, and equipment configurations were conceived by designers who in many cases devoted a lifetime to refining the design technology. Consequently, anyone new to the field today is at a decided disadvantage.

In the years since the baby boom began, health care design specialists and their increasingly sophisticated clients have had to adapt to unrelenting advancements in medical technology, proliferation of services, regulatory change, decentralization of hospital services to small specialized clinics, and client desire for pleasant, psychologically comforting hospital spaces.

Stone, Marraccini & Patterson is a 60-year-old firm with offices in San Francisco and St. Louis that has specialized in health care since the mid-1950s. Providing a high level of client service is the management philosophy that keeps projects coming into the SMP offices, says firm president Wilbur ("Tib") Tusler, AIA. "We are constantly seeking new ways to meet our clients' demand for cost-effective, flexible facilities in the rapidly changing health care field. I find that we have difficulty working with clients who are looking for a fast and cheap product rather than high-value design services."

In recent years SMP has had good experiences diversifying to other building types: laboratory facilities, computer complexes, and office plazas. "We are diversifying because one can get too narrow in a specialization," Tusler says. "At one point, SMP was doing 95 percent of its projects in health care. I find that a mix in project types helps keep the work interesting for the designers. Design quality suffers when architects lose interest in their work. Furthermore, a good mix of projects on the firm's boards helps attract the best new people."

SMP entered the health care market just as semiprivate rooms were replacing wards as the standard choice in hospitals. Over the years, as the modern hospital was taking form, SMP was developing its expertise in step. Now, the grasp of technology and accumulated information necessary to design a regional hospital makes it a market nearly impenetrable to novice firms. The market that smaller firms are finding more accessible is a spin-off attributable to the debundling of services from large hospitals to small ambulatory care centers, which handle minor emergencies and outpatient care, for example, and leave the high-tech diagnostics and major surgery to hospitals. Smaller firms often are better positioned to win the smaller projects, Tusler says. Despite the competition, the emerging market for ambulatory and specialized health care facilities today represents over 50 percent of SMP's health care work, he says. He predicts large urban hospitals with a full complement of technological wonders supported by many small, local health care centers.

A firm that is looking at expanding into a segment of the emerging health care facility spin-off market is Kromm, Rikimaru & Johansen of St. Louis. The "people services" the firm is targeting include housing for the aged, nursing and health care facilities, schools, and child care centers. Currently about 75

percent of the firm's business is in nursing facilities or housing for the aged, says principal David V. Kromm, AIA. The firm has been designing nursing homes for 25 years, and congregate living facilities for nine.

With the percentage of retired persons in our population increasing every year, facilities that cater to the elderly in various states of health and vigor promise to become a major design specialty in the near future. Now, however, a formal body of information—a first step toward standardization of a building specialty type—is lacking. Kromm, Rikimaru & Johansen looked to the National Association of Senior Living Industries and the American Association for Housing for the Aged for much of the information they have used to supplement their experience.

"Though we'd consider ourselves quite knowledgeable when it comes to designing for people services," Kromm says, "we always are reminded that our clients are sponsoring facilities to treat people who are often strongly attached to what they want. We find we must always be willing to adapt our recommendations and learn from the experience."

With 25 employees, Kromm, Rikimaru & Johansen is in a period of organizational transition that allows growth but still accommodates the close working relationship between project designer and client that characterizes design of this building type. Partnership is changing and the firm is developing a matrixed project delivery approach, whereby project managers guide projects through a departmentalized production system complete with in-house engineering, interior design, cost estimation, master specification updating, and code compliance departments. With this system, production is streamlined while responsibility is still clearly assigned to one person, Kromm says.

The firm is also beginning a staff training program. "One thing that shows up again and again to plague this firm is staff turnover, and of course we resist the idea of being a training facility for our competitors," Kromm says. "On the other hand, training is an incentive. If we keep our architects interested, they're more likely to stay."

With several major building specialties, Henningson, Durham & Richardson, an A/E firm headquartered in Omaha, Neb., offers its architects a choice of health care, justice facility, and research and development facility design opportunities, among others. The firm is able to maintain a consistent management philosophy because each of these building types involves clients who are looking for a high level of service.

Firm president Larry Hawthorne, AIA, says he decided about 15 years ago to specialize. "I found, somewhat to my surprise, that each building type brings with it clients with a whole different set of needs and expectations. So the philosophy of a totally eclectic engineering/architectural practice didn't seem as good an idea as tailoring a practice to the prevailing business environment," he says.

With a very long learning curve for design expertise, and with the firm depending heavily on their experts for firm survival, staff turnover is naturally a concern for HDR. A phenomenon they find is that architecture graduates tend to get a wanderlust about the time they get their license. Some leave the firm and never come back, but many do return after two or three years, according to Hawthorne.

"What is interesting is that those who return to the firm within a couple of years begin to find a place within HDR's several design specializations and often become long-term employees," Hawthorne says.

Keystones of its mission are the array of design specialties HDR pursues and the firm's flexibility in allowing architects to move from specialty to specialty. Hawthorne estimates that HDR maintains a design staff breakdown of 20 percent who are dedicated specialty experts and 80 percent who are generalists and as yet uncommitted to a specialty. By strategically shifting the majority of uncommitted architects among jobs, HDR encourages those architects to move toward niches that interest them. Furthermore, project flexibility is attractive to younger architects, while at the same time it expands the firm's depth of expertise in case key designers leave or markets shift, Hawthorne says.

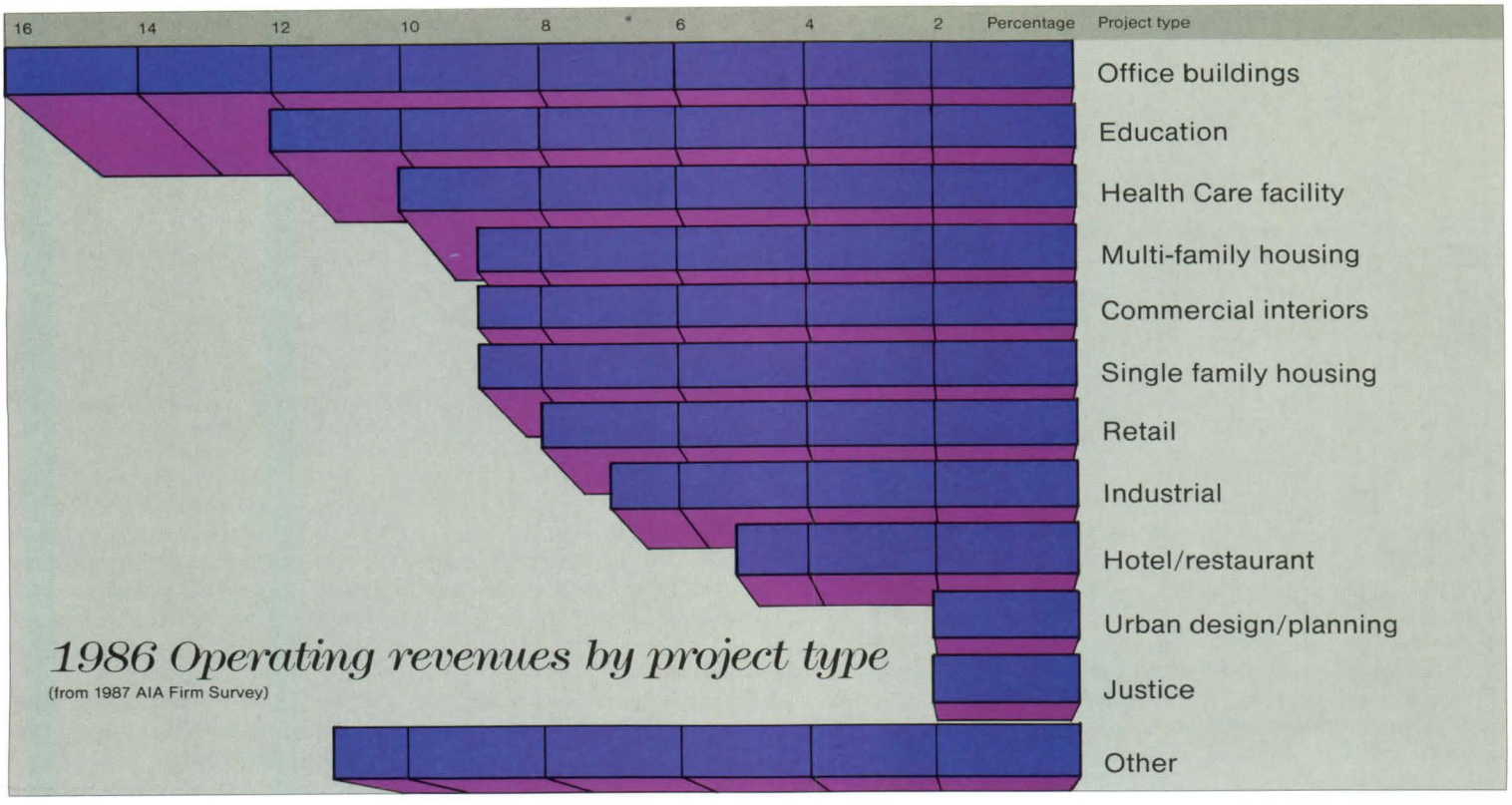
HDR does find it must separate the specialties into different groups within the firm because there are some significant differences among the design specialties. For instance, the justice facility services HDR offers are delivered in much the same way as its health care facility services. A difference, according to Hawthorne, is that subspecialties are not generally found in jail and prison design because justice facilities have less complex space and adjacency requirements than health care facilities. This means the project team for a jail or prison may be smaller and able to deliver design more rapidly and still give individualized service to the client.

Many, if not most, justice facility clients want individualized design service because jurisdictions building jails and prisons typically face a great deal of pressure from courts and politicians to build facilities quickly that will also meet strict standards of habitability. Thus, for many clients, the higher fee for a justice facility specialist is secondary to the need for such a specialist. Still, the market is also strong for designers who offer efficient and relatively inexpensive delivery of a standardized product. An indication that the market may be ready for non-site-specific justice facilities is the apparent success of a firm working with Bechtel Construction Inc. of San Francisco.

American Correctional Systems Inc. of Fort Collins, Colo., is pre-engineering jails and prisons in conformance with the standards developed by the American Correctional Association. Harvey Pricket, the company president, says their pre-engineered jails and prisons have been built and have proved operable nationwide. Jurisdictions want a certain combination of features, such as common areas, inmate program facilities, safety factors, and close inmate observation, Prickett says, and he sees a strong market for a standardized and partially modularized product.

In the case of justice facilities, a large market and high demand are shifting the emphasis toward fast, inexpensive delivery and away from individualized client service. With major sports facilities, however, the market is small yet demand is high and clients are willing to pay for a high level of design service that only a handful of specialists can provide.

The Hellmuth Obata & Kassabaum Sports Facilities Group in Kansas City, Mo., is one of the very few firms in the United States experienced enough to design professional sports facilities for nationally televised teams. The number of such facilities built in a year is small, but the demand for first-class facility design is high. The result is that only firms already in the market are willing to develop the esoteric technological innovations—in movable dome covers for stadiums, easily reconfigured seating and playing areas, accommodations for television trucks and broadcasting equipment, etc.—that make up major sports facilities. The Sports Facilities Group, a corporate subsidiary of HOK, consists of five principals who have worked together for about 10 years designing facilities for professional and collegiate sports.



Large cities are disinclined to seek smaller firms. But smaller cities, which are beginning to recognize the business-generating effect of sports and convention facilities, present a growing market for firms such as Loschky, Marquardt & Nesholm of Seattle. The three principals began their practice after working together, for another firm, on the Seattle Kingdome. Now, public assembly facility design makes up 35 to 40 percent of their practice.

The growing demand for large public assembly spaces has its roots in the county fair, says partner Judsen Marquardt, AIA. That tradition of gathering for festivity and business has evolved into the high-tech convention center, which has displaced other building types, such as city halls and religious centers, as public gathering places. Civic-mindedness and image are now the realm of the spectacular engineering of sports facilities and the architectural identity of convention centers.

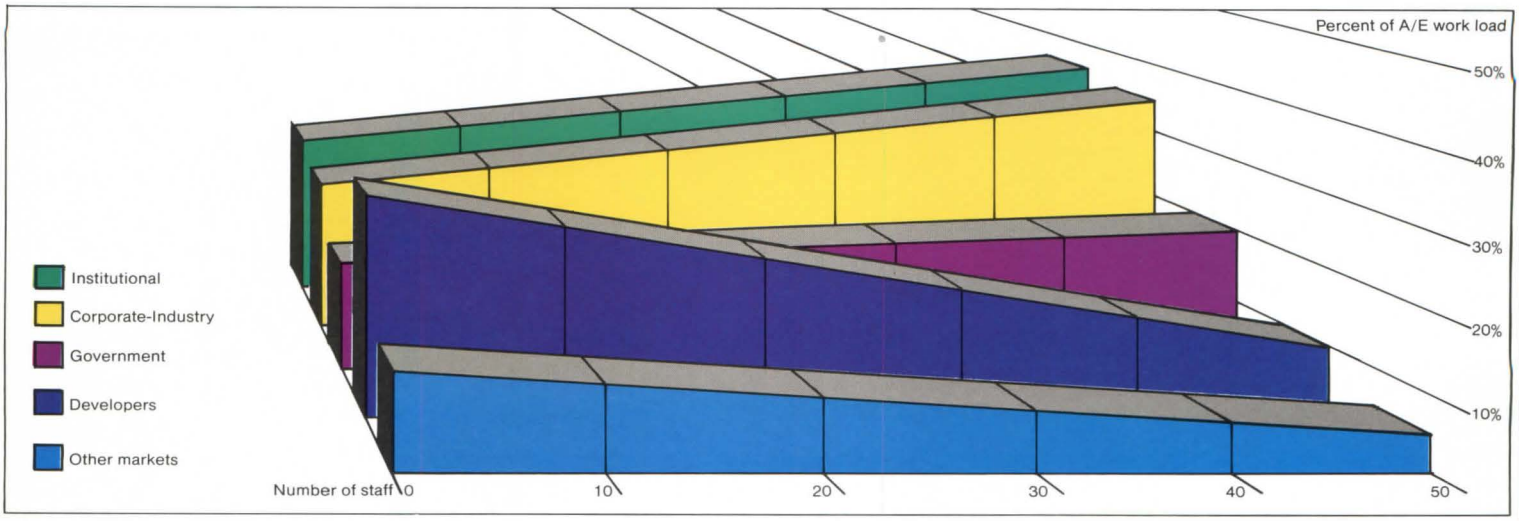
The increase in civic demand for these facilities has generated increased technical sophistication. It wasn't long ago, for instance, that long-span warehouses were thought to afford everything needed for a convention center, Marquardt says. Now designers pay much more attention to service grids in the floor and supplementary grids in the ceiling for mechanical services and lighting. More interesting to Marquardt is a new appreciation of the ambience of convention center lobbies, which are rivaling hotel lobbies for opulence. In the quest for the biggest bang for the buck, the money for such opulence sometimes comes out of the budget for other spaces, Marquardt says. However, many convention-center cities are simply budgeting more money for what they recognize as an income producer. Other factors getting more attention are ambient light control, which is important to exhibitors, and food service.

With sports facilities, the design programs increasingly call for smoother transition of seating and field arrangements between games for sports with concurrent or overlapping seasons. Turf systems and television camera accommodations are two other areas of expertise that designers of this building type must develop. The next major technological innovation expected to become popular in the near future is convertibility of roof systems to take advantage of sunny days and protect from rainy ones, Marquardt says.

Laboratory design for research and development is another specialty that requires a high level of staff expertise and accumulated data. It is also a specialty that is not easy to penetrate. As in health care design, the complexity of the design technology spawns many subspecialties. But unlike health care and public congregation facility design, the small but strong market for research and development facilities is not likely to provide much fodder for firms developing their expertise. Haines Lundberg Waehler of New York City is a 101-year-old firm that has been working on technically oriented projects almost from the beginning, according to Leevi Kiil, a managing partner. From 25 to 40 percent of its work is now in research and development facilities.

The most pressing need for design technology for research and development facilities involves control of the air, gas, water, and waste delivery and disposal systems. From the 1940s, when HLW designed the nation's first industrial lab—Bell Laboratories—until the '60s, space was made flexible by delivering all services to all parts of the building, Kiil says. The building became an expensive collection of modular labs with service cores. During the '70s and '80s, the trend has been to provide to all locations an infrastructure for all services, if not the services themselves. Raceways are installed in all areas, but do not necessarily contain service lines.

"Because research needs change rapidly, the building must



Atilla Bilgutay of the State University of New York in Buffalo shows here a tie between firm size and client type. Large firms work with large clients. Smaller firms devote more time to developers and esoteric specialties, his research shows.

be a gentle container," Kiil says. "We provide a lot of service paths, but actually install only minimal service conduit because they are potentially obstructive."

Like HDR, HLW maintains a 20/80 ratio of dedicated specialists to generalists. "But even the 20 percent of the staff who are specialists work in areas unrelated to their specialty, just for the exposure," Kiil says.

HLW's preference is to train people within the firm. The advantage, Kiil explains, is the consequent familiarity they have with client requirements and HLW project histories. But when faced with an in-house knowledge gap, such as when the Occupational Safety and Health Administration and pharmaceutical regulation boomed, HLW has had to bring in outside experts.

The client/HLW work usually begins with a goal-setting meeting. Programming is highly interactive because research and development facilities accommodate a process, not an entity, Kiil says. For project delivery, HLW separates tasks by the studio method, with a project design team guiding each project through to completion. A project manager is the key decision maker and reports to a partner in charge. Day-to-day activities are monitored by a project designer and coordinated by a project architect.

Expertise is only one factor that limits the number of firms practicing a given specialty type. Risk is another. Ten years ago E. Allen Roth, AIA, got involved with his first asbestos abatement job, mostly as a way to get work experience with an appealing potential long-term client. Riding a wave of EPA-induced demand for asbestos abatement services, Roth Asbestos Consultants Inc. owes its existence to this one rapidly developing but risky new building technology.

Roth was a principal with Abend Singleton Associates of Kansas City, Mo., when he began providing asbestos abatement consulting services. With EPA literature forming the bulk of the existing knowledge base at the time, Roth found himself in the vanguard of health care and design professionals developing risk assessment procedures and abatement strategies and methods.

When professional liability insurance carriers stopped covering services related to hazardous waste, Abend Singleton Associates decided to set up a separate firm, under Roth's control, to administer asbestos abatement projects. That approach didn't work. For one thing, the insurance carrier required of Abend Singleton Associates absolute noninvolvement with asbestos abatement. Furthermore, the strategy had been to staff the asbestos abatement firm with architects from Abend Singleton Associates during slack times. But because the architecture firm had a policy of hiring young professionals for their design aptitude, the firm managers found it difficult to interest their architects in asbestos abatement. The result was a clean split of Roth Asbestos Consulting from Abend Singleton Associates about a year and a half ago.

Asbestos abatement consultation is a comfortable specialty for architects, Roth says. The client/designer relationship, building analysis, contracting, and contract administration for abatement coordination are quite similar to traditional architecture services. "I find the work satisfying to a large extent because I am applying old, familiar processes to a totally new technology, and I'm getting good response from clients," Roth says.

Roth finds that a quarter to a third of his time is billable. He adds that he would like to see that percentage go down as he develops a knowledgeable staff and spends more of his own time managing and marketing the firm for growth.

Staff development is a key concern in the asbestos abatement specialty because the discipline is so new. While hiring hygienists, lab technicians, and designers, Roth has stayed within a studio delivery system. His current staff of 20 is organized by job phase, passing jobs through each department in turn. With the heavy demand for asbestos abatement consultation, Roth sees rapid growth for his firm in the short run and is planning on expanding into other cities this year.

In the long run, Roth expects the market to continue strongly for 10 to 15 years. He is undecided whether he will seek other markets when the asbestos abatement market dwindles or whether he will let the firm retire when he does. "Right now we're going strong," Roth says. "We've already added a profit center by establishing a bulk sampling lab that tests for us in-house as well as for the open market. But I think that if the asbestos abatement market were to fail on me prematurely, I would be more interested in getting back to more traditional architectural services than in pursuing abatement consultation with other hazardous wastes. Of course, I am finding that with my firm development—just as with my client services—I have to be flexible." □

A Phased Process of Strategic Planning

It can be an effective tool for change.
By Ellen Flynn-Heapes

"Having lost sight of our objective, we redoubled our effort." —old adage

We've all heard about strategic planning theory, but how many of us have ever really put all that talk into action? We've been too busy "redoubling our effort" without a clear vision and focused goals to guide us. Strategic planning provides a framework for addressing all the firm's issues, ultimately resulting in a united direction and a creative problem-solving process.

Often in the A/E industry the natural progression is to start with the marketing plan and progress to firmwide strategic planning. Even with marketing plans in place, there are major questions that just cannot be answered without further probing in management, personnel, finance, design, and technology issues. Certainly, marketing questions cannot be fully addressed without a good grasp of the firm's visions and goals.

Strategic planning is most often implemented in firms that are passing from a growth phase into a more mature phase, or from a plateau into more growth. Typically, the firm is facing unresolved issues, an impending crisis in the marketplace, or significant office unrest. Strategic planning offers the tool to embark on the process of facing problems squarely and creating positive change.

Whatever a firm's reasons for undertaking strategic planning, its ability to plan effectively will be enhanced if several key principles are understood:

- Planning is a means to make better current decisions. Each decision can be made in the right direction, avoiding appealing but diverting detours.
- Planning is a social and organizational process as well as a rational one—in that order. As in any creative endeavor, ideas come from everywhere and must be harnessed within a framework.
- In planning, the overall perspective is more important than small details. That you're going through the process of strategic thinking is what really counts.
- People want to participate, be challenged, and contribute creatively. Planning is an excellent vehicle to tap this energy.
- Each firm is unique. Planning has fundamental structures but content varies tremendously.
- All antiplanning biases are based in truth. The process does change interpersonal and power relationships. It does reveal uncertainties and highlight conflicts. It exerts pressure to be responsible and accountable for your agreements.

Ms. Flynn-Heapes is principal of Flynn-Heapes Consulting, a strategic planning and marketing consulting firm in Washington, D.C., specializing in A/E work.

Step 1: Recognize turmoil. Frequently, internal and external factors will converge. For example, the firm may begin to change from a rapidly growing "child" to an "adult," which of course translates as the "teenage" years. The core staff members who have been part of the firm since the early days begin to worry about their futures in the company. The technical staff pick up on the concerns of their managers and begin to feel upset, losing productivity.

Society's needs for various building types are constantly changing, and the firm's major markets may have lost ground. Perhaps competitors are becoming tougher. Clients may question the firm's performance.

Step 2: Introduce the idea. When the idea of a plan is first broached, most owners/entrepreneurs feel that it probably would be a good idea but really is not needed. The owner's intuition and experience has guided the firm well so far. Typical antiplanning biases that tend to emerge include:

"We can't foresee the future, so why bother to plan?"

"There's not enough time. We've got a million fires to put out!"

"If we do a plan, we'll have to keep explaining to staff."

Because strategic planning calls for participation by others in the firm, owners and managers who have never delegated authority may see it as a threat. Sometimes it's best to introduce the idea gradually.

Step 3: Prepare for the plan. First, the owners must select a strategic planning group. This could include the associates, vice presidents, board of directors, and any others the owners consider important to the firm. Each individual selected to participate must show commitment to the process. This means spending personal time, not just office time.

A formal dinner is a nice way to kick off the process and make everyone feel that this is a privileged group with a special mission. The owners can give a brief talk

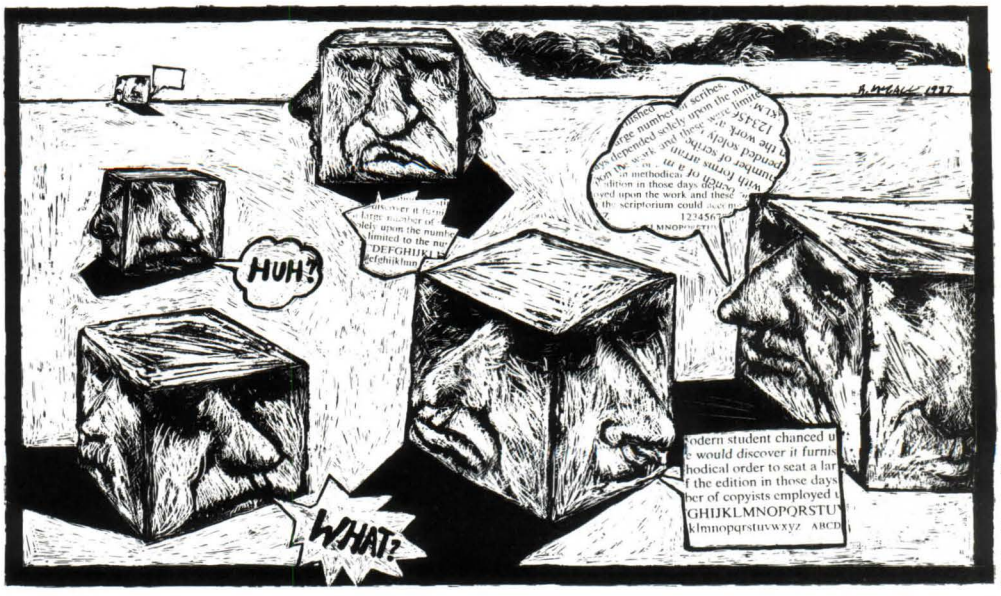


Illustration by Brian McCall

about the planning process and thereby set the stage for the event to come.

Next, an objective intermediary must be selected as a liaison between the owners and the planning group. The liaison systematically gathers internal and external information, enumerates the major issues, and develops an agenda.

It's best to collect specific ideas from each individual prior to a group process. When the list is assembled, it becomes a basis from which to build.

Also during this phase, the owners should select a facilitator for a retreat. The facilitator's role is to keep the group on target and present an unbiased, third-party view. Both the facilitator and the liaison should be experienced with the A/E industry.

Step 4: Schedule the retreat. A weekend retreat provides for a concentrated effort to interact intensively and creatively about the issues and goals of the firm.

The agenda that has been developed should be used as a basis for discussion. A great way to start is for the owners to highlight the firm's history and their vision of it. Then turn to the "big picture" issues, such as design practice versus business orientation, specialization versus diversification, reinvestment versus distribution of profits, and partnership.

The retreat should be completely open. Disagreements should be aired in full view of everyone. The facilitator acts as referee, supports the sharing of ideas, draws out opinions, and challenges assumptions.

Step 5: Establish the planning process. A strategic plan can take as little as two to three weeks or as long as a year to complete, depending on the level of concentrated effort. After the retreat, it's best to set up a routine meeting schedule to establish the meat of the strategic plan. Continue using your liaison and facilitator since problems may arise as you push from dreams to reality.

The structure of strategic planning is basic and consistent—at all costs avoid getting too elaborate. No organization can handle more than 10 goals, and five are much more workable. The following elements must be present in your plan, and an example is given to illustrate each.

- Mission statement—The firm's mission is to excel nationally in architectural and interior design.
- Corporate goals—Specialize our practice in three major markets.
- Measurable objectives—Become one of the top ten hotel designers in the country.
- Strategies/approaches—Appeal to the need for luxury at low cost.
- Tactics/programs—Circulate a targeted newsletter on hotel design issues.
- Resources—$7,000 annually for the newsletter.

Illustration by Brian McCall

There are plenty of problems that may arise. The approach/avoid syndrome is often at work in strategic planning, evidenced when an issue is raised and discussed almost to the point of decision. Then, to everyone's relief, someone conveniently changes the subject. Some problems may be very difficult to resolve, and a group situation can aggravate as well as illuminate a problem. This is where a good facilitator can make a difference.

Another major problem is ego. Many times there is no "group" at all; there are only individuals. The lesson is that everyone must have his or her say—even if just to agree. But it is critical that everyone listen closely to each point, rather than lobby for a favorite cause.

Step 6: Leap the budget hurdle. The hardest thing about planning is budgeting. It forces you to go from blue sky to accountability.

This is the point where the group should learn about the firm's finances and how each part of the puzzle fits together. Frequently, owners will favor reinvestment while nonowners will favor disbursement. Because none of us has unlimited funds, we simply must establish priorities. Yet, when you say, "This item is number one and this item is number 10," there are definite political ramifications. It's usually best for the owners to decide, having heard all discussion.

Each member of the planning committee should take his or her programs and project costs in terms of both labor and expense.

It will require several iterations between costs and priorities to reach the final budget. Remember that it takes about three years to work out a reliable budget.

Step 7: Present the plan to staff. When the plan is finally in place, present your findings to the staff. This should not be the first time the staff is involved. In fact, their input must continually be included in the decision making, both for their ideas and for their ownership of the plan.

The staff may express skepticism after the plan is presented if problems have remained unsolved for too long. The answer is to stop talking and take action immediately. Refer individuals to members of the planning group who now have expanded responsibility in their respective areas to implement their portions of the plan.

Step 8: Monitor the plan monthly. To measure your progress, establish a schedule of monthly meetings where all owners and members report on their areas of responsibility. It is critical to the success of the planning process that it be ongoing and integrated into everyday firm management. A common failing is to let follow-up slide once the highs of creating the plan return to business as usual. Keeping the process on track requires a "champion" who really cares about planning. The tendency of groups is to let someone else take the lead, especially when there's pressure from a project deadline.

Little of lasting value comes easily. Strategic planning is a long process—especially the first time you try it—and patience is needed to communicate ideas and educate staff. Yet strategic planning, as an integral part of firm management, will provide you with the framework so crucial to turning change to your advantage and problems into successes. □

Flashing for Built-up Roofs

The purpose of roof flashing is to make a waterproof transition from one surface to another. Often, one surface is vertical while the other is horizontal, the two are made of completely different materials, and they are expanding and contracting at different rates. Making a transition requires materials that are impermeable to water, flexible enough to accommodate thermal variation and structural movement, compatible with the roofing membrane and the adjoining surfaces, stable enough not to sag or slip, and durable enough to resist corrosion, rot, and weathering. Normally, no single material can fulfill all those requirements. Therefore, most flashing for built-up roofs is made up of two components: base flashing, essentially a continuation of the built-up roof membrane, and counterflashing, usually sheet metal attached to the adjoining surface, extending down and over the exposed joints of the base flashing.

A continuation of the roofing membrane, base flashing is usually made of the same two materials, bitumen and felt, laminated together. Bitumen acts as a waterproofing agent, and the felt as the reinforcing agent, giving the membrane its strength while inhibiting the bitumen's tendency to flow in hot weather. Built-up roof bitumen is either petroleum asphalt or coal tar pitch. Composition base flashing is made of bituminous-impregnated felt and woven fabric, or sometimes glass fiber scrim. By combining the two roofing materials, base flashing exploits the qualities of both.

For the flashing itself, the primer, bituminous flashing fabric, and mastic must be compatible with each other and with the roofing membrane. Applying a flood coat of asphalt over a coal tar pitch-impregnated membrane can result in an unpredictable mess that may soften and flow off, exposing the weather-vulnerable coal tar pitch.

Climate and exposure constitute the most important factors in choosing between asphalt and coal tar pitch. In areas with prolonged cold winters and shorter, milder summers, or in areas subject to daily extreme temperature variations, coal tar pitch generally will perform better. Conversely, in climates characterized by long, hot summers and less intense winters, an asphalt-impregnated membrane may be the better choice. Asphalt is also recommended for roofs subject to frequent ponding.

Consult the roofing manufacturer for approval of flashing details. If the design incorporates a nonstandard detail, check with the manufacturer about warranties and guarantees. You would also do well to avoid using metal base flashing, because it lacks the required flexibility, is difficult to connect to the roofing membrane, and has a thermal coefficient incompatible with that of the membrane.

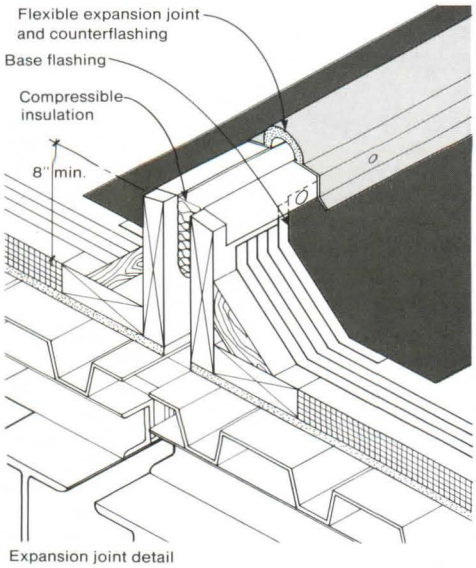
Corrosion-resistant metal counterflashing provides superior protection for base flashing. Metals suitable for counterflashing include aluminum, galvanized steel, stainless steel, lead, and copper.

Where segments of counterflashing overlap, detail the horizontal joints for differential movement. Each metal has a distinct rate of thermal expansion. A 100-foot length of galvanized steel exposed to a summer temperature of 110 degrees Fahrenheit will expand 5/64 inch. Rolled zinc the same length exposed to the same temperature expands 13/64 inch. These amounts of expansion can cause buckling and can actually tear out fastenings.

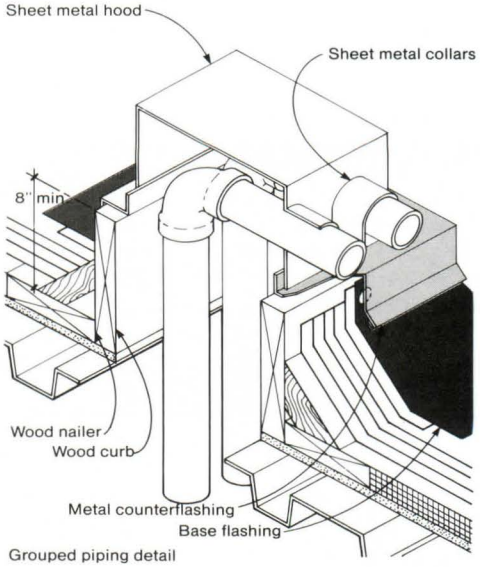
Counterflashing should be installed immediately after the base flashing. If this isn't possible, the top edge of the base flashing will require a temporary counterflashing to protect it.

Working as a system

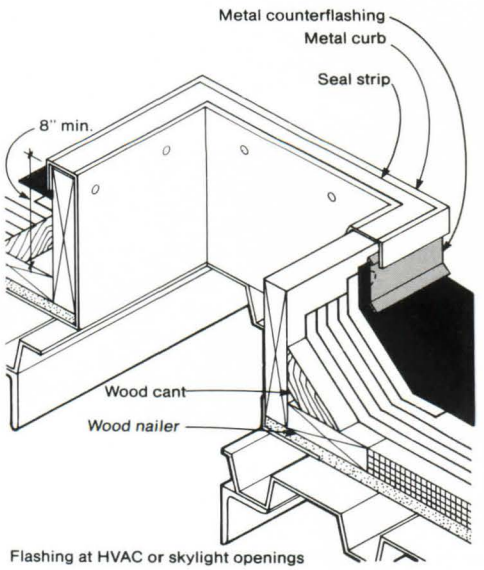
The base flashing/counterflashing combination is perhaps the best flashing system for built-up roofs because it allows both elements to work together. Metal counterflashing, while providing a corrosion-resistant seal over the base flashing, moves when the surface it is attached to moves. The base flashing expands and contracts with the roofing membrane. To achieve a good built-up roof flashing system, consider the following guidelines:



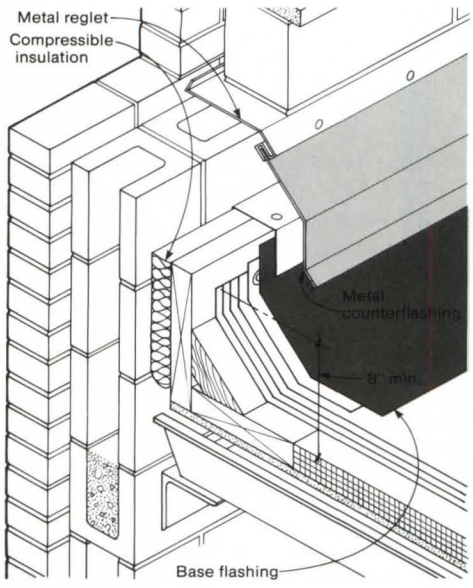
Expansion joint detail



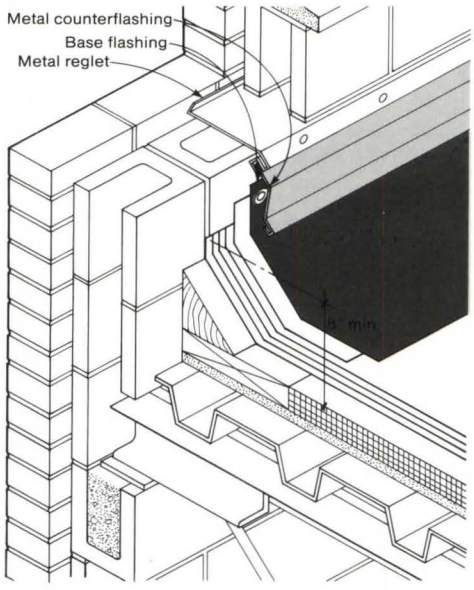
Grouped piping detail



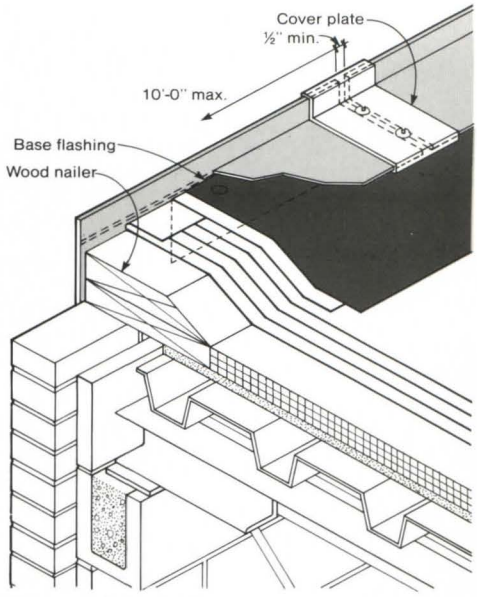
Flashing at HVAC or skylight openings



Flashing deck not tied to wall



Flashing when deck is tied to wall



Heavy metal edge detail

• Design for differential movement of the system. Don't anchor the base flashing to the counterflashing, walls, or any other portion of the building independent of the roof assembly.
• Design the flashed surface to avoid sharp bends in the flashing—45 degrees is the maximum. This rule is especially important for bituminous flashing felts that tend to be particularly stiff.
• Detail wood cant strips rather than the more rot-prone fiber cant strips. Because even wood cants can rot, it is safer to specify preservative-treated cants. Most water-based salt-type preservatives are compatible with bituminous-saturated flashing materials. Wood cants, unlike fiber cants, will also provide some degree of bracing for curbs or nailers.
• Design the roof to provide positive drainage away from any flashed joints. Locating the flashed joints above the anticipated water level will reduce the possibility of future leaks. This requires coordination of the roof design with the expected flashing locations such as mechanical stands, vent stacks, wall intersections, and skylights.
• Work with the mechanical engineer to limit the number of penetrations through the roof. If the piping can be grouped and the number of roof-mounted units kept to a minimum, the quantity of required flashing and areas of potential leaks will be limited. Locate all roof penetrations at least two feet from all vertical surfaces such as walls and parapets to allow enough room for proper flashing around the penetrations and the vertical surface.
• Avoid roof-mounted HVAC units if possible to reduce the number of flashed joints and the amount of future foot traffic.
• Avoid the use of pitch pockets, which are often a source of leaks.
• Fasten flashing to prevent roofing failures due to wind uplift. Nail spacing should not exceed eight inches, or three inches for lighter gauge metal flashing. The nail should penetrate the wood a minimum of 1½ inches, be corrosion resistant, and should have a twisted or treated shank.

Specific flashing conditions

All roof penetrations require a curb. Even skylights, scuttles, and HVAC units with integral metal curbs should not be used without some sort of modification. Because the metal curb isn't compatible with the built-up roof flashing, the manufacturer or contractor should provide a continuous wood nailer fastened to the metal curb and extending vertically a minimum of eight inches above the finished roof surface. The architect should also detail continuous metal counterflashing and a wood cant around the opening.

Large roof penetrations in flexible decks are subject to wind racking and other lateral forces that can damage flashing and cause leaks. Provide structural framing or stiffening where large roof penetrations are expected.

Vertical flashing, such as masonry wall and parapet flashing, is detailed depending on the need to accommodate differential movement if the roof deck and wall are not structurally connected. Flashing details designed for differential movement employ a continuous curb at the edge of the deck to which the base flashing is attached, allowing the flashing to move with the deck and still keep the joint above anticipated water levels. The gap created between the curb and the wall should be filled with a compressible insulation and a flexible vapor retarder to prevent condensation.

For any vertical surface—parapets, roof-to-wall intersections, or curbs around penetrations—the base flashing should extend vertically from the horizontal plane of the roof at least eight inches, but no more than 12 inches. Two-piece, through-wall counterflashing contains a "receiver" portion to prevent water from seeping through to the core of the wall and back behind the base flashing. The receiver also makes it possible to remove the counterflashing easily for repairs.

Expansion joints

Expansion joints must accommodate horizontal expansion, contraction, and shear, as well as vertical shear perpendicular to the roof plane. Designing flashing for expansion joints that will keep water out and allow for movement requires the designer to follow two simple rules of thumb. First, don't use uncurbed, unelevated expansion joints. Instead, design the expansion joint with a wood curb and cant. Second, insulate the expansion joint with a compressible insulation material to prevent condensation forming on the underside of the joint.

—Timothy B. McDonald

Interiors

Following the maxim that shopping should be fun, Design Austin Inc. used colors, forms, and light to create such an atmosphere for Clever Kids, an 1,800-square-foot children's specialty shop in Austin, Tex.

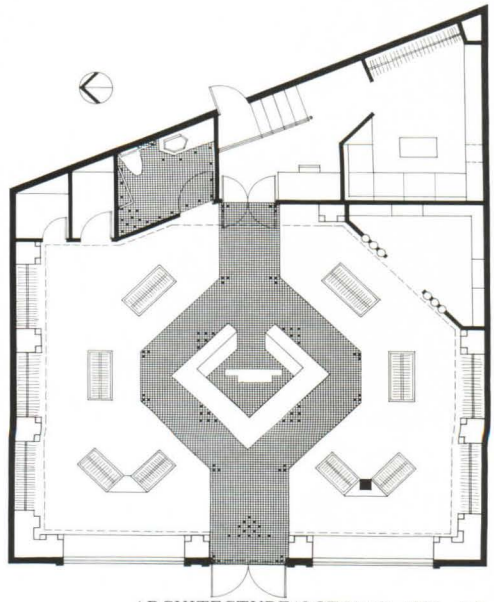
In response to the client's specific request to avoid "primary colors and the metal display racks traditionally associated with children's retail spaces," project designer Maria Vallbona chose a palette of vibrant red, deep purple, and cool turquoise blue against a background of soft grays and whites. Although the budget was modest, the owner wanted "an exciting space to compel passersby to enter with curiosity." Custom-designed storage units, display cases, and the central counter and gift-wrapping station have laminate finishes in these three colors, while accents in the tile floor, molding and trim, modular mannequins, and central canopy repeat the color theme. The project recently won a local design award for commercial interiors under $100,000.

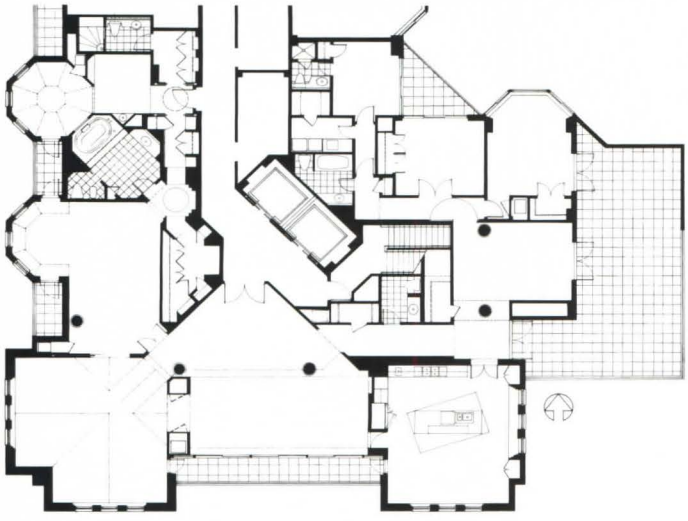
A partition of stacked red vinyl balls defines a triangular play area in one corner, designed to display educational toys and puzzles in a way that encourages children to explore and experiment with the merchandise.

The ceiling grid, says Vallbona, is rows of "kite string stretched tight and tied individually, so if one section breaks it's easy to replace." The square grid contrasts with the purple ceiling, which is set deep to shield track lighting fixtures.

Additional illumination for the shop includes black-light fixtures along the top of the center canopy and red metal bulkhead lamps to accent the display cases.

—Lynn Nesmith





The Abramson penthouse by David M. Schwarz Architectural Services respects the client's collection of contemporary art and crafted objects while creating its own unique identity. The apartment's volumes and detailing are strong enough to hold their own, but subtle enough not to overwhelm the art.

The program was unusual. The Abramsons, who live in a suburb of Washington, D.C., wanted the apartment to serve as their city retreat, a place to entertain and showcase the art. Schwarz, however, says he approached the project as a residence, not a gallery.

The 4,000-square-foot space located on the ninth floor of the Schwarz-designed Griffin condominium (see Nov. '86, page 58) was purchased before the building was completed, which allowed modifications that would have been impossible later. The foyer is shaped as a triangle whose widest side edges a barrel-vaulted space. A mounted work by Dan Dailey (above left) is especially appropriate for the end wall, although none of the apartment's spaces was designed to accommodate a particular work of art.

This long room with skylights along the top of the vault separates the living room from the similarly proportioned kitchen; all three overlook the Potomac River at Georgetown. The living room has cove lighting that emphasizes the gables (right). The kitchen (above right) incorporates similar ceiling detailing over twin oculuses. A diagonal inlay of black vinyl floor tiles provides a durable floor surface while creating a pleasant asymmetry.

The most successful melding of art with architecture is the delicate inlaid floor pattern in the public spaces, designed and executed by artist Jay Stanger.

Anne Abramson says she wanted "a space where nothing gets between the art and the architecture... the best of what is done today." In that sense the apartment is successful. It's an exhilarating space but cool and impersonal—a project you could imagine seeing 20 years from now miraculously transported to the Museum of Modern Art, labeled "apartment for young urban professionals, circa 1987."—Lynn Nesmith

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BOOKS

A Guide to the Use Of Natural Light

Daylighting Design and Analysis. Claude L. Robbins. (Van Nostrand Reinhold, $79.95.)

This book is the most comprehensive and technically complete treatment of the subject of daylight illumination since the 1966 classic, *Daylighting,* by R.G. Hopkinson. In many important areas, Claude Robbins's book updates pioneering work of Hopkinson, particularly in the treatment of the clear sky conditions characteristic of North American climates and in the estimation of annual energy and cost savings due to daylighting. The purpose of *Daylighting Design and Analysis* is to explain the science and technology of daylighting in a manner that is useful to architects, engineers, interior designers, and lighting designers. Familiarity with this science will foster a better understanding of how the design of the daylighting concept and the engineering of the daylighting system fit into the building design process.

Robbins is certainly well qualified to author such a definitive book on daylighting. A Colorado-based architect, he is president of the Environmental Research Groups Inc., where he has been responsible for more than 300 building projects. He has been a professor of architecture at Florida A&M University and the manager of the building research and solar energy research sections at the Solar Energy Research Institute, where he directed one of the most active and productive daylighting research programs in the country. This combination of experience in the fields of architecture, engineering, and research is unique and is responsible for the breadth, depth, and architectural focus that Robbins brings to this important book.

Robbins has organized the book to follow the same sequence as the actual building design process. It is divided into five parts: "Light and Daylight," including an overview of daylighting and lighting principles; "Daylighting Concepts," describing the performance characteristics of most basic and some advanced daylight concepts, as well as site analysis and urban planning techniques; "Daylighting Analysis," detailing some key methods of analyzing both quantitative and qualitative performance characteristics of daylighting concepts; "Lighting Integration," covering electric lighting in the context of daylighting; and extensive appendixes, which comprise a wide range of information, data, and design tools discussed in previous parts of the book.

The principal strengths of *Daylighting Design and Analysis* are its use of design rules of thumb; the graphic comparisons of the relative daylight illumination performance of alternative design strategies (based on measured model studies); and the chapters on glare analysis and control, physical modeling, and the effects of various control strategies (switching, dimming) on annual energy and cost savings. This last chapter is the result of Robbins's extensive research at SERI on the economics of daylighting. It includes the methods for calculating the savings in peak demand charges in commercial buildings—usually the strongest economic justification for daylighting.

Weaknesses, which are minor in comparison with the book's strengths, include the absence of historical background on daylighting in architecture; the scarcity of actual building case studies; the occasionally cryptic nature of illustration notations; and the inadequate coverage of electric lighting control hardware. In terms of sheer volume, there is an imbalance between text (325 pages) and appendixes (552 pages). However, the voluminous content of the appendixes is justified by their relative unavailability from other sources.

The very comprehensiveness and technical depth of the book may prove troublesome for some design-oriented architects seeking a simple introduction to the basic concepts of daylighting and rules of thumb for application during the schematic design phase. These elements are present but tend to be sandwiched among the tables and equations. A more hierarchical structure to the chapters would have given a needed emphasis and isolation to these important concepts, making them more accessible to less technically oriented readers, while retaining the technical depth that is the book's greatest strength. The book is a must for technically oriented architects, consultants, researchers, and educators in the field of daylighting.—FULLER MOORE, AIA

Mr. Moore teaches architecture at Miami University in Oxford, Ohio.

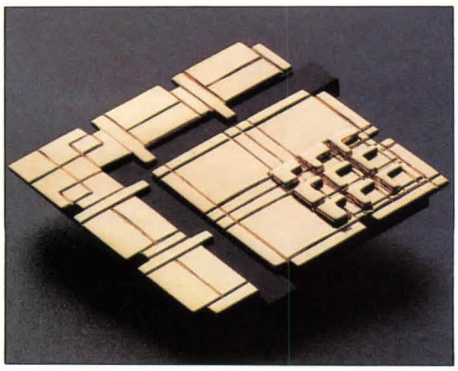
Concepts and Practice of Architectural Daylighting. Fuller Moore. (Van Nostrand Reinhold, $39.95.)

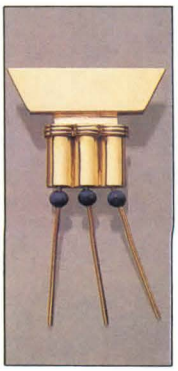
Until this century daylighting has been an intrinsic aspect of all architecture. With the invention of electric lighting, it's necessity waned, and many architects also lost sight of its experiential value. Recently, a rediscovery of historic design principles, in combination with a rising energy consciousness, has led to a renewed interest in daylighting.

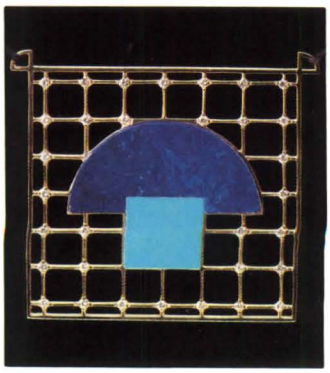
For most architects practicing today, the subject of daylighting was never for-

continued on page 114

Jewelry by Architects. Barbara Radice. (Rizzoli, $35.) How much architecture can you pack into a lapel pin? More than you'd expect, as this book demonstrates in its presentation of jewelry by an international array of architects and designers, among them Graves, Meier, Tigerman, Sottsass, and Venturi. Many of the pieces, as the author observes, have been designed by the architects ". . . as an extension of their work with architecture." Trademark themes are obvious in many pieces, most of which are rendered in color photographs and sketches and accompanied by a brief commentary by each designer. Shown below from left to right, a brooch in gold and black onyx by Peter Eisenman, an earring in gold onyx by Hans Hollein, and a pendant in gold, turquoise, and diamonds by Arata Isozaki. —MICHAEL J. CROSBIE







Books *from page 113*
mally presented during their professional education. They are woefully lacking in understanding of both its principles and analytic techniques. Fuller Moore has produced a book to fill this educational gap by providing "a collection of concepts and design tools intended to justify (through performance and economic analyses) an otherwise only intuitively attractive design direction."

The book is thorough and complete in its coverage of all aspects of daylighting. Divided into four parts where consideration is given to light, buildings, fenestration, and analysis, the work is organized in such a way that each chapter is treated as a topic unto itself. The prose is clear, and the illustrations, mostly diagrams, are both abundant and effective. The seven appendixes are mostly large-scale charts that can be easily copied and used as transparencies.

In organization, the book could have had fewer chapters (several are only four pages long) and more design illustrations. The chapters are somewhat uneven in their treatment of various topics. For example, chapter five, "A Conceptual Model for Design," is presented with clarity and thoroughness drawing upon well-illustrated examples from Aalto's libraries. On the other hand, chapters six and seven, on siting and form, present only a theoretical introduction to these subjects without the same level of example. Other excellent chapters are one and ten, entitled "Historical Response" and "Design Strategies." Also, the sections in part four on analysis are clearly and thoroughly presented.

The underlying theme of this book is analysis of many kinds: graphic, geometric, visual, economic, physical, and numeric. By using the many analytic tools and techniques presented, the architect can become disciplined and rigorous in the development of daylighting design. In this regard, this book is the most advanced statement on the subject of daylighting to date. The book is a meaningful complement to *Daylighting in Architecture* by Benjamin H. Evans (McGraw-Hill, 1981), which serves more as a basis for understanding daylighting and its role in architectural design. As architects begin to use the analytical techniques presented, we can expect more sophisticated and more effective daylighted buildings. It is hoped that in this evolution the poetics of daylighting also will not be overlooked.

—Michael J. Bednar, AIA

Professor Bednar, author of the recent book entitled The New Atrium, *is associate professor of architecture at the University of Virginia.*

Natural Energy and Vernacular Architecture. Hassan Fathy. (The United Nations University by the University of Chicago Press, $25.)

From Hassan Fathy, Hon. FAIA, the world-renowned Egyptian architect, has come a modernized book of lasting international importance. *Natural Energy and Vernacular Architecture* is seminal in an even more profound way than his classic *Architecture for the Poor,* for this text delivers tools in addition to concepts. Such a classic comes from both cultural maturity and the intimate experience of building physics.

Bey Hassan Fathy, born in 1900 and raised among the urban elite of Cairo and Alexandria, writes from his own rich professional experience. He advocates those vernacular building traditions evolved through millennia. By recommending the mud, fiber, and stone of preindustrial construction, he promotes those materials that continue to shelter most of the world's population. By demonstrating that the use of these materials in hot, dry climates evolved intuitively from scientifically verifiable principles, he has created an informed illustration that "there can be no art without science," regardless of style.

Fathy is a conceptual thinker with his goals grounded in technical as well as cultural intelligence. In a profound and

simple preface Fathy states that he wants to "bridge the gulf that separates folk architecture from architect's architecture." He suggests that the modern architect is often "like a football player playing football with a cannon. If the purpose of the game is scoring goals, then assuredly he can score a goal with every shot. But the game itself will disappear. . . ." Thus process is critical to the quality of the experience. He does not advocate a continuing of medieval inconvenience. Neither does he promote the "unquestioned international industrial solutions that produce cultural, psychological, moral and material havoc," to say nothing of discomfort. He establishes some standards of reference to engage the concept of contemporaneity; the future is on his mind.

In 72 pages of carefully crafted narrative, Fathy first describes with formulas "architectural thermodynamics and human comfort in hot climates," and then examines both the physical and human response to the architectural elements of vernacular architecture. Hot, dry climates and Islamic traditions are the subjects of reference, but Fathy also understands cold climates and other cultures. Eighty-six crisp photographs and elegant scaled drawings in a separate section illustrate "principles and examples." A glossary provides precise descriptions of such distinctive Arabic terms as "claustrum" and "Iwan."

If Fathy's faith is in preindustrial knowledge, his intelligence is up to date. The select bibliography is definitive and identifies the most accessible primary and secondary sources. His clear examination of building physics is often illustrated by an architectural example. One area that seems slighted, however, is the coverage of solar orientation. Sun angles are given only for Cairo, and the discussion of East and West orientation, while accurate, is too short and without illustrations. But this is a subject well covered in other sources. Similarly, the examination of the structural fabric of construction, the material composition of walls and roofs, is covered in a most elementary fashion. The full range of inventive assemblies even using native materials is not explored. Yet each of these subjects could fill a full text unto itself.

Some may be disappointed by the incomplete discussions of such concepts of comfort and human response as mean radiant temperature. Especially, the principle of radiation as a source of cooling, particularly to the night sky, is missing. Spatial redundancy and daily or seasonal migration within the building are not identified as parts of the building program because they are also parts of the cultural pattern in northeastern Africa. Similarly, the influence of clothing, furniture, food, and life style are scarcely mentioned.

Yet the conceptual framework of the book is almost seamless. Indeed, although it is oriented to the overheated and underdeveloped arid regions, its moral imperative is equally applicable to any location. The foreward by the senior program officer of the United Nations University summarizes that concept: "that architectural form should be determined by spiritual, artistic, climatic, and social considerations as well as function, material, and structure."

Fathy believes that "a systematic application of science and comprehensive comparison of modern and traditional structures" is necessary if the architect is to fulfill his professional obligation as well as his cultural role. "If modern science is to revitalize architecture in this way, the principle that produced the traditional solutions must be respected. This is the only way modern architecture can surpass, in human and ecological quality, the achievements of vernacular architecture in the hot, arid regions of the world." Fathy is both learned and wise in this published search for that harmonic balance of knowing and feeling.—Jeffrey Cook, AIA

Mr. Cook, professor of architecture at Arizona State University, directs its graduate program in bioclimatic design. He is founding editor of the Passive Solar Journal.

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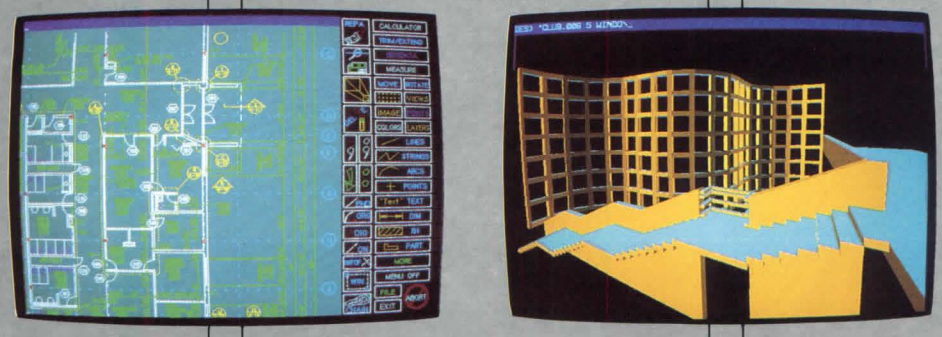

Get more business done. *On-screen menus (left screen) facilitate the production of contract documents. Drawing courtesy of Heard & Associates, Chicago, Illinois.*

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Some Basic Tools of The Architectural Trade

In a series of telephone interviews, architects in firms of all sizes throughout the country indicated that they consider word processors and CADD systems to be their most indispensable office equipment acquisitions this year.

Even the smallest architectural offices have acclimated themselves to the high-technology environment of the computer, with many firms relying on the machines for billing, accounting, specifications writing, and record keeping purposes. Offices without CADD stations are keeping an eye on their declining cost, and many firm owners are admitting they are waiting only for the right system to become available for the lowest cost before purchasing.

But high-tech office automation is not limited to CADD. Other office staples the architects mentioned were copiers and blueprint and lettering machines. While blueprint machines are considered invaluable for everyday office work, most prints for presentations are not done in-house, indicating a need for higher-quality machines that turn out a more professional-appearing product. Copiers of all kinds were deemed important for the sheer frequency of their use. True workhorses of the office, they are heavily relied upon for documenting work coming in and going out of the office and for general record keeping purposes.

And, of course, no functioning architectural office is complete without proper drafting boards, drafting supplies, and sizable filing equipment. Considering the amount of office space that files consume, it's surprising more firms don't adopt automated data bases. While medium- and large-sized firms are beginning to lean in this direction, most said they still keep their files in flats or roll files, numbered numerically according to project.

The following is a sampling of the office equipment and products offered for architects' office needs. It does not include computer hardware or software, which are covered in a continuing series of feature articles.

Products *is written by Amy Gray Light.*

File Systems

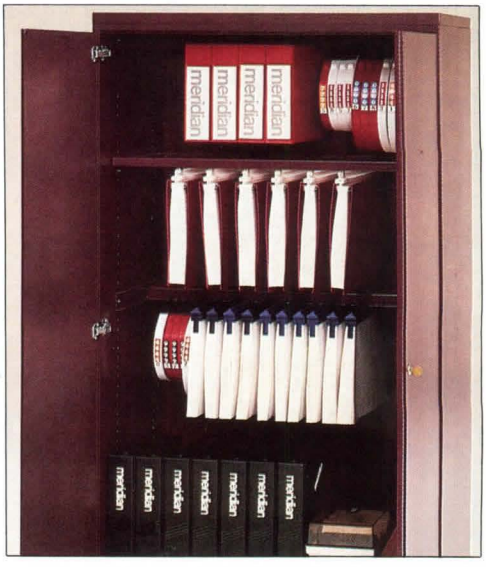
Modular, stackable lateral metal file cabinets from Meridian accommodate electronic and conventional filing in a single system. Stackable Storage modules are available in five standard heights that can be stacked vertically. Each module features reversible drawer access and adapts to store either suspended printout folders, magnetic tape reels, and binders of all sizes, or half-height tubs for floppy disks or disk packs. Each module is constructed of heavy-gauge steel in its own rigid ladder-type "U" frame, interlocked module to module. Drawers glide out on full-extension slides with steel ball bearings. A single key lock located in any module will secure all stacked modules regardless of height.

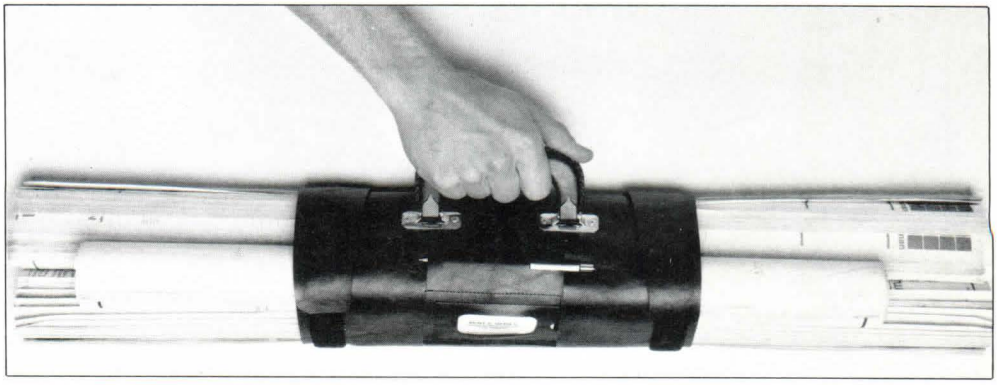
A Media Storage Cabinet (right) is designed to coordinate with the stackable storage system. Adjustable interior options include removable/adjustable shelves for all types of software and computer peripherals; coat rod and shelf combinations; and hanging bars to accommodate paper and computer reels.

Allsteel's Computer Media lateral files store magnetic tapes, data cassettes, and floppy disks. Wire racks in several sizes provide storage options for standard and thin-line canisters and plastic reels. The racks can be case or drawer mounted. Full-extend drawers accommodate side-to-side filing of printouts, increasing storage capacity. Computer media boxes with vacuum inserts enable files to hold data cassettes and floppy disks and manage card filing needs. The files are available in widths of 30, 36, and 42 inches and a variety of drawer heights. The company's recently introduced Spectra-One lateral files can be specified to color-coordinate with furnishings, and feature an integral drawer-front design.

Corrugated roll files from Safco come

continued on page 118





Drawings Carrier The Plan Handler allows large-scale rolled-up plans and blueprints to be carried easily and keeps them from unrolling inadvertently.

Constructed of a heavy, cloth-backed Naugahyde, the carrier incorporates a pen- and-pencil holder and an easy-access "window" that can hold up to a dozen business cards. A briefcase handle glued and riveted to the main frame assembly offers extra security, and a Velcro snap-strap system holds the rolled materials in place. When not in use the Plan Handler rolls up to fit in a small desk drawer or traditional briefcase.

Intelect, Circle 262 on information card

Products *from page 117*
in sizes of 25, 37, and 43 inches to store drawings, charts, maps, and other rolled materials. Index grids help provide easy identification. The files are constructed of corrugated fiberboard two layers thick and reinforced by a steel frame, and the contents are stored in square tubes with black plastic molding. The exterior doors are wood grain. Three cabinet sizes are available and an optional metal base fits all sizes.

The VIP/3000 vertical pocket file from Plan Hold features a gas-assisted lift to the cabinet lid, making operation smooth and easy and allowing the cabinet to sit flush against a wall. The filing system is designed to hold up to 3,000 large documents. Sheets are housed vertically in heavy-duty indexed folders held together by spring pressure, keeping documents smooth and flat.

The VIP/3000 rolls on casters and is available in three sizes: 24x36, 30x42, and 38x48 inches. A disc tumbler lock and key protects file contents. Fire resistance is provided by a double steel wall cabinet and spring pressure that reduces airspace and provides a buffer zone against flames. A water apron around the top of the cabinet and a flush-fitting lid help prevent water damage.

Meridian Inc.
Circle 245 on information card
Allsteel Inc.
Circle 246 on information card
Safco
Circle 247 on information card
Plan Hold Corporation
Circle 248 on information card

Copiers, Printers, and Printing Supplies
The 32.NV portable tabletop engineering copier from Ozalid is small enough to go virtually anywhere in the workplace. The low-volume diazo copier incorporates fully synchronized printing and is designed to produce the same quality reproductions as larger, high-performance copiers.

Weighing 25 pounds, the 32.NV can reproduce drawings up to 30 inches wide by any reasonable length. The copier has a variable copying speed of up to 12 feet per minute and has low enough speeds for making sepias and film intermediates.

If the user has to retrieve improperly inserted originals, the copier can be instantly reversed at the same running speed to protect the prints. With the optional vapor removal system, venting is not necessary.

The SL-42/20 whiteprinter from Teledyne Rotolite features a 46-inch throat that accommodates drawings of any length up to 42 inches wide.The high-output printing system makes quick exposures of all diazo materials. A developer system, combined with the printer system, produces bluelines, blacklines, sepias, and diazo films in one pass. The self-cleaning printer has standby switching for instant operation.

An ultrawhite presentation stock that accepts a dark brown image using the diazo process is available through Repro Speciality Coatings in either an art-grain texture (BNT22RX) or a smooth matte finish (BNC22RX) heavyweight 56-pound card stock. The product is available in both sheets and rolls.

Model S-139-MX4 polyester film for xerographic engineering copiers from Dietzgen is designed specifically to resist the distortion possible in the hot fuser sections of xerographic copiers, while reputedly retaining its inherent high strength, resistance to aging, and erasability. Also in the line are fixed-image and image-erasable vellums in two weights each, plus "hard-copy" opaque paper and translucent bond. Copiers covered by the line include all Xerox Corp. models; the Screen-36, DP-36, and 920 copiers from Shacoh USA/PPC Inc.; Ozalid Corp.'s 6030 machine; the SZ-920 by Ideal Copier Division Inc.; and the Oce-Industries Inc. models 7200 and 7500.

Ozalid Corporation
Circle 241 on information card
Teledyne Rotolite
Circle 242 on information card
Repro Speciality Coatings Inc.
Circle 243 on information card
Dietzgen Corporation
Circle 244 on information card

Drafting Equipment
An edge-to-edge illuminating drafting board lamp from Waldmann Lighting, called Model ZLS, is designed to eliminate glare and stray light, reduce reflection from the work surface, and prevent light from

continued on page 121

Products *from page 118*

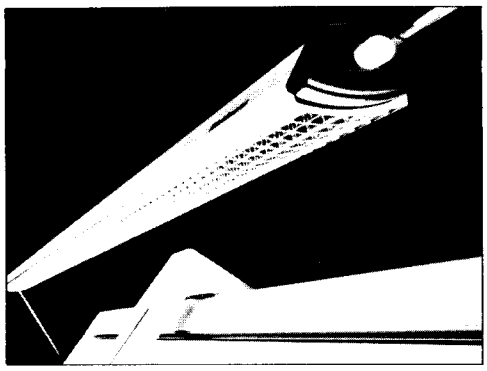
"spilling" off the board (shown at right).

The parabolic louver is molded of impact-resistant plastic in a gridded pattern. The lamp attaches to the back of the drafting board, allowing unrestricted carriage movement. A counterbalancing system holds the unit steady in any position.

The ZLS is available as an option for new lamps, as a replacement for standard prismatic diffusers, or as an upgrade for lamps already in use. Model ZLS-130 has a 30-watt fluorescent tube for 42- to 48-inch drafting boards, and the Model ZLS-140 uses a 40-watt tube for 55- to 72-inch boards.

The VRXR drafting table from Hamilton Industries is designed to handle heavy loads at any height or angle, and the table's dual pedestal design provides unobstructed legroom and added stability. The Model VRXR table can be adjusted automatically to a vertical tilt of 11 inches, or manually tilted from zero to 90 degrees from a front pivot point. The drawing surface is a Stratasteel board with a replaceable vinyl surface. A heavy-duty VR-20 drafting table base is also available from the company, with a choice of a hand- or foot-controlled height adjustment. The adjustable base is designed to hold heavier loads resulting from the increased use of CADD tablets or digitizers. The VP-20 has a large motor and a strong lift mechanism.

The Stoway portable drafting table from



Mayline is lightweight and compact and offers the options of two different sizes, two drafting tops, and four base colors. The drafting top comes in a ¾-inch basswood with steel end cleats, or self-edged white melamine. A pencil trough is standard. Fully adjustable steel stabilizer bars provide overall dimensional stability. Knobs on four telescoping tubes adjust the tilt from horizontal to 45 degrees and the height from 29 to 45 inches. While the table is open, the front legs are held in place by guides underneath the drawing board. The side legs and top are hinged for folding. Sizes are 24x36 inches or 30x42 inches.

Waldmann Lighting
Circle 249 on information card
Hamilton Industries
Circle 250 on information card
Mayline
Circle 251 on information card

Drafting Supplies

Leroy Reservoir Pens from Keuffel & Esser feature a one-piece nickel-silver pen point that helps provide balance and control in manual drafting and is designed to be exceptionally durable and corrosion resistant. A revolving pen caddy that comes with the set holds up to 12 pens and three holders. The caddy has a humidifying sponge that enables the pens to be stored uncapped without drying out. Seven-pen sets are offered in stainless steel and jewel tip. An eight-pen set is also available.

The Ultrasonic Cleaner 613128 cleaning aid for technical pens and plotter points, also from Keuffel & Esser, has a removable basket that holds up to seven pens vertically, with no need to disassemble the pens or remove the ink. Additional space in the cleaner is provided for pen points, plotter points, and small items such as airbrush parts. Ultrasonic waves push cleaning fluid through precision-formed parts, cleaning technical pens within 30 seconds.

Clear plastic drawing tools with beveled edges from PMC Industries allow the designer to construct isometric projections. Oriented at 30 degrees, the tools are available with architect's scales graduated and scaled in sizes of 1/16, ¼, and 1 inch and in metric sizes. A built-in ellipse template with multiple ellipses is also oriented at 30 degrees and comes in sizes from ⅛ to 1½ inches. The tools can be used alone

continued on page 122

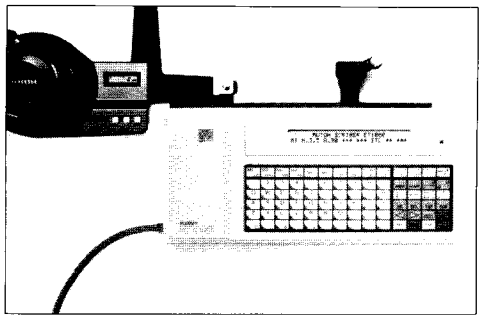
Products *from page 121*

or with a standard drawing arm. Each tool is supplied with a removable chuck for mounting to a drawing arm and an integral 360-degree protractor.

Compasses and dividers from Rotring are finished in high-gloss chrome-plated, velour nickel-plated, or matte nickel-plated finishes. The instruments have a quick-set compass with a top one-button release and micro adjustment wheel. A drop compass holds a technical pen in a vertical position to ensure accurate inked circles. Compasses provide graphite, technical pen, and universal holders. Among them are the pinch-bar/quick-set compass and compasses with an extension bar. The extension bar enables circles to be made as large as 21 inches in diameter, and drop compasses create circles as small as ½ inch in diameter.

Martin Instrument Co.'s Point Pod drawing lead pointer has a smoothly rotating motion that produces clean, finely sharpened points with accuracy and speed. Constructed of durable plastic, the Point Pod is disposable, so it doesn't require replacement parts or disassembly.

The ET-1000 lettering machine from Mutoh America (shown above) has an extra-large, 1.57x7.08-inch working area and a 210-function keyboard equipped with a two-line, 32-character display so that the user can enter and edit type before printing. The machine has an 1800-character memory that permits storage and



instant recall of frequently used items. The ET-1000 is capable of a variety of lettering techniques and also has optional cassettes that allow the user to add functions. The user can send illustrations to the manufacturer, who will digitize them and place them on a personal cassette.

Keuffel & Esser Company
Circle 252 on information card
Draftette division, PMC Industries
Circle 253 on information card
Koh-I-Noor, a Rotring Company
Circle 254 on information card
Martin Instrument Company
Circle 255 on information card
Mutoh America Inc.
Circle 256 on information card

Office Calculators

Business cards, logos, names, or photographs can be cut to a finish size of 2x3¼ inches, laminated with clear plastic, and bonded to the back of a wafer-thin, solar-powered, six-function (with memory) electronic calculator that weighs less than an ounce. From CP Products, each calculator comes in a vinyl leather case packaged in a gift carton.

The solar-powered EL-374 calculator from Sharp Electronics computes measurements directly in yards, feet, and inches. The unit calculates length, area, and volume, converts fractions to decimals, and offers all standard arithmetic functions plus square root, change sign, and percent. The calculator also features convenient length, area, and volume functions.

The Inch-Mate from Digitool is a pocket-sized foot/inch/fraction calculator that calculates measurements exactly as they would be written. The instrument can convert to decimal feet or meters.

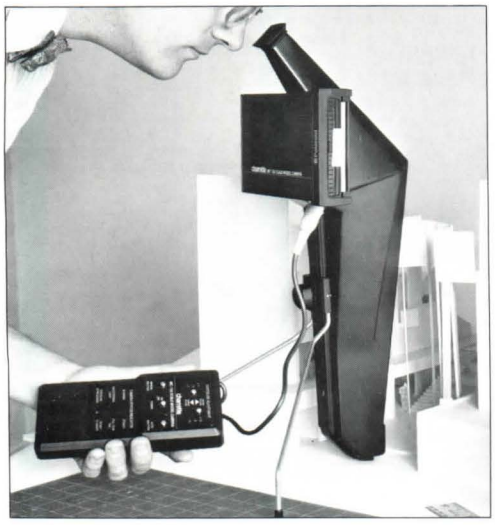
CP Products
Circle 257 on information card
Sharp Electronics Corporation
Circle 258 on information card
Digitool Corporation
Circle 259 on information card

Document Reproduction

For overlay compositions or reproducing CADD plots, a document reproduction system from Du Pont offers the quality of silver films at about the same cost as diazo. Drawings reproduced by Du Pont's "Silver Slicks" are designed to be optically clear, with no cloudiness or shadows; lines are crisp and black, screens are sharp, and backgrounds are clean. Layers can be put

continued on page 125

Products *from page 122*
together to produce composites. Drawings can be reproduced to any size, on clear or high translucent matte surfaces, and are formulated never to fade, yellow, or smear. Exposure time with "Silver Slicks" is reputedly six to 15 times faster than diazo.
Du Pont Company
Circle 261 on information card



Scale Model Camera
The Charrette instant scale model camera (shown at right) produces eye-level-view photographs of preliminary models that can become underlays for tracing basic shapes in perspective drawings once the photographs are enlarged with a photostat camera or an office copier. The six-element lens system produces distortion-free, in-perspective photographs of architectural, landscape, and other scale models, and also photographs interior scale models to simulate eye-level views.

The camera is designed with a virtually unlimited depth of field. The camera's objective lens is mounted in a narrow snorkel nose, allowing for easy positioning in the restricted space within models. An optical viewfinder at the top of the camera allows convenient framing of each shot. The picture is ready for use 30 seconds after the shutter snaps.

The camera produces 3¼x4¼-inch black-and-white prints on Polaroid 667, 691, and 665 film. When a stat camera or copier is unavailable, an opaque projector can throw the image onto a wall or drafting board to guide sketching.
Charrette Corporation
Circle 260 on information card

CREDITS

Geyserville Service Center for Pacific Gas & Electric Company, Geyserville, Calif. (page 44). *Architect: John K. Miller, FAIA, Roland Miller Associates, Santa Rosa, Calif.* Project architect: Robert R. Davis, AIA. Structural engineer: Larry Miyano, MKM & Associates. Mechanical engineer: Paul Larkin. Electrical engineer: Stephen Curtis, O'Mahony & Myer. Landscape architect: Renee Felciano. General contractor: Wright Contracting Inc.

Cape Cod Cottage, Cape Cod, Mass. (page 46). *Architects: J.P. Chadwick Floyd, AIA, and J. Whitney Huber, AIA, Centerbrook Architects, Essex, Conn.* General contractor: Geoffrey Willis.

Giraffe Habitat, Georgia/Florida border (page 48). *Architect: Anthony R. Moody, AIA, Staten Island, N.Y.* Structural, mechanical, and electrical engineer: Eugene Rose. Landscape architect: Herb Cobb. General contractor: Howard Gilman.

Ritter Playground, Huntington, W. Va. (page 50). *Architect: Bohlin Powell Larkin Cywinski, Wilkes-Barre, Pa.* Principal in charge: Peter Q. Bohlin, FAIA. Project manager: Jon C. Jackson, AIA. Project architects: Charles J. Cwenar, AIA, James Rogers. Landscape architect: Lawrence L. Ridenour, ASLA. Electrical engineer: Caplan Engineering. Builders: Neighborgall Construction, Childers Construction.

Southside Place Bath House, Houston (page 54). *Architect: Taft Architects, Houston.* Partners: John J. Casbarian, AIA, Danny Samuels, AIA, Robert H. Timme, AIA. Project manager: Larry Dailey. Support team: Robert Bruckner, Suzanne Labarthe. Structural engineer: Cunningham Associates. Contractor: Renaissance Builders.

St. Albans Recreation Center, Queens, N.Y. (page 55). *Architect: Medhat Salam Associates, New York City.* Structural engineer: Harwood Associates. Mechanical and electrical engineer: George Langer. General contractor: Perna Contracting. Construction consultants: Falk Associates.

Children's Garden House, Houston (page 56). *Architect: Thomas M. Colbert.* Landscape architect: Thomas M. Colbert. General contractor: Thomas M. Colbert.

Magdalena Elementary and Middle School, Magdalena, N.M. (page 58). *Architect: James N. Rowland Partners, Albuquerque.* Project architect: Marc Diament. Structural engineer: Bacchus Consulting Engineers. Mechanical engineer: Charles Thomsen & Associates. Electrical engineer: Tierra Del Sol. General contractor: Charles Taylor (gymnasium), Seegee Engineering (Phase IV), Mesilla Valley Construciton (Phases II and III).

Los Angeles Zoo Entrance and Gift Shops (page 62). *Architect: John Aleksich Associates, Los Angeles.* Structural engineer: Robert Englekirk Structural Engineers Inc. Mechanical engineer: Thermalair Inc. Electrical engineer: Hoffman Electric. Landscape architect: William Hynek. General contractor: Dillingham Construction. □

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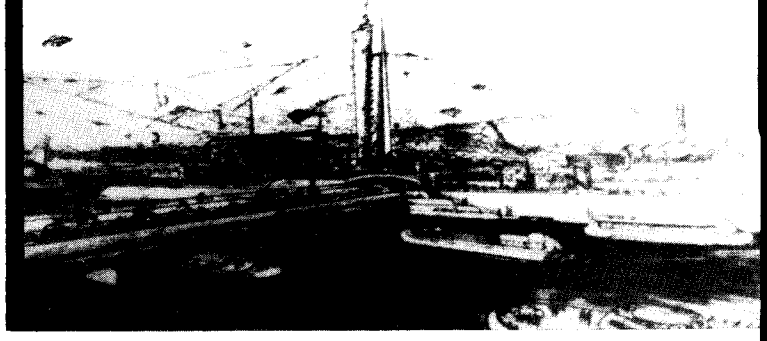

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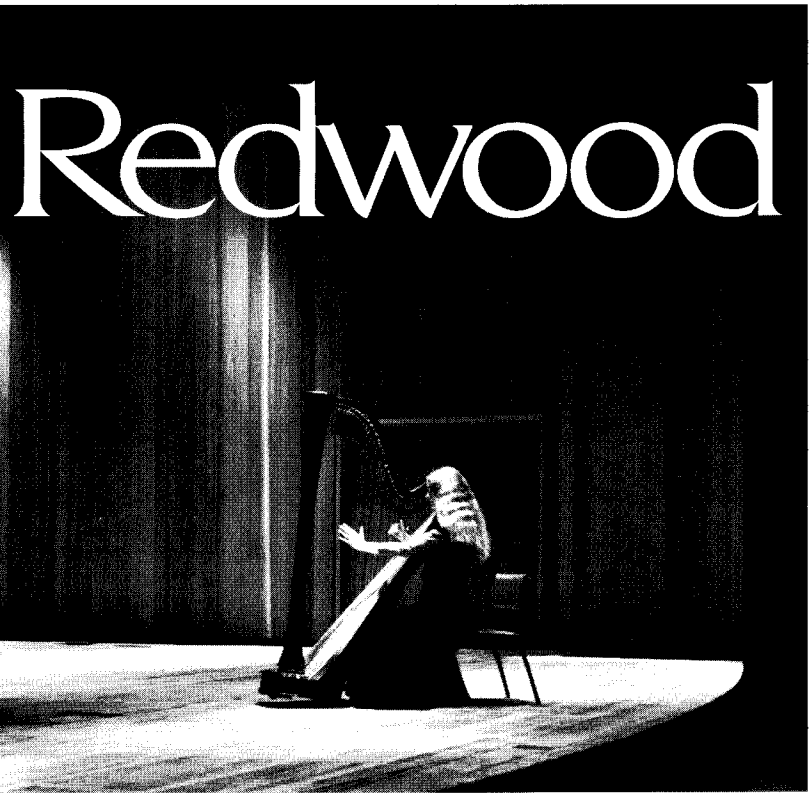

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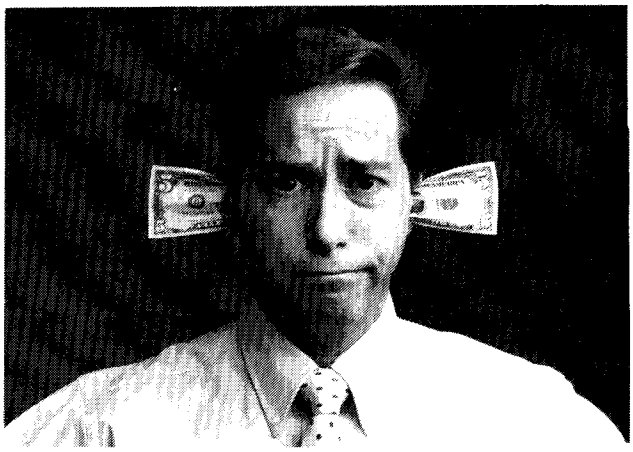

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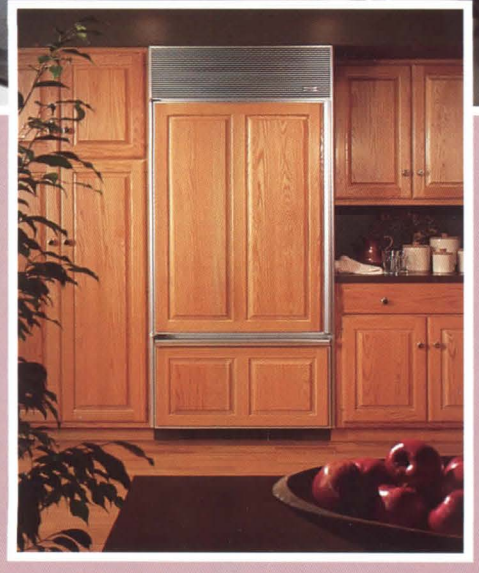

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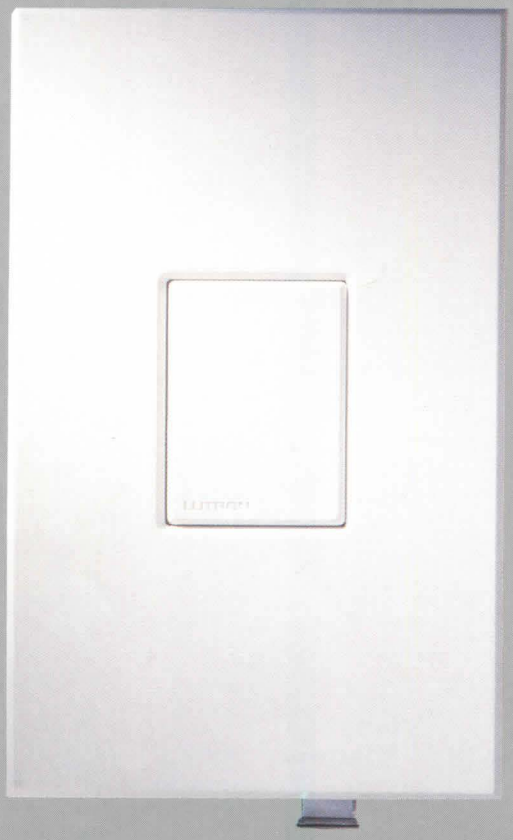

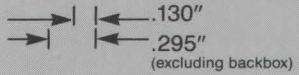

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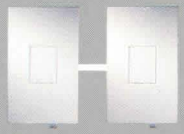

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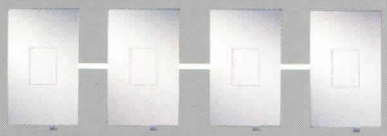

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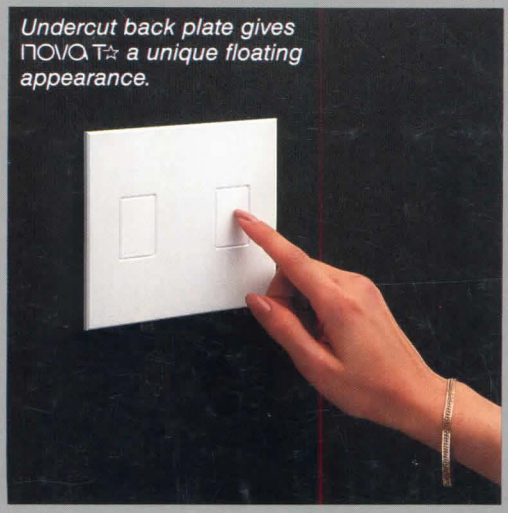

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