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### "Edge City" and real people

"Edge City" is not the right word, nor is "urban village," but Joel Garreau is describing not only the state of urbanizing America, but the current expression of a universal desire. Your reviewer [RECORD, August 1992, page 52] accepts blindly the "experts" whose case against suburban "sprawl" says more about their personal notion of a rational order than about their knowledge of real people.

In the stable society of ancient Rome, those who could afford it had their country villas. The concentrated and walled medieval town we idealize was only a necessity—a defense against a lawless countryside. As soon as social stability and modern technology made it possible, Americans who could afford it moved to places in the country—by railroad. When other Americans had to leave the farms as machines took over, they still brought with them to the city the "rural ideal" of Sam Warner's *Streetcar Suburbs* . . . And so with the advent of that "villain," the automobile, Americans have found it possible to recapture some of that ideal and to live outside the city center.

Clarence Stein, Henry Wright, and Lewis Mumford, in a report to the AIA in the 1920s, said that the way to a decent life was to leave the dirty city behind, whence were born the several new towns in the 1930s which are still held up as models . . .

It is ridiculous to charge the suburbs to "speculators." They were political responses to a widespread desire to raise a postwar family in the best surroundings . . .

*Robert S. Sturgis, Architect  
Weston, Massachusetts*

### Family Values

In his article "Shattering Old Housing Myths" [RECORD, July 1992, page 70] Robert Campbell makes the mistake of equating the existence of something with the proof of its worth. Just because the composition of families has changed, it does not follow that those changes are inherently for the good of society. It certainly does not follow that what the family changed from was a "myth"; in fact, if it was a myth, there would have been no change to notice. If the family composition we have now is better than the "myth" of the two-parent household, there is no need to decry the high divorce rate and economic straits inherent in single-parent-families. My advice for future articles is to drop the amateur social philosophy and stick to architecture.  
*Paul Ashley, Architect  
Madison, Wisconsin*

Mr. Campbell replies:  
*Our private opinions about appropriate or inappropriate family structure shouldn't keep us from recognizing that divergent family models have always existed, are becoming more common, and deserve the best housing architects can give them.*

### Corrections

Jonathan Cohen was project manager for Delancey Street Embarcadero Triangle [RECORD, July 1992, page 72].

Elizabeth Bull was lighting designer of JPBT Advisors, Inc., Miami [RECORD, September 1992, page 78].

Bob Shaye is chairman of New Line Cinema and client for the company's offices in New York and Los Angeles [RECORD, September 1992, page 122].

### November 18-20, 1992

Lighting conference for architects and contract interior designers, GE Lighting Institute, Cleveland, Ohio. For information: 800/255-1200.

### Through November 30

The Nara Convention Hall International Design Competition preview, Philip Johnson Gallery, Museum of Modern Art, New York City. Contact Dept. of Public Information, 212/708-9750.

### Various dates

A national lecture series conducted by Simpson Gumpertz & Heger Inc. on "Building Envelope" design. Boston, 11/18-19, Seattle, 12/7; Los Angeles, 12/9. For information, contact: Archimediæ, 617/951-2199.

### December 1

1992 Gabriel Prize Competition. Requests for application forms are to be made in writing and received no later than December 1, 1992 at the Western European Architectural Foundation, c/o The Boston Society of Architects, 50 Broad St., Boston, Mass. 02109.

### December 6-8

An international exhibition of products and services on building restoration. Hynes Convention Center, Boston. For more information: Ellen Glew 617/933-9699, fax 617/933-8744.

### Through January 3, 1993

"Framing American Cities," an installation by architect/sculptor Mark Robbins, Wexner Center for the Arts, Ohio State University. Contact: Mark Robbins, 614/292-5567 or 614/292-3182.

### January 30

"Call for Vision, San Francisco Embarcadero/Waterfront Competition." Sponsored by the Center for Critical Architecture and a coalition of community organizations. For competition kits, send \$75 to CFCA/2AES, 1700 17th St., 2nd Floor, San Francisco, Calif. 94102.

## **Not Again! Dade County Fixup Plans Threaten Replay of Old Mistakes**

If, as Le Corbusier reportedly said, an airplane is a small house that flies, then there were a lot of airplanes flying about Southern Dade County, Florida, as Hurricane Andrew passed through that tragic morning of August 24. As I write this now, two months have passed, and a picture is beginning to emerge of the effort to turn around the human suffering and physical decimation that flattened 75,000 houses and left an area of 140 square miles a wasteland.

The way things look, this effort is a recipe for failure. First, the understandable pressures to put a roof over the heads of the homeless are threatening to repeat the very mistakes that supposedly caused the damage in the first place—a building code with an Achilles' heel in the form of a tough performance version coexistent with a weaker prescriptive version open to watering down; pressures by the insurance companies to build the replacement structure just like the original that failed; a shortage of inspectors; delay in translating state-of-the-art wind-design savvy from testing labs to field practice; the advent in droves of mobile-home suppliers competing to replace the trailer parks that, as one architect said to me, resembled a field of Kleenex after the storm (see also a report in RECORD, October 1992, page 35.)

Still, serious as these concerns are, none to my mind is so potentially tragic in the long term as loss of this opportunity to create, out of the shambles, viable neighborhoods and communities. Instead, we are seeing a return to the status quo by cost-conscious officials defending the re-use of existing road and infrastructure networks. Wrecked townships such as Florida City and Homestead, along with the various unnamed migrant camps, were essentially characterless developments with few or no community facilities (had these existed, by the way, they may well have served as community centers to manage disaster relief and reduce the suffering). On the plus side, dramatically reconceived land-use planning, backed up by an adopted zoning resolution prepared for Dade County by Andres Duany and Elizabeth Plater-Zyberk, could create livable communities at every income level, from migrant to upper-middle-class housing, help protect the fragile marine environment from future disasters, and replace the inefficient infrastructure with a less sprawling, more energy-conscious network, including public transit.

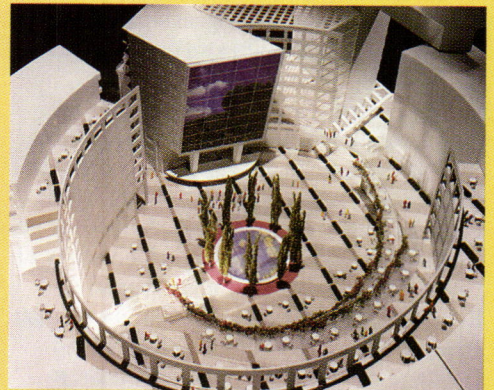
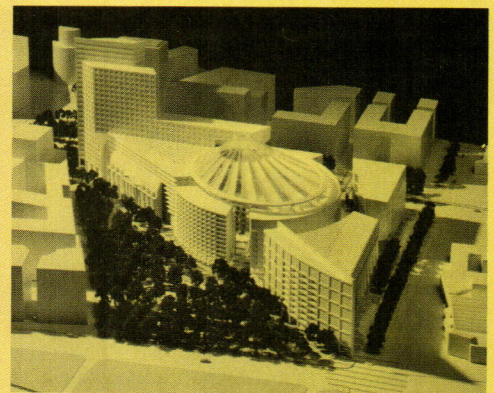
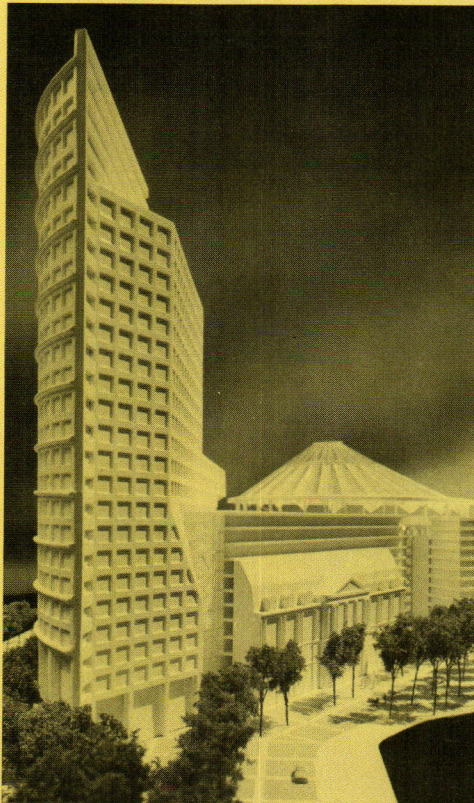
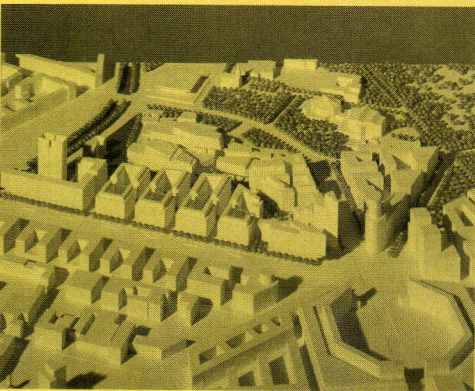
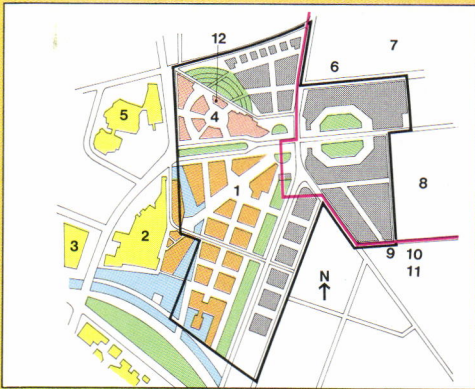
So there is hope. Committees of architects, developers, homeowners, and public officials, working through the federally appointed "We Will Rebuild" committee, as well as Florida International University, the University of Miami, and the Miami AIA chapter, are taking steps in the right direction. For example, a charette planned for later this month is to lead to a plan of action. The intent is in part to edit out the duplicated efforts that have slowed progress through too much good will and not enough coordination, and to bring proven expertise to bear on key opportunities. Case studies will focus on replanning some 20 prototypical site-specific places, such as migrant camps, shopping centers, and Homestead Air Force Base, with a special eye on those where plans are more likely to succeed due to single ownership of large parcels. One joint University of Miami/AIA group has produced a manual for homeowners, with over 50,000 copies distributed.

Yet, despite the good will, the danger is real that the drive to rebuild *now* is elbowing out the drive to rebuild *right*. The homeless need to be provided for. But doing things the same old way will, with the next hurricane, bring the same destruction, to the same people. *Stephen A. Kliment*

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Berlin

## Murphy/Jahn and Renzo Piano Win Potsdamer Sites; Golden-Age Approach Ignores 60 Darker Years



Plans are underway for two office/hotel/retail/residential/entertainment complexes in the Potsdamer/Leipziger Platz development area. Daimler Benz (*lower left photo and 1 on map*) has chosen a scheme by Renzo Piano with Christoph Kohlbecker that injects a waterway system into the site, and proposes breaching Hilmer & Sattler's masterplan in order to give Scharoun's 1978 State Library (2) an eastern approach worthy of a united Germany. The library's west facade faces Mies van der Rohe's 1968 New National Gallery (3).

Sony's European headquarters (*center and right photos; 4 on map*) by Murphy/Jahn with Ove Arup as structural environmental consultant and Peter Walker as landscape designer should begin construction in mid-1994. The program calls for video monitors

with 24-hour broadcast capability to "replace flower pots and more traditional urban ornaments," and a large video wall dominating a roofed urban forum. The scheme, criticized by some as "too American," includes a tower well over masterplan limits, links to Scharoun's 1963 Philharmonie (5), and exact restoration of the Beaux-Arts facade of the Esplanade Hotel as "an icon and memory of turn of the century Berlin."

Both projects deliberately appeal to an earlier Berlin, where the facing plazas were Europe's busiest and most glamorous venues, surrounded by hotels, ministries, embassies, offices, entertainment establishments, and department stores. However, a once-and-future Golden Age design approach leaps over the 60 most recent years in development-area history. During the

Third Reich, it was ringed by the entrance to Hitler's bunker system (6), Goebbels's Enlightenment and Propaganda Ministry (7), the Air Ministry (8), Gestapo headquarters (9) where basement cells and torture chambers still remain, SS headquarters (10), the main SS Security office (11), and the infamous People's Court (12) that was one door over from Sony's hotel restoration.

In 1961, the development area was pierced by the Berlin Wall and engulfed in the weeds, barbed wire and armed patrols of No-Man's Land. Since the Wall fell on November 9, 1989, Kristallnacht's 51st anniversary, violent reaction against "difference" has escalated, recalling the menace that reigned, along with the glamour, the last time Berlin was the capital of Germany. *Judith Davidsen*

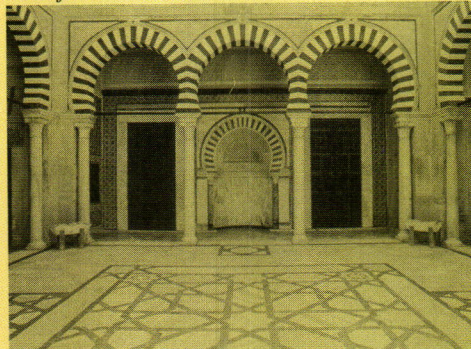
## Nine Projects Honored for Muslim-World Diversity

Aga Khan Award winners are Indonesia's Kali Cho-de where Yousef B. Mangunwijaya exchanged cardboard/plastic shanties for A-frame variations on local design; Istanbul's Palace Parks Ottoman compound restorations; Panafrican Institute for Development (top) in Burkina Faso, where ADAUA used mud brick in a Volta-village type plan; Turkey's Demir Holiday Village, where Turgut Cansever's volume and massing variety challenges area tourism concepts; Cairo's Culture Park by Abdelhalim I. Abdelhalim with a plan that local schools use for geometry lessons; Amman's East Wahdat Upgrade, which turned Palestinian refugee squats into an area of serviced homes and small businesses; Syria's Stone Building System (center), where the family computer-analyzed uncut local black basalt curves for a low-cost arch-and-vault alternative to cement-block; India's Entrepreneurship Institute, where Bimal Patel drew on Indo-Islamic design for cost/maintenance/climate-controls; and Tunisia's Kairouan Conservation (bottom), where new uses occupy sites that honor religious and historical themes. Jury: architects Balkrishna Doshi, Frank Gehry, Fumihiko Maki, Adhi Moersid, Ali Shuaibi, and Dogon Tekeli, University of Pennsylvania art history chairwoman Renata Holod, University of Florida religion chairman Azim Nanji, and Unesco World Heritage deputy director Saïd Zulficar. ■

Kamran Adle/AKAA



Khedija M'hadhebi/AKAA



## Briefs

### Projects

- Gino Rossetti's new U. S. Tennis Association stadium, New York City, adds private suites and upgrades player facilities.
- Kaplan/McLaughlin/Diaz's 400,000-sq-ft Mission Bay project won San Francisco's "beauty contest" for office-space allotment.
- Fentress Bradburn/Antoine Predock/Domingo Cambeiro's desert-friendly design won Nevada Clark County government center commission.
- KPF/Johnson Tsushima Luersen Lowrey design \$175-million Honolulu high-rise.
- LA Community Design Center and Pico Union community begin service/housing for Central American Refugee Center.

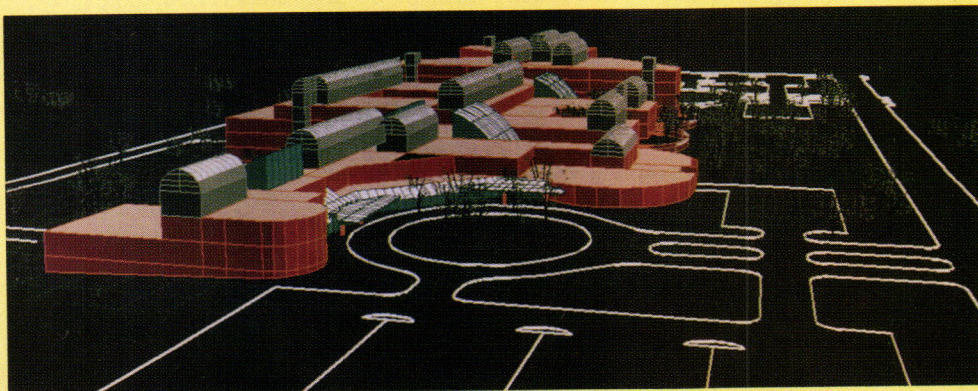
### Competition Deadlines

- *AIA/AAF*: Dec. 4 for Minority/Disadvantaged undergraduates; Jan. 15 for health care; Feb. 1 for advanced degree; Feb. 15 for study/research, RTKL travel awards. 1735 New York Ave. N. W., Washington, D. C. 20006-5292, 202/626-7511.
- *Rotch forms*: Jan. 4: Boston Society of Architects, 52 Broad St., Boston, Mass. 02109.
- *Interior Design Education Research grants*: Jan. 4: Contact FIDER, 60 Monroe Ctr. N. W., Grand Rapids, Mich. 49503, 616/458-0400.

### A. E. Komendant Dies at 85

- Structural engineer A. E. Komendant, a 1978 AIA medalist, died this fall. His work included the Kimbell Art Museum, Habitat '67, and a 1975 book on Kahn. ■

## Radiation Medicine Center for Victims of Chernobyl

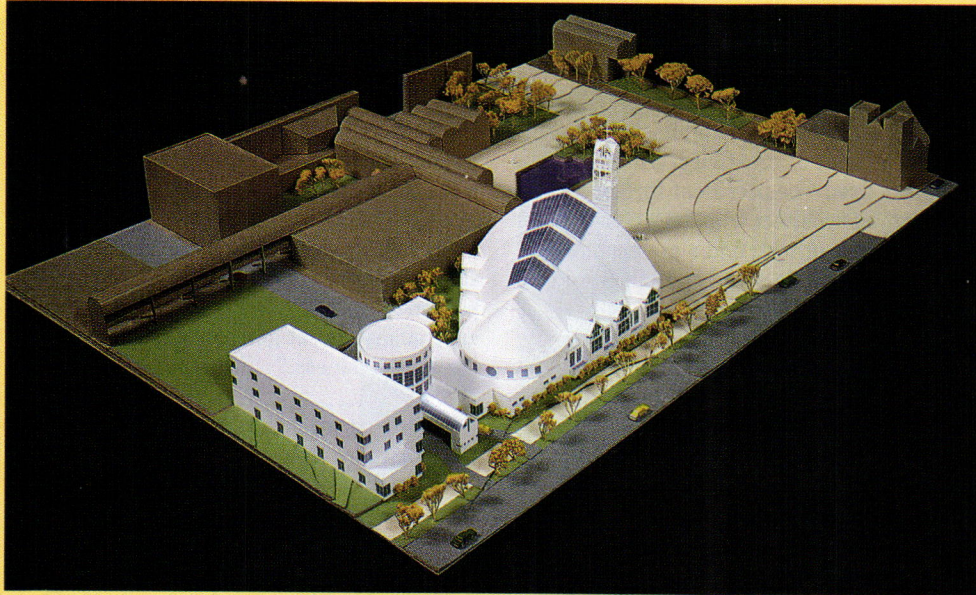


Ellerbe Becket's Minneapolis office is designing a Radiation Medical Center at Bryansk to provide continuing treatment for victims of the Chernobyl nuclear-power-plant explosion and to research improved diagnosis protocols and dosimetry and radiometry methods. Preliminary design uses a center circulation spine to unite polyclinics, library and auditorium, a diagnostic and treatment block, and two separate hospitals—260 beds for adults and 90 for children. Scattered winter gardens provide a refuge from the rigors of medical care. ■



## Atlanta

# Second, Larger Ebenezer Baptist Church for King Center



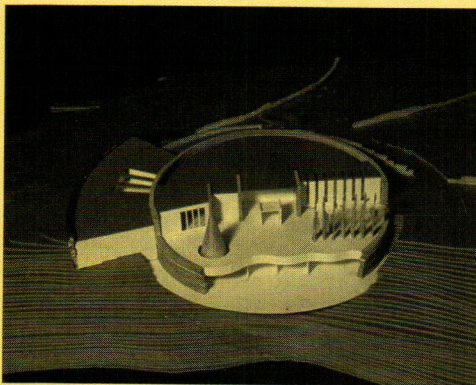
Harrison Northcutt

To adjust to the growing visitor-rate at the King Center, Stanley, Love-Stanley plans a 2,400-seat Ebenezer Baptist Church facing the original (model right) where Martin Luther King, Jr.'s father and grandfather were both pastors. The central axis passes a 150-seat choir, with baptismal pool and orchestra pit, to King's crypt at the King Center for Nonviolent Social Change. Weave-patterned brick cladding echoes the old church, the "mud-trade" history of Southern Black-American brick masons, and African surface-pattern traditions. Roof ribbing recalls

African thatch, and fenestration in a rotunda connecting classrooms and pastoral offices is arranged in a classical African drum image. The bell-tower is a weave-and-glyph-patterned obelisk. Stained-glass teaching windows chronicle the march to freedom, from Africa and the middle passage, the diaspora, the civil rights movement (when old Ebenezer hosted the Southern Christian Leadership Conference), current times and future hope. Round windows in the dome of peace above the choir map King's ideal of harmony for all continents.

## Nebraska

# Architecture Redefined for Tribal Interpretive Center



Mark Hoistad's Omaha Tribe Interpretive Center outside Macy "caused [the architect] to redefine architecture . . . as part of a larger nature/ culture continuum." With a plan echoing the tribe's symbol for the world and shape of its homes, grass roofing, and rough stone cladding to collect soil and plant matter, it will be less a building than an environment in the Omaha's spiritual landscape. It will house sacred artifacts of great spiritual power, including the Old Omaha, or Sacred Pole, recently returned by the Peabody Museum after more than 100 years.

## New Hampshire

# Wright vs. Nature

James Joyce and Frank Lloyd Wright share the distinction of having spawned entire industries devoted to researching, interpreting and preserving their legacies. One might expect the third annual conference of the Frank Lloyd Wright Building Conservancy, held this fall in Manchester, New Hampshire, to be yet another gathering picking over the minutiae of the well-known corpus of work and life.

Yet most of the presentations about the practicalities and thinking behind preserving Wright's built legacy proved to be informative and highly charged. For one thing, Wright's willingness to try out details such as a one-inch deep gutter and a "hole" instead of a drain in the roof at Fallingwater, or his use of built-up roofing to line gutters in the Isabel Roberts house, River Forest, Illinois, proved not to be minor decisions, after a certain amount of rain fell.

Some vicious encounters with nature were alleviated by design. The structural repairs for the Hanna House at Stanford University, which suffered earthquake damage in 1989, are costly. The roof had to be stabilized with steel elements acting as seismic collectors that extend from the fireplace. But "the hexagonal module did save the house from collapse," reported Jonathan Ryan, the restoration architect.

Building Conservancy meetings now attract not only owners of Wright's houses, but also historians, architects, and preservationists. Pedro Guerrero, a former apprentice and photographer whom Wright had invited to document art and life at Taliesin between 1940 and 1959 (below), presented slides of his work. *Suzanne Stephens*



© Pedro E. Guerrero

survey RECORD, October 1991, page 31). The nearly 42 percent in this survey who make between \$50,000 and \$75,000 are right up there with most in private practices who are firm principals, according to the AIA survey. Then there are the 18 percent who make \$75,000 to \$100,000 and another 18 percent who make over \$100,000. (Some say "much more.") There are *very* few in the latter two categories who say they are unhappy with what they do. So too with the fewer than 5 percent who make less than \$35,000 (the ju-

now do, although some 20 percent of those said that they would have been happier with more practical courses, especially business, (5 percent of this group also have MBAs) and a few said that architectural schools should spell out career options. Several who had been exposed to schools after leaving said they are not what they used to be—that there is a decreased emphasis on problem solving and more on "fashion." And several said the obvious, especially for those choosing alternate careers: The only true teacher

effect: "Consider whether you can make a difference."

The answers are much more varied on how to go about picking a career option outside private practice. The most agreement (8 percent) is on getting a rounded architectural background before anything else. "Learn to be an architect first," says Gary Molenda, a development-group manager in Tucson. A similar sentiment is expressed by James Leggitt, an architect and planner with the Denver Museum of Natural History. Almost as large a number say to get a broad general education. "Get an MBA and learn business theory and language," advises Eugene Bittinger, architect for the Cuyahoga Community College in Cleveland, with whom 5 percent share this opinion. "Try before you decide," is the essence of advice from some 4 percent. "Talk to others," say 2 percent.

*They assert, in some cases, that what they do is traditional practice and, in others, express happiness at being free of it. Over 90 percent say they are content, but 37 percent say they would like to go back—under the right circumstances.*

nior to medium range in architectural firms). They tend to have picked occupations in which there are motivations other than money: city commissioners, nonprofit-foundation volunteers, archeologists, parks personnel, or working with the poor in remote (and affordable) rural areas.

What do the people who make the most do? Of those who make more than \$75,000, real-estate developers win hands down with close to 20 percent. The next highest group (14 percent) is project managers for the government, banks, retail organizations, and developers. About evenly split (9 percent each) are interior designers, contractors, and design-builders. Also evenly split (6 percent each) are facilities managers, construction managers, and people who make products such as maps, cabinets, and a manufacturer of kiosks. One response each is products consultant, local-government administrator, offshore drilling-rig designer, and bank risk manager.

#### **Did architectural school prepare them?**

A surprising 74 percent said that architectural school prepared them for what they

is experience. Still, "architectural training provides a well-rounded basis for any field," said Fredrick Winter, a bank staff architect in Columbus, Ohio.

The 26 percent who thought that schools had not prepared them for their ultimate careers had much the same reservations, but tended to feel more strongly about them—especially that they had to learn what they do by experience. "No academic schooling can teach that," said Duane Schultz, vice president for design and construction at the Children's Memorial Medical Center in Chicago. A few were more critical than others. "If doctors received the same level of formal education as architects, 90 percent of their patients would die," said Donald Smith, senior construction manager for Heery-Vanir in Sacramento.

#### **Breaking out**

When asked what advice they would give others considering leaving private practice, 16 percent say simply: "Go for it." Nearly as many say it depends on your personality, preferences, and/or motivations. The highly dedicated, though in lesser numbers, say, in

"Go with your gut instinct of what you'd really love to do," advises Ron Paterson. But, cautions Barry Lynch, senior architect for RJR Nabisco in Winston-Salem: "Know where business trends are headed and figure out how to fit in." Indeed, there is even more caution from some—especially in the private sector—who point to the growing trend to streamline by dumping support staff. "Corporations are getting lean and mean," is the way one respondent puts it.

"You have to be creative in finding niches where you can truly exert skills and do what's interesting," says Douglas Govan, chief designer for Acorn Structures in Concord, Massachusetts. "Start early," advises Robert Wagner, a rehab developer in the Bronx. "The longer you wait to break out, the harder it is. Know your strengths and follow them. What you enjoy will ultimately yield money and happiness. There will be few to help you along. But don't give up."  
*Charles K. Hoyt*

# Dodge/Sweet's Construction Volume Outlook for 1993

*This will be a different kind of cycle—up, yes, but not as strongly and in different areas of construction than in past recoveries.*

By Robert A. Murray

*Recovery of the construction industry from its post-'80s crash was never going to be "business as usual." The excesses of the previous decade—commercial overbuilding, the banking crisis, the federal-budget deficit—all meant that the upturn would take place against a backdrop unlike any seen before. Indeed, cyclical recovery within the context of structural change is a good way to look at what has happened so far in 1992, and what is expected to occur over the next several years.*

Where does the construction industry's recovery stand three-fourths of the way into 1992? After hitting bottom during 1991's opening quarter, the Dodge Index of construction contracting climbed more than 15 percent through the start of 1992. Although not up to the standards of previous recoveries (the corresponding gain in 1982-83 was 40 percent), the advance was nevertheless welcome. The industry's measure of construction put in place behaved in its typical lagging fashion by bottoming out in mid-1991, and then heading back up.

Yet by 1992's second quarter, the modest recovery became derailed, at least temporarily. Contracting for new construction fell back more than 5 percent, and then was unable to show any improvement in the third quarter. The main culprits: a soft house-building market amidst sagging consumer confidence, and weakening of the type of construction dependent upon public funding—institutional building and public works. With the shortfall in contracting, the first year of recovery for the building industry has turned out to be more wobbly than anybody expected.

Assuming that some of the lost momentum is regained by year's end, the advance of total construction-contract value for 1992 as a whole is now estimated at 6 percent, which adjusted for inflation translates into a 3 percent real gain. By contrast, the first year of the previous cyclical upturn in 1983 witnessed a 22-percent real gain. Clearly, the start of the current building cycle has already assumed a much different character. And, given the vulnerable condition of commercial real estate, which was still slipping

as 1992 began, this usual second-year boost to the building cycle is highly in doubt.

To more fully examine the industry's near-term prospects, it is useful to combine building types under the two broad headings used in recent *Outlooks*: stable and cyclical.

- *The stabilizer group*—institutional building and public-works construction—has constituted about one-third of total construction during the past decade. Predominantly publicly owned, these types of construction are reasonably well insulated from the instability of the banking system. Funding comes from bond issues, tax revenues, and user fees. Often, a built-in continuity is present through such long-term programs as the five- or six-year highway bills. Significantly, this group actually increased 7 percent in dollar volume from 1989 through 1991, when the industry as a whole was falling 15 percent. Whether this group can maintain its steady 3- to 4-percent gains per year will have an impact on 1993's overall pattern of contracting.

- *The cyclical group*—single-family housing, income properties (commercial and multi-family building), and manufacturing building—accounts for about two-thirds of total construction activity. These categories are largely privately financed, and are highly sensitive to financial and economic conditions. True to their name, the cyclical categories were entirely responsible for the industry's 1990-91 downturn, sliding 25 percent from the 1989 peak. The behavior of this group will largely determine if recovery can get back on track.

Several key issues that will be important to the progress of this uncertain recovery:

- What will be the response of institutional buildings to the budget squeeze on state and local governments?
- How will the constraint of a sluggish economy and deficit-reduction pressures affect spending on public works, and how will the outcome of the November election impact these categories?
- Has single-family housing gone about as far as it can go, or is there still some room for further improvement?
- Will the commercial and industrial market

continue to drag down the industry as a whole, or is it close to bottoming out?

The economic background against which these events will play out is anticipated to be continued slow growth. Weak employment, corporate downsizing, sagging consumer confidence, and deficit-reduction pressures will remain as limitations. Growth in real GDP will be kept under 2 percent for 1992 as a whole, and within the 2- to 3-percent range for 1993.

The positive side to a half-speed recovery is that inflation will remain in check. Single-digit mortgage rates will still be present in 1993, remaining supportive of single-family house sales. (Low rates have also helped commercial banks show improvement from their precarious balance sheets of the past several years.) Availability of funds to developers, however, will stay tight, due to the ongoing scrutiny of bank portfolios by regulators. With real-estate values depressed in many parts of the country, it's unlikely that banks will rush to increase real-estate lending for the near term.

## **The stabilizers: Institutional building**

From 1980 through 1991, schools, healthcare facilities, and public-administration buildings made small but steady gains each year, growing from \$20 billion to last year's \$45 billion. This was in sharp contrast to the boom-and-bust pattern of commercial and industrial building, which gained and lost more than 50 percent over that period. One of the more noteworthy aspects of 1991's construction volume is that institutional building exceeded the commercial and industrial sector, on a dollar basis, for the first time in 20 years, and is likely to this year and next, despite some loss of momentum by the institutional categories.

The basic trend of institutional building is closely tied to the slow rate of change of demographic development. Back in the 1960s, the largest institutional category, educational building, reflected the impact of the '50s generation on school enrollments. In similar fashion, the increase in births since the mid-1970s—the baby boom "echo"—has led to an extended rise for school construc-

tion since 1983. Last year's total of school projects, at 165-million square feet, was easily more than twice what was reported at the start of the 1980s. Not surprisingly, primary-school construction paced the early stages of this resurgence, with new secondary-school starts adding more recent support.

Growth at the other end of the age spectrum, the 65-year-old-and-over group, has contributed to the demand for healthcare facilities. For some time now, contracting has held fairly stable in the range of 70- to 75-million square feet. Since clinics and nursing homes in the mid-1980s experienced their own mini-boom, induced at least partly by real-estate tax shelters, the continued stability of this category with little hint of collapse attests to the benefits of ongoing demographic support.

A third institutional category, public buildings, climbed from 20-million square feet at the start of the 1980s to last year's 50-million square feet. Demographic forces are joined by sociology here; much of the increase is due to an expanding volume of prison starts (one of the few building types not burdened with excess space).

But whereas demographics shape the broad overall trend for the institutional market, periods of fiscal stress can modify the near-term pattern. With state governments coming under severe budget pressure in 1992, the gradual upward trend for this market has been put on hold. The drag on revenues resulting from the weak economy, combined with the increased cost needed to cover welfare and unemployment benefits, has caused a shift in state budgets away from discretionary spending—which includes institutional-building projects.

A recent study by the National Conference of State Legislators noted the emphasis on spending cuts in trying to achieve better fiscal balance. The other alternative, increased taxes, is particularly difficult to achieve given the current economic and political climate. Bond issues too face close scrutiny by voters hesitant to add to the debt burden.

Already, 1992 has seen a reduction in the value of educational starts (down 8 percent

## 1993 National Estimates Dodge Construction Potentials

	1992 Preliminary	1993 Forecast	Percent Change 1993/92
<b>Nonresidential Buildings</b>			
<b>Floor Area</b> (millions of sq. ft.)			
Office Buildings	85	85	-
Stores and Other Commercial	168	177	+ 5
Other Commercial	192	193	+ 1
Manufacturing Buildings	85	85	-
<b>Total Commercial and Mfg.</b>	<b>530</b>	<b>540</b>	<b>+ 2</b>
Educational	143	142	- 1
Hospital and Health	75	69	- 8
Other Nonresidential Buildings	162	159	- 2
<b>Total Institutional and Other</b>	<b>380</b>	<b>370</b>	<b>- 3</b>
<b>TOTAL NONRESIDENTIAL BUILDINGS</b>	<b>910</b>	<b>910</b>	<b>-</b>
<b>Contract Value</b> (millions of \$)			
Office Buildings	\$ 11,600	\$ 11,875	+ 2
Stores and Other Commercial	11,125	11,950	+ 7
Other Commercial	9,625	10,150	+ 5
Manufacturing Buildings	7,150	7,325	+ 2
<b>Total Commercial and Mfg.</b>	<b>\$ 39,500</b>	<b>\$ 41,300</b>	<b>+ 5</b>
Educational	\$ 16,250	\$ 16,625	+ 2
Hospital and Health	10,600	10,025	- 5
Other Nonresidential Buildings	18,500	18,325	- 1
<b>Total Institutional and Other</b>	<b>\$ 45,350</b>	<b>\$ 44,975</b>	<b>- 1</b>
<b>TOTAL NONRESIDENTIAL BUILDINGS</b>	<b>\$ 84,850</b>	<b>\$ 86,275</b>	<b>+ 2</b>
<b>Residential Buildings</b>			
<b>Dwelling Units</b> (thous. of units)			
Singlefamily Houses	960	1,050	+ 9
Multifamily Housing	165	175	+ 6
<b>Total Housekeeping Residential</b>	<b>1,125</b>	<b>1,225</b>	<b>+ 9</b>
<b>Floor Area</b> (millions of sq. ft.)			
Singlefamily Houses	1,685	1,855	+ 10
Multifamily Housing	175	185	+ 6
<b>Total Residential Buildings</b>	<b>1,860</b>	<b>2,040</b>	<b>+ 10</b>
<b>Contract Value</b> (millions of \$)			
Singlefamily Houses	\$100,250	\$113,150	+ 13
Multifamily Housing	10,175	11,025	+ 8
<b>Total Residential Buildings</b>	<b>\$110,425</b>	<b>\$124,175</b>	<b>+ 12</b>
<b>Nonbuilding Construction</b>			
<b>Contract Value</b> (millions of \$)			
Transportation Construction	\$ 32,000	\$ 35,600	+ 11
Environmental Construction	15,450	16,000	+ 4
<b>Total Public Works</b>	<b>\$ 47,450</b>	<b>\$ 51,600</b>	<b>+ 9</b>
Utilities	\$ 4,900	\$ 5,300	+ 8
<b>TOTAL NONBUILDING CONSTRUCTION</b>	<b>\$ 52,350</b>	<b>\$ 55,900</b>	<b>+ 9</b>
<b>All Construction</b>			
<b>Contract Value</b> (millions of \$)			
<b>Total Construction</b>	<b>\$247,625</b>	<b>\$267,350</b>	<b>+ 8</b>
Dodge Index (1987=100)	96	103	

## 1993 Regional Estimates Dodge Construction Potentials

Construction Contract Value (millions of dollars)	1992 Preliminary	1993 Forecast	Percent Change 1993/92	1992 Preliminary	1993 Forecast	Percent Change 1993/92
<b>Northeast</b> CT, ME, MA, NH, NJ, NY, PA, RI, VT						
<b>Nonresidential Building</b>						
Commercial and Manufacturing	\$ 6,675	\$ 6,800	+ 2			
Institutional and Other	9,300	9,000	- 3			
<b>Total</b>	<b>\$15,975</b>	<b>\$15,800</b>	<b>- 1</b>			
<b>Nonbuilding Construction</b>	<b>\$11,375</b>	<b>\$12,650</b>	<b>+ 11</b>			
<b>Residential Building</b>						
Singlefamily Houses	\$11,975	\$13,275	+ 11			
Multifamily Houses	2,050	2,200	+ 7			
<b>Total</b>	<b>\$14,025</b>	<b>\$15,475</b>	<b>+ 10</b>			
<b>TOTAL CONSTRUCTION</b>	<b>\$41,375</b>	<b>\$43,925</b>	<b>+ 6</b>			

### North Central IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD, WI

<b>Nonresidential Building</b>						
Commercial and Manufacturing	\$ 8,825	\$10,000	+ 13			
Institutional and Other	10,925	10,325	- 5			
<b>Total</b>	<b>\$19,750</b>	<b>\$20,325</b>	<b>+ 3</b>			
<b>Nonbuilding Construction</b>	<b>\$11,400</b>	<b>\$11,800</b>	<b>+ 4</b>			
<b>Residential Building</b>						
Singlefamily Houses	\$22,950	\$25,425	+ 11			
Multifamily Housing	2,725	2,850	+ 5			
<b>Total</b>	<b>\$25,675</b>	<b>\$28,275</b>	<b>+ 10</b>			
<b>TOTAL CONSTRUCTION</b>	<b>\$56,825</b>	<b>\$60,400</b>	<b>+ 6</b>			

### South Atlantic DE, DC, FL, GA, MD, NC, SC, VA, WV

<b>Nonresidential Building</b>						
Commercial and Manufacturing	\$ 7,000	\$7,675	+ 10			
Institutional and Other	7,975	8,575	+ 8			
<b>Total</b>	<b>\$14,975</b>	<b>\$16,250</b>	<b>+ 9</b>			
<b>Nonbuilding Construction</b>	<b>\$ 8,325</b>	<b>\$ 9,025</b>	<b>+ 8</b>			
<b>Residential Building</b>						
Singlefamily Houses	\$24,450	\$28,475	+ 16			
Multifamily Housing	1,900	2,250	+ 18			
<b>Total</b>	<b>\$26,350</b>	<b>\$30,725</b>	<b>+ 17</b>			
<b>TOTAL CONSTRUCTION</b>	<b>\$49,650</b>	<b>\$56,000</b>	<b>+ 13</b>			

### South Central AL, AR, KY, LA, MS, OK, TN, TX

<b>Nonresidential Building</b>						
Commercial and Manufacturing	\$ 5,700	\$ 6,975	+ 22			
Institutional and Other	6,875	7,000	+ 2			
<b>Total</b>	<b>\$12,575</b>	<b>\$13,975</b>	<b>+ 11</b>			
<b>Nonbuilding Construction</b>	<b>\$ 8,250</b>	<b>\$ 9,225</b>	<b>+ 12</b>			
<b>Residential Building</b>						
Singlefamily Houses	\$16,150	\$19,150	+ 19			
Multifamily Housing	850	1,000	+ 18			
<b>Total</b>	<b>\$17,000</b>	<b>\$20,150</b>	<b>+ 19</b>			
<b>TOTAL CONSTRUCTION</b>	<b>\$37,825</b>	<b>\$43,350</b>	<b>+ 15</b>			

### West AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY

<b>Nonresidential Building</b>						
Commercial and Manufacturing	\$11,300	\$ 9,850	- 13			
Institutional and Other	10,275	10,075	- 2			
<b>Total</b>	<b>\$21,575</b>	<b>\$19,925</b>	<b>- 8</b>			
<b>Nonbuilding Construction</b>	<b>\$13,000</b>	<b>\$14,200</b>	<b>+ 9</b>			
<b>Residential Building</b>						
Singlefamily Houses	\$24,725	\$26,825	+ 8			
Multifamily Housing	2,650	2,725	+ 3			
<b>Total</b>	<b>\$27,375</b>	<b>\$29,550</b>	<b>+ 8</b>			
<b>TOTAL CONSTRUCTION</b>	<b>\$61,950</b>	<b>\$63,675</b>	<b>+ 3</b>			

through September) while the institutional total has barely been able to hold steady with last year's amount. Given the degree of austerity pushed through in fiscal year 1993 budgets, which for most states began on July 1, there's not much impetus for greater state funding of institutional projects until at least mid-1993. Accordingly, the deferral of this sector's upward trend will continue into next year, as the reductions spread from school projects to other types.

A moderately improved 1993 economy should allow some measure of relief for state governments by the time their next fiscal year begins. Rising employment will expand the tax base while alleviating income-maintenance payments, making possible a return to pre-recession priorities. Although down for the year as a whole, institutional contracting during 1993's second half is likely to renew expansion, aided by still supportive demographics. And to keep the near term pause in perspective—the 1993 estimate of institutional square footage (370 million square feet) is still a full 40 percent above the early 1980s trough.

#### Public-works construction

While institutional building won't be giving much help in the near term, the public-works categories offer more promise. New high-way legislation is already in place, and greater spending on public-works projects is being viewed increasingly as the way to jump-start the economy. Accordingly, this sector of the construction market is poised to climb above the narrow \$43- to \$45-billion plateau where it settled during the 1987-91 period.

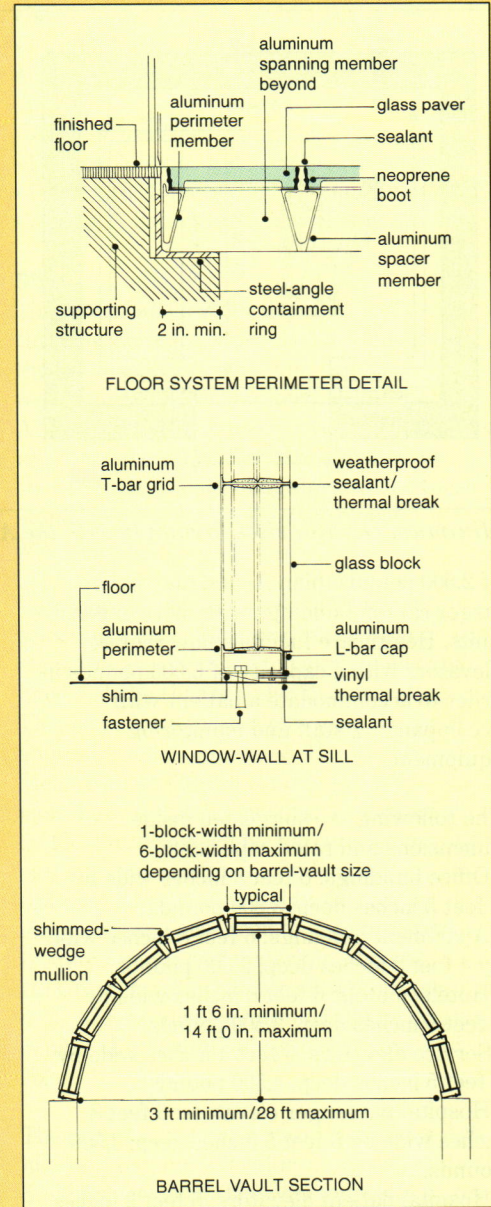
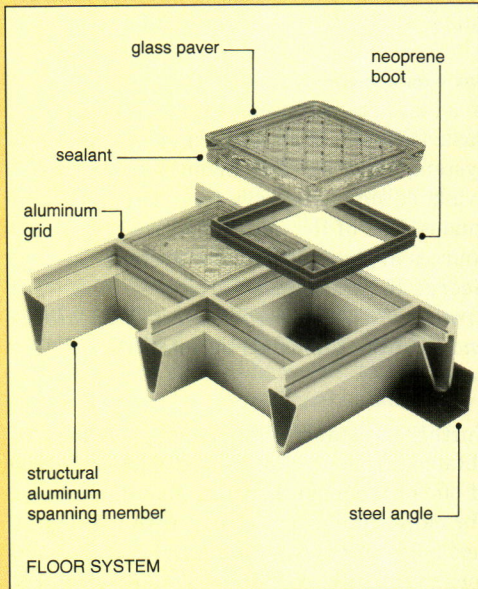
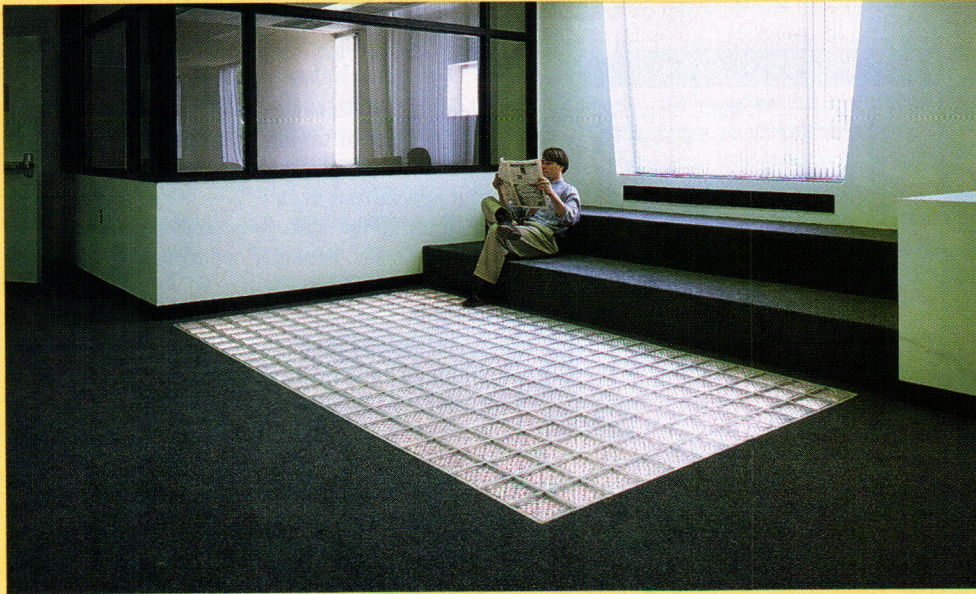
A less positive picture comes through for the environmental public-works categories due to the recent shift in funding responsibility away from the federal government. The case of sewer and waste-disposal systems is perhaps the most telling.

The result of this financing transfer is that sewer contracting has slipped back about 10 percent during the 1990-91 period from the previous three years, as states have struggled to offset the phase-out of federal support. In 1992's more difficult fiscal climate, sewer projects will be hard-pressed to

Prepared by the Economics Department, Construction Information Group, McGraw-Hill Information Services Company, Robert Murray, vice president, economic affairs.

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## Metal Grid System for Glass-block Floors, Skylights, and Walls



**300.** A mortarless aluminum assembly supports 1-in.-thick glass pavers in free-span configurations of up to 7-ft 6-in. These grids, supported in turn by structural spanning members and L-shaped steel retaining rings, (see drawing, left, and detail, upper right) can be mullioned together edge to edge to form continuous glass floors without conspicuous joints. The floor grid can also accommodate unusual shapes. Made with engineered-metal parts, the grids are assembled on-site without screws or welds, and can be installed at any point in the con-

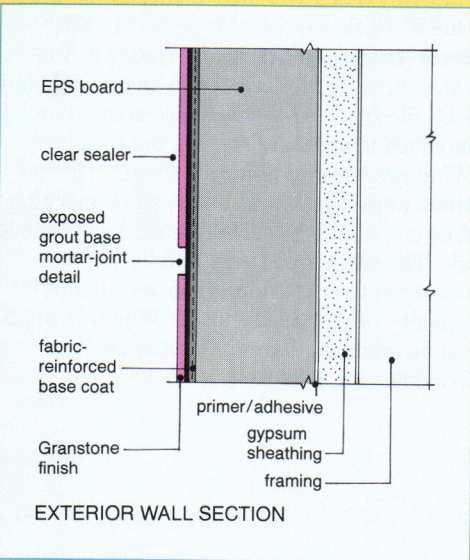
struction process once the support structure is in place. A Neoprene gasket that encases the pavers cushions the glass from traffic deflection, which can cause hairline cracks, and accommodates expansion and contraction. Damaged blocks are said to be easy to replace if necessary.

The assembled floor weighs 17 lb psf, and the narrow, 1/2-in.-wide joint between 6-in.-sq pavers permits a glass area of 87 percent (cement-mortar systems restrict glass exposure to about 64 percent.)

A similar aluminum grid, with deeper flanges that accept full-size glass blocks from any manufacturer, is available for wall construction, weather-sealed with silicone caulk that gives an all-glass appearance on the exterior. A mechanically connected version of the IBP grid can achieve segmented barrel vaults up to 28 ft wide. In wall and skylight applications, the aluminum grid offers an extra level of security against break-ins. Innovative Building Products, Inc., Fort Worth, Texas. ■

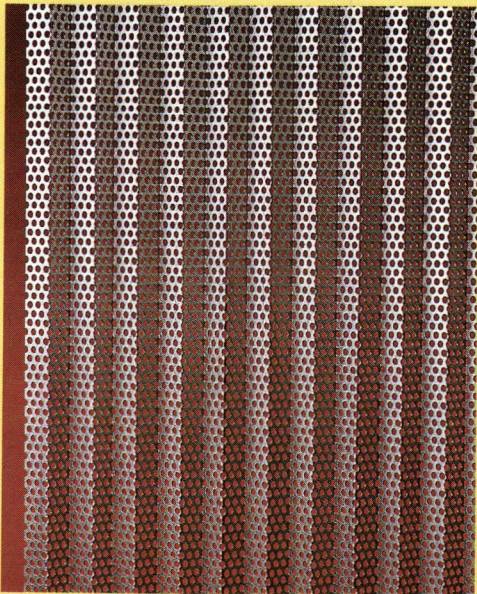
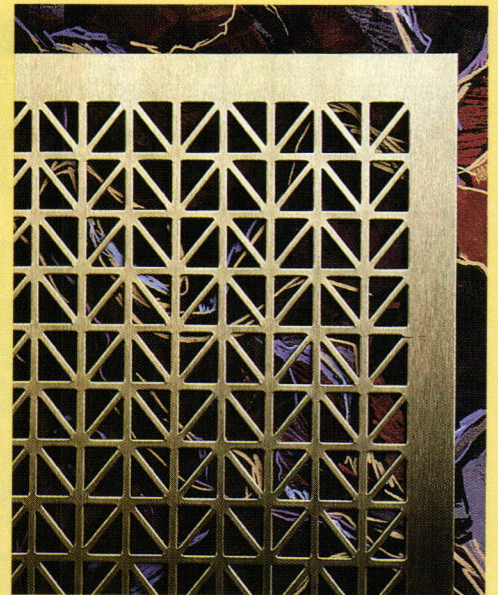
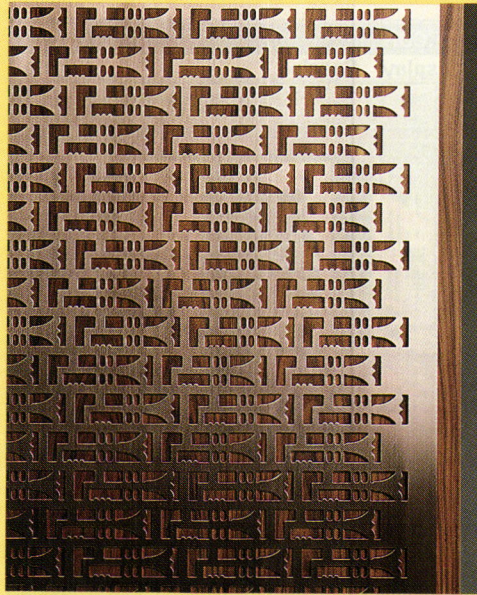
## Simulated-granite Finish

**301.** An architectural exterior finish for cast-in-place or precast concrete, masonry, cementitious scratch coats, or EIFS, Granstone replicates the appearance of natural stone with a variety of esthetic joints, arches, and dimensional effects. A water-based filled coating with graded aggregates of different colors and sizes in an acrylic-resin binder, the spray-applied material comes in 12 standard colorations that mimic reddish, gray, and beige granites in sawn or shot-ground finishes. The dimensional mortar-joint is achieved by applying a self-adhesive foam tape prior to spraying on the Granstone finish. After the surface cures, the tape is stripped off to reveal a grout-colored base coat. The "double joint" shown below was done by alternating applications of tape and Granstone finish. Thoro Systems Products, Miami. ■



## Architectural Metalwork

For more information circle item numbers on Reader Service Cards.



**302.** Metal fabricators A. Zahner Company has added still another decorative option to its line of architectural sheet-metal products (a custom embossing technique was introduced last year). This time, it's MetaPERF, a fabrication method in which computerized robotic cutting machines perforate metal sheets in any pattern desired. Depending on the complexity of the design, cuts are either by laser or mechanical; the lotus motif, top left, by the Pfister Partnership, was laser-cut into the copper. For both interior and exterior installation, MetaPERF sheets can

come in stainless steel in natural and five Interference colors, copper and alloys, anodized aluminum, and enamel on steel. Perforated metal can also be curved, embossed, or crimped, lower left. The technique is especially useful for lighting fixtures and decorative acoustic partitions; completely assembled elements are delivered ready to install. Ceiling treatment (lower right), designed by Raffle Architects, incorporates both perforations and integral flange. A. Zahner Sheet Metal Co., Kansas City, Mo. ■

range of programs and solutions. We're proud to present this as number 700, and look forward to number 1,000 in or around the year 2017. S. A. K.

Learning the Bottom Line

# Labs Come of Age

By Nancy Levinson

Colleges and universities have been constructing science buildings for only about a century. Already, however, the evolving nature of scientific investigation has forced this relatively new building type through several phases. Built in the early decades of this century when mechanical ventilation systems were rudimentary, early science facilities were designed in one or another prevailing campus style, often collegiate Gothic or neo-Georgian (1); the labs then were little more than classrooms outfitted with plumbing and special case-work. By mid-century, academic science buildings began to change; inside and out, they reflected both the growing sophistication of building systems and the quickened pace of scientific discovery and technological advance. By the 1960s and '70s, their interiors were crowded with mechanical systems; laboratories overflowed with instruments and apparatus. And building exteriors often expressed all this. As John Nunemaker of Perkins & Will in Chicago observes, "There was a strong trend, then, towards expressing science buildings as such—as places of research. This led, for example, to a generation of buildings whose mechanical systems were articulated in the elevation."

Today, lab planners and users are again rethinking science buildings. To explore the issues that now determine the design of these facilities, RECORD spoke with designers, facility managers, and science professors across the country. Most agreed that the mid-'80s marked the start of a new era of academic laboratory design, in which architects have come to focus on the following issues:

**The research environment versus technology**

Academic science buildings vary greatly in size, form, organization, and image, but mostly they provide some combination of laboratories, lab-support space, classrooms, offices, and meeting rooms. They also differ from most other campus structures in that they typically house a complex network of mechanical and other equipment.

Lab designers agree that one critical task is balancing the needs of the building's occupants with those of its machines. "Lab buildings significantly affect the morale of a research community. Above all, they must support, in humane fashion, the working lives of scientists," says O. Robert Simha, director of planning at Massachusetts Institute of Technology. "But, inevitably, their mechanical systems

will powerfully influence the building's dimensions." In acknowledging the need for balance, designers today are reacting to the shortcomings of earlier science buildings. As Ian Adamson, of Payette Associates in Boston, notes, "Many lab buildings of the '60s and '70s were designed more for mechanical convenience than human comfort. Because it was efficient, they often had few windows—in one case, windows were actually value-engineered out of most of the building. As a result, scientists were spending long hours in dismal spaces." Architect Alton Parks of the Howard Hughes Medical Institute—which has co-sponsored construction of research centers on more than a dozen U.S. campuses—is also critical of this machine-centered approach. "Too often, the complexity of lab buildings is defined mainly as *mechanical* complexity. The real complexity involves understanding how a group of scientists works." The layout of laboratories—the dimensions of benches and aisles, the location of equipment, the delivery of services—must be painstakingly worked out. "Labs are such high-intensity, design-conscious spaces," notes Peter Samton of Gruzen Samton Steinglass in New York City. "They are used to the hilt, and architects must think about every inch of them." Lab planners also stress that architects must carefully resolve how laboratories relate to lab-support space and to offices, and how all these relate to formal and informal meeting rooms.

Even when emphasizing the user's comfort, lab designers should not underestimate the importance of hvac, plumbing, and electrical systems. "With lab buildings, it's as if you're designing duplicate, even triplicate, systems," says Michael Reagan of Ellenzweig Associates in Cambridge, Massachusetts. "Hvac systems, for instance, are complex, because so much experimentation is done in controlled environments like fume hoods, which may require dedicated air supplies (4). Plumbing multiplies when you add—besides the usual lines—pipes for lab waste, de-ionized water, vacuum, compressed air, and various gases (5). And electrical systems are intensive not only because labs need many outlets, but because they require about twice the illumination of typical classrooms." Taken together, ventilation and plumbing systems can account for 60 percent of the volume of a science building, and, in most cases, as engineer Brian Moore, of CUH2A in Princeton, New Jersey, says, "They will significantly determine that volume. Ductwork alone usually dictates floor-to-floor heights of 14 to 16 feet."

1. This early lab, Walker Laboratory at RPI, cost \$110,000 in 1906. 2. Columbia University's \$62-million Schapiro Center for Engineering and Physical Science Research marks a new kind of partnership with industry and government. Architects: HOK. 3. Audubon Research Building, Columbia University, by Davis, Brody & Associates. Flexible system permits a lab (shown) or an office layout.

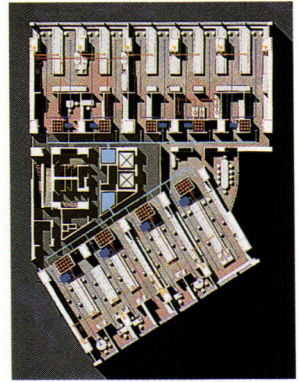


1



Joe Pineiro

2



3



# Today's academic science buildings must confront rising mechanical costs—in dollars and energy—and a new focus on the wellbeing of their users.

## Energy efficiency

Campus facilities managers describe science buildings as by far the costliest to operate, often using two or three times the energy of conventionally serviced structures. (One average six-foot fume hood, for example, requires 1100 to 1200 cfm of 100 percent fresh, conditioned air.) For this reason, most schools insist that these buildings be as energy-efficient as possible. Current consumption-cutting strategies include variable air-volume systems (for fume hood as well as building air), electronic energy-management controls, daylighting, and, climate permitting, heat-recovery techniques. Unfortunately, these conventional means rarely achieve big savings. "Certainly they help; but even in the best cases, labs use staggering amounts of energy compared with classroom buildings," says Jerry McFarland, director of planning and construction at Drexel University in Philadelphia. As Adamson says, "In the long-term, energy use may be the most vulnerable aspect of today's lab."

## Flexibility and adaptability

Lab planners agree that science buildings must be flexible. Their focus on flexibility is due partly to the current emphasis on interdisciplinary research. As lab consultant Ulrich M. Lindner, of Earl Walls Associates in San Diego, says, "This is the day of the hyphenated scientist." It is due also to cost. Science buildings can cost as much as \$300 per square foot, and, according to consultant Nolan Watson, of McLellan and Copenhagen in Seattle, "most schools expect to use these buildings for 25 to 50 years, before major renovation." More than program or cost, however, concern with flexibility is due to the pace of scientific discovery. Writes Watson, in the chapter on "Laboratory Facilities" in *The Handbook of Facilities Planning*: "The very nature of research is to discover new ways to render present techniques obsolete and, in turn, render the research facility obsolete." Clearly, this intensifies the designer's challenge, and flexibility must be carefully defined (3). Jon Schleuning, of SRG Architects in Portland, Oregon, notes that the flexible lab is often misunderstood to be the generic lab. "The fully flexible lab—one that can be used by chemists, biologists, physicists, and engineers—is not a usable prototype. It's far too expensive. Each discipline has its own equipment, and no institution can afford to supply all this." For this reason, lab designers often prefer the term *adaptability*, which they define not in terms of lab space itself—which is often generous and not hard to retrofit—but of mechanical capacity. "Lab

buildings become adaptable when their mechanical systems are adaptable," says Moore. "You can't easily predict change, but you can upsize the main ducts, install air-handling equipment with extra-large casings, allocate extra chase space, and build spare capacity into electrical systems. And you can make these easily accessible."

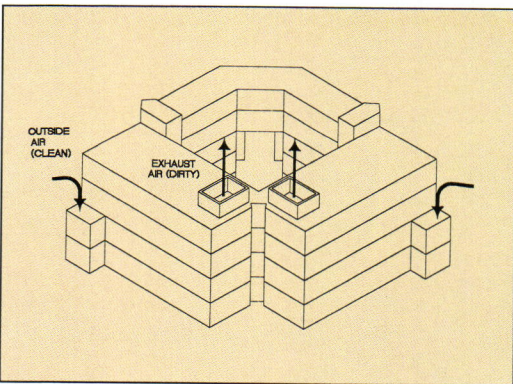
## Life-safety, environment-drive design

A generation ago, health and environmental concerns had comparatively little effect on laboratory design. Today, environmental and life-safety laws affect science buildings enormously. Most obviously, they contribute to the complexity of mechanical systems. Codes require, for example, that more chemical experiments be done in fume hoods; they require also that these hoods use 100 percent fresh air, and, in some cases, that they be separately exhausted to avoid undesirable mixing of gases. Contemporary chemistry labs thus have more hoods and fewer benches—and far more ductwork. Regulations also influence the layout of labs. Years ago, a principal investigator's office was typically located within or next to his or her lab. Today, however, largely due to heightened awareness of the danger of exposure to toxic substances, the professor's office and graduate student's workstation have moved out of the lab, sometimes across the corridor and sometimes even to a separate wing.

Regulations even affect the variety of spaces in science buildings. In today's strictly controlled labs, occupants are forbidden by code to eat, drink, smoke, or apply makeup. As a result, science buildings now include "interactive" spaces. As the projects on the following pages show, these can be seminar rooms, common rooms, lounges, stairhalls with window seats, roof terraces, atria, landscaped courtyards, or spacious front lawns. "Good science buildings," says Simha, "encourage the sharing of ideas, which is essential to the success of the enterprise."

## New interest in building image, amenity

Designers and users agree that many lab buildings of the '60s and '70s—with their blandly rational exteriors, their cramped and dreary interiors—have aged poorly. Today, in reaction, schools are keenly interested in the image and amenity of their science buildings. "These used to be backlot facilities. Now they're prominent buildings, even gateways," says Perkins & Wills' Nunemaker. This new *Continued on page 120*



4. At Engineering Unit II at University of California, San Diego, exhaust fans are placed in locations remote from air intakes. Ove Arup & Partners California, engineers; Zimmer Gunsul Frasca Partnership, architects. 5. Materials and Life Sciences Building at Northwestern University (by Perkins & Will) has large rooms with overhead piping for equipment flexibility.

**P**hysics is the fundamental science, the study of matter and motion and the relationship between the two. At the University of Miami, the James L. Knight Physics Building takes heed of that in subtle ways, with copper-clad vaulted rooftops that, by implication at least, show human mastery over material. The building sits at the northern edge of the campus (to the right of axonometric), shielded by a thicket of trees from the surrounding residential neighborhood of Coral Gables.

The university wanted a “science quadrangle” at this end of the campus. Thus the Knight Physics Building forms one part of the perimeter of a quadrangle it creates with the engineering school to the east and a school of sciences to the south. “We tried to stretch the building as much as we could,” says Michael Kerwin, the Spillis Candela & Partners vice president who conceived the building’s design, which the Enrique Marciá team then completed.

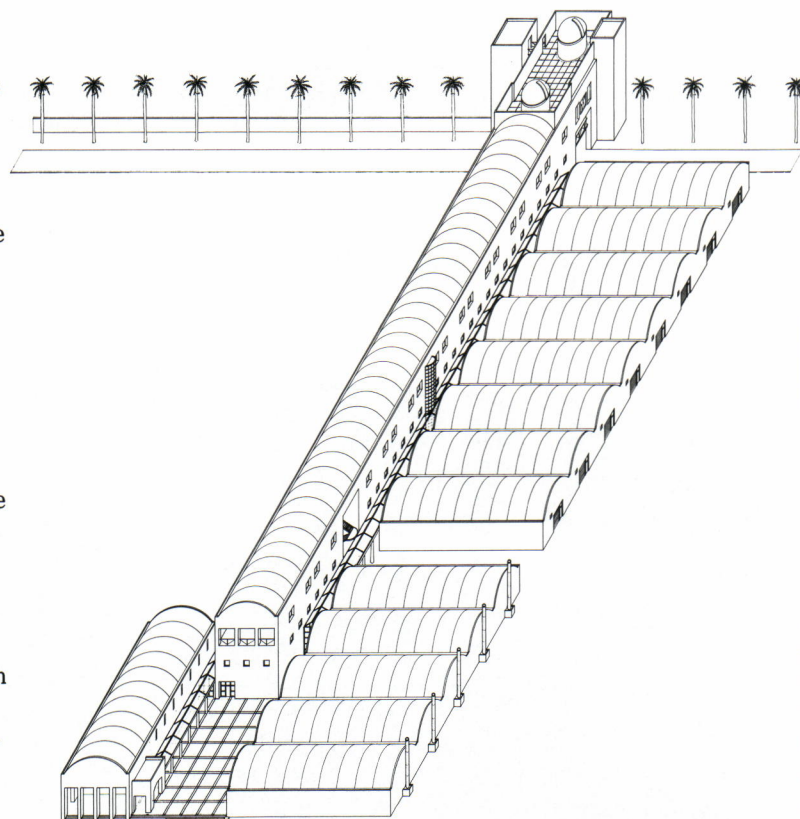
The need for highly secured lab space produced a program that included a strict hierarchy of uses from accessible to inaccessible—a public auditorium, undergraduate classrooms, semiprivate graduate student labs, private faculty offices, and the large protected labs. In the tall part of the building, undergraduate classrooms and labs are on the first floor, graduate facilities are on the second, and faculty offices and a small physics library are on the third. A glass-roofed arcade between the high and low parts of the building is meant to be a meeting place for everyone.

It is in the large laboratories in the low part of the building that the main experiments are done. These are bare-bones spaces in which environments are built to test the behavior of such phenomena as sound, movement, and light. The activities often resemble a construction site as much as a science facility. Each lab has its own climate controls, but there was no need for these to be especially elaborate. Spillis Candela did set the labs on isolated, movement-free slabs to prevent vibration transmission from one lab to another and to avoid vibration from the elevators. Ceilings are high, with exposed-steel fireproofed roof-trusses. Huge “garage” doors at the end of each lab allow for the delivery of new equipment. Most technical innovation here is left to the physicists themselves. The auditorium, which opens out onto a small courtyard, is designed with a catwalk and a back-of-the-house storage and preparation area to allow for the theatrics that are necessary to many a physics lecture.

The architects studied the original campus plan done in 1926 by Coral Gables architect Phineas Paist (which envisioned a now-truncated major boulevard extended through the campus), and then studied the reality. The dominant historical style in Coral Gables is Mediterranean Revival, but the University of Miami campus is more a confusion of comparatively dreary postwar institutional styles. The Knight Physics Building makes reference to both. Thus, openings are squared off rather than arched; aluminum-frame windows and steel railings are austere. But the precast concrete panels cladding the tall concrete-frame structure and the stucco over concrete block of the low one are painted in Mediterranean colors. The main stair (previous page) is the most classical gesture in the building, while the piers along the open corridors give it a steady cadence and solidity. *Beth Dunlop*



© John Gillan photos



*The main entrance (above) is on the axis of what was to have been a major boulevard in the 1926 Coral Gables masterplan. To reinstate some of the original plan, the architects hope to see it used as a campus entry as well. Named for the late chairman of Knight-Ridder Inc., the media company, the building cost \$11.2 million.*



*Boyer Center for  
Molecular Medicine  
Yale Medical School  
New Haven, Connecticut  
Cesar Pelli & Associates,  
Architects*

# Collegial Crosstalk



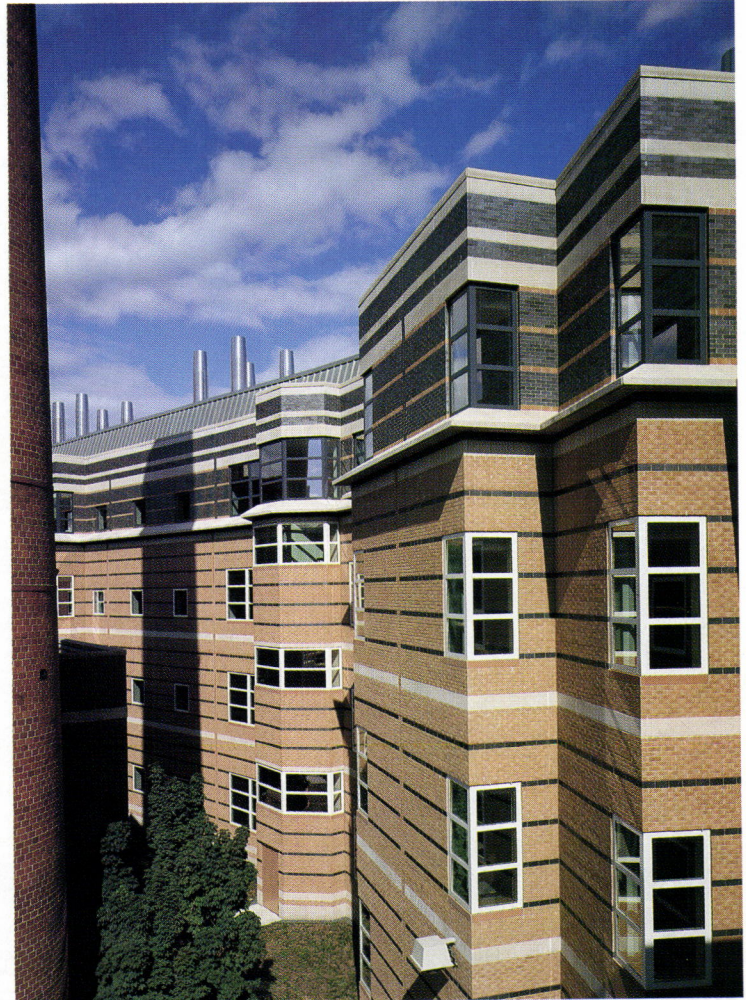
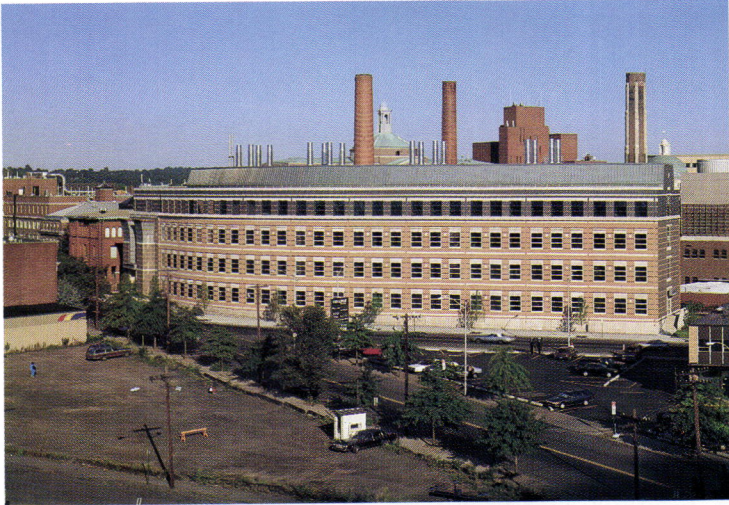
*Yale's new center for multi-disciplinary biomedical research connects with the broader campus community.*



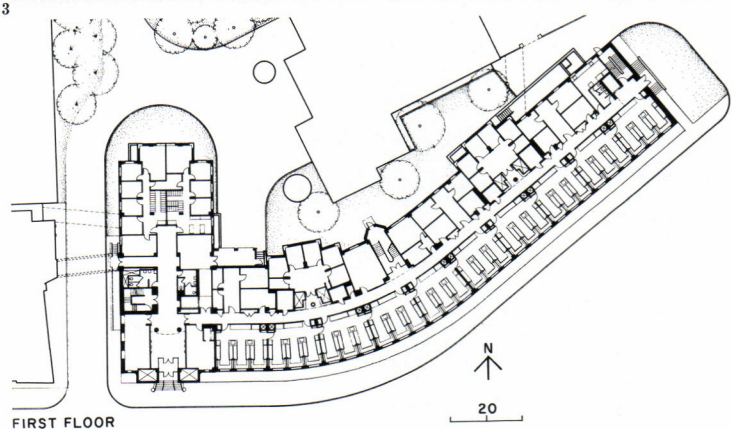
The 138,000-square-foot Boyer Center disposes flexible loft space for research labs in 30- by 30-foot bays along the south facade's 350-foot-long curve (1). Across the central corridor, support/service spaces are interspersed with staff offices which are clustered around reception/conference areas and offset (3) to provide corner windows that escape head-on views of the power plant. Break

rooms on each floor and benches in halls and stairwells encourage casual contacts among researchers; more formal shared spaces are in the headpiece. On the first floor a modest lobby flanked by conference rooms introduces an administrative suite to the rear; second-floor conference space includes a small auditorium adjacent to a terraced common room. Core resource

labs occupy the two upper floors, with additional support facilities in the basement. Scrubbers housed in the mechanical penthouse jet exhaust air through missile-like stacks (2). The two-story entrance lobby (4, 5) is paneled in maple-trimmed oak that continues in wainscoting along the center corridor, whose gentle curvature and generous borrowed daylight from re-



SECTION THROUGH LOBBY



FIRST FLOOR

N

20

cessed glass-paned doors and clerestories lessen the visual impact of its daunting length. Inside the loftlike stretch of laboratories (6), an internal passage links U-shaped 10-foot-wide lab modules organized in bays of three.

Wood-trimmed cabinets soften workmanlike lab fittings, which include constant-exhaust fume hoods and "wet" utilities.

**Credits**

*Boyer Center for Molecular Medicine*

*Yale School of Medicine  
New Haven, Connecticut*  
**Owner:** Howard Hughes Medical Institute/Yale University

**Architect:** Cesar Pelli & Associates—Cesar Pelli, design principal; Fred Clarke, project principal; Bruce W. Sielaff, project manager; Robert

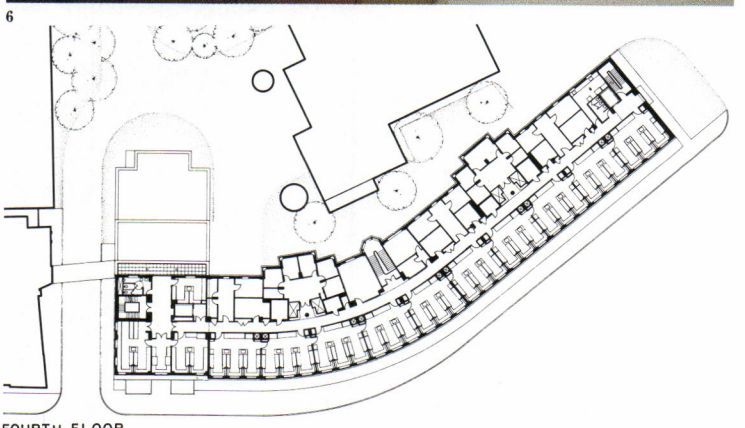
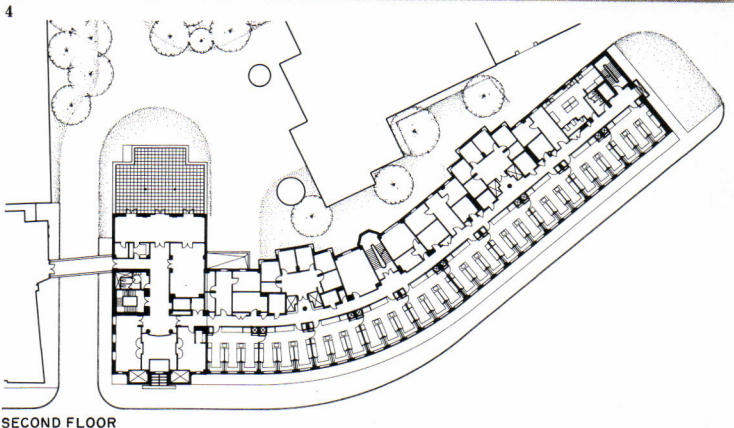
Taylor, design team leader; Timothy McGrath, Roger Schickedantz, project architects; Richard Brown, Roberto Espejo, Mark Hesselgrave, Michael Hilgeman, Walter Miller, Susan Papadakis, Benjamin Schreier, designers; Julann Meyers, Karen Koenig, Charlotte Breed, interiors  
**Engineers:** Martin Horton & Associates (structural);

*vanZelm Heywood & Shadford, Inc. (MEP)*

**Consultants:** Balmori Associates, Inc. (landscape)

**General Contractor:** Turner Construction Company

**Manufacturer Sources:**  
See Contents page



SECOND FLOOR

FOURTH FLOOR

**T**he Oregon Institute of Marine Biology lies on a small sliver of beach between a sheltered boat basin just off Coos Bay and a bluff covered with undisturbed old-growth forest. The sights, sounds, and smells of the sea permeate what feels more like a fishing camp than a college campus, and justly so. This site has history. The Institute's first lab and dorms were recycled from 1930s Civilian Conservation Corps buildings, some of which in turn had been recycled from Corps of Engineers buildings built here in the 1910s.

The Institute operated in these buildings from the 1960s until the early 1980s when, as Nora Terwilliger, a longtime teacher and researcher at the Institute says, "the termites were eating them up faster than we could fix them. We needed a new facility to keep attracting good people. The old place had a tremendous kind of social success; groups that came there became cohesive very quickly." University planner Fred Tepfer adds wryly, "Sometimes that happens with bad facilities. But we didn't want to lose that positive quality when we took out the element of adversity."

The University of Oregon's pattern language-based planning process allowed university planners to help the OIMB users establish program requirements for the new campus before the SRG Partnership was hired as architect. SRG's design team, headed by partner Jon Schleuning, then held workshops with users to discuss and refine their ideas and come up with a design. The resulting campus comprises 18 buildings, 14 of which are new. The buildings are arranged to form courtyards that open toward Coos Bay on the east, and back up toward the bluff on the west.

A curving sidewalk links four courtyards, starting at the campus's south end with the space formed by the administration building and research lab buildings. A second court is formed by the research building and south teaching lab-dorm. The walk continues north to the "hearth" formed by the dining hall and south and north lab-dorm buildings, and goes northward again to a "staging" courtyard where equipment and people are assembled for field trips. Cottages for faculty are located north of the field trip and equipment buildings. Though the buildings here were deliberately laid out to create sightlines and paths, the campus has an informal quality, as if it grew spontaneously over time without surveyor's equipment.

The new structures are clad in gray-stained cedar shingles, fitted with white-painted wood trim, operable wood windows, and wood doors. SRG used wood in lieu of metal throughout the buildings to reduce maintenance in the corrosive coastal atmosphere. The climate is mild enough not to require cooling equipment, and all buildings have been kept less than 28 feet wide for better cross-ventilation and daylighting. Windows on south elevations are much larger than those on the north to limit winter heat loss.

The laboratories require a constant supply of running seawater. The low-tech system pumps it from the Bay to a storage tank on the bluff above the campus. It is gravity-fed from storage to the labs through one of two identical pipe systems. The second system assures a backup whenever the first is being cleaned or repaired. In each lab the seawater flows overhead through plastic pipes that can be tapped anywhere seawater is needed. After use, the water flows into a trench drain in the floor that runs parallel to the supply piping, and is released outside into a stream that returns to the sea. Seawater is highly corrosive, so all light fixtures, light switches, electrical outlets, and other equipment in the labs is corrosion-resistant and vaporproof. *Charles Linn*



Michael Parker

*The Oregon Institute of Marine Biology (above) is very much a part of the community of Charleston, nestled between the harbor, fish-processing plants, and Coast Guard housing.*

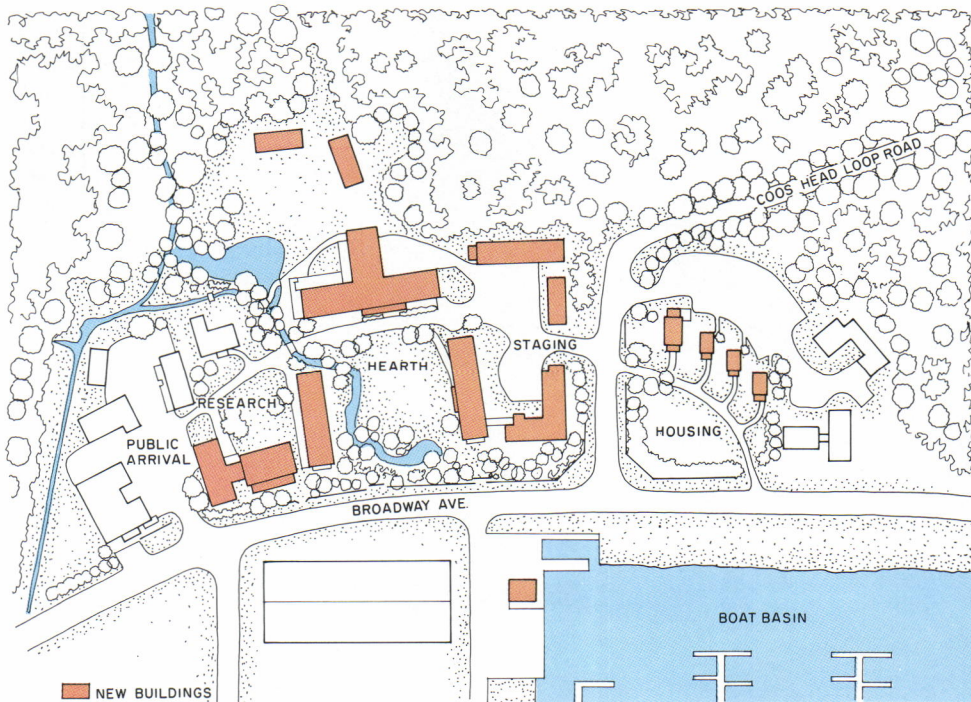
*Located in the center of the campus and facing east toward Coos Bay, the dining hall-dormitory (opposite top) is the largest building at the Institute and contains a dining area, kitchen, a classroom used for guest lectures, and student housing upstairs. The entrance, outside porch, and sun porch are adjacent to the main pedestrian walk through the campus to encourage meeting. The courtyard formed by the dining hall and two flanking laboratory-dormitory buildings is the "hearth" of the campus and is used for volleyball and basketball games and other informal gatherings.*

*Visiting instructors and researchers stay in simple cottages at the north end of the campus (opposite bottom). These also face the Bay, and are sited along the same curving sidewalk that runs in front of the dining hall.*



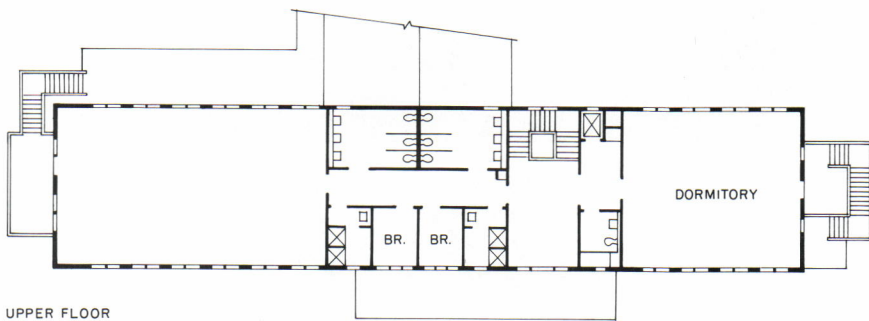
Ed Hershberger photos, except as noted



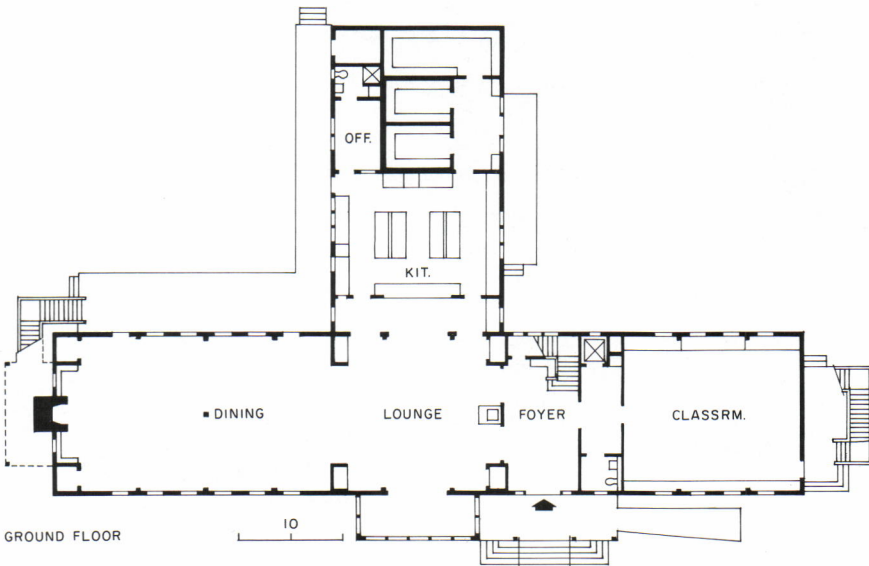


The dining hall (plan, bottom, and opposite top) with dormitories upstairs is the heart of the Institute's informal campus (site plan, left). Here, students and faculty enjoy a variety of spaces for dining and conversation, from the very open areas to a semi-private alcove with a corner window overlooking a stream, volleyball court, and nearby buildings.

Research labs (opposite bottom left), teaching labs, and specimen holding tanks (opposite bottom right) feature running seawater and corrosion-resistant materials (light fixtures; wood in lieu of metal) where they would not normally be expected. SRG deliberately kept all buildings on the campus narrow in width to facilitate daylighting and cross-ventilation.



UPPER FLOOR



GROUND FLOOR

**Credits**

Oregon Institute of Marine Biology

University of Oregon  
Charleston, Oregon

**Owner:** University of Oregon—Fred Tepfer, University planner; Mike Greybill, Jan Hodder, Don and Betty Rogers, Jerry Rudy, Bob and Nora Terwilliger (user group)

**Architect:** SRG Partnership—Jon R. Schleunig, partner-in-charge; William Tripp, project designer; Jon Deckerd, project architect; Alan Osborn, Julie Clupatch, Terry Dieter, Naomi Caplin, design team; William C. Church, design consultant

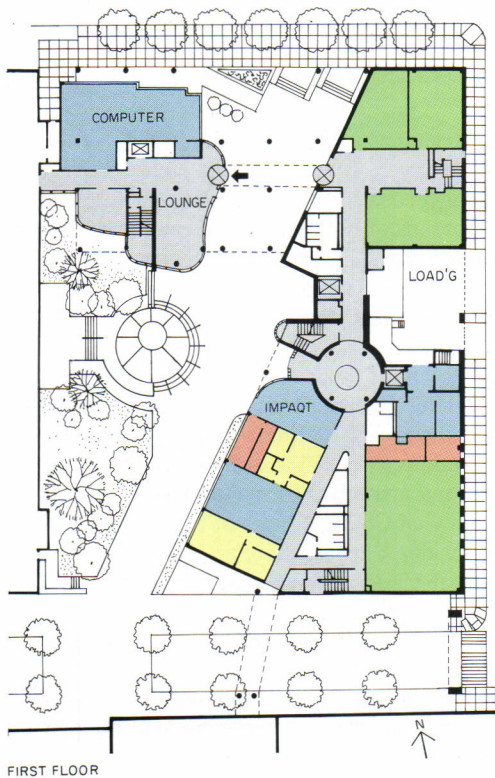
**Engineers:** Stanley Carlson & Associates (structural); Carson, Bekooy, Gulick, Kohn (mechanical/electrical)

**Consultants:** Walker & Macy (landscape design); Doug Hollis (artist)

**Contractor:** Wildish Construction

**Manufacturer Sources:** See contents page

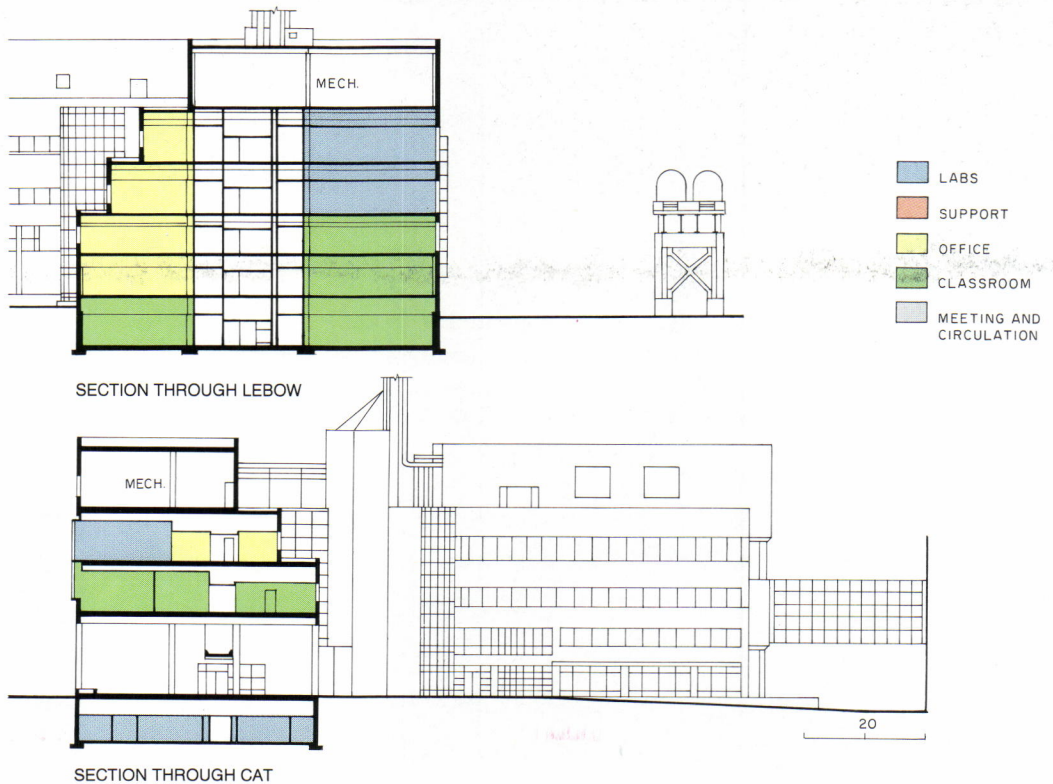




*With labs serving a wide variety of needs, Kling-Lindquist dispensed with the neat rows of modular bays typical of most research buildings (plans left). The architect used glass to make much of LeBow/CAT's work visible. The ground-floor IMPACT lab combines closed offices, a demonstration room, and a glass-walled lab that opens onto the courtyard (plan far left). Noontime loungers may be startled by a six-legged robot being put through its paces. Bridges one level above grade tie the new building to older ones. The orange brick is a Drexel signature, but the courtyard's intimate sense of enclosure (above) departs from Drexel's past, in which projects (including some by Kling-Lindquist) typically have been undistinguished boxes, each unrelated to its neighbors.*



*The LeBow Engineering Center offers a face to Market Street, an important artery, that abstractly suggests a Classical division (above). Within an arcade, a glass-enclosed computer lab “advertises” the university’s engineering program. Two-story-high windows bring ample north light to third- and fourth-floor labs; the mechanical penthouse is indicated by round attic windows. The architect’s original diagram proposed offices facing the courtyard and labs facing outward. Ever-changing research and teaching realities required a less “pure” approach (sections right), but one that creates places that support more interaction among students and researchers. One basement classroom, for example, was supplanted by a vibration-sensitive lab.*





For LeBow/CAT, Drexel sought to depart from a research tradition of closed doors and windowless corridors and create a more visible research presence. Curving window walls frame views toward the inner courtyard from a stair in LeBow (top left) and from the double-height lobby lounge (bottom left). On the other side of the courtyard, experiments in computer-controlled manufacturing processes are visible to passers-by. The rooftop is a constructivist display of fume-hood exhausts (below). In the fibrous materials lab (as in other materials-sciences areas) most work is done with freestanding equipment rather than on more-familiar lab benches. A new fiber-strand braiding device (foreground of photo opposite) shares lab space with a nearly 100-year-old predecessor (device with metal loop in background).

#### Credits

LeBow Engineering Center/  
Center for Automation  
Technology, Drexel University  
Philadelphia, Pennsylvania

**Owner:** Drexel University

**Architect:** Kling-Lindquist  
Partnership—Charles E.  
Bailey, partner-in-charge; Eric  
A. Chung, design principal;  
Gene Spurgeon, Peter Dustin,  
project managers

**Engineer:** Kling-Lindquist  
Partnership (structural,  
mechanical, electrical)

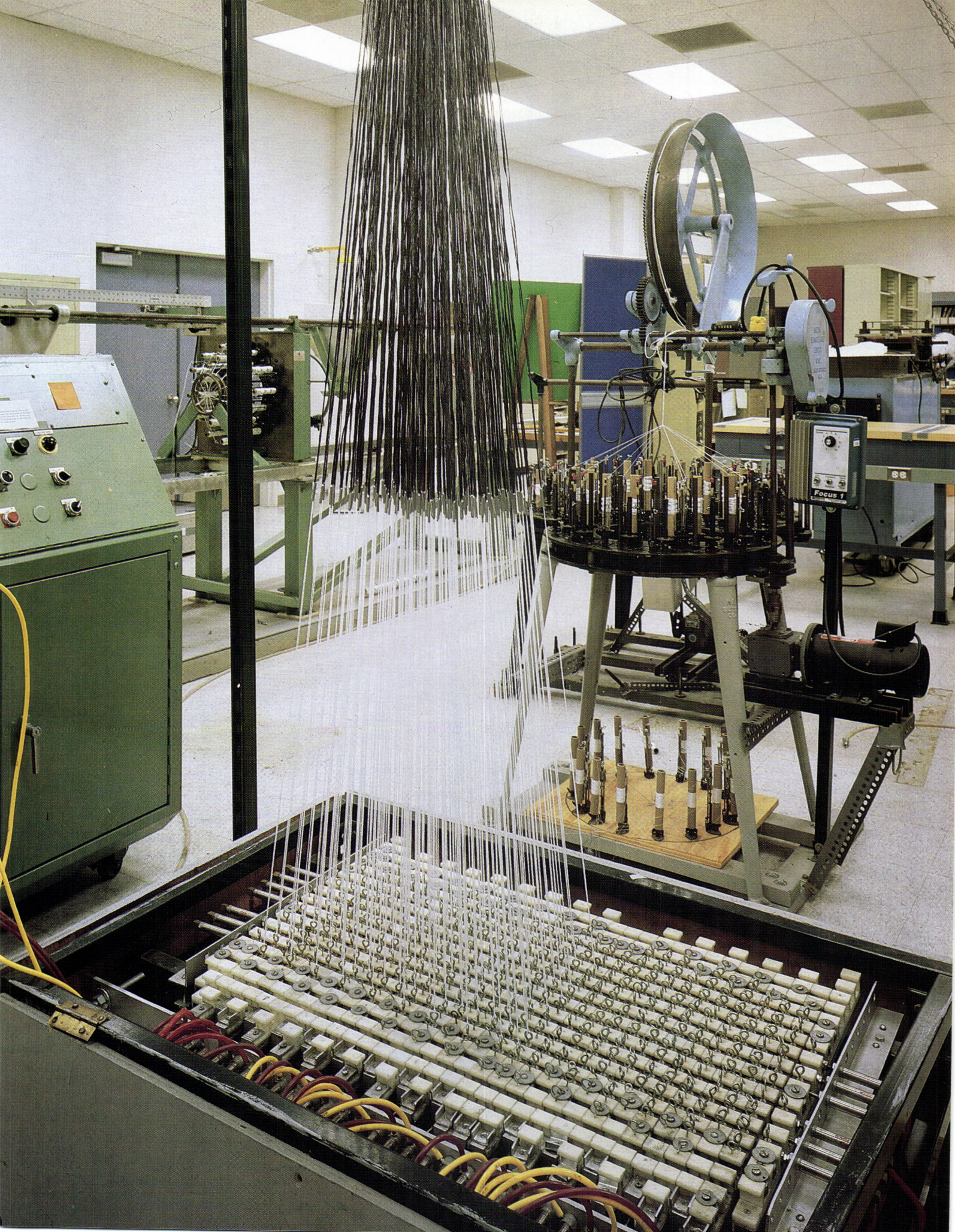
**Consultants:** Shen, Milsom  
Associates (acoustics)

**Contractor:** Daniel J. Keating  
Company

**Manufacturer Sources:**

See Contents page





# Friendly Fellow





*A state-of-the-art facility respects  
its academic neighbors and fosters  
chance meetings.*

*Burke Laboratory, Dartmouth College  
Hanover, New Hampshire  
Ellenzweig Associates, Architects  
R. M. Kliment & Frances Halsband,  
Architects, Associated Architects*



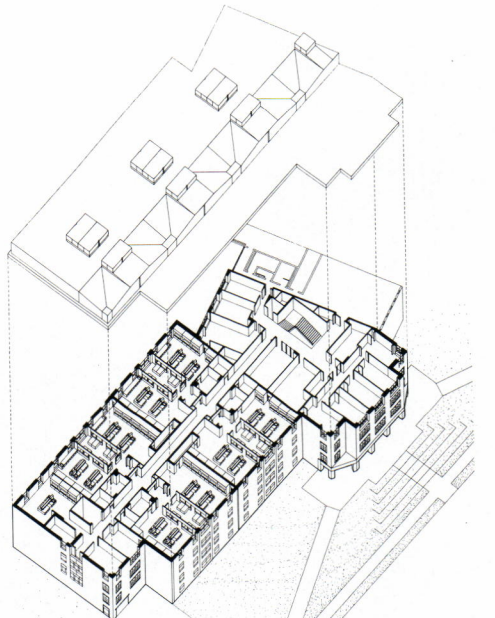
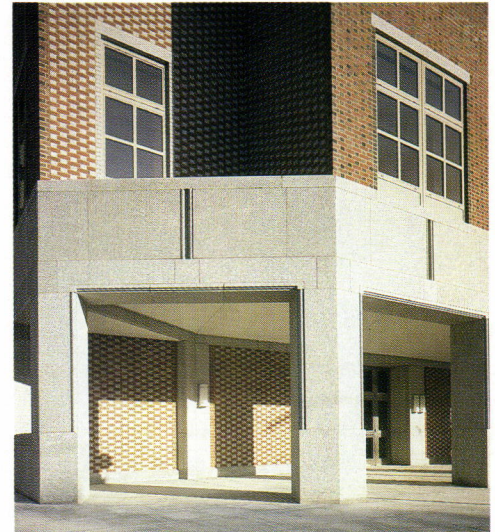
The design of Burke Laboratory at Dartmouth College posed for its architects—Ellenzweig Associates of Boston with associated architects R. M. Kliment & Frances Halsband Associates of New York City—a three-fold challenge. First, the new building had to provide the school's chemistry department with up-to-the-minute teaching and research laboratories, offices for faculty and graduate students, and formal and informal meeting rooms. Next, through careful siting and exterior design, the building had to bring coherence to a stylistically diverse complex of science buildings constructed over 50 years. Finally, to strengthen the department's identity within the college, it had to hold its own architecturally yet fit in with Dartmouth's idyllic New Hampshire campus.

With its long experience in lab design, Ellenzweig Associates has accommodated a detailed program within a strong, clear parti: laboratories and research support spaces are all in one section of the 81,000-square-foot building, while most offices and meeting rooms are grouped around a handsome three-story stairhall. The parti separates spaces that must be kept clean, controlled, and conditioned from areas with looser requirements. (In labs, for instance, eating and drinking are forbidden by code, while offices are subject to no such rules.) It also sharply cuts operating costs, by allowing laboratories, whose fume hoods must be supplied with 100 percent fresh air, to be serviced separately from offices, whose air is recirculated. And splitting laboratories from offices—a break with department tradition—acknowledges the school's concern with occupant safety, by limiting researchers' exposure to potentially toxic chemicals and gases.

Some Dartmouth professors may miss the old proximity of office to laboratory, but few will regret the old labs themselves. Located in gloomy Steele Hall (1922), these spaces had over the years become crowded with benches, shelving, ducts, pipes, and all manner of retrofitted instrumentation. In contrast, the new labs are spacious and light, with large windows looking to the hilly countryside. To enhance the sense of openness and for easier access to its mechanical systems, the architects chose to leave exposed the building's ducts, pipes, and poured-in-place concrete structure.

In their choice and use of exterior materials, and through skillful manipulation of proportions, Kliment & Halsband have made Burke distinctly contemporary, yet contextual with Dartmouth's older buildings. With its Flemish-bonded brick, granite portico, and regular pattern of large metal windows, the building fits neatly into the red-brick, neo-Georgian campus. Closer by, Burke's materials acknowledge its neighbors. Its warm gray metal windows and penthouse complement the purplish precast concrete of Fairchild Hall, the 1974 structure next door; its rosy brown waterstruck brick extends the brick palette of Steele.

In siting the building, the architects responded to the College's charge that Burke, along with Fairchild, Steele, and nearby Wilder hall, form a unified science complex. The connection of Burke's stairhall to Fairchild, then beyond to Steele, encourages contact among the scientists and students. After considering, then rejecting a hillside site, they chose to link the new structure directly (and successfully) to Fairchild. The adjacency serves to deemphasize the undistinguished street facade of Fairchild. Says Gordon De Witt, Dartmouth's director of facilities planning, "The consensus here is that Burke actually *improves* Fairchild—improves this whole part of the campus." *Nancy Levinson*



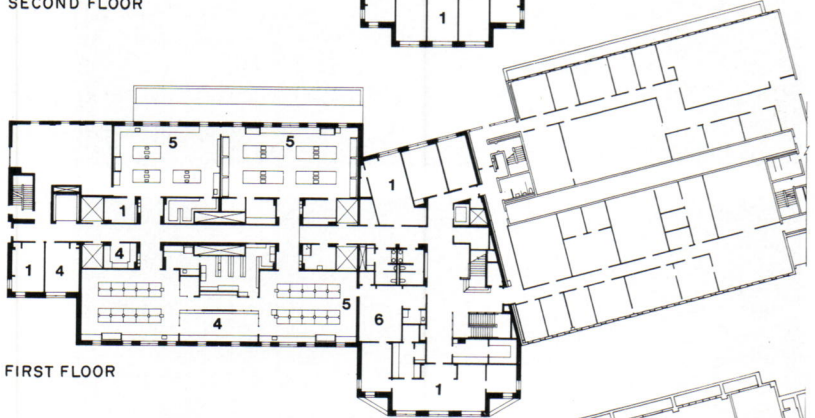
Like most laboratory buildings, Burke's design is strongly influenced by its high density of mechanical services. The ground-floor mechanical room and penthouse together comprise almost 17,400 of the total 81,000 square feet. According to project manager Leslie Sims, of Ellenzweig Associates, these spaces, along with shafts, account for 25 percent of the building's volume. Floor-to-floor heights are 14 feet—a dimension taken from adjacent Fairchild, but which accommodates the necessary ducts and pipes. Burke's poured-in-place concrete structure was chosen in part to reduce vibration—of major concern to researchers—and in part because the architects preferred the sleeker and more finished look of exposed concrete to a fireproofed metal deck.

You approach Burke along one of the two diagonal paths (opposite).

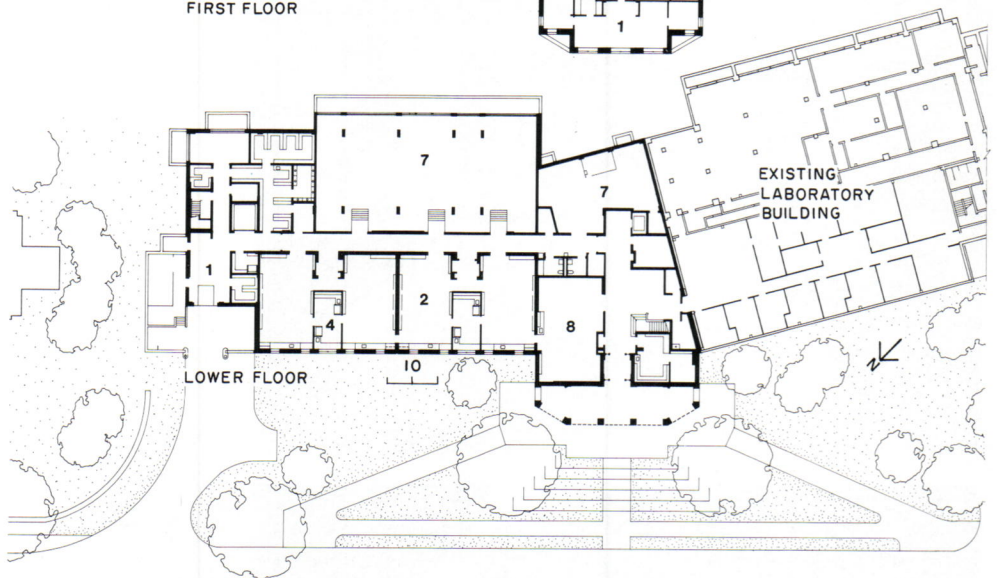
Spaces that must be kept clean and conditioned are separated from spaces with looser requirements, such as offices. This cuts operating costs, since only laboratories with fume hoods require 100 percent fresh air.



SECOND FLOOR

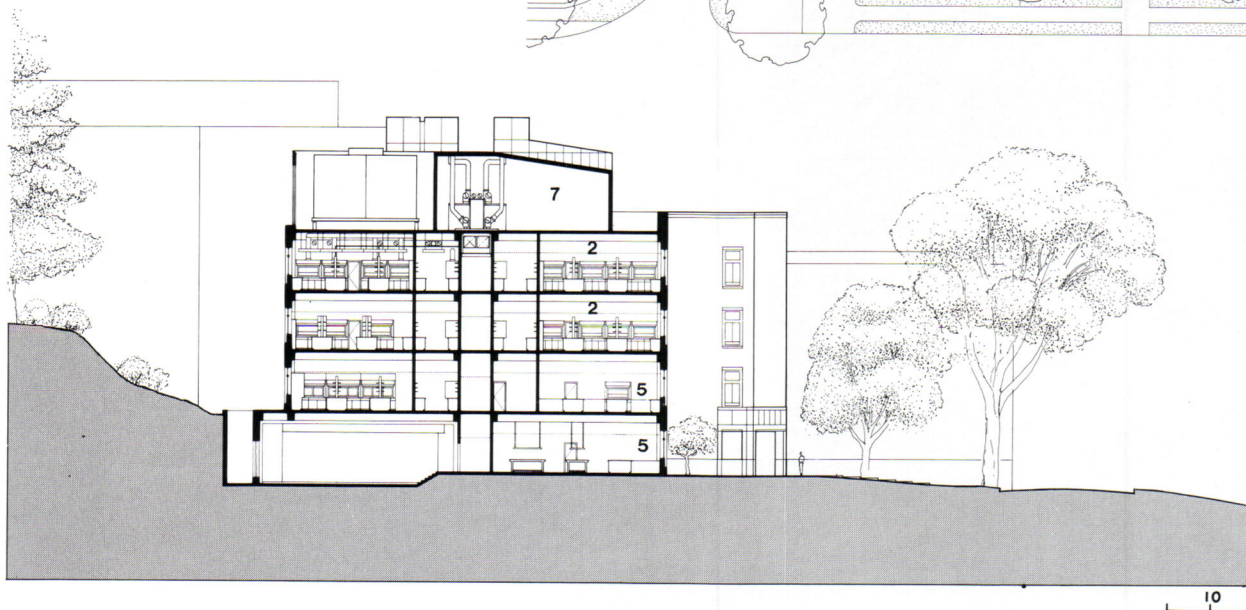


FIRST FLOOR



LOWER FLOOR

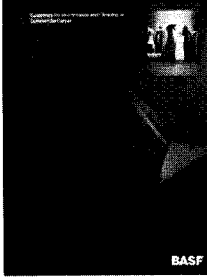
EXISTING LABORATORY BUILDING



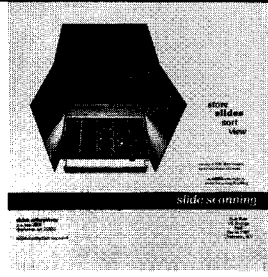
1. Office
2. Research lab
3. Student write-up
4. Support
5. Teaching lab
6. Lounge
7. Mechanical
8. NMR room

# Product Literature

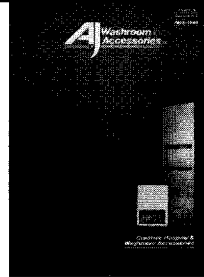
For more information circle item numbers on Reader Service Cards.



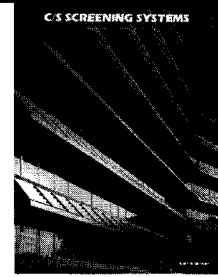
**412. Carpet-maintenance guide**  
A booklet for architects, interior designers, and facility managers discusses the importance of planned maintenance in keeping commercial carpet at maximum appearance levels throughout its specified life span. Chapters range from picking the right color and pattern for anticipated traffic to on-site carpet repairs. BASF Corp., Williamsburg, Va.



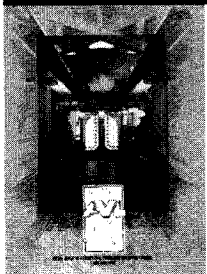
**413. Illuminated slide storage**  
Equipment for the large-volume graphic requirements of design offices is shown in a fold-out brochure. Flat trays hold 120 slides each, ready for viewing, project by project. Compact Abodia units can hold as many as 64,000 slides. Elden Enterprises, Charleston, W. Va.



**414. Washroom accessories**  
A 48-page catalog illustrates stainless-steel soap and towel dispensers, mirrors, cabinets, shelving, grab bars, and other accessories for commercial, institutional, hospitality, and healthcare applications. Units that meet federal ADA guidelines are included. Dimensions are given for all products. A&J Washroom Accessories, New Windsor, N. Y.



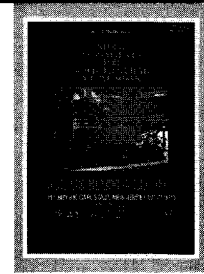
**415. Screening systems**  
Aluminum grilles for sight screening, building refacing, ventilation, and solar control are pictured in an eight-page brochure. Designs specified by I. M. Pei and Partners and Kohn Pedersen Fox demonstrate the custom capabilities of modular, geometric grilles. Finish options and mounting details are illustrated. The C/S Group, Cranford, N. J.



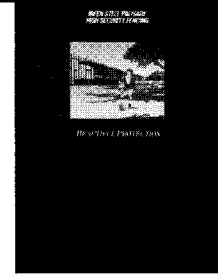
**416. Acoustical treatments**  
Brochure describes ceilings designed to control sound and unwanted acoustic reflection, absorption, and transmission. Fiberglass-core panels and other components are covered with vinyl or fabric to provide a custom solution to noise problems while resisting abuse and high humidity. AVL Systems, Inc., Ocala, Fla.



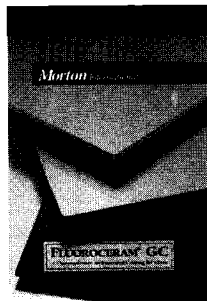
**417. Anodized colors**  
A pocket-size selection chart contains actual metal samples anodized using Swiss-made Sandalor dyes. Colors range from yellows, through various golds and reds, to turquoise and dark blues. Architectural Anodizing Corporation of America, Elkhart, Ind.



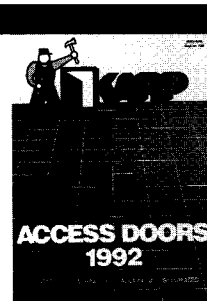
**418. Railings**  
A colorful catalog has 52 pages on railing systems for all applications, from high-end retail to wastewater treatment. It describes the non-welded Connectorail and site-specific Carlstadt product lines, along with customizing components of wood, glass, and acrylic. Julius Blum & Co., Carlstadt, N. J.



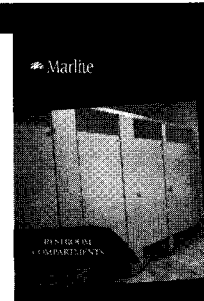
**419. High-security fencing**  
A European design, the Irfen palisade fence is made of hot-dip galvanized steel in three finish options, including custom-color PlasGalv polymer coating. A distinctive, three-point Triad head design combines entry deterrence with a uniform esthetic that can accommodate varying ground levels. Irfen Industries, Inc., Chicago.



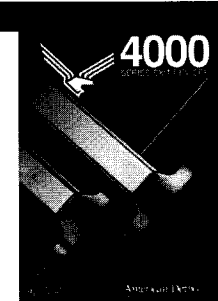
**420. Opacifier**  
Design guides explain how Fluoroceram GC coatings are factory-applied and oven-fused to properly prepared structural glass substrates, and illustrate the appearance options offered by applying the 70 percent fluoropolymer resin to in-board and exterior lights of glass. Morton International, Chicago.



**421. Access doors**  
Flush and recessed doors and hatches may be specified to blend or complement any wall or ceiling finish. A 16-page catalog shows all door and frame choices, including fire-rated and security units. Karp Associates, Inc., Maspeth, N. Y.



**422. Toilet compartments**  
A six-page catalog describes melamine component-panel partitions, said to have the decorative range of laminate surfaces for the lower cost of steel compartments. Floor-mount, overhead braced, and door-and-frame configurations are shown in different layouts. Marlite, Dover, Ohio.



**423. Exit devices**  
Architectural brochure describes narrow-stile vertical rod, rim, surface-vertical rod, and mortise exits, listing full specification data and detailing installation requirements for each product. American Device Mfg. Co., Steeleville, Ill. ■

## Manufacturer Sources

For your convenience in locating building materials and other products shown in this month's feature articles, RECORD has asked the architects to identify the products specified.

### Pages 62-67

James L. Knight Physics Building  
University of Miami  
Spillis Candela & Partners, Architect  
Cast-in-place and precast concrete: Stresscon.  
Standing-seam copper roofs: Berridge Mfg. Co.  
Aluminum-framed windows and glazing: PPG Industries, Glass Group. African-mahogany cabinetwork: Frederick Schill. Fixed seating: Krueger. Outdoor lighting: Street Lighting Equipment Corp.(custom). Elevators: Otis.

### Pages 68-73

Boyer Center for Molecular Medicine,  
Yale Medical School  
Cesar Pelli & Associates, Architects  
Brick: Glen-Gery Brick. Masonry trim: Indiana Limestone; Briar Hill Sandstone; Wass Precast Stone. Mortar: Colorbond. Coal-tar roofing: Koppers, Inc. (Built-Up Roofing Membrane System). Metal roofing: W. P. Hickman Co. (Micro Zinc). Outdoor step-lighting fixtures: Devine Lighting; Bega/FS. Aluminum window system: Wausau Windows (Visuline). Insulated glass: Viracon, Inc. Selective-transmission interlayer: Southwall Technologies (Heat Mirror). Skylights: Super Sky Products, Inc. Entrance: Wausau Metals Corp. Stile-and-rail and solid-core wood-vener doors: Weyerhaeuser Co. Fire doors: Cookson Co. Locksets and door closers: Sargent & Co. Hinges: The Stanley Works. Floor closers: Rixson-Firemark, Inc. Automatic door operators: Stanley Magic-Door, Inc. Panic devices: Von Duprin. Wet-standpipe sprinkler: Grinnell Corp., Reliable. Concealed hinges: Häfele. Drawer slides: Grant Hardware. Acoustical ceilings: Armstrong World Industries (Finetex). Exposed suspension grid: National Rolling Mills. PVC ceiling system: Kemlite (Fine-X Glasbord). Gypsum drywall: Gold Bond Building Products; United States Gypsum Co.; Marine Industries Corp. Red-oak cabinetwork and laboratory casework: Fisher Scientific. Custom millwork: Valley City Mfg. Co., Ltd. Paints and stains: Glidden, Inc.; US Paint; Benjamin Moore & Co.; Themec. Red-oak tambor wainscoting and maple trim: Winona Industries. Laminate surfacing: Ralph Wilson Plastics. Quarry tile: American Olean. Vinyl-composition tile: Tarkett; Vinyl Plastic, Inc. Sheet-vinyl flooring: Tarkett (Multiflor). Conference-room carpet: Karastan. Parabolic lighting: Lithonia. Linear fixtures: Peerless Lighting Corp. Undercounter task lights: Alkeco (Little Inch).

### Pages 80-85

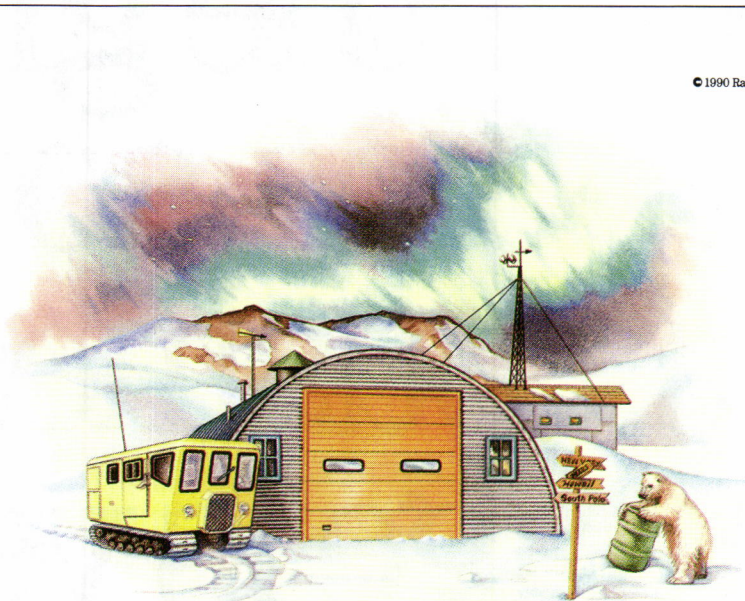
LeBow Engineering Center/Center for Automation Technology, Drexel University  
Kling-Lindquist Partnership, Architect and Engineer  
Brick: Taylor. Anodized-aluminum curtain walls and aluminum windows: Kawneer, Inc.; National Glass. Entrances: Kawneer, Inc.; Lupton. Stainless-steel locksets: Corbin Hardware. Sprinkler system: Oliver. Ceilings: Armstrong World Industries. Suspension system: National Rolling Mills, Inc. Gypsum drywall: United States Gypsum Co. Operable walls: Modernfold, Inc. Paints: M. A. B.; Plastic laminate: Ralph Wilson Plastics Co. Seamless-vinyl flooring: Hüls, Inc. (Mipolam). Office

furniture: Steelcase, Inc. Amphitheater seating: American Seating. Laboratory casework: Duralab Equipment Corp.; St. Charles. Fluorescent fixtures: Columbia Lighting. Metal-halide pole-mount luminaires: Staff Lighting. Elevators: Dover.

### Pages 86-91

Burke Laboratory, Dartmouth College  
Ellenzweig Associates, Architects  
R. M. Kliment & Frances Halsband, Architects, Associated Architects  
Waterstruck brick: Morin Corp. (College Blend). Granite: Stanstead. Curtain-wall metal panels: Alpy Architectural Panels. Adhered and ballasted EPDM roofing: Carlisle SynTec Systems. Aluminum windows: Modu-Line Windows, Inc.

Stainless-steel entrances: Dawson Metal Co., Inc. Aluminum grilles: Overhead Door. Mortise locksets: Corbin Hardware. Hinges: Stanley. Closers: LCN. Checks and operators: Glynn-Johnson. Exit devices: Von Duprin, Inc. Ceilings: USG Interiors, Inc. Cabinetry and cherry woodwork (lobby): Davenport/Brown. Laboratory casework: Valley City (custom). Paints: DeVoe & Reynolds, Inc. Broadloom carpet: Karastan. Office and reception furniture: Steelcase, Inc. Seating and tables (Seminar rooms and lounges): Thomas Moser, Inc., Steelcase, Inc. Tackboard fabric: Gilford of Maine. Lobby lighting: Kurt Versen; Limberg Glass. Laboratory lighting: Litecontrol; Columbia. Exterior wall-mount fixtures: Visa Lighting. Pole-mount fixtures: Guardco. Elevators: Payne. ■



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# Designing Against Malice

By Joseph F. Wilkinson

The designers of schools are, quite literally, circling the wagons. The newest development in school design is either a quadrangle or a circle enclosing a courtyard. The school, accessible by only a single gate, presents an impregnable face to the world.

The steadily rising incidence of burglary, vandalism, and violent crime has led the administrators of schools, private as well as public, to require school architects to underscore security in their designs. The security measures protect not only property, but students and staff.

In earlier days, a school was like bread in a restaurant, there for the taking. But (at the same time), according to Richard Passantino, president of LEA/Passantino+Bavier, Rosslyn, Virginia, when kids broke into a school there would be vandalism, obscenities written on blackboards, and wastebasket fires. In recent years, Passantino says, schools have been equipped with TVs, VCRs, computers, and laboratory equipment and electronic devices that have high market value. This expensive gear, not the blackboards, gets the attention of trespassers.

Burglaries occur five times more often in schools than in businesses, according to Sonitrol, an Orlando, Florida-based supplier of security systems. Further, says the firm, vandalism costs schools more than \$250 million annually; moreover, 8,500 fires in elementary- and high-school buildings in 1990 caused \$136 million in property damage. Some architects estimate that the demands of security account for 10 percent of the cost of school construction.

## The face of security

A current LEA/Passantino+Bavier project illustrates some of the challenges to school architects. The school is divided into three separate education wings plus community activities, including a day-care center for children of unwed teenage mothers, a latchkey facility, and a well-baby clinic for high-school mothers.

"Initially, we considered an exterior playground, because that was more cost efficient," says Passantino. "When security, protection, and maintenance concerns were evaluated for this urban setting, the design of the building was affected in several ways. For instance, it had to be redesigned so there would be courtyards inside the building that could be accessed only by coming through controlled security points within the building.

"Compared with schools designed a decade ago, we dramatically limited the number of exterior doors. None of these has any exterior hardware except the designated entrance points. Now we also greatly reduce the amount of glass on the school's exterior, though we use more glazing in the courtyard. Today, school boards aren't even happy with polycarbonate substitutes for glass. Kids using an

*Joseph F. Wilkinson, a freelance writer, was formerly the managing editor of Engineering News-Record.*

ordinary roadside flare can burn through that material and gain access to the building. [Editor's note: Polycarbonate can also be burned through by sticking bubble gum on it and igniting the gum after it dries.]

"Many school districts set limits of 100 feet around school buildings to create a drug-free zone and these areas are policed by outside security forces. The U. S. State Department, in planning its embassies, coincidentally also uses that 100-foot setback as a counter-terrorist measure. I am amazed how closely school design resembles embassy design for use in hostile countries.

"School architects are also concerned about rooftop access or entry through skylights. Buildings are frequently broken into that way. Consequently, our office now designs parapets that slope so steeply they do not encourage kids to climb on a roof. When you have gravel on the roof, vandals are going to drop it down the vent stacks and they are going to mess up your air-intake system or damage the mechanical equipment on the roof."

Passantino's schools, like many designed today, are equipped with electronic motion sensors to detect unauthorized persons moving in the school after hours and frequently provide closed-circuit television cameras for surveillance. This expensive equipment has to be solidly mounted and enclosed so that it can't be removed and sold.

"Today, when you're designing a building for small children, you've got to design to prevent child molestation," says Passantino. "We design easy-operating doors that small children can open if they are trapped. We don't use doors on accessible low-storage cabinets. In the bathrooms where the very young kids go, the walls are low so that teachers can see over them. There are no doors to the toilets. We haven't made the next jump, how to monitor the adult bathrooms, but people are very worried about children being taken to adult toilets."

## Influencing the basics

"Security not only affects the things you install in a building or site after it's finished," says Passantino. "It influences the intrinsic, basic design philosophy of the project. Security is affecting basic design."

Gaylord Christopher, of Wolff, Lang and Christopher, Rancho Cucamonga, California, takes security seriously but doesn't think it influences design. "Security is one of the major concerns people are looking at these days, but I haven't seen it as something that changes the way that schools are designed completely," says Christopher. "It hasn't been the tail wagging the dog. School districts are concerned about security, but they don't let it dominate their programs."

Like most school architects, Christopher is bothered by the F word—fortress. "I think it is very important not to make the school look institutional or even approaching a prisonlike appearance. We've tried to do a number of things with colors and wainscoting and masonry. We try for a material and appearance that looks good, but is almost bombproof." Most of the schools planned by Wolff, Lang



and Christopher are equipped with electronic central security systems that include motion detectors in every room.

One of the pioneers in protecting schools through design was John Zeisel, a sociologist on the faculty of the Harvard Graduate School of Design. In the early 1970s he wrote *Stopping School Property Damage*, which was published by The American Association of School Administrators and Educational Facilities Laboratories.

The premise of the book is that slightly less than half the damage to schools, except theft of property, was caused by malicious vandalism. The rest of the damage he attributed to accidental damage, nonmalicious property damage, and poor maintenance.

Zeisel urged architects to design schools that eliminated opportunities for these kinds of damage. Most of his 20-year-old suggestions are included in today's security guidelines. Zeisel advised against accessible rooftops, hidden niches, vulnerable windows, exterior door hardware, walls that invite graffiti, drop-in ceiling panels, accessible wall fixtures, excessive glazing, and unsubstantial floors and walls.

### Conquering the fortress

In New York City, school security is big business. If the New York Board of Education were a city, its security organization would be the fourth or fifth largest police force in the country. The city's school builder, The New York City School Construction Authority, has a set of security standards that all designers must meet.

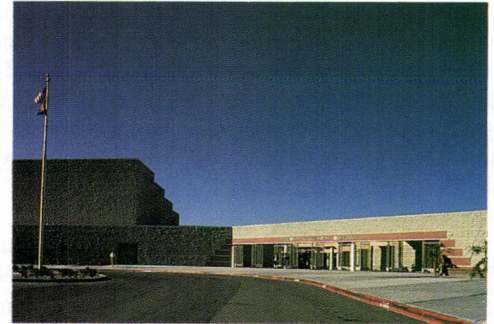
"In terms of materials and the finishes of the building, they must be vandal-proof," says Michael Stevenson, of Ehrenkrantz, Eckstut, Whitelaw, New York City, which has designed many New York City public schools. "The Board of Education assumes that a lot of times there will be things happening that simply cannot be controlled, so the building should be able to withstand pretty abusive situations. For example, I was talking with a Board of Ed official who had problems with roof leaks caused by bullet holes. People in nearby taller buildings could shoot down on the school.

"A school is for little kids and it should be welcoming in character. We don't want it to be a fortress, but at the same time we have these security and security-related maintenance concerns. Windows, for instance. In New York City it is clearly spelled out that they be shielded. Most schools have wire screens or expanded metal. We worked with a fabricator to come up with a perforated metal window guard that we had seen on college campuses. We thought it looked less like something you might see on a detention center, more in keeping with the character we wanted for the building.

"The corridors are designed with straight lines of sight, leaving no hiding places or nooks and crannies where people could be hiding from teachers or dealing in drugs.

"Our schoolyards are completely fenced and gated and laid out so that they have no areas that can't be seen by a passing patrol car.

*The face of Desert View High School, Tucson, is windowless, has a single entry and split-face concrete block cladding that defies graffiti. The wing has an arcade entry secured in off hours by steel bar gates. TMP Associates, Inc., Architect.*



© Timothy Hursley photos this page

### The Handwriting on the Wall

Graffiti is a challenge to most school designers, and there are three basic solutions: make it impossible to apply, make it easily and quickly removed, make the school so attractive that it defies disfigurement.

John J. Castellana, TMP Associates: "We cope with graffiti by very carefully choosing the material palette of the school. We try to come up with materials that are easily cleaned, and are washable. If you provide a very pleasant learning environment for the kids, there is more respect paid to that structure and graffiti is minimized."

Gaylord Christopher, Wolff, Lang and Christopher: "Immediate removal is the biggest deterrent to graffiti. A big part of graffiti is to see your art work later on. If it is taken off immediately, you get no recognition."

Bernard Zipprich, Richard Dattner Architect: "We use materials that are resistant to graffiti—structural glazed facing tile or glazed concrete block in the corridors and glazed face brick for the exterior first floor."

"The school has to be rugged enough to withstand abuse. For example, we don't use lay-in ceiling tile. It is too easily destroyed. Kids can stand on one another's shoulders and get at it. Also, it can be lifted and things hidden up there. We don't use dry wall, either. It is all some sort of masonry or glazed material. If it is wood, it is a solid piece of wood, no veneer, wood that can age more gracefully and from which scratches can be sanded.

"We've looked at a lot of buildings that have been around 50, 60, and 70 years and withstood abuse with some degree of grace. We try to incorporate some of their features in our schools."

### **School without Big Brother**

Among the commissions held by Gruzen, Samton, Steinglass, New York City, is design of the new Stuyvesant High School. Stuyvesant is one of the New York City's four elite high schools, where students are admitted on the basis of competitive examinations.

"The challenge was to produce conditions safe for students and teachers and to keep it from looking like a prison," says associate partner Timothy Schmiderer. "Because of the nature of the student body, we made some deviations from the Board of Education guidelines in design and systems. The school was not comfortable having a lot of TV cameras watching critical areas, which is the Board of Education standard. We provided the infrastructure and if there is a problem, the cameras can be mounted. But the school was not opened with that Big Brother look.

"At the other extreme, there is more very valuable equipment in this school than in most schools. We put a lot of effort into protecting it. There are motion detectors to monitor movement in the high-tech labs and card-entry systems that record whose card was used to enter a room and at what time that person entered and left.

"A pilot project at Stuyvesant High School is to use magnetic locks on street-level doors. They release automatically with a fire alarm. In a nonfire situation, they will open if they are pushed for five seconds, but the opening sounds an alarm."

Richard Dattner Architect, New York City, has six public school projects under way for the City of New York. Bernard Zipprich, an associate, defines the firm's design philosophy: "We try to take very utilitarian materials and through creative use of them make the buildings attractive and not threatening or fortress-like.

"We have been fairly successful with that approach. By using different colors of brick with a transparent glaze we have been able to create attractive designs at very modest cost. We have custom-designed the security grills to coordinate with the windows and make them look less institutional. The city allocates a certain percentage of construction cost to art works and we have used that to create attractive fences."

The elaborate and expensive electronic security devices fitted into many schools can be used for more than protection, says Lee

Brockway, a principal at Fanning/Howey, Michigan City, Indiana. "We have over the years put a lot of electronic devices in buildings and in most cases they were entirely separate systems. Now we try to take advantage of the money spent on fire-alarm, energy-management, reporting and communication systems by interfacing them," says Brockway. "For example, the motion detector that would tell the police someone is in the building at night can be used during the day to turn off the lights and turn off the fresh-air supply to classrooms that are not being used. When students leave a classroom to go to the gymnasium or cafeteria, the system turns off the lights. This conserves energy."

### **Healthy circulation**

Not only electronic equipment, but simple common sense can resolve a lot of the security challenges, according to William Brubaker, vice chairman of Perkins & Will in Chicago.

"School designers can take a lesson from office buildings," says Brubaker. "Thousands of people come and go in a big corporate office building and they use a single main entrance that is watched by a control desk in the lobby.

"A variation on that is schools designed as a quadrangle, which makes all the buildings easy to secure. Attractive iron gates swing shut at night. We designed a school in Florida that is a two-story ring around a circular courtyard. Good-looking fences make it easy to secure without damaging the character of the place. It is still welcoming and pleasant.

"We adopted the airline-terminal restroom design, using baffles instead of doors. They provide a visual barrier, but not an acoustic barrier."

Earl R. Flansburgh, president of Earl R. Flansburgh & Associates, a firm that has designed many public schools, blames frustration for a large share of vandalism. "In a large school, we reduce the frustration level by making movement easier," he says. "We have streets—corridors—big enough for two cars, 18 to 20 ft wide. They make for a relaxed environment."

John J. Castellana, vice president of design of TMP Associates in Bloomfield Hills, Michigan, is another advocate of easy circulation and high visibility. "I think security presents more of an opportunity than a challenge. There are certain things an architect can suggest in planning and layout to give a school a lot more open atmosphere as far as circulation goes. The important thing is good visibility throughout the school. That is the best security you can have. From an external standpoint, it is a good, recognizable front-door entry. The schools of the 1950s had doors all over the place. People from the outside gained uncontrolled access. There is a lot we can do to facilitate security, but do it in a human kind of way."

Visual control is particularly important in schools attended by very young children. "School administrators are always concerned that the wrong person will pick up a child from school," says Lee

Brockway, a principal of Fanning/Howey. "The wrong person might be the other parent or the parent who doesn't have custody or even something worse. In the beginning design we look at the layout, how automobiles access the area, how a member of the staff can see the pickup point and supervise arrival and departures from an office." Designers usually try to keep a visual corridor between the parking area and the school entrance so that a parent can observe a child all the way to the door. Play areas are usually well fenced and often screened from public view.

An aspect of schools that complicates security design, but adds to school security, is the use of schools by the community during nonteaching hours. Use of a school during off-hours discourages break-ins, but the school must be designed with interior security zoning. For instance, locked doors deny access to the rest of the school by users of an auditorium or swimming pool.

**Security for architects**

"Architects have to consider the quality of the security they design into schools," says Richard Passantino. "Say you have designed a molestation spot, a place under a stairway where somebody could be raped or assaulted. You may be facing another area of liability as a designer because you did not use professional caution to prevent that attack from occurring. I don't think architects have thought about that yet. I'm waiting for the first case."

Society pays for security in several ways. School buildings, no matter how architects strive to avoid the fortress look, are likely to appear more forbidding. The elements of security, such as the monitored single entrance, the shielded windows, and the TV observation cameras, lower the quality of life for students. The whole school operation pays, too. As Richard Passantino says, "In terms of school budget, all this security takes away from the school programs. I would estimate that security's architectural elements and its electronic systems were from 5 to 10 percent of school costs. School budgets are not going up but down, and the impact of security cost is meaningful." ■

*Below: A wall-mounted audio sensor detects the presence of unauthorized persons in a school and reports to a security monitor point. Card-access systems (not shown), frequently used for school labs, record time of entry and owner of the card.*



*Top two photos courtesy of Somitrol*



*© Garry Quesada, Balthasar Korab Ltd.*

*Above: A computer-equipped classroom at Pleasant Lake Elementary School, Walled Lake, Michigan, is lockable and extensive visibility enhances the room's security. TMP Associates, Inc., Architect*

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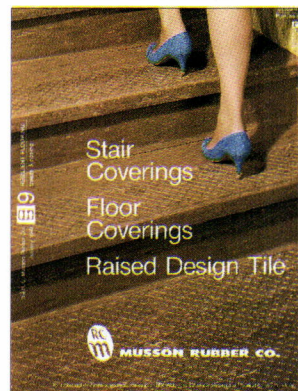


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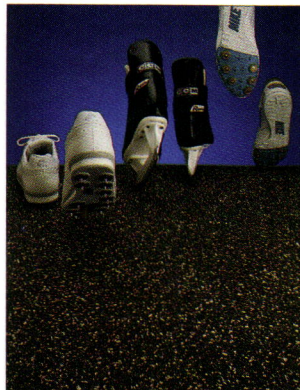


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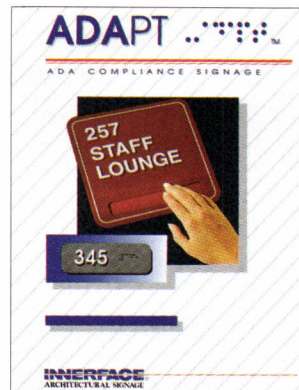


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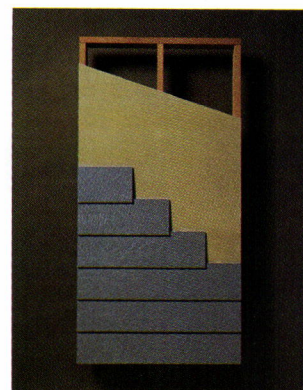


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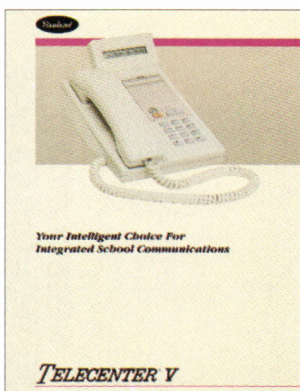


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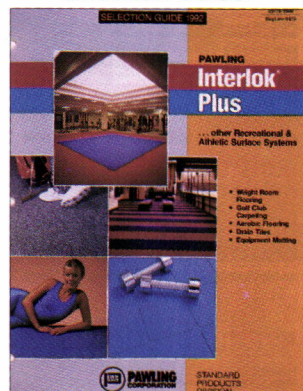


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## 1992 Pawling Interlok-Plus Selection Guide

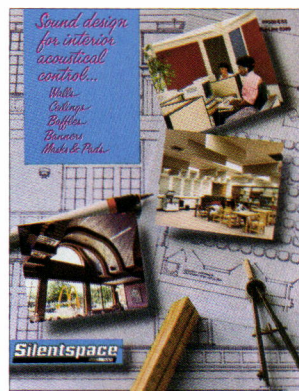


Guide features photos, diagrams & specs. for many styles of specialty flooring ideally suited for professional sports, fitness areas, locker rooms & wet areas, schools & playgrounds, work & high traffic areas. Applications include: entrances, lobbies & halls, weight rooms, exercise areas, aerobic floors, equipment areas, showers, saunas, & pool areas. Wide selection of colors, textures & easy care materials guarantees the best match-up to any decor or protection needed. Call 800-431-3456.

### Pawling Corporation

Circle 61 on the inquiry card.

## Silentspace

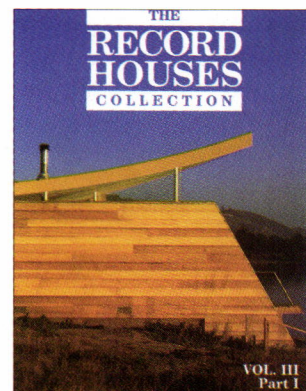


This full-color brochure describes a wide range of interior acoustical products for applications from administrative offices to gymnasiums. Included is the entire silentspace products line of wall panels, baffles, banners, ceiling panels and encapsulated masks and pads. **Essi Acoustical Products**, P.O. Box 643, Cleveland, OH 44107-0643. 216-251-7888.

### Essi Acoustical Products

Circle 62 on the inquiry card.

## THE RECORD HOUSES COLLECTION

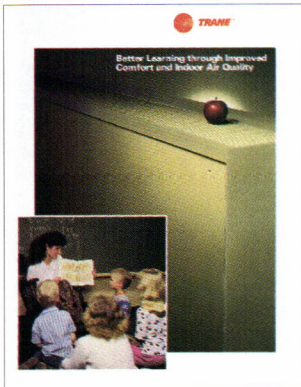


Compilation from 1990/1991/1992. We put 3 yrs. worth into a 2 volume set. Over 290 pages, in full color, with plans & text directly from the pages of Architectural Record's RECORD HOUSES issues. Just \$19.95 (including postage & handling). A single compilation 1987/1988/1989 is also available for \$19.95. Send check or money order to ArchitecturalRecord, 1221 Ave. of the Americas, New York, NY 10020. Attn: Back Issues.

### Record Houses

Circle 63 on the inquiry card.

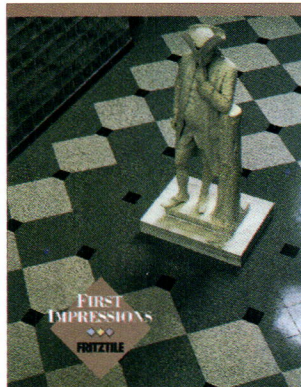
### Classroom Unit Ventilators



Lower operating costs, lower maintenance costs, indoor air quality, heavy-duty construction, factory-mounted controls, system flexibility and quiet classroom comfort are some of the reasons why Trane classroom unit ventilators are the right system choice for today's schools. Complementing the product line is a new line of decorator shelving.

**The Trane Company**  
Circle 64 on the inquiry card.

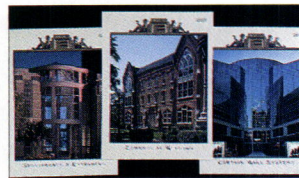
### First Impressions



**First Impressions**, from **Fritztile**, illustrates a variety of uses for Fritz Chemical Company's genuine marble, flexible terrazzo flooring. From airports to industry this low-maintenance tile is strong, durable and highly slip resistant - ideal for areas where performance, style and safety are factors. Technical information is given in this catalog. **Fritz Chemical Co.** P.O. Drawer 17040, Dallas, TX 75217. (800) 955-1323. FAX#(214) 270-0179.

**Fritz Chemical Co.**  
Circle 65 on the inquiry card.

### New 1993 Sweets Brochures



Copies of EFCO® Corp's 1993 Sweets Brochures are now available upon request. Each showcases specific applications in one of three Section 8 categories. Curtain Wall, Storefronts & Entrances, and Commercial Windows. To receive your copies, call toll-free at 1-800-221-4169.

**EFCO Corporation**  
Circle 66 on the inquiry card.

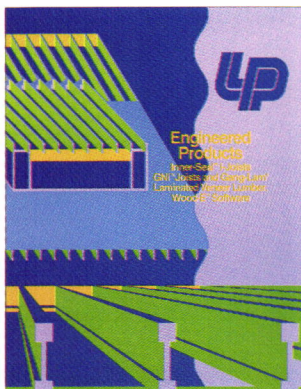
### Solnhofen Natural Stone Green Limestone



West Germany's leading quarry/fabricator, introduces a unique Green Limestone. "Greenstone" is excellent for interior/exterior paving & cladding. Cut from blocks & can be molded & shaped in 3 dimensional forms. 3 shades & unique surface textures, rough, sandblasted, honed & polished, offer the Design Professional a subtle palette of green limestone. Available in slabs and 3/8" thick tiles. For more info. on "Greenstone" & the Architectural Specifier Kit, with extensive ASTM data, Call: 415-647-3088.

**Solnhofen Natural Stone, Inc.**  
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### Engineered Products



Louisiana-Pacific's engineered wood products are designed to eliminate the common problems of solid sawn lumber. Gang-Lam LVL, Inner Seal I-Joists and GNI Joists are stronger, more stable and easier to handle. Catalog includes span and uniform load charts, and information on the Wood-E engineering software package.

**Louisiana Pacific**  
Circle 68 on the inquiry card.

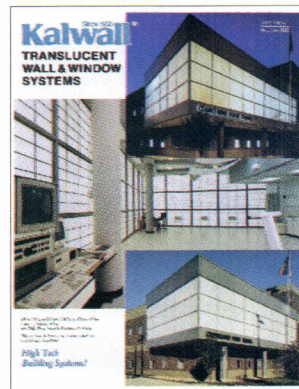
### Fresco Collection of Marmoleum® Floorcoverings



Forbo Industries introduced **Marmoleum Fresco**, a collection of all-natural, marbled floorcoverings in 12 light-hued colors, rich neutrals & soft pastels, that complement **Marmoleum's** existing 36 colorways. An environmentally-safe, biodegradable linoleum floorcovering. Resists abrasions, indentations, cracking & stains, withstands heavy traffic & rolling loads. More info: Forbo Industries, Inc., Humboldt Industrial Park, P.O. Box 667, Hazleton, PA 18201. (717) 459-0771.

**Forbo Industries, Inc.**  
Circle 69 on the inquiry card.

### Kalwall® Corporation



The most highly insulating, light transmitting, light diffusing system. Fills classrooms, entries & hallways, libraries, labs, gymnasiums & swimming pool areas with diffused, glare-free natural light. Formulated fiberglass sheets are permanently bonded to a structural aluminum interlocking grid system. The result is a rugged, shatterproof, highly insulated wall, roof, skylight or window. Kalwall® Systems offer exceptional energy savings & are virtually maintenance free. For more info: 1-800-258-9777.

**Kalwall Corporation**  
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### Sound Performance & Quality Tectum Inc.



From the roof deck overhead to the wall and ceilings within, Tectum Inc. continues to be the leader in the manufacture of acoustical abuse resistant interior and deck products for the commercial, industrial & institutional market. Products of quality with over 40 years experience and testing gives the building industry a family of products for quality specifications. Tectum, Inc., 105 S. 6th St., Newark, OH 43055. Fax (614) 349 9305.

**Tectum**  
Circle 71 on the inquiry card.

# Academic Buildings: Showcase Focus

## Time-Proven Floors By Tuflex

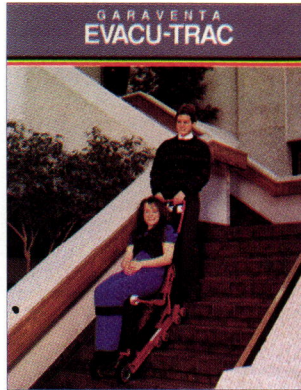


Tuflex Rubber Flooring is known worldwide for its high quality resilient rubber flooring, which offers excellent slip & spike resistance, comes in many attractive colors, & is adaptable to areas where normal flooring suffers damage. The floor is guaranteed by Tuflex, the #1 selling resilient floor in the U.S. for 35 years. Tuflex Rubber Products, 4521 W. Crest Avenue, Tampa, Florida 33614. (813)-870-0390. FAX (813) 875-2312.

### Tuflex Rubber Flooring

Circle 72 on the inquiry card.

## Garaventa Evacu-Trac

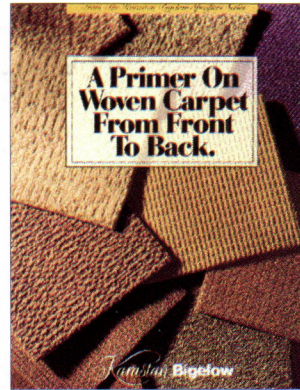


In an emergency when elevators cannot be used, a disabled person may have no way out...unless you have a Garaventa Evacu-Trac. The only laboratory-tested emergency evacuation chair available, Evacu-Trac provides a fast and reliable means of egress. Ensure the safety of everyone in your building. Call Garaventa today: (800) 663-6556 or (604) 594-0422.

### Garaventa

Circle 73 on the inquiry card.

## A Primer on Woven Carpet from Front to Back

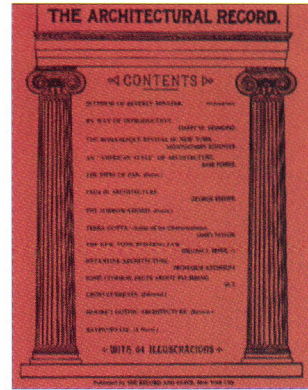


Karastan Bigelow offers a Primer on Woven Carpet in this new brochure for the commercial carpet specifier. Woven carpets offer exceptional levels of performance, aesthetics, reliability and life cycle economy. Discover the benefits of woven commercial carpet and the difference it can make for your facility.

### Karastan Bigelow

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## Limited Numbered Edition

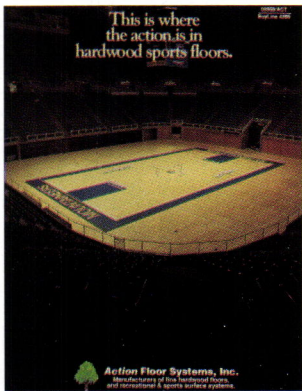


ARCHITECTURAL RECORD'S first issue (1891) is reprinted to celebrate our centennial. 150 pages. 64 illustrations. Every architect should have this collector's issue. Only \$16.95 ppd. For more information call: 212-512-3443. ARCHITECTURAL RECORD, Circulation Department, 1221 Avenue of the Americas, New York, NY 10020.

### Architectural Record

Circle 75 on the inquiry card.

## HARDWOOD SPORTS FLOOR SYSTEMS



4-color catalog from Action Floor Systems, Inc. features specifications for several types of hardwood sports floor systems. Action Floor Systems, Inc. manufactures a wide variety of hardwood flooring systems providing cushioning & shock absorption, uniform resiliency, & low sound transmission to meet your performance & budgetary requirements. P.O. Box 469, Mercer, WI 54547. 715-476-3512 or see Sweets 09550/ACT Buy-line 4260.

### Action Floor Systems

Circle 76 on the inquiry card.

## Soundblox® Sound-Absorbing Structural Masonry Units



The Proudfoot Co. presents its Soundblox unit - the solution to acoustical correction and noise control problems in masonry construction. An excellent choice for industrial settings, gymnasiums, mechanical equipment rooms, and comparable installations. Soundblox units are attractive and economical and fire rated for up to 3 hours plus. For more information please call (800) 445-0034.

### Proudfoot Co.

Circle 77 on the inquiry card.

## ADA Signage Kroy, Inc.

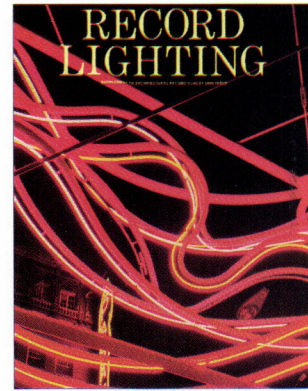


Kroy Sign Systems has been supplying interior signage to educational facilities for over a decade. And now that you are required to meet the American Disabilities Act (ADA) regulations pertaining to signage, it is important to talk to the experts at Kroy. Our Design Programming Services will help guide you through the complex ADA requirements. Call 1-800-733-5769 or Fax 602-951-7033.

### Kroy, Inc.

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## Back Issues of Record Lighting



Add to your files by ordering back issues of RECORD LIGHTING, the exciting color supplement to Architectural Record. The price per issue is only \$3.50 each (includes postage and handling). Send check or money order to Architectural Record, 1221 Ave. of the Americas, New York, NY 10020. Attn: Back Issues.

### Record Lighting

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### Storage Solutions For Educational Facilities

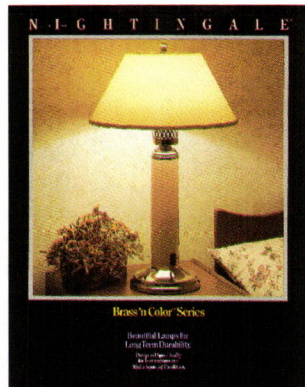


Fully modular casework systems from TMI are ideal for educational settings. Modularity provides added flexibility so storage system can change as curriculum, staff, and new technologies unfold. Call or circle reader card for comprehensive planning guide including primary, secondary and specialty classrooms, staff workstations and dormitory storage systems. TMI Systems Design Corp. (701) 225-6716.

#### TMI Systems Design

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### Adjustable Fixture Co.



New heavy-duty, tamper-resistant lamps for public areas, lounges, resident rooms & university apartments. Handsome Brass'n Color table & floor lamps available in 7 designer colors or the Benjamin Moore color of your choice. Options include a night light, plug-in receptacle, theft-resistant Perma-Mount base & Safety Guard to prevent bulb removal. UL listed & CSA approved. Free 30 day trial offer. (800) 558-2628, or fax (414) 964-2944 for info. & samples.

#### Adjustable Fixture Co.

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### The Riviera® Mark I Blind with SheerView™ by Levolor



The Riviera Mark I Blind represents Levolor's top quality horizontal blind for exposed headrail applications. The Riviera Mark I combines a valance free design with a concealed mounting system to provide an overall clean, finished look to the interior space. The SheerView perforated option lets the outside in even when the blind is closed without glare and solar heat gain. Innovative solutions to your window treatment needs, only from Levolor. Call (800) 222-8830.

#### Levolor Corporation

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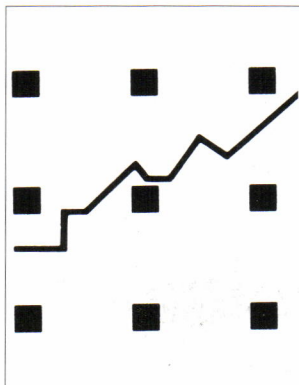


PLYCEM Fiber-Reinforced Cement Boards address the needs of today's marketplace. For non-combustible, fire-rated wall, floor and roof systems, PLYCEM is the answer. As versatile as plywood, PLYCEM is rot-proof and moisture-resistant, and it's an excellent replacement for failed FRT plywood! For more information, please call (800) 243-6677.

#### U.S. Plycem Corp.

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### Keep Dodge In Your Plans!

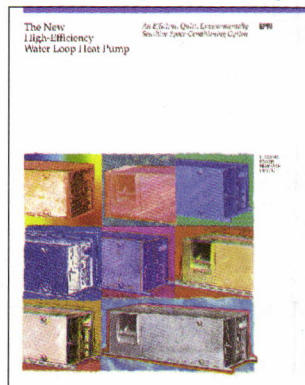


Don't forget to provide your local Dodge Reporter with the details and plans for your next job. You don't want them to miss out on the best bid for your next job. Contractors can't bid on jobs they don't know about. Thank you for your input. We appreciate your cooperation. F.W. Dodge, Mc-Graw-Hill Construction Information Group.

#### F.W. Dodge

Circle 84 on the inquiry card.

### High-Efficiency Water Loop Heat Pump

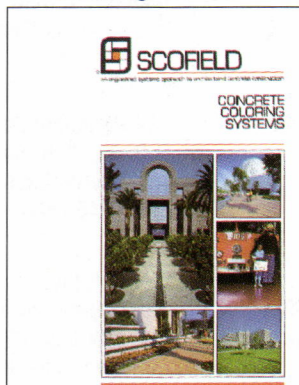


An efficient, quiet, environmentally sensitive space-conditioning option, Trane water loop heat pumps are a reliable, cost-effective alternative to conventional heating and cooling systems. New high-efficiency units, developed in partnership with EPRI, provide additional advantages, including simplified maintenance, reduced noise and improved air distribution and quality.

#### The Trane Company

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### Architectural Concrete Coloring Products

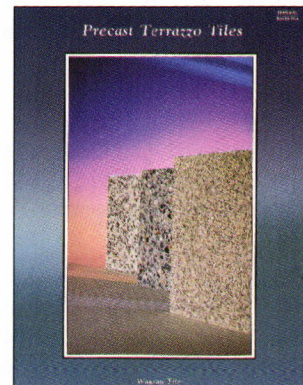


Limitless design options are possible using Scofield's quality products to color-condition and harden concrete. CHROMIX® Admixture and LITHOCROME® Color Hardener are designed to permanently and cost-effectively color and beautify architectural concrete. Charts show standard and new designer colors. Literature details applications and cost. Call (800) 800-9900, (213) 723-5285, (404) 920-1200.

#### L.M. Scofield Company

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Wausau Terrazzo Tiles, the only domestically made terrazzo tiles, are produced on completely automated, computerized equipment, without waste. Materials are carefully metered to assure uniformity, while computer calibration guarantees exact sizing. Steam curing and 600 tons of pressure provide superior strength & durability. Gleaming finish. Low maintenance. Call 800-388-8728 for additional information. 38 years experience.

#### Wausau Tile

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# Academic Buildings: Supplier's Directory

**Adams Rite Manufacturing Co.**  
4040 So. Capitol Ave., P.O. Box 1301  
City of Industry, CA 91749. (310) 699-0511  
TOUCHBAR EXIT DEVICES

**Claridge Products & Equipment, Inc.**  
P.O. Box 910, Harrison, Arkansas 72602  
Phone: 501/743-2200 FAX: 501/743-1098  
Chalkboards, tackboards & directories.

**Connor. AGA, Inc.**  
P.O. Box 246, Amasa, MI 49903-0246.  
"Wood & Synthetic Flooring Systems Selection  
Guide". (800) 833-7144, fax (906) 822-7800.

**Dodge-Regupol, Inc.**  
P.O. Box 989, Lancaster, PA 17603  
Phone: 717-295-3400 Contact: Laura Dodge  
Cork Flooring & Everlast Rubber Tile.

**Federal APD / 800-521-9330**  
24700 Crestview Court  
Farmington Hills, MI 48335  
Parking, access & revenue control systems.

**Fritz Chemical Company**  
P.O. Drawer 17040, Dallas, TX 75217  
Bob Schoolfield, Nat'l Sales Manager  
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**Glassform® Duraform®**  
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800-842-1121, Fax 213-762-9410. Planter, Trash  
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**HMK Stone Care Products**  
2585 Third Street  
San Francisco, CA 94107  
Detlev Wolske Phone: 415-647-3086

**INNERFACE ARCHITECTURAL SIGNAGE, INC.**  
5320 Webb Pkwy., Lilburn, GA 30247.  
(404) 921-5566. Signage: Interior, Exterior,  
ADA Compliance, Sign Planning.

**Kaylien, Inc.**  
P.O. Box 711599, Santee, CA 92072-1599  
Contact: J. Knox Phone: 619-448-0544  
Doors and Panels

**Mapes Industries, Inc.**  
2929 Cornhusker Hwy., Lincoln, NE 68501  
Laminated Panels & Walkway Covers.  
(800) 228-2391, fax (402) 466-2790

**Musson**  
P.O. Box 7038, Akron, Ohio 44306  
Contact: Ben Segers 216-773-7651  
Floor and Stair Coverings

**Overhead Door Corp. / 214-233-6611**  
6750 LBJ Freeway, Dallas, TX 75240  
Pamela Vance, Overhead sectional & coiling  
steel doors, counter doors, & security grilles

**Pawling Corp., Standard Products Division**  
157 Charles Coleman Blvd., Pawling, NY 12564  
Contact: R. Collete, 800-431-3456  
Interlok-Plus Flooring System

**The Proudfoot Co., Inc.**  
P.O. Box 338, Botsford, CT 06404  
Architectural Acoustic Products  
(800) 445-0034

**Steelite, Inc.**  
1010 Ohio River Blvd., Pittsburg, PA 15202  
Diane Winter 800-824-1371  
Standing Seam Roof Systems (07610)

**TMI Systems Design Corporation**  
Dickinson, ND (701)225-6716  
Fax 701/225-6719. Fully modular casework  
systems for educational facilities.

**Tubelite Division of Indal Incorporated**  
8200 Mackinaw Trail, Reed City, MI 49677  
W. Lutzke, 616/832-2211, fax: 616/832-2611  
Institutional Alum. Doors & Wall Systems

## Academic Science Buildings

*continued from page 61*

attention to design is underscored clearly by the growing trend to team a firm with lab-planning expertise with another known for design skills.

Concern with looks and comfort is spurred also by competitive pressures. Just as researchers must now compete more fiercely than ever for public and private grants, so too universities vie for top-notch faculty (meaning those who get the grants). Many schools regard handsome, well-equipped buildings as crucial to recruitment.

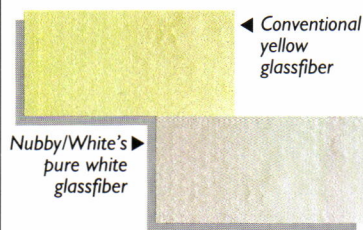
## Uncertain future

Schools may recognize the importance of science buildings, but fewer and fewer can afford to build them. According to F. W. Dodge, total construction volume of laboratory buildings—corporate and government as well as academic—more than doubled from 1980 to 1985; since then it has declined somewhat. "State universities are strapped for cash, and most private schools can't afford the high cost of science buildings," says Dr. Richard R. Rietz, a lab planner in Foster City, California. Thus, when asked about prospects for the next decade, most planners were equivocal: uncertain about funding, but certain that new facilities will be needed. Says MIT's Simha, "There's no doubt we'll need new buildings. Many labs of the '50s and '60s are reaching the end of their useful life, and will have to be renovated or replaced."

Given the general need for facilities, what is the outlook for particular types of labs? Planners and consultants predict that the fields of bioengineering and biotechnology will continue to grow and to need new space. Biotechnology, especially, "will lead the field for some time to come," says Gerold Roschwalb of the National Association of State Universities and Land Grant Colleges in Washington, D. C. Laboratories for applied research should also become increasingly important. This continues a trend begun in 1986, when Congress passed the Technology Transfer Act designed to encourage a closer relationship between academia and industry (2). And, in the next decade, universities are likely to need more labs for multidisciplinary research. "Scientists of different disciplines are working together more and more, so distinctions between different types of labs should become less and less pronounced," says Watson. "In some cases, it's already hard to tell if you're in a chemistry, biology, or physics lab." ■

Leave it to USG Interiors to invent a glassfiber ceiling panel so white, it makes every other panel look old and yellow.

It's called Premier™ Nubby/White. And the secret of its amazing brightness is its exclusive white-on-white construction.



You see, ordinary panels have white fabric over yellow glassfiber.

This gives them a slightly yellowed look. But Premier Nubby/White is the only panel that has white nubby

fabric on pure white glassfiber. That produces a noticeably whiter panel—one that looks fresher the day it goes up, and keeps looking newer years longer.

New Nubby/White is available in 1" and 1-1/2" thicknesses, with Shadowline or Fineline™ edges. And it's just one of a long line of ground-breaking ceiling products from USG Interiors.

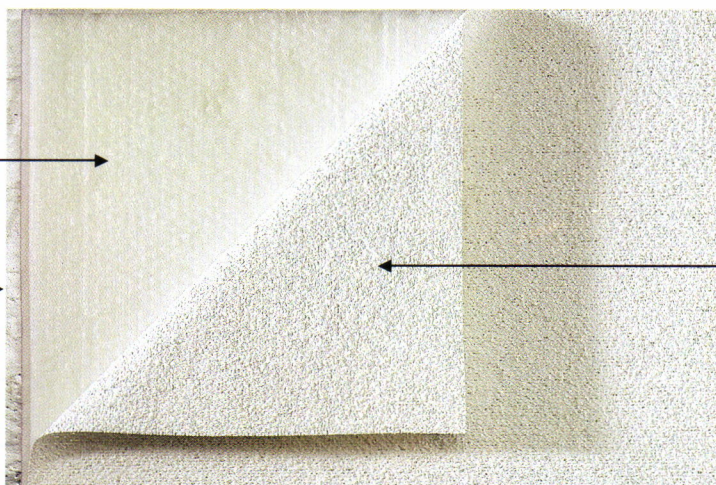
So call 1-800-950-3859 for more information or to see a sample of Premier Nubby/White.

And find out why, when it comes to ceilings, everyone looks up to us.

# White-On-White Nubby Ceiling Panels.

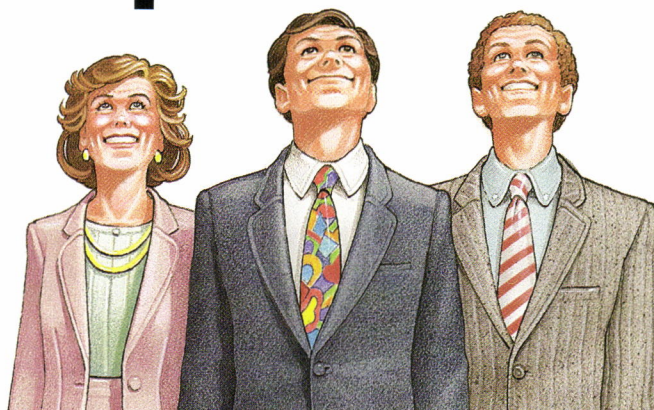
Exclusive pure white glassfiber substrate

Optional foil backing



White nubby fabric

## One More Reason To Look Up To USG Interiors.



USG Interiors, Inc.



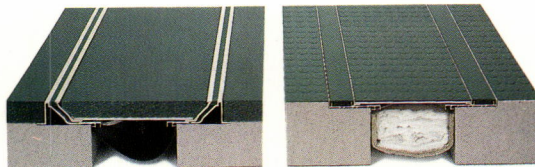
## NOT EVERYTHING CAN BE HIDDEN AS EASILY AS C/S SEISMIC JOINTS.

Concealing old fashioned seismic joints is sort of like trying to hide an elephant with a tablecloth. But now C/S offers a dramatic breakthrough which enables both exterior and interior seismic joints to be completely "undercover".

What's the catch? There's none! Both systems employ minimally visible gaskets for moderate movement along with recessed center

plates to accept a variety of exterior and interior materials — from granite to linoleum. And should seismic accommodation be necessary, vast additional expansion capability pops into action. After cycling, patented systems allow center plates to easily return to flush position.

For information on the first, low visibility exterior and interior seismic system, call 1-800-233-8493.

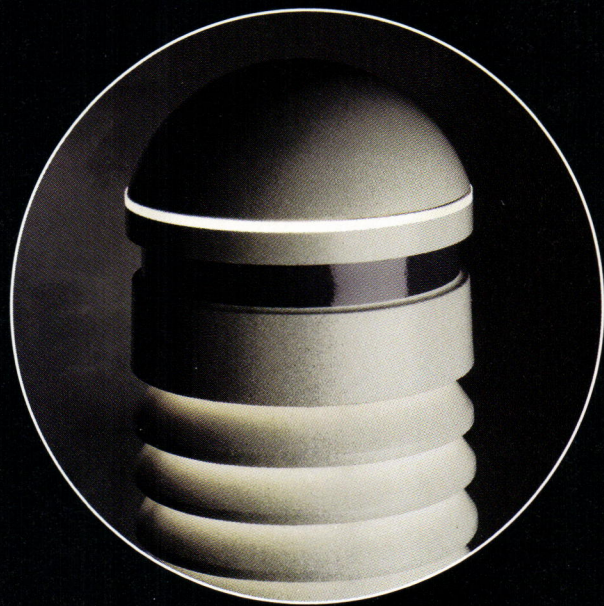


**THE C/S GROUP**



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Circle 103 on inquiry card

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**Bombay Connection, Laredo, Texas 32**

Tarik Currimbhoy, Design & Architecture  
Tarik Currimbhoy, Lighting Designer

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**Oregon Coast Aquarium, Newport, Oregon 38**

SRG Partnership, Architects  
Robert Dupuy and Mark Ramsby, Lighting Designers

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**W. K. Kellogg Foundation Headquarters, Battle Creek, Michigan 42**

Luckenbach/Ziegelman + Partners Inc. Architects  
Gary Steffy Lighting Design Inc.

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**Sportsgirl Centre, Melbourne, Australia 46**

Anthony Belluschi Architects, Ltd.  
Hayden McKay Lighting Design

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Skylights and Incandescents Lend a Link to Life/IESNA Presents Guth, Waterbury, and Energy-Efficiency Awards/Tennis Lighting Aces Out Multiple Problems/Lightened Loads at Busy Workstations/Abe Feder Tells All/Spanish Design, the Canadian Way/Pirates and Steelers Save Energy by Dumping 1,024 Luminaires

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**Lighting Design Practice 20**

ESCos Changing the Lighting Industry, *By Lindsay Audin*  
DSM: A Lighting Design-Services Market Opportunity, *By James R. Benya*

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**Lighting Product News 22**

Cable-Hung Halogen Lighting  
For Corporate Offices

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Cover: *Bombay Connection, Laredo, Texas; Tarik Currimbhoy, Design & Architecture; Tarik Currimbhoy, Lighting Designer; Peter Paige photo*

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# . . . Lights great in the dark.



## Maine

### Skylights and Incandescents Lend a Link to Life

© Steve Rosenthal



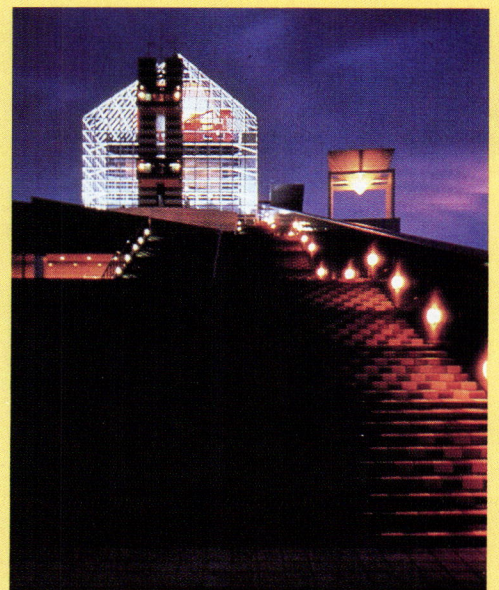
Cove's Edge Long Term Care Center in Damariscotta, Maine, is a combination 65-bed nursing home, adult day-care center, and hospice that depends heavily on natural lighting to keep its clients and visitors grounded in the world. Rothman Rothman Heineman Architects of Boston cued lighting design to five skylights topped with wood-frame-and-lattice cupolas that cast hourly and seasonal shadows throughout the entrance lobby and the patient wings. Incandescents in Michael-Graves-designed pendants provide a complementary glow. The 5500K fluorescent uplights tucked into moldings lengthen the daylight effect into the evening hours. Natural light enters the hospice area (above), through high clerestories, mullioned to cast moving shadows; recessed uplights shine on a pale sky-blue ceiling. ■

## Lighting Awards

### IESNA Presents Guth, Waterbury, And Energy-Efficiency Awards



W. L. Thompson has won the IESNA Guth Award for Carolina Place Mall, Charlotte. Citations went to 30th Street Station, Philadelphia (Lighting Practice/Dan Peter Kopple); Cascade Plaza Dome, Banff (Falcon Engineering); Ohrstrom Library, Concord, N. H. (Cline Bettridge Bernstein); St. Matthews Church, Alberta (Grice Maskell/TIR); 3M, St. Paul (HGA/3M). Waterbury Awards went to London's Albert Bridge (Philips Lighting), Stardust Hotel & Casino, Las Vegas (John Renton Young/Vegas Lighting), and Toyota, Tokyo (Nikken Sekkei), with citations for St. Paul Ice Palace (Fratalone/Hunt) and Harumi Terminal, Tokyo (right; Minoru Takeyama/TL Yamagiwa Laboratory). Energy Awards went to Boogies, New York City (left; WGFS Lighting) and Health Park Center, Fort Myers, Fla. (Craig A. Roeder Assoc.). ■



## Tennis Lighting Aces Out Multiple Problems



"TV is the driving force in any sport these days," says Van Zelm Heywood and Shadford associate Donald K. Segee, lighting consultant on New Haven's 15,000-seat Connecticut Tennis Center. Four rows of 20 narrow-beam 1500-watt metal halides mounted on the stadium structure 100 feet above the playing surface, and tilted 15 degrees from the vertical to accommodate the

tilt of TV cameras, provide a glare-free game for spectators and color-integrity for home viewers, as well as optimal comfort for players dealing with tennis balls traveling up to 125 miles per hour. Half concentric louvers in the bottom of the reflectors shield the surrounding community from light pollution. Metal halides shining up the exterior (above) create a floating effect. ■

## Lightened Loads at Busy Workstations



To help reduce the fatigue that pervades computer-based offices, lighting designer Mitchell Kohn used indirect color-corrected triphosphor SP35 energy savers in 92-ft courses below the 24-ft-high barrel vaults that float over 400 loan-servicing

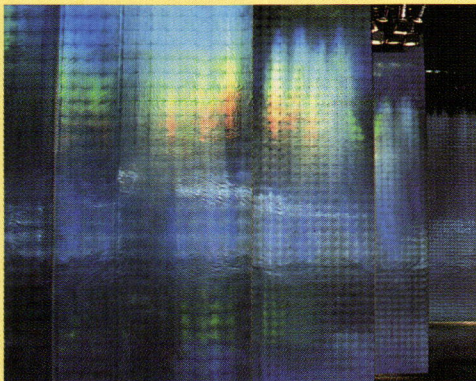


workstations at the Student Loan Marketing Association (Sallie Mae) in Wilkes Barre. They provide 45 glare-free footcandles, minimal ceiling brightness, and even distribution, and a complement to well-shielded natural sources. ■

## Abe Feder Tells All

- The legendary Abe Feder, considered the first independent lighting designer in the U. S., is writing his memoirs. His career, sparked at the age of 12 when a magician invited him on stage, began in the theater, where he lit his first Broadway production in 1932 and used light to replace scenery for Orson Welles in 1937. By the end of World War II, he was firmly ensconced in architectural and interior lighting. Now 83, he recently finished a major commission in Virginia and continues his never-ending projects at the Rockefeller Center complex.
- Newly renamed Fisher Marantz Renfro Stone is the lighting component on the team assembled to bring back the pizzazz to New York's 42nd St. now that plans for Times Square office towers are on hold.
- Osram has reached an agreement to acquire GTE's North American lighting business, including Sylvania, which has 29 plants in the U. S. and Canada. The deal should almost double Osram sales figures.
- Strand Lighting won a film-studio award from the American Society of Lighting Designers for its 18K HMI retrofit, and "Product of the Year" from the Lighting Dimensions show for its CD90 dimmers.
- The July issue of the journal *Cancer Causes and Control* contains a hypothesis that any extremely bright light, 400 nanometers or above, in hospital nurseries may contribute to childhood leukemia.
- Chip Israel, Julia Rezek, and Alex Pappas are the core of the new Lighting Design Alliance, which has purchased the West Coast operations of Grenald Associates. The address is 3710 S. Robertson Blvd., Culver City, Calif. 90232, 310/204-2274.
- The Lighting Practice moves to 327 N. 17th St., Philadelphia 19103, 215/241-9115.
- Upcoming San Francisco Designers Lighting Forum programs include a holiday party on December 8, and for 1993, certification in January, neon in February, UL problems in March, light artists in April, Lightfair in May, and a show-and-tell of recent work in June. Contact: 415/626-1978.
- San Francisco IES plans include a holiday party in December, awards deadline and installation tour in January, and a glare update in March. Contact: 415/626-1950.
- Deadline for the Richard Kelly Grant is January 31, 1993. Contact: IES, 345 E. 47th St., New York City 10017, 212/705-7915. ■

## Spanish Design, the Canadian Way



Horst and Marion Thanhauser photos



"I wanted to build a Spanish building in a Canadian way," says Bing Thom of his Canadian Pavilion for Seville's Expo '92, which drew crowds seven hours long, and which the Spanish government hopes to use as an engineering school. During the day, the titanium zinc tile cladding changes color as it catches light at different angles; at night, incandescents tucked into folded tile create a firefly dance (above, left). The wall blocks the Seville sun from the courtyard, where theatrical lighting targets a water-washed wall of off-the-shelf holographic grating (left; detail above, right) to call forth an effect of flickering flame and surfaceless infinity. Reflections in the pool change shade as the visitor climbs a spiral ramp. Twinkle lights and a mirrored frieze lend a little infinity to the small Aurales restaurant (above, center). ■

## Pirates and Steelers Save Energy by Dumping 1,024 Luminaires

Advances in lighting technologies recently enabled Caplan Engineering to offer Three Rivers Stadium \$100,000 in annual energy savings by using 608 1,500-watt metal halides, roughly one-third of the 1,632 1,000-watt lamps installed when the Pirates/Steelers facility opened in 1970. The new luminaires circle the roof in banks 145 ft above the field. Each was positioned individually at 45 to 65 deg vertical aiming angles to produce precise and uniform results. The field was sectioned into 30-ft sq grids, and TV camera readings of horizontal and vertical

projection were taken at home plate and centerfield to insure the minimum 100 footcandles required from every point. Caplan worked with CBS and the American League for baseball, and ESPN and the NFL for football. "In a fast-moving game like baseball, it's hard to follow the ball to center field," says Al Taylor, an independent operations producer for ESPN. "I don't remember anyone having difficulty focusing opening night, and we were using older cameras, which need more light. There wasn't a dark spot in the whole stadium." ■



## ESCOs Changing the Lighting Industry

*By Lindsay Audin*

I've recently engaged in a number of discussions on the state of the lighting industry. A lamp manufacturer speaks of the recent burst of technical innovation in lamps, at the same time noting the purchase of one large lamp manufacturing company by another. A fixture manufacturer says, "We've come up with several new products, but our production is down. There's not as much new construction as there was a few years ago." His view was echoed by an electrical contractor: "I've got some of my best employees changing lamps just to keep them working."

The only optimist on the block is the head of an energy services company (ESCO.) "I'm getting so many calls for lighting upgrades that I'm subbing out work!"

It seems that, like the fabled blind men describing an elephant by touching only its tail, trunk and leg, each of these members of the industry has a different perception of where the work is. And there is an "elephant" of sorts that many have not yet perceived: the burgeoning energy-efficiency upgrade market. Now a few are beginning to regard it as a source of both competition and megasales, as entire institutions—and even whole state governments—begin re-lighting their millions of square feet in the quest for lower utility bills.

### **The status quo**

But how have things really changed? Let's follow a product on its usual path to a client.

A typical job starts with the design phase, during which lighting-product agencies representing manufacturers work closely with architects or engineers to choose appropriate fixtures. Configuring the agency's product lines into one comprehensive proposal is usually called "packaging" the job. This is not always done, but where a competitive price is critical it is the norm.

When the job goes out to bid, electrical contractors try to make their bids more competitive by substituting less-expensive

*Lindsay Audin is manager of energy conservation at Columbia University.*

alternate equipment. The lighting agencies try to keep the package intact in order to hold onto the sale. The designers' intent is to hold spec as necessary to maintain the esthetic and technical quality of the job.

Once a bid for the equipment has been accepted, the fixture distributor supplies the equipment it purchases from the manufacturer. A general contractor oversees the entire job, while an electrical subcontractor installs the fixtures. Markups, conflicts, and negotiation are common. Some are mystified that anyone can complete a job and still make money at it.

### **The new market . . .**

Large facilities are grasping the potential economic impact of high-efficiency lighting systems on their buildings' operating budgets. With urging from the EPA's "Green Lights" program, they are becoming amenable to major lighting upgrades that will be worth tens of billions of dollars over the next decade. The simultaneous need for more electric-generating capacity has led many utilities to prime the economic pump with rebates for equipment that cuts electrical demand and costs less than building new plants.

### **. . . And a new way of doing business**

Some members of the lighting industry are not interested in what they see as low-quality work, or feel energy efficiency is a passing fad. As a result, new companies have sprung up to supply personnel, equipment, capital, and services to satisfy this market. Several lesser-known fixture makers have adapted to supply low-cost, high-efficiency fixtures, supplanting some of the usual industry stalwarts. Smaller firms are developing and supplying energy-efficient fixtures and devices aimed at hotel and restaurant chains.

The chain of events and control over the job have been re-arranged in this new market. A company making high-efficiency lighting equipment directly secures a job, guaranteeing that its products are used. They hire their own electrical contractor, design and manage the installation with their own people. No outside agents, architects, engineers, designers, or distributors ever enter the pic-

ture. Total job cost is lower for the client, the job gets done quickly, and early payment is ensured by a quick utility rebate—plus the savings generated by the client's reduced electric bill.

Alternatively, an ESCo obtains and manages the job, subs out the design and equipment to a fixture maker, and capitalizes the project under a long-term agreement with the facility's owner.

In a reversal of the usual roles, when working under contract to an ESCo, the electrical contractor is relegated to competing for the work after the job has already been let, so the contractor can no longer use the product selection or its price as a bargaining chip. Instead, the contracting company may be forced to use its least skilled and least profitable employees in order to compete for the fixture maker's or the ESCo's business. Some enterprising fixture manufacturers—once forced to take a back seat to the contractor—are now instead driving the market.

Both vertical and horizontal corporate integration is underway. ESCos are expanding so rapidly that one recently bought its own fabrication company, while another purchased a West Coast lighting design firm. At the same time, some contractors are struggling to keep their staffs working, and lighting agents, designers, architects, and engineers are being laid off due to a lack of work.

Since each job is a promotion for the rest, this takeover is gradually eating away at the renovation and replacement markets that keep lighting people fed between bursts of construction—such as the dip we are in now.

While this is happening most often in areas hit hardest by the recession and high electrical rates, its expansion is inevitable as older power plants are retired and new ones are blocked by high costs, siting problems, and environmental constraints. Rebates and utility energy savings provide large incentives for real-estate and facility managers to renovate their presently inefficient lighting. This trend is having a major ripple effect in the lighting industry. Entrepreneurs will seek ways to "catch the wave" or else be inundated by it. ■

# DSM: A Lighting-Design-Services Market Opportunity

*This column explains Design Side Management (DSM) from the perspective of a lighting designer whose firm, Luminae Souter Lighting Design, recently became the wholly owned subsidiary of Proven Alternatives, Inc. an energy-services company, or ESCo. While most of the Luminae Souter staff will continue to work on high-end lighting design projects, some of the staff, including Mr. Benya, are now working in the energy-services area as lighting specialists. C. D. L.*

*By James Robert Benya*

Demand Side Management is the management of electrical-power consumption and distribution on the customer's side of the meter, thus known in utility parlance as the "demand side." As a lighting-design firm working in the energy-services area, our goal is to produce retrofits that respect the original design and, when appropriate, to improve the quality of the lighting system while saving energy.

the result of a major governmental reform. Prior to DSM, most state utility rate-setting agencies allowed electric companies to set their rates based on an acceptable profit after expenses, including capital investments in power-generating plants. DSM allows electric companies to invest capital in conservation on the *customer's premises* instead of building more generating and distribution capacity, and still profit from the investment. This is a revolutionary change.

DSM is a direct result of a nationwide movement toward more energy-efficient buildings. The EPA's Green Lights Program, the DOE's Federal Energy Management Program, and other codes and ordinances have also invigorated the DSM movement.

How does it work? There are two major types of DSM projects: Subsidized ("wholesale") and private ("retail"). Many utilities subsidize DSM programs through rebates and fees paid to ESCOs. The ESCOs in turn take this subsidy and use it to achieve large savings in one of the utility company's specific service areas by working on the facilities of many of the utility's customers. In "retail" DSM, the utility rebate is obtained by and used by the property owner directly. Typical projects include the lighting retrofits performed by lighting-maintenance companies. Lighting is only about 25 to 30

percent of the electric load in the United States, but improving the efficiency of it will reap the biggest benefits fastest. Lighting is conservation's cream of the crop.

While opportunities in electric-energy conservation exist for all loads, including electric motors and hvac equipment, lighting is the only portion for which changes in technology and technique have allowed for a 50- to 80-percent reduction in consumption from the standards of 1973. Moreover, these improvements are cost-effective, and frequently result in other benefits, such as the improved color rendering of T8 lamps.

## **The designer's role in DSM.**

The lighting-energy business is currently preoccupied with hardware-efficiency retrofits. The most typical of these, the "reflector-electronic ballast-and-T8 lamp" retrofit, doesn't exactly require a trained lighting professional for implementation. The genuine science of lighting, let alone the art of it, is often completely ignored. This is not to say that there isn't a highly competitive hardware-oriented retrofit business; there are plenty of situations where the reflector-electronic ballast-and-T8-lamp solution is appropriate, and it doesn't take a lighting designer to figure this out. But it does take genuine illumination engineering to determine the illumination levels correctly in these cases.

I believe it is necessary for people who really understand lighting and architectural design to become part of the DSM industry. The absence of design professionals in the mainstream energy-efficiency business has allowed esthetic nightmares and snake-oil-sales tactics to flourish. I cringe at the sight of screw-in compact fluorescent R lamps sticking out of downlight cans!

By taking a leadership role in the emerging

DSM industry, design professionals can bring their expertise to the retrofit lighting-design process, and to take advantage of a market that is bound to expand at the same time. The cost of new buildings now significantly exceeds the cost of remodeling and retrofitting older buildings, many of which already have significant advantages over new buildings, such as location, identity, mature landscaping, and so on. So retrofit buildings can be made as valuable as a new building for a fraction of the cost.

Since most lighting DSM work involves paybacks of four years or less, building owners are often hard pressed to discover better ways to spend money and earn a rapid—and fairly guaranteed—return as a result. All of this points to DSM as an area of potential business growth for the 1990s.

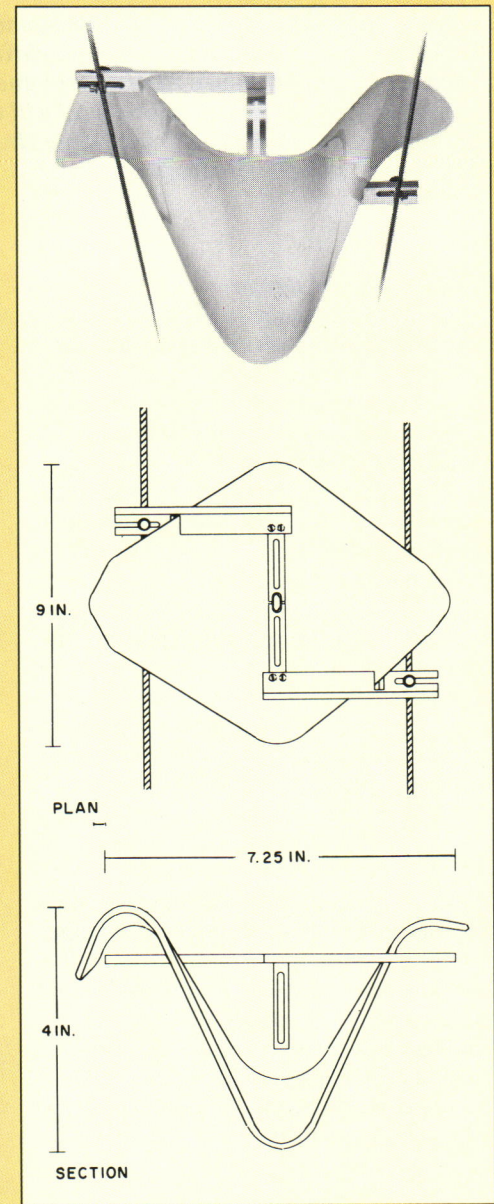
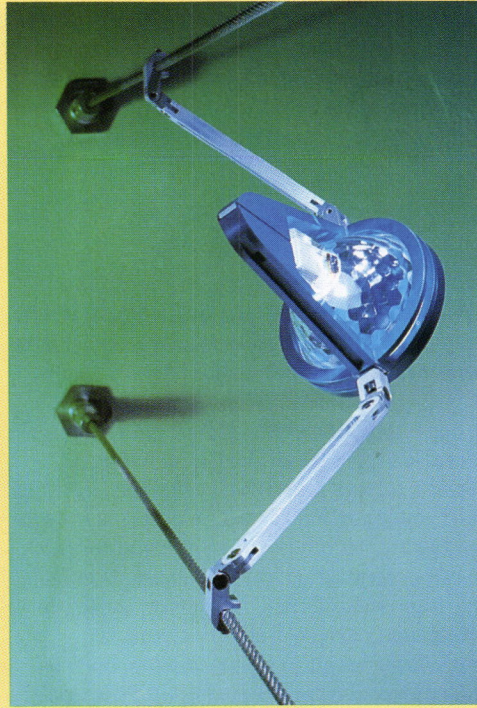
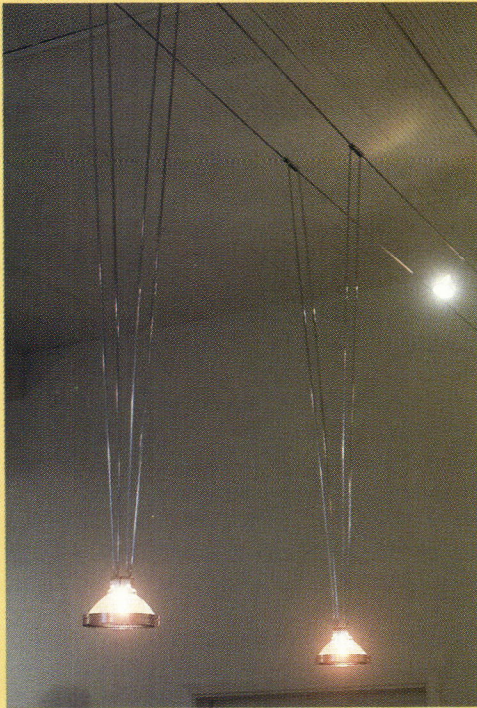
What role will lighting-designer certification play in DSM programs? A large one, I hope. The technical nature of lighting design alone demands that utility companies or building owners who offer DSM contracts should be able to establish the qualifications of those they are dealing with. Hence, the sudden interest in developing certification programs in the lighting industry.

EPA's Green Lights Program already recognizes certification programs sponsored by the Association of Energy Engineers (AEE) and the National Association of Lighting Maintenance Contractors (NALMCO) while the National Council for the Qualification of Lighting Professionals' (NCQLP) certification program is still on the drawing board.

Their NCQLP program is being developed with input from many different professional design organizations, including the IESNA, the IALD, the ASID, IBD, and others. I hope when this certification program is complete, it will recognize the rapidly evolving and very important realm of DSM, and perhaps the need for multiple certification programs will be eliminated. ■

## Cable-hung halogen lighting for corporate offices

For more information circle item numbers on Reader Service Cards.



### 308. Low-voltage trapeze

The Halogen Bridge was designed by Californian Damon Peterson to span space point-to-point, with pairs of horizontally tensioned conductor cables six inches apart strung between walls or crossing diagonally in unsupported lengths of up to 30 feet. Light sources are primarily MR-11s and -16s held in interchangeable pendant- and rod-mounted lampheads that can be clipped anywhere on the cables. A simpler, more architectural and rugged-looking version of European bare-cable systems such as Ingo

Mauer's YaYaHo, the Bridge is made with metal parts—turnbuckles, stud ends, cables, and universally jointed aluminum mounting cradles—that have been machined to exact tolerances for multiple-unit commercial applications. System and all components are E. T. L. approved.

Lamp-holders include Sing, upper left, a pendant with two angled conductor rods connected to a 4-in. diachroic shade. A cap ring holds lenses and honeycomb filters. Next to it is Byrde, a completely adjustable

accent light that comes in natural aluminum and anodized-metal colors. The Glass Scarf, detailed at right, diffuses ambient light from a bi-pin halogen bulb through a flashed-white shade suspended between the cables from an aluminum framework. The installation pictured below left, offices for a software manufacturer in Mountain View, California, was designed by Primo Orpilla. SF 12V, Inc., San Francisco. ■

## Fluorescent Lamp Quiz: What Is an RE 735?

According to the National Electrical Manufacturers Association (NEMA), it's a triphosphor lamp with 70 CRI and 3500K color temperature. Recently, lamp manufacturers who are members of NEMA approved a new standard nomenclature for indicating the range of color-rendering index (CRI) within which various triphosphor fluorescent lamps operate. This will eliminate the minor confusion that existed when each manufacturer had its own way of designating CRI and color temperature.

What used to be called a thin-coat triphosphor, which operated between 70 and 79 CRI, will now be called RE 70. Thick-coat triphosphors, which operated between 80 and 89 CRI, will now be called RE 80. A designation called RE 90 will cover rare-earth phosphor lamps with a CRI over 90. Color temperature may also be indicated by the new designation system. A 3500K lamp that had a color-rendering index of 70 would be designated as an RE 735, for example.

This development affects only the way triphosphor coatings are designated. NEMA and the lamp manufacturers are still working with manufacturers to try to standardize the actual color of the lamps so that different brands of, say, an RE 841, could be used in a single room with no noticeable difference in color from lamp to lamp.

These new designations will make it easier to identify, specify, and replace fluorescent lighting products, and thus take us a few steps closer to the day when high-quality fluorescent lamps will be the rule—rather than the exception—in buildings. *Charles Linn*

If Luis Barragán had designed a night club, it might have resembled the Bombay Connection wholesale/retail outlet, which is the largest store in downtown Laredo, pop. 133,000 at night and more than 300,000 during the day when people cross the border from Mexico to shop till they drop. A certain wild-west aura lingers in Laredo, even though the legendary cowboys have given way to merchants, the pickup truck is the new horse and wagon, and lighting has replaced lasso as a means of persuasion.

According to Sunil Gurnani, vice president of the 40,000-sq-ft border-town fashion emporium, "The lighting is a magnet that pulls people from both ends of the street to the entrance cylinder on the corner. You see the entire store from the entrance and you want to venture onwards and onwards. Even if you don't feel like shopping, you wind up shopping, it looks so good."

New York architect Tarik Currimbhoy marched sparkling bays of glass block, diamond-faceted and back-lit by yellow neons, along two sides of the exterior; they converge at the entrance, a dark mauve metal cylinder dominated by a large display window and a tilted acrylic cap lit from within by daylight white fluorescent lamps. A stainless-steel serpentine cornice reflects the glow of blue airport landing-strip lights set into the entablature and a strip of red neon along the edge. These lamps create, in turn, an entirely new set of colors on the mauve-painted, saddle-curved canopies over the doors. (See cover detail.)

MR 16 beams bounce off the display window's copper-leaf backdrop, where a punch-out provides a view into the rubbed and varnished burnt sienna vestibule lit by incandescents, and from there to the terraced retailing area, where MR 16 task lights zero in on the merchandise and twinkle back from mirrored fascias.

The view climbs upward to the junction where retail and wholesale meet in a great play of Barragán-esque color and form, seen through light-bouncing lacquer finishes that reveal new palettes as the shopper changes vantage point.

The space is filled with clean geometric forms covered in saffrons, rag-rolled blues, and combed raspberries, all sealed in lacquer; not-quite-whites in an eggshell finish; platinum leaf underlaid with saffron and lit by blue airport landing-strip fixtures; metal finished in a high gloss or painted red; floors of polished granite or rich carpeting.

Everything pulses beneath a black ceiling, from which hang what must be the most startling devices in the space, metal-halide street lamps. "Haggling over merchandise needs to be done in light bright enough for a football stadium," says Currimbhoy. (The metal halides were turned off to avoid bleached-out photography.)

Even in booming Laredo, possibly the fastest-growing city in the U. S., Bombay Connection shines: The store earned Currimbhoy the mayor's award of distinction. *Judith Davidsen*

*Judith Davidsen is a freelance writer based in New York.*



*Previous pages: Retail meets wholesale at a juncture filled with Barragán-esque color and form seen through light-bouncing lacquer finishes. Metal-halide street-lamp pendants provide the visibility needed for haggling. Above and cover: Some of the many colors that glow at the entrance result from light of one color playing on a surface of another color. Opposite: In the retail area (top), downlights above the door draw yellow glints from varnished rubbed burnt sienna, and pull in the yellow neons that backlight exterior glass-block bays. From the balcony couture section (bottom), a glistening mannequin looks straight through to the semi-wholesale area. Sand-blasted windows, set high, soften Laredo's bright sunshine.*





Peter Paige photos



Top left: Dramatic light and color distinguish the couture section. Bottom left: A black and white photo stands out on a wall of saffron with graphite scribbles fronting the staircase to couture. A punk bustier on the platinum-over-saffron rear wall reminds Currimbhoy of a light fixture. Opposite: The route to couture is by way of Barragán, seen through a gloss, brightly.

**Credits**

*Bombay Connection  
Laredo, Texas*

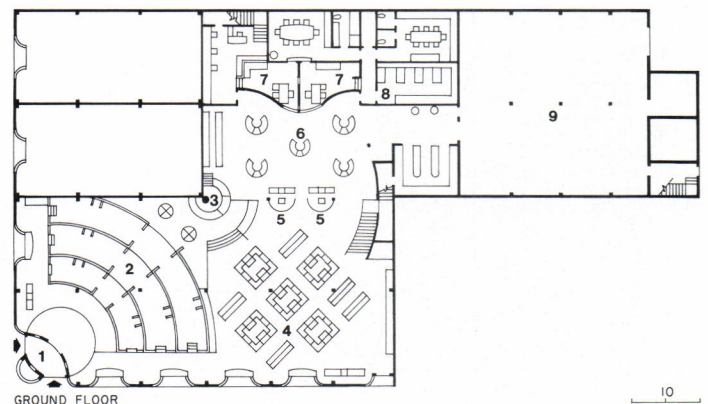
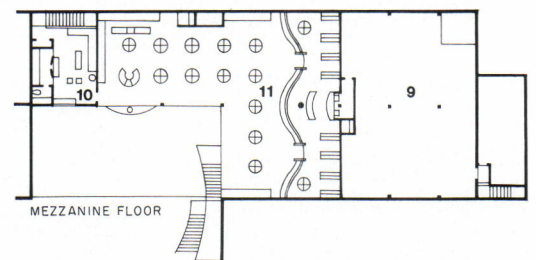
**Owner:** *Ishwar Gurnani*

**Architect:** *Tarik Currimbhoy  
Design & Architecture*

**Lighting Designer:** *Tarik  
Currimbhoy*

**Manufacturer Sources:**  
*See Contents page*

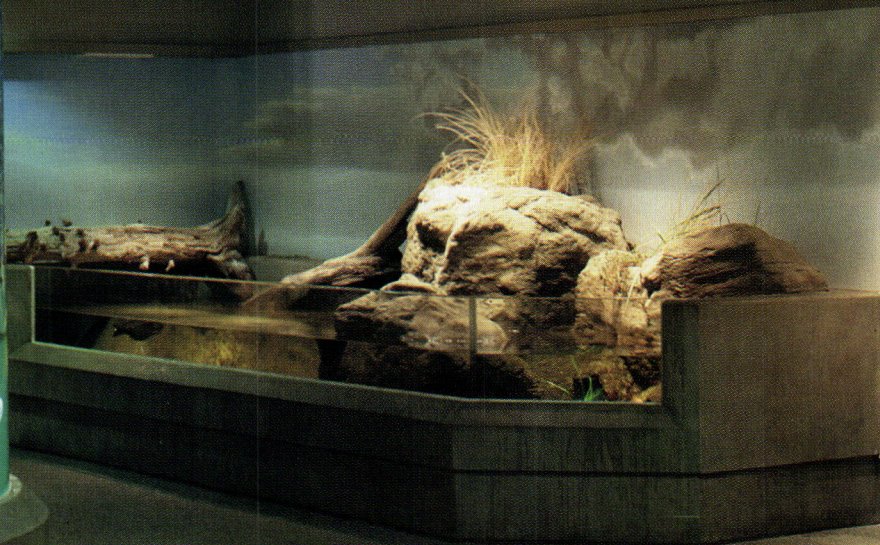
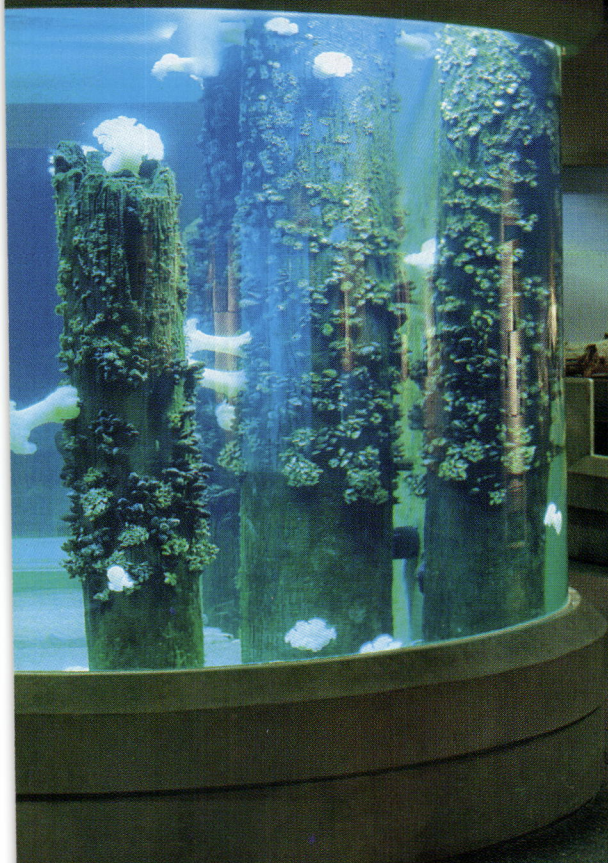
1. Vestibule
2. Retail section
3. Cash counter
4. Wholesale section
5. Perfume counters
6. Negotiable counters
7. Offices
8. Storage
9. Warehouse
10. Private lounge
11. Couture





# Oregon's Light House

*Oregon Coast Aquarium  
Newport, Oregon  
SRG Partnership, Architects  
Robert Dupuy and Mark Ramsby,  
Lighting Designers*



The new Oregon Coast Aquarium is a departure from aquaria designed in past years. Gone are dark, dank hallways featuring tanks full of weird species from faraway places. Gone are the recessed tanks and spooky backlighting that made them look two-dimensional, like color television sets or luminous paintings. At the OCA, interior and exterior exhibits re-create a dozen different local aquatic habitats, from small streams in the upland forests of the Coastal Range to the wide-open waters of the Pacific. Exhibits are brightly lit and freestanding to emphasize free visitor circulation and interaction: the glass barriers between the viewer and the viewed seem to disappear.

Even the aquarium building is at home here on Yaquina Bay, inspired by the traditional materials and proportions of boatsheds and seafood-processing plants across the bay in Newport's Old Town district. In the lobby of the building, a school of fiberglass salmon sidelit by adjustable 70W metal-halide spots leads visitors into a series of brightly lit display halls where freestanding tanks, shallow wave tanks, wall displays, and hands-on exhibits are located. Electric light from nautically inspired shades fitted with metal-halide lamps blends with the ambient clerestory daylight.

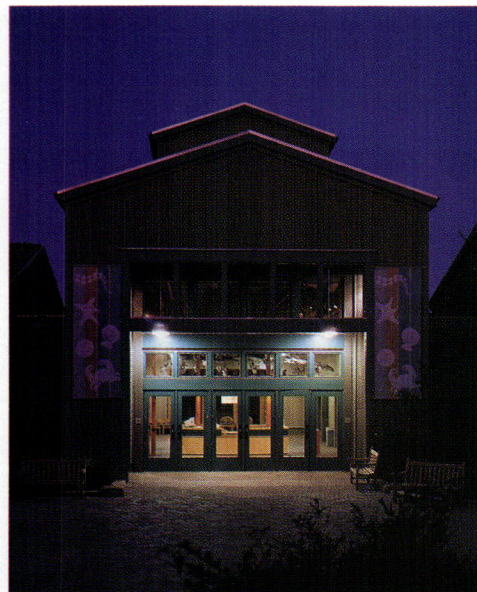
Lighting designer Robert Dupuy used an accent approach similar to retail display lighting for the interactive hands-on displays and wall exhibits employing marine-grade track lighting, fitted with 90W PAR 38 lamps. Ambient lighting for interior circulation is provided by 3000K fluorescent lamps housed in fiberglass fixtures, which are fastened to the bottom chords of the wooden roof trusses. Lighting for the freestanding tanks was designed by the exhibit designers, BIOS, Inc., and employs 250W metal-halide lamps in vapor-proof fixtures suspended 2 ft over the surface of the water.

Exterior exhibits are constructed of concrete surfaced with gunite, dyed and sculpted to appear as natural-rock formations to produce caves, cliffs, and tunnel-like passageways, and fitted with glass viewing ports so visitors may view the sea lions, otters, octopi, sea birds, and other creatures from above and below the surface of the water. Night lighting for the exterior exhibits is used occasionally for special events. To avoid disrupting the animals' circadian rhythms, the lighting comes on before dusk to replace the sunlight that is gradually fading away. This extends the effect of the natural twilight. When the event is over, the electric lighting gradually dims until it is turned off, in effect, emulating the sunset.

Mark Ramsby took a very theatrical approach to lighting the exterior habitats, and the outdoor dimming system used to extend the hours of these exhibits also allowed flexibility in setting lighting levels to gain the best effect at each area. IR halogen PAR 38 lamps in hidden corrosion-resistant lampholders are aimed both at the rock formations and at the surface of the water, so the light picks up moving reflections.

Below the surface of the water, submersible narrow-beam fountain lights fitted with 250W halogen T lamps project mysterious shafts of light. Fixture lens are protected by fiberglass louvers; the fixtures themselves are wired through plastic conduit using portable cable so they may be easily replaced if they become damaged. Outdoor exhibit circulation paths are lighted by vapor-proof A-lamp fixtures, concealed inside recesses created in the artificial rock structure.

Charles Linn



© Stephen Cridland



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*Nautically inspired industrial metal shades reflect pools of metal-halide light onto the entry doors of the Oregon Coast Aquarium (above.) The shades are also used in the lobby of the clerestoried, fish-processing shed-inspired building. Track lighting at the perimeter of the lobby will be used to highlight traveling exhibits that will be displayed at the museum in the future.*

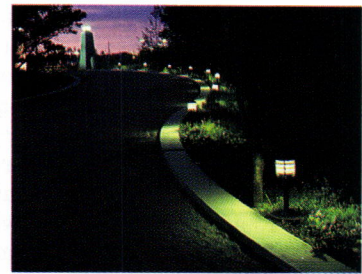
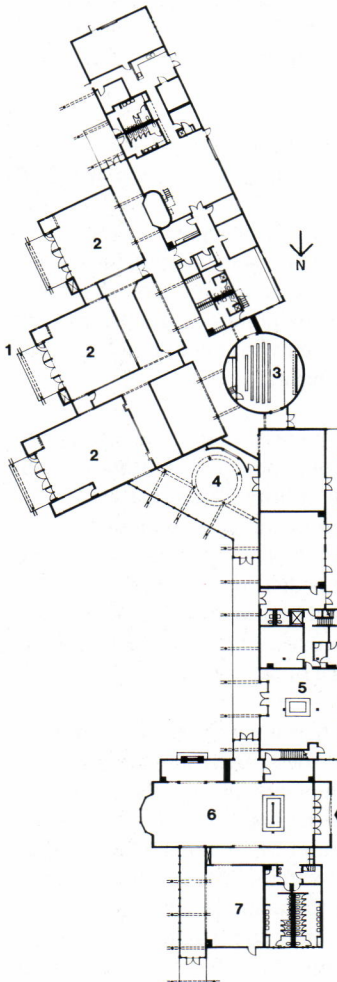


The Sea Otter Pool (top) and Wave Crash Tide Pool (above) are actually built of concrete, and lit theatrically with IR halogen PAR 38s controlled by dimmers. Lighting Designers Mark Ramsby and Robert Dupuy discovered one difficulty with outdoor dimming: dimmers can create electrical noise that will trip the ground-fault interrupt (GFI) circuit breakers required outdoors. Solving the problem required running a separate neutral wire for each fixture and designing circuits so that no

dimmer was loaded to more than 50 percent of its capacity.

A school of fiberglass silver salmon suspended from wooden trusses in the lobby directs visitors to the exhibit areas (opposite, top left.) Lighting designer Robert Dupuy used lighting techniques typically found in retail to punch up the wall displays, and interactive "hands-on" exhibits (remaining photos opposite) using easily adjustable, marine-grade track lighting, with 90W PAR 38 lamping.

1. Outdoor Exhibits
2. Gallery
3. Theater
4. Introductory Exhibit
5. Bookstore & Gift Shop
6. Lobby
7. Food Service



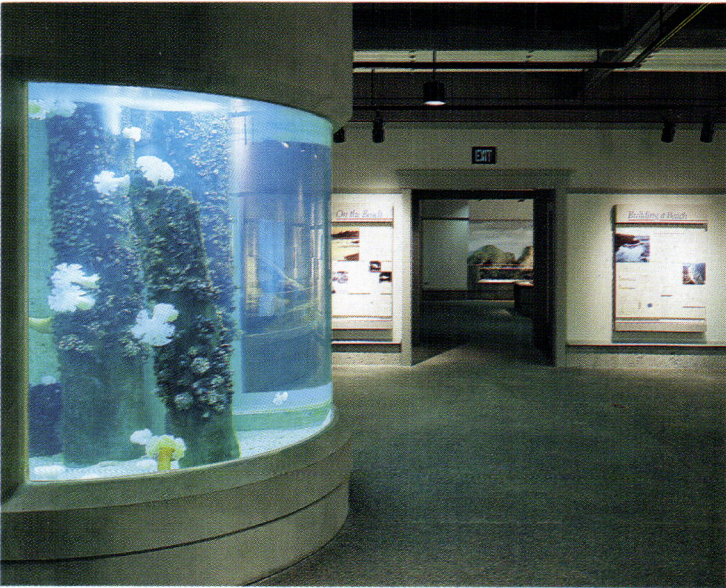
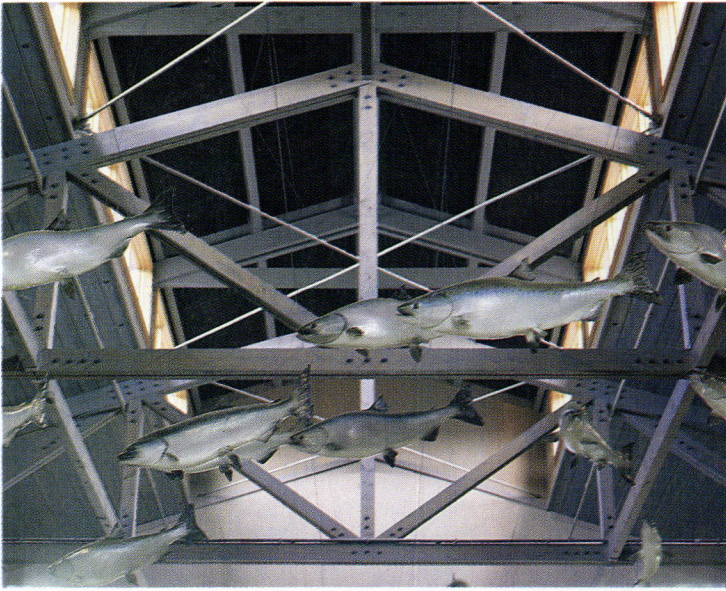
Incandescent lights punctuate the gravel path (above) leading from the parking area to the aquarium.

3000K fluorescent lamps in noncorrosive fiberglass fixtures provide a cheerful level of ambient light in exhibition areas (opposite), not often found in aquarium exhibits. Freestanding tanks are lit from the inside by 250W metal-halide fixtures suspended over the water.

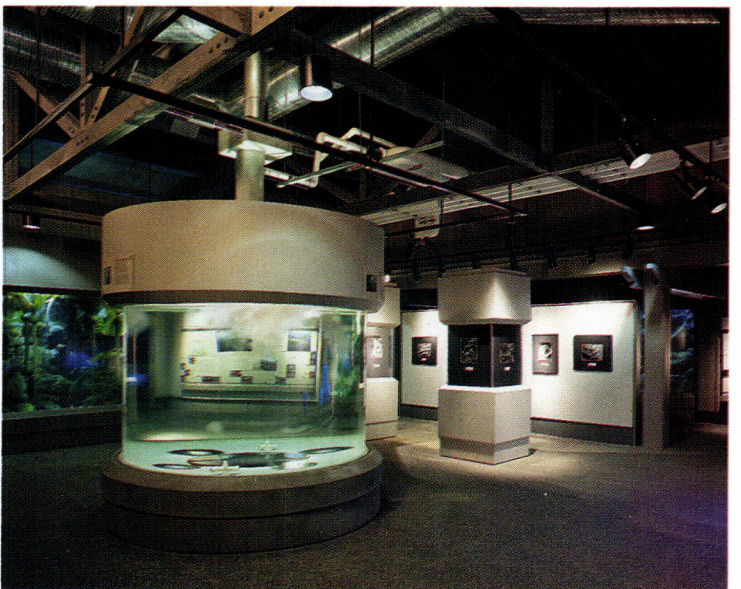
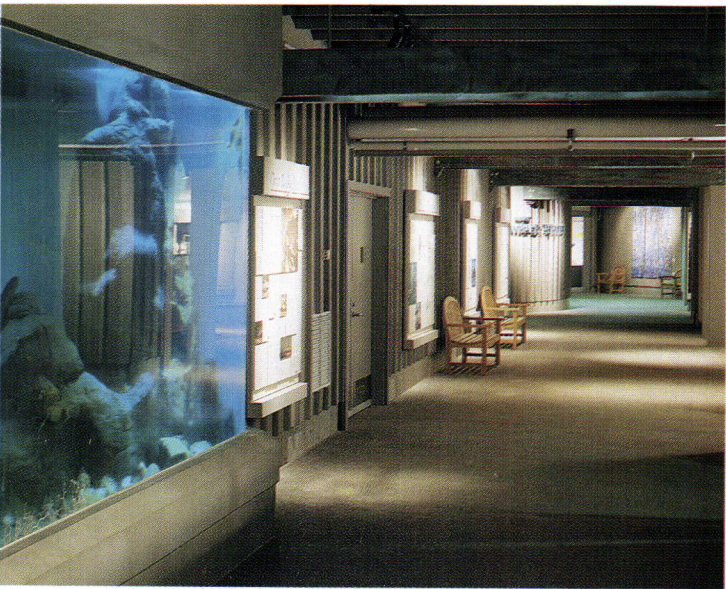
**Credits**

**Oregon Coast Aquarium**  
Newport, Oregon  
**Owner:** Oregon Coast Aquarium  
**Architect:** SRG Partnership—Jon Schleuning, design principal; Dennis Cusack, managing principal; Richard Farrington, project architect; Laura Hill, interior design; Doug Reimer, construction architect  
**Lighting Design:** Robert Dupuy, Mark Ramsby  
**Exterior Aquarium Design:** Fulton Gale Architects  
**Exhibit Design:** BIOS: Inc.  
**Landscape Architect:** Walker & Macy  
**Life Support Systems:** ENARTEC  
**Engineers:** Holmes/Entenman Engineers, Inc. (structural); Carson Bekkl Gulick Kohn (mechanical/electrical)  
**Manufacturer Sources:** See Contents page

© Stephen Cridland



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# Office Politics

*W. K. Kellogg Foundation  
Headquarters  
Battle Creek, Michigan  
Luckenbach/Ziegelman  
+ Partners Inc. Architects  
Gary Steffy Lighting Design Inc.*







*Custom pendants holding compact fluorescent lamps float over the main reception desk for a charitable foundation (opposite). The building has a basically L-shaped footprint with a gently undulating facade (top). A view from inside the open-plan office area that occupies most of the two wings (above) shows the pattern of ceramic frit on the top windowpane. The glazing is key to optimizing the visual environment for users of video display terminals, which are on nearly every desktop.*

**A**s tempting, commonplace, and incredible as campaign promises, the program for the W. K. Kellogg Foundation headquarters included a computer on every desk, full-height window views equally shared by workers, and freedom from eye-straining glare. Recognizing the near incompatibility of these goals, architects at Luckenbach/Ziegelman + Partners called in Gary Steffy Lighting Design to handle the problem. A strong egalitarian theme ran through the program for the open-plan areas to be used by the highly educated staff, who distribute humanitarian grants totaling more than \$200 million a year. Views of river and park were to be seen from the modules stretched along two wings. No offices were to be located along the perimeter, because not everyone could have one.

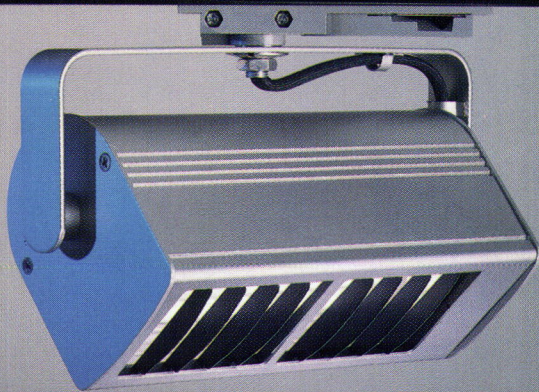
Steffy explained to the client and architects that the key to avoiding computer-screen glare is to have consistent, balanced luminance. From a worker's seat, views in all directions should have about the same brightness, but never so bright as to cause discomfort. There should be no dramatic adjustment of the pupils needed for the person gazing alternately at computer screen and paper documents, occasionally looking up at other objects or visitors, and glancing for a restful look out the window. In addition, a room peppered with computers must avoid the classic trap of screen glare: display terminals will reflect images of anything unusually bright, such as windowpanes or 2 by 4 fluorescent fixtures. In the ideal environment, screen, paper, walls, ceiling, and sky views should all measure within a fairly narrow range of luminance, with the ratio of brightest to darkest area no greater than 4 to 1.

Clearly, solar control would be key to the Kellogg project. Appropriate indirect lighting would make the ceiling a softly glowing plane. Then, the window brightness would be stepped down to near that of the ceiling. At Steffy's recommendation, ceiling heights were set at 10 feet, primarily to work better with indirect lighting. The design team then proceeded to review a full range of options for daylight control, including awnings, louvers, coated and modified glass, and mechanically operated fiberglass shades. Typical venetian blinds were excluded because the designers wanted consistently open views rather than haphazard individual use.

Steffy's firm calculated that, based on local solar conditions, building orientation, and the amount of glazing desired, the windows should have a net transmittance of 3 percent to 4 percent. The final selection of a daylight-control system was made by the design team after visiting a glazing manufacturer to view a mockup of four possible window systems, complete with a computer terminal. The chosen system uses double panes of bronze-tinted glass (8 percent transmittance) with a frit coating on the innermost surface from 6 ft 6 in. to 9 ft above floor level, for a 5 percent transmittance where sky brightness is harshest. The horizontal stripes of white ceramic frit are permanently fused to the glass.

For the electric lighting system in the offices, a two-lamp T8 fluorescent pendant is combined with electronic ballasts for excellent energy efficiency. Other areas of the building use standard and compact fluorescents wherever possible: in strip lights, downlights, wall washers, step lights, sconces, and even in decorative custom pendants. Incandescent lamps are reserved for use where dimming is needed or for areas like the cafeteria, where a lively sparkle provides relief from the deliberate uniformity of the office. This is one building that delivers on its promise to be a comfortable place for people. *Gareth Fenley*

*Gareth Fenley is a frequent contributor to RECORD LIGHTING.*



# SPACE CAPSULE

Our payload is energy efficient, long life, compact fluorescent lamps. Additional launchings scheduled throughout 1992.

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Lighting Services Inc  
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Stony Point, NY 10980  
Circle 122 on inquiry card

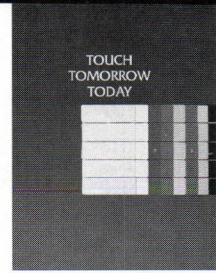


## Product Literature



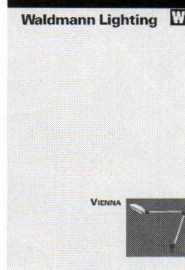
### 424. Landscape lighting

A 24-page, four-color catalog explains how the addition of low-voltage lighting can improve the evening beauty, safety, and security of grounds and structures. It describes the variety of lighting effects, recommends fixtures to achieve these effects, and details the Intermatic line of accessories. Intermatic, Spring Grove, Ill.



### 425. Switches and receptacles

A color brochure on contemporary-design Piano and Grand Piano light switches, receptacles, and accessories illustrates the devices in room settings. Made of FR plastic in 10 colors, the piano-key-like plates conceal fastener screws. Elements fit any standard outlet box from 2- by 2-in. to 4- by 6-in. U. S. Switch, Inc., Miami.



### 426. Designer lighting

The CAD-Room Vienna model lamp allows for strict light control to illuminate reference documents and computerized drafting while maintaining high contrast levels on the VDT. It has a parabolic louver with a matte-black finish. A catalog sheet gives specifications and describes accessories. Waldmann Lighting Co., Wheeling, Ill.



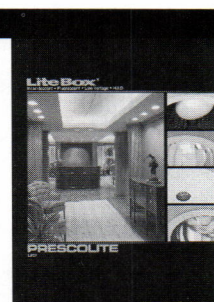
### 427. Ceramic table lamps

The 11 styles of The Architectural Collection draw their inspiration from building designs, shapes, and finishes, recalling ancient temples and modern skyscrapers. The 33 finishes include white stippled plaster, unglazed terra cotta, and metallic glazes; lamp shades are hexagonal, square, rectangular, and round. Design Technics, New York City.



### 428. Outdoor lighting

The two-part BEGA Catalog Number 5, totaling 154 pages, is devoted entirely to outdoor lighting for public, residential, and commercial architecture. Part 1 deals with building-mounted luminaires and Part 2 with site-located luminaires. The selection is exhaustive and the standard color is black. BEGA/FS, Carpinteria, Calif.



### 429. Recessed fixtures

The LiteBox downlighting line, originally for incandescent only, now offers housing and optics for compact-fluorescent, low-voltage, and HID sources as well. A 24-page catalog includes 10 pages of specifications, and illustrates downlight fixtures for each source. Installation advice is included. USI Lighting, Inc., San Leandro, Calif. ■

For more information, circle item numbers on Reader Service Card.

## Manufacturer Sources

*For your convenience in locating lighting fixtures shown in feature articles, RECORD has asked the architects and lighting designers to identify the products specified.*

### Pages 17-19

Lighting Design News

**Maine**, Cove's Edge Long Term Care Center: pendants, Baldinger Architectural Lighting (Michael Graves). **Connecticut**, Tennis Center, metal halides: Hubbell Lighting (exterior, Sportsliters; interior, Miniliters). **Pennsylvania**, Sallie Mae, indirect fixture: Litecontrol (LCI). **Seville**, Canada Pavilion, holographic grating wall: Melissa Crenshaw. **Pittsburgh**, Three Rivers Stadium, metal halides: Hubbell Lighting (SLG Series Sportsliter).

### Pages 32-37

Bombay Connection, Laredo, Texas  
Tarik Currimbhoy Design & Architecture  
Tarik Currimbhoy, Lighting Designer  
Neon: South Texas Neon. Fixtures: Halo, Artemide, and Flos. Metal fabrication: Mojica & Nava. Glass block: Pittsburgh Corning. Painting: Laredo Paints. Decorative finishes: John Spray, New York. Custom cabinetry: Morales. Seating: Leather Center. Mannequins: Hindsgul, dressed by Michael Sasoon.

### Pages 38-41

Oregon Coast Aquarium, Newport, Oregon  
SRG Partnership, Architects  
Robert Dupuy and Mark Ramsby, Lighting Designers  
Cold cathode: National Cathode Corp. Compact-fluorescent downlights: Kirlin. Marine-grade track lighting: Lite Lab, Inc. Marine-grade metal-halide downlights: Hazlux. HQI accents: Miroflector, Inc. Polyester/fiber-glass fluorescent down/work lights: Simkar. Compact-fluorescent path lights and metal-halide floodlights: Kim Lighting. Metal-halide pole-top fixtures and incandescent aquarium underwater lights: Hydrel. Compact-fluorescent step lights: BEGA F/S. Incandescent niche lighting: Stonco. Dimmer controls for outdoor exhibit lighting: Lithonia (Max Star). Electroluminescent exits: Lithonia. Louvers: Nova Industries.

### Pages 42-45

W. K. Kellogg Foundation Headquarters  
Luckenbach/Ziegelman + Partners Inc., Architect  
Gary Steffy Lighting Design Inc., Lighting Designer

Fritted glass: PPG Industries, Glass Group.  
Indirect fluorescent system: Peerless Lighting Corp. Downlights and wall washers (both incandescent and compact fluorescent) and incandescent adjustable accents: Kurt Versen, Inc. Slot lights: ALCAN Baffle with Leviton (incandescent) and Lithonia (fluorescent). Low-voltage cable system: SF 12V Inc. Custom luminaires: Peerless Lighting Corp.; Sterner Lighting; Visa Lighting. Cold-cathode fixtures: Sign Art. Fluorescent steplights: Bega/FS; Sterner Lighting. Fluorescent lamps: Sylvania. All other lamps: GE Lighting.

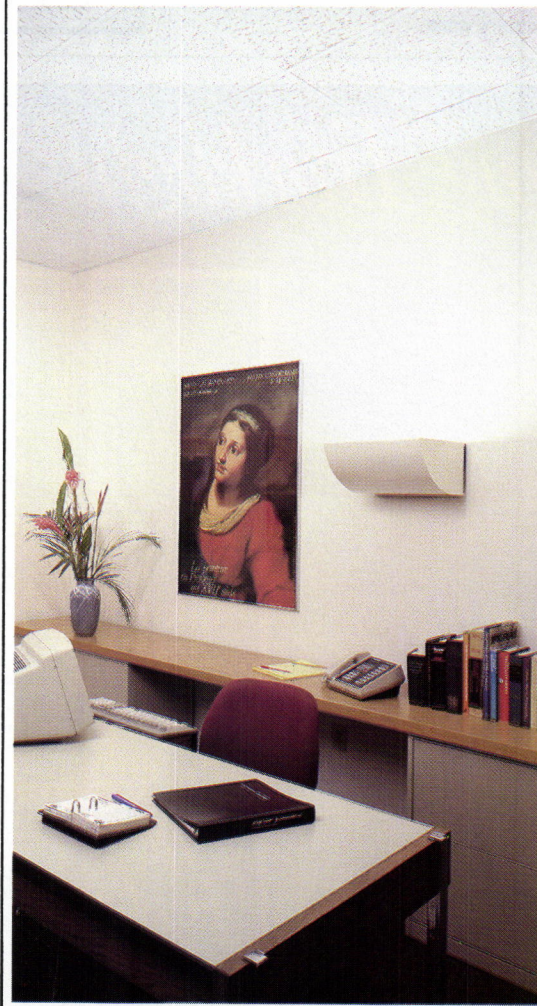
### Pages 46-47

Sportsgirl Centre, Melbourne  
Anthony Belluschi Architects,  
Hayden McKay Lighting Design  
Fixtures: custom designs, fabricated in Australia. Sources: Osram, GE, and Philips.

### Correction

In the body of the text for the article on Three Nationwide Plaza Atrium [RECORD LIGHTING, August 1992, page 36, "Tropical Light"], the credit for the lighting design should have also included the principal-in-charge, Len Auerbach.

Lighting  
the private  
office...



Elliptipar's high-powered Ensconce® series provides all the benefits of indirect lighting without overhead obstructions. Even with relatively low ceiling heights the surface appears evenly luminous, and the space free of harsh glare. Wall mounting enables concealment within decorative sconces from Elliptipar or others.

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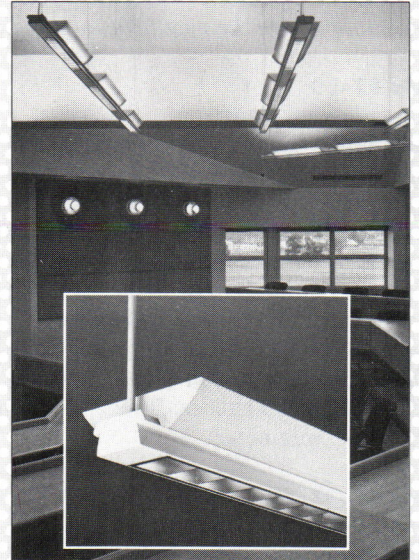
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Higher perceived illumination with lower perceived brightness. Ideal for office, classrooms, conference spaces, or any areas utilizing VDT's and where visual comfort is paramount. Uniform ceiling luminance from wide spread indirect distribution. Luminaire and ceiling luminances and ratios meet IES RP-24. Perceived brightness, low glare from parabolic louver for controlled direct lighting. Fixture efficiency is greater than 82%. Variety of lamping options. One two or three T8 or T10 lamps, one or two T12 lamps.



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*The  
Eclipse*



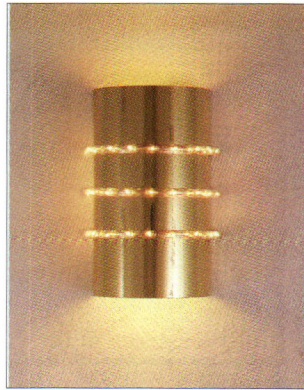
*The  
Gemini*

Circle 126 on inquiry card

# Product & Literature Spotlight

Here are some lighting products, catalogs, brochures, and technical literature available in the architectural lighting market today. To receive your copy of any of them, circle the corresponding number on the Reader Service Cards bound to this issue.

## Wall Fixtures With Low-Voltage Accents



**Liteline's Lifetube** boldly compliments this new line of fixtures. Interiors take on a new brilliance, creating a sensational architectural statement with accent & task lighting. **Liteline's Lifetube** creates this dramatic illumination effect with a life expectancy of over 50,000 hrs., transformers are not needed, & Lifetubes are easily replaced. Catalog available. 1-800-24-LIGHT.

### Liteline Ltd.

Circle 127 on the inquiry card.

## COOL AND BEAUTIFUL



Ideal for jewelry and fine art displays, or discreet accent lighting where back glow is undesirable, the new Reflektol® lamps from Ushio have a special aluminum dichroic reflector that projects all light forward through the front of the lamp. No emission through the back also means that sockets and fixtures keep cool.

### Ushio America

Circle 128 on the inquiry card

## New Decorative Patient Bed Lights from Alkco



A new 8-page, 4-color catalog introducing Alkco's new light fixture which both decorates & illuminates a patient room. With Impressions Plus™ your patient room can convey a feeling of "hospitality". Select from 4 distinctive profiles & 3 unique inserts in any combination of solid & textured finishes. Offered in lengths of 1', 2', 3', 4' & 5', with Biax & Octron lamps, Impressions Plus is more than just a bed light.

### Alkco

Circle 129 on the inquiry card.

## New Art Deco Fitter Gives Feeling of 1920

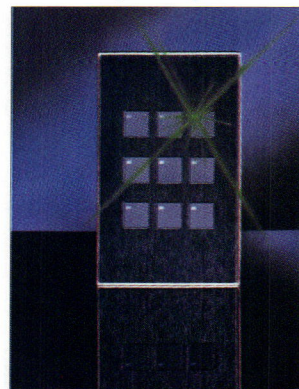


Sternberg Vintage Lighting announces the introduction of the new Art Deco I, cast-aluminum fitter for use on Sternberg ornamental poles or to slip-fit existing poles with 3" tenons. Shown here with an 18" white acrylic globe. This is just one of many new products shown in the 1993, 64-page, 4-color catalog.

### Sternberg Lanterns, Inc.

Circle 130 on the inquiry card.

## Not Just Another Pretty Faceplate

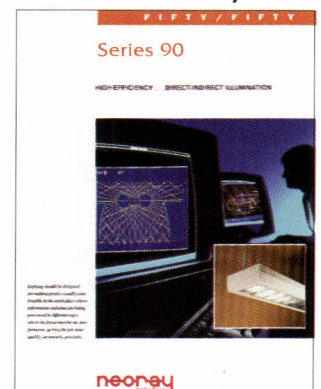


The distinctive look of the **Touchplate** decorative switch cover puts the finishing touch to any business or home decor. New catalogs and literature are available for the complete **Touchplate** product line, including our lighting control systems and occupancy sensors. For more information on how you can specify **Touchplate** to achieve your look, call (219) 426-1565 or FAX (219) 426-1442.

### Touchplate Lighting Controls

Circle 131 on the inquiry card.

## Series Fifty/Fifty from Neo-Ray



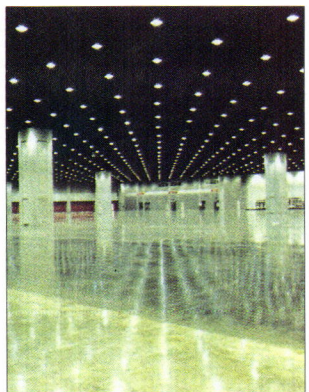
Embodies the latest computer aided luminaire design technology. Benefits are, a visually comfortable environment, the use of fewer luminaires, reduction of energy costs. Features include: 92% efficiency, 1.9 to 1 spacing to mounting ratio, 28° cross baffle shielding. Low glare direct component & wide spread indirect component. Continuous parabolic baffles for 60/40 light distribution. Low iridescence baffles, 2 or 3 T8 lamps & integral ballasts. Exact incremental hanger locations, top or bottom relamping. 718/456-7400 or fax 718/456-5492.

### Neo-Ray Lighting

Circle 132 on the inquiry card.

# Product & Literature Spotlight

## HID Dimming at its best!



Broadest dimming range in the industry for all Metal Halide and HPS lamps up to 1500 watt. Patented remote ballasts can interface with any brand incandescent controllers. Arenas (indoor and outdoor), multipurpose rooms, auditoriums, churches, atriums, anywhere the best available HID light control is desired. Hundreds of jobs; a decade of experience.

**Payne-Sparkman Mfg., Inc.**  
Circle 133 on the inquiry card.

## REGGIANI USA INTRODUCES WETSCAPE



The first interior/exterior low voltage lighting fixture. WetScope fixtures are suitable wherever landscape accent lighting effects are required. WetScope is weather tight & UL listed. The fixtures are constructed of die cast aluminum & are fully adjustable with a "cool grip" device for maximum aiming possibilities. They are available in 4 finishes and accommodate MR-16 50 watt lamps.

**Reggiani USA**  
Circle 134 on the inquiry card.

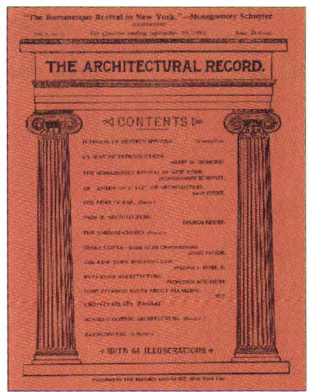
## The Right Chemistry



Ushio's new compact Metal Halide lamps provide energy efficiency, long life and excellent color balance. It's in the chemistry. An enhanced sodium scandium mix, less sensitive to voltage or temperature change than multichemistry dysprosium lamps gives you color stability; crisper whites, richer colors.

**Ushio America**  
Circle 135 on the inquiry card.

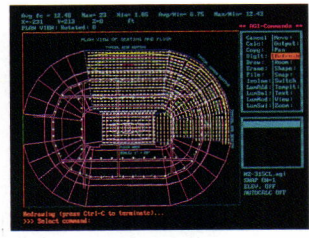
## Limited Numbered Edition



ARCHITECTURAL RECORD'S first issue (1891) is reprinted to celebrate our centennial. 150 pages. 64 illustrations. Every architect should have this collector's issue. Only \$16.95 ppd. For more information call: 212-512-3443.

**Architectural Record**  
Circle 136 on the inquiry card.

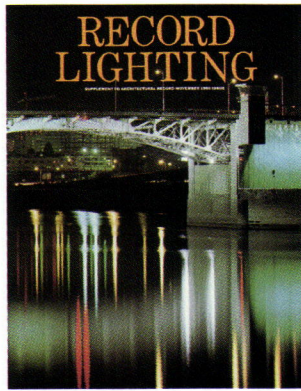
## Graphical Outdoor and Sports Lighting Analysis



The Advanced Graphics Interface is a completely graphical, mouse-driven, 3-dimensional outdoor and sports lighting design system. Users have the ability to locate luminaires, aiming points and multiple planes of analysis on top of CAD or internally created drawing backgrounds using intuitive graphical commands. AGI operates with IES standard photometric reports.

**Lighting Analysts, Inc.**  
Circle 137 on the inquiry card.

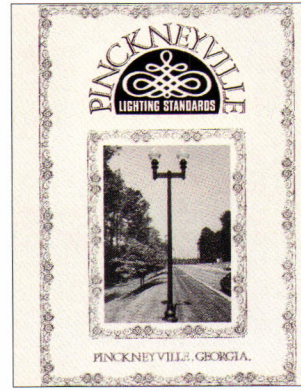
## Back Issues of Record Lighting



Add to your files by ordering back issues of RECORD LIGHTING, the exciting color supplement to Architectural Record. The price per issue is only \$3.50 each (includes postage and handling). Send check or money order to Architectural Record, 1221 Ave. of the Americas, New York, NY 10020. Attn: Back Issues.

**Record Lighting**  
Circle 138 on the inquiry card.

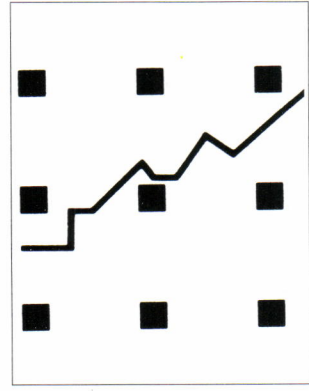
## "Pinckneyville Lighting Standards"



"Pinckneyville Lighting Standards" by TrimbleHouse offers expertly crafted extruded aluminum and steel fluted poles with cast bases, reminiscent of Colonial, Federal and Victorian styled lighting standards from America's historic past. These lighting standards, along with TrimbleHouse luminaires, offer unparalleled quality, durability, engineering and ease of maintenance for traditional streetscaping projects.

**TrimbleHouse**  
Circle 139 on the inquiry card.

## Keep Dodge In Your Plans!



Don't forget to provide your local Dodge Reporter with the details and plans for your next job. You don't want them to miss out on the best bid for your next job. Contractors can't bid on jobs they don't know about. Thank you for your input. We appreciate your cooperation. F.W. Dodge, Mc-Graw-Hill Construction Information Group.

**F.W. Dodge**  
Circle 140 on the inquiry card.

### A New Twist In Energy Savings

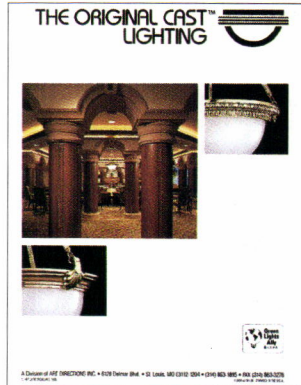


Duro-Test is introducing the Ultra-9 fluorescent tube, the first and only one specifically designed to operate in both T-8 and T-12 systems. The perfect retrofit for any T-8 fluorescent system. Features exclusive patented Energy-Twist design for increased light output. Costs less to operate than any T-8 on the market. Life-rated at 22,000-26,000 user hours.

#### Duro-Test Lighting

Circle 141 on the inquiry card.

### The Original Cast® Lighting



New 20th anniversary catalog features energy-efficient compact fluorescent lamps & HID sources in exciting new indirect fixtures. Our "classic technology" assures excellence in design, craftsmanship, quality, material selections & energy conservation. Function & design are blended together for perfect appearance & performance. 6120 Delmar Blvd., St. Louis, MO 63112-1204. Please call (314) 863-1895.

#### The Original Cast Lighting, div. of Art Directions, Inc.

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### MARINER III Series



Eclipse Lighting Inc. introduces the **MARINER III Series**. A decorative, durable & energy efficient solution for compliance with new ADA standards. UL listed, & available in three attractive models, plus the option for tamper resistant or custom modifying to meet most every demanding application. For complete information: Eclipse Lighting, 1259 Wood Street, Chicago, IL 60022. Tel: 312/862-0802, FAX: 312/862-1138.

#### Eclipse Lighting Inc.

Circle 143 on the inquiry card.

### The Archetto Series FLOS, Inc.

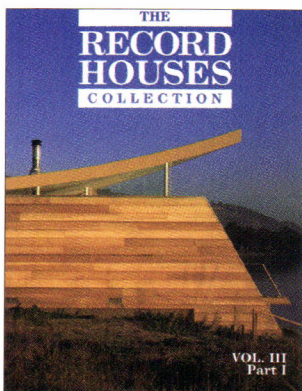


The new "Flight" catalog of U.L. listed Low-Voltage Lighting includes the original Expanded Line Network and the new Archetto Series of plug-in fixture heads. Heads are fully adjustable and accept a variety of lenses, filters and devices to create special effects. FREE brochure: (516) 549-2745, Fax (516) 549-4220.

#### FLOS, Inc.

Circle 144 on the inquiry card.

### THE RECORD HOUSES COLLECTION

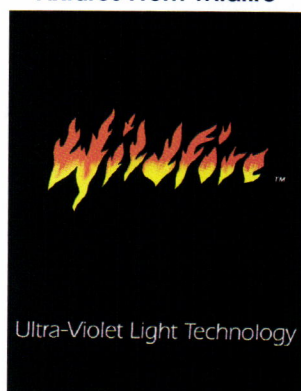


Compilation from 1990/1991/1992. We put 3 yrs. worth into a 2 volume set. Over 290 pages, in full color, with plans & text directly from the pages of Architectural Record's RECORD HOUSES issues. Just \$19.95 (including postage & handling). A single compilation 1987/1988/1989 is also available for \$19.95. Send check or money order to ArchitecturalRecord, 1221 Ave. of the Americas, New York, NY 10020. Attn: Back Issues.

#### Record Houses

Circle 145 on the inquiry card.

### Long Throw Blacklight Fixtures From Wildfire

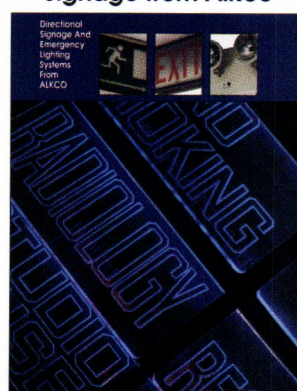


Wildfire's 400 Watt series U.L. approved long throw (up to 100') Blacklight (U.V.) fixtures define the 'state of the art' in U.V. effects lighting for architecture and entertainment worldwide. The Wildfire unit produces the Blacklight effect with many times the brightness, intensity, and coverage of previously available technology. Fluorescent paints, specialty coatings and materials also available (310) 559-8907.

#### Wildfire, Inc.

Circle 146 on the inquiry card.

### Custom Illuminated Signage from Alkco



Illuminated signage has become a very important component in both new and existing construction. Alkco's new 26-page, 4-color catalog features some of their capabilities to include; neon, edge-lit, electro-luminescent and a new European profile. Also featured is Alkco's ability to offer engraved signs to comply with ADA requirements and internationally recognized symbols.

#### Alkco

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### Introducing U.S. Architectural Lighting



Extensive offering of quality, outdoor luminaires and poles featuring durable, cast aluminum construction. Standard product offering includes roadway and parking area lighting, area and site lighting, low level bollard lighting, wall and pier mount luminaires. U.S. Architectural further designs and manufactures custom lighting products.

#### U.S. Architectural Lighting

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*Quality Lighting*<sup>TM</sup>

A Subsidiary of Jac Jacobsen Industries Inc.

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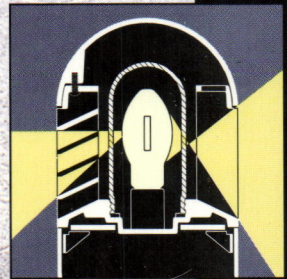
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