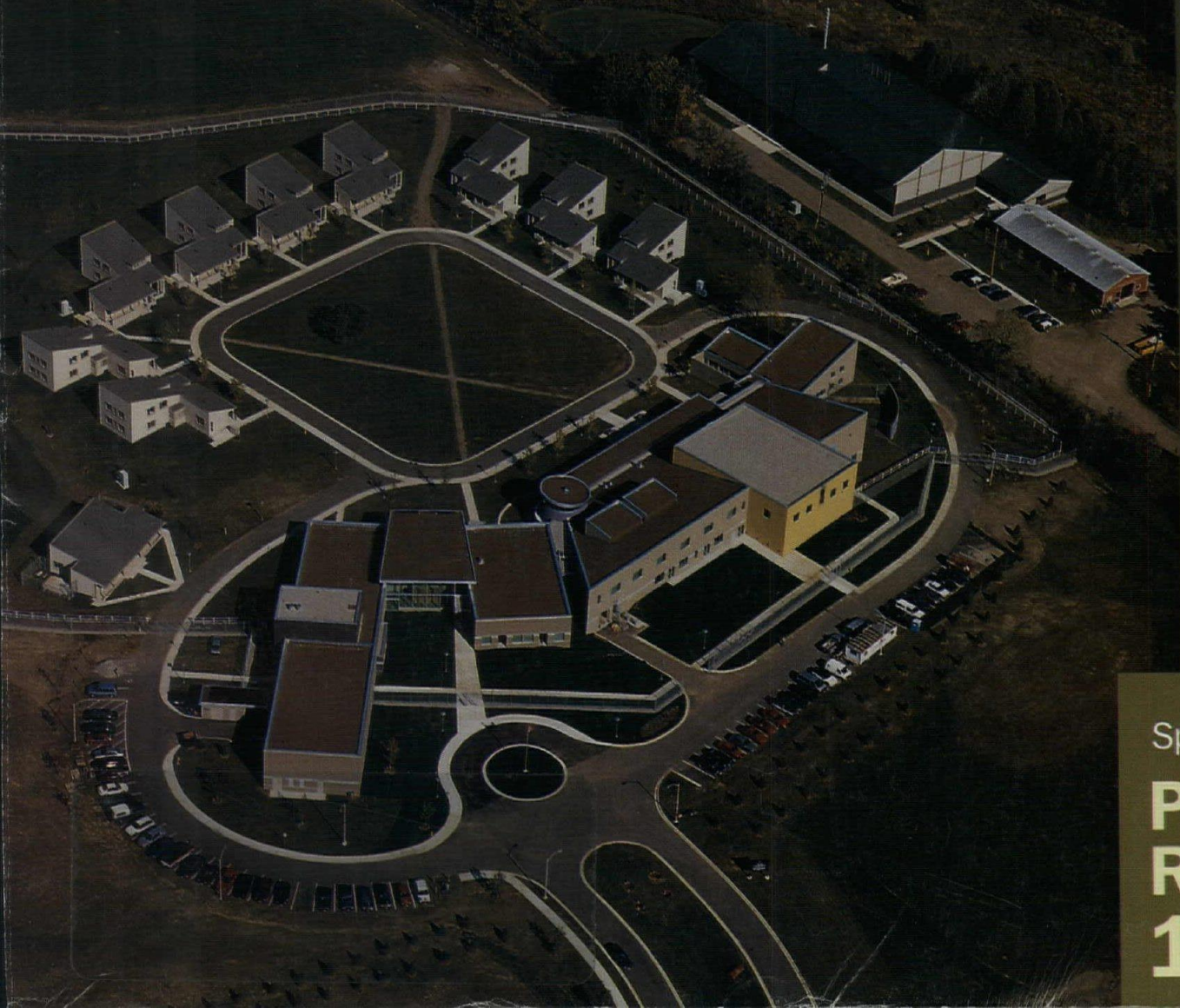


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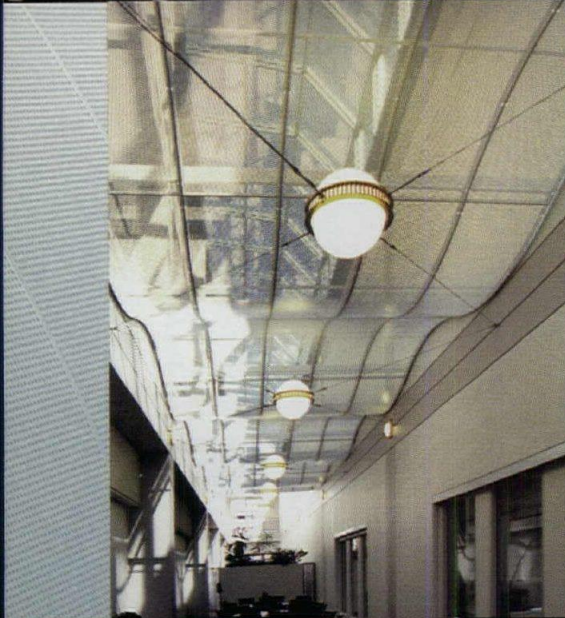
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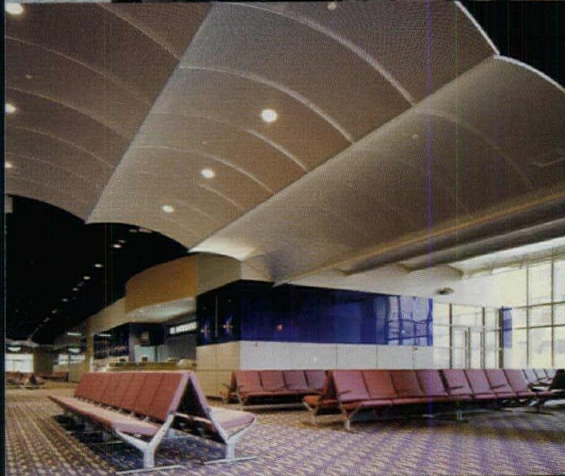




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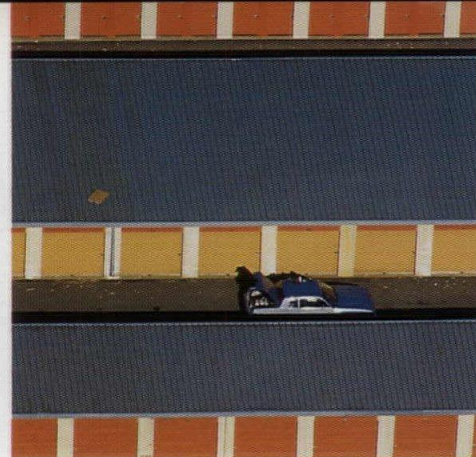
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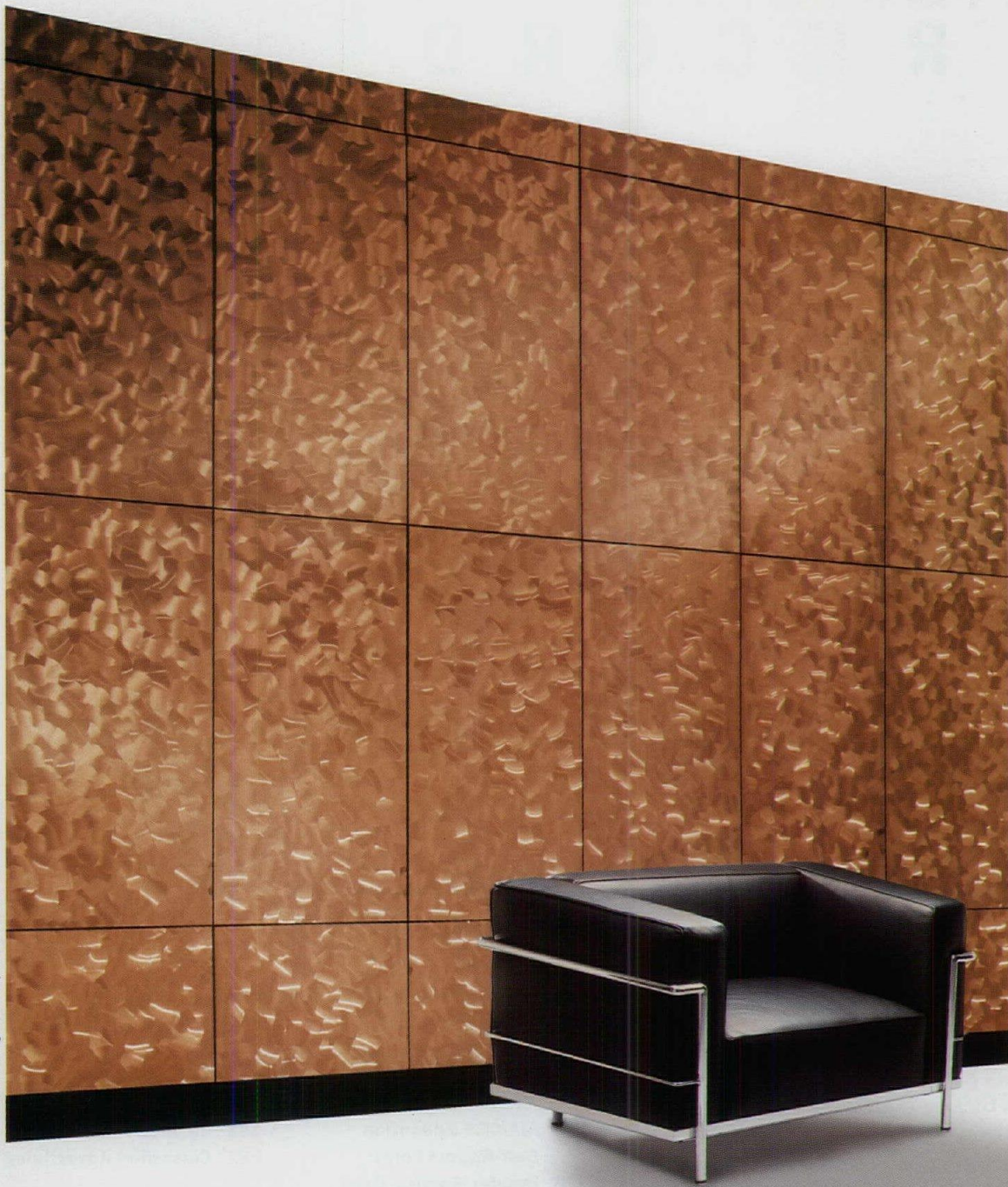
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Cover: Grand Valley Institution for Women, Kitchener, Ontario. *Kuwqbara Payne McKenna Blumberg Architects*. Photograph © Steven Evans.
Above: Self-storage lockers, Lowell, Massachusetts, 1993 (detail). Photograph © Alex S. MacLean. See story beginning on page 54.

LeCorbusier Lounger courtesy of Gordon International, NY, NY.



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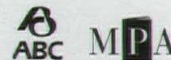
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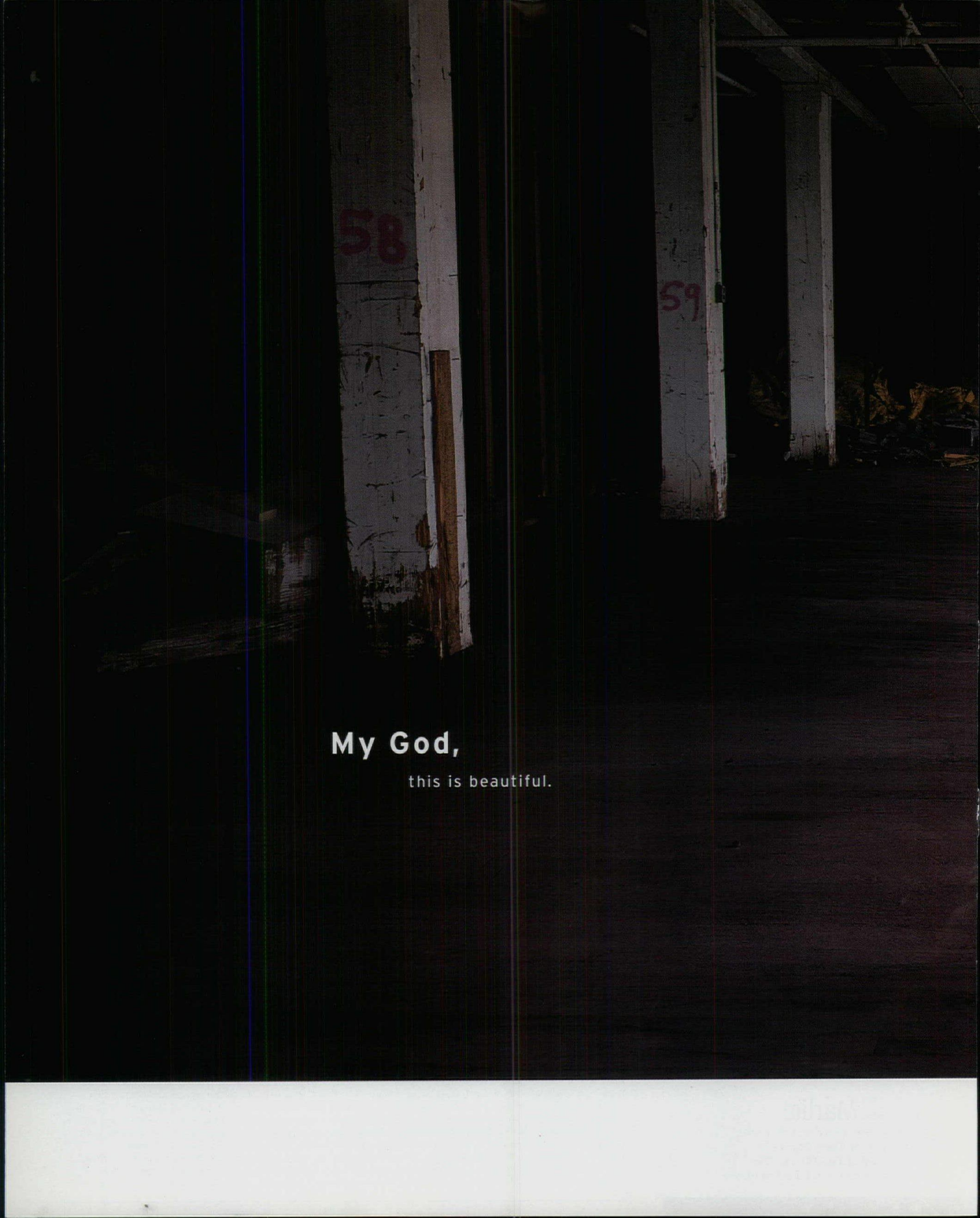


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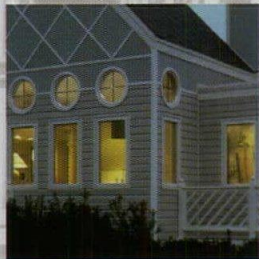
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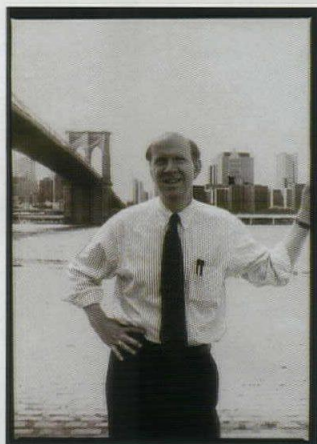
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EDITORIAL

Taking The Cruise

BY ROBERT IVY, FAIA



The Cruise is a just-released documentary film that architects are bound to talk about. It's the story—or performance—of Timothy “Speed” Levitch, a tour guide who loves New York obsessively: its streets, its buildings, its grunge, its detail. Day after day he mounts a double-decker Gray Line bus and spills out a verbal rhapsody, a riff that celebrates the power of the city, breaking down the whole urban fabric into a wealth of history and rationale for ordinary and sometimes bemused folks, weaving architectural and social history into a nonstop monologue. Levitch is funny and blindingly articulate, and although apparently emotionally troubled, he is an arch, ironic, yet passionate lover of buildings and streets, a kind of Jane Jacobs on speed.

While we may never reach Levitch's manic level, he's a freewheeling brother of sorts to architects. Any time we travel, our sketchbooks are tucked into the briefcase, whipped out to catch polyphonic skylines or single, simple tones. We photograph incessantly, to capture or isolate reality and to relate the larger world to our own experience. As tourists, we walk with fervor, burning the physical world into our consciousness, where it can be revisited in the future to inform our own designs. Free time for us means time to love architecture.

I felt a kinship with Levitch when he interrupted a walk across the Brooklyn Bridge to hug the stones—and meant it. While I have never embraced those granite blocks, I have grazed them with my hands and traced the outline of the bridge's massive Gothic arches with my eyes. In another scene, he stands transfixed by Louis Sullivan's Condict Building and groans with comic abandon. This guy really loves architecture.

Levitch hits on a singular term that sums up his highest admiration. Michael Sorkin, writing in the pages of this magazine, talked about the “urban vibe” as an ineffable, but discernible, spirit that inhabits whole cities. Levitch's descriptive, kin to Sorkin's, is “cruise,” which primarily refers to products of human design that promote the flow of energy, of freedom and

individual creative potential; unlike *vibe*, “cruise” encompasses individual buildings and streets, as well as ensembles of architectural elements, big or tiny. In New York, the canyons of Wall Street, the Brooklyn Bridge, Greenwich Village, as well as a rusted floret on a cast-iron storefront all qualify as “cruise.” For Levitch, it is a way of life. The urban grid, by contrast, represents imposed order, an arbitrary pattern that stifles creativity. Again he has a term, “anti-cruise,” that is epitomized in the city's police headquarters, a monolithic, hierarchical structure. Lockup stops the flow.

The movie, directed in a gritty style by Bennett Miller, was very “cruise” for me. I noticed that the architects in the audience laughed louder and clapped longer during the credits than the rest of the crowd. Perhaps others found Levitch's idiosyncratic life disquieting; perhaps he was too over-the-top for a public unaccustomed to such displays of ardor for inanimate objects. I left smiling, making my own list of contemporary places outside New York that qualify as “cruise.” Here are a few:

London's high-tech transportation buildings, like Nicholas Grimshaw's Waterloo Station, that erupt from the city's ancient stones. They are jolts of energy, light-filled and paper-thin, reinvigorating layers of history.

Frank Gehry's office in Santa Monica, a factory-like warren of humming talent, where cardboard models with swooping roofs litter the tabletops and an armlike laser converts the actual into the virtual.

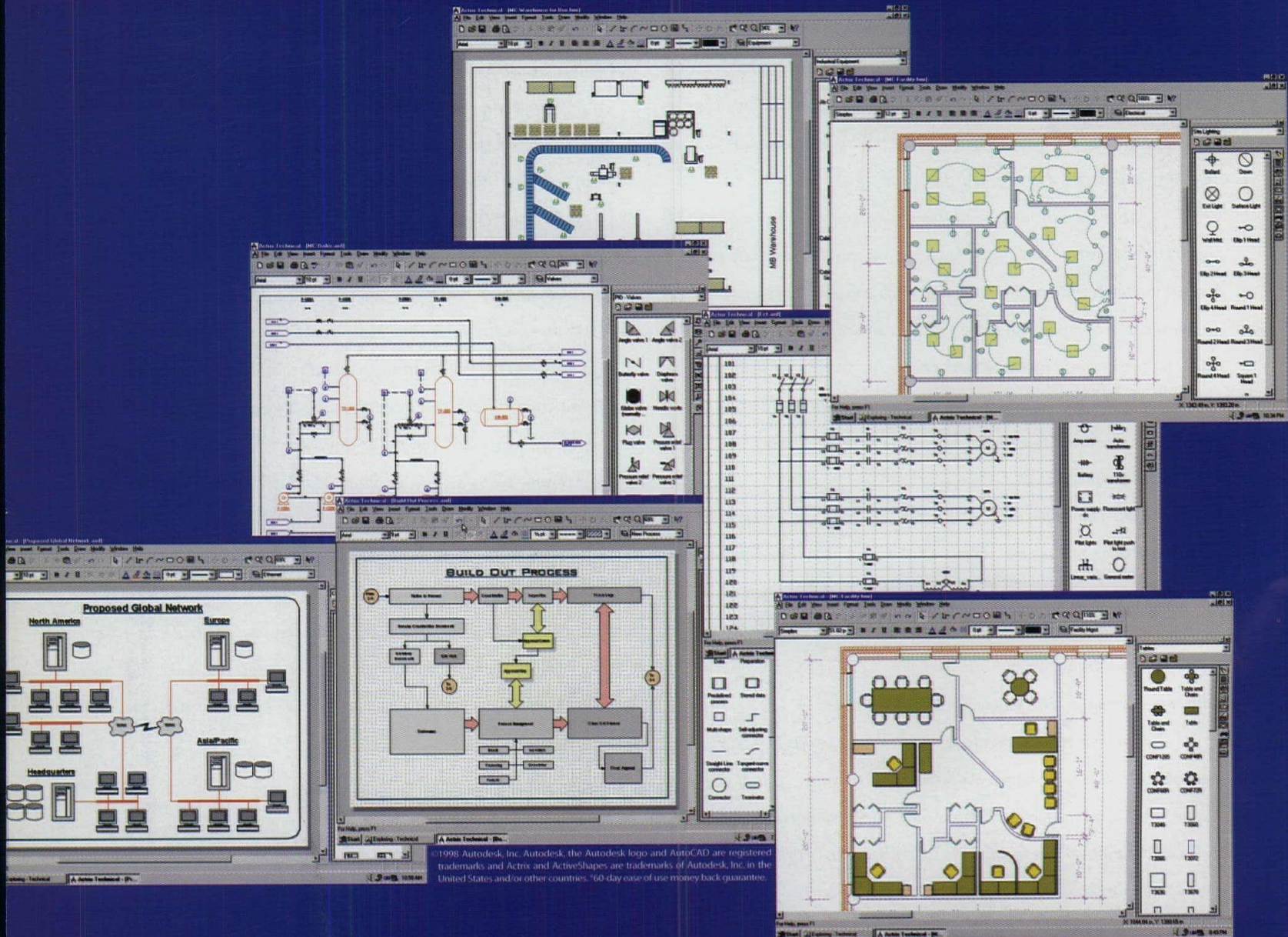
Boston's Central Artery, a churning mass of tunnels and highway construction transforming the waterfront for people. The cruise in action.

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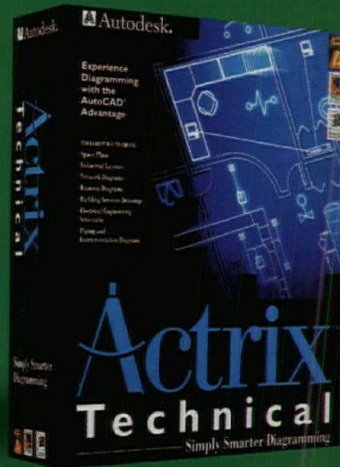
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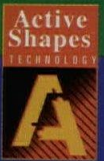
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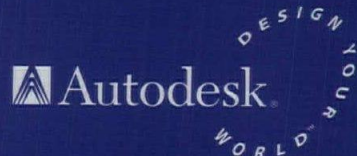
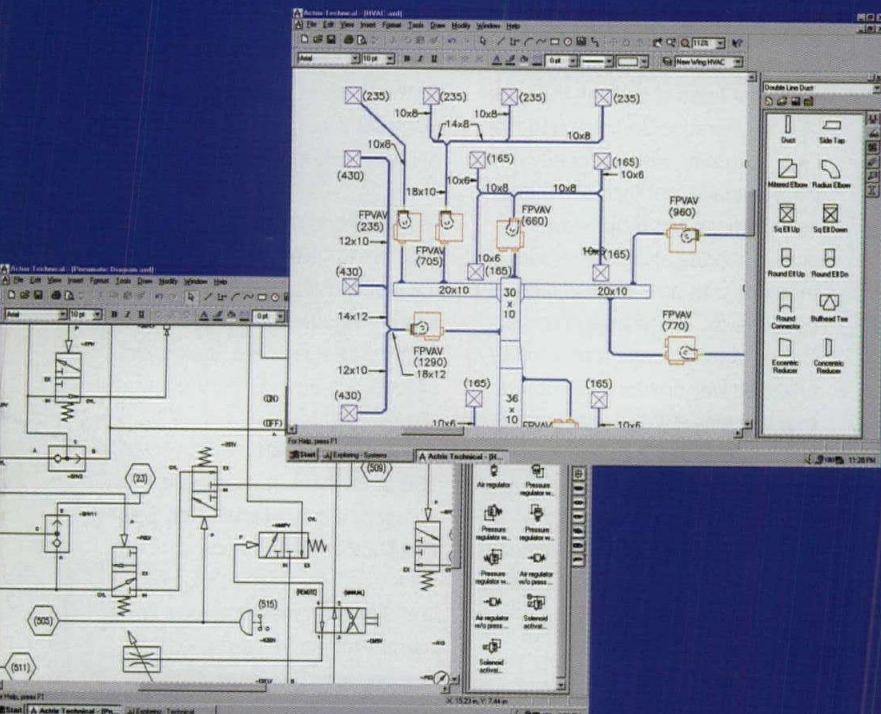


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LETTERS

An engineer for design-build

Robert Ivy's October editorial on design-build [page 15] and the article "Listening to Engineers" [page 108] are two excellent examples of stories that promote stronger relationships between architects and engineers.

As an engineer working alongside architects, I find that the evolution of project delivery methods is both exciting and necessary. True project teamwork involving owners, design professionals, and contractors can mean successful projects, delivered on time and within budget guidelines. While new project delivery methods, as well as the faster pace of projects, may be unsettling, we all need to adapt to and embrace these changes. One of the biggest challenges we face is how to maintain our professionalism as we adapt. Thank you for making us think about the new relationships and changes going on around us.

—Michael Cunningham, PE
State Farm Insurance Co.
Bloomington, Ill.

Owners, at least, like PMs

"Listening to Engineers" in the October issue was very enlightening.

Engineers and architects are concerned that their responsibilities have been eroded by project managers and construction managers. Did it ever occur to the design industry that it has itself to blame? While designers feel that project managers are, as Norman Kurtz put it, "unnecessary and don't help the process," owners feel otherwise. More project management firms are thriving in today's market despite the supposed competition of lower fee options, and more owners are developing internal project management departments. These people are better paid than most architects and engineers.

Despite Frouma Narov's claim that project managers "have no technical ability, no knowledge of owner needs," most project man-

agers have architectural, engineering, or construction backgrounds and degrees, and many are licensed. In fact, they are often the only licensed professionals in the room, considering that on many projects, the active members of the design team are young and unlicensed.

Most project managers are very talented architects and engineers who were disgusted with the low pay, long hours, lack of respect, and internal politics that come with working in design firms. Design firms have spent the last two or three decades cutting their fees in an effort to get jobs. By doing this, they have undermined their credibility with owners, reduced their responsibilities, and staffed projects with low-paid, inexperienced professionals. Often the result is poor documentation, more liability, and damaged reputations. Perhaps design and engineering firms should spend less time griping and making disparaging remarks about project managers and others who have the respect of the owners, and instead work to fix the problems inside their respective professions.

—Charles S. Maggjo, AIA
Project Director
Granary Associates
via E-mail

Keep in touch

My experience is evidence that Judson Kline gives good advice when he encourages architects to "promote interest at the high school level" [Speak Out, October, page 24]. As a sophomore in high school I had an interest in architecture and wrote letters to HOK, Richard Meier, and Helmut Jahn, and included photos of some of my renderings. Much to my surprise, I received letters from all three. Mr. Meier wrote, "It is a true gift to be so focused and directed so early in life. Keep up the good work." My enthusiasm grew.

Other letters followed to Cesar Pelli, Michael Graves, Dirk Lohan, Herbert Beckhard, and Eugene Kohn. All of them responded, many sending monographs.

I realized that the only real way to judge whether or not architecture was for me was to test the waters. Murphy/Jahn went far beyond even what Mr. Kline suggests and gave me, a 16-year-old aspiring architect, a job at the firm.

Three years and a few gray hairs later, I have completed my third internship with Murphy/Jahn. I am now an architecture student at the University of Cincinnati, and I look forward to interning at other offices around the world, continuing to test the waters. The experiences and skills I gained as a high school student at Murphy/Jahn will be with me the rest of my career. I thank all the architects who responded to my letters. The few minutes it takes to respond to a letter from a student of any age can change a career, a life, forever.

—Tom Lee
Glenview, Ill.

Glass performance questioned

In the August article "Improving Glass Performance" [page 131], Stephen Daniels writes that, according to the head of building technologies at Lawrence Berkeley National Lab, "a building with a properly glazed facade that includes these new coatings can have a lower annual heating and cooling load than one with an R-19 insulated opaque wall." Is the writer comparing the glazed facade with a totally unglazed wall or with an R-19 wall that has less efficient windows? The highest performing commercial window I've seen will, according to its manufacturer, do no better than R-6 overall. Much of this performance is due to a very large thermal break.

—Tom Van Driel
via E-mail

Technology editor Wendy Talarico responds:

The term "properly glazed" means that not only are windows with the best R-values utilized, but that the glazing is designed to interact with internal and external conditions. For example, solar gain can be maximized on cold days, actually

adding heat to the building. Shading devices on warm days keep radiation at a minimum but permit natural light to enter, reducing the need for artificial lighting (which consumes energy and adds heat). Low-e glazings actually prevent heat loss during heating season by reflecting radiation back into the building. Certainly a wall that is fully glazed has a lower thermal value than one that is properly insulated to R-19, but well-placed glazing in a well-insulated wall is the best choice and will improve a building's overall energy performance.

Credits/corrections

In the October coverage of the Gap office building (page 94), William McDonough + Partners should have been identified as the design architect and Gensler as the architect of record and interior designer. Ove Arup & Partners was the mechanical/electrical/plumbing engineer. The key player on the project for Gap Inc. was Eugene Torchia.

Also in the October issue, the credits for the Praxair Distribution Center (page 98) incorrectly gave Stephen Knowles, AIA, an FAIA designation.

The architects for the Telenor headquarters in Oslo (October, page 49) are NBBJ, HUS Sivilarkitekt MNAL, and Per Knudsen Arkitektkontor as joint venture partners. The project executive is Bjørn C. Sørum.

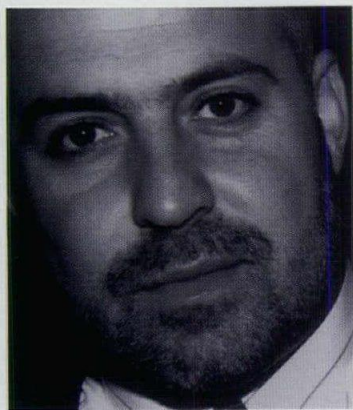
The Zumtobel Staff product on page 168 of the November issue is the company's curved track with Solar (not Dancer) track heads.

The Sigma Sigma Commons Tower mentioned in the November Correspondent's File (page 38) was designed by Machado and Silvetti Associates; Rodolfo Machado was the partner-in-charge of the project.

Letters may be E-mailed by visiting our Web site at www.archrecord.com and clicking on News/Features/Dialogue. RECORD may edit letters for grammar, style, and length.

MENTORS Maintaining a dual career in teaching and architecture requires a well-disciplined balancing act.

Lawrence Scarpa is a partner in the architectural firm Pugh + Scarpa, based in Santa Monica, California. He has taught at numerous schools, including UCLA, the University of Florida, and Mississippi State University.



Many practicing architects enjoy and thrive on teaching, while many academics want to maintain an architectural practice—but achieving the right balance between the two professions can be elusive. RECORD asked architect Lawrence Scarpa to offer his perspective on getting the best of both worlds.

I've been practicing architecture since 1986 and have taught and lectured part-time at the university level since 1985 at numerous schools. In that time, I've learned that maintaining a career in both fields is no easy task. Only the most extraordinary people under extraordinary circumstances can keep a successful full-time practice alongside a full-time teaching career.

To start with, don't overcommit. Clients and, especially, students know when you are overworked and when they are not getting the attention they need. Neither clients nor students will accept less than 100 percent dedication, and perception of less than 100 percent means failure. But how to maintain that 100 percent level in multiple endeavors?

Be prepared to work harder. To teach and practice requires more than a 9-to-5 effort; to do both means working long hours. Also, you don't have to go it alone. On the practice side, consider a practice partnership if you haven't already—but be certain your partner is fully aware of the details of your professional and academic endeavors. He or she can sit in for you with a client or deal with other client needs if you have another obligation.

As for the clients, be sure they

know about your teaching schedule and remind them of your commitments when you are scheduling meetings and presentations. Open communication is essential and will help reduce conflicts. I have found that if a client knows about my extracurricular duties, he or she will be accepting and not reluctant to continue working with me.

If you haven't been involved with education and are looking to start, talk with teachers and peers; consistent interaction can lead to abundant opportunities. Partnership can also help on the teaching side. Consider team teaching, especially with classes such as design studios, which require an extensive time commitment. Co-teaching will be credited the same on your resume as a solo teaching gig, but it will reduce your physical burden, as well as give you a chance to share ideas.

Most architects want to teach in the design studio, but keep in mind that studios require the most hours with students and have the most unpredictable schedules. Consider teaching a seminar; they are just as important as studio sessions. And though they require as much, if not more, planning, the instructors have better control of their time and can teach effectively within scheduled periods. Furthermore, leading a seminar allows you to choose a topic that greatly interests you. Schools and administrators are open to good ideas; if you present them with an issue you want to teach about, they will likely accept it as a course.

Good ideas and good teaching can result in a faculty appointment.

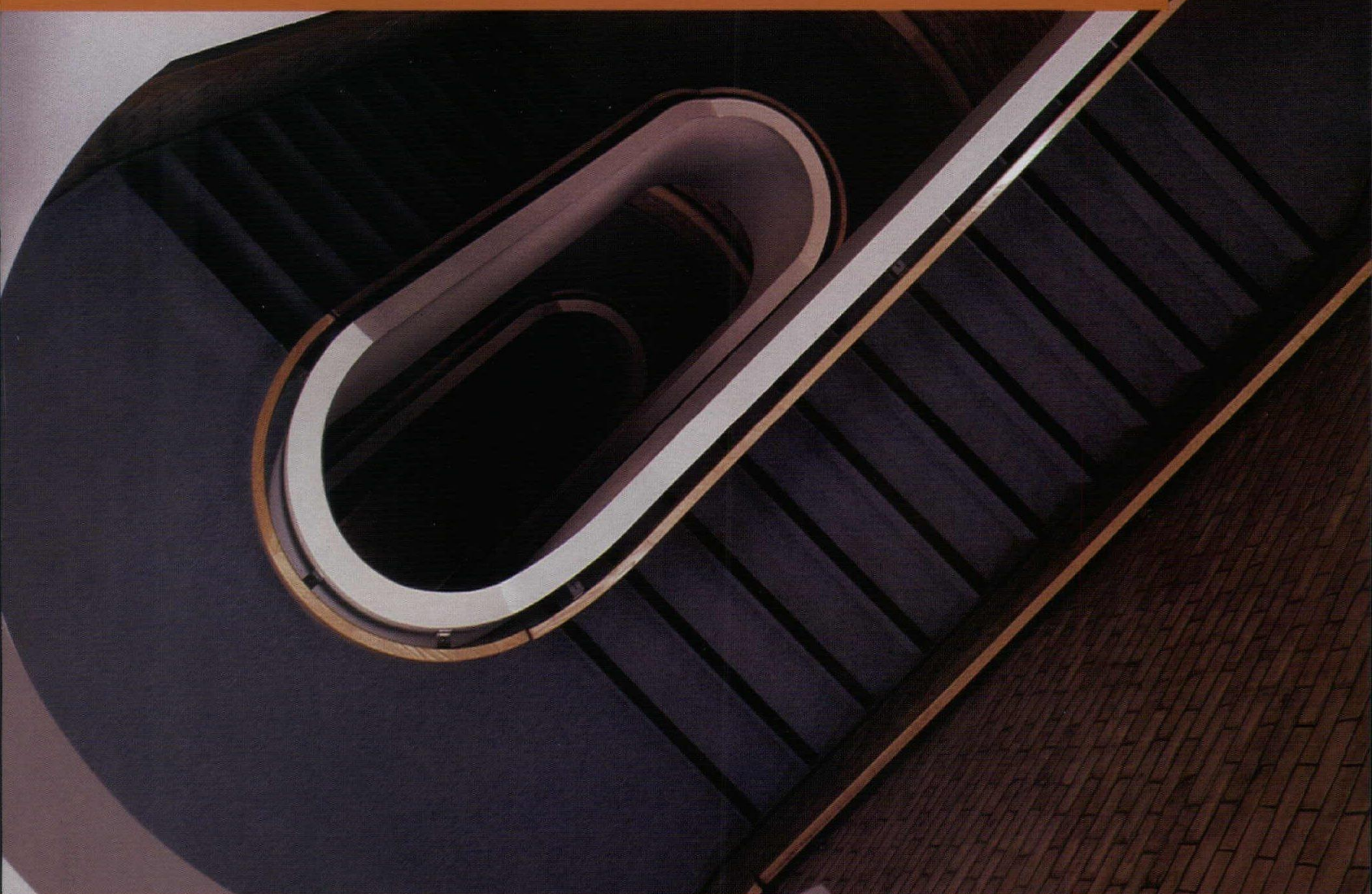
But you should carefully evaluate this choice as well. Consider teaching as adjunct faculty. While you may not receive medical insurance or other benefits of full-time faculty, you probably won't have to attend school and faculty meetings that don't pertain to your course. Not having to serve on committees or deal with school politics and fundraising will free up precious time.

Teaching and practice both move in cycles. Sometimes I teach out of state as a visiting faculty member, but only when my practice is slow or my partner and key staff won't be stressed by my absence. I consider myself a full-time practitioner, but I have found that when I don't have academic duties, I miss teaching. You don't get complacent when you teach. Working with students, who find excitement in the simplest things, is invigorating.

It is possible to succeed in both areas. But you must make a difficult choice: whether to be a full-time architect and part-time teacher, or vice versa. Be aware that your part-time role, whichever it is, will often be overlooked. But the fulfillment that comes from a variety of experience is well worth the effort. ■

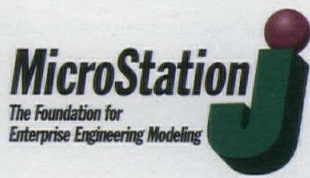
Questions: *If you have a question about your career, professional ethics, the law, or any other facet of architecture, design, and construction, please send submissions by mail to Mentors, Architectural Record, Two Penn Plaza, New York, N.Y. 10121; by fax to 212/904-4256; or by E-mail by visiting www.archrecord.com and clicking on News/Features/Dialogue. Submissions may be edited for space and clarity.*

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CIRCLE 8 ON INQUIRY CARD

PULSE RECORD readers were asked: Are competitions a fair and effective way to hire architects?

No: A design competition is a great way to generate ideas for a potential client. However, I believe that the process lacks fairness and effectiveness for clients as well as architects. Clients should investigate architecture firms of interest based on previous work, and then select a firm that will fit well with the client's needs throughout the process. Architects' time, effort, and money would be saved for more viable projects.

—Robert Marshall
Cedarwood Architectural Inc.
Akron, Ohio

No: Do we ask a handful of lawyers to submit their defense strategies prior to hiring one? Competitions are a great way for owners to collect ideas, but they are extremely unfair to design professionals. An owner might even benefit financially from a

submitted idea. Such ideas should not be free.

—Henry Chao, AIA
Boston

No: I think it is most fair and beneficial to owners if they hire architects based on their track record.

—Roberto B. Yumol, AIA
Honolulu

No: Unlimited architectural competitions are a legacy of the days of the gentleman architect, who didn't have to make a living from his work. An elite jury would premiate the most attention-getting entry, not always the best entry. That participants in one of these competitions should pay to enter and then give hundreds of hours of free services is a concept that no other profession would accept. In addition, the winning project is often abandoned

when it does not prove buildable or functional. The winners of invited and paid competitions, however, have a better record of actually getting a project built, because the clients have a real financial commitment to it.

—Henrik Bull, FAIA
San Francisco

Yes: The spirit of competition helps to inflame the imagination of the participants. However, it is important to educate those who run competitions on the investment of energy and resources made by architects.

—Bob Cardello
Greenwich, Conn.

Yes: In most instances, a carefully organized and well-run design competition greatly enhances the probability of achieving design

excellence. It is critical, however, that in the process, the interests of both the owner and the competing architects are fairly represented and protected. This would presume the identification and empowerment of an experienced professional advisor and the establishment of rules that are consistent with guidelines suggested by the AIA. If either of these are lacking, architects should run, not walk, to the nearest exit.

—Roger Schluntz, FAIA
Professor, School of Architecture
University of Miami
Coral Gables, Fla.

Yes: Competitions can be fair and effective if they are managed by an unbiased third party.

—Glenn Sweitzer
Assistant Professor of Architecture
Cornell University
Ithaca, N.Y.

This Month's Question

Can a new building that ignores principles of sustainable design be considered a success?

Architects are discovering new ways to design buildings that consume less energy. Such advances are prominent in the work of innovators like Norman Foster and Ken Yeang. In their buildings, passive devices such as double-pane glazing, naturally ventilated atria, and sun shields diminish the need for mechanical and electrical systems. In Europe, sustainability is considered a first priority of design, while in the United States it is often considered a luxury.

Can a new building that ignores principles of sustainable design be considered a success? Yes No

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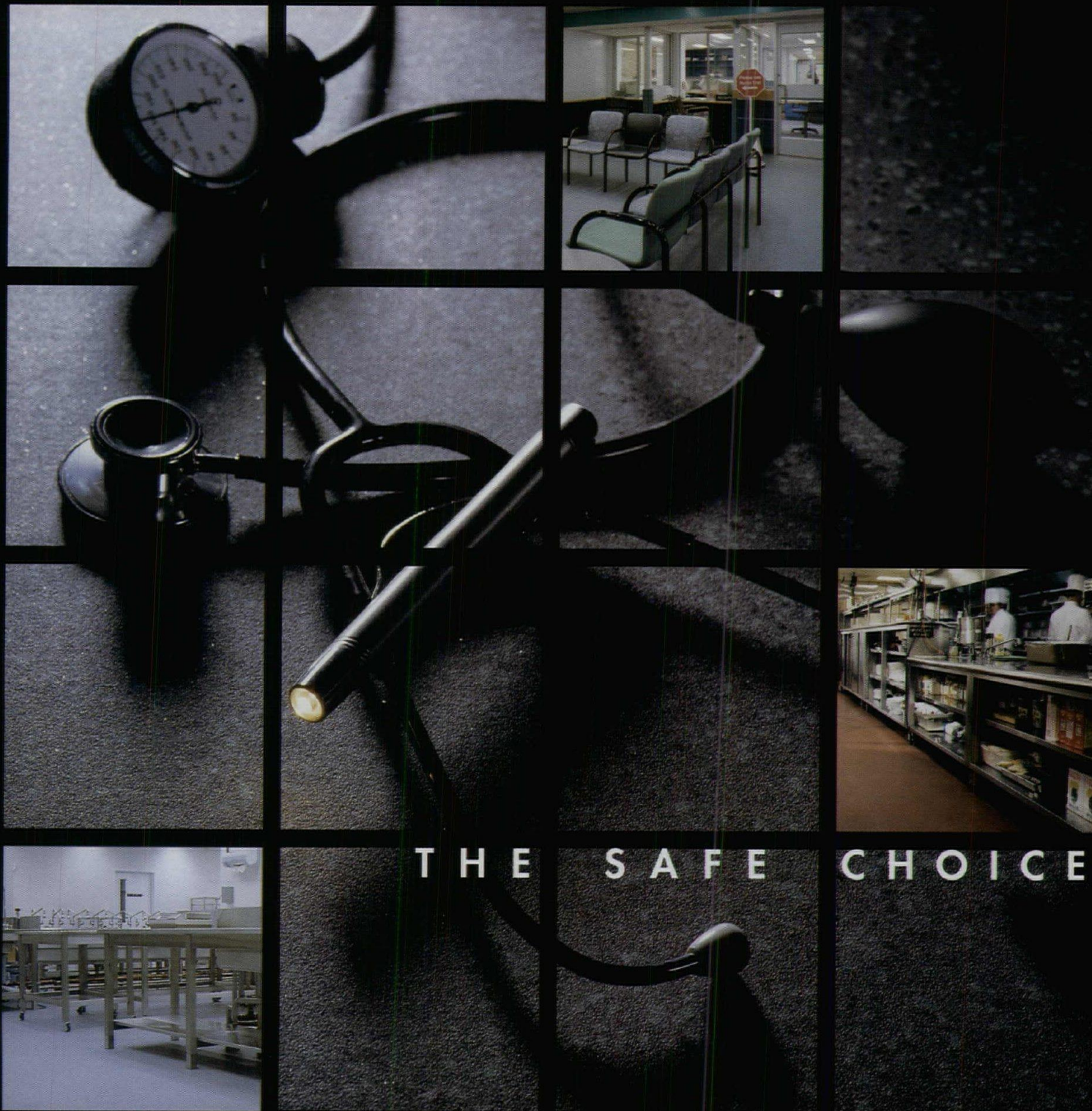
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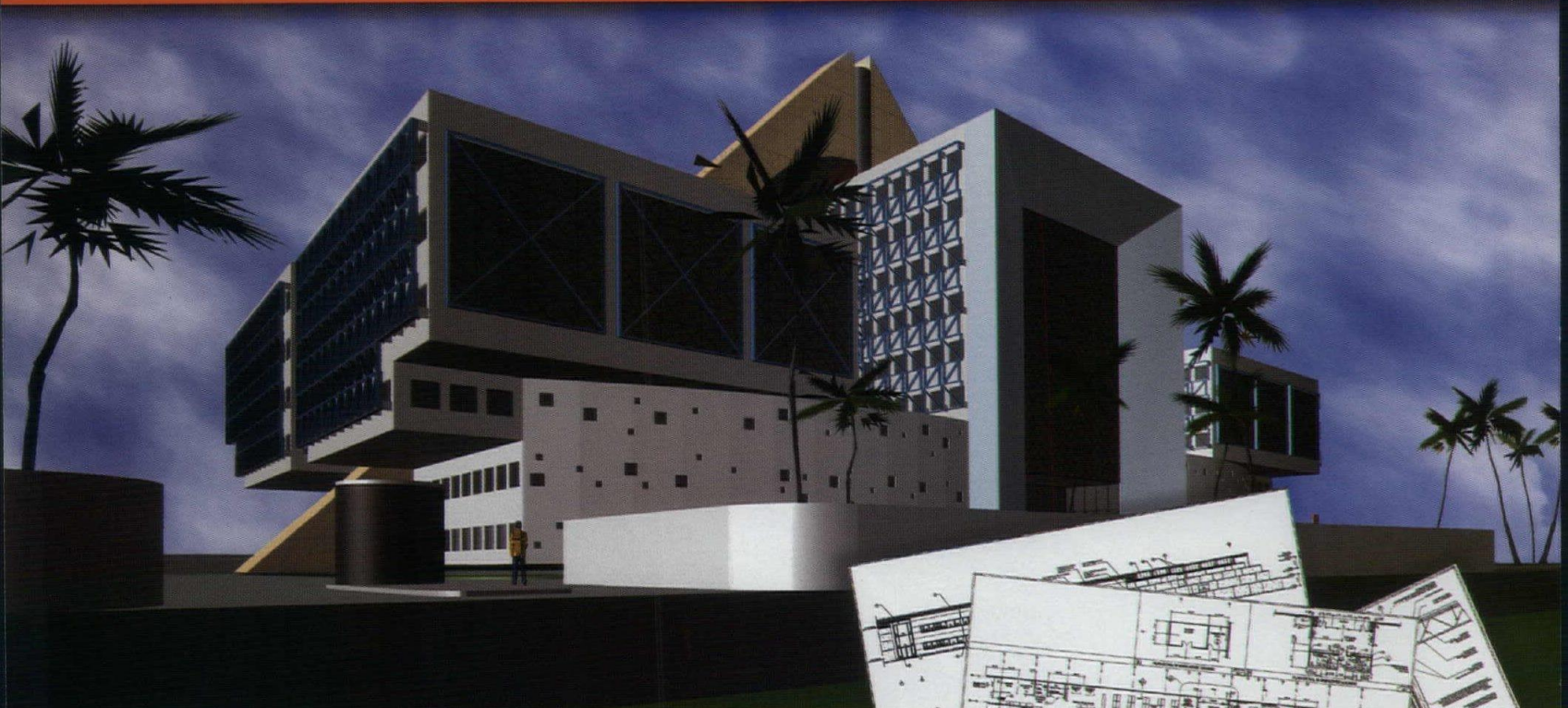
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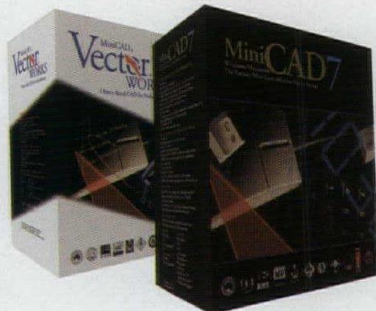


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CIRCLE 52 ON INQUIRY CARD

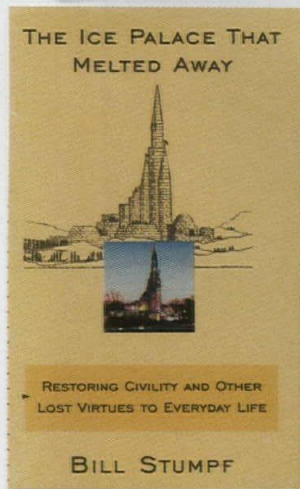
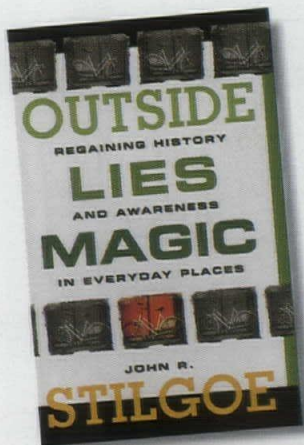
BOOKS Everyday matters: What the little things can tell us about the big picture.

BY DAVID SIMON MORTON

Outside Lies Magic: Regaining History and Awareness in Everyday Places, by John R. Stilgoe. New York: Walker and Co., 1998, 187 pages, \$21.

The Ice Palace That Melted Away: Restoring Civility and Other Lost Virtues to Everyday Life, by Bill Stumpf. New York: Pantheon Books, 1998, 192 pages, \$21.

Architecture of the Everyday, edited by Steven Harris and Deborah Berke. New York: Princeton Architectural Press, 1997, 229 pages, \$20.



A body of literature has emerged in the past three decades, most noticeably in the past few years, in which authors explore buildings and places termed ordinary. Compared to the numerous studies of hero designers, these works consider a much wider set of questions about how people shape their spaces. Academics are primarily responsible for this development, a group including not just architectural theorists, but historians, sociologists, and economists as well. When we also consider the recent proliferation of academic conferences devoted to the subject, it would appear that the everyday moment has arrived.

With *Outside Lies Magic: Regaining History and Awareness in Everyday Places*, landscape historian John R. Stilgoe aims to turn readers into explorers, leading them behind commercial strips, along drainage ditches, across power-line right-of-ways, and through torn chain-link fences. The book treats these margins of life, places we are used to ignoring or abhorring, as

essential material for the understanding of how the apparatus of new technologies has ordered our physical environment.

Visiting these places, Stilgoe tells us their histories: how asphalt created new roadside ecosystems, how fencing in the agricultural north differed from fencing in the free-range west, how street trees in every city, town, and village were felled to accommodate the demands of fire insurance companies that power lines have clear space around them. Discussions of railroad and mail-delivery infrastructures are not meant to be complete, but rather to provide the reader with model routes of discovery.

Occasionally Stilgoe departs from neutral observation. He is bothered by electric fences, gated communities, and highway motels, as they signify the disappearance of public space and neighborly trust. Exploring offers a solution: the more we wander places that are supposedly "off-limits," the more we recover them for public use.

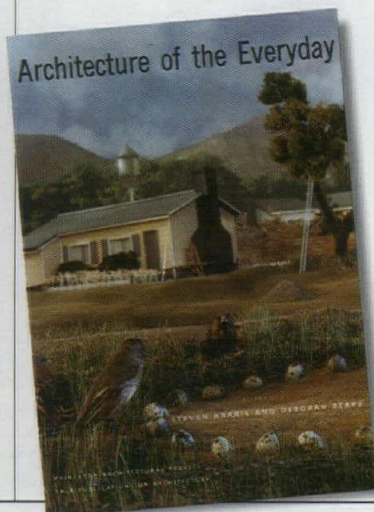
Bill Stumpf, author of *The Ice Palace That Melted Away: Restoring Civility and Other Lost Virtues to Everyday Life*, is an industrial designer and the creator of the Aeron and Ergon chairs. Having spent his life evaluating designs for functionality and comfort, he has found that designers, whether of buildings, utensils, parks, or processes, often forget to infuse a little of what he calls civility. Design, he writes, should encourage tolerance in place of firmness, play instead of ruthless economy, the public good over individual greed. British taxi-

cabs, for instance—toylike, iconic, and operated by "convivial, well-mannered, street-smart urban pathfinders"—represent good, civil, design, while American taxicabs, "lurching, rattletrap affair[s] painted school bus yellow," do not.

Stumpf's standard for civility in design is the Ice Palace of the title, which was designed and built pro bono by architects, engineers, and contractors for the 1992 St. Paul Winter Carnival. The palace was an unquestionable delight to the one million people who visited it that winter. Stumpf's message to architects, that there is a strong need for their civic involvement, is delivered with humor and without undue force.

Architecture of the Everyday, edited by Yale professors and New York-based architects Steven Harris and Deborah Berke, demonstrates a more fiercely articulated political agenda in a collection of what are mostly obtuse, academic essays. Behind several of the essays is the argument that everyday or generic architecture, as lived in by most of us, resists capitalist demands to keep up with the Joneses. By limiting their discussion primarily to issues of class, the essayists—and the editors who chose them—have narrowly selected their audience.

More engaging are the book's essays about houses designed by untrained architects (whose work is mistakenly called "everyday"), floor plans of the homes of famous TV families (see Exhibitions, page 25), and presentations of artworks that show the everyday world as ordered yet isolated and frightening.



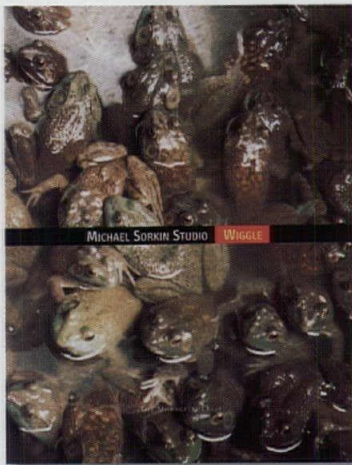
Briefly Noted

Michael Sorkin Studio: Wiggle, by Michael Sorkin. New York: The Monacelli Press, 1998, 192 pages, \$35.

Michael Sorkin, the critic (once for the *Village Voice* and now as a contributing editor to ARCHITECTURAL RECORD), prefers architecture that is green, exuberant, and expressive of what he calls a tolerant community "vibe." Michael Sorkin, the architect and planner, is guided by the same creed. *Wiggle* is the Michael Sorkin Studio's first published collection of work. The projects are cheery, rainbow-hued responses to often dire urban circumstances in places like East New York, Bucharest, and Beirut.

None of the projects have been built. Like the work of Archigram, an obvious and acknowledged inspiration, the drawings are hyper-developed fantasy. Conceived with humor and optimism, they were designed not to solve problems real-

istically but rather to guide urban problem-solving along humane paths. Many of the projects are urban master plans and appear to have been formulated in respect to how they might appear framed on a



wall, not how they might appear to a hypothetical city dweller at ground level. In one design, large, rational circles interrupt a shattered urban grid—picturesque chaos. It's not a broken city, however. The urban

fragments represent green public space emerging in places where most powerful interests would find it inconvenient. The vision may be impossible; the message is humanistic.

Indonesia: Design and Culture, by Clifford Pearson, with photographs by Bryan Whitney. New York: The Monacelli Press, 1998, 248 pages, \$55.

ARCHITECTURAL RECORD senior editor Clifford Pearson hopped the islands of Indonesia with photographer Bryan Whitney to research an architecture and a building culture that are unfamiliar to most Western eyes. The resulting book, *Indonesia: Design and Culture*, is an enormous effort. There are 13,000 to 17,000 islands in Indonesia (depending on the tide), populated by 200 million people tethered only loosely by several hundred different languages.

The work is a thorough survey, revealing what is modern, traditional,



imported, inventive, and—to us—unusual in Indonesian design. The plurality of cultures and building practices makes generalization risky. "Indonesian," after all, may only mean what the regime wants it to mean. Pearson, however, finds meaningful commonalities among the major cultures he surveys. Indonesians, he writes, are bold designers, brave enough to be open to nature, combine clashing elements, and absorb foreign influences. ■

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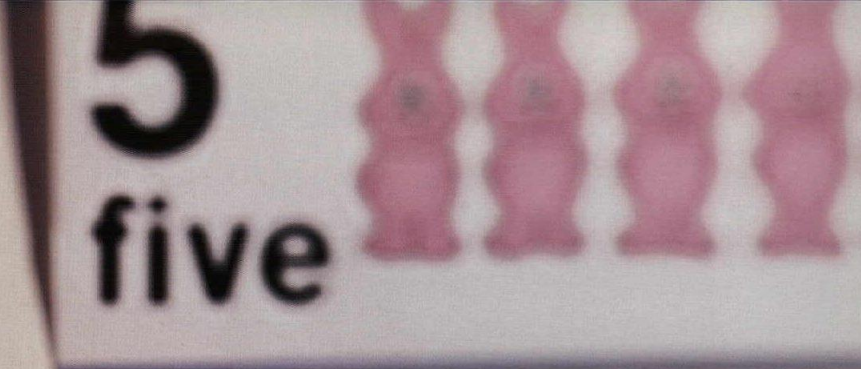
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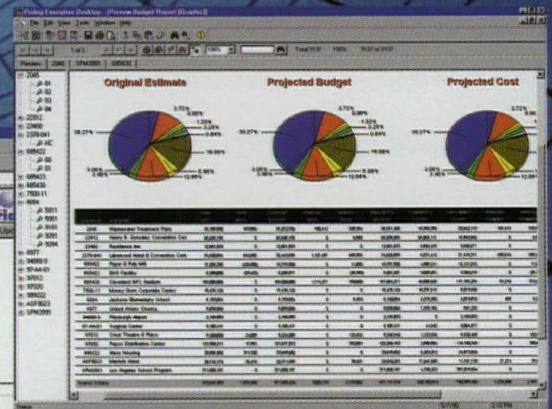
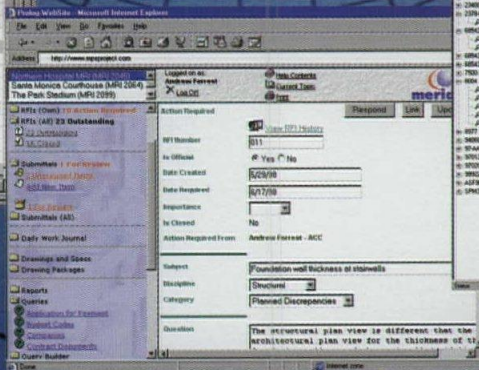
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CIRCLE 13 ON INQUIRY CARD

EXHIBITIONS Domestic arrangements: a variety of shows look at everything from sitcom houses to men and women working as design partners.

Affinities with Architecture,

Belk Gallery, Western Carolina University, Cullowhee, N.C., *January 13–February 18, 1999*; Carroll Reece Museum, East Tennessee State University, Johnson City, Tenn., *March 4–April 20*; Anderson Gallery School of the Arts, Virginia Commonwealth University, Richmond, *June 4–July 25*.

Fifteen: Jim Isermann Survey,

University of North Texas Art Gallery, Denton, *January 19–February 13, 1999*; Santa Monica Museum of Art, Santa Monica, Calif., *April 2–May 30*; Weatherspoon Art Gallery, University of North Carolina, Greensboro, *June 27–August 8*; Institute of Contemporary Art, Philadelphia, *September 11–October 31*.

Young Americans 2, Saatchi Gallery, London, *through November 22*.

Equal Partners: Men and Women Principals in Contemporary Architectural Practice,

Smith College Museum of Art, Northampton, Mass., *through December 13*.

Affinities with Architecture; Fifteen: Jim Isermann Survey; Young Americans 2

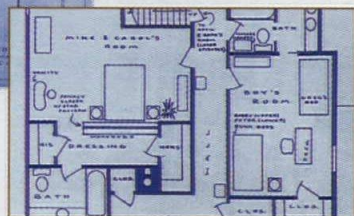
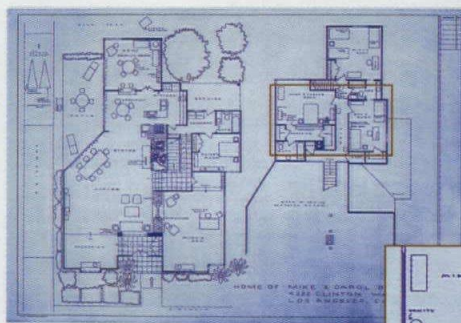
When architects are inspired by contemporary art, the results can range from the sculpted forms of Frank Gehry's Guggenheim Museum in Bilbao to the zigzag layers of Daniel Libeskind's Jewish Museum in Berlin. A series of current exhibitions and books display the by-products of a reciprocal trend in contemporary art, as a group of young artists uses architectural devices to explore the construction of modern identity.

Winning widespread exposure in American and European galleries, these artists, all of whom grew up in the late 1950s and '60s, are obsessed with ordinary domestic architecture. What architects should find interesting—and disturbing—about this new aesthetic trend is the source of the fascination. Forget larger-than-life figures like Frank Lloyd Wright and Richard Meier. Popular culture—sitcom decor, thrift-shop design, and the outré glamour of Palm Springs during the era of the Rat Pack—defines this generation's idea of domesticity. Representing the coming-of-age of the Me Generation, their work is consumed with the self-conscious construction of identity in the form of mise-en-scènes.

Mark Bennett's obsessively detailed plans of the television

Donald Albrecht is an independent curator and writer in New York City.

Contributing editor David Dillon lives in Amherst, Massachusetts.



Sitcom simulacra: Mark Bennett's plans of the house from *The Brady Bunch* (left and below) reflect a fixation on television and its cultural by-products.

sitcom homes of his youth are featured in *Architecture of the Everyday*, a book edited by Steven Harris and Deborah Berke (see Books, page 22), and in "Affinities with Architecture," a traveling exhibition organized by Sam Yates, director and curator of the Ewing Gallery of Art and Architecture at the University of Tennessee, Knoxville. In "Fifteen: Jim Isermann Survey," sponsored by the Institute of Visual Arts and the University of Wisconsin, Milwaukee, Isermann revels in the visual pleasures of do-it-yourself domestic craft. Overseas, this trend surfaces in "Young Americans 2" at the Saatchi Gallery in London. In this survey of what's hot in U.S. art, Clay Ketter's art-as-building-carpentry celebrates the marriage of Mondrian and IKEA.

The artists included in these exhibitions use actual construction as a metaphor for the construction of the self. Their work is often frankly autobiographical, alluding in personal, confessional ways to their own childhoods. The objective of this new art is to fabricate self-contained fantasy worlds, using set design techniques and theatrical lighting effects. Domestic life absorbs Bennett and his colleagues,

who focus on the personal over the public, manipulating familiar and ordinary images of the home to create surreal visions of the postwar suburbs in which so many of their generation were raised.

Mark Bennett works like a contemporary monk, transcribing onto paper every detail of a pop-culture televisual bible. Drawing the fictional homes of Lucy and Ricky Ricardo in *I Love Lucy* or Carol and Mike Brady in *The Brady Bunch*, Bennett fills in the architectural blanks, creating buildable homes, complete with furniture, implied by the screen's partial sets. (Bennett's day job as a postal worker in swank Beverly Hills hones his capacity to imagine houses he has never personally experienced.) The artist provides viewers with the layouts of ancillary spaces that we never see but know must be there. And attention New Urbanists: Bennett has documented that El Dorado of small-town America—Mayberry, the site of *The Andy Griffith Show*.

Without critiquing mass culture, Bennett expresses his television-



Jim Isermann's "TV Lounge" is a permanent installation at the American Museum of the Moving Image.

fabric with matching linoleum and window curtains.

Similarly, Clay Ketter elevates carpentry and millwork into fine art at London's Saatchi Gallery. Like unfinished houses or soon-to-be-demolished buildings, there's an eerie feeling of absence in Ketter's work. His canvases range from monochromatic assemblies of dry-wall, gypsum, spackle, and steel trim to "traces paintings" that reveal the silhouettes of electrical outlets and wires. Ketter's wall structures recall the abstract compositions of Charles and Ray Eames's storage units for Herman Miller. But Ketter reverses the Eameses' adaptation of Mondrian-like canvases into useful furniture. Instead, he combines IKEA cabinets, melamine, and Masonite to create nonfunctional compartments.

In their fascination with vernacular architecture and design, the works of Isermann, Bennett, and Ketter are typically American. Without an elite, aristocratic tradition in the arts, American artists often look to the everyday to express the country's egalitarianism. Edward Hopper's roadside motels and urban diners house America's "lonely

Gregory Crewdson's photographs of dioramas depict a suburban world where even nature is artificial.



saturated generation's bittersweet awareness of the disparity between real life and life on TV. His work underscores a unique characteristic of television: because it comes into our homes, its simulations have the power to blur the distinction between reality and fiction. "I created the TV sitcom floor plans," Bennett has written about his art-as-autobiography, "because I love the families on television and I figured if I drew their houses or living environments, then they could become real and become my family." You can go home again, even if only on television.

Part arts-and-crafts devotee, part Sonny and Cher, Jim Isermann creates architectural art of psychedelic intensity. A current retrospective, curated by David Pagel, showcases Isermann's hand-loomed rugs, hand-woven fabrics, wall hangings, stained-glass windows, hooked shag paintings, and furniture in tableaux evocative of postwar suburban living rooms. Isermann's installations blur the boundaries between the hermetic art gallery and everyday life. His interiors and furnishings fuse the aesthetics of postwar abstract art with vernacular domestic forms and do-it-yourself craft techniques.

"Without exception," Pagel writes, "Isermann's streamlined hybridizations of media, styles, and sources begin with the simple demand that art increase the pleasure

people take in their surroundings."

The current traveling exhibition can only suggest Isermann's flair with architectural settings, which has been demonstrated in two other installations, one in New York, the second in France. "TV Lounge" (1988), a television-centered rec room permanently installed in New York's American Museum of the Moving Image, offers visitors the chance to watch avant-garde videos and network sitcoms in a 1960s "conversation pit" with red shag carpeting, yellow linoleum flooring, and a built-in sofa and swivel chairs upholstered in black-and-white cowhide. A Victor Vasarely-like Op Art canvas of yellow and red circles is mirrored by a hand-hooked yarn hanging on an adjacent wall, showing Isermann's view of the reciprocal relationship between the fine and decorative arts.

Isermann's ability to envelop viewers in sensuous patterns peaked in his temporary 1993 remodeling of a duplex at Le Corbusier's Unité d'Habitation in Firminy-Vert, France. Like many artists of his Postmodern generation, Isermann knows the history of the visual arts, and he consciously fashions a hybrid of opposing aesthetic traditions in this installation. Decorating the interior of Le Corbusier's high-art Brutalist monument in a traditionally low-art way, Isermann covered virtually every surface in multicolored, hand-sewn

crowd," while Walker Evans elevates the common man with his photographs of rural churches and sharecroppers' cabins. Like Edward Ruscha, who devoted entire books to gas stations and Los Angeles apartments, however, this new generation of artists presents a more deadpan, ironic view of the vernacular. What makes them unique is their use of media not normally associated with fine art, like Bennett's architectural plans or Isermann's handcrafted furnishings.

Whereas Ketter and Isermann practice art as full-scale architectural and furniture elements, "Honey, I Shrank the Art" might be the motto of many contemporary artists who use miniatures, dioramas, and other nontraditional media to create cinemalike worlds where scale is eerily manipulated. For these artists, reality is a construction, fabricated in a studio like a model or a photograph. In the hands of artists like Michael Askin or the more established Chris Burden, miniatures based on toy train sets suggest these baby boomers' attempts to recapture their childhood. Especially elaborate are Gregory Crewdson's color photographs of dioramas, also included in *Architecture of the Everyday*. Copying the cheap rear-projection techniques of 1950s sci-fi films, Crewdson's suburban scenes foreground three-dimensional birds, butterflies, and other animals against more two-dimensional

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representations of suburban tract housing. Crewdson's images expose the man-made artificiality of the postwar suburb's concept of "nature," with its manicured lawns neatly divided by white picket fences. Malevolence seems to lurk behind Crewdson's placid everyday architecture, evoking the opening of David Lynch's movie *Blue Velvet*, where hordes of vicious ants wage war in the roots of small-town lawns.

The work of model-making artists like Crewdson is radically different from that of the previous generation of artists, whose affinities with architecture tend toward the monumental and heroic. There is nothing ordinary or comfortable about Richard Serra's monumental sculptures *Torqued Ellipses*, now on view at the Geffen Contemporary in Los Angeles. Just how far the new generation has moved from Serra's sublime aesthetic can be seen in Sam Durant's series of flimsy cardboard and foam core models of the

idealistic postwar Case Study Houses in Los Angeles. Riddled with holes and graffiti, the models' decrepit states metaphorically comment, according to Durant, on how the "utopian ideals of Modern design mutated into the culture of corporate ideals," losing their progressive social agenda in the process. This loss of high ambition and the acceptance of a highly personal role for art is an underlying theme in the work of this new generation of artists who sew, remodel, art direct, and miniaturize a brave new world of domesticity. *Donald Albrecht*

Equal Partners: Men and Women Principals in Contemporary Architectural Practice

Smith College's "Equal Partners" exhibition asks an intriguing question about contemporary architectural practice, only to leave the answer floating in the speculative fog. The question: whether buildings designed collaboratively by men and

women are somehow different, less aggressive, more ingratiating and contextual than those designed by men alone. The answer appears to be, "Who knows?"

Curator Helen Searing, an architectural historian at Smith, says her intention was to celebrate women making their way in a notoriously closed profession, not to

The live/work "canyon house" by Cigolle X Coleman Architects.

make a polemical point about gender. "I don't know that there is some essential quality to a woman's designing or a man's," she explains. "On the other hand, the work presented here seems different from that produced by macho male architects. I like to think that the buildings are friendlier and more contextual, that they don't stand out so clearly as autonomous objects."

Searing invited 15 firms that operate as male/female partnerships



PHOTOGRAPHY: © ECHARD PFEIFFER (LEFT)

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to submit one built and one unbuilt project. She wanted some geographical distribution and some diversity in style and methodology; the only unbendable rule was that the work must be collaborative.

The range of the submissions is impressive: from a large government center in China by Fred Koetter and Susie Kim to a pair of small, vernacular houses in western Massachusetts by Andrus Burr and Ann McCallum. Cigolle X Coleman Architects of Santa Monica are represented by their own live/work "canyon house," while the London firm Long & Kentish submitted its stunning National Maritime Museum in Cornwall, England, which uses tidal pools and canals in its design. The exhibition features churches, theaters, and airports, storytelling projects and highly theoretical ones.

One inescapable conclusion is that women architects are no longer restricted to picking draperies and paint colors. They are now moving into the upper tier, with Smith itself

having a particularly impressive list of architect alumni, including Kim, Coleman, and M. J. Long.

Beyond that, the exhibition provides an instructive overview of the various formal strategies and representational techniques in contemporary practice. In addition to conventional plans, drawings, and models, it includes computer graphics, CD-ROMs and virtual-reality presentations.

All of this is valuable information, particularly for an undergraduate contemplating an architectural career. But on the question of how—or whether—women are transforming contemporary architectural practice, "Equal Partners" is less convincing.

The best illustration is a pair of houses by Los Angeles architect Craig Hodgetts, one designed in 1982 when he was a solo practitioner, the other in 1997 in collaboration with his wife, Ming Fung. Searing describes the first as "aggressive" and "mechanistic,"



while the second she praises as "contextual" and "connected to the landscape."

Unfortunately, it's impossible to say even this much about the other projects in the exhibition, which reveal little about their making. In the catalogue, Tod Williams and Billie Tsien describe their studio as "a family" in which each member is responsible for his or her own work, and also for the good of the whole. But there is no hint of this rich col-

Arquitectonica's design for the Miami Airport expansion.

laboration in the exhibition text, which is mostly about materials and technology.

In the end, it is perhaps best not to focus too much on the gender issue and instead see "Equal Partners" for what it is: a provocative, handsomely presented sampler of contemporary design.

David Dillon

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CORRESPONDENT'S FILE

A separatist government and a raw, industrial aesthetic have been shaping the new look of Montreal.

BY BETH KAPUSTA

Beth Kapusta, who graduated from the University of Waterloo School of Architecture in 1991, is working on a book about the National Archives of Canada. She lives in Toronto.

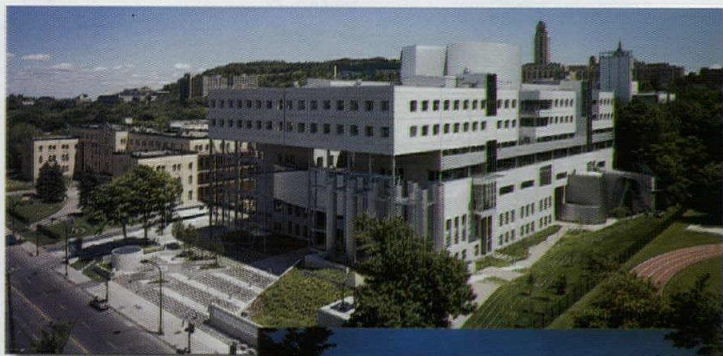
Montreal's historic architecture is perhaps the most European of all North American cities, an urbane amalgam of French, English, and other immigrant influences.

One might expect to see the same leading-edge, cosmopolitan influences in contemporary work. However, there is a curious lack of sophistication here, especially in terms of tectonics, though this is somewhat offset by an overarching focus on the public character of recent buildings.

This island-city seems fated to experience both the best and the worst of visionary planning and architecture, from the white elephant 1976 Olympic Stadium, a dysfunctional and deteriorating facility that taxpayers are still paying off, to the 1967 Expo site, now reoccupied with symbols of a new era: the skeletal Buckminster Fuller dome serves as the podium for an environmental interpretation center, while the French Pavilion houses a popular casino.

Montreal's greatest planning triumph is also its oldest: the Frederic Law Olmsted-designed park on the mountain that is the psychological heart of the city, a 550-acre masterpiece of picturesque planning surmounted by a neon-trimmed cross.

As apparently seamless as the marriage of symbols may be—the cross of French Canadian Catholicism watching over the second-generation English landscape—a war of words between the cultures continues to rage. Many of Montreal's architects claim to be apolitical in response to the divisive



The University of Montreal's school of business, by Dan Hanganu Architects and Jodoin Lamarre Pratte (above); the Cinémathèque Québécoise, by Saucier + Perrotte (right).



debate over the future of Quebec as a Canadian province, but with another election looming, uncertainty still reigns.

Even though architects haven't done badly over the past decade, enjoying work from a program that resembles a mini-*grand projet* initiative in the French tradition, there is an undercurrent of anxiety that political divisiveness is wearing the city down. While the incumbent separatist government has been preoccupied with weaving a cultural mythology, it has little concern for the day-to-day upkeep of the projects it has funded.

Some cultural facilities originally financed in this propagandist spirit are in a sorry state of disrepair because of a lack of ongoing maintenance. In addition, much of the provincially funded construction of

the last four years has concentrated on Quebec City, seat of provincial politics, rather than Montreal, where a decisive majority voted against sovereignty in the last referendum.

Recent architecture mirrors the restlessness of Montreal's political spirit. While Toronto's architecture is a refined but extremely conservative neo-Modernism and Vancouver's regional bias is toward rustic tectonics of exposed (mostly wood) structure and lots of glass, Montreal is marked by the use of off-the-shelf materials, assembled with an unmistakable rawness.

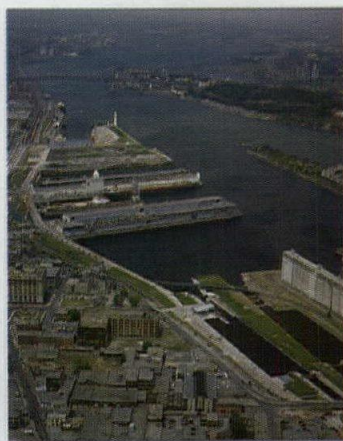
It is a city whose architecture is surprisingly indifferent to the craft of building, a deliberately anticorporate sensibility that seems to be a sustained response to the conservative structures that characterized Montreal until Toronto supplanted it

as Canada's financial capital. It is almost as if the seduction of temporary architecture embodied by the Expo insinuated itself into the collective building techniques of a whole generation of architects.

Alongside the less-than-pristine craftsmanship is an emphasis on a building's most public dimensions and on powerful, even graphic gestures. One of the strongest examples is the Old Port of Montreal by Cardinal Hardy and Associates Architects, a fine waterfront park that establishes an intimate relationship between the old city and the postindustrial landscape at the river's edge by converting the abandoned port area into a crisply landscaped linear park. The park is being extended west to include parts of the Lachine Canal, which the city plans to reopen to recreational watercraft.

Just north of the Lachine Canal site, a project by the young firm Atelier In Situ is one of the most fetishistic examples of Montreal's

industrial aesthetic. Like the work of many other local practitioners—Atelier Big City, Jacques Rousseau, Saia et Barbarese—InSitu's designs have a tough, graphic quality.



The Old Port park by Cardinal Hardy (left); Luc Laporte's Via Roma (right).

Formerly the home of a marine outfitter, the industrial building was scoured out to create offices for a movie software business and a multimedia production company. The

design strategy is more reductive than additive, with several large spaces carved from the existing floor plates. The detailing on new elements has the feel of a sort of



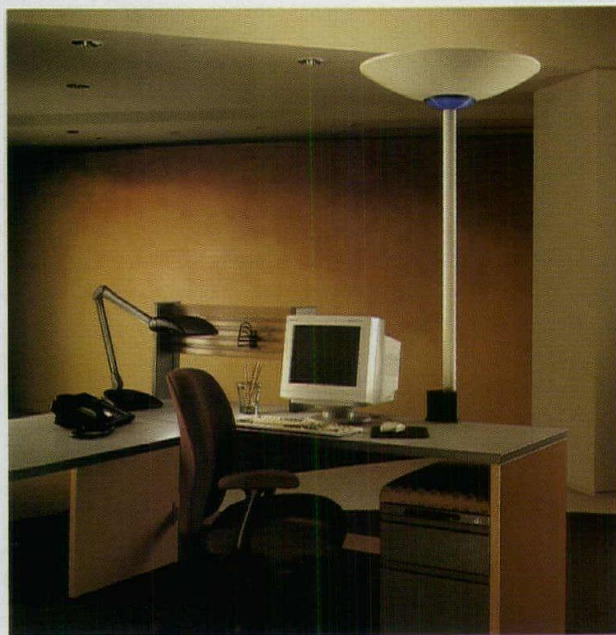
welding-torch Modernism. The found spaces are raw and powerful, although aesthetic novelty tends to get the better of function and pragmatic detail.

A heavy emphasis on public amenity characterizes the Ecole des Hautes Etudes Commerciales de

Montréal (H.E.C.), the school of business at the University of Montreal, by Dan Hanganu Architects and Jodoin Lamarre Pratte & Associates. At best, the Hanganu-led team has the ability to create buildings that are microcosms of slightly disheveled, chaotic, and animated cities. At the tectonic level, the work is preoccupied with using inexpensive materials, often in incongruously expensive ways. In the business school, for example, there is remarkably little standardization of technique, making what seems to be an off-the-shelf building quite expensive to build (about \$150 per square foot).

An oversized, five-story portico that marks the business school's entry is an extremely overt indicator of arrival. The strength of this building lies within, with its complex sectional collage. On the main floor, a sinuous glass inflection in the east wall preserves a stand of trees. The interior winter garden, a powerful visual focus, serves as the main

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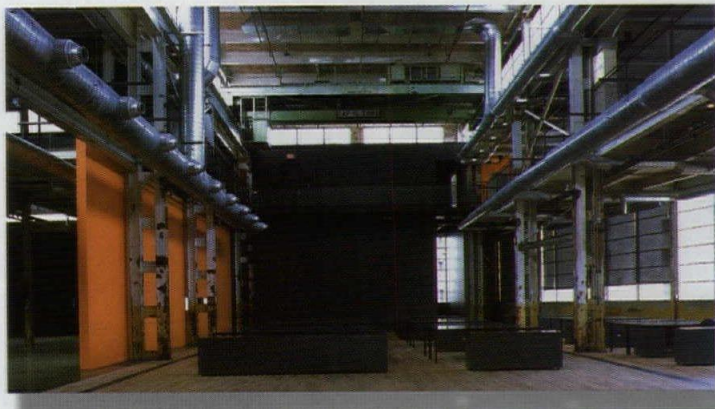
Next door to H.E.C. sits the recently completed University of Montreal School of Architecture, by one of Montreal's most talented firms, Saucier + Perrotte Architectes (with Menkès Shoener Dagenais as associate designers). Like many of the most successful architects in Montreal, Saucier + Perrotte has made its mark by being diplomatic negotiators with history. The problem of expanding the school of design from its rather penitential vessel in an old nunnery has been handled with elegance, rigor, and compositional dexterity.

A grand lobby, featuring a huge screen showing the slides appearing in the 450-seat auditorium whose back wall protrudes into the space, is a grandiose move. The studio areas are less thoroughly designed, although a Bauhaus-like louvered glass wall on the north elevation creates an intriguing, almost digital

display of goings-on within. The palette, shades of gray, is a little cool, but it is mediated by a careful modulation of light via a transparent courtyard.

The most interesting project to date by Saucier + Perrotte, probably the least "industrial" of contemporary Montreal practitioners, is the Cinémathèque Québécoise, whose salient feature is a backlit frosted glass wall that animates the street with moving images projected from within. The firm's preoccupation with the cinematic effects of architecture is well suited to this program, as themes of voyeurism and architectural promenade are skillfully overlaid as montage on the structure of an old school.

To better understand the principles of Montreal's unique sensibility, it's good to look at the work of a lesser-known architect, Luc Laporte, whose designs, though mostly small-scale, are some of the city's most cosmopolitan. Like Saucier + Perrotte's work, Laporte's



In Situ's "Zone," an industrial building converted to offices.

is highly expressive and carefully directed, and it has a spirited sense of the social quality of the city. His latest project is Via Roma, a trattoria that addresses one big idea: how to make a commodious outdoor dining terrace in one of the coldest cities in North America. This is accomplished by means of two retractable greenhouse roofs supported above a large, simple room, which is radiant-heated through the

floor and has lush grapevines growing up the walls. It is an economical gesture, devoid of unnecessary embellishment, though it lacks finesse on the detail level.

In its contemporary architecture as in its politics, Montreal continues to feel the conflicting forces of parochialism and cosmopolitanism. Broadening the architectural dialogue and coming to terms with the technique and craft of building will be important factors in realizing the city's rich architectural potential. ■

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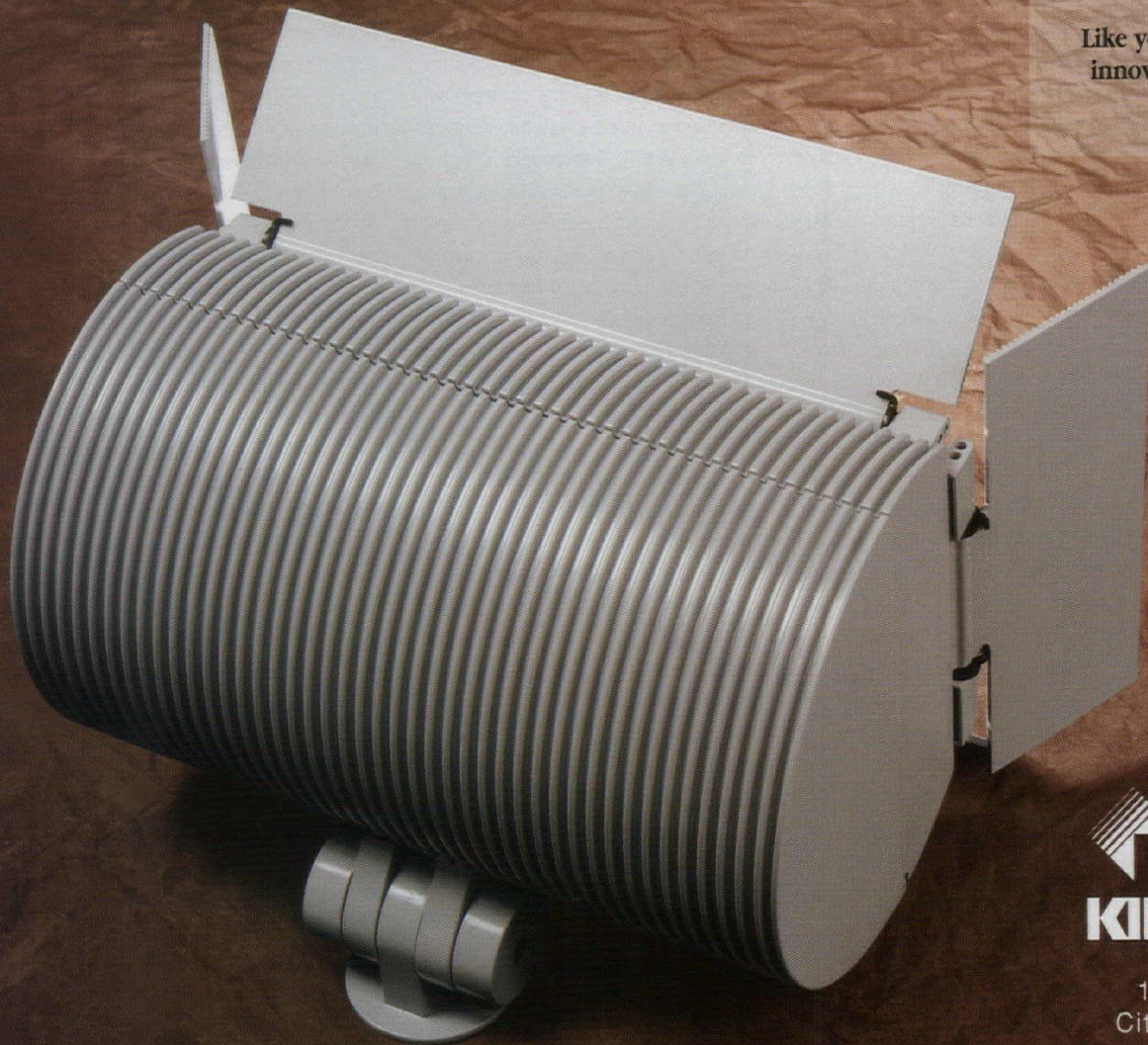
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CYBERSPACE REPLACES CLASSROOMS IN INTERNET ARCHITECTURE SCHOOL

Architecture education will take a bold leap into cyberspace in January when the new Graduate School of Architecture opens its virtual doors. The program, which can be found at www.newgraduate.org, will offer holders of accredited architecture degrees—from either a five-year bachelor's program or a master's program—a way to earn advanced degrees via computer.

NewGraduate students can earn nonprofessional Master of Architecture degrees in three areas that are considered important to practice but are seldom stressed in traditional education: business and practice management, information systems technologies, and environmental design.

Tuition for a 30-credit master's degree will average about \$4,400. Students can expect to spend about eight hours a week on their studies in order to earn a degree in 15 months, says the school's dean and cofounder, David Mackey, an associate professor of architecture at Ball State University in Muncie, Indiana, which has no ties to the new school. Students can also choose to take courses to earn AIA Continuing Education credits.

Mackey expects to attract recent architecture school alumni and mid-career architects looking for ways to squeeze continuing education into harried home and working lives. As one soon-to-be-newGraduate student put it in an E-mail: "I have been practicing architecture for 15 years and manage a seven-person firm. You just gave me a way to reach my goal of an M. Arch. degree without sending seven other people to the unemployment line."

Mackey and the school's other cofounder, Theodore C. Alex, director of the MBA program at the University of Findlay, in Findlay, Ohio, are hoping to enroll at least 80 students

in 1999, with a goal of 240 in three years.

College-level distance learning using the World Wide Web has been spreading since schools like the University of Phoenix pioneered the idea on a large scale two years ago. More recently, other major, traditional schools like New York University have begun vying for a share of the online learning market.

Architecture education has been, until now, a scarce presence on the Internet. There are schools where students share projects over the Internet, or where individual courses have been put out on Web sites, says Martin Moeller, recently departed executive director of the Association of Collegiate Schools of Architecture (ACSA).

The ACSA has greeted the new program cautiously. NewGraduate won initial accreditation status with the Indiana Commission on Proprietary Education, permitting it to accept student applications. Still, the ACSA's board rejected Mackey's first bid for affiliate membership last June, opting instead to form a task force to study, among other things, how a school on the Internet might conform to existing rules and standards.

Among the early concerns is whether traditional architecture schools will honor newGraduate degrees for those wanting to gain teaching positions. Another worry is the quality of the faculty. A few, like Mackey, E. Fuller Moore of Miami University of Ohio, and Kenneth W. Schaar of Louisiana Tech, are veterans. Many others are junior faculty at architecture schools, attracted to newGraduate by the creative freedom and the prospect of royalties.

"NewGraduate is the first out of the box," says R. Wayne Drummond, president of ACSA. "We want to set the bars in the right place in this brave new world." *Lee D. Mitgang*



DESIGNING IN THE HOMELAND: AN AMERICAN GOES BACK TO IRAN

In June 1997, the government of Iran called Iranian-born Yahya Fiuzi, AIA, at his home in the suburbs of Washington, D.C., and asked him to design and lead construction of a huge convention center in Teheran. The new building would shelter the triannual summit of Islamic nations, to be held that December.

There are few architects, if any, in Iran with the requisite expertise for such a project. Fiuzi's concern was whether he could hire non-Iranian contractors; he was told he could. Two days after getting the go-ahead, Fiuzi was meeting his new clients in Teheran.

Upon arrival, however, Fiuzi was asked to use local contractors. He adjusted: in the first 15 days Fiuzi selected a site and a primary contractor and hired a design staff of 140. "I didn't hire architects older than 26," he says. "The young generation are like hungry tigers waiting to show their ability to the international community." Fiuzi's design team produced 4,800 drawings over the next several months, including designs for fabrics and furniture.

Several alternatives were rendered to account for the limitations of available technologies.

In the completed International Conference Center, much of the 250,000 square feet is given over to an 1,800-seat central assembly hall. A steel-framed, stainless-steel-paneled dome—a 130-foot-diameter cone centered off-axis—peaks 100 feet above the floor. The panels were punched with holes and fitted with 40,000 glass cylinders to channel daylight inside.

With 6,000 workers laboring around the clock, the project was finished on time. The government was satisfied, having spent \$30 million, with only 7 percent of that in foreign currency. And Fiuzi was offered a dozen new commissions. "I'm staying because the country needs me, but also because some ideas take shape better here," he says. While admitting there are clear limitations to working in Iran, Fiuzi says that "in the United States every project is affected badly by developers and the like. I feel freedom here." *David Simon Morton*



The main facade of the 250,000-square-foot International Conference Center in Teheran (above). Local laborers work on the dome, whose panels were fitted with 40,000 glass cylinders (left).

ARCHITECTS AND ARTISTS TEAM UP FOR CALIFORNIA'S VILLA MONTALVO

Since 1912, Villa Montalvo has been an active arts center in Northern California; since 1942, it has had an artist-in-residency program. The Villa Montalvo Foundation recently invited five architects to collaborate with the artist of their choice to design a new complex of live/work spaces (one pair per design team) for the artists who populate the 175-acre site in the foothills above Silicon Valley.

Portland-based architect Donald J. Stastny, coordinator of the project, designed a commons building incorporating a large gallery and a library/office. His is the only scheme to evoke the palette and Mediterranean style of the original villa, which is listed on the National Register of Historic Places.

All the other schemes exhibit a range of design, construction, and materials, along with a range of muses. Jim Jennings, who teamed with artist Richard Serra and poet Czeslaw Milosz, saw in Milosz's poetry "an articulation of clearly defined volumes and spatial experi-

ence," which he translated into a solid-walled rectangle cut into a slope. Jennings's other rectangular structure, inspired by "both the lightness and heaviness" of Serra's sculpture, is of concrete block and translucent sheathing. The plan is one-quarter solid living cube and one-quarter open courtyard cube, balanced by two translucent studio cubes.

Each 700- to 900-square-foot cottage was conceived for the execution of a specific art form, such as writing or performance art. "The contradictory requirements of a hermetic retreat and the need for community," as participating architect Dan Solomon puts it, was a programmatic concern as well.

The buildings, joined by a pathway and set in five acres of orchard, will complement the existing site's redwood groves, extensive formal gardens, miles of nature trails, and an Audubon Society bird sanctuary. Construction will begin next July and be completed by the summer of 2000. *Terry Bissell*



ST. JOHN'S AIMS BEYOND COMMUTERS WITH FIRST ON-CAMPUS RESIDENCES

"Build it, and they will come," is the philosophy behind St. John's University's first on-campus student residence halls, to be completed by the fall semester of 1999. The university's urban campus in the New York City borough of Queens has never had a strong dorm-based social life, catering mainly to commuting students who don't have to stay overnight. Now St. John's wants to encourage students outside commuting distance to enroll, and it has hired the New York architecture/design firm Einhorn Yaffee Prescott

(EYP) to complete phase one of a \$300 million project to house and feed students near where they go to class.

EYP's marching orders are to design three residence halls, holding some 700 students, and a separate dining facility with seating for 430 on the Queens campus. "The design concept is a village of buildings separate from the academic buildings," says Ron Whatley, an EYP partner and principal-in-charge of the project. Since it's an urban campus, he says, EYP wanted "a village that fits in with the surrounding landscape, yet still feels like residences."

The dining hall will be only two stories high, while the residence halls (above) that surround it will be five or six stories and total 250,000 square feet. Each residence floor will consist of at least six suites, and each floor will also include a common area, study, and lounge; EYP has used bay windows to break up the scale in these areas so they don't appear too academic. For the facades, EYP is using a salmon-colored brick alternating with stonework, to harmonize with the campus's dominant materials.

The dining hall and assembly facility will also include a fitness center and a "cyber lounge." The overall goal: use architecture to create a self-contained, inviting social environment, something the university has been short on. The project will also set the tone for future on-campus housing. *Rachael Butler*

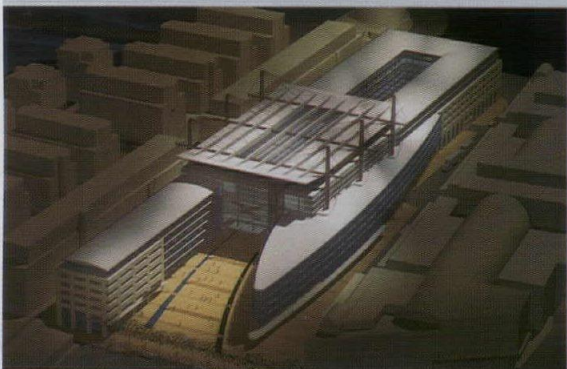
LOHAN'S SWEDISH ADVENTURE Chicago's Lohan Associates, whose current projects include an office building in Prague and a Grand Hyatt in São Paulo, has won a competition to design Vastra City, an 877,300-square-foot mixed-use development in Stockholm. Initiated by the city of Stockholm and the Swedish State Railway (SJ), the project will occupy the space over a section of railyard located near the city's historic and business districts. Plans include a 450-room hotel and a congress hall capable of seating 4,000, as well as retail, office, and residential space. The city and SJ are currently seeking investors; construction should be completed around 2003.

Although the site is not far from the 16th-century Klara Kyrka church, many of the adjacent buildings, such

as the World Trade Center, were erected in the past 30 years. Municipal authorities requested that the design respect the surrounding building heights but they made no other style specifications. "[City officials] were concerned about how it fits into the urban context, yet they very much didn't want us to replicate what's around it," notes Lohan principal Floyd Anderson. "They wanted a bold aesthetic statement."

Working with a Swedish partner, Thurffjellgruppen, Lohan designed a rectilinear mass with two projecting wings, one a glass-sheathed ellipsis. In a

gesture both structural and symbolic of the context, the central portion of the building is topped with a mastlike rigging that supports the roof of the congress center and provides the building with a distinctive presence on the skyline. An extensive plaza between the two wings acts as an antidote to the massiveness the program demanded; in addition, the architects suggested bisecting the existing World Trade Center (at left in photo) to create a vista of the nearby waterway. *Thomas Connors*



FOREIGN PRESS ROUNDUP

DUTCH TREATS

In the first of two issues of *Architecture + Urbanism* (Tokyo) devoted to the Netherlands, writer Peter Buchanan describes the Dutch government's extremely generous efforts to promote and develop architects and contemporary architecture. The government subsidizes the publication of architectural books and journals, the Netherlands Institute of Architecture in Rotterdam, and even foreign travel for architects. Because of such official support, the country is the easiest place for a young architect to start a career, according to Buchanan. In another unusual situation, private clients vie with government agencies to discover new talent as proof of architectural connoisseurship.

SITE CONCERNS

French firm Art'M recently completed its first big job, a junior high school for one of Marseille's less cheerful neighborhoods. In the September issue of *L'Architecture d'aujourd'hui* (Paris), Art'M principal Matthieu Poitevin writes frankly about the building's fate. "In spite of their reputation as combat zones, these places have a definite identity of their own and the violence is formalized. . . . The school is broken into every other weekend [including 'bunker-rooms' designed to be especially secure] and burnt-out hulks of cars regularly appear beyond the sports grounds. But this is nothing out of the ordinary. You could almost say that it's normal."

HISTORY ON ICE

The latest issue of *Arkkitehti* (Helsinki) celebrates the 250th anniversary of the building of Soumenlinna, a small group of fortified islands near the docks of Helsinki. The Finnish government has recently abandoned its attempt to vitalize the archipelago with full-time residents and move the islands into the stream of everyday Helsinki life. Twenty-five years after the military ceded the islands to civilian authorities, 870 people live there, far short of the goal of 2,000. Further funding will concentrate on the renovation of the historic military facilities and their conversion to tourist-grade public spaces, such as theaters and museums.

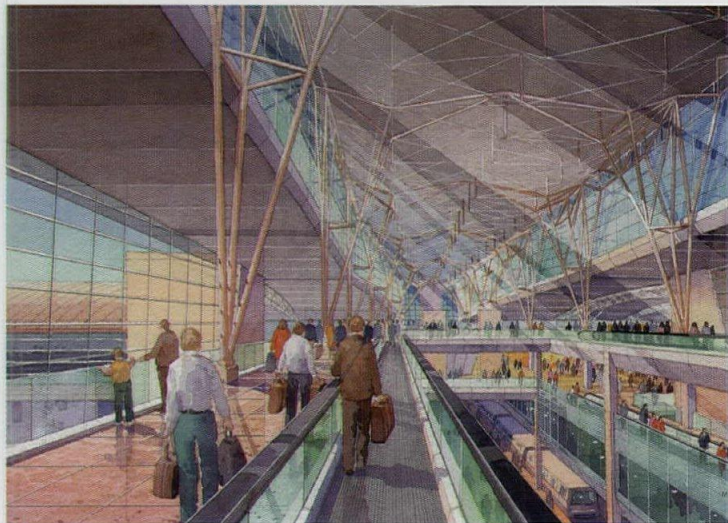
URBAN VALUES ENDANGERED

Sarona is a century-old Tel Aviv neighborhood of 70 small homes and relatively lush greenery—dominated by a long-present military base. *Architecture of Israel* (Tel Aviv) editor in chief Ami Ran writes, "Thanks to the base, not only are the city streets filled with easy-going soldiers, but a very gentle and civilized piece of urban fabric has endured." However, commercial developers recently purchased much of Sarona's real estate, and the bulldozing has commenced. Ran suggests that the city engineer, who told Ran he was too occupied by the coming elections to interfere with the destruction, is a political crony who should be replaced.

SLOW LEARNERS

As reported in the October issue of *Blueprint* (London), British architect Kathryn Findlay has been named associate professor at the University of Tokyo's architecture program, the first woman to hold such a position at the university. She is also the first foreign-born professor to be appointed this century.

—compiled by David Simon Morton



SALT LAKE CITY AIRPORT WILL FLY IN A NEW PATTERN

A new kind of airport design is preparing to take flight in Utah. Conceived by a joint Gensler/HNTB team, the Salt Lake City International Airport Authority will usher in the new millennium with a building that it hopes will be efficient and dynamic. It will be built in two phases over 15 years.

The building departs from typical airport layouts, which utilize fingerlike piers extending from a central hub. The organizing element of the new SLC airport is a linear spine that runs perpendicular to the terminal and roadway system. The spine is actually an extension of an existing light-rail line, which itself is tightly woven into the city's grid and terminates inside the airport's parking structure. The spine will connect parking with the terminal and main concourse, and includes a station for an underground moving walkway to ferry travelers to the remote concourse.

The building forms rise up along this line, emerging organically from the landscape. The multilevel spine separates outbound and inbound traffic, so travelers on each level all move in the same direction. The axiality of the building serves as a means of orientation and is important to the notion of "intuitive wayfinding" that the designers say they have explored extensively. That idea is further reinforced by the

careful attention to daylight, which is present everywhere in the building and draws people forward and toward specific destinations.

The building's skin is highly transparent to take advantage of the spectacular views of the surrounding mountains.

The design team has come to know Salt Lake City and its inhabitants well, resulting in a building that responds to its context. To express the community's rootedness and connection to the environment and landscape, as well as its role as a leader in technology research and development, the airport is a mix of heavy materials at the base and lighter, transparent materials above.

The base is richly colored in rusts, purples, reds, greens, and golds, reflecting Salt Lake City's unique geography and culture. Out of it rises a glass skin and expressive steel structure and roof volumes.

If the architects' experimental spine design functions as intended, the resulting clarity of movement and spatial richness, coupled with the drama of the surrounding landscape and the tectonic boldness of the structure, could make the airport experience a pleasant and dynamic one for the millions of travelers who will pass through each year. *Alice Y. Kimm*

MIXED NEWS FOR BUILDINGS PROGRAMS IN LATEST FEDERAL BUDGET

Under the fiscal 1999 appropriations approved by Congress in October, some federal buildings programs saw increases, but other major players were cut. Winners included the General Services Administration (GSA), the National Institutes of Health (NIH), and the Department of Housing and Urban Development (HUD). But funds for building programs at the Department of Veterans Affairs (VA) and the Federal Bureau of Prisons were decreased.

Jim Dinegar, the AIA's vice president for government and industry affairs, says, "We think this is the start of some good money flow for public buildings construction."

The GSA is receiving \$492 million for new building, after getting nothing for new construction this year. "I don't think it's going to alleviate the backlog, but it's going to help us go forward," says John Sporidis, senior vice president with HDR Architecture Inc., a firm based in Omaha, Nebraska, that designs many federally funded projects. The GSA will also get \$668 million for repairs and alterations, more than double last year's \$300 million.

The GSA's main business remains courthouses: 14 federal court projects account for \$462 million of the agency's new construction budget, including design money for projects in Biloxi-Gulfport, Mississippi; Eugene, Oregon; Springfield, Massachusetts; Little Rock, Arkansas; and Cape Girardeau, Missouri.

At HUD, the HOPE VI program, which finances demolition of older high-rise public housing projects and construction or renovation of lower-rise replacement units, got a 14 percent boost, to \$625 million. Other urban building projects are financed through HUD's 24-year-old Community Development Block Grant program, whose spending rises 7 percent, to \$5 billion, including \$200 million for disaster relief.

Receiving less funding are agencies like the VA, whose major

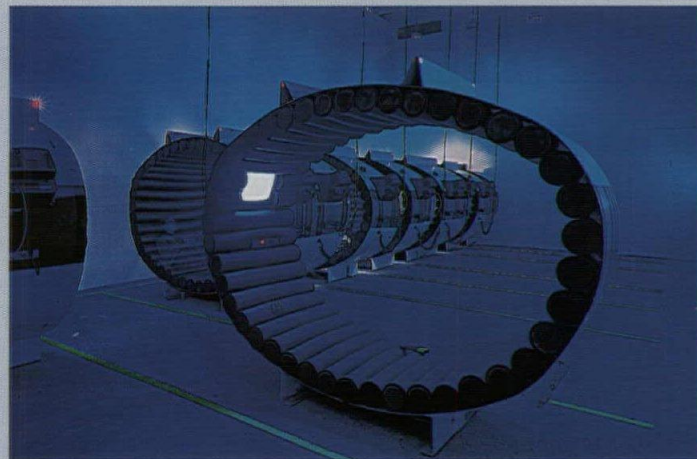
construction program slipped 20 percent, to \$142 million, and the Department of Defense, where construction money for military family housing plunged 20 percent, to \$712 million, and other military construction declined 3 percent, to \$3.1 billion.

HDR's Sporidis says budgets for law enforcement and medical research agencies will continue to be healthy. The NIH, which has some \$850 million in construction planned or under way, will get \$238 million, up 15 percent. At the Bureau of Prisons, which has turned to design-build for new projects, facilities spending will be down 26 percent, to \$411 million. But Congress did instruct the bureau to seek an extra \$300 million in fiscal 2000 for modernization and repair.

In the State Department's budget, lawmakers approved funds to design two U.S. embassies: \$10 million for Berlin and \$15 million for Beijing. The department is also getting \$627 million for security improvements at overseas posts, prompted by bombings in August at embassies in Dar es Salaam and Nairobi. Of that amount, \$163.5 million will go to clean up the sites of the damaged embassies, acquiring new sites, and design-build contracts for replacements.

Architects were disappointed that Congress rejected President Clinton's plan to stimulate school construction by buying down interest rates on bonds that local school districts issue. In addition, Dinegar says the big Capitol Hill news for architects this year was the Transportation Equity Act for the 21st Century. Funds for urban planning and for designing rail stations and other projects in which architects play a sizable role make up a relatively small part of the bill's \$217 billion total authorization. But, Dinegar says, "The total amount is so big people fail to realize how many dollars are there for design."

Tom Ichniowski



LOST AND FOUND The New York firm LOT/EK, run by two young Italian-born architects, Ada Tolla and Giuseppe Lignano, has been making use of industrial leftovers in its various designs. The duo's latest work involved cutting a petroleum trailer tank into slices and installing rubber tubing and televisions, creating individual viewing capsules. "TV/Tank" will be at New York's Deitch Projects through January 2. *Soren Larson*

LATIN AMERICAN EDITION OF MIES PRIZE GOES TO MEXICAN ARCHITECTS

The first Latin American Mies van der Rohe Prize, established by the Barcelona Foundation as a biannual award to complement its well-known European honors program, has been awarded to the Televisa Services Building, designed by Enrique Norten and Bernardo Gómez-Pimienta of Mexico City-based TEN Arquitectos. With the award, a miniature replica of Mies's Barcelona Pavilion, comes a 50,000 ECU (\$55,000) purse.

TEN Arquitectos, founded in 1987, has sought to bring some of the rationalizing qualities of the global avant garde to a country with chaotic urban conditions and con-

servative tastes. The firm's winning building, completed in 1995 on a difficult wedge of Mexico City land for Mexico's largest television network, houses a parking garage and offices in a polished black concrete plinth, and contains a dining area in a vaulted, aluminum-paneled shell above.

Juror Ignasi de Solá-Morales said the design won for the clarity of its urban placement, the adjusted hierarchy of its interior spaces, and the lightness of its forms. It was selected over projects by Oscar Niemeyer, Teodoro González de León, and Ricardo Legorreta, among others. *Miquel Adrià*



A STUDY IN LONGEVITY: RAMBUSCH CELEBRATES 100 YEARS

Of all the decorative arts workshops in business in the United States at the turn of the last century, the Rambusch Company of New York and Jersey City is one of the very few that will survive into the new millennium. The firm, founded by a Norwegian immigrant, Frode Vladimir Christian Rambusch, is celebrating its 100th anniversary this month.

Though many architects are familiar with the company's lighting products, decoration was the firm's core business for much of its history (below, the studio in 1898). An ad Rambusch placed in the 1906 edition of Sweet's Catalogue lists its services as "interior decorations, mural painting, wall hangings, relief work, painting and wood finishing, and cabinet work." Among commissions listed in the young firm's ad were the Baltimore Cathedral, St. Jerome's Church in New York, the Grand Opera House in Cincinnati, and Brooklyn's Orpheum Theater.

The firm went on to decorate thousands of churches and cathedrals, hundreds of movie palaces, restaurants, academic buildings, and hotels such as the Waldorf-Astoria. Rambusch even had contracts to camouflage air bases during World War II. One of the

firm's current projects is the redecoration of Conception Abbey in Conception, Missouri.

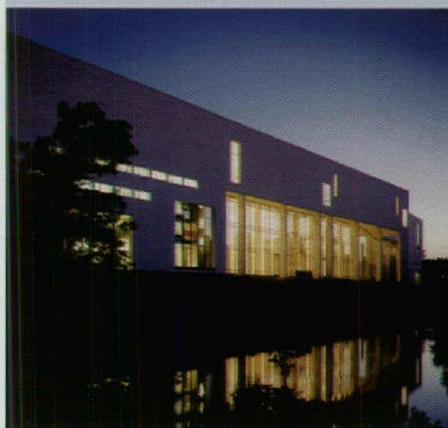
Viggo Rambusch, former president of the firm and grandson of the founder, attributes the firm's longevity to its never having adhered to any particular design style. The firm completed commissions in whatever look was popular, including Beaux-Arts and various revival styles, Art Deco, streamlined, Modern, and Postmodern. "We have always felt that it was the role of our designers to refine the ideas of the architect and the client, and not to dictate them," he says.

The firm is also well known for its lighting products. Legend has it that the firm began designing its own light fixtures in 1908, after Frode Rambusch became frustrated with the poor electric lighting that was obscuring some newly painted murals. In 1937 Rambusch patented the first recessed architectural downlight; the current catalog lists 1,081 variations of this basic design.

The firm is now operated by Edwin and Martin Rambusch, Frode's great grandsons, from a newly established factory and studio in Jersey City, New Jersey. *Charles D. Linn, AIA*

CLASSIC MEETS CONTEMPORARY After two years of construction and renovation, the Danish National Gallery (Stanes Museum for Kunst) in Copenhagen reopened last month, showcasing a revamped 100-year-old main building and a

new addition erected in the park behind it. The project's architects, Anna Maria Indrio and Mads Moller from local firm C. F. Moller and Partners, created a Modernist design for the new building (left), where predominantly 20th-century art is displayed. The rooms are minimally decorated



and painted white, while the doors, window frames, and other detailing are graphite gray. The extension traces the length of the old gallery's north facade, with a glass-covered arcade connecting the two wings. Meanwhile, extensive restoration work has returned the classical main building, where older works are displayed, to its original appearance. The project nearly doubled the museum's space, to 315,000 square feet. *S.L.*

ATTENDEES AT GREEN CONFERENCE PONDER SUSTAINABLE RATING SYSTEM

There were neither winners nor losers among the teams of architects, building owners, engineers, and designers who entered the Green Building Challenge, a sort of cooperative and friendly competition among 14 countries to build the most ecologically sound building. Instead, the goal of the challenge, which culminated in a conference held in Vancouver in October, was to work to define an industry-level rating system for green buildings.

"There's no question that buildings of sustainable design are essential. We're already reaching the end of the earth's capacity," said William Rees, a professor at the University of British Columbia. "It's easy to say buildings should be green, but difficult to know how to make them that way."

Each of the 14 participating countries selected buildings in one or more categories, which included offices, residential structures, and schools. These were scored according to a list of environmental attributes, such as land use, water

conservation, proximity to mass transportation, energy efficiency, and indoor air quality.

The scoring process used a benchmark based on "standard practice," or buildings that meet code but do nothing more to benefit the environment. The benchmark varied from country to country, and the regional nature of sustainable design was taken into account in other ways: for instance, what makes sense in one climate and economy won't work elsewhere, and products differ in availability.

"Ultimately, what we want to develop is a sort of environmental building code," said Lynn Foreschle, AIA. "We want to make it as easy to size up green performance as we can tell the gas mileage of a car."

The conference addressed other issues that come with sustainable design: using software programs that evaluate energy performance, selecting sustainable products, making green buildings attractive, and professional liability. *Wendy Talarico*



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EIFFEL'S BUDAPEST STATION TO GET A MODERN EXTENSION

The spirit of Alexandre Gustave Eiffel is alive and well in downtown Budapest. His artistry can already be seen in the Nyugati (Western) Railway Station, designed and built in the 1870s, and his legacy will be visible in TriGranite Development Corp.'s \$200 million West End City Center, an office-and-shopping complex currently under construction adjacent to the station.

But unlike the Eiffel Tower, which soars 984 feet into the Parisian sky, the new center's buildings will reach a height of 88.5 feet at most and sprawl across approximately 12.4 acres.

A new commuter station will connect the center to Nyugati Station, which has been an important hub for travelers and daily commuters for over 100 years. Trams, buses, an underground Metro line, and commuter and international trains all converge at the terminal and the square it dominates. More than 400,000 pedestrians and 225,000 vehicles pass by daily.

In designing West End City Center, Finta and Associates Architect Studio "used elements of the old [terminal]," according to Jozsef Finta, the firm's managing director. "We think it's a beautiful building and we didn't want to break the continuity. For example, the glazed roofs of the new commuter station and the main entrance to the center will have the same 22-

degree pitch as the roof of the terminal." The present commuter terminus, scheduled for demolition, "is garbage," says Finta.

Four separate buildings will house a 65,000-square-foot hypermarket, a 14-screen multiplex cinema, more than 150 specialty shops, over 300,000 square feet of leasable office space, a five-star casino hotel, and indoor parking facilities for 1,700 vehicles. There will be an 80-foot-wide promenade along the street side of the complex, and a landscaped roof garden with an ice skating rink will extend over the tracks leading to the commuter station.

The first phase of construction began last year. The retail/entertainment portion is scheduled to open next November; the hotel and office components will open later the following year.

"It's the largest project of this kind in Central Europe since the fall of Communism," claims Brian Jenkins, chief development officer for TriGranite, a joint venture between the Toronto-based real estate giant TrizecHahn Corp. and a major Hungarian real estate firm, Polus Investment Co. "It's longer than six blocks in New York City," Jenkins adds.

And the complex will become even larger. Ensuing phases will include residential facilities and additional office space, with completion slated for 2005. *Carl Kovac*

BIG, BUT NOT THAT BIG: PALM BEACH CONTEMPLATES SCALE

Palm Beach has always had its share of big houses, to say the least, but in recent years the winter home of America's rich has been beset with stylistic problems.

New owners, not happy with the Old World eccentricities of Palm Beach's 1920s houses, have chosen to alter, expand, and otherwise deface important pieces of the town's architectural legacy. Speculators have bought smaller, simpler houses—some of them dating to the early years of the century or even before—and assembled two- and three-lot parcels for new houses that overwhelm the old.

Two separate but complementary ideas have been proposed to grapple with the problems of scale, style, and visual intrusion brought about by the town's newest and biggest additions.

The Palm Beach Civic Association asked New York planning consultant and Yale professor Alex Garvin to create urban design strategies for the north end of town, where many of the more egregiously big houses have appeared. Garvin, working with Miami architect and garden historian Joanna Lombard, proposed a series of landscape interventions that would appease the eye and enhance the "continuity and distinctiveness" of Palm Beach streets.

The Palm Beach Preservation Foundation hired Ray Gindroz of Pittsburgh's Urban Design Associates (UDA) to create a model for future development based on the ideas of 19th-century architectural pattern books. Gindroz put together

a pattern book for Disney's town of Celebration, and has used the same approach in other cities.

Gindroz and his staff spent almost 100 hours looking at and recording Palm Beach's architecture, to begin to understand it as "a remarkable ensemble of urban and public spaces," he says.

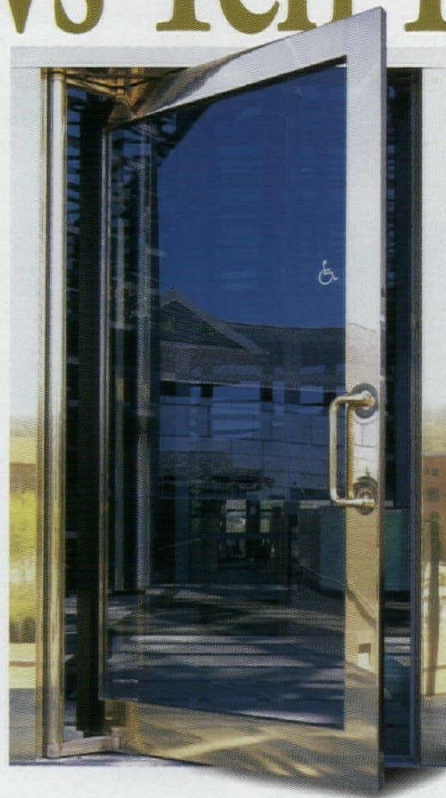
Palm Beach has long been the winter resort of choice for America's most moneyed, who moved into Mediterranean-inspired houses by such architects as Addison Mizner and Maurice Fatio. "These are discreet houses," Gindroz told Palm Beach's Planning and Zoning Commission at a hearing last month. "The composition is superb. The proportions are correct, balanced, harmonious. The use of decoration and ornament is restrained."

Gindroz's studies show that most of Palm Beach's greatest landmark houses could not be built under the current zoning, a code that leads more to "inflated-looking, pumped-up houses with monster roofs." (UDA's "ideal plan" for Queens Lane is shown below.)

Gindroz's study starts to provide an alternative to that zoning; it proposes a pattern book as an overlay to a stricter code, so that architects and developers who would like to build bigger must follow time-tested approaches to siting, massing, and form. The next step is for the city and its various boards to decide whether to proceed with a full pattern book as a way to keep the attack of the "monster houses" at bay. *Beth Dunlop*



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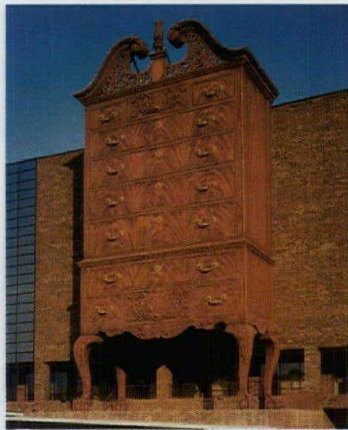
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NEWS BRIEFS

Quite a pair After creating perhaps the most talked about design of the decade, the Guggenheim Museum in Bilbao, Spain, Frank Gehry and the Guggenheim could be teaming up again. According to reports, the museum is planning a large new branch, to be designed by Gehry and built on New York's West Side, at the Hudson River off Houston Street. It would be built on state land in the middle of a new shorefront state park, and would be the third Guggenheim in Manhattan—though the SoHo branch is losing money and has an uncertain future.

Prado picks Moneo Spanish architect Rafael Moneo has won a competition to enlarge the Prado Museum in Madrid, Spain's Ministry of Culture has announced. His design was selected from projects by the 10 finalists in a 1996 open international competition that ended



At 85 feet, this highboy in North Carolina lives up to its name.

without a winner. The extension, to be located behind the existing building, used by the museum since 1819, will house temporary exhibition galleries, visitor services, and modern technical facilities.

Curtain raiser Construction has started on the latest in a series of new buildings that is changing the face of Times Square. The New

42nd Street Studios, a 10-story structure housing rehearsal studios (much needed in the area), offices, and a small theater named The Duke, was designed by Platt Byard Dovell Architects. The \$23 million costs are being covered by public and private funds. Meanwhile, a development that would include as many as 11 small theaters and 350 new apartments is being planned for Theater Row, a stretch farther west on 42nd Street. A large theater and some smaller ones would likely occupy the base of a new mixed-income apartment tower. The project will be financed primarily by the state-sponsored 42nd Street Development Corporation, with some private help.

Good connections Robert A.M. Stern is already having an effect in his new role as dean of the Yale School of Architecture. He's lured architects Philip Johnson, Hendrik Koning, Julie Eizenberg, and Charles Gwathmey to sign on as visiting pro-

fessors for next spring. Each will present one lecture and instruct a studio course. In addition, Bernard Tschumi, Peter Eisenman, Rafael Viñoly, Michael Sorkin, and others will give lectures.

Biloxi bound Frank Gehry is also set to commence work in the spring on the design for a museum in Biloxi, Mississippi, to showcase the region's culture—in particular, the work of George E. Ohr, known as the "mad potter," whose ceramics did not receive acclaim until long after his death in 1917. The city has pledged \$1 million toward construction. Former Mayor Jerry O'Keefe, who is raising funds for the \$8 million project, has donated \$750,000.

Well furnished You've heard of the "Chippendale Building," the nickname for Philip Johnson's AT&T (now Sony) Building in New York, whose cutaway top resembles a piece of furniture. Taking the idea a step further, the Furnitureland South Mart

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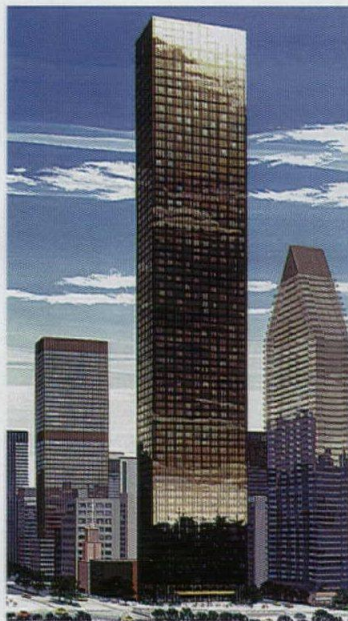
in High Point, North Carolina—known for its home furnishings market—has constructed an 85-foot-high replica of a highboy chest to sit at its front door. Furniture designer Sid Lenger designed the facade, which is made of Outsulation, an exterior insulation and finish system. The detail work on the top is made of foam.

Eastern philosophies New York's Van Alen Institute, a civic organization devoted to public architecture, has given first prize in its "Design Ideas for New York's East River" competition to Victoria Marshall and Steven Tupu, who suggested that waste accumulation be used to build livable and evocative landscapes on the waterfront. Other schemes, on display at the institute through February, ranged from a series of interlocking parks to a new subway line running along the river.

Trumped again Donald Trump isn't short on ambition. The devel-

oper, who has long wanted to build the world's tallest building, is settling for the claim of New York's tallest residential building. Trump has hired architect Costas Kondylis to design Trump World Tower; Kondylis's 900-foot-tall building, sheathed in a bronze glass curtain wall, would house 376 luxury condominiums, a health club, and a restaurant. If all goes according to plan, the building will be in place on its site across from the U.N. sometime soon after the turn of the millennium.

New doings at DMJM International architecture and engineering firm Daniel, Mann, Johnson, & Mendenhall has reshuffled by combining its architectural and interior design divisions to form a new, as yet unnamed practice. The move coincides with the departure of Richard Keating, FAIA, who had headed its design practice, and the return of Paul Danna, AIA, who was at HOK.



Trump's latest gesture.

The show won't go on The site of Hungary's new National Theater (June, page 40) may now become an underground parking garage. In late October, the newly elected government, citing cost overruns, killed

the project after \$11.5 million had been sunk into excavating the site, near Budapest's city center, and pouring the foundation. Plans now call for a smaller theater, to be built in or near City Park. As for the National Theater site, since the underground parking garage is almost completed, that's probably what it will become.

Harry Weese; Albert Frey

Harry Weese, a Chicago planner and architect best known for designing the Metro system in Washington, D.C., died last month at age 83. Weese also oversaw the renovation of both Adler and Sullivan's Auditorium Theater and the Field Museum in Chicago, while designing new structures such as that city's Time and Life Building.

Albert Frey died last month at the age of 95. Early in his career, the Swiss-born Modernist worked in Le Corbusier's atelier; later, his houses and buildings had a great impact on the Palm Springs area. ■

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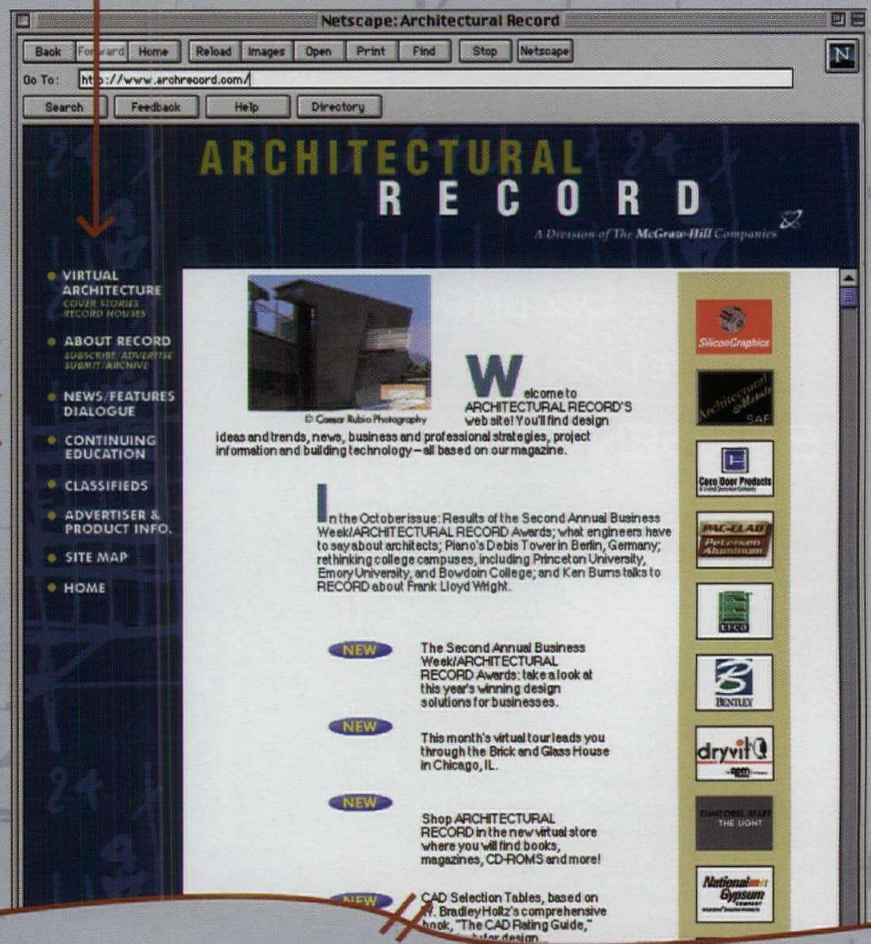
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DATESEVENTS

Calendar

**Equal Partners
Northampton, Mass.***Through December 13*

A celebration of male/female professional collaborations, featuring the work of 15 American firms founded and run jointly by men and women, including Arquitectonica, Asymptote, Hodgetts + Fung, and Tod Williams Billie Tsien Associates. Smith College Museum of Art. 413/585-2760.

**New Chicago Skyscrapers:
The Year 2000
Chicago***Through December 31*

An exhibition of new skyscrapers that will be completed early in the next millennium, a welcome relief from the drought of construction in downtown Chicago over the last decade. Included are buildings by DeStefano & Partners, Solomon Cordwell Buenz, SOM, and others. Chicago Athenaeum. 312/251-0175.

**The American Dream by
Mail Order
Chicago***Through December 31*

An exhibition exploring the history of Sears, Roebuck & Co. catalog houses built between 1908 and 1940. Chicago Architecture Foundation. 312/922-3432.

**New Ways of Revitalizing the
American City
Washington, D.C.***Through January 3, 1999*

An exhibition illustrating how new cultural facilities have enlivened tired downtowns in Phoenix; Cincinnati; Fort Worth; Newark, New Jersey; San Jose, California; and Kansas City, Missouri. National Building Museum. 202/272-2448.

**La Présence des Objets:
Gaetano Pesce
Montreal***Through January 3*

Furniture, objects, models, and

plans of recent projects by the architect and industrial designer. Musée des Arts Décoratifs de Montréal. 514/284-1252.

**The Elusive City: Photographs
of Houston by Paul Hester
Houston***Through January 3*

Approximately 40 black-and-white photographs of Houston from the late 1970s to the present. Menil Collection. 713/525-9404.

**Japan 2000: Kisho Kurokawa
Chicago***Through January 3*

A retrospective of the Japanese architect's work, from his early Metabolist projects to his current addition to the Van Gogh Museum in Amsterdam. Art Institute of Chicago. 312/443-3600.

**Robert Adam: The Creative
Mind
Washington, D.C.***Through January 3*

An exhibition of drawings by the 18th-century neoclassical Scottish architect, demonstrating his design process from conception to final presentation. The Octagon. 202/638-3221.

**The Work of Charles and
Ray Eames
London***Through January 3*

A comprehensive traveling retrospective of the work of the great modernist designers, organized by the Vitra Design Museum and the Library of Congress. More than 500 examples of their work, from furniture to toys, are included. Design Museum. 011/44/171/378-6055.

**Bechtel's First Century
Washington, D.C.***Through January 4*

A portfolio of projects by the San Francisco-based Bechtel Group, one of the world's largest engineering and construction firms. High-

lighted projects include the Hoover Dam, San Francisco's rapid-transit system, and the Channel Tunnel between England and France. National Building Museum. 202/272-2448.

**Tensions in Architecture
New York City***Through January 5*

An examination of the extraordinary recent developments in the materials and technology of tensile structures. Material ConneXion Gallery. 212/445-8825.

**Ad Fontes: The Art and
Projects of Vebjorn Sand
Washington, D.C.***Through January 8*

An exhibition of works by the Norwegian artist, including documentation of three unusual public projects: a highway bridge modeled after one of Leonardo's designs, a troll's castle built of ice and snow, and an installation based on the discoveries of astronomer Johannes Kepler. AIA Headquarters Gallery. 202/638-3221.

**Designing the Disney Theme
Parks
New York City***Through January 10*

"The Architecture of Reassurance" examines how Disney attractions are conceived, planned, and built. On display are 200 plans, drawings, paintings, and models from Disney archives, many of which have never been publicly displayed. Cooper-Hewitt National Design Museum. 212/849-8300.

**George B. Post: Great
American Architect
New York City***Through January 10*

Among the works featured in this exhibition of the late 19th- and early 20th-century architect are renderings of the long-demolished Equitable Life Assurance Society (the first building to use elevators) and the Western Union Building (the first to reach 10 stories). New-York Historical Society. 212/873-0509.

**Premises: Invested Spaces
from France
New York City***Through January 11*

An exhibition of visual arts, architecture, and design in France from 1958 to 1998 that underlines the relationship between the artist/architect and the constructed environment. Included are models, drawings, photos, and installations by Christian Boltanski, Yves Klein, Le Corbusier, Jean Nouvel, and Annette Messager, among many others. Guggenheim Museum SoHo. 212/423-3500.

**All Wright: The Dana-Thomas
House
Chicago***Through January 31*

An exhibition showcasing the most complete and best-preserved example of Frank Lloyd Wright's early Prairie houses. Chicago Architecture Foundation. Call 312/922-3432 or fax 312/922-0481.

**Main Street Five-and-Dimes
Miami Beach***Through January 31*

Photographs, drawings, architectural fragments, and store merchandise document the architectural history of one of America's foremost chain store operations, S. H. Kress & Co. The Wolfsonian, Florida International University. 305/535-2631.

**Louis Comfort Tiffany at the
Metropolitan Museum of Art
New York City***Through January 31*

Nearly 100 Tiffany works from the museum's collection, including windows, lighting fixtures, and objects, are featured. The full-scale entrance loggia from Tiffany's Long Island estate is also on view. Metropolitan Museum of Art. 212/570-3951.

**Cities on the Move
New York City***Through February 7*

This exhibition brings together artists, architects, filmmakers, and other "creators" who explore the

(continued on page 48)

(continued from page 47)
 shapes and forms of Asian cities.
 P.S.1 Contemporary Art Center.
 718/784-2084.

**Monuments of the Future:
 Designs by El Lissitzky**
Los Angeles

Through February 21
 An exhibition of works by the early
 20th-century Russian artist, includ-
 ing designs for utopian skyscrapers.
 Getty Center. 310/440-7300.

Incandescence: Watercolors
by Laurretta Vinciarelli
San Francisco

Through February 23
 A series of paintings commissioned
 by SFMOMA that examine the rela-
 tion of space to the horizon line.
 San Francisco Museum of Modern
 Art. 415/357-4000.

The Cartoons of Roger K. Lewis
Washington, D.C.

Through February 28
 More than 100 cartoons satirizing

the state of architecture and urban
 design, originally published in the
Washington Post. National Building
 Museum. 202/272-2448.

**Design Ideas for New York's
 East River**
New York City

Through February 28
 On display are entries to the Van
 Alen Institute's ideas competition to
 transform the East River into public
 space, and the New East River
 Park Project by Reiser + Umemoto
 Architects. Van Alen Institute.
 212/924-7000.

Unlimited by Design
New York City

Through March 21
 An exhibition of products, services,
 and environments designed to meet
 the needs of people throughout
 their life spans, from toddlers to the
 elderly, demonstrating the effect
 design can have on the quality of
 life. Cooper-Hewitt National Design
 Museum. 212/849-8300.

**Forgotten Gateway: The Aban-
 doned Buildings of Ellis Island**
Washington, D.C.

Through March 28
 A photographic exhibition docu-
 menting the deterioration of the
 historic hospital complex on Ellis
 Island, which remains untouched by
 the renovation that transformed the
 north side of the island. National
 Building Museum. 202/272-2448.

The Little Apple: Souvenir
Buildings
New York City

Through March 28
 On display is a collection of 125
 miniature New York buildings, with
 the oldest souvenir dating from
 1800. Museum of the City of New
 York. 212/534-1672.

Zigzags and Speed Stripes:
The Art Deco Style
Pittsburgh

Through March 28
 An exhibition that surveys the
 impact of the Art Deco style on

architecture and design, tracing the
 interwar phenomenon from zigzag
 moderne to streamlined moderne.
 The exhibition complements the
 permanent installation of *The*
Chariot of Aurora, a gilded and
 lacquered relief from the SS *Nor-*
mandie. Carnegie Museum of Art.
 412/622-3131.

Building the Empire State
New York City

Through March 31
 A documentary look at the design
 and construction of Shreve, Lamb &
 Harmon's 1931 Empire State
 Building. Skyscraper Museum.
 212/968-1961.

**Architecture on the Rise: Ren-
 derings by Hughson Hawley**
New York City

Through April 4
 Hawley's watercolor drawings from
 1880 to 1931 offer a vision of the
 developing city. Museum of the City
 of New York. 212/534-1672.

(continued on page 50)



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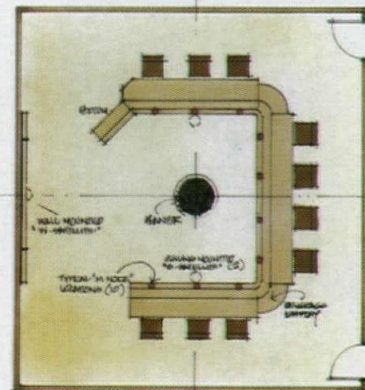
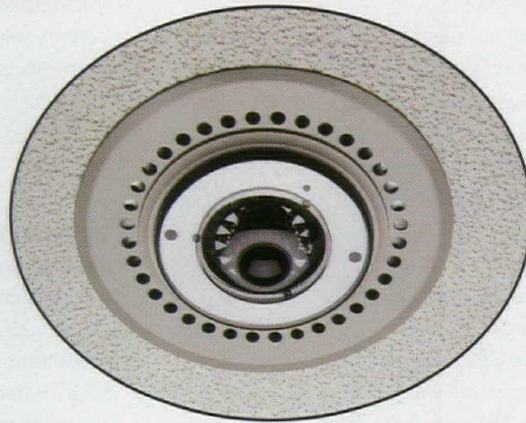
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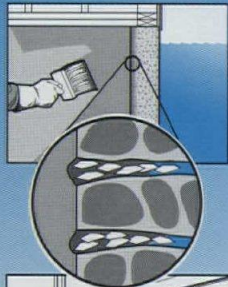
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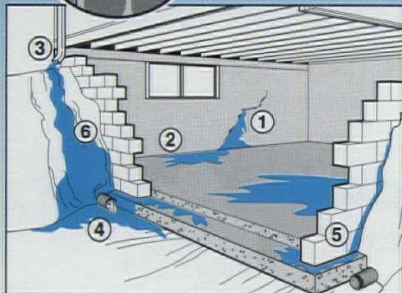
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CIRCLE 25 ON INQUIRY CARD

(continued from page 48)

Beyond Architecture: Marion Mahony and Walter Burley Griffin Sydney, Australia

Through May 2

This exhibition explores the professional and spiritual journey of architects Mahony and Griffin, from their years in Frank Lloyd Wright's office at the turn of the century through their work in Australia and India in the 1920s and 1930s. Powerhouse Museum. 011/61/02/217-0111.

Thermal VII Clearwater Beach, Florida

December 6-10

A conference focusing on the latest technologies related to the thermal performance of building envelopes. The core conference and workshops meet AIA/CES criteria for quality levels II and III, respectively. Sheraton Sand Key Resort. Call Mia Prater at 423/576-7942 for details or E-mail her at unb@ornl.gov.

Photography and Transformations of the Contemporary City: Venezia-Marghera Montreal

December 9-April 25

The work of 15 Italian photographers exploring the relationship between historic Venice and the modern, industrialized, and polluted mainland port of Marghera nearby. Canadian Centre for Architecture. 514/939-7000.

IASTE '98 Cairo, Egypt

December 15-19

This year's conference of the International Association for the Study of Traditional Environments examines how nations are cultivating traditional architecture as a means of attracting tourism. About 120 papers by scholars from around the globe will be presented. Contact the Center for Environmental Design, University of California at Berkeley, 510/642-2896.

Celebrating Chandigarh: Fifty Years of the Idea Chandigarh, India

January 8-11

An international conference marking the 50th anniversary of the Punjab capital's conception includes discussions of how its design, by Le Corbusier and many others, affected city planning in developing nations around the world. Among the speakers are Charles Correa, Norman Foster, Ricardo Legoretta, Richard Rogers, Kenzo Tange, and Robert Venturi. Call 011/91/172/548742 or visit www.cperspectives.org for details.

International Builders' Show Dallas

January 15-18

The world's largest convention and exposition geared to the home-building and construction industry will also host, for the first time, the International Commercial Construction Exposition. Dallas Convention Center. Call Jason Lowe at 202/861-2104 or E-mail jlowe@nahb.com for details.

Transformations: Mixed-Media Assemblages by Keith Krueger Washington, D.C.

January 15-February 26

An exhibition of works by a local architect, who uses discarded elements from buildings and construction sites in his compositions. AIA Headquarters Gallery. 202/638-3221.

World of Concrete USA Las Vegas

January 18-22

An exposition focusing on materials, equipment, and technology for the concrete construction, repair, and refurbishment industries. Las Vegas Convention Center. Call Maria Prior at 630/705-2578 or visit www.wocexpos.com for more information.

Solid Surface '99 Las Vegas

January 21-23

The International Solid Surface Fabricators Association's annual event will feature over 100 exhibitors and 5,000 attendees. Riviera Hotel. Call 702/567-8150 for more information.

Restoration and Renovation Washington, D.C.

January 28-30

This year's International Exhibition and Conference for Traditional Buildings, Homes, Design and Craft will be held in the nation's capital to encourage networking with the public sector. Sheraton Washington Hotel. Call 978/664-6455 or visit www.egjexhib.com for more information.

Community Built Association Conference Santa Barbara, Calif.

January 29-February 1

A conference run by an organization devoted to involving local residents in the building process. Attendees will include artists, architects, landscape architects, designers, builders, community gardeners, park and recreation officials, and community development specialists. La Casa de

(continued on page 52)



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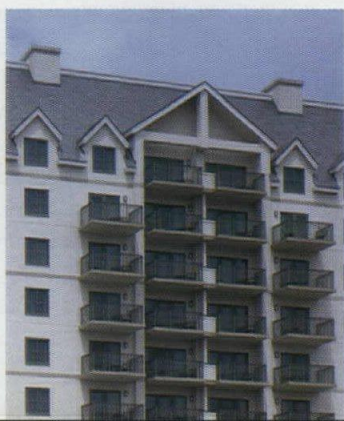
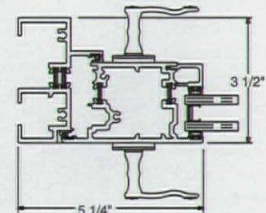
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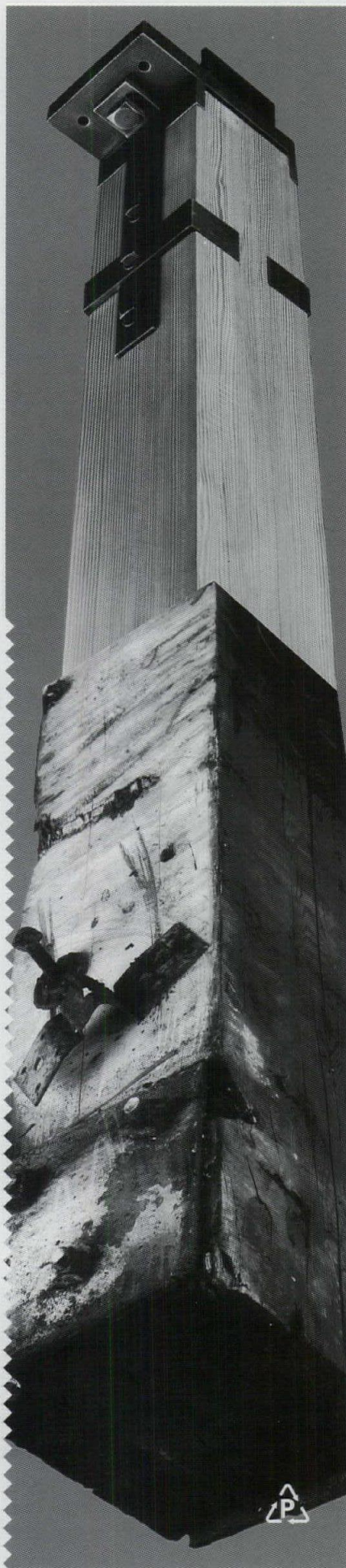
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(continued from page 50)

Maria. For more information, contact Kyle Cundy at 607/277-1650 or E-mail leathers@dreamscape.com.

National Roofing Contractors Association Convention Phoenix

February 7-10

The NRCA hosts the largest roofing convention in the United States, attracting more than 8,000 attendees and 390 exhibitors. In addition to educational programs, there will be presentations by Gen. Colin Powell and humorists Dave Barry and Rita Rudner. Phoenix Civic Plaza. For registration materials, call 800/323-9545, fax 847/299-1183, or visit www.roofonline.org. For fax-on-demand, call 888/455-6722 and request document 1203.

Greenprints '99: Sustainable Communities by Design Decatur, Ga.

February 22-23

A conference and trade show on environmentally appropriate building technology and sustainable community design, hosted by Southface Energy Institute and the Georgia Environmental Facilities Authority. Atlanta-Decatur Hotel and Conference Plaza. Call the Morningstar Management Group at 404/653-0606 for more information, or visit www.southface.org.

Inter Con '99 Orlando

February 24-28

A convention and trade show for the commercial interiors construction industry, sponsored by the Ceilings and Interior Systems Construction Association and *Interior Construction* magazine. Walt Disney World Coronado Springs Resort. For information, call 630/584-1919 or visit www.CISCA.org

AIA National Convention Dallas

May 6-9

The theme of this year's convention, expected to draw as many as 14,000 people, is "Think Big, Make

It Happen: Leadership in the New Millennium." Architects can earn all 36 Learning Units needed for AIA accreditation by attending seminars and exhibitor education sessions. Dallas Convention Center. For information, visit the convention Web site at www.aiaexpo.com (not yet online). For information on exhibiting, contact Hill, Holliday Exhibition Services at 617/572-3553.

Competitions

Rudy Bruner Award for Urban Excellence

Submission deadline: December 18

This award is given to urban places that demonstrate a successful integration of effective processes and meaningful values into good design. The Gold Medal winner receives \$50,000. For more information, call 617/492-8401 x139 or E-mail info@brunerfoundation.org.

London AIA Excellence in Design Awards

Submission deadline: January 15

The awards program honors excellence in architectural design for work completed between January 1, 1993, and December 31, 1998. Eligible are projects by U.K.-based architects working anywhere in the world; projects in the U.K. by architects from anywhere in the world; and projects in the U.K. by U.K.-based students. For more information, write AIA, Kent House, 14-17 Market Place, London W1N 7AJ, or fax 011/44/171/636-1987.

Young Architects Forum

Submission deadline: January 29

"Scale" is the theme of this year's competition sponsored by the Architectural League of New York. Open to architects and designers who have graduated from undergraduate or graduate programs in the last ten years. Winners receive a cash prize and are invited to exhibit their work and give a lecture at the Urban Center. For an entry form or for further information, call 212/753-1722.

(continued on page 160)

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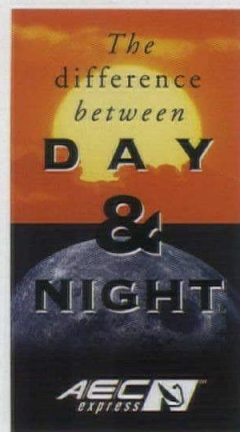
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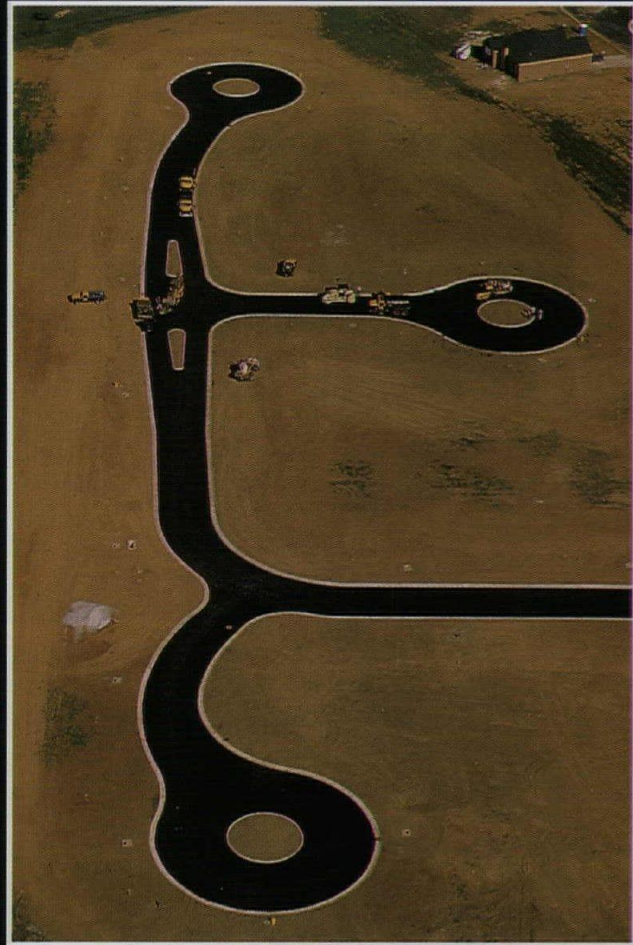
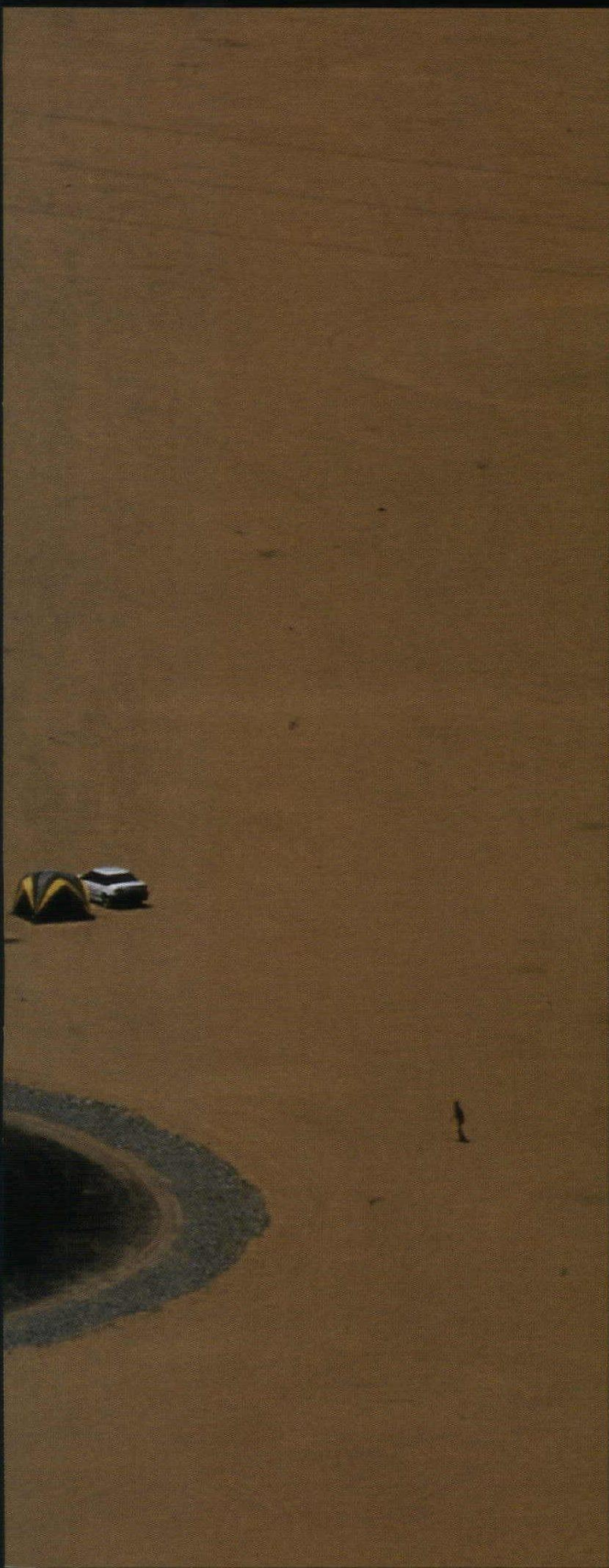
CIRCLE 28 ON INQUIRY CARD

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Earthly Inscri



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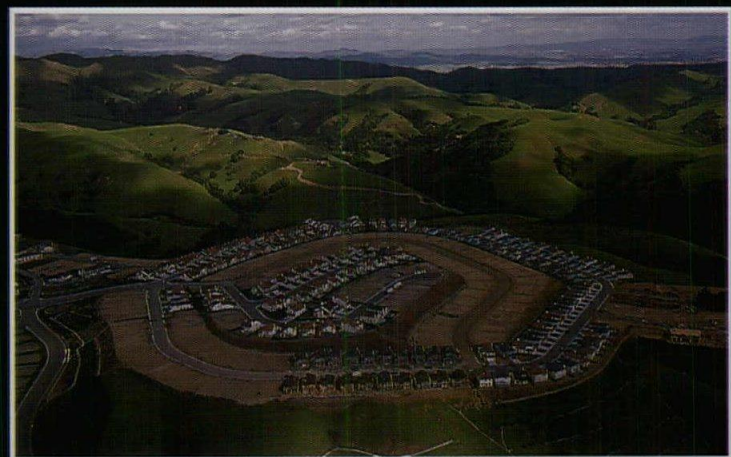


Lines

Opposite: Off-road vehicles are launched from macadam, Winter Haven area, California, 1994. **Above:** Cul-de-sac layout, Bowling Green, Kentucky, 1997.

Photographs by Alex S. MacLean

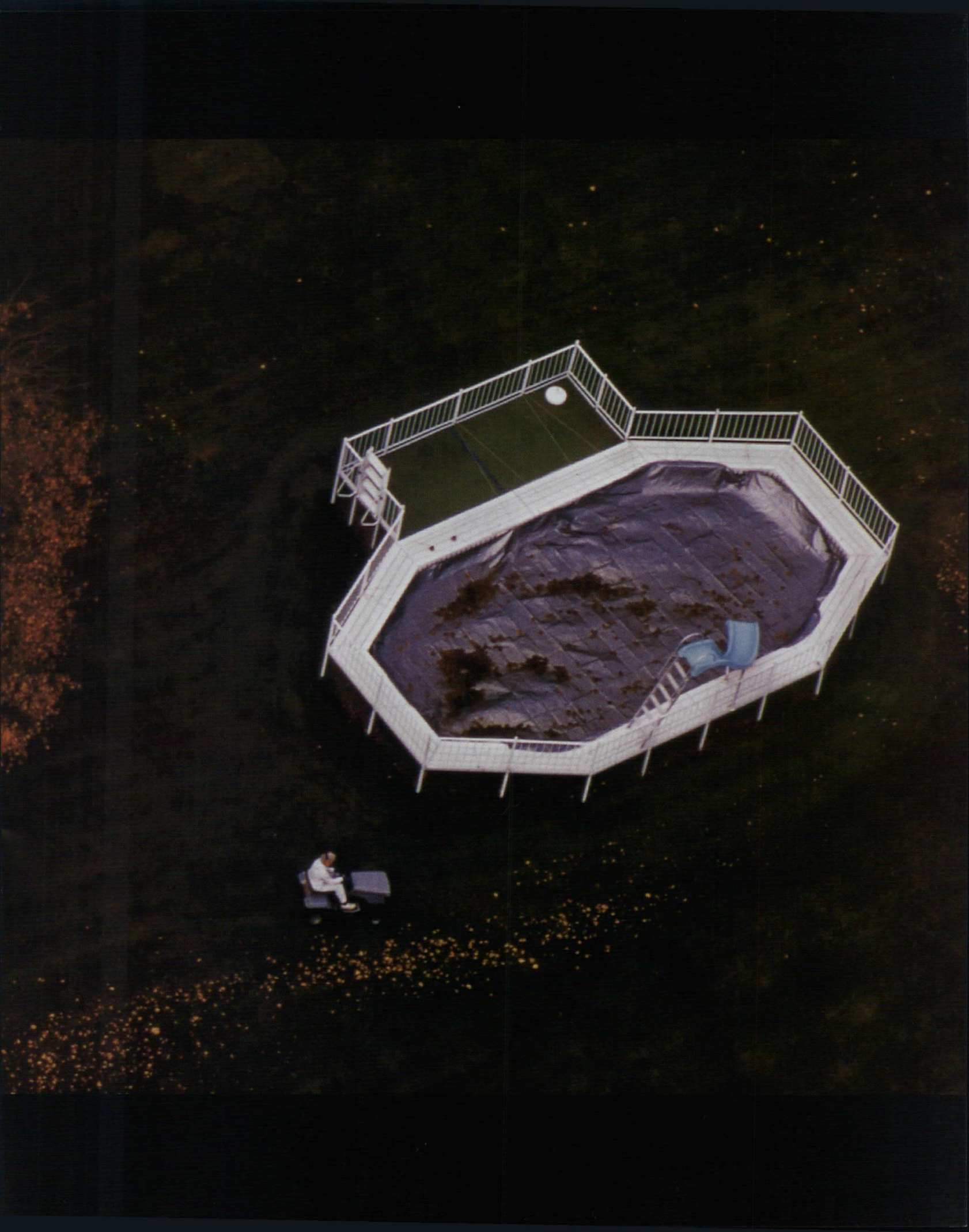
Step back and take a cosmic view of the world. That's what photographer Alex S. MacLean and writer James Corner did in their award-winning book, *Taking Measures Across the American Landscape* (1996). ARCHITECTURAL RECORD is pleased to present a collection of MacLean's previously unpublished images photographed from a high vantage point. Our selections illustrate the intersection of human intervention and the natural world—specifically, the relationship of construction and landscape. MacLean's work demonstrates how emphatically and forcefully the world is changed by human will, how directed and linear, how like a language, are the patterns that we make. Here are circumscribed pentagrams and octagons of suburban developments counterpoised with the random lushness of the northeastern hills, the stylized inscriptions of asphalt paving laid like a ribbon on the desert, and the rhythmic power of simple storage buildings. All speak to intention and to transformation, and from such a height, even these simple artifacts sing. *Robert Ivy, FAIA*



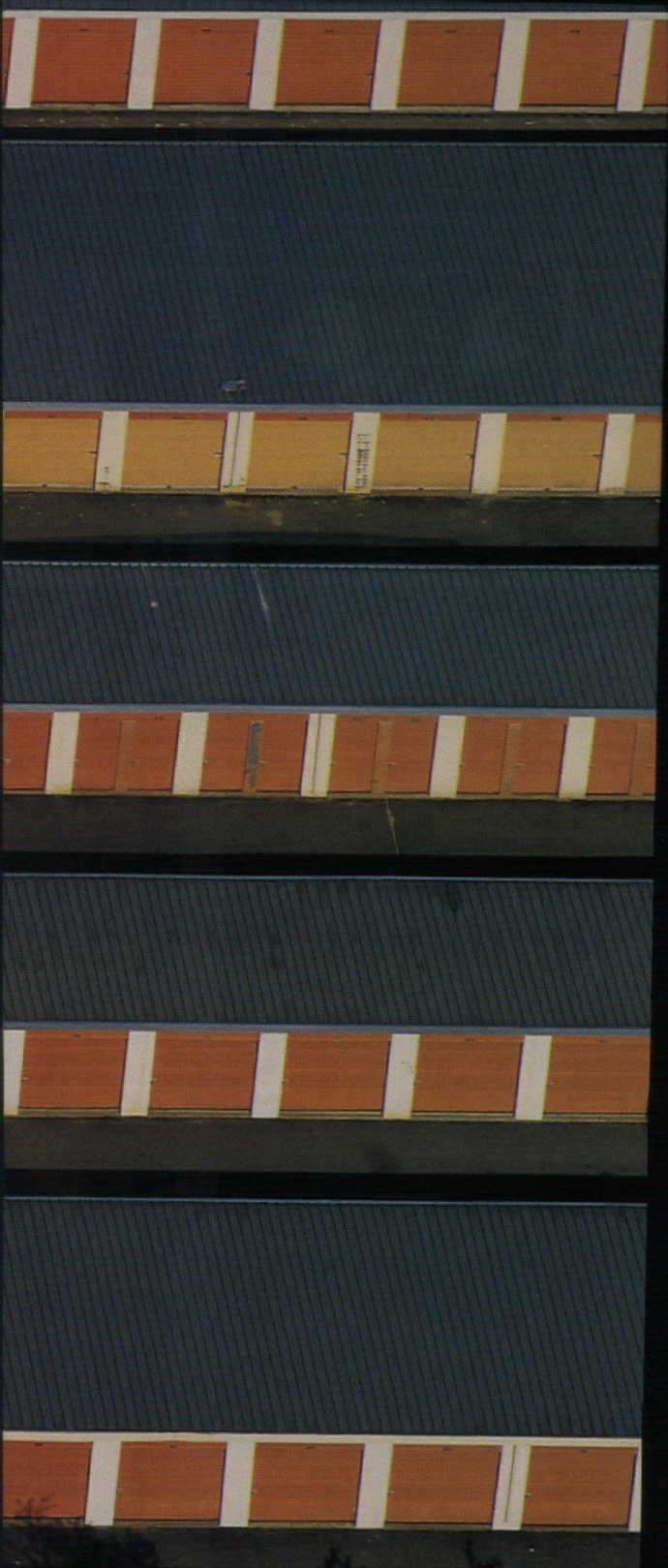
Objects in the landscape

Top: Large lot subdivision, St. Albans, Vermont, 1996. Above: Phase of hillside construction, Dublin Canyon area, California, 1997. Opposite: Pool and lawn-boy, central New Hampshire, 1993.









Patterns

Opposite: Self-storage lockers, Lowell, Massachusetts, 1993.

Above: Storage lockers on cul-de-sac, Jericho, Vermont, 1994.

Planning for FIRM



SUCCESSION



by John Morris Dixon, FAIA

Amid the anxieties of starting and running an architectural practice, the founders of a firm are not likely to think about who will succeed them. They are just hitting their professional stride, and their objectives rarely extend beyond simply surviving. But from the first day of business, an unwelcome and often frightening deadline looms: the day when the current principals must step down and make way for the next generation.

No matter when a firm confronts it, the issue of leadership and ownership transfer is a touchy one. The realignment of power involves establishing new leaders and ushering out the old ones, who are often reluctant to let go. It involves finding money to compensate former principals while coping with friction and competition among remaining staff members. And it involves maintaining a good image and a solid front so that clients see the firm as steady and reliable.

While ownership turnover is hardly a new issue, there are undoubtedly more firms considering it now than ever before. For one thing, there are exceptionally large numbers of principals confronting the prospect of retirement, however varied their ages. A large proportion of today's firms date from the prosperous postwar years, roughly 1950 to 1965, when the profession expanded rapidly. Many of the leaders, in their prime then, are now ripe for retirement.

The most recent recession also left a lot of pent-up demand for ownership transition. When a firm's finances are languishing, there is little incentive for anyone to seek ownership shares, or to offer them. Although financial markets are volatile today, most firms are prospering. Indeed, many cannot find enough help. That means now is a good time for transitions to take place. Staff members who survived the downturn have absorbed some tough economic lessons; no starry-eyed idealists,

they are concerned and informed about the business of architecture. They want to be adequately rewarded for remaining loyal whether times are good or bad.

Two Kinds of Firms

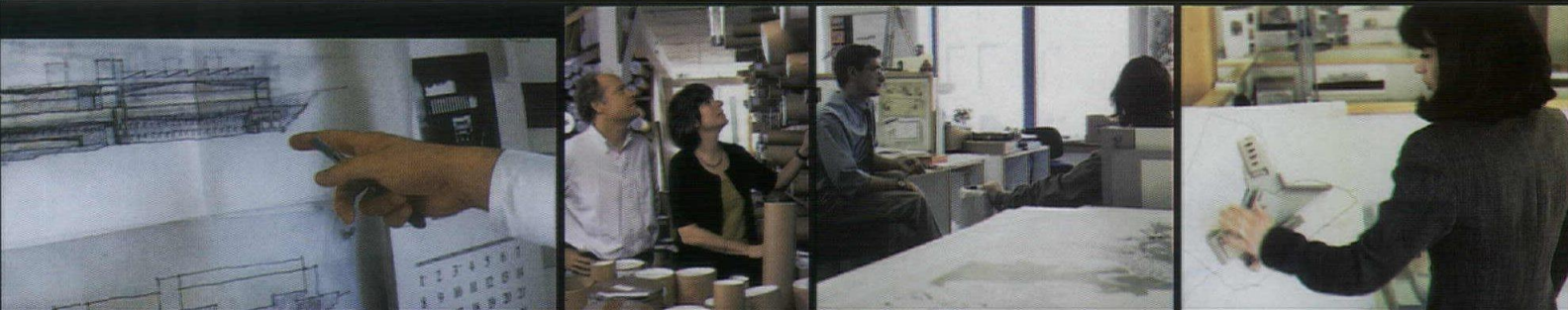
Though an architecture firm may be set up in various ways—as sole proprietorships, partnerships, or professional corporations—legal structure is not as important to the ownership transition process as is the firm's history. For the purposes of this article, there are two types of firms: those where the founders are still the owners and those that have gone through the transition process before.

Past experience can make a big difference in how leadership succession is handled. Second-generation principals tend to focus on maintaining the firm's continuity rather than their personal reputation. They are likely to view ownership transition more objectively and to think about the next transfer of power from the day they take the reins. By comparison, founding partners often don't think about succession until they have to, which is often too late. It is hard for them to imagine the firm without them; it is a part of their identity. Founding partners have the hardest time letting go. In fact, some simply can't.

The death of a firm's senior principal may complicate the ownership transition process. If the heirs become embroiled in an estate battle or a dispute with the surviving partners over the value of the firm, untangling the matter in court could take years.

A buyout is most difficult financially if a firm is entirely owned by one individual, or by two or three partners of about the same age who want to retire at about the same time. So much change all at once is not only disruptive to a firm, it also creates financial strains: buying out the retiring owner or owners overtaxes the new principals, especially if the decision is a relatively sudden one and the new partners haven't had an opportunity to reserve some money. The selling partners, too, will feel the

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THERE IS AN OWNERSHIP TRANSITION IN EVERY FIRM'S FUTURE, IF IT IS TO HAVE A FUTURE.



effects, since they are likely to get less money for their shares or will be forced to wait for their money.

The greatest challenge comes when a firm is headed by a star architect, one with a strong design reputation and whose firm carries his or her name. All of the firm's appeal in the marketplace, and often the ownership as well, is invested in one individual. Firms headed by a design celebrity rarely survive after that person's departure. But there are exceptions, rare instances when architect stars have determinedly provided for the continuation of their firms and their name. Marcel Breuer and I. M. Pei, for instance, both made full-fledged partners of younger associates while they were in the heyday of their practices. Breuer's successor firm flourished briefly after his death, then disbanded. But Pei Cobb Freed & Partners has continued to prosper despite Pei's retirement, though the question now is who will succeed Harry Cobb and James Freed in the firm's name.

If a firm is to survive, it must take a hard look at its staff, its resources, and its long-term goals. Whatever the structure of the firm, ill-considered succession decisions can negate the years of effort that went into building it. Successful ownership transition demands the full attention of current principals and potential ones, and it calls for some soul-searching.

Developing a Transition Plan

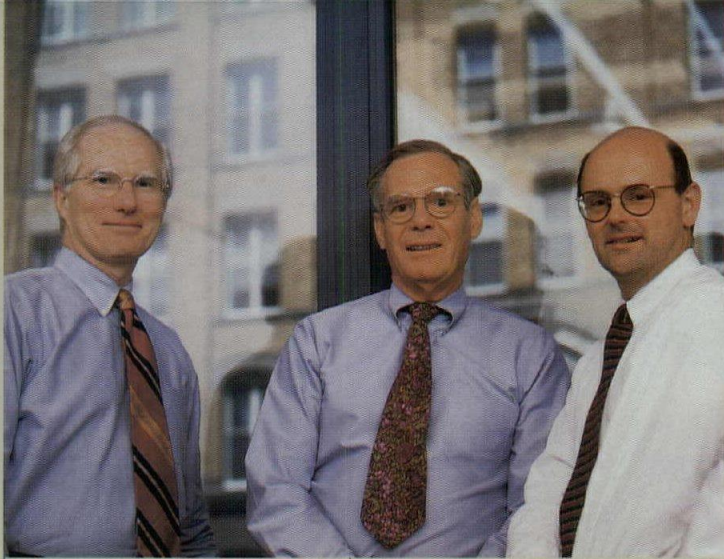
Effective transition involves sharing ownership with valuable talents and potential leaders on the staff as soon as they can be identified. Firms should begin succession planning when the current owners are in their 40s, advises Boyce Appel, an Atlanta-based management consultant. Plans must be in place early enough to allow adequate transition time for those moving into senior management positions. Unless incoming principals have the opportunity to gain adequate experience in leadership roles, they may be ill equipped to do their jobs and inspire confidence that the firm

can maintain its momentum. That's not only detrimental to the firm, it may reduce the amount that departing principals will get for their ownership shares. Worse yet, late plans are more likely to be disrupted by death or disability.

Why is transition planning so seldom started early? One reason is that current owners are reluctant to share control and accountability. And any planning for transition is difficult psychologically, says Perry King Neubauer, FAIA, of ADD Inc., in Cambridge, Massachusetts, because it signals a first step toward retirement, implying the loss of identity, authority, and income. Everything the owner has worked for over the years is about to be handed over to others while being coldly evaluated in dollars and cents.

This process is not easy, yet refusing to face it can damage the whole firm. "For your own good and for the good of the company, put your ego aside and start planning early," says Leonard Peterson, FAIA, president of O'Donnell Wicklund Pigozzi & Peterson Architects of Chicago. His firm has made identifying and training potential partners one of its guiding principles (see sidebar, page 63). Doing so makes the transition process more gradual and, therefore, smoother. Also, Peterson knew that if he and his associates didn't take the initiative in making succession plans, they might find themselves reacting to demands by key staff members instead of orchestrating the changes themselves.

There are essential financial details to every transition plan, including how payments are made to outgoing principals, the basis for valuation of shares, and the number of votes each share brings. But most of these issues can be worked out with a lawyer once the more important fundamentals of the plan are decided. Laying the foundation of a good transition plan requires studying every aspect of a firm—its clients, its staff, its modes of operation, and its goals. Lawyer and consultant Paul Lurie of Schiff, Hardin & Waite in Chicago draws an analogy to architectural design: the most important part is the programming and conceptual



PROFILE

Payette Associates in Boston

was structured to allow partners to play a major role in governing their firm. Tom Payette, FAIA, is a second-generation owner himself, having been chosen at the age of 33 to succeed Paul Nocka and Frederick Markus, who founded Markus & Nocka in 1931. (The firm became Markus Nocka Payette & Associates in 1970.) Since those early years, Payette has been committed to sharing ownership with promising staff members, as Markus and

Nocka had with him. He is critical of owners of architectural firms who wait until the next generation of leaders is in their 50s or beyond before they turn over control.

Payette's ongoing goal is to create ownership equalization, ideally with each partner having the same number of voting shares. This is a collaborative approach that guarantees a balance of power among partners—there are now 11—and also helps ensure their full commitment to the firm.

COO Bob Mattox (left) was brought in from outside to join Payette Associates chairman Tom Payette (center) and CEO Jim Collins (right).

When an employee becomes a partner, he or she may be granted one-third or one-half of full voting rights. The balance is granted over a period of a few years. But that doesn't mean that leadership is similarly dispersed. Payette Associates' officers are responsible for day-to-day operations. The firm is governed by a five-member board, while the partners are involved in making general planning and strategic decisions.

"Leadership and ownership are distinct from one another," says Payette. But, as CEO Jim Collins Jr., AIA, explains, "It was the partners—the firm's owners—who gave the leaders their authority to start with. In other words, the owners chose to have it this way. The purpose of management is to maintain a balance between running a business and keeping the quality of design high."

Last year Payette, who has

headed the 120-member firm since 1973, decided to reduce his day-to-day management responsibilities. Collins, who has been with the firm for 18 years, became president and CEO, and Payette became chairman of the board. But a search for a COO within the company was unsuccessful. With guidance from the Coxe Group, management consultants who specialize in working with architectural firms, Payette found Robert Mattox, FAIA, who joined the company as COO last year. Mattox not only has experience with architectural firms, he also ran a company that created architectural management software.

Bringing in outside talent as needed can be successful, Payette says, as long as those individuals have the same kinds of goals and ethics as the firm. But he does not advocate choosing people from outside the profession. While some firms have introduced managers from other fields, Payette feels that this can be divisive: outsiders don't necessarily understand architectural work well enough to make such a relationship prosper.

design. The firm that just wants to draw up a quick buy-sell agreement to effect a transition is something like a client who just wants a quick set of construction documents.

Much of the research and analysis involved can be done by members of the firm itself, though consultants may be useful in setting up some guidelines (see sidebar, page 64). The benefits of such self-examination, though, can extend far beyond the succession plan itself and help the firm to redirect its efforts or even reevaluate its goals.

Ownership transition planning should be entrusted to a specially appointed in-house task force. The plan will probably take months or even a year to prepare, depending on the level of commitment of those involved. But it is crucial to agree on a plan within a reasonable time. If the process drags on for years, as it has been known to do, prime candidates for ownership may get exasperated and leave. Disagreements can also develop, with the risk that some dissenters will depart. But such departures may also be to the long-term benefit of everyone concerned.

Once a plan is drawn up, it is essential to explain it fully and candidly to everyone in the firm. "Many plans fail," Lurie says, "because little effort is made to sell them."

Identifying the Next Principals

When Martin Raab, FAIA, was first offered a partnership at HLW in New York City, he was told by his seniors: "Your first job is to find your successor." Since partners usually aren't compensated for their stake in the firm until they retire from ownership and are bought out, Raab

EVALUATING THE WORTH OF THE FIRM



Crucial to the transfer of any ownership shares is placing an accurate value on the firm as a whole. As one wise old sage has said, the most important assets an architecture firm can possess can't be bought: "blue sky and goodwill."

One common measure is book value: the total value of a firm's financial assets minus its liabilities. But Peter Piven of the Coxe Group stresses that value must not be set by simple rules

or formulas but by a careful assessment that is adjusted to such factors as real estate ownership, backlog of work, market prospects, and whether people in key positions will be retained in the transition.

Internal sale of ownership shares is typically about 10 to 30 percent above book value. The added percentage is calculated based on such hard-to-define qualities as the firm's reputation, the promise of continuity, and confidence in the newly aligned leadership.

If firms are sold on the outside—to other firms, for instance—the buyers may pay up to twice the book value, assuming that the merger enhances the efficiency and revenue potential of both firms.

recognized the importance of putting a good team in place and retaining their respect. That way, the firm would be willing and able to compensate him and his associates adequately when they departed. Effort also had to be invested in making the successors function as a team, since staff members with leadership qualities are bound to be competitors from the start and to remain competitors. When he retired in 1996, Raab left behind a thriving firm.

Many lists of desirable qualities for ownership candidates have been drawn up. The distinction between owners and leaders is more than mere semantics. Not all architects with skills essential to the firm have either the ability or the desire to exercise leadership. It must be made very clear to those who are given ownership without an obligation to lead that they must support the designated leaders. They may have a voice in partner or shareholder meetings, but their support of the leaders is essential to the firm's survival and, ultimately, its succession to the next generation of leaders.

However ownership may be dispersed, it is widely agreed that an effective firm should have a single, buck-stops-here leader. "Camaraderie among partners is vital, but there has to be one individual who wants to lead and commands the respect of both clients and staff," says Tom Payette, chairman of Payette Associates in Boston (see sidebar, opposite page).

Founders should avoid hunting for successors with characteristics that match their own. First-generation leaders have an entrepreneurial spirit that is invaluable in launching the firm. These qualities may

FOUNDERS SHOULD AVOID SUCCESSORS WITH TRAITS SIMILAR TO THEIR OWN.

be hard to find among employees who choose to stay with an established firm and, more important, they may not be the most essential for perpetuating it, says Hugh Hochberg of the Coxe Group, management consultants in Seattle. Ideally, a leadership team should have a combination of first-generation enthusiasm and second-generation cautiousness.

As a way of retaining the most promising candidates for succession within the firm, Hochberg proposes singling out employees with leadership potential early in their careers. His recommendation is to announce that such individuals have been selected as principals-to-be, then to begin grooming them for the roles they will be filling 10 or more years later. The risk of error in such selections is small if they are carefully done, he contends, since traits consistent with leadership—effectiveness, talent, insight, intelligence, dedication, maturity, and modesty—evidence themselves early. Payette, who took over leadership of his firm at the age of 33, finds it ironic that principals looking for successors hesitate to elevate 35-year-olds to leadership positions, when statistics show that the average age for starting a practice is 31.

It is essential to involve valuable members in this strategy and to explain it carefully throughout the firm. It's also necessary to emphasize that these designees are not the only candidates. Grooming someone to be a principal doesn't preclude others from having a shot at the job. There is always the possibility that the principals-to-be could be lured away or leave the firm on their own. The risk of developing and then losing potential leaders must be weighed against the risk of not developing them at all.

Simply identifying next-generation leaders is not enough. They must be put in positions to develop the leadership skills they will need. Management skills in particular must be nurtured. If a potential principal is sent off to earn an MBA, he or she must be allowed to put this knowledge to the test in the firm, or the value of the degree will be lost. Ideally,



O'Donnell Wicklund Pigozzi & Peterson Architects, a 255-person architecture/engineering firm in Chicago, began searching for new officers 10 years ago. The process gave the original owners a chance to do some soul-searching, examining and redefining the long-term goals of the company and its leadership principles.

Founded in 1958, OWP&P began planning for change in 1988, when Len Wicklund, FAIA, the firm's CFO at the time, and Larry O'Donnell, FAIA, announced their retirement plans. But it wasn't until February 1995, after months of research and intensive meetings, that an in-house task force produced a set of transition guidelines.

The guidelines spell out the steps to a smooth transition, as well as stating that the most important quality the firm's leadership can possess is high ethical standards. The leaders must assume responsibility for the firm's successes and limitations, trust fellow principals, and show a willingness to take personal risks for the good of the firm. While marketing is essential to the firm, bringing in work is not a prerequisite for becoming a principal, says Leonard Peterson, FAIA. The guidelines are specific about the retirement process. Partners can cut back incrementally, but salaries and bonuses are reduced proportionately. Retirement from the board of directors by the age of 65 is mandatory, and board members must give at least three years' notice. They are expected to sell their ownership shares over that three-year period, although this can be extended to 10 years so the

number of shares for sale is balanced with the number of buyers. Principals identify candidates for each key leadership position and mentor them for their future roles. When Wicklund confirmed that he would retire at the age of 65, the firm provided financial assistance to partner Gary Wendt, AIA, so he could get his MBA and would be ready to become CFO.

New principals must "write a check" for their ownership shares. Associate principals generally hold 1 to 3 percent ownership shares, principals hold 3 to 5 percent, and senior principals hold up to 10 percent. Bonus compensation can be put toward the purchase of shares, and the firm will help to arrange loans. Such a pay-as-you-acquire policy demands adequate compensation, but it also provides performance incentives.

Since OWP&P has a federally recognized employee stock ownership plan, the value of the firm must be recalculated annually by an outside accountant (calculating the value in-house invites conflict).

Although principals who are in the process of selling their shares now account for 60 percent of the firm's ownership, long-term decisions—like a recent move from the Chicago suburbs into the Loop—are left to those they will affect the most, the younger principals.

Principals Angie Lee (left) and John Seivertson (right) and senior partner and CFO Gary Wendt (center) are among OWP&P's new leaders.



WHEN TO HIRE A CONSULTANT



What is the function of a consultant in a transition plan? As Paul Lurie explains, any lawyer can handle the technical business. The valuable expertise a consultant can bring is in dealing with the process and the human issues. In earlier days, there were many consultants who simply offered a cookie-cutter solution. A partner of a major firm once received a recommendation from a consultant on which the name of another firm appeared.

Now it is widely understood that the consultant must learn the culture of the firm. This does not necessarily imply that the firm must invest in an expensive consultant's study; to a large extent, Boyce Appel points out, the firm can do the research, with the consultant acting as a facilitator.

Consultants come from backgrounds like law, as Lurie does, or accounting or business management. "The trouble with some of the best-known consultants is that they are strongly bottom-line oriented," says Peter Piven, an architect as well as a consultant. "They try to convert architects to this profit orientation, which is contradictory to the culture and inclinations of most architects."

special opportunities should be created for potential successors to hone and test their leadership skills. One excellent way is for next-generation candidates to head branch offices where they will face the kinds of challenges they will be exposed to as leaders, but on a smaller scale.

If members of the owners' families are in line for succession, the picture changes in significant ways. David Martin and his cousin Chris Martin, of A. C. Martin Partners in Los Angeles, represent the third generation of family ownership of their firm. In some ways, David Martin says, the issue of succession is easier in a family setup. There is no question as to who will lead the firm next. But there are family dynamics to contend with—a parent who doesn't want to retire, spouses who may want to get involved, family members who feel left out, incompetent relatives who cannot be gracefully dismissed.

Family-owned firms also run the risk of alienating anyone outside the family who has management ambitions. The Martins have responded to the lack of ownership opportunities for those outside the family by providing a generous profit-sharing program. And though both David and Chris have children who show promise as fourth-generation owners, they are not ruling out the possibility of broader ownership in the future.

When the Boss Won't Let Go

At Firm X, there is an employee of tremendous skill. He knows the firm's background and he has extensive contacts. But he takes exception to management or design decisions and lets everyone within earshot know it. He's a threat to efficiency and morale. He is, in fact, one of the firm's former principals who has retired from ownership with the agreement that he can continue to work part-time.

Almost everyone interviewed for this article advocated continued employment, on a full- or part-time basis, for former owners. But most of them cautioned that keeping former principals on staff requires

sensitive orchestration. People who have been at the top of the firm are so accustomed to a certain level of power and respect that becoming a mere member of the team can be traumatic. They may try arguments that used to be persuasive, and they may be shattered if they're overruled.

If retired owners are to work on staff, certain rules should be observed. Make sure the retired owner is comfortable with his or her buyout money and, conversely, that current principals don't resent the cost to them. Be sure that the firm's current structure gives one person—a president and/or CEO—the final word on all decisions, to defuse divide-and-conquer tactics. Make it clear to previous owners working in the firm that criticism of the firm's current management should be taken up with the boss, not aired with others.

Of course, there are owners who welcome the chance to retire, in some cases before they are 65. Sometimes they are wary of getting involved in the firm's liability suits, which could (depending on the firm's structure and on state laws) threaten their own resources. More commonly, such suits threaten the firm's reputation, making the owners' stock in it less valuable. And while the economy is good right now, it is also volatile. Some owners would rather bow out now, before another recession undermines the value of shares.

Who Pays?

Money for retirement may not ultimately be the most important concern in firm succession, but it is one that always presents a fundamental conflict. Principals giving up their ownership always want to be adequately compensated for it, while those buying in don't want to be unduly burdened. Professionals who may have had a mentoring relationship before are forced to become adversaries, assuming the uncomfortable roles of seller and buyer.

Some type of payment plan that compensates the departing owners without placing painful burdens on new principals must be devised. The most financially successful transitions are those in which the owners see their holdings not as assets they can cash in when they retire, but as an opportunity to have a say in directing the firm for all those years before retirement.

But ownership transition is the major way most departing principals fund their retirement. It is easy to see retirement as the reason a succession plan is needed, Lurie says, because senior partners who initiate the process are probably seeking an exit strategy. The attitude of the outgoing principals is crucial here. If there's greediness on any side, things can get bitter.

There are two common ways for incoming principals to buy out present owners: tapping their personal resources (second mortgages, loans, or other cash), or paying in installments that come from bonuses or profit-sharing. Much less frequent, but recommended by some, are two alternatives: present partners simply donate shares to younger members of the firm, or they establish a retirement fund, so that the firm as a whole contributes to the buyout, reducing the burden of the principals acquiring ownership.

The strict pay-for-your-own-shares policy works best if compensation for the incoming principals is generous. Paying out of bonuses usually means increasing the size of bonuses for those buying in. In one common scenario, all partners receive equal shares of the profit, but the junior ones pay back part, installments toward their ownership stake.

A retirement fund was established by one successful (hence valuable) firm when they realized that the buyout of the three founders, all of whom would retire about the same time, could not be comfortably achieved by conventional means. Money paid into the fund in monthly

Turnbull Griffin & Haesloop's transition would have been hard even under the best of circumstances. Matters were made worse when William Turnbull Jr., FAIA, died suddenly last year at the age of 62. His wife, Mary Griffin, AIA, who was president and CEO of San Francisco-based William Turnbull Associates, became the sole shareholder. That meant she suddenly had full responsibility for the firm's succession plan. Fortunately, enough thinking had been done that succession proceeded as smoothly as could be expected.

These were "tough emotional circumstances," says Lou Marines, president of the Advanced Management Institute for Architecture and Engineering, an educational and management consulting firm in San Francisco. While Turnbull had suffered a chronic illness, his death came unexpectedly. "We had done some prior planning in light of [Turnbull's] poor health, but we carried on with the great hope that this was going to be a conventional succession," Marines says. "There was an established framework, but the specifics were not in place."

Eric Haesloop, AIA, joined the firm about the same time as Griffin, almost 13 years ago. Griffin became a controlling shareholder in 1994 and was selected president and CEO in 1996. But all three principals shared leadership responsibilities, with each taking one third of the firm's business, which includes institutional and residential work. Within a few weeks of Turnbull's death, the firm changed its name to Turnbull Griffin & Haesloop—a move that had been planned before last summer—and Haesloop began the long process of buying ownership shares, paying for them out of his bonuses.

Some type of ownership role is important to establishing Haesloop's position with the firm and is a logical career move for him. "It is a reflection of how we had been working before Turnbull's death. Becoming an owner is part of a natural succession," Haesloop says.

The partners face a challenge similar to that confronted by their mentor in 1970, when Turnbull became sole owner of MLTW. Griffin and Haesloop must prove themselves without their partner. It's a scenario played out whenever a



Eric Haesloop and Mary Griffin, CEO and president of Turnbull Griffin & Haesloop, continue the traditions established by William Turnbull.

leadership transition occurs. Since Turnbull was active until just before his death, most of the work in progress bears his imprint. Reassuring clients that they will receive the same level of design service has been a top priority.

Two associates, Andrew Mann and Susi Marzuola, have served as a secondary level of leadership, helping to keep work moving steadily while Haesloop and Griffin were forced to meet with lawyers, accountants, and consultants. "Just as these kinds of things bring a

family closer together, we've found everyone here has contributed a lot and helped work through this," Haesloop says.

With both partners in their mid-40s, now is the time to look ahead to the next succession, even as Haesloop and Griffin continue to decide what kind of firm Turnbull Griffin & Haesloop will become.

installments has spread the burden over all aspects of the firm's operation. In recent years, the cost has hardly been felt, and the fund is growing nicely.

When a large majority of ownership has to be bought out, and the financial burden on incoming owners is daunting, it is tempting to expand the pie by pursuing strategies intended to expand revenues and

an annual valuation of the firm by an outside expert, which provides a useful index of its value.

Whatever type of plan is adopted, it is essential to involve key staff as planning proceeds. Firm members earmarked for ownership may find it difficult to buy their shares, whether by borrowing or paying for

MOST ARCHITECTS WANT THE ORGANIZATIONS THEY HAVE NURTURED TO GO ON LONG AFTER THEY'VE DEPARTED.

make the buyout painless. The problem with such an approach, of course, is that business conditions and competitive forces can thwart even a well-considered expansion strategy. *The Complete Guide to Ownership Transition* (PSMJ Resources, 1996) is very blunt on this point: base buyout plans on actual revenues, not on the assumption that they may increase.

The easiest solution is to stretch payments out over a period of years. Or the firm may pursue more imaginative strategies, such as establishing a retirement fund or an employee stock ownership plan (ESOP). These profit-sharing plans invest in the stock of the employer rather than a diversified portfolio. ESOPs are recommended as a way to fund buyouts when large amounts of ownership have to be bought from retiring partners within a short period. Though few architecture firms have adopted ESOPs, they can be advantageous because the funds are also available for such purposes as purchasing equipment. Special tax provisions for ESOPs magnify these advantages. And with an ESOP comes the requirement for

them out of future income, so it is essential to involve them in the planning process, not just offer them a take-it-or-leave-it deal.

The Price of Perpetuity

How much effort should be invested in the firm's survival? Some star-designer firms seem to have no reason to exist without the stars, but most architects want the organizations they have nurtured to go on representing their intentions long after they have departed. A combination of personal ego, professional responsibility, and camaraderie with associates is involved. However long a firm survives, it will never stay the same. It will constantly evolve, quite possibly becoming an organization hardly recognizable to its founders. The cost of survival is often the transformation of a firm into an organization less daring and more businesslike. But while the surviving firms are more likely to become businesslike, the more businesslike firms are the most likely to survive. ■

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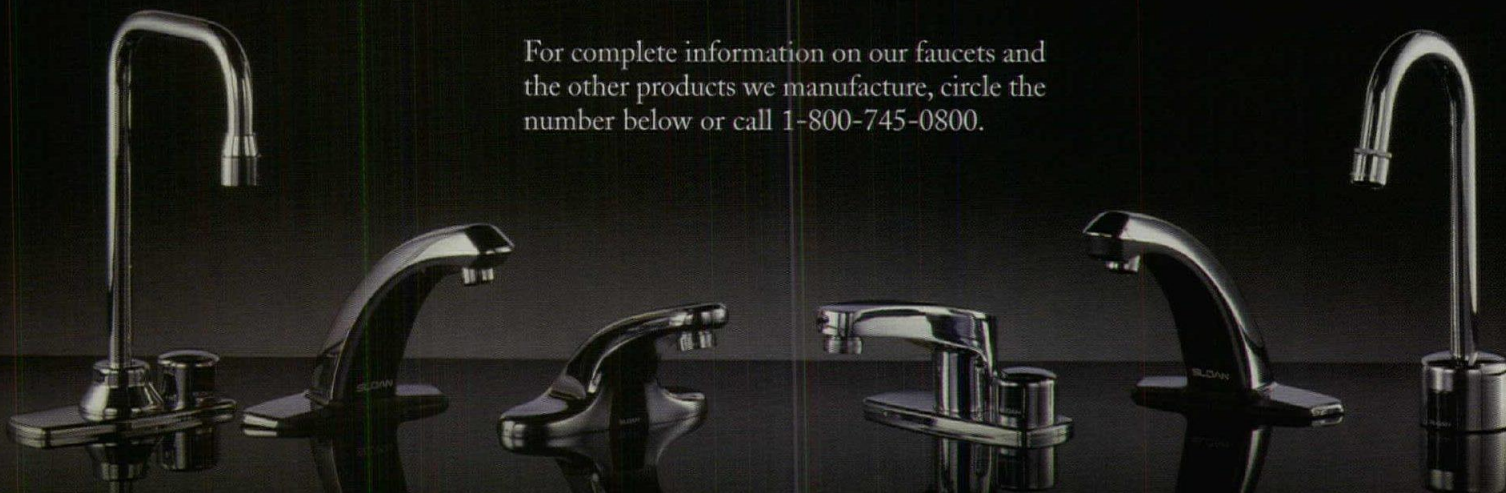
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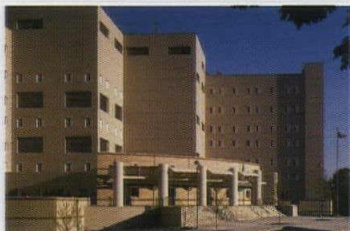
James S. Russell, AIA



1

Kitchener, Ontario

The Canadian approach to corrections is highlighted in this facility where women detainees are prepared for reintegration with the rest of society.



2

SeaTac, Washington

Most federal prisons house offenders serving terms of 18 months or more, but this 10-story facility serves a range of more transient populations.



3

Charlotte, North Carolina

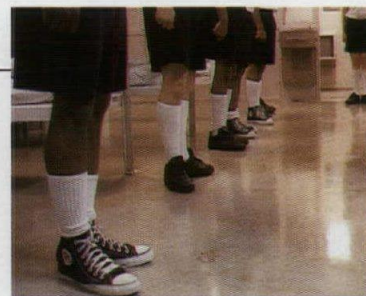
Designed with a civic presence for a downtown setting, this 1,000-bed county jail also provides outdoor recreational spaces for each housing pod.



4

Brooklyn, New York

Alleged offenders at this 124-bed city facility range in age from seven to 15. The goal is to use their time here as an opportunity for positive intervention.



Politicians may be calling for more prisons that punish offenders at the lowest cost, but architects and facilities operators understand the need to tailor the approach to the population. The four projects featured in this Building Types Study address the needs of different kinds of detainees, from women with children to children themselves. The essay below considers the dilemmas of corrections design at its most vexatious: the world of juvenile offenders.

The Epidemic of Youth Violence," screams one headline. "Crime Time Bomb" cries another. "In a Dark Alley, Most Feared Face Is a Teen's" declares *USA Today*. Moral relativism and glamorization of violence, say pundits, have bred a new generation of teen "superpredators," a phenomenon whose lurid potential is gleefully seized on by sensation-hungry media. Out of this attention to juvenile crime has come legislative action mandating more jail-like facilities for juveniles, a reduction in rehabilitative programs, and the transfer of juvenile offenders to the adult courts and corrections systems.

Most people involved in juvenile justice believe that a significant percentage of youth offenders are capable of rehabilitation. Most designers see their chief role as making environments that encourage better behavior. Yet the political momentum toward harder facilities and more severe punishment is at odds with this consensus.

A bill now in Congress would relax federal restrictions on jailing juveniles with adult felons, and make some federal aid available only to states that prosecute violent juveniles age 15 or older as adults. It has yet to pass, but similar efforts have succeeded in the states. For architects, the dilemma is: should they design better kid warehouses, get out of the business, or help change the political climate? There are no easy answers.

Fear drives policy

John J. DiIulio Jr., the Princeton professor of politics and public affairs who coined the term "superpredator," calls those who think youth violence can only be averted by the threat of long, hard prison terms "dangerously deluded." Frightening trends, many of them highlighted by DiIulio himself, fuel the fear that youths are more violent and less capable of rehabilitation. Over the last 10 years the rate of juvenile arrests has

WHAT YOU MUST CONSIDER WHEN DESIGNING A JUVENILE FACILITY

Many clients say they want to do more with the design of juvenile detention facilities. Architects can help by creating facilities that reconcile staffing, programs, and other needs. What follows are some key design issues that architects must address.

Siting: The detention facility must be secure and project a sober institutional face to the community, yet it must not overtly advertise its function. High chain-link fences topped by razor wire are usually not acceptable in established communities and may fly in the face of regulations or corrections methodology. Many jurisdictions choose to site facilities in remote rural areas to lower costs and avoid neighborhood conflicts. These locations make family visits onerous (an important concern, especially for younger offenders), entail high inmate-transportation costs, and may offer a too-limited pool of talented specialized staff.

Hard or soft: In spite of the trend toward harder facilities, Essex County's Joseph Clark says, "You've got to make sure it is possible to

have appropriate programs." Harder facilities are generally more expensive to build and operate, and not all facilities need to be heavily secured. "I would like the flexibility to house different behaviors," says Robert Murray, director of a Hudson County, New Jersey, jail. "Not all kids need two-inch-thick doors and very heavy furniture." In every facility, however, security comes first, not just to keep inmates in, but also to protect staff. Walls, doors, and gates control undesired movement but can impede the visual surveillance and communication needed to supervise and manage the facility. Excessively inconvenient security features may prompt staff to circumvent them, creating unintended problems. Higher levels of programs and higher security generally mean higher staffing. A facility will simply fail—become prone to violence and escapes—if necessary staffing levels are not funded.

Housing type: Most new facilities have moved to a "direct supervision" model, in which staff mingle with detainees within the housing unit and elsewhere. (Prisoners are

observed from outside the secured unit in the "indirect" model, used in many adult prisons.) Though it would seem risky to expose guards directly to residents, supervisors placed in the housing units know better what is going on with inmates, can reach out to them, and can address problems before they get out of control. Total beds in a juvenile detention center are likely to be far fewer than in adult facilities. While as many as 40 adults may reside in a single unit, juvenile housing units usually have no more than 12 residents. Adult facilities often have little daylight and few design flourishes, but juvenile facilities may have residential-style amenities such as carpeting, sunlight, and a range of recreational offerings. "You are not going to lock up most of these kids for a long time," says architect Michael McMillen, "so you want a good response from them. You want to co-opt them, rewarding good behavior."

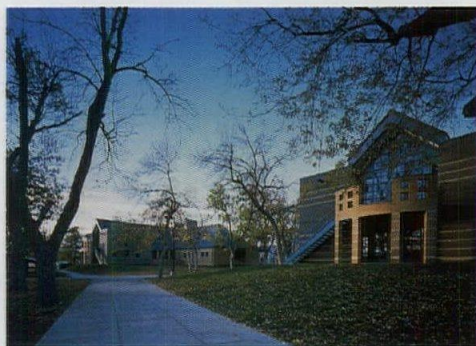
Programs: Most in-facility programs need to address small groups, for security reasons and to assist residents who often have major deficits in school and social skills. Regular programs may include mentoring, school (even a Graduate Equiva-

lency Degree), drug treatment, psychotherapy, and religious services. "Our program may be the first time these kids have ever received individual attention," says Joseph Panepinto, principal of the Hudson County facility's school. The location of programs within facilities is key to security and operational efficiency. Centralized locations for education, dining, and other programs may offer efficiencies of scale but may also entail time-consuming and costly inmate movements. Many juvenile detention facilities house some programs in the housing units (or share them among two or more units), but this arrangement may stretch staff too thin or cost too much for duplicated spaces.

Durability: Building products and finishes suited to residential occupancies were acceptable in the days of less-confining facilities. Today operators seek a residential appearance, but also a level of durability that reflects lower maintenance budgets, as well as a population that is typically more aggressive and more suicide-prone. (With time on their hands, inmates can turn a sprinkler head, a light fixture, or any kind of hardware into a weapon.) J.S.R.

risen, and the arrests are for more violent crimes. All arrests for murder and negligent manslaughter, for example, increased about 23 percent between 1985 and 1994, but the number of juveniles arrested for the same crimes went up by 150 percent, according to FBI figures. The percent of homicides committed by juveniles also increased rapidly in the '80s and early '90s, though it still represents only 10 percent of all murders. But from 1994 to 1996, the juvenile arrest rate declined by 12 percent. The recent declines have been variously attributed to crime-prevention efforts, a reduction in the availability of handguns, and the waning of the crack-cocaine epidemic. Complacency about juvenile crime, though, is risky,

Lookout Mountain in Golden, Colorado (Anderson Mason Dale and RNL Design, 1988), represents a model that is falling out of favor. Its residential character is meant to encourage good behavior among inmates.



warns DiIulio. The number of teenagers will grow rapidly in the next few years, presumably pushing youth crime up as well.

Though only about 5 percent of all juvenile arrests are for violent crimes, it is this "small percentage of youth that is driving public policy," says Karen L. Chinn, of Chinn Planning, a consultant based in Columbia, South Carolina. Many state and local governments are building "harder" new facilities that are more secure and institutional in design, or requiring the transfer of juvenile offenders to adult courts (and thus prisons).

The great majority of juvenile arrests (2.7 million in 1994) are related to drugs or vandalism, or are "status offenses" such as truancy or running away from home. Chinn says drug treatment, education, and vocational training programs have high success rates for these offenders, but are often sacrificed in today's overheated political environment.

Locking kids up instead of finding other solutions

About 674,000 kids passed through juvenile facilities in 1993, but only about 60,000 were actually held. That number is growing rapidly, however, as is the number of beds. This is less because of a growth in convictions per se than because juveniles are now incarcerated for crimes that in the past would have resulted in probation or other punishment.

F. Jerald Adamek of the Colorado Division of Youth Corrections described the events that spurred \$30 million worth of spending in his

The Hudson County (New Jersey) Detention Center offers some of the amenities of the less harsh "normative" model in a higher-security, more discipline-oriented facility. Design architect Ricci Associates worked with Dean Marchetto Associates.



system. Several terrifyingly violent crimes committed by teenagers in Colorado in 1992 became, in the media, a "summer of violence." After that, the system started adding beds, but demand surged ever higher: "Detentions went from an average of seven days to 18 days," recounted Adamek at a conference last spring sponsored by the AIA Architecture for Justice professional interest area. "Policy changes and mandatory sentences moved incarceration times from an average of two years to approaching five years. What were once misdemeanors became felonies," he says. As a result, a 600-bed system in 1991 will become a 2,200-bed system by 2004.

Juvenile facilities, because of their staffing needs and the intensity of their programs, are significantly more expensive to build and operate than adult facilities, which have, over the years, cut back on many rehabilitative programs. The average cost per bed to construct a juvenile

model. "This is a secured, locked-down jail," he says, and the brooding red-brick exterior of this one-year-old facility, with its chunky massing and slitlike windows surrounded by a high, barbed-wire-encrusted fence, leaves no doubt. He thinks cities like his need more youth jails. (Clark, once a high-school principal, was immortalized as a baseball-bat-wielding protector of youth in the movie *Lean on Me*. He took over the Essex County juvenile justice program four years ago.)

Given a population that comes largely from what Clark calls environments of "hopelessness and despair" that "lure young people into lives of criminality," he disparages the usefulness of the behavior-modification model. The design of the housing units at the Essex County facility reflects this perspective. On each of three floors, four 16-room units fan out around a glass-enclosed central control room. Furniture is

ONLY ABOUT 5 PERCENT OF JUVENILE ARRESTS ARE FOR VIOLENT CRIMES, BUT IT IS THIS SMALL GROUP THAT IS DRIVING PUBLIC POLICY.

detention center is \$100,000 to \$150,000, says Chinn. Operating costs are equally daunting at \$150 to \$200 per day. (The upper range is more than double what it costs to house a typical adult prisoner.)

Changing roles for the justice system

Juvenile facilities design is changing because the perception of what the justice system is supposed to accomplish is changing. From the 1970s to the late 1980s, a "normative" model prevailed, emphasizing behavior modification in noninstitutional settings that had a minimum of the visible apparatus of security or confinement. Projects built according to these tenets respected privacy and individuality through varying architectural finishes, movable furniture, generous use of daylight, and a great deal of interaction with staff, who could encourage residents while controlling them.

This model, though successful in some jurisdictions—such as Colorado's Lookout Mountain facility, designed by Anderson Mason Dale and RNL Design and completed in 1988—has been overwhelmed by political reality. The growth in offenders, the lengthening of sentences, and the reduction in judicial discretion over the past few years have made this model a luxury fewer jurisdictions can afford.

Joseph Louis Clark, who directs a new juvenile detention facility in Essex County, New Jersey, that serves Newark, which is among America's poorest and most crime-ridden cities, has returned to the "custodial"

fixed; floors are vinyl tile; lights are fluorescent. The rooms have toilets and sinks of standard prison type. But Clark has also developed a 300-person mentoring program and involves 35 churches to encourage a grounding of character through spirituality.

Clark's approach resembles the military model promoted by advocates of "boot camps" in which inmates are subjected to military-style discipline, sometimes humiliating, sometimes physical. These programs and lock-down-type facilities have been politically popular with a public fearful of parole and halfway houses. But can such approaches be credited with recent drops in the crime rate? This question elicited a room-wide groan at last spring's juvenile justice conference. "No data support this," says James R. Bell, staff (continued on page 151)



Get-tough politicians argue for higher-security jails for juveniles, such as this recently completed facility for Essex County, New Jersey.

1 Grand Valley Institution for Women Kitchener, Ontario

MODELED ON THE IDEA OF A VILLAGE, THIS WOMEN'S PRISON PROVIDES VARYING LEVELS OF SECURITY IN A NONINSTITUTIONAL SETTING.

by Beth Kapusta

Project: Grand Valley Institution for Women, Kitchener, Ontario

Client: Public Works Canada, Correctional Service

Architect: Kuwabara Payne McKenna Blumberg Architects—Marianne McKenna, partner-in-charge; Bruce Kuwabara, Robert Sims, project architects; John Allen, site architect; Howard Sutcliffe, David Pontarini, project team

Engineers: Read Jones Christoffersen (structural); Crossey Engineering (mechanical/electrical)

Landscape Architect: Milus Bollenberghe Topps & Watchorn

General Contractor: G. W. Harkness Contracting

Size: 74,730 square feet for main building, 1,800 square feet for each of 10 houses

Number of beds: 80

Construction cost: \$9.4 million

Both critics and supporters of the Grand Valley Institution for Women agree on one point: it feels more like a community center than a jail. This relatively casual atmosphere is the result of two decades of studies by the Canadian government, which revealed what many corrections workers knew intuitively: the old methods of incarceration weren't working, especially for women.

Before Grand Valley was built, all federally sentenced women with terms of two years or more were sent to a central maximum-security facility in Kingston, Ontario, a complex too inflexible to accommodate inmates with lesser security needs. Geographic dislocation was a particular hardship for the 40 percent of incarcerated women caring for children, and reintegration into society often proved very difficult.

A 1990 government report entitled "Creating Choices" led to something of a minor revolution in thinking about prisons and to a radical shift in the architecture of women's prisons. Grand Valley, designed by Kuwabara Payne McKenna Blumberg Architects, is one of five regional centers built to replace Kingston's centralized facility. The new prison is just outside Kitchener, a small southern Ontario

Beth Kapusta writes about architecture and teaches at the University of Toronto School of Architecture.

city selected for its strong local industry and numerous community colleges, which facilitate outreach and work programs that act as transitional steps back to society.

Loosely modeled on the layout of a village, the institution comprises 10 "houses" surrounding a green, with all of the shared and administrative services located in a long wing to the east. Even here, the institutional character is played down by the articulation of the various programmatic elements—administration, visitation, casework, gymnasium, education, and health care—into separate volumes joined by a loggia facing the common. Rather than radiating from a central surveillance tower, Grand Valley has

at its core a cylindrical structure that serves as a nondenominational chapel.

While the prison's perimeter wall is solid, almost monolithic, to reinforce the notion of security, its highly transparent inner skin gives the complex an architectural quality. Light-filled corridors stepping down to match the sloped grounds create an attractive common realm. Subdued colors, natural maple millwork, and indirect lighting reinforce the noninstitutional character. Particularly successful are the entrance sequence and the visiting area, a lofty pavilion supported by tall, exposed steel columns with branch-like capitals.

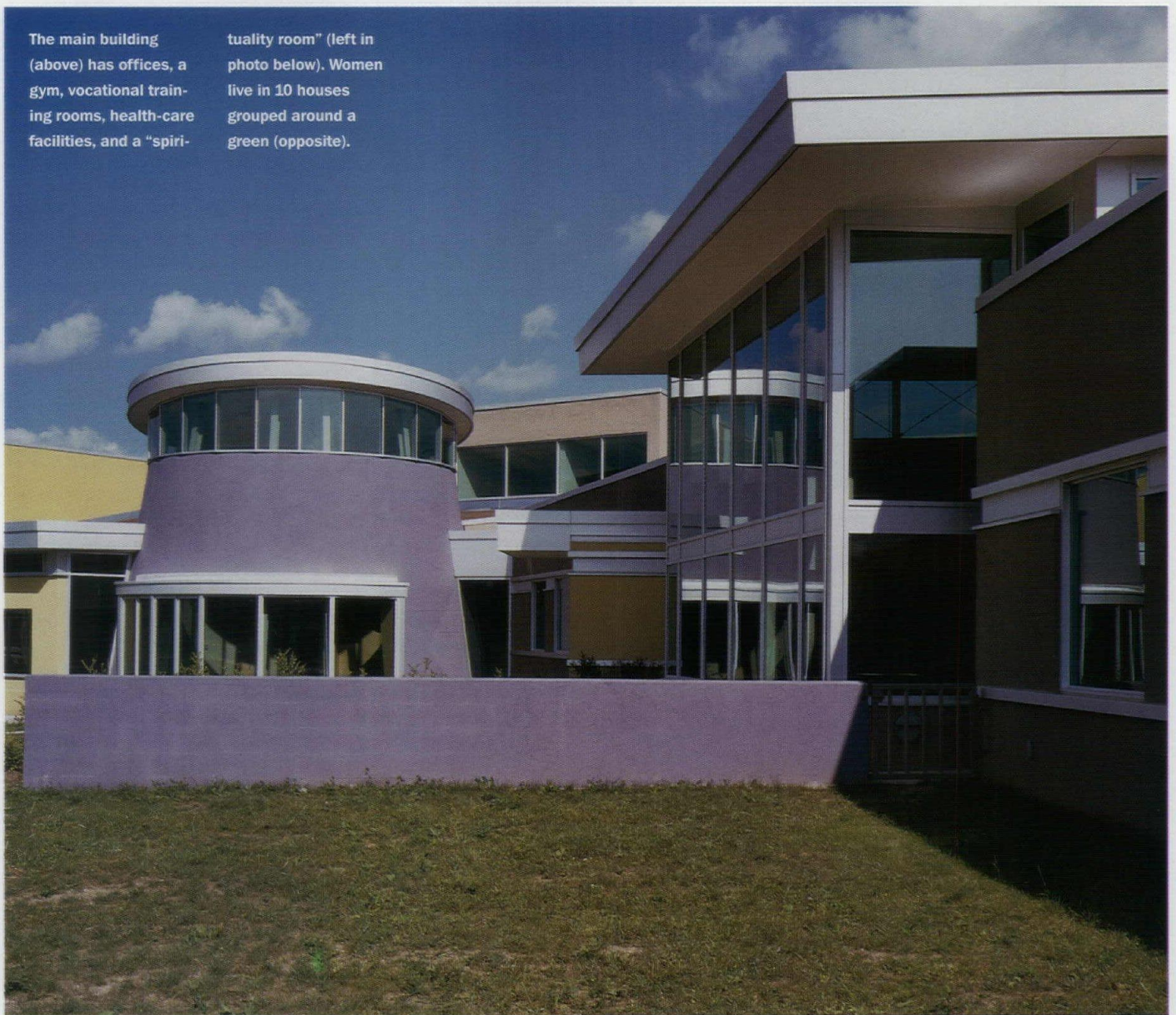
To encourage self-sufficiency

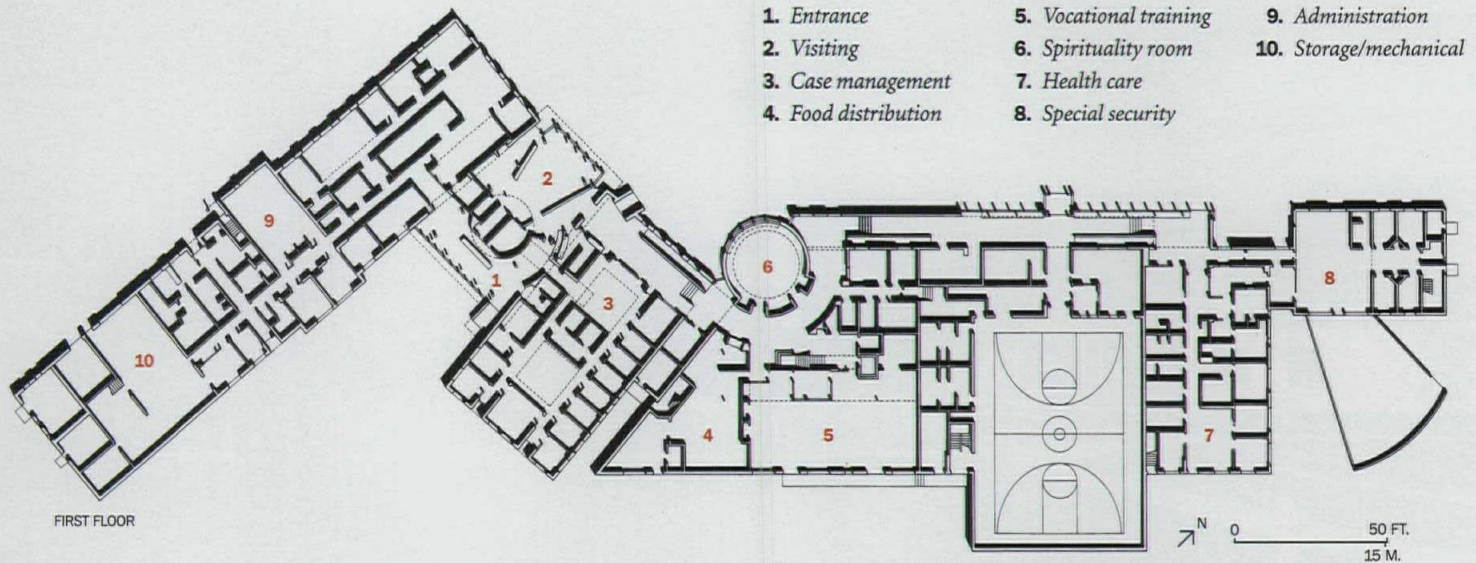




The main building (above) has offices, a gym, vocational training rooms, health-care facilities, and a "spiri-

tuality room" (left in photo below). Women live in 10 houses grouped around a green (opposite).





- 1. Entrance
- 2. Visiting
- 3. Case management
- 4. Food distribution
- 5. Vocational training
- 6. Spirituality room
- 7. Health care
- 8. Special security
- 9. Administration
- 10. Storage/mechanical

FIRST FLOOR



and make their eventual transition back into society smoother, the women live in houses, each of which accommodates a maximum of eight people.

The sloped-roof cottages offer a progression of spaces from the most public (porch, living, dining, kitchen) to more private areas (laundry, study, bathroom) and finally to the most private (four bedrooms on two levels). Instead of one large cafeteria, each house at Grand Valley is responsible for ordering and cooking its own food. The well-maintained gardens in front of the houses reflect a palpable pride of place, an indication that the inmates appreciate the responsibilities offered them.

Though all 10 houses appear similar, they accommodate varying levels of security; the maximum-security house, for example, has an enclosed walking yard. Another house is for women who have children.

According to George Centen, acting director of facility planning and standards for Correctional Services Canada, the cost per unit for this type of prison is one-third to one-half that of traditional penitentiary construction. Maintenance costs are also greatly reduced, as the sense of ownership and responsibility instilled by this model results in less vandalism and damage. And the simple wood-frame construction

is much easier to alter than traditional concrete prisons. Although it is too early to document the effect of the new prison model on recidivism rates, anecdotal evidence from both inmates and staff indicates that the more humane environment has a calming effect. "The public is best served if we can assist in making better people when they return to society," observed Centen.

Some of the initial idealism, though, has been tempered since the start of the project. The notion of replacing fences with electronic security devices, for instance, was abandoned in the face of public fears that prisoners were insufficiently confined. Barbed wire was also added at the front to reinforce the appearance of security, even though the building's public face acts as a secure perimeter.

Yet the humanist aspirations of this project remain powerful. Like the facility's staff, Marianne McKenna, the partner-in-charge, is committed to the idea that good design can help create a prison that rehabilitates, not just incarcerates. ■

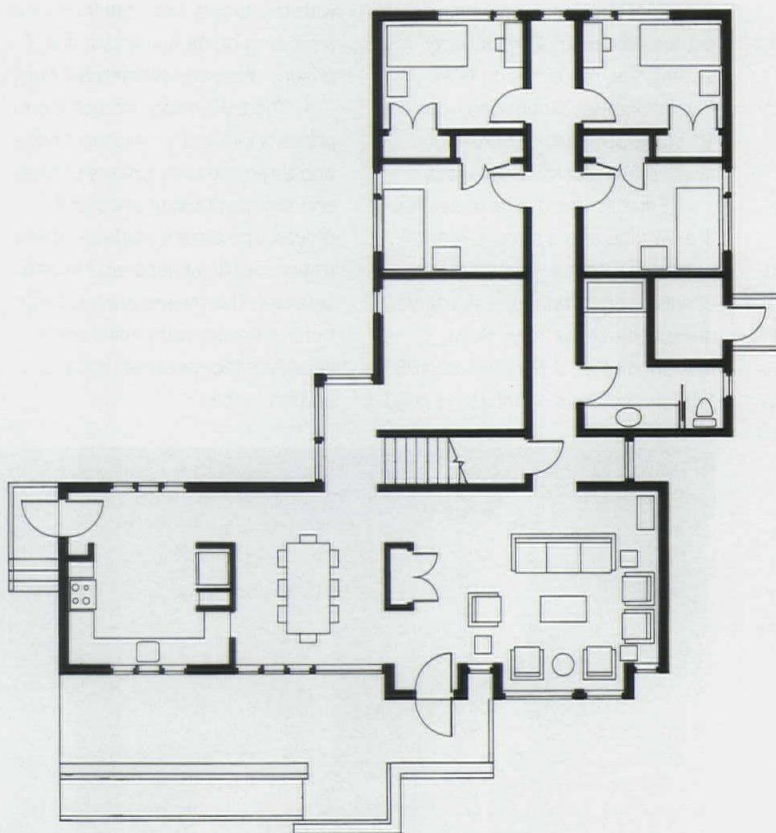
To help inmates prepare for their return to society, the prison has spaces for education (right) and casual interaction (above).



Sources

- Steel frame:** Nu-Arch Steel
- Aluminum curtain wall:** Sherwood Industries
- EIFS:** Durock
- Rigid roof insulation:** Dow Chemical
- Security hardware:** Von Duprin, Rutherford, Locknetics

Each of the 10 houses accommodates eight inmates. Women take responsibility for everyday chores such as doing their laundry and ordering and cooking food. Front porches reinforce the residential feeling of the facility (right).



RESIDENTIAL COTTAGE FIRST FLOOR



SECOND FLOOR

0 10 FT.
3 M.

2 Federal Detention Center SeaTac, Washington

NBBJ WRESTLES WITH THE CHALLENGE OF DESIGNING A HIGH-RISE FEDERAL PRISON IN A MAJOR METROPOLITAN AREA.

by **Barbara A. Nadel, AIA**

Project: Federal Detention Center, SeaTac, Washington

Client: Federal Bureau of Prisons

Architect: NBBJ—James Jonassen, FAIA, partner-in-charge; Richard Dallam, AIA, design principal; Steve McConnell, AIA, senior project designer; Leigh Sutphin, project manager; Gary Edmonds, technical designer; Niranjan Benegal, project planner; Bruce Bonine, AIA, medical planner; John Adkins, AIA, Steve Bettge, John Christiansen, Tessie Dantes-Era, Budy Djunaedi, Bob Dooley, Becca Dudley, Ken Eckert, Laurance Glasser, Kristine Gormley, Jay Halleran, Gretchen Harriott, Connie Halloway, Ralph Jorgenson, AIA, Dave Leptich, AIA, Bing Lin, John Palewicz, Mike Rogers, Derek Ryan, Andrew Smith, Daniel Smith, Ed Storer, Rysia Suchecka, Vince Vergel De Dios, Karen Wiram, designers

Engineers: Andersen Bjornstad Kane Jacobs (structural); Anne Symonds Associates (civil); CBGKL (mechanical/electrical)

Construction Manager: Heery International

General Contractor: M. A. Mortenson

Size: 355,000 square feet

Number of beds: 1,013

Construction cost: \$63 million

From Seattle to New York City, new detention facilities are emerging on the urban landscape, one product of legislative and popular mandates for longer sentences for criminals. The limited availability of sites and the need to be close to courts, transportation, workers, and inmates' families often mean that metropolitan facilities must be located in established neighborhoods.

While communities often resist attempts to locate prisons in their backyards, the jobs, contracts, and tax revenues generated by these projects can be attractive. And architecture can play a key role in making prisons good neighbors. Balancing costs, the needs of security, and community concerns remains a major challenge for architects and their clients.

The Federal Bureau of Prisons (BOP) operates 93 institutions housing over 108,000 inmates. While most prisons house inmates sentenced to 18 months or more, the Federal Detention Center at SeaTac International Airport serves a more transient population: those awaiting trial at the Tacoma or Seattle federal courthouses; convicted criminals awaiting transfer to other federal prisons; illegal aliens awaiting deportation; and a work cadre of

short-term minimum-security inmates performing maintenance chores. The facility is also the western hub for the U.S. Marshals air transportation service ("Con Air"), which moves up to 120 detainees each week.

The detention center is located on a 6.86-acre site on a hillside adjacent to SeaTac Airport, amid industrial buildings and single-family homes. Because of the steeply sloping site, motorists on busy Pacific Highway South can't see the 10-story, 355,000-square-foot tower a few blocks to the west.

Establishing a civic image for the building and a secure, federal presence within a neighborhood context were among the primary design objectives, says Steve McConnell, AIA, a principal at NBBJ. "The project team wanted the build-

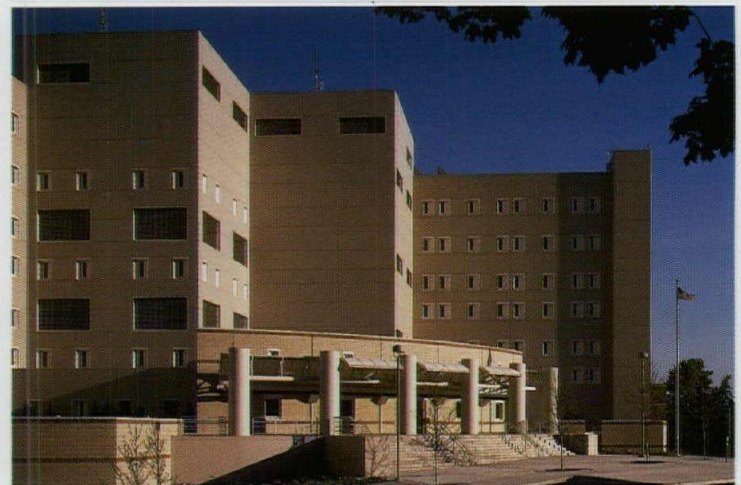
ing's scale, form, materials, and detailing to articulate durability and the prudent use of public funds."

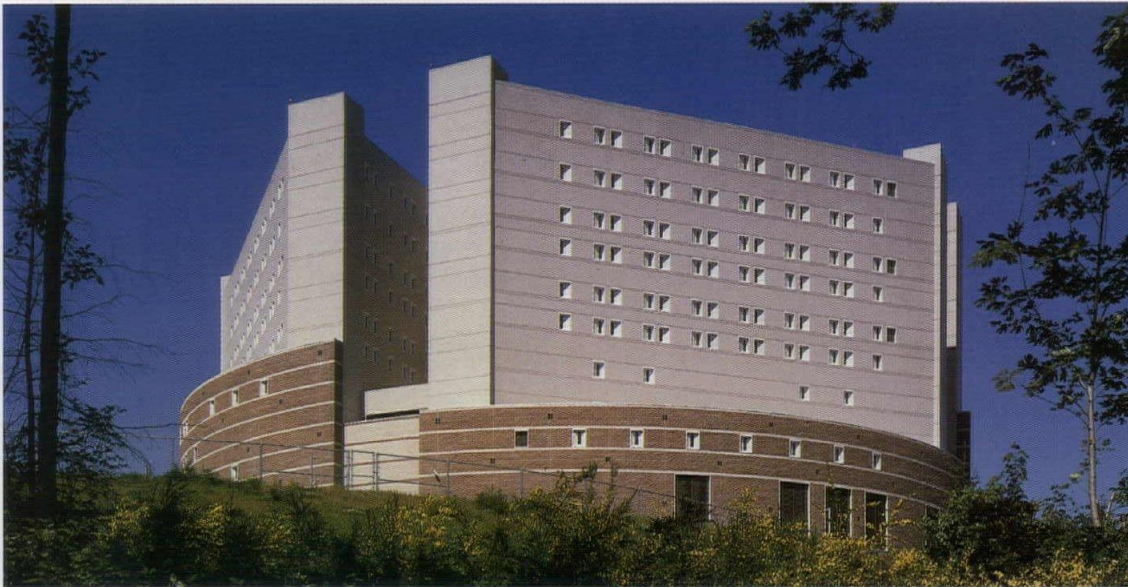
The building's exterior envelope is the primary security element. Closed-circuit television and motion detectors monitor the building exterior, rendering perimeter fencing unnecessary.

"Our neighbors are pleased with this facility because it looks like a modern office building, not a prison," observes Warden Bill Perrill.

The \$63 million complex comprises a four-story cylindrical base and three six-story towers of male and female housing units and offices. The base includes administration, public spaces, and inmate services. The towers are set back from the main entry, minimizing visual contact between inmates and the public.

Barbara A. Nadel, AIA, is principal of Barbara Nadel Architect and specializes in criminal justice and institutional work.





Three triangular housing towers sit above a circular base with public spaces and administrative functions (left). Dayrooms in the center of each housing unit allow for direct supervision of inmates by corrections officers (plans below).

Designing a high-rise prison for an urban area was made more challenging by the need to monitor daily inmate transfers while also separating inmates, staff, and visitors, says Mitch Miskimins, AIA, BOP project administrator. Three separate entries clarify circulation: a vehicular sally port for the marshals and a service entry (both below grade), and a public entry for staff and visitors.

The number of cells (502), types of housing units, and number of beds per unit were specified by the BOP. Double bunking expands capacity to 1,013 beds, allowing flexibility for population spikes. Stacking functions vertically posed design and operational challenges, says Niranjan Benegal, project planner for NBBJ. Due to a small footprint, housing units are on separate floors from program spaces, multipurpose rooms, and education areas—requiring inmates to move around more than in other facilities. Outdoor recreation areas, though, are directly adjacent to each housing unit.

Sources

Concrete masonry units: *Eastside Block*

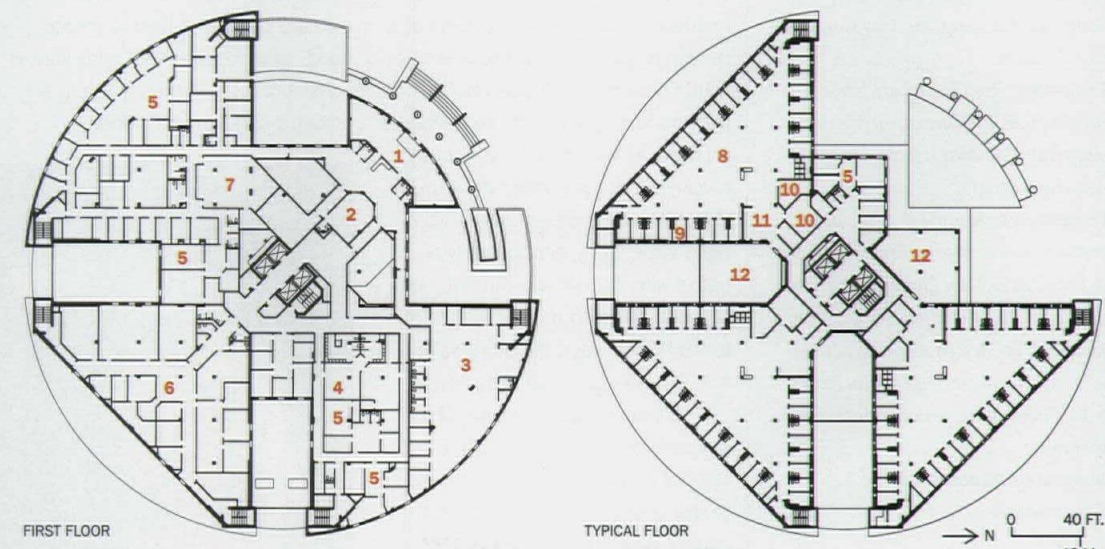
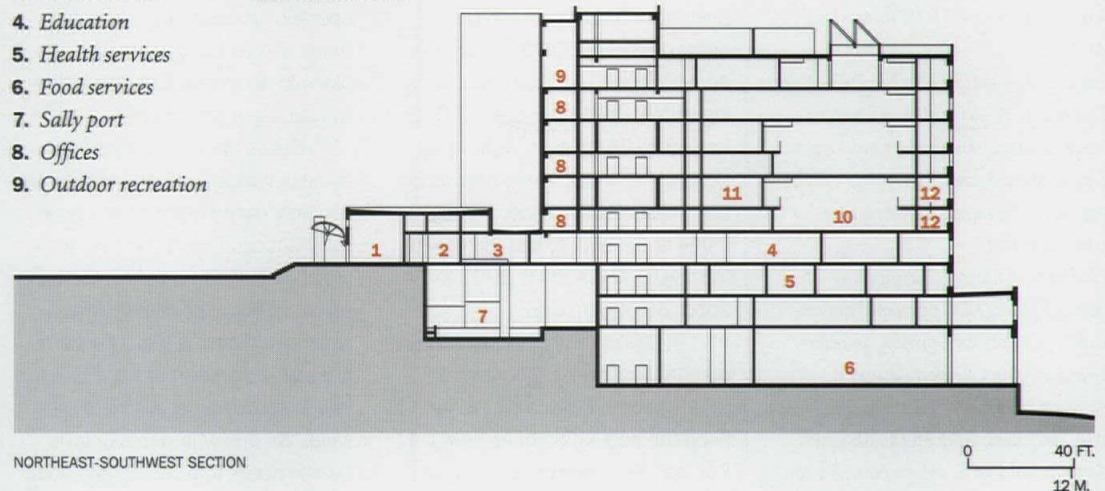
Steel doors: *Habersham*

Hardware: *Folger, Adams*

Acoustical ceilings and resilient flooring: *Armstrong*

Elevators: *Montgomery-KONE*

- | | |
|-----------------------|-------------------|
| 1. Entry | 10. Housing unit |
| 2. Reception | 11. Activity room |
| 3. Control room | 12. Inmate room |
| 4. Education | |
| 5. Health services | |
| 6. Food services | |
| 7. Sally port | |
| 8. Offices | |
| 9. Outdoor recreation | |



- | | | | |
|-------------------|--------------|-----------------|------------------------|
| 1. Entry | 4. Staff | 7. Hearing room | 10. Activity room |
| 2. Control center | 5. Office | 8. Dayroom | 11. Food preparation |
| 3. Visiting | 6. Education | 9. Inmate room | 12. Outdoor recreation |

3 Mecklenburg County Jail Central Charlotte, North Carolina

TO DEAL WITH THE PROBLEM OF OVERCROWDING, THIS COUNTY JAIL WAS DESIGNED TO PROCESS DETAINEES AS EFFICIENTLY AS POSSIBLE.

by Charles Linn, AIA

Project: Mecklenburg County Jail Central, Charlotte, North Carolina

Owner: Mecklenburg County

Architects: Little/HOK Joint Venture Architects

Little and Associates Architects—Philip

Kuttner, AIA, principal-in-charge;

James Metze, AIA, project manager;

David Malushizky, AIA, project architect;

Alan Pettigrew, construction administrator

Hellmuth, Obata + Kassabaum—

James Kessler, AIA, principal designer;

Robert Karamitsos, project architect;

Duncan Lyons, project designer;

Anhtan Le, designer; Scott Hemlock,

AIA, architect; Julie Steele, designer;

Suzette Goldstein, urban planner; Jon

Pearson, landscape architect; Spencer

Poon, graphic designer; Amy Coe, interior

designer

Engineers: Restl Designers (structural); HOK Engineers (mechanical/electrical/plumbing); GNA Design Associates (civil)

Consultants: Kimme & Associates (master planners/programmers); Law & Policy Associates (systems analysts); LTS Consulting Engineers (electronic security); Foodesign Associates (food service); Hanscomb Associates (cost); F. N. Thompson/Turner (construction manager)

General Contractor: Metric Construction

Size: 423,000 square feet

Number of beds: 1,004

Construction cost: \$58 million

The past few years have seen major growth in Mecklenburg County, North Carolina. The population has risen from 511,000 in 1990 to approximately 550,000 today, with an additional 5.5 million people living within a two-hour drive of Charlotte, the county seat. As in other geographic areas where population becomes quickly concentrated, crime in the county has increased from 40,000 arrests in 1991 to about 60,000 in 1997.

In dealing with this increase in potential prisoners, Mecklenburg County worked with a simple idea to keep the population of its new Jail Central low: move people through as quickly as possible. Everything needed to complete the release of a person accused of a crime was put within easy reach. Those who can post bond, pay a fine, or be released on their own recognizance get out quickly, so the jail does not fill up. Police can drop off arrestees, complete paperwork, and be back on patrol with little delay. "Fifty percent of those arrested are out within 24 to 48 hours," says James Kessler, AIA, the jail's principal designer.

Efficiency was also one of the key considerations in siting Jail Central in downtown Charlotte, next to the courthouse and a city and county government building. (An obsolete 350-bed, 1970s-era jail was demolished in phases to make room for the new facility.) The prox-

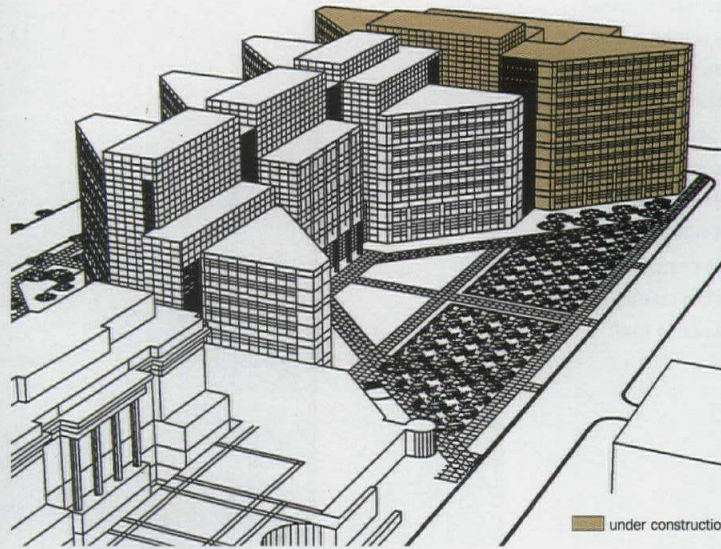
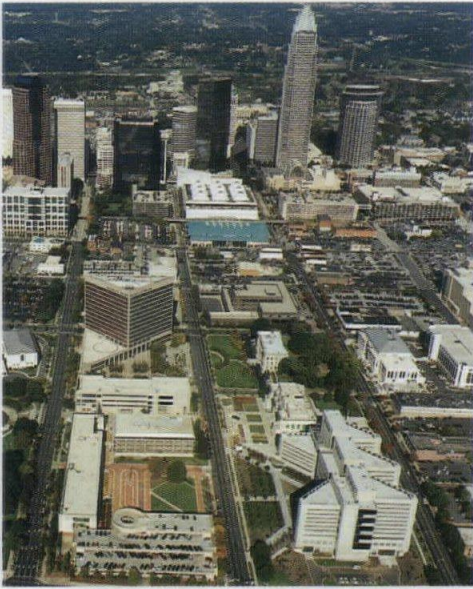
imity to other government facilities is important: the less the prisoners have to be moved, the lower the operational costs. And because many of the county's arrests take place in downtown Charlotte, a central jail made good sense.

But as plans for the jail were being developed, citizens expressed concern. They worried that a large jail might counteract the hard work they had put in to maintain the economic vitality of downtown Charlotte. In addressing these concerns, the architects knew that the building had to convey an appropriate message. "No one who works or lives nearby needs to have lessons about the strength of justice embodied in a massive building in their neighborhood," says Kessler. "But a jail should be part of the community that creates it; it shouldn't be hidden."

To design a building that projected a dignified image without looking like a fortress, the architects used the unusual triangular floor plate of the adjacent government office building as a starting point. They developed the jail's plan as a series of triangular, direct-supervision pods organized along a circulation spine. Setbacks on both major elevations break up the facade and prevent the building from appearing monolithic.

As in most detention facilities, arrestees at Jail Central are moved from police cars and into the building out of public view. In the main lobby's glass entry, though, Jail Central feels like a safe, public building. A special emphasis was placed on making the layout of the building comprehensible through signage. "We want people to feel



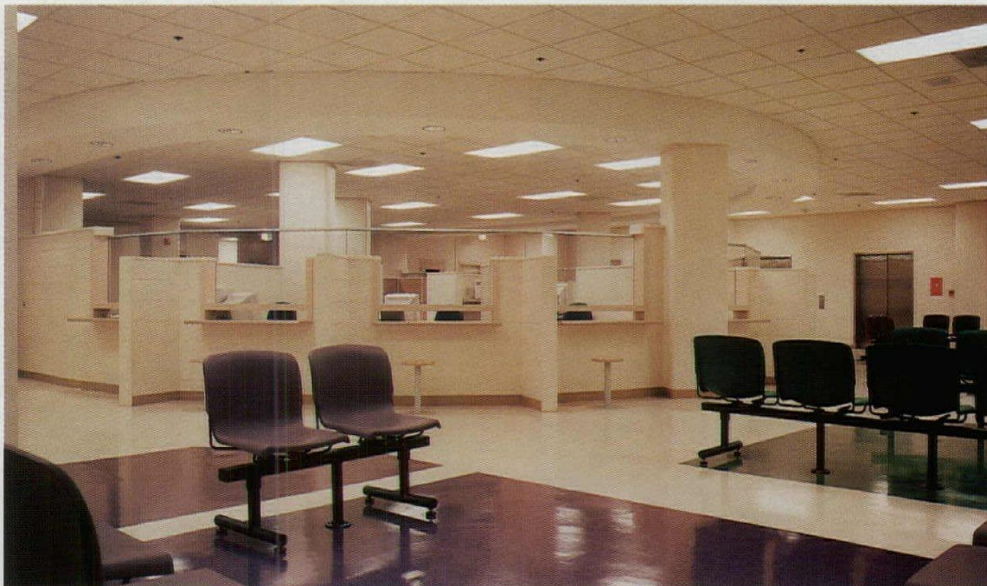


The triangular blocks of the new jail relate to the floor plate of a city and county office building across the street (far left). Ground has just been broken for a new wing of the jail (far right in axonometric). The jail's public entry (below) and its relationship to the existing courthouse give the structure a prominent civic presence in downtown Charlotte.



PHOTOGRAPHY: © THOMAS FRED BROWN (TOP)

Rather than sitting in an unsupervised cell with an assortment of unclassified detainees, everyone being held at Jail Central sits together in airport-style seating (right) in full view of corrections officers. Detainees (below) is meant to give the facility a less oppressive feel.

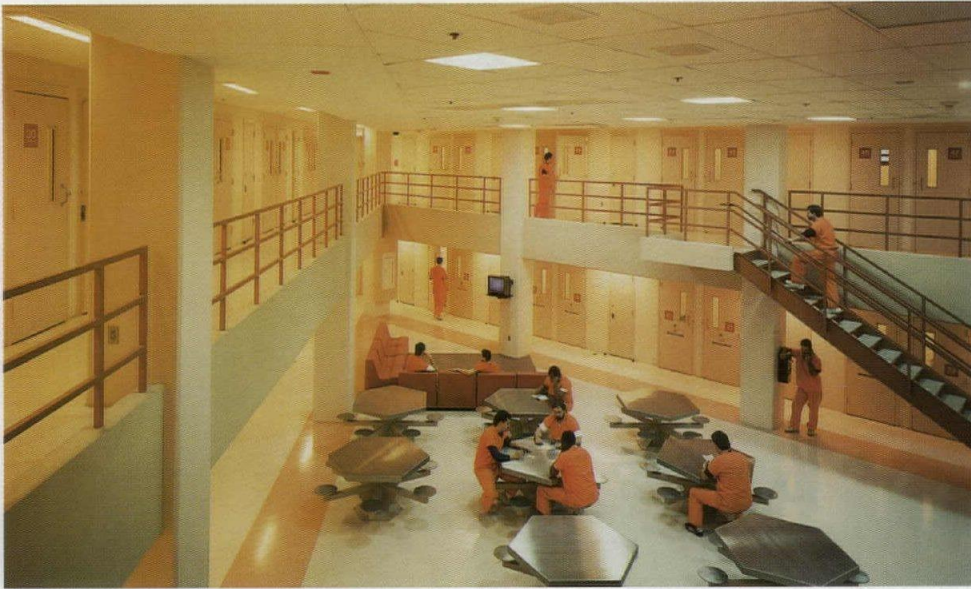


that safety and professionalism reside here," says Kessler.

Everyone arrested in the county is booked at Jail Central, unless they are injured, in which case they are booked at the hospital. This eliminates the wasted time and personnel redundancies that occur when booking is spread over many locations. After being searched and given physical examinations, the accused are seated in an open waiting area while their identification is being established and their criminal records are being researched. The process allows the staff to classify detainees and determine whether they are of danger to themselves or to others.

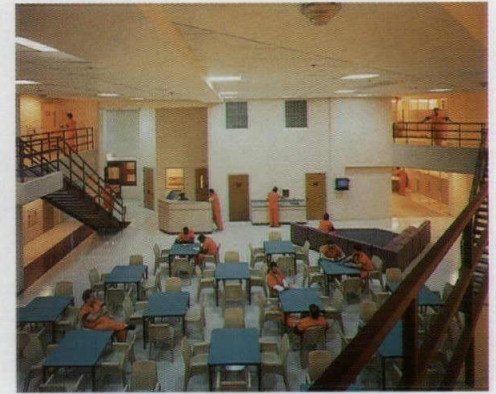
There are areas here for magistrates, court-appointed defense counsel, and district attorneys. If negotiations for release on bond or recognizance are successful, or if charges are dismissed, the detainee is released. If not, the accused person is bound over for arraignment or trial.

Prisoners are placed in one of two types of security pods: those with "wet cells" and those with "dry cells." Detainees who are new to the prison system or who are in maximum security go to wet cells, which are equipped with their own plumbing. General-population prisoners go to dry cells and use common toilet facilities, a system that is much cheaper to construct.



Security pods consist of a central dayroom lined with cells. All of the cells at the facility are single-occupancy;

some pods have cells with their own plumbing, while others have less expensive cells with no plumbing.



Direct-supervision detention was chosen for the Jail Central facility. Officers work alongside prisoners in large, open dayrooms; prisoners can move about freely between these rooms and their cells, which are located nearby. This creates an environment where detainees feel they are safe, says Kessler, and where "security is maintained with the least amount of force."

Because privacy is considered a key element in preventing trouble within a detention facility, the architects agreed with Jail Central's citizens' advisory committee to take the unusual step of making all the cells single-occupancy. "Operating costs are lowest when both detainees and staff feel the least amount of stress," says Kessler. "That's what we've tried to accomplish here." ■

Sources

Curtain walls and entrances: *Vistawall*

EIFS: *Dryvit*

Elastomeric roofing: *Johns Manville*

Steel windows, special doors, and security devices: *Norment*

Glazing: *LOF, Viracon*

Wood doors: *Weyerhaeuser*

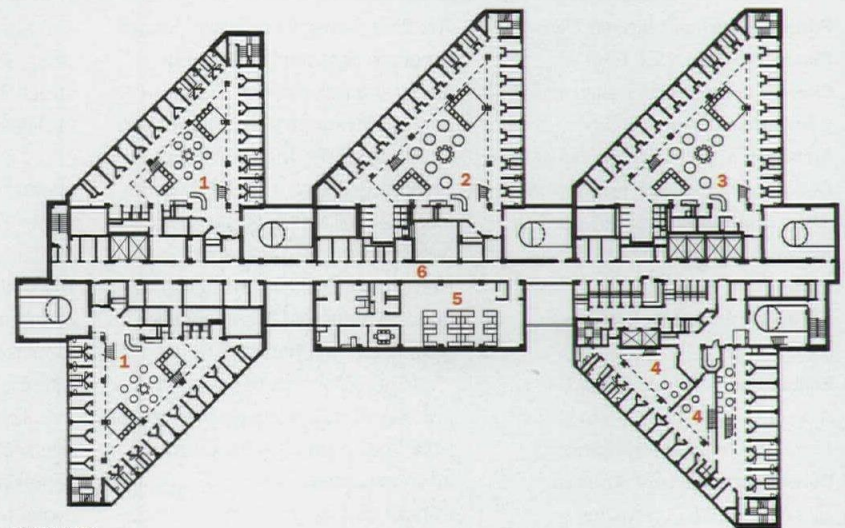
Hardware: *Corbin, Hagar, LCN, Yale, Von Duprin*

Lighting: *Failsafe, Vista, Louis Poulsen, Halo, Sterner*

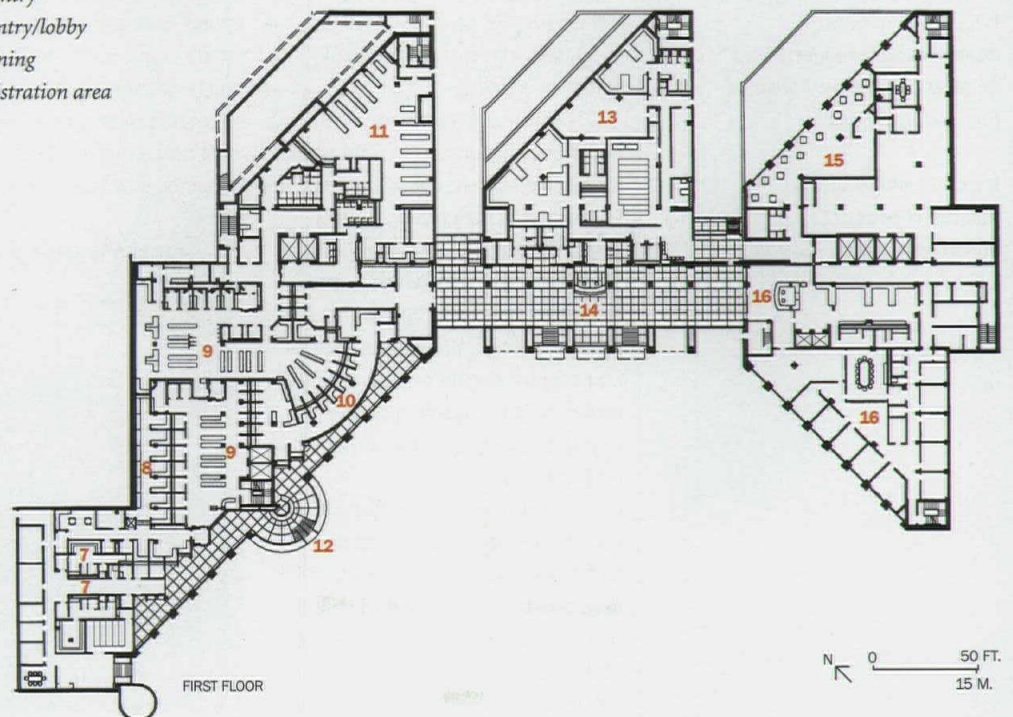
Lighting controls: *Microlite*

Elevators: *Otis*

1. Male intake/classification pod
2. Male trusty pod
3. Female general-population pod
4. Special needs pod
5. Classification office
6. Circulation spine
7. Intake administration offices
8. Magistrates
9. Waiting area
10. Pretrial area
11. Property storage
12. Staff lockers
13. Arrest-processing/public entry
14. Main entry/lobby
15. Staff dining
16. Administration area



THIRD FLOOR



FIRST FLOOR



4

Crossroads Juvenile Center Brooklyn, New York

A NEW SECURE-DETENTION FACILITY BY KAPLAN McLAUGHLIN DIAZ AND KARLSBERGER AIMS TO GET YOUNG OFFENDERS ON THE RIGHT TRACK.

by **Barbara A. Nadel, AIA**

Project: *Crossroads Juvenile Detention Center, Brooklyn, New York*

Client: *Department of Design and Construction, New York City*

Architect: *Kaplan McLaughlin Diaz—David Hobstetter, AIA, principal and design director; Robert Fierro, project manager and construction administrator*

Associate Architect: *Karlsberger Architecture*

Engineers: *DeSimone Chaplin + Associates (structural); Syska + Hennessey (mechanical/electrical)*

Consultants: *Maurice Wrangell (landscaping); ESA (security)*

Artists: *Carlton Ingelton (lobby); Willie Birch (courtyard)*

Construction Manager: *CRSS*

General Contractor: *Monarios Contracting Company*

Size: *114,500 square feet*

Number of beds: *124*

Construction cost: *\$24 million*

The time a juvenile offender spends in secure detention—between arrest and adjudication—is an opportunity for positive intervention in his or her life. The Crossroads Juvenile Center, a 114,500-square-foot, \$24 million facility run by the New York City Department of Juvenile Justice (DJJ), was designed to take advantage of this chance for guidance and rehabilitation.

The center houses alleged juvenile offenders aged seven to 15 while their cases are pending and, after sentencing, while they await transfer to state facilities. In 1998, 37 percent of the residents stayed three days; 58 percent were out in 10 days; the rest remained for weeks or months.

Crossroads' temporary residents are encouraged to rehabilitate themselves before becoming further enmeshed in the criminal justice system; the DJJ offers counseling as well as discipline, which is often lacking in their lives. "Aftercare," a voluntary program, provides continued support services—counseling, advocacy, educational monitoring—to youth returning to the community after detention.

In 1985, the city authorized replacement of the 289-bed Spoford Juvenile Center—built in 1957 as a home for runaway boys—with two new 124-bed secure detention facilities, in Brooklyn and the Bronx. The politically charged site-selection

and approval process took four years. Planning began in 1989, construction started in 1993, and both facilities opened in 1998.

"The Brooklyn community was apprehensive," recalls DJJ Commissioner Tino Hernandez. "We met regularly with neighborhood leaders. The [finished] facility looks like a community center, has a meeting room for public use, and fits in well with the rest of the neighborhood."

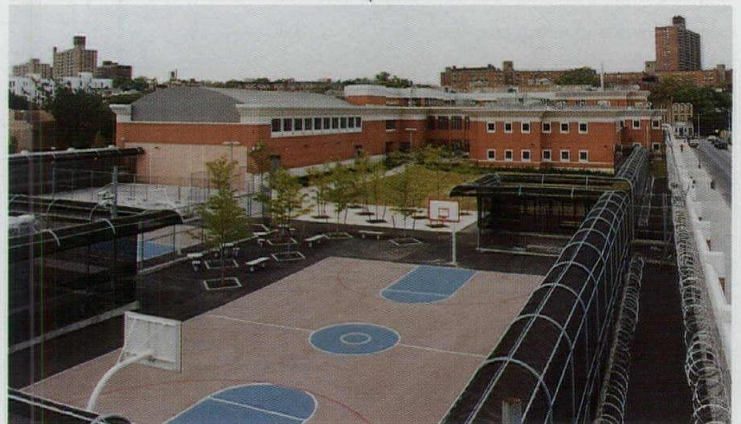
Located in Brooklyn's Brownsville section, the juvenile detention center has projecting cornices that evoke the classic silhouette of New York brownstones, while its precast panels contrast with the neighborhood's aging commercial, industrial, and residential buildings. Across the street, the blank brick wall of the local police precinct faces the center's modestly scaled sidewalk entry.

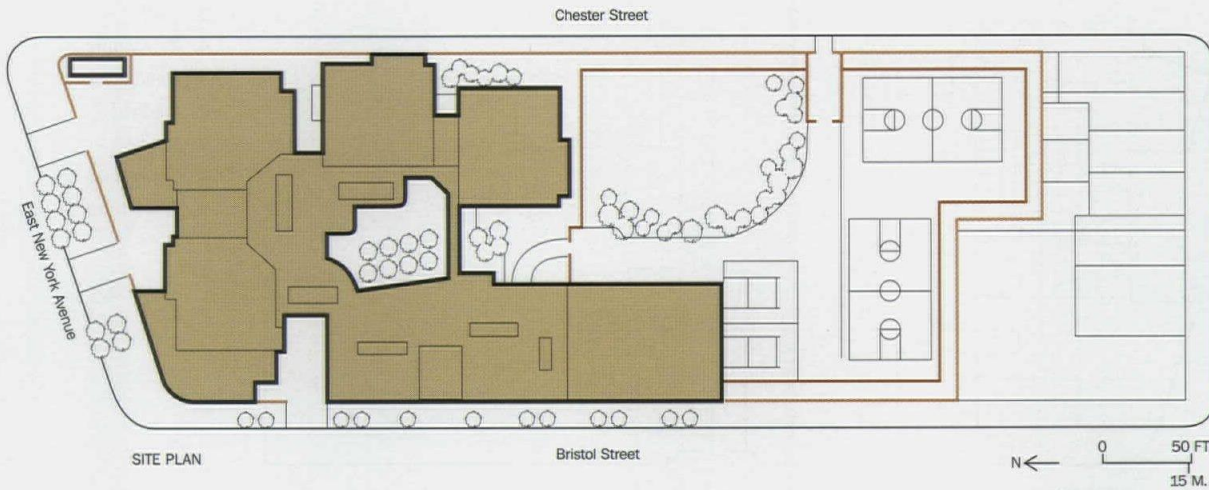
"The challenge was to create a

normalized environment to rehabilitate kids, not a lock-up facility," says David Hobstetter, AIA, the Kaplan McLaughlin Diaz (KMD) principal in charge of the project. "Housing units, or pods, are designed as small residential neighborhoods," he adds.

Pods consist of either eight or 16 single bedrooms, allowing flexibility for accommodating girls or boys. Each pod includes private, rather than communal, toilets, counselor offices, and an enclosed outdoor recreation space. Gypsum board, not concrete-block, walls are used throughout the facility, and the pods feature commercial finishes, soffitted ceilings, and skylights—elements of an environment that is intended to have a positive effect on juvenile behavior.

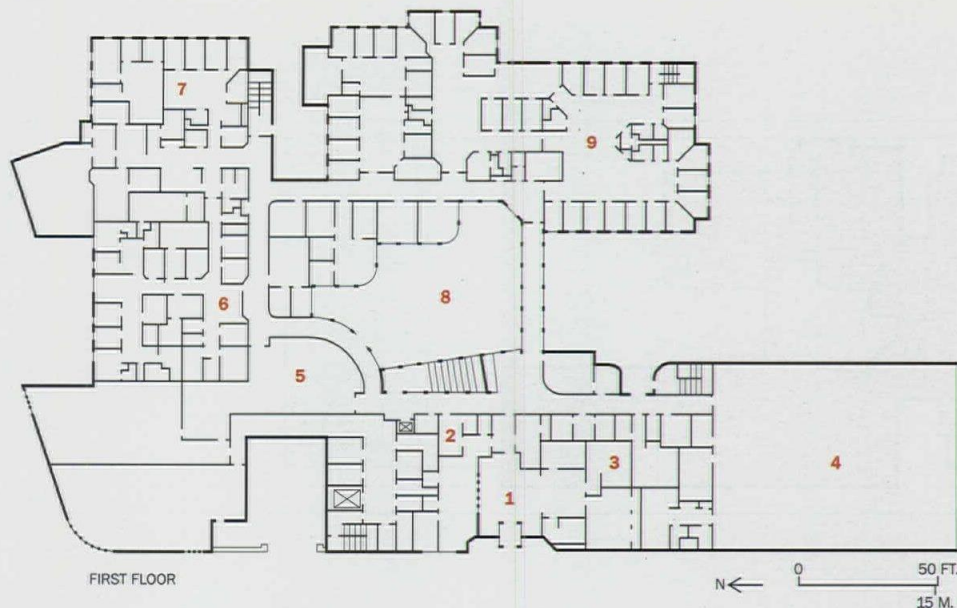
A central outdoor courtyard, paved with terrazzo mosaics designed by a local artist, is an



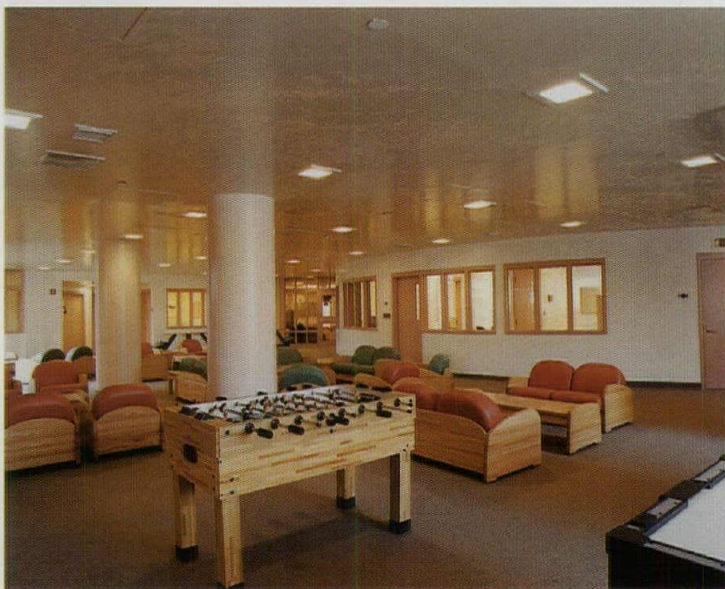


A masonry street wall helps connect the facility to its neighborhood (below). To protect the identity of juveniles, the building offers few views inside but many outdoor spaces within its walls (opposite).





1. Entrance
2. Visiting room
3. Staff
4. Recreation
5. Food service
6. Medical
7. Intake
8. Courtyard
9. Short-term housing



Incandescent lighting, along with soffitted ceilings, warm colors, and wood trim (above

and top), gives the facility a residential feeling that supports its mission as a place

to help rehabilitate young offenders before they get more deeply involved in crime.

organizing element visible from many areas inside the facility. The building's spacious public areas receive plenty of daylight and provide clear sight lines for supervision.

To prevent visual contact with the public, street-facing windows are frosted. Windows overlooking the interior courtyard and the light-filled two-story main entry hall, though, are transparent.

Wall-mounted sconces and indirect lighting, instead of fluorescent ceiling fixtures, illuminate corridors and activity areas. The palette of warm, natural colors and noninstitutional finishes, fabrics, furniture, and wood trim all reinforce the facility's residential feeling.

Recreation spaces within the complex include landscaped socializing areas, handball and basketball courts, play structures, and a gym. An "elite lounge," reserved for residents exhibiting good behavior, is available for cooking, crafts, and learning new skills.

The facility is monitored by closed-circuit television from a central control room near the entrance. Counselors, wearing individual duress alarms, work closely with residents; roving officers are unnecessary. By law, one counselor is provided for every eight residents.

"The public wants to treat juvenile offenders as adults," observes Peter Krasnow, AIA, KMD's director of justice facilities. "Yet the client

users we work with believe that kids can change their behavior in a normalized environment within the security envelope. Our challenge is to balance the call for harsh lock-ups by the public, politicians, and contracting agencies with the rehabilitation staff's request for user-friendly, manageable environments."

Next spring, the DJJ and KMD will complete a postoccupancy evaluation to see if the facility is working as intended and if the softer environment is appropriate for more secure housing units planned for the site.

From its experience at Crossroads, the DJJ has identified key steps for a successful juvenile detention project: work with the community early on so it is supportive, not frightened; involve staff during the planning process; design in flexibility for male or female housing; test materials for durability; and locate offices within the housing pods to provide greater interaction between the staff and the residents. ■

Sources

GFRC and precast concrete: *GFRC Cladding Systems*

Security steel windows: *William Bayley Company*

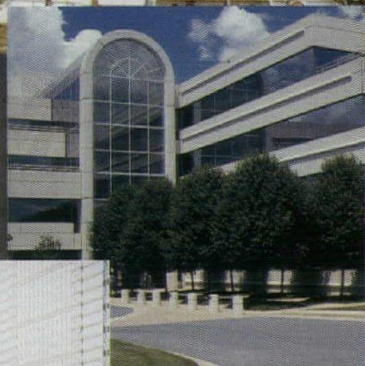
Security glazing: *GE*

Security sliding doors: *Folger Adam*

Acoustical ceilings and resilient flooring: *Armstrong*



*Taj Mahal Parking Garage
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*Rock Creek
Rock Creek, MD*



*Liberty Place, Phase II
Philadelphia, PA*

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CIRCLE 31 ON INQUIRY CARD

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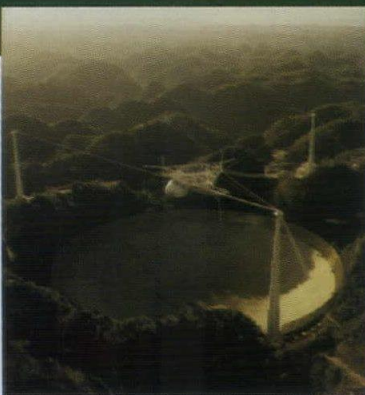


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PRODUCT REPORTS...

This year, a panel of five judges gathered at our offices to select the best products for ARCHITECTURAL RECORD's Product Reports 1998. Steven Goss, AIA, from HLM Design (formerly JPJ Architects) in Dallas; Sandra Leibowitz from Hellmuth, Obata + Kassabaum (HOK) in Washington, D.C.; Robert Siegel from Garrison Siegel in New York City; Dan Himmelberg, AIA, from Gould Evans Affiliates in Kansas City, Missouri; and Berni Hui from Gensler in New York City spent a full (and intense) day sifting through piles of product literature, information, drawings, and photographs. From the more than 500 products submitted, 101 were chosen for publication because of their high level of innovation or improvement in three areas: performance, appearance, and value. The judges agreed that these new and noteworthy products would meet the needs of their peers, our readers.

The panel of judges found that the most dramatic product innovations were in the area of technology. Two- and three-dimensional imaging and rendering programs, real-time document sharing, design software packages, and wireless communication devices were just some of the products that incorporated new technologies for design professionals.

But even though the industry is moving toward a high-tech future, the judges also found much to admire in improved building materials, both traditional and new. They chose products that have revived interest in brick, metal, wood, plastic, and concrete. They were particularly impressed, for instance,

with concrete-form liners that produce walls with a three-dimensional texture and deep shadows.

One of the judges, Robert Siegel, summarized the panel's overall feelings on the technology trend and how manufacturers of traditional building products are keeping up: "Computer applications allow for a rationalized, quantitative analysis of a building," he said. "They are effective tools, but cannot substitute for human knowledge and intuition." With this in mind, the panel chose a variety of product literature on paper and CD-ROM that documents building products and installation procedures.

Also included as part of Product Reports 1998 is the Readers' Choice Awards. This year, we tallied the winners from ballot forms that were mailed, faxed, and E-mailed to our office, grouping the winners by individual product categories. They are presented on page 91.

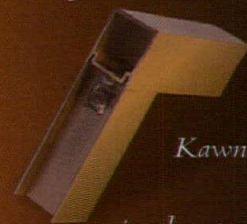
We want to thank the five judges on our panel, the readers who filled out Readers' Choice surveys, and the manufacturers who submitted products for consideration. We look forward to reviewing next year's submissions. —Elana Frankel

94 General Data	112 Finishes
97 Site Work	117 Specialties
99 Concrete	119 Equipment
101 Masonry	120 Furnishings
103 Metals	122 Special Construction
104 Woods & Plastics	123 Conveying Systems
106 Thermal & Moisture	125 Mechanical
109 Doors & Windows	127 Electrical

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Confidence. Dependability. These
qualities are obvious every time
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*Kawneer door is virtually
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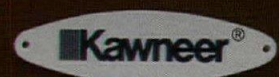
*isn't the only element of the entrance
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*Kawneer engineers the entrance
and frame hardware to*

*withstand constant use and the
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READERS' CHOICE

Winners

ARCHITECTURAL RECORD's 1998 Readers' Choice Awards recognize manufacturers whose products contribute to the success of architectural projects. Using a survey circulated in the August issue, readers nominated manufacturers based on their product's design, cost, and value as well as the company's level of customer service. The companies that received the most votes in each of 33 CSI categories are presented below.



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APPLE

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ARMSTRONG

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AUTOCAD

CAD Software
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BELDEN BRICK

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330/456-0031

CARLISLE

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GAF

Roofing System/Residential
800/766-3411

HEWLETT-PACKARD

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JOHNS MANVILLE

Roofing System/Commercial (tie)
800/654-3103

JULIUS BLUM

Architectural Metalwork
800/526-6293

KAWNEER

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Window System/Commercial
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LARSENS

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LEVOLOR

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LIGHTOLIER

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LM SCOFIELD

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MARVIN

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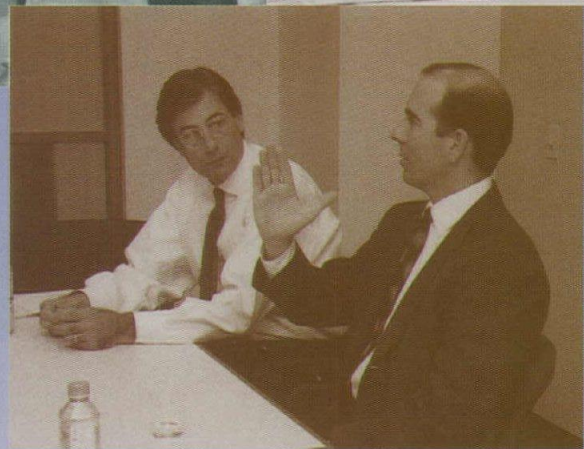
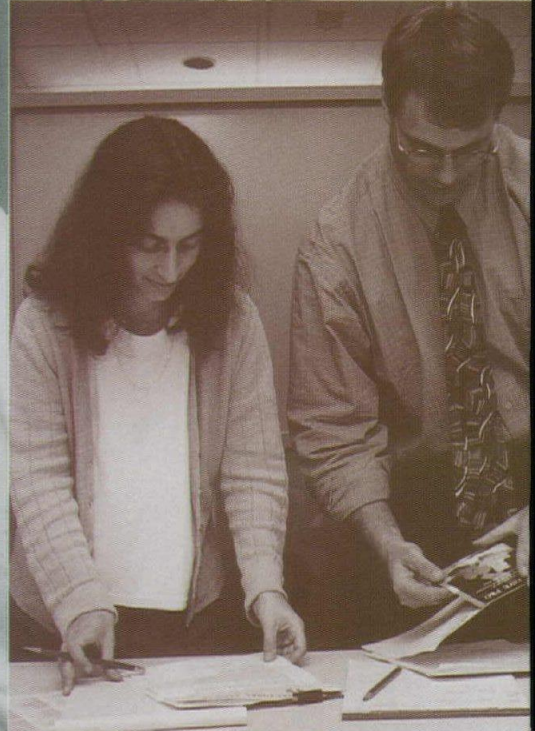
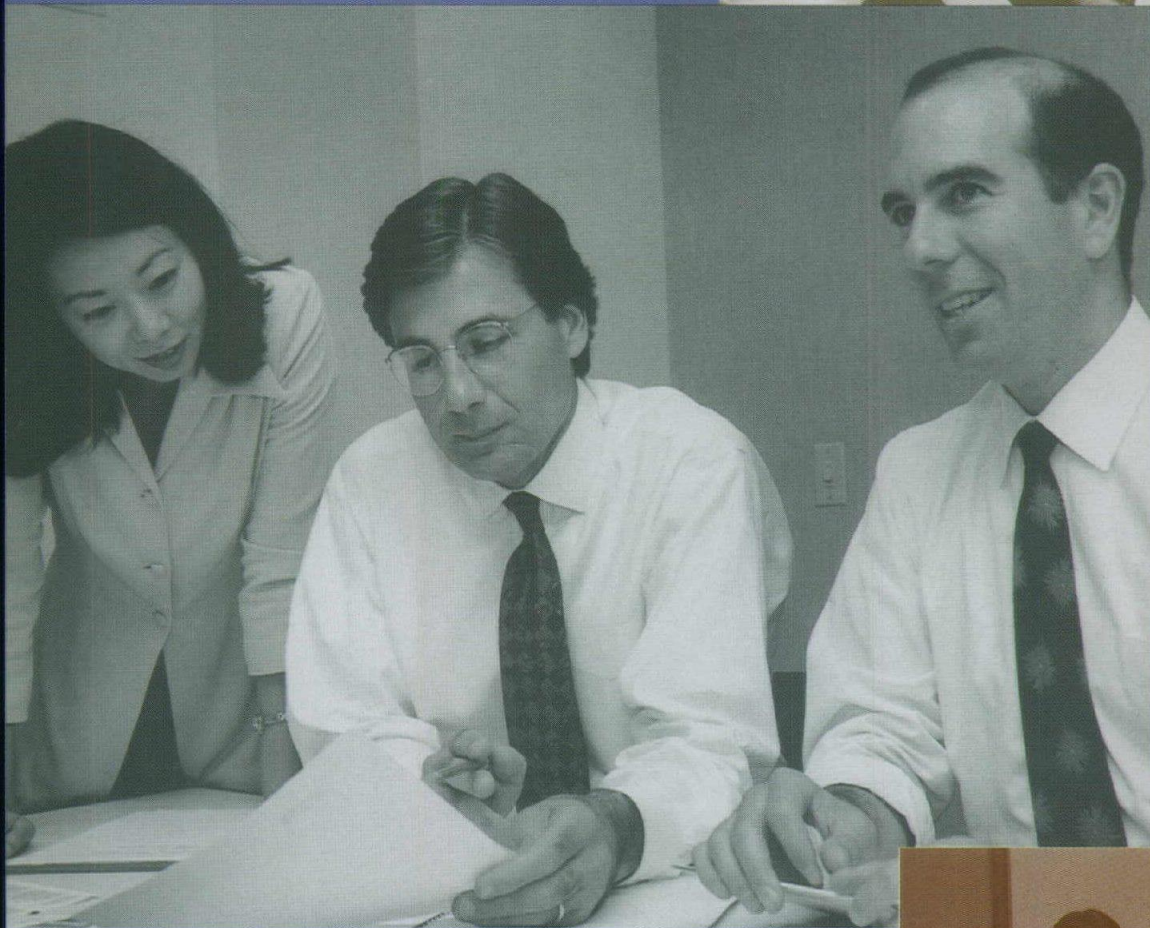
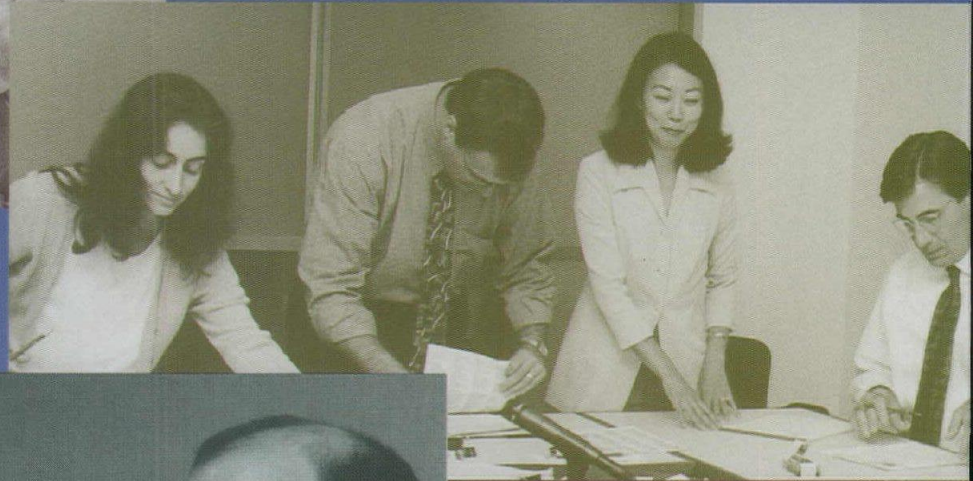
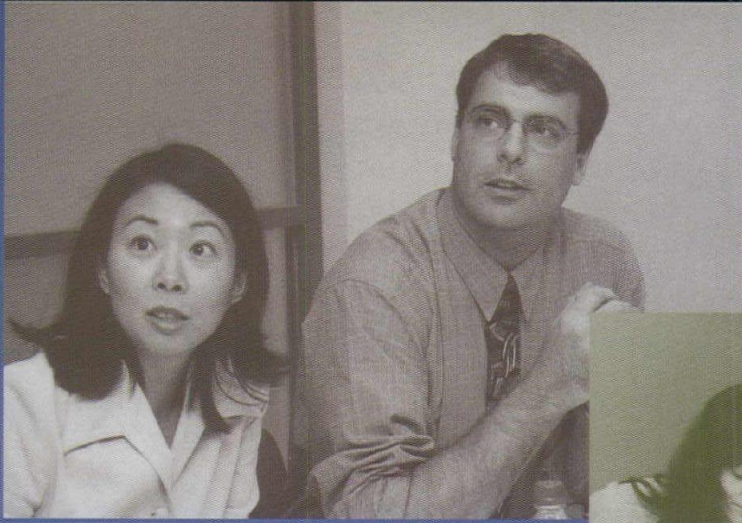
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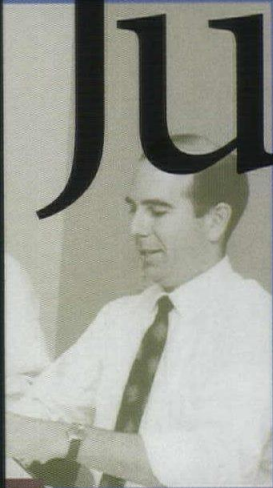
Exterior Cladding/Residential
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This year's panel of judges included (middle photos, left to right) Berni Hui, Steven Goss, AIA, Robert Siegel, Sandra Leibowitz, and Dan Himmelberg, AIA. Each panel member brought his or her own area of architectural

expertise to the judging and a personal understanding of materials and products to the process. They reviewed a wide range of entries from various product manufacturers to identify which were worth noting to their peers.

PRODUCT Judges 1998



A PANEL OF FIVE JUDGES SPENT THE DAY IN OUR NEW YORK OFFICES EXAMINING MORE THAN 500 PRODUCT SUBMISSIONS.

In choosing our panel of judges for the Product Reports each year, we try to create a good balance of experts, taking into consideration the architect or designer's involvement with specifying materials and products, the type of design the person specializes in, and the size and location of his or her firm. This year, we brought together a particularly well-rounded group.

Berni Hui graduated from the University of Toronto in Fine Arts Studio. Her design career began in Tokyo, where she worked on a variety of projects, including the first Japanese Blockbuster store. She is now a project designer for Gensler, New York, where she is working on projects for Goldman Sachs.

Steven H. Goss, AIA, a senior associate and lead designer of the corporate studio for HLM Design (formerly JPJ Architects) in Dallas, is responsible for the design of all planning, architecture, and interior design projects. Goss received a bachelor's degree in architecture from Oklahoma State University.

Robert Siegel is a partner in New York's Garrison Siegel

Architects. His current work includes the Korean Embassy in China, the Swiss Center in New York, and the master plan for Tokyo's Gotanda district. He graduated from Syracuse University's School of Architecture and received a master's degree in architecture from Columbia University.

Sandra Leibowitz, a sustainable design specialist and chair of the sustainable building materials committee for Hellmuth, Obata + Kassabaum in Washington, D.C., focuses on materials research and environmental specification development. She holds a master's degree in architecture from the University of Oregon with a concentration in sustainable design.

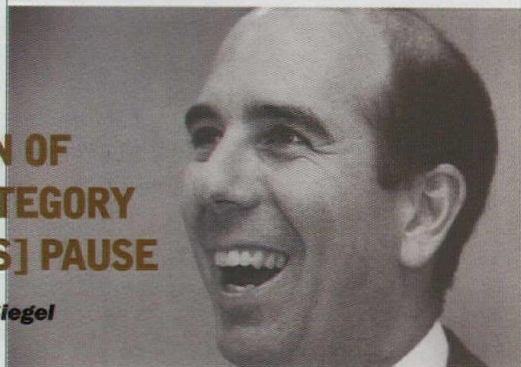
Dan Himmelberg, AIA, vice president at Gould Evans Affiliates in Kansas City, is the senior designer for the retail group and the director of the environmental graphic design group. He is overseeing the design of several projects, including the Times Square AMC Theater. He has a bachelor's degree in architecture from Kansas State University.

GENERAL DATA

**Computer software and systems • Product literature
Design office equipment and materials**

Technology products have become essential tools for design professionals. Every year we receive more submissions in this category, making it an increasingly difficult one to assess. This year, we expanded the category to include products that aren't traditional architectural tools, such as the wireless phones that are now ubiquitous on job sites.

THE PROLIFERATION OF PRODUCTS IN THIS CATEGORY MADE [THE JUDGES] PAUSE FOR REFLECTION. —Robert Siegel



PRODUCTS

Wide-format digital system

Xerox's 8830 Digital Document System (DDS) can copy, print, and scan engineering and technical documents from sizes A to E. For increased ease of use, printing jobs can be interrupted to make copies. With scan-to-network software, the DDS can store documents on a local or network drive. 800/XES-TALK. Xerox, East Rochester, N.Y. **CIRCLE 200**

Interior specs on CD-ROM

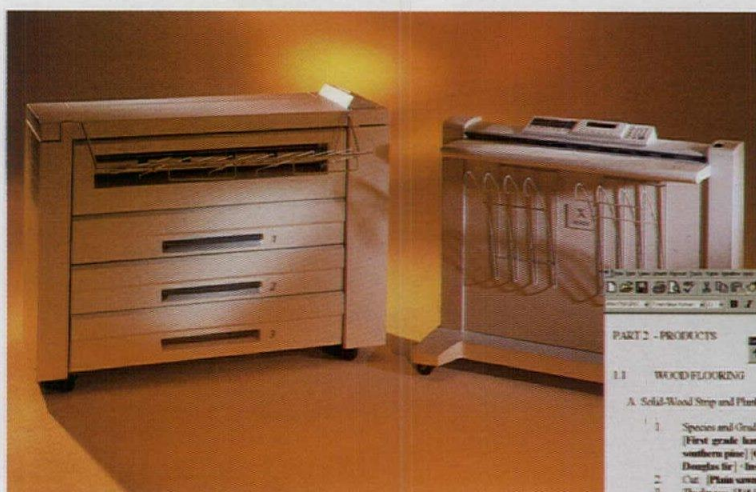
The MasterSpec interior design library on CD-ROM provides more than 75 specification sections, which are organized by CSI categories, including interior construction, finishes, furnishings, and equipment. With Masterworks 3.0 (free with the CD-ROM), designers can customize data and tailor it for use on a specific project. 800/424-5080. Arcom, Salt Lake City. **CIRCLE 201**

Accessible British products

The Virtual Design Centre's Web site and companion CD-ROM make foreign product information more accessible. The CD-ROM includes detailed information on various British products, allowing specifiers to shop without leaving the office. 011/44/171/928-7248. Virtual Design Centre, London. **CIRCLE 202**

Window and door software

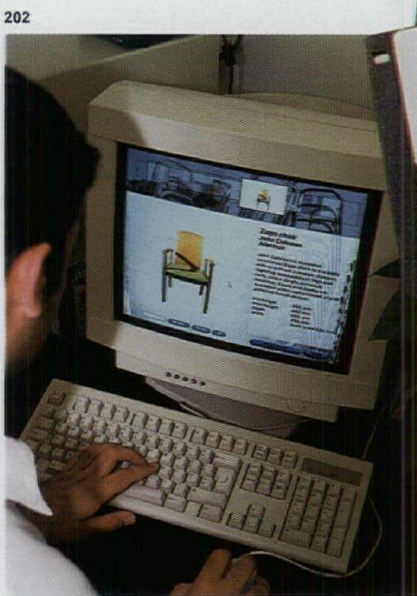
Window Studio from Andersen Commercial Group is CAD-compatible software that allows users to design combinations of Andersen window and patio doors. The software also includes product specification text files in CSI format. 800/426-1899. Andersen, North Bayport, Minn. **CIRCLE 203**



200



201



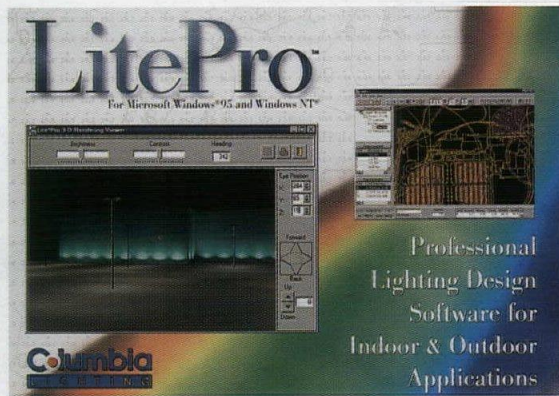
202



203

Lighting design software

Columbia Lighting and Prescolite Mold-cast have created LitePro software for Windows 95 and NT. For indoor and outdoor lighting projects, designers can use the software for information on vertical and horizontal illuminance, exterior building shadowing, and other details. 510/562-3500. Columbia Lighting, San Leandro, Calif. **CIRCLE 204**



204

Wireless network on site

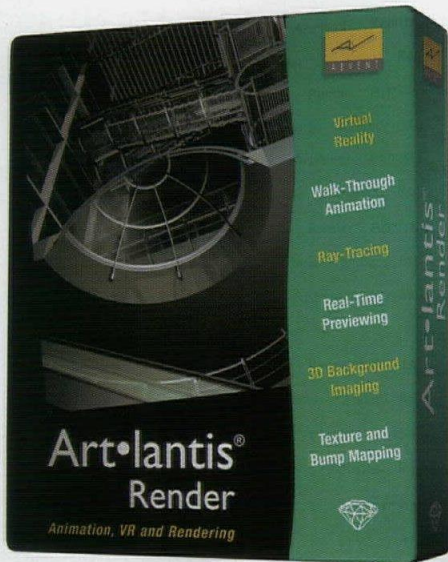
In response to industry demand for wireless communication on the construction site, Sprint has partnered with SONY and Samsung (shown) to develop a wireless, digital phone and battery system that provides approximately 2.5 hours of talk time. 800/480-4PCS. Sprint PCS, Kansas City. **CIRCLE 205**



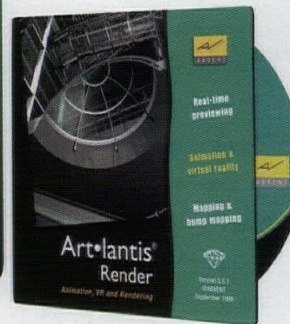
205

Realistic graphic imaging

The latest version of Art•lantis Render 3D software (3.0) is compatible with ArchiCAD, MiniCAD, Arc+, Amapi, and Star. New functions include background editing as well as animated and virtual-reality creations in QuickTime, QuickTime VR, Video for Windows (AVI), and Real-Space. 415/431-3412. Abvent, San Francisco. **CIRCLE 206**

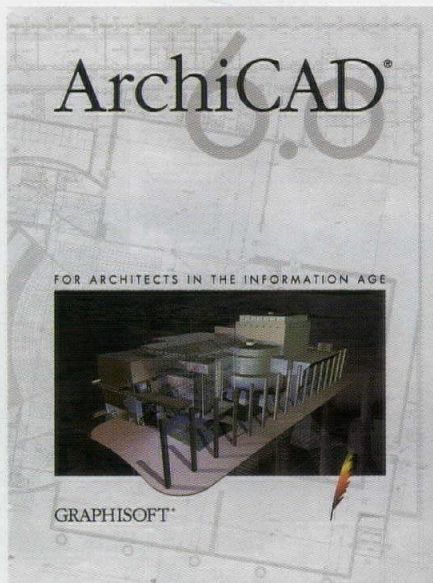


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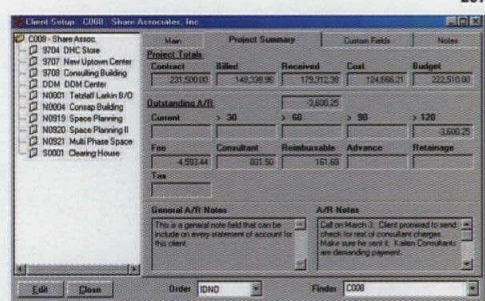


Client and project tracking

Sema4 software tracks project expenses and schedules and provides real-time processing of financial and accounting data. One section of the screen features a tree structure that displays all projects relating to a client. The other section displays relevant financial information. 800/545-7484. Semaphore, New York City. **CIRCLE 207**



208



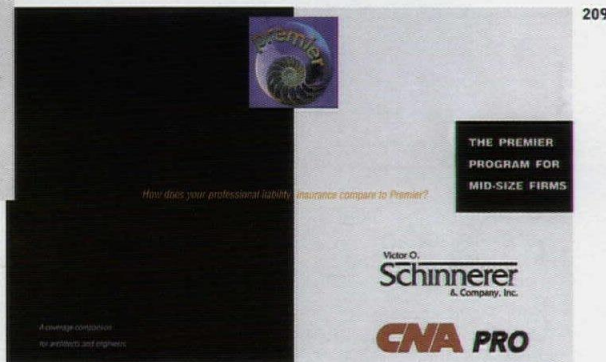
207

Virtual building

In response to user demands, ArchiCAD's new version 6.0 features 3D editing, database links, an open API, and a variety of 2D drafting tools. Available for Windows 95 and NT and Macintosh operating systems. ArchiCAD 6.0 translates DWG files up to r14 and preserves any Xref files within ArchiCAD for later export to AutoCAD. 800/344-3468. Graphisoft, San Francisco. **CIRCLE 208**

Professional liability program

Victor O. Schinnerer's current Premier program for mid-sized architecture and engineering firms includes broader coverage of issues such as pollution, asbestos, equity interest, and insurance. 301/961-9800. Victor O. Schinnerer & Company, Chevy Chase, Md. **CIRCLE 209**



209

SNAP-CLAD™ **Metal Roofing Panels**

Petersen Aluminum Corporation's SNAP-CLAD Panels top the new \$4.75 million press box and stadium club, completing an eight year long renovation of the 48-yr-old Rosenblatt Stadium in Omaha, Nebraska. The stadium plays host to the NCAA College World Series and serves as home field for the Omaha Royals. The new press box features a peaked metal roof, which dramatically altered the exterior appearance of the stadium. Boone Brothers Roofing Inc. in coordination with the general contractor, Weitz Company, Inc. installed over 11,000 square feet of SNAP-CLAD Panels manufactured by Petersen Aluminum Corporation. The panels are a custom blue PAC-CLAD finish and were corrective leveled to provide superior panel flatness. Color and panel appearance was critical considering the prominence of the roofing panels in the stadium design.

For more information on SNAP-CLAD Panels, please contact Petersen Aluminum Corporation, **1-800-PAC-CLAD** or visit our web site @ <http://www.pac-clad.com>

Rosenblatt Stadium
Omaha, NE
Owner: City of Omaha
Architect: Bahr, Vermeer & Haecker
General Contractor: Weitz Company Inc.
Roofing Contractor: Boone Bros. Roofing
Custom Color: Rosenblatt Blue
Profile: Snap-Clad

PAC-CLAD
Petersen Aluminum

1005 Tonne Road
Elk Grove Village, IL 60007
1-800-PAC-CLAD
FAX: 1-800-722-7150 or
1-847-956-7968

Other Plant Locations:
Tyler, TX: 1-800-441-8661
Annapolis Junction, MD:
1-800-344-1400

<http://www.pac-clad.com>

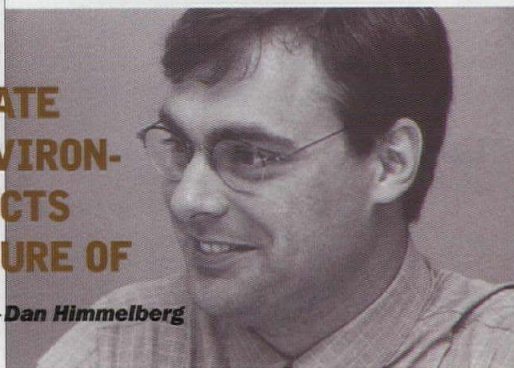
CIRCLE 48 ON INQUIRY CARD

SITE WORK

**Earth retainage • Unit pavers
Site improvements • Landscape accessories**

All five of the judges were particularly drawn to site work designs and products that were aesthetically pleasing without deliberately imitating natural elements. The more subtle the look, the better it fared with the panel. The unit pavers, retaining walls, and site furniture presented here all demonstrate that quality of subtlety.

DESIGNERS WANT TO CREATE 'NATURAL' MANMADE ENVIRONMENTS. WITH NEW PRODUCTS THAT EMBRACE THE NATURE OF ENVIRONMENT, WE CAN. —Dan Himmelberg



Concrete unit pavers

Hanover's Tumbled Brick concrete unit pavers have the look of worn stone. The pavers meet or exceed ASTM standard C936. 800/426-4242. Hanover Architectural Products, Hanover, Pa.

CIRCLE 210

Retaining wall source

Mesa Retaining Walls from Tensar Earth Technologies have a block-to-grid connection with a structural geogrid for soil reinforcement. The walls are available in different facing options and a variety of color blends. 800/TENSAR-1. Tensar Earth Technologies, Atlanta. **CIRCLE 211**

Natural inspiration

Wausau Tile's precast-concrete Stoney Creek pavers are available in four color blends. Custom colors are also available for orders over 10,000 square feet. 800/388-8728. Wausau Tile, Wausau, Wis. **CIRCLE 212**

Streetscape seating

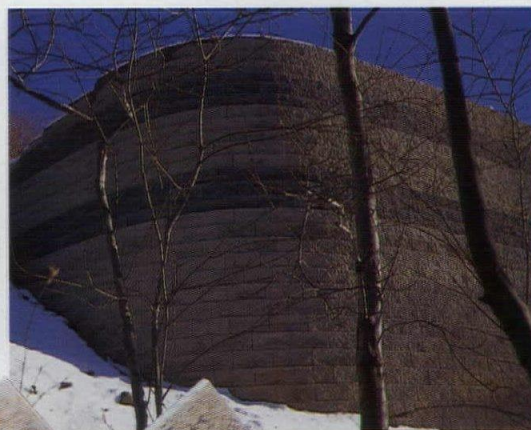
Landscape Forms' Plainwell bench and litter receptacles are made with partially recycled cast-aluminum frames that can be powder coated in a variety of colors. Seating and receptacle surfaces are available in ipe, oak, maple, or jarrah wood. 800/430-6203. Landscape Forms, Kalamazoo, Mich. **CIRCLE 213**

Retaining wall source, too

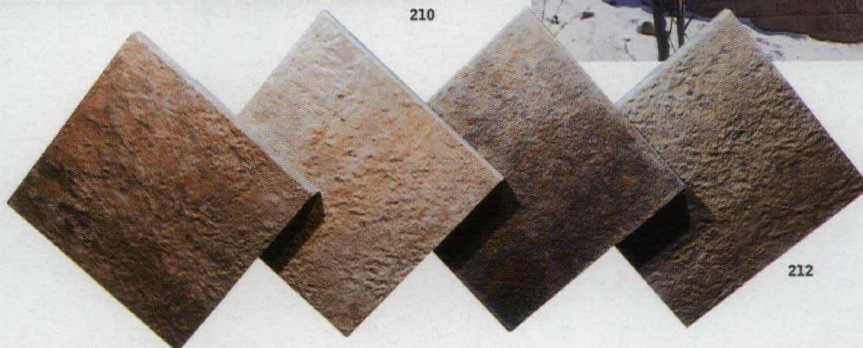
Keystone's residential wall is created with an interlocking, dry stacked assembly system. Instead of using mortar, the wall is held in place and aligned by fiberglass pins. The system is noncorrosive. 800/891-9791. Keystone Retaining Wall System, Minneapolis. **CIRCLE 214**



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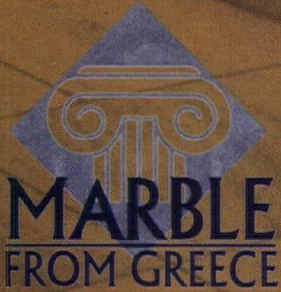


214

A CALL FOR ENTRIES
**MARBLE
FROM
GREECE**
DESIGN COMPETITION

99

Seat of the Universal House of Justice, Baha'i World Centre, Haifa, Israel.
Winner of a previous Marble From Greece Design Competition.



SEND ME AN ENTRY FORM! To request an entry form, complete the information below and return it to Marble From Greece.

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By Facsimile: (212) 644-9201

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545 MADISON AVENUE, NEW YORK, NY 10022

Name/Title: _____

Firm: _____

Address: _____

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THE GREEK TRADE COMMISSION ANNOUNCES ITS
MARBLE FROM GREECE 1999 DESIGN COMPETITION.

ENTRIES ARE ENCOURAGED FOR DESIGN PROJECTS
COMPLETED IN THE LAST TWO YEARS USING
GREEK MARBLE. CASH AND/OR TRAVEL PRIZES WILL BE
AWARDED TO WINNERS. THE DEADLINE FOR ENTRY IS
JANUARY 31, 1999.

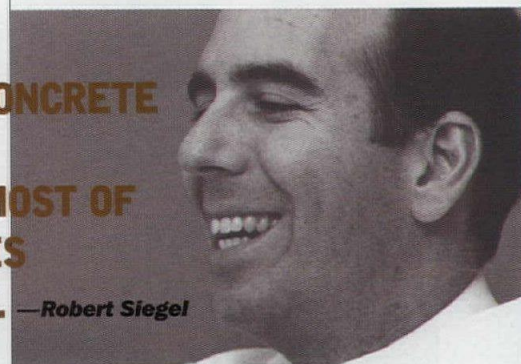
CIRCLE 36 ON INQUIRY CARD

CONCRETE

Concrete accessories, materials, and restoration Form liners • Precast concrete

Concrete materials have seen substantial changes over the past 10 years. Form liners, for example, now produce beautiful, complex designs for highway barriers, while new stains give concrete a natural stone look. One of the most exciting recent products is autoclaved aerated concrete, a new type of manufactured building stone.

INNOVATION IN CONCRETE SHOULD BE FOLLOWED CLOSELY, AS MOST OF THE WORLD USES THIS MATERIAL EXTENSIVELY. —Robert Siegel



Concrete design and effect

Increte's Stain-Crete is a permanent chemical stain that creates color tones in existing concrete by reacting directly with its natural minerals. 800/752-4626. Increte Systems, Tampa. **CIRCLE 215**

Solid, aerated material

Autoclaved aerated concrete from YTONG combines cement, limestone, sand, and water to provide thermal and sound insulation with a six-hour fire rating. Wall, roof, and floor panels are lightweight and easy to work with and can be hand-sawn. 800-YTONGFL. YTONG, Haines City, Fla. **CIRCLE 216**

Concrete-forming system

AFM's Diamond Snap-Form is an insulated concrete forming system that uses expanded polystyrene panels connected by AFM's Diamond Snap-Ties every 12 inches. The system remains in place after the concrete is poured to become the wall, insulation, and facing material. 800/255-0176. AFM, Excelsior, Minn. **CIRCLE 217**

Prison all-in-one

The Tindall prison construction module is a double-cell unit made of precast-concrete panels that can be lifted and finished. Custom modules are also available. 800/849-4521. Tindall, Spartanburg, Pa. **CIRCLE 218**

Concrete floor overlay

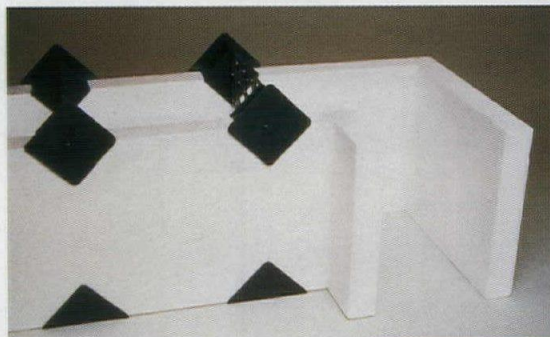
L. M. Scofield's Overlay has been developed as an abrasion-resistant interior concrete floor finish. It is available in ash white, light gray, beige cream, tile red, and natural gray. 800/800-9900. L. M. Scofield, Douglasville, Ga. **CIRCLE 219**



215



216



217



218



219

THE BEST BUILDINGS ON EARTH ARE STILL BUILT BY HAND



More than a million bricks laid in a series of unique patterns, textures and colors make the Veterans Administration Health Care Facility in Detroit, Michigan, a striking example of masonry design by architects Smith, Hinchman & Grylls Associates. But masonry was chosen for more than its beauty and flexibility of design. Buildings built of masonry by skilled union craftworkers will outperform, outshine and outlast any others. Add to that the speed and efficiency of union masonry contractors, and you have a prescription for health care facilities that satisfies any schedule and budget. We're The International Masonry Institute, and we'd like to help you design and construct the best buildings on earth. Visit us on the World Wide Web at www.imiweb.org, or call us toll free at 1-800-IMI-0988 for design, technical and construction consultation.



The International Masonry Institute



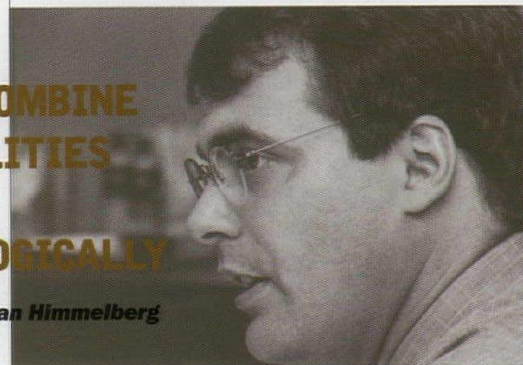
The International Masonry Institute — a labor/management partnership of the International Union of Bricklayers and Allied Craftworkers and the contractors who employ its members.

MASONRY

Unit masonry • Stonework anchors and accessories

The judges found that most of the masonry products on the market today are being designed to look as natural as possible or to have an Old World feel. Among the examples are sand-coated bricks manufactured with the same recipe used by 17th-century masonries, and exterior cladding that resembles red sandstone.

THESE PRODUCTS COMBINE THE EVERLASTING QUALITIES OF MASONRY WITH TODAY'S TECHNOLOGICALLY DEMANDING DESIGNS. —*Dan Himmelberg*



Bricks from the heart

Heartland sand-coated bricks from Glen-Gery Bricks are available in six sizes: utility, modular, three-inch queen, 70 modular, econo, and 16 inches. They meet ASTM standard C216 for grade SW and type FBS. Colors include a variety of grays, roses, tans, and reds. 800/854-4863. Glen-Gery Brick, Iberia, Ohio. **CIRCLE 220**

Old-world building layers

Boral Brick's 17th Century bricks are made with a casting process in which moist wet clay is pressed into handmade wooden molds. The bricks are dusted with sand, which serves as a releasing agent and gives them their final color, then put through a two-week drying and firing process. 800/5-BORAL-5. Boral Bricks, Atlanta. **CIRCLE 221**

Natural masonry units

Renaissance masonry units are pressure-formed from calcium silicate, then autoclave cured. They are now available in cinnamon (red sandstone), wheat (soft buff), and nutmeg (striated white and beige), bringing the total available colors to 12. 800/265-8123. Arriscraft, Cambridge, Ont., Can. **CIRCLE 222**

U.K.-designed anchor system

CLS's Cintec is an anchor system in a mesh fabric sleeve. A cementlike grout is injected under low pressure into the sleeve, which restrains the flow and expands up to twice its normal diameter. The sleeve then takes on the shape of the designated area, like the arch shown at right. 800/363-6066. CLS Cintec, Nepean, Ont., Can. **CIRCLE 223**



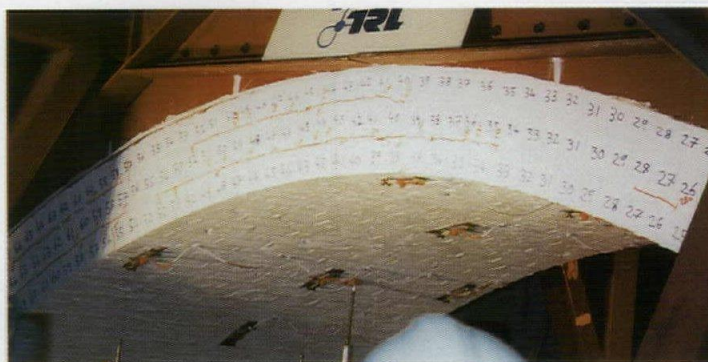
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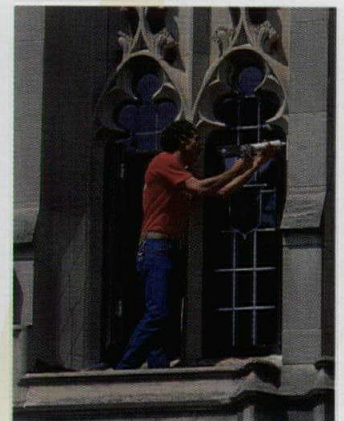
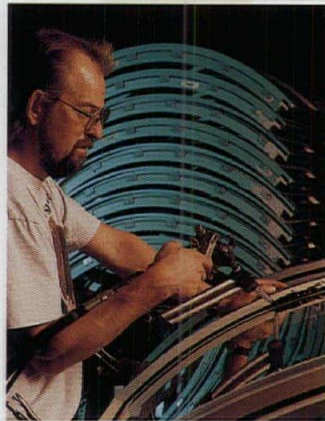
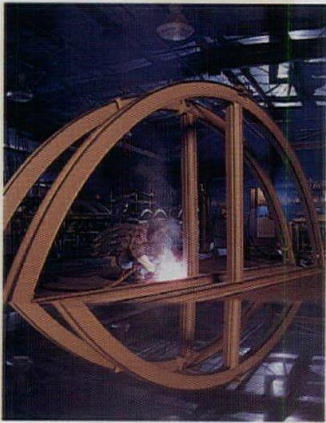
222



223

WAUSAU'S HIGH QUALITY ARCHITECTURAL WINDOWS AND WALL SYSTEMS ARE ENGINEERED AND MANUFACTURED BY EXPERIENCED, CONSCIENTIOUS ASSOCIATES FOR TROUBLE-FREE PERFORMANCE AND ENERGY EFFICIENCY. WHAT'S THE SECRET? INTELLIGENT DESIGN. PRECISE FABRICATION. EASY INSTALLATION. WE PLACE A HIGH VALUE ON VALUE. ASK ABOUT OUR INDUSTRY-LEADING 10-YEAR STANDARD WARRANTY.

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CIRCLE 37 ON INQUIRY CARD

METALS

Architectural metalwork • Perforated metals Railings and handrails

The metal products submitted for our panel's review had uses ranging from the structural and utilitarian to the sculptural. Whether bolted, welded, cast, or woven together, they provided a wide range of architectural possibilities. While all of the metal products were well received by the judges, the five below really caught their eye.

Interior and exterior cable net

DecorCable's stainless-steel X-Tend flexible cable net can be used for displays, shelving, furniture, stairways, or cable components. The stainless-steel fabric mesh, for interior and exterior use, has the structural properties of a membrane or tent. 800/444-6271. DecorCable, Chicago. **CIRCLE 224**

Custom-designed frieze

For a client who wanted to re-create a wall frieze from the SS *Normandie* for his home, Forms + Surfaces used a bonded metal in a resin mold. The design team worked from a color photograph that documented the Art Deco frieze, which was destroyed when the ship burned. It measures 7½ feet by 11 feet by 3 inches. 877/626-7788. Forms + Surfaces, Carpinteria, Calif. **CIRCLE 225**

Railings for children

Hewi's balustrades now include small-diameter handrails at the right height for children. The rails are made of nylon with steel inserts. 877/HEWI-INC. Hewi, Lancaster, Pa. **CIRCLE 226**

Metal column covers

MM Systems' aluminum column covers feature circular, round, and rectangular profiles. Available in 36 standard and custom color finishes and covered with Kynar 500 or Hylar 5000. 800/241-3460. MM Systems, Tucker, Ga. **CIRCLE 227**

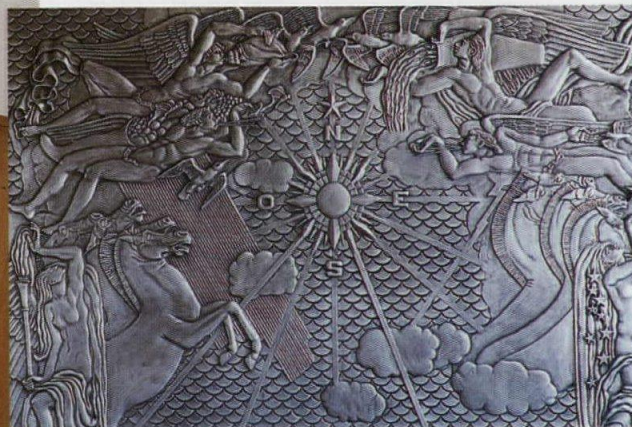
Exterior metal cladding

Foamwall, Centria's exterior metal cladding, is a lightweight, highly insulated composite panel system. 412/299-8240. Centria, Moon Township, Pa. **CIRCLE 228**

ENTRIES IN THIS CATEGORY CONTAINED THE MOST VARIETY OF COLOR, TEXTURE, AND FORM AND COVERED THE WIDEST RANGE OF APPLICATIONS. —Robert Siegel



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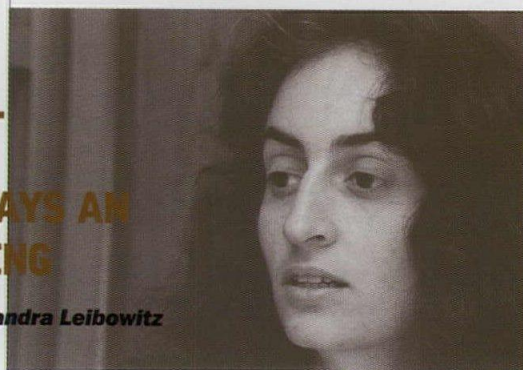
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WOODS & PLASTICS

Architectural woodwork • Laminates Prefabricated wood joists and trusses

While forest preservation continues to be an important topic in the environmental movement, its relevance to designers lies in the choices they make about the type and quantity of wood to specify. In selecting products within this category, the judges kept these issues in mind, choosing, for instance, a guide to specifying certified forest products.

ALONG WITH THOUGHTFUL USE OF ENGINEERED LUMBER, 'GOOD WOOD' PLAYS AN IMPORTANT ROLE IN PRESERVING FOREST HEALTH. —Sandra Leibowitz



Prefab shearwall

The Simpson Strong-Wall is a factory-built wood shearwall that comes complete with preattached hold-downs. Less expensive than site-built shearwalls, it also provides more strength. 800/999-5099. Simpson Strong-Tie, Pleasanton, Calif. **CIRCLE 229**

Perforated plastic sheets

Plasti-Perf, a perforated polypropylene plastic sheet, is stocked in .063 and .125 gauges, and with hole sizes from 3/8- to 5/8-inch. 800/237-3820. McNichols Co., Tampa. **CIRCLE 230**

Engineered wood beams

Parallam parallel strand lumber beams can span up to 60 feet. The high-strength, defect-free beams are available in cambered and noncambered configurations. 800/423-5808. Trus Joist MacMillan, Boise. **CIRCLE 231**

Certified forest products guide

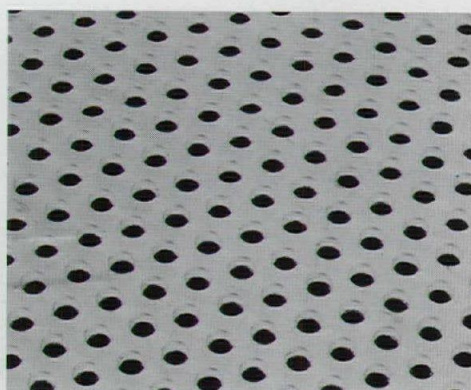
To qualify as a certified forest product, a wood product must come from a forest that has been independently audited to ensure it is being managed in a way that maintains the health of the ecosystem. This brochure explains how to develop specifications for such products. 503/590-6600. Certified Forest Products Council, Beaverton, Oreg. **CIRCLE 232**

High-pressure laminates

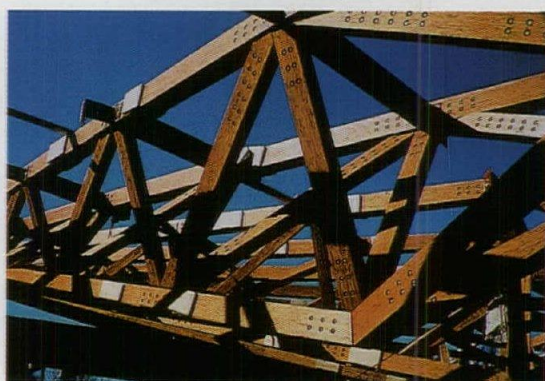
ChemArmor high-pressure laminates are resistant to more than 100 substances, including acids, solvents, bases, reagents, and difficult stains, such as India ink. Almost two dozen colors and patterns are available. 800/638-4380. Nevamar, Oderton, Md. **CIRCLE 233**



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TODAY'S PRODUCTS DEMONSTRATE THAT ARCHITECTS DON'T NEED TO ENDANGER RESOURCES TO ACHIEVE STYLE. —*Elana Frankel*

EDITOR'S CHOICE

Balustrade system

Style-Mark has added seven new sizes of balustrades and two new sizes of rails to its product line. The traditionally styled balusters, made from fiberglass-reinforced urethane, are now available in heights from 18 to 36 inches. The rail system includes balusters, top and base rails, and newels. The newels and rails are also made from urethane but are reinforced with PVC. The system is double-primed using a UV-stable exterior coating that requires no additional finish, and is resistant to rot, weather, and insect damage. 800/446-3040. Style-Mark, Archbold, Ohio. **CIRCLE 234**

Engineered wood product line

Willamette's line of engineered wood products, called the E-Z Frame system, consists of glulam beams capable of spanning up to 130 feet in several grades and sizes; StrucLam laminated veneer lumber, for unexposed headers and beams; StrucJoist engineered wood joists, for floors or roofing; and E-Z Rim Board, for rim joists. The company backs up the system with a staff of engineers and field representatives, and provides a guarantee that all of its products are free from defects. 541/926-7771. Willamette, Albany, Oreg. **CIRCLE 235**

Laminate flooring

Bruce Laminate Floors has expanded its Traffic Zone oak collection to include Mountain Oak. The product is available in 7½-inch-wide strips to produce a wide-plank appearance, and comes in natural and chestnut finishes. Other additions to the Traffic Zone line include Toledo, a 15½-inch-square pattern inspired by ceramic tile, and Terrana, an octagon-shaped stone pattern that can incorporate matching or contrasting diamond-shaped accent patterns. The Toledo and Terrana patterns are available in two colors, Rossa and Fontana. The ¾-inch-thick materials can be installed over existing floors. 800/722-4647. Bruce Laminate Floors, Dallas. **CIRCLE 236**



234



235



236

THERMAL & MOISTURE

**Protection • Insulation • Siding
Roof and wall panels • Skylight structures**

In a category that is not always known for sustainable or environmentally friendly products, the judges identified responsible manufacturers who are creating some new and noteworthy items. Sustainability expert Sandra Leibowitz from HOK was particularly excited by these recent developments.

WE CHOSE ENVIRONMENTALLY SOUND PRODUCTS IN THIS CATEGORY, INCLUDING INSULATION THAT DOES NOT USE HCFCs AND A COPPER ROOF THAT'S LEAD-FREE. —Sandra Leibowitz

PRODUCTS

Pan and batten system

This new pan and batten system uses an ultra-high batten cap in heights up to 11 inches to create deep profiles and cast shadows. 909/829-8618. Custom Panel Industries, Rancho Cucamonga, Calif.

CIRCLE 237

Fire-finished building panel

AFM's FireFinish is an R-Control structural building panel with a fire-resistant thermal barrier directly applied to the OSB surface, eliminating the need for gypsum board. 877/R-CONTROL. AFM, Excelsior, Minn. **CIRCLE 238**

HVAC duct insulation

ToughGard Ultra Round is a new semi-rigid acoustical and thermal insulation used to line spiral and oval metal HVAC duct systems from CertainTeed. 800/233-8990. CertainTeed, Valley Forge, Pa. **CIRCLE 239**

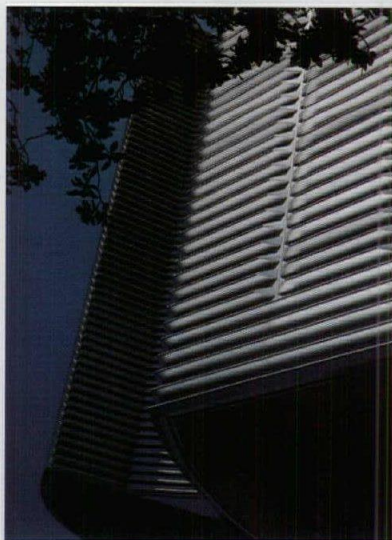
Environmental insulation

AFM's Perform Guard is insect-resistant, expanded polystyrene (EPS) insulation that does not contain CFCs, HCFCs, or formaldehyde, preventing decomposition, decay, and off-gassing. Perform Guard is used with AFM's R-Control and Diamond Snap-Form concrete-forming systems. 877/R-CONTROL. AFM, Excelsior, Minn.

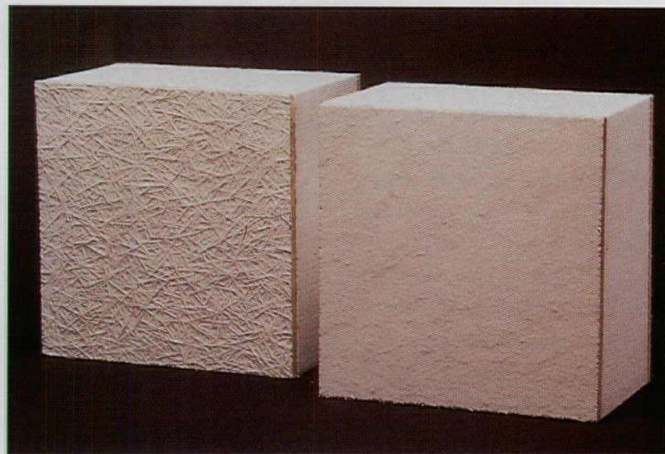
CIRCLE 240

Lead-free roofing

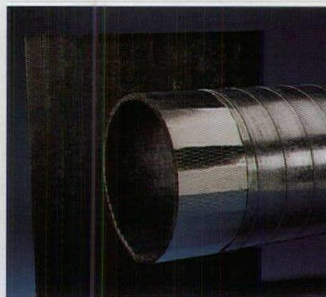
FreedomGray roofing is made from Revere Copper and is coated with a preweathered zinc/tin coating from Follansbee. The process gives the lead-free roofing a weathered gray look. 800/448-1776. Revere Copper Products, Rome, N.Y. **CIRCLE 241**



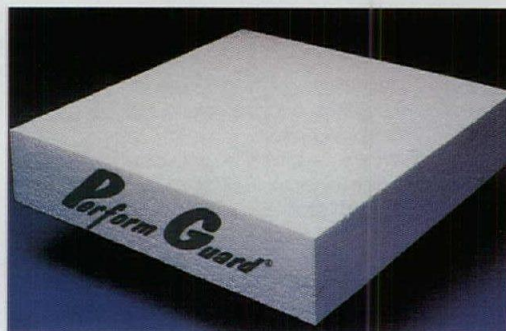
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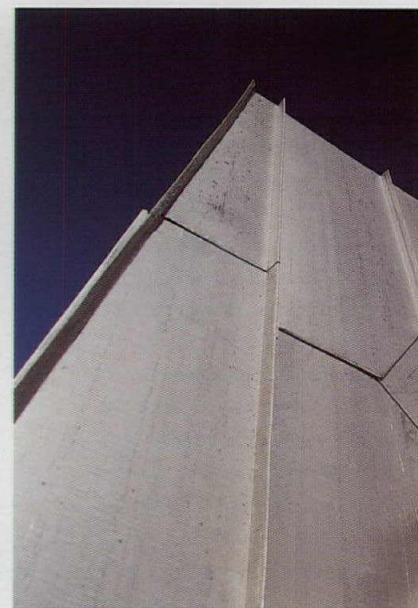
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EDITOR'S CHOICE

Coating application

Reynolds Metal's collection of architectural products now includes Durogloss Colorweld 3000, a polymer-based paint finish in bright glossy colors for the company's Reynobond aluminum composite material (ACM) and flat-sheet material. Durogloss-painted ACM and flat sheet are available in standard colors; they can also be matched to custom corporate colors. Applications for the finish include canopies, signage, columns, fascia, trim, and accents. 804/281-3939. Reynolds Metal Company, Richmond, Va.

CIRCLE 242

Mortarless siding

Novabrik from Allan Block is a split-face concrete masonry product made with an interlocking tongue-and-groove design that screws into place. It does not require a foundation and does not need to be installed by brickmasons. Color options include snow white and rustic red, among others. Measuring 3 by 2.6 by 8 inches, Novabrik can be used in both commercial and residential settings. 800/899-5309. Allan Block, Edina, Minn.

CIRCLE 243

Enhanced board performance

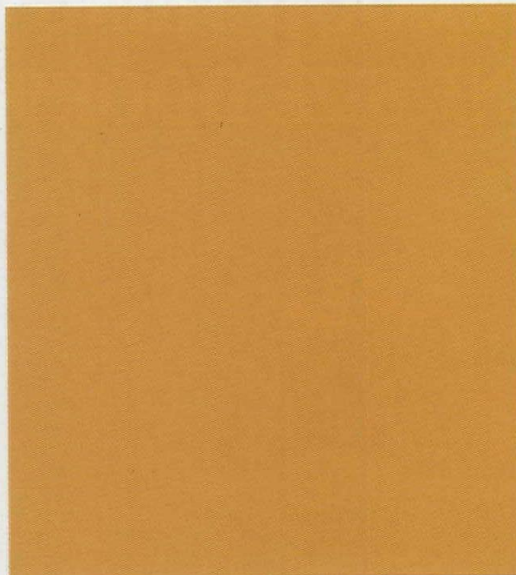
Johns Manville's new darker TopLoc coating for its Fesco and Retro-Fit boards optimizes the bitumen adhesion between membrane and board. Mopping asphalt takes more easily to the improved surface because it's smoother and produces less dust. 303/294-9944. Johns Manville, Denver. **CIRCLE 244**

Light block shades

The electric LightBlock shade from VELUX-AMERICA, Inc., is available for all models and sizes of the company's roof windows and skylights. The shade has an energy-efficient coating that reflects heat. LightBlock is available in eggshell white. 800/283-2831. VELUX-AMERICA, Inc. Greenwood, S.C. **CIRCLE 245**

Exterior insulation finish

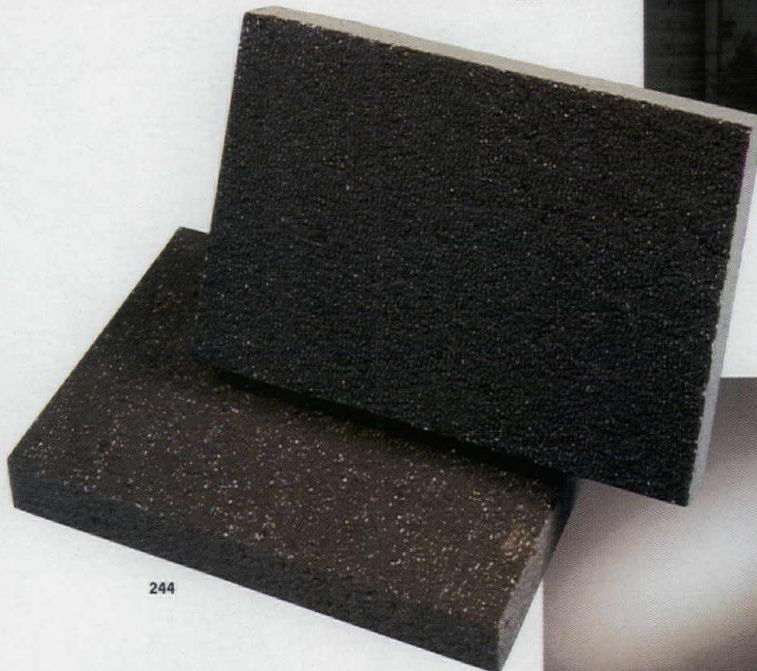
TEC's Ful-O-Mite exterior insulation finish system can be applied in the field to approved substrate; panelized in the pre-assembly stage and built into place on the skeleton; or created in a combination of the two. The installed system weighs approximately one pound per square foot. TEC offers 16 standard colors as well as custom shades. 800/323-7407. TEC, Inc., Palatine, Ill. **CIRCLE 246**



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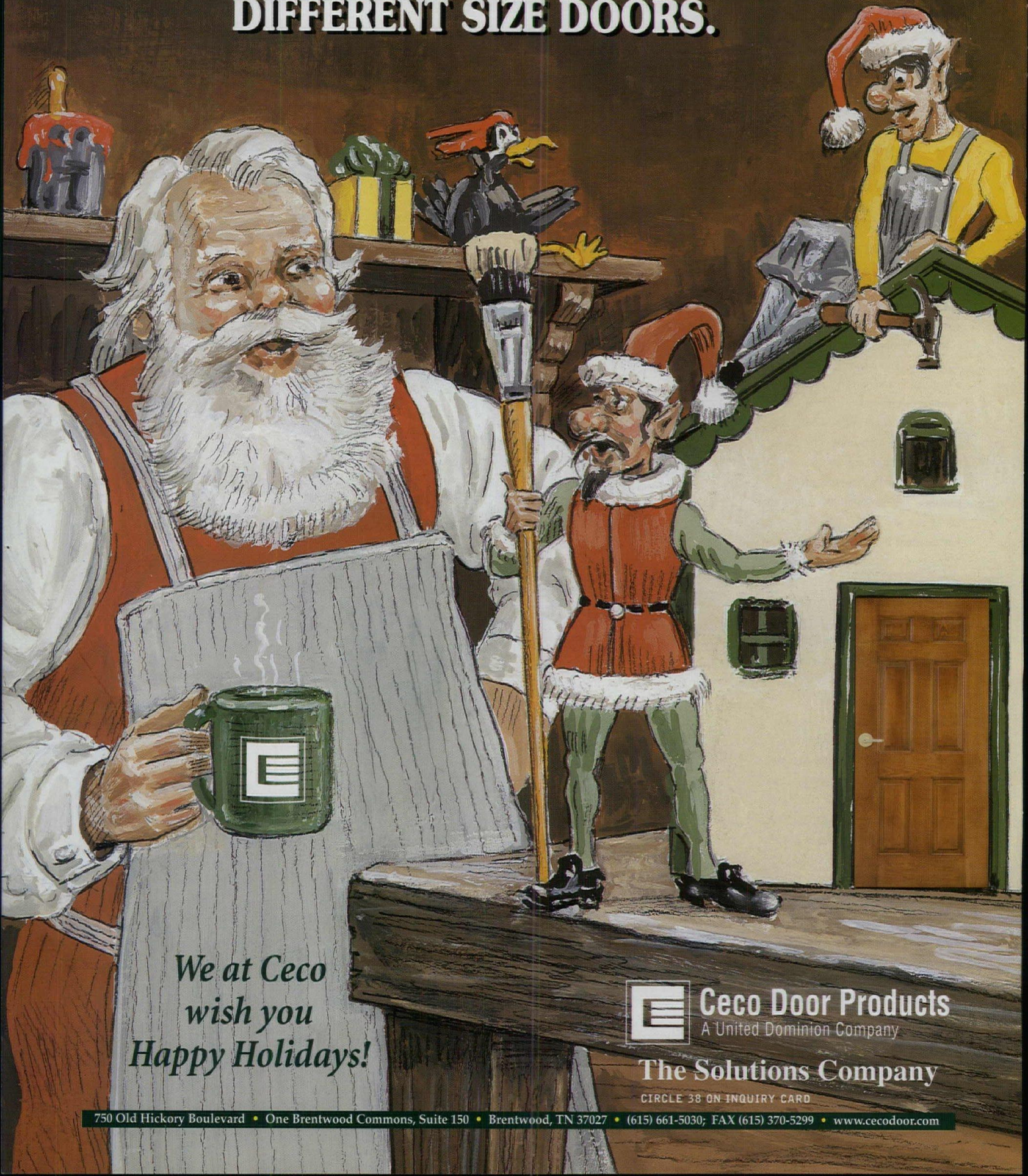


245



246

**HEY BOSS, IT'S A GOOD THING CECO MAKES
DIFFERENT SIZE DOORS.**



*We at Ceco
wish you
Happy Holidays!*



Ceco Door Products
A United Dominion Company

The Solutions Company

CIRCLE 38 ON INQUIRY CARD

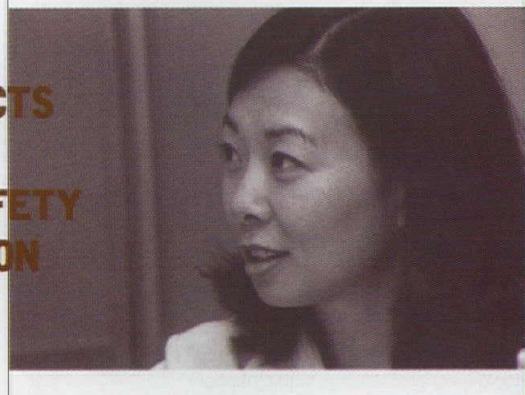
750 Old Hickory Boulevard • One Brentwood Commons, Suite 150 • Brentwood, TN 37027 • (615) 661-5030; FAX (615) 370-5299 • www.cecodoor.com

DOORS & WINDOWS

Fire-rated glazed wall/door assemblies Weatherstripping and thresholds • Special doors

When evaluating products in this category, as in the others, the judges used performance, appearance, and value as their criteria. However, here they were also concerned with personal safety and protection from the elements. Most of the products chosen deal with these issues in new ways.

**WE FAVORED PRODUCTS
IN THIS CATEGORY THAT
TOOK PERSONAL SAFETY
AS WELL AS INNOVATION
INTO ACCOUNT. —Berni Hui**



Engineered water flashing

The Sto Sill Sentry captures water from beneath windows and other wall openings and channels it to the exterior of the wall, preventing it from entering the wall cavity. The flashing is made of rigid polyvinyl chloride (PVC) and can support the weight of windows or doors. It is non-corrosive, nonstaining, and eliminates the thermal bridge between exterior and interior. The Sto Sill Sentry can be used for both new and retrofit applications. It is available in 10-foot lengths, which are cut on site to custom-fit each window opening. 888/522-0184. Sto Corp., Atlanta. **CIRCLE 247**

Upward-acting glass doors

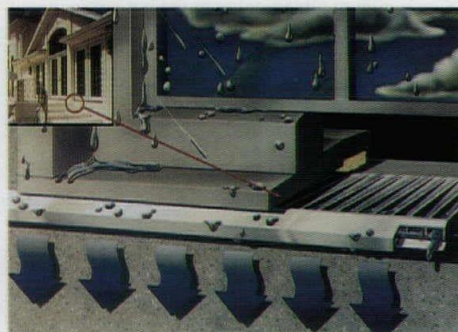
Clopay's Model 901, a full-view, upward-acting sectional door, is available with insulated glass, wire glass, Plexiglas, DSB, or aluminum panels. It provides protection against rain, snow, heat, and cold and is designed to withstand wind-load pressures as required by building codes. Standard finishes include white or brown, clear anodized aluminum, or anodized bronze. Glazing options, such as thermal glass, are also available. 800/2CLOPAY. Clopay Building Products, Cincinnati. **CIRCLE 248**

Fire-rated glazing

FireLite Plus is a wireless glass that is fire-rated and impact-safe, meeting ANSI standard Z97.1 and CPSC standard 16FR1201 in category II. The glazing fits in standard fire-rated frames and comes in sizes up to 36 by 84 inches. 800/426-0279. Technical Glass Products, Kirkland, Wash. **CIRCLE 249**



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247



249

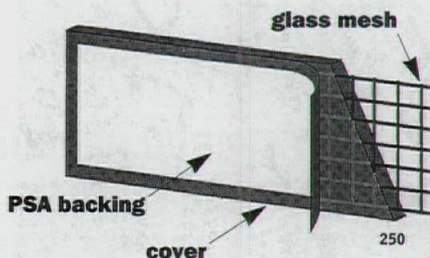
continued

DOORS & WINDOWS

Fire-rated glazed wall/door assemblies
Weatherstripping and thresholds • Special doors

Intumescent glazing tape

Zero International's intumet glazing tape has successfully been tested with 3/4-inch wire glass for positive-pressure fire performance under the new UBC 7-2 1997 fire door standard. It is applied using pressure-sensitive adhesive (PSA), eliminating the spacers and caulks used by other systems. 800/635-5335. Zero International, Bronx, N.Y. **CIRCLE 250**



Composite sectional door

The Genesis sectional door is made of a composite material called Fybron. It is dent- and rust-proof, scratch-resistant, and will not pinch fingers when manually opened or closed. The door is available in a white or almond powder-coat and in three sizes. 800/4-RAYNOR, Raynor Garage Doors, Dixon, Ill. **CIRCLE 251**



Fire-rated glazing compound

FireGlaze is a black flexible sealant that is gun-applied. It allows glass panels up to 106 inches (in any direction) to be 20-, 45-, and 90-minute fire rated when used with a hollow metal door and frame, and Pilkington's Pyroshield polished 3/4-inch wire glass. 800/283-9988. Pemko Manufacturing, Ventura, Calif. **CIRCLE 252**



Hardware by Sir Norman

Sir Norman Foster has designed a collection of hardware for Fusital, a division of Gruppo Valli & Valli. Foster was inspired by the form of a bird in creating these new designs, which are available in wood, metal, black rubber, leather, and other materials. The Italian hardware manufacturer also produces door levers, knobs, and other accessories. 800/423-7161. Gruppo Valli & Valli, Duarte, Calif. **CIRCLE 253**



Exit door device

Von Duprin has introduced fire exit hardware that does not need a bottom rod. The less-bottom-rod option eliminates the need for a floor strike, reducing the installation and maintenance associated with vertical rod applications. Applied to pairs of doors, the device includes a spring-loaded latch that installs in the lower door edge. When exposed to heat, the latch releases one door leaf and engages the other, keeping doors closed and aligned during a fire. 317/897-9944. Von Duprin, Indianapolis. **CIRCLE 254**



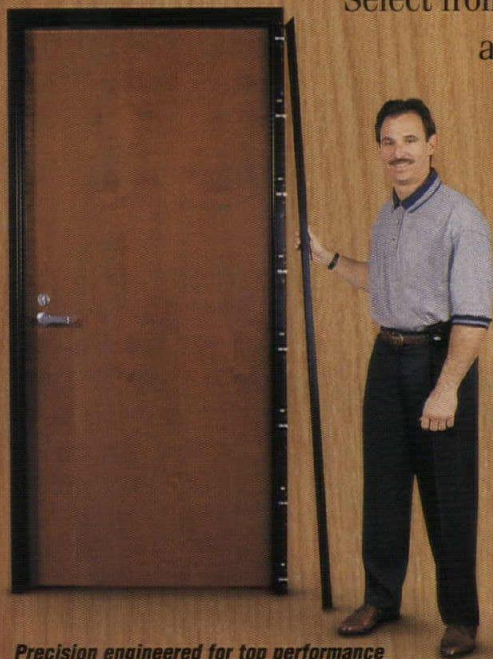
PRODUCTS

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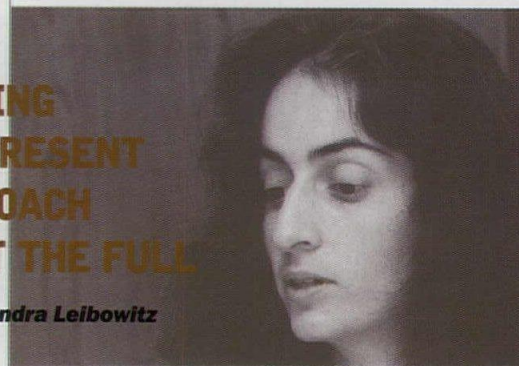
CIRCLE 39 ON INQUIRY CARD

FINISHES

**Carpet • Tile • Tile-setting materials & accessories
Resilient flooring • Ceiling systems**

This year, mosaic, patterned, and inlay tile were all the rage. As the demand for quality products and skilled installers increased, manufacturers delivered the goods, from terrazzo-style tile to an in-depth, technical, tile-installation guide. Another trend that emerged this year was carpet recycling, which extends the life of a product in an ecofriendly way.

**PRODUCTS ARE NOW BEING
MADE THAT REPRESENT
A SIGNIFICANT NEW APPROACH
TO THINKING ABOUT THE FULL
LIFE CYCLE OF FINISHES.** —Sandra Leibowitz



PRODUCTS

Terrazzo-like tiles

Bisazza's new Logos collection, designed by Atelier Mendini, includes terrazzo-like tiles for floors, walls, counters, and, because they are lightweight, even furniture veneer. They can also be used on preexisting floors or surfaces. To create the tiles, glass granules held together by an organic amalgam are embedded in a composite base, creating a glistening effect. At right, Logos is shown with Bisazza's Le Gemme glass mosaic tiles and Oro 24 karat gold-leaf mosaics on a wall. 305/597-4099. Bisazza, Miami.

CIRCLE 255

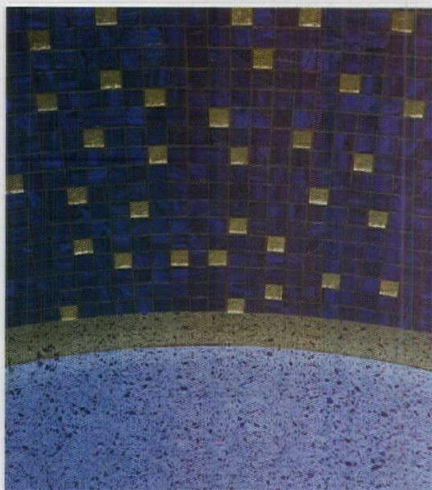
Street-smart tiles

Based on images and textures from the streets of lower Manhattan, Street Smarts ceramic tiles from Imagine Tile are made with all-natural materials to look like manhole covers, asphalt, and crosswalks. Floor tiles are available in eight, 12, or 16 inches square and in glossy or slip-resistant surfaces. Wall tiles are available in eight or 10 inches square. 800/680-TILE. Imagine Tile, Jersey City, N.J. **CIRCLE 256**

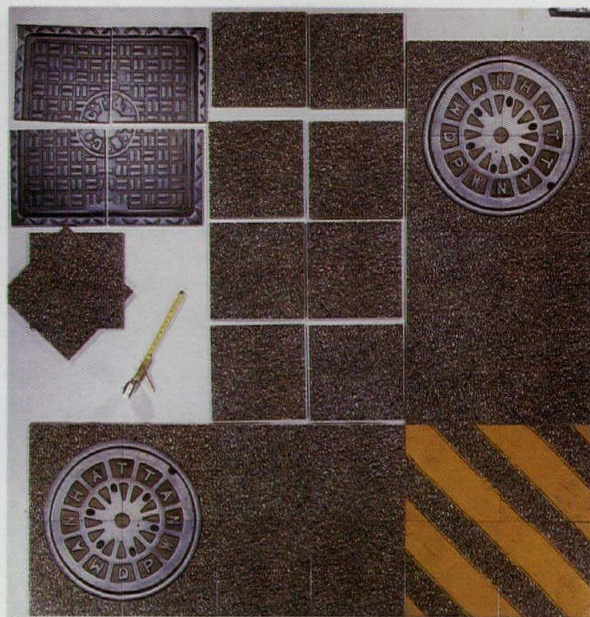
Resilient flooring

LonFloor Galvanized resilient sheet vinyl flooring from Lonseal looks like a solid surface but has a subtle galvanized pattern. The flooring has a wear layer of .016 inches and a cloth backing measuring .084 inches. It is available in six-by-60-foot rolls in seven patterns: White Diamond, Platinum, Peridot, Black Pearl, Crystal Blue, Gold, and Granite. 800/832-7111. Lonseal, Carson, Calif.

CIRCLE 257



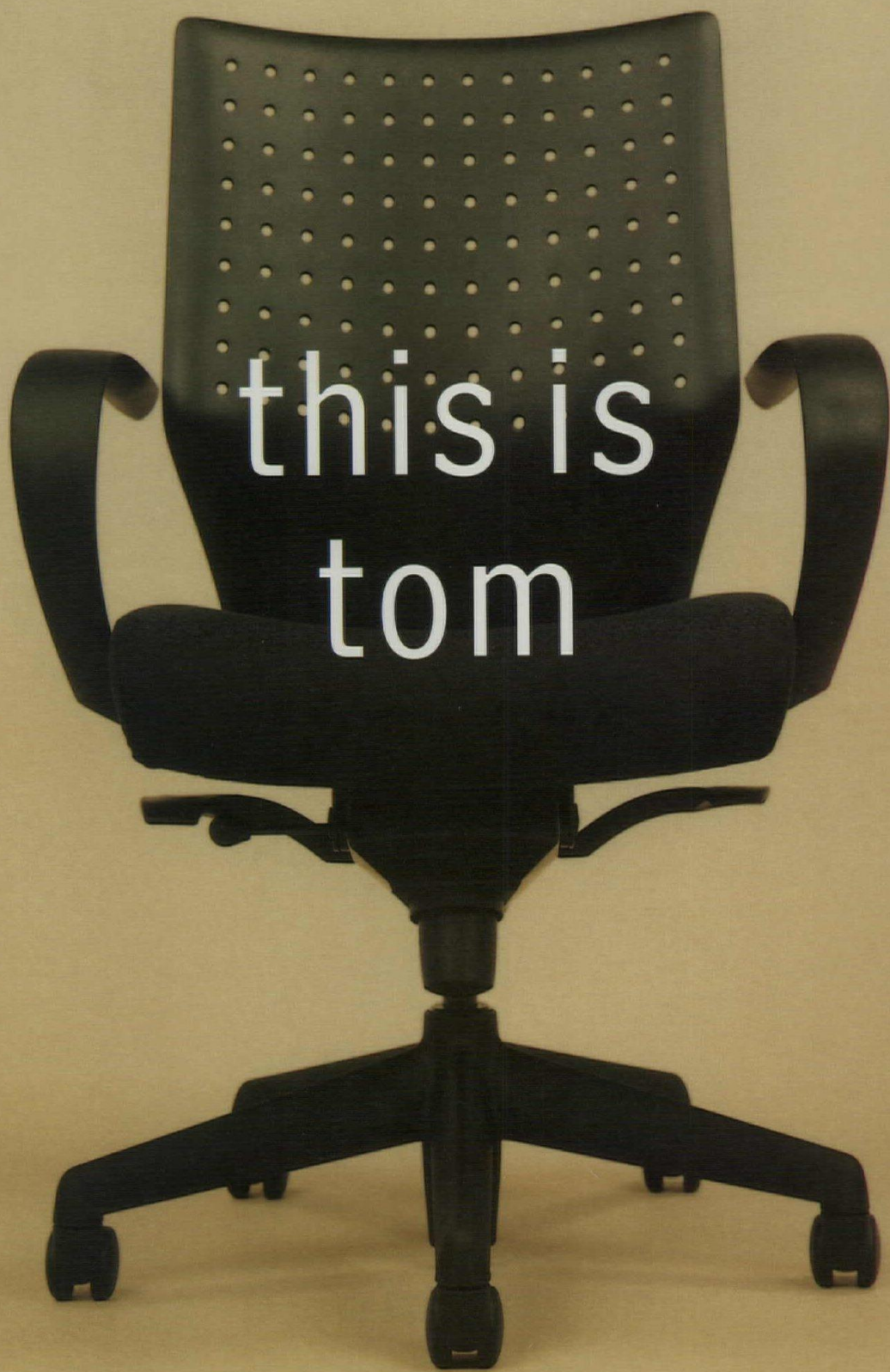
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256



257



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Ceiling system

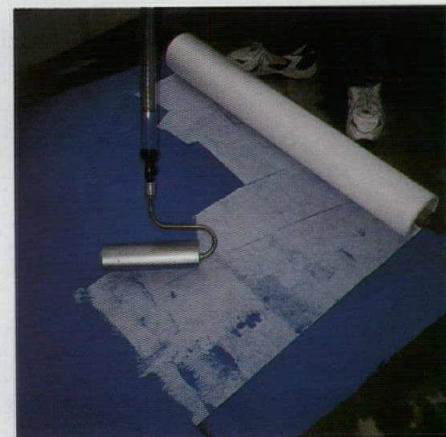
Gordon's Aluma-Vault is a ceiling grid system that integrates lighting, air handling, and sprinklers. Shown here is the ceiling in a ballroom at the Denver Center for the Performing Arts. The lighting combines recessed incandescents and fiber optics. The curved cross runners, spaced three feet apart, provide the housing for the sprinklers and fiber optics. Movable theatrical lights are hung throughout the ceiling by two-way hinging access panels made from perforated aluminum. 800/747-8954. Gordon, Shreveport, La. **CIRCLE 258**



258

Antifracture tile and stone

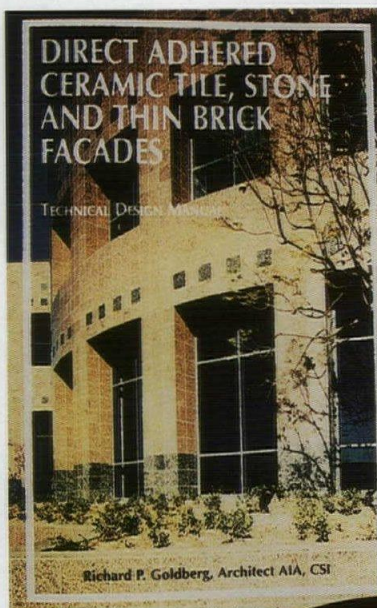
Laticrete's Blue 92 is a two-part system for tile and stone floors that consists of a blue liquid rubber and a reinforcing fabric. The company offers a written guarantee that the system will prevent tile and stone floors from cracking. 800/359-3297. Laticrete, Bethany, Conn. **CIRCLE 259**



259

Exterior tile-installation guide

Laticrete has published an information and technical guide by Richard Goldberg, AIA, for the design community. The book is a technical manual that provides step-by-step methodologies for installing direct-adhered tile, stone, and thin brick on building facades. 800/359-3297. Laticrete, Bethany, Conn. **CIRCLE 260**



260

Renewable carpet program

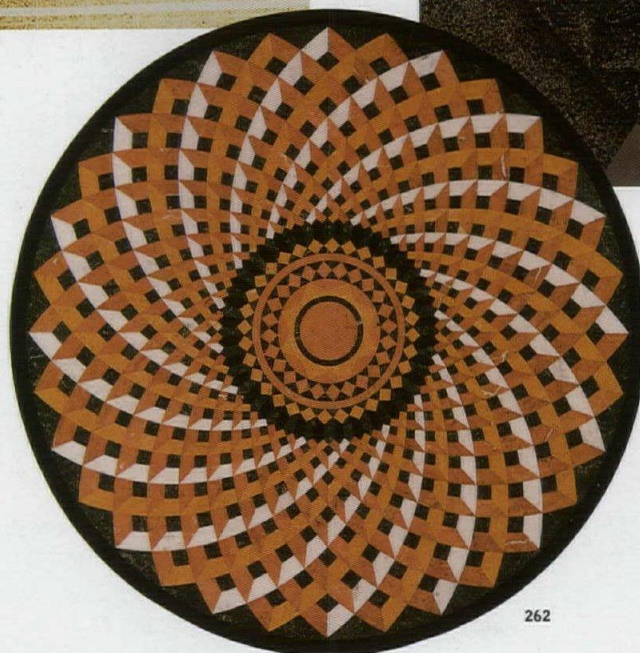
Earth Square, Milliken Carpet's renewable carpet program, rejuvenates old carpet for reuse. In a three-step process, customers' old carpet tiles are super-cleaned, retextured, and dyed, creating recycled tiles that cost 50 percent less than new carpet. Milliken will ship the carpet back to the customer to be reinstalled. All Milliken carpets can be renewed through the Earth Square process. 877/E2-RENEW. Milliken Carpet, West LaGrange, Ga. **CIRCLE 261**



261

Inlaying elegance

In Latin, *intarsia* refers to the process of inlaying fine materials to create lasting beauty and elegance. The American company Intarsia uses waterjet cutting, directed by a CAD/CAM computer, to create elaborate marble and granite designs. The Medallions collection, an example of which is shown at right, comes assembled in round, oval, square, or rectangular formats in 24- to 96-inch sizes. 407/859-5800. Intarsia, Orlando, Fla. **CIRCLE 262**



262

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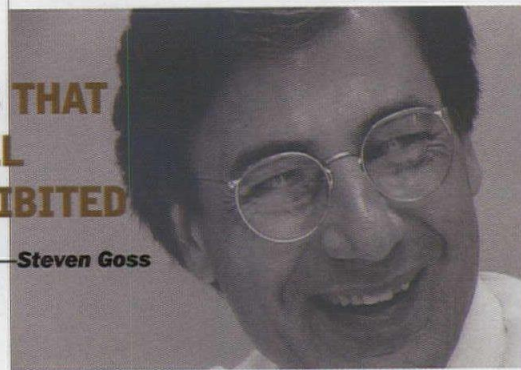
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SPECIALTIES

Toilet, bath, and office accessories

When choosing products in the specialties category, the judges favored those that got their points across clearly and simply. Starck's elegant bathroom fixtures, Steelcase's unique power accessories for the office, American Specialties' user-friendly hand dryer, and Metpar's ecofriendly toilet partitions all exhibit a single strong idea.

THE SUBMISSIONS THAT STOOD OUT FOR THE PANEL WERE THOSE THAT EXHIBITED A SINGLE STRONG IDEA. —Steven Goss



Bathroom collection

Philippe Starck has designed a new bathroom collection called Edition 2, available from Duravit. The collection includes an elegant one-piece porcelain toilet with an elongated bowl. 888/387-2848. Duravit, Duluth, Ga. **CIRCLE 263**

ADA-compliant hand dryer

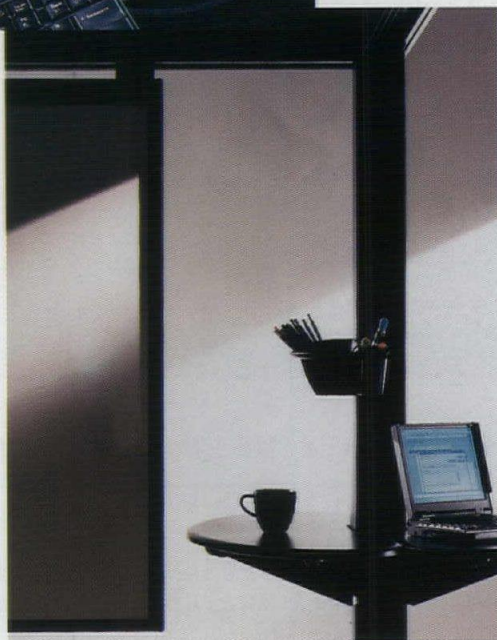
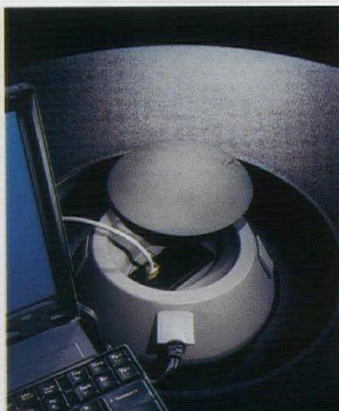
American Specialties has developed an ADA-compliant surface-mounted hand dryer. The Profile dryer's infrared sensors start the dual jets of warm air when hands are placed under the nozzle. The dryer stops when hands are taken away. 914/476-9000. American Specialties, Yonkers, N.Y. **CIRCLE 264**

Office system enhancements

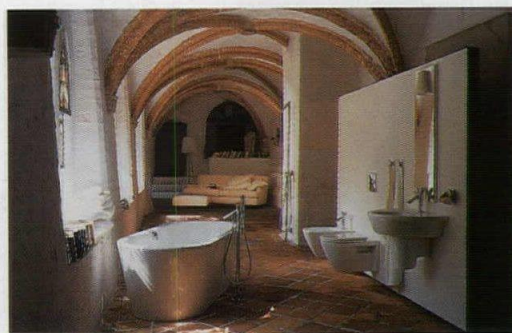
Two new components of Steelcase's office system are the Conjunction corner shelves and hub table and post. The shelves fit around power access structures, while the table and post are modular components that house four electrical outlets on a single circuit and accommodate one communication faceplate. 800/333-9939 x799. Steelcase, Grand Rapids, Mich. **CIRCLE 265**

Toilet partitions

Metpar's Polly toilet partitions are made from fire-rated recycled plastic. Other features include a concealed lock with an in-use indicator; stainless-steel pilaster mountings with leveling bolts; contoured corners on the doors and panels; and heat sinks on all the doors and panels. A lifetime guarantee promises that the plastic will never rust or delaminate. 516/333-2600. Metpar, Westbury, N.Y. **CIRCLE 266**



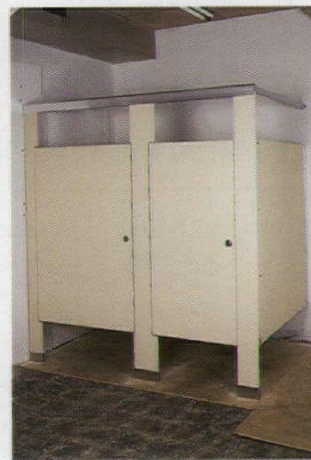
265



263



264



266

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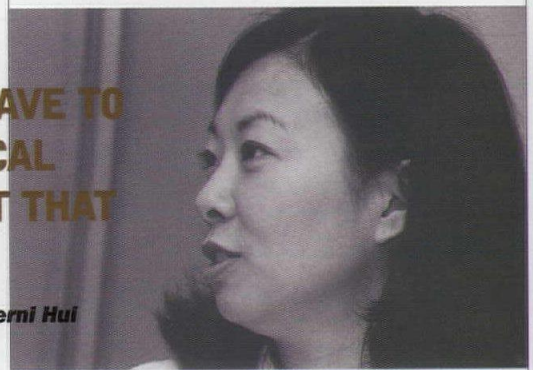


EQUIPMENT

Residential appliances • Waste chutes and collectors Audiovisual equipment

The panel chose products in this category that represent technological trends affecting equipment for both corporate and residential environments. Audiovisual products, like Smart Board, and appliances, like Viking's and Jenn-Air's kitchen stovetops, are enhancing the workplace and bringing commercial standards to the home.

AS DESIGNERS, WE HAVE TO KNOW ABOUT TECHNOLOGICAL TRENDS FOR EQUIPMENT THAT WILL PLAY A LARGE ROLE IN THE FUTURE. —Berni Hui



A dry-erase board with memory

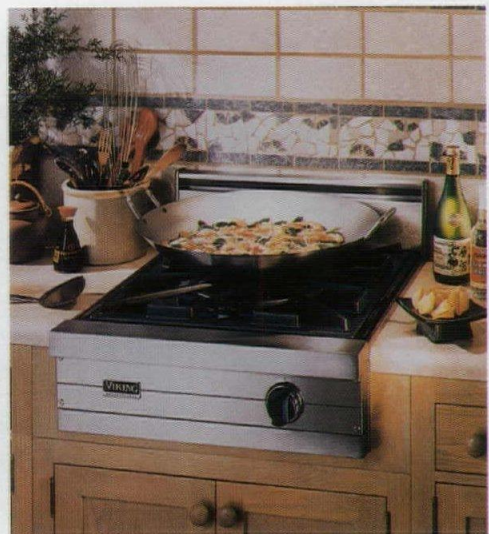
An ideal tool for design meetings, Smart Board looks and acts like a conventional dry-erase board. But when the board is linked to a computer, what's written on it can be saved to disk and printed out. Users can also use a finger as a point-and-click device to operate computer applications that are projected onto the board. 888/42-SMART. SMART Technologies, Calgary, Alta., Can. **CIRCLE 267**



267

A built-in wok for the home

This 24-inch-wide wok/cooker gives the kitchen counter a restaurant-quality cooking appliance. The gas burner reaches 27,500 BTUs. 888/845-4641. Viking Range Corp., Greenwood, Miss. **CIRCLE 268**



268

Stashing ash trash

The Bullet Buttler ash receptacle is a stylish stand-in for the conventional, open-face ash can, which always seems to be overflowing. The closed canister, rounded at both ends, comes in polished and coated aluminum and standard and custom powder-coated colors. The smaller model can handle 100 cigarette butts and the larger fits 200. 800/451-0410. Forms + Surfaces, Carpinteria, Calif. **CIRCLE 269**



269

More professional cooktops

Jenn-Air offers restaurant-quality gas cooking appliances for residential kitchens. Available in 48-, 36- (shown), and 30-inch models, the cooktop features electronic, pilotless ignition and burners that can be adjusted from 800 to 15,000 BTUs. 800/536-6247. Jenn-Air, Newton, Iowa. **CIRCLE 270**



270

FURNISHINGS

Furniture

Furniture for the home and the office (and the home office) has seen subtle improvements in recent years. Cordless blinds and an ADA-compliant filing cabinet solve safety problems, while new office chairs and adjustable workstations address ergonomic issues. The products highlighted here solve these problems in an aesthetically pleasing way.

File-friendly cabinet

The Arcus lateral file from Office Specialty is available in 60 standard colors as well as custom colors. The pulls may also be specified in 15 colors. The ADA-compliant cabinet, with four lateral drawers and a lock at the top, measures a total of 44 inches. 905/836-7676. Office Specialty, Holland Landing, Ont., Can. **CIRCLE 271**

Sit there—it's vacante

The Vacante seat from Forms + Surfaces (in cooperation with Sellex Spain) was created by architect Enric Miralles. The company is currently expanding the line to include an upholstered version in wood or metal, and complementary products such as litter receptacles, planters, side tables, and bicycle racks. 877/525-5566. Forms + Surfaces, Carpinteria, Calif. **CIRCLE 272**

Conference table with pop

Designer Edward F. Weller III has created a new conference table for Halcon's Gemini collection. The center square pops up to accommodate electronic and voice communications. 507/533-4235. Halcon, Stewartville, Minn. **CIRCLE 273**

Tiny tables

The methacrylate polystyrene tops of Zero's Art Café tables are removable for use as trays and come in black, white, blue, opaline orange, and transparent with serigraphic patterns. The supporting structure consists of cast-aluminum legs bound by a steel ring, finished in protective gray powder. 401/724-4470. In New York City, 212/925-3615. Zero U.S. Corporation, Lincoln, R.I. **CIRCLE 274**

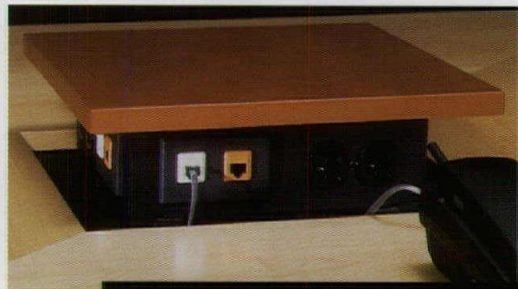
ALTHOUGH SEEMINGLY INSIGNIFICANT, A DEVELOPMENT SUCH AS THE CORDLESS BLIND IS UNDOUBTEDLY INNOVATIVE FOR THIS CATEGORY. —Berni Hui



271



272



273



274

Computer stand with flexibility

Designer Richard Holbrook has designed a new computer furniture system for Herman Miller called the Levity Suite, which consists of three components. The Interaction Tower uses a counter-weighted system to adjust the keyboard, mouse, and monitor to heights from nine to 48 inches above the floor. The equipment cart holds a CPU, a printer, and a built-in display chart. A mobile worktable provides an additional work surface. 800/851-1196. Herman Miller, Zeeland, Mich. **CIRCLE 275**

Tom terrific

Keilhauer's Tom chair is both functional and attractive. It is available in four types of upholstery; three back heights; five arm types; three seat depths; two widths; and two colors: black or gray. The Tom can be raised, lowered, tilted, and otherwise adjusted for comfort. 416/759-5665. Keilhauer, Scarborough, Ont., Can. **CIRCLE 276**

Leaning tower of shelves

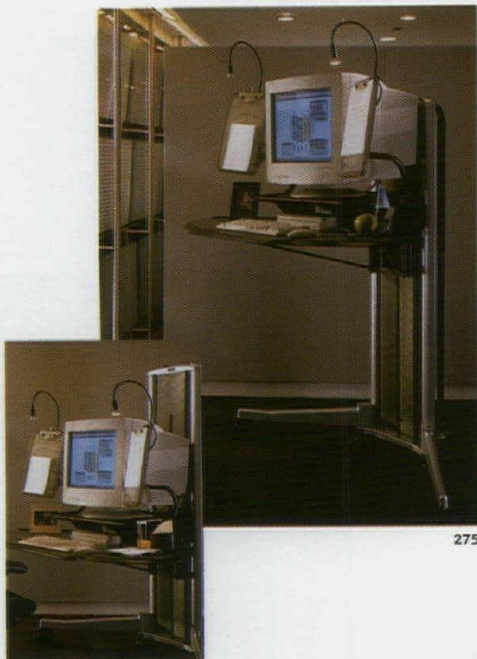
Jonah Zuckerman of City Joinery designed the remarkably stable Leaning Shelves: the more weight placed on them, the sturdier they become. The shelves shown are made from birch and walnut; other wood species are available. The shelves are 86 inches high, 56 inches wide, and 16½ inches deep, and can be joined end to end to create wider shelf systems. 718/596-6502. City Joinery, Brooklyn, N.Y. **CIRCLE 277**

Cordless blinds lead the blinds

The Mark I cordless blinds from Levolor have no lift cords and are raised and lowered simply by moving the bottom rail. This creates a safer environment for children and pets and a sleeker appearance. The blinds are tilted by turning a rod at one end. The Mark I is available in 110 colors. 800/826-8021. Levolor Contract, High Point, N.C. **CIRCLE 278**

Folding shelf brackets

Stanley Works' new folding shelf brackets allow shelves to be folded down when they are not being used, to avoid personal injury. Able to support up to 150 pounds, the brackets attach to wall studs and have a bright powdered-white finish. The brackets can accommodate shelves 12 inches deep. 800/STANLEY. The Stanley Works, New Britain, Conn. **CIRCLE 279**



275



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279

SPECIAL CONSTRUCTION

Glazed and vaulted structures

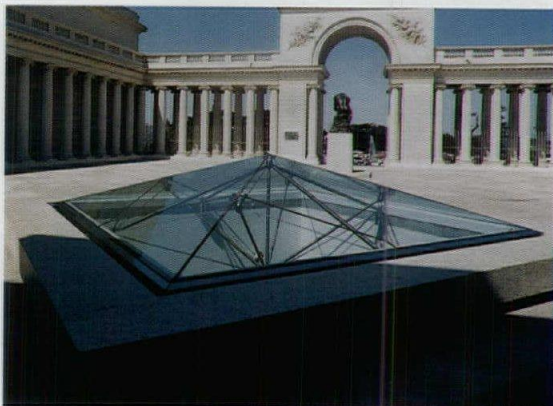
The judges had fun choosing products in this category. They opted to highlight two types of unique structural systems that are beginning to pop up in cities around the United States.

Invisible fasteners

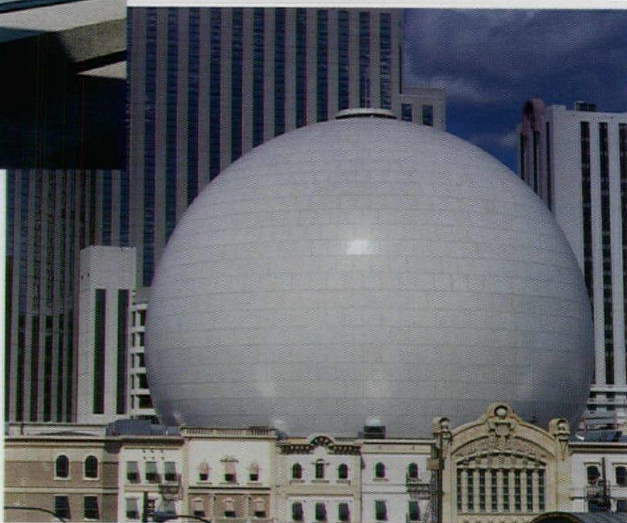
With Pilkington Planar's structural glass system, Integra, structural fasteners are placed inside a laminate layer. Integra was first used in the United States for the surface of the pyramid at the California Palace of the Legion of Honor in San Francisco (above right). 800/452-7925. W&W Glass Systems/Pilkington Planar, Nanuet, N.Y. **CIRCLE 280**

Dome-style original

Ratech specializes in the design, fabrication, and installation of vaulted architectural structures that require spherical, compound-curved, or other shapes. The company recently completed the world's largest dome—180 feet in diameter—located in Reno, Nevada. 702/827-2222. Ratech, Sparks, Nev. **CIRCLE 281**



280



281

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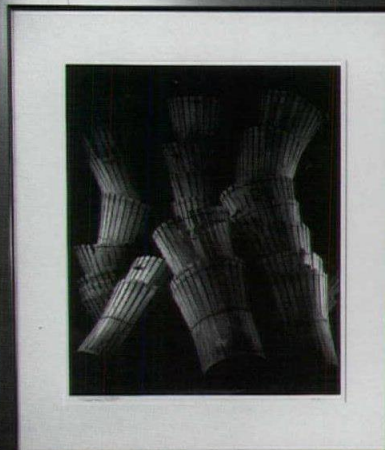
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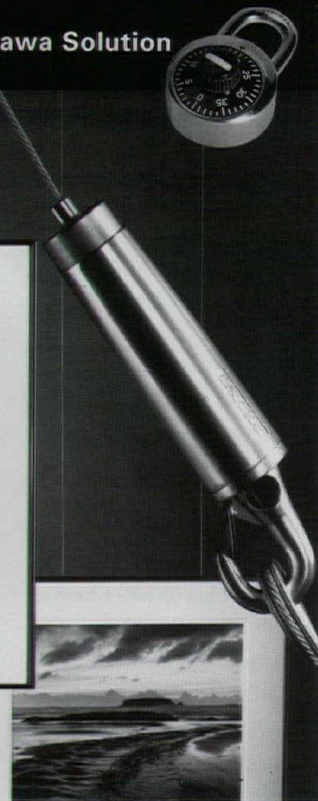
CIRCLE 41 ON INQUIRY CARD

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CIRCLE 42 ON INQUIRY CARD

CONVEYING SYSTEMS Elevators

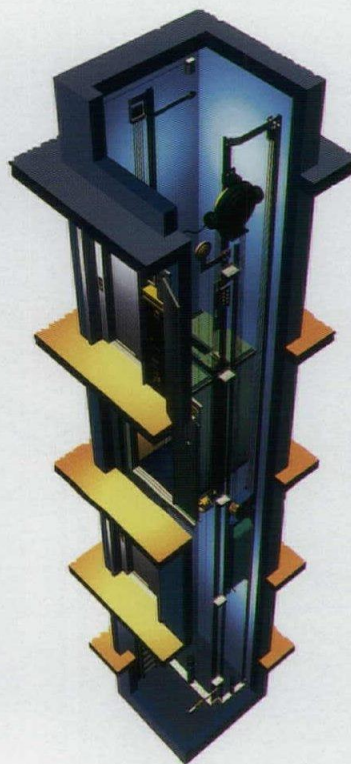
The judges were particularly impressed with the Montgomery-KONE elevator system because of its environmental friendliness: it eliminates the use of hydraulic fluid and reduces energy consumption because of its downsized power supply.

New elevator design

The AC gearless EcoSystem elevator from Montgomery-KONE (far right) is powered by EcoDisc (detail, right), a compact machine disc that integrates the traction sheave, brake flange, and rotor into a single flat, thin design with two independent brakes. The system does not need hydraulic fluid nor does it require additional building space like a penthouse unit. The EcoSystem elevator has a weight capacity of 2,000 to 2,500 pounds (NEII standard platform size); a speed of 200 feet per minute; a standard eight-foot cab; and a seven-foot entrance. 800/956-KONE. Montgomery-KONE, Moline, Ill. **CIRCLE 282**



282



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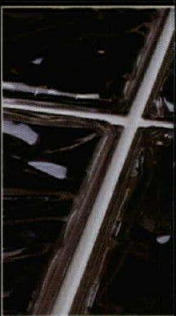
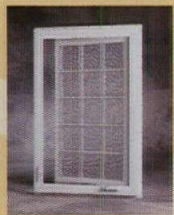
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CIRCLE 45 ON INQUIRY CARD

MECHANICAL

Plumbing fixtures and features

From a wide variety of products submitted in the mechanical category this year, the judges chose these five because of their commitment to design. From Sieger Design's classic Tara shower to Moen's futuristic faucet and filter, each presents a new way of looking at a product that is usually more concerned with function than with form.

WE LIKE TO SEE PRODUCTS THAT ARE USUALLY CONSIDERED UTILITARIAN BUT ARE ALSO WELL DESIGNED AND THOUGHT THROUGH. —Steven Goss

Water filter system

Moen's PureTouch combines a faucet and a filter in one unit. Water can flow unfiltered or, at the push of a button on the faucet's wand, be filtered through a replaceable Culligan cartridge. 800/321-8809. Moen, North Olmstead, Ohio.

CIRCLE 283

Open shower

Dornbracht's Tara, an exposed shower system created by Sieger Design, is available in polished chrome, brushed or matte platinum, and brass. The shower is wall-installed with headstand and ring. 800/774-1181. Dornbracht, Duluth, Ga.

CIRCLE 284

Temperature reset control

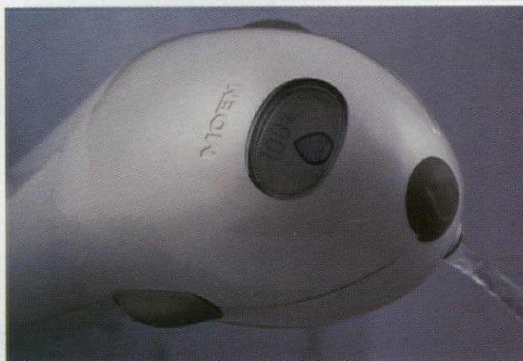
Wirsbo's DuoMix 201 is a two-temperature reset controller for a hydronic heating system. It resets two separate water temperatures using variable-speed injection mixing and primary/secondary piping. 612/891-2000. Wirsbo, Apple Valley, Minn. CIRCLE 285

Bathroom exhaust fan

American Aldes's SV 160 multiport bathroom exhaust fan vents three areas: two at 40 cfm and one at 80 cfm. 800/255-7749. American Aldes Ventilation, Sarasota, Fla. CIRCLE 286

Kitchen faucet control

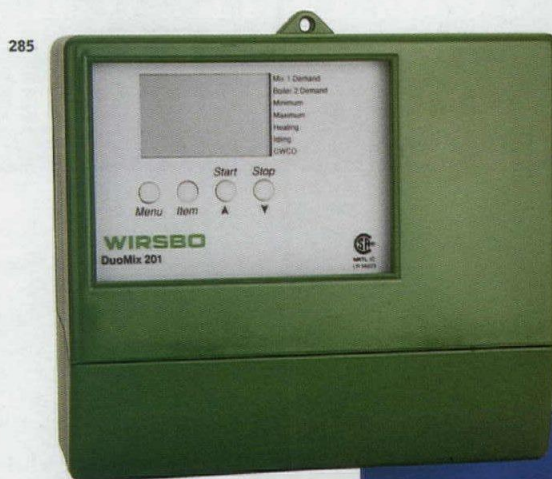
The new Allegra Linea kitchen faucet from Hansgrohe has a retractable spout and two spray settings: a nonsplash, aerated spray and a needle spray. Allegra Linea is available in four finishes: chrome, chrome/gold, white, and black. 800/719-1000. Hansgrohe, Cumming, Ga. CIRCLE 287



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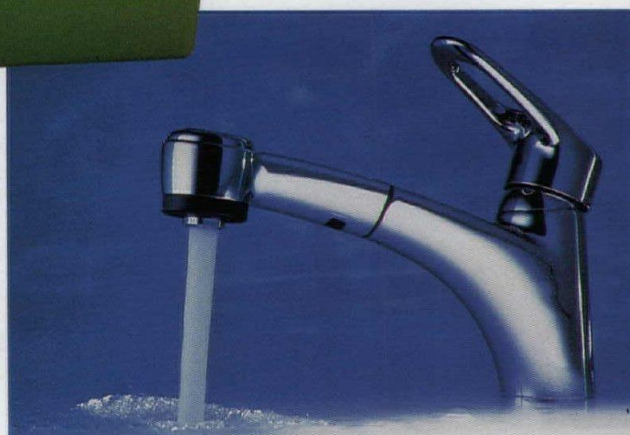
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Shown with optional accessory cartridge.

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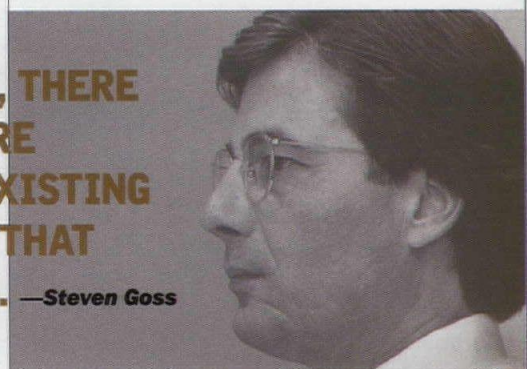
CIRCLE 46 ON INQUIRY CARD

ELECTRICAL

Lighting products

The jury noted that when it comes to lighting, designers continue to be given a wide range of options. This is true not only in terms of fixture appearance and the types of lamps available, but also in terms of emerging lighting technologies. Among the most interesting developments are those in fiber optics and sulfur lamps.

IN THIS CATEGORY, THERE ARE PRODUCTS THAT ARE IMPROVEMENTS ON EXISTING IDEAS AND THOSE THAT ARE JUST GOOD DESIGN. —Steven Goss



Bendable-stem luminaires

The Curly Torpedo's hand-bendable stem measures 3/16-inch in diameter. The luminaire requires a MR16 lamp and can be accessorized with several different shades. It can also be mounted on a track, from one- or three-point canopies. 773/883-6110. TechLighting, Chicago.

CIRCLE 288

Fiber-optic downlight

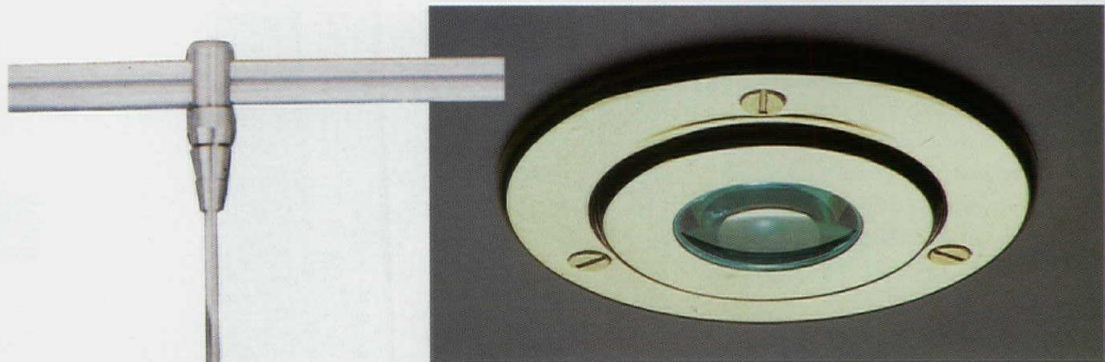
Lucifer Lighting's interior and exterior fiber-optic lighting products now include the Fiber Downlight. Light is supplied to the downlights via fiber-optic cable that originates at a remote metal-halide light source. Once installed, the downlights never need to be removed for servicing. 210/227-7329. Lucifer Lighting, San Antonio. CIRCLE 289

Mercury- and lead-free HPS

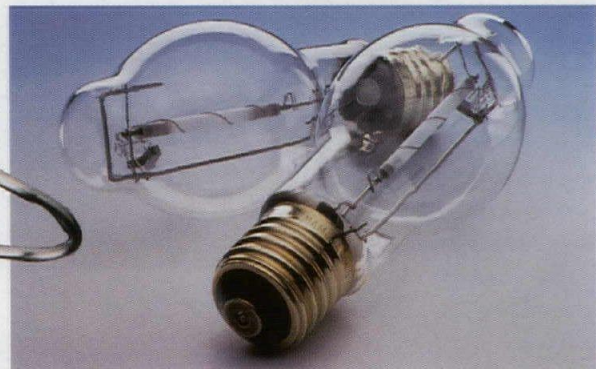
Osram Sylvania has introduced a mercury- and lead-free high-pressure sodium (HPS) lamp. The conversion of all HPS lamps currently in use to this technology could eliminate the use of 330 pounds of mercury and 14 tons of lead per year. The direct-retrofit lamps have the same light output as previous HPS lamps in equivalent wattages. 800/544-4828. Osram Sylvania, Danvers, Mass. CIRCLE 290

Outdoor light columns

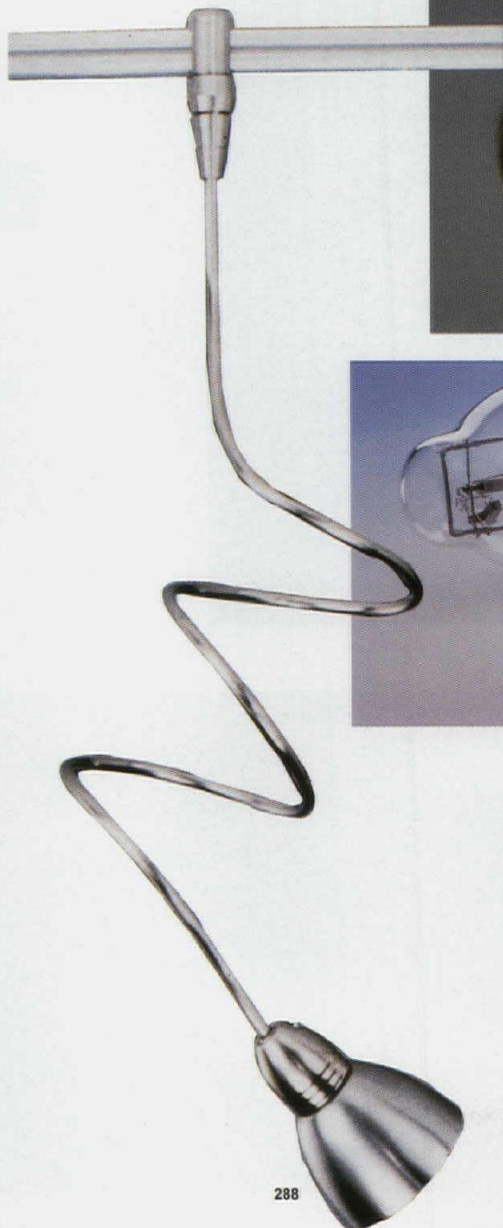
The Sierra light column by .hessamerica consists of a steel column with an integral base topped by an acrylic diffusion lens. The luminaire is available in 3½-foot, 6½-foot, and 12-foot heights and takes compact-fluorescent or metal-halide lamps. 704/471-2211. .hessamerica, Shelby, N.C. CIRCLE 291



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ELECTRICAL

Lighting products

Fluorescent on track

Mobilé's three-circuit track can accommodate T8 or T5 fluorescent uplighting and diffused downlighting fixtures, as well as aimable halogen accent lights. The track can be ceiling-integrated, suspended, or span-mounted. The system is ideal for use in spaces that change frequently. Mobilé is the first of LAM's Leuchte series of fixtures to be adapted for the U.S. lighting market. 800/732-5213. LAM Lighting Systems, Santa Ana, Calif. **CIRCLE 292**

Glass fiber light bar

Lighting Services' fiber-optic lighting system consists of a remote illuminator, bundles of glass fiber-optic cable, and light bars and fixtures. The cables do not transmit UV or infrared wavelengths, making the system ideal for illuminating heat- and UV-sensitive objects. Light bars are also useful for illuminating shelves or niches where conventional fixtures would not fit. 914/942-2800. Lighting Services, Stony Point, N.Y. **CIRCLE 293**

Compact-fluorescent dimming

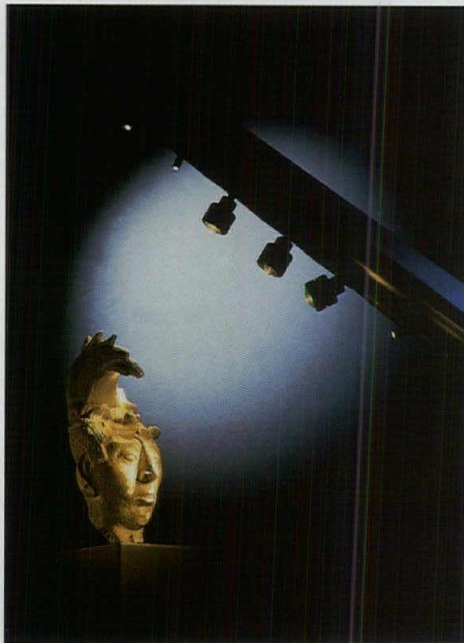
The Tu-Wire compact ballast from Lutron Electronics uses only two wires to provide power and control for dimming of 34W, four-pin, compact-fluorescent lamps. The unit is capable of smoothly dimming these lamps down to 5 percent of full light output without flickering. The unit meets FCC and commercial RFI requirements, and is designed for factory installation into architectural lighting fixtures. 877/2LUTRON. Lutron Electronics, Coopersburg, Pa. **CIRCLE 294**

Economical suspended series

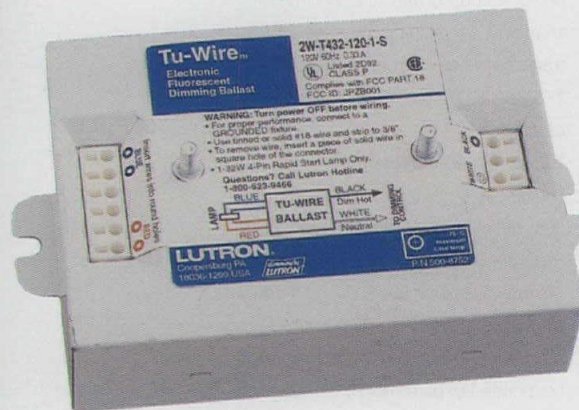
Ledalite has introduced a series of suspended fluorescent fixtures that are competitive in price with parabolic fluorescent troffers. There are five different fixtures in the line: fully perforated, semi-perforated, perforated with cutouts, perforated with louvers, and fully indirect. A patent-pending linear leveling system helps overcome the problem of sag between mounting points to ensure straight rows. The fixtures are prewired and quickly snap together to save on installation costs. 604/888-6811. Ledalite Architectural Products, Langley, B.C., Can. **CIRCLE 295**



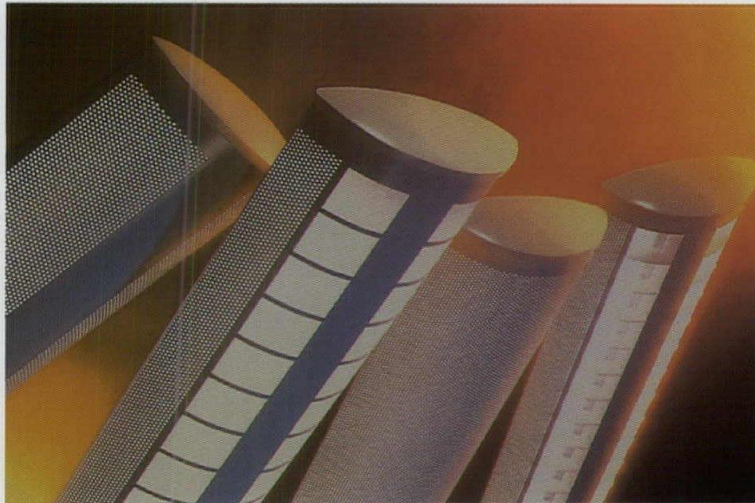
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Bivergent direct/indirect

Zumtobel's new La Trave direct/indirect linear fluorescent downlight uses a bivergence reflector for uniform illumination without glare or reflections; the indirect component of the fixture is provided by the reflector's translucent wings. The fixture, developed by the company in response to the need for better lighting in VDT environments, is available in four- and eight-foot lengths, with three or six 32W T8 lamps. 800/932-0623. Zumtobel Staff Lighting, Highland, N.Y.

CIRCLE 296

Post-top luminaire

Kipp is the newest luminaire from Louis Poulsen. Using a flat-top shade, a white internal reflector, and a conical diffuser to shield the lamp, the luminaire provides a uniform, efficient, wide distribution of light. The support arms are made of die-cast aluminum and are available in a natural or painted finish. 954/349-2525. Poulsen Lighting, Fort Lauderdale, Fla.

CIRCLE 297

Remote source lighting system

3M's Light Pipe System couples Fusion Lighting's electrodeless sulfur-lamp technology with tubes ranging from 13 to 131 feet. The tubes emit bright full-spectrum light continuously along their lengths. The luminaire is located at one end of a polycarbonate tube lined with 3M's Optical Light Film, and a mirror is located at the other end. Light is projected into the tube and reflected out by the film. 800/480-1704. 3M, St. Paul. CIRCLE 298

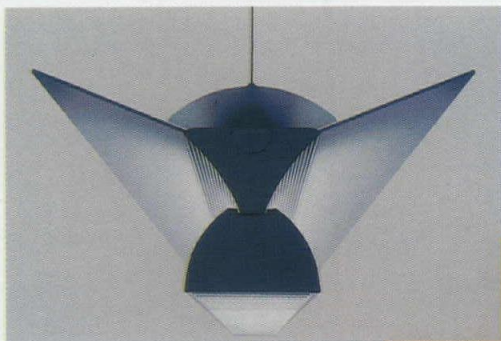
Automated downlights

Irideon's AR6 and AR7 recessed luminaires produce either a hard- or soft-edged beam. With the use of a computer or motorized scanning mirror, the luminaire's intensity, color, and motion can be choreographed. 214/819-3208. Irideon, Dallas. CIRCLE 299

T5 fluorescent uplight system

Surf from Artemide is a lighting system made of extruded aluminum that provides indirect fluorescent uplighting with a T5 fluorescent lamp. The Surf system can be wall-hung, suspended, or joined using 90-degree corners and can be finished in white or metallic gray. With Surf's wall-mounted and suspended systems, power can be fed to several modules from a single point. 516/694-9292. Artemide, Farmingdale, N.Y.

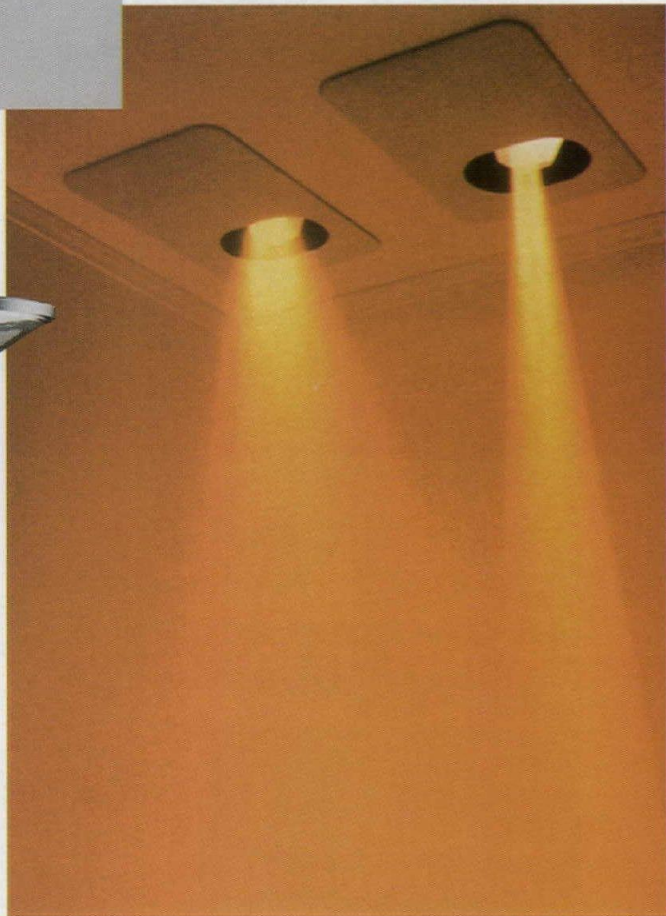
CIRCLE 300



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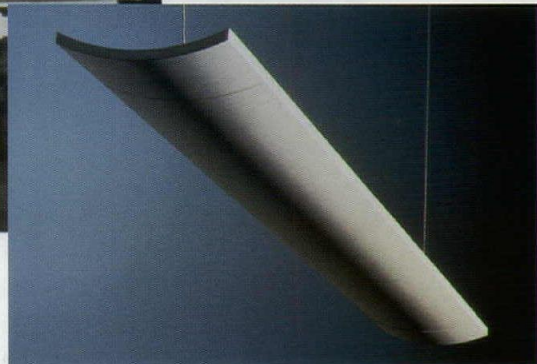
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Building Comfort with Less HVAC

ARCHITECTS AND ENGINEERS MUST WORK TOGETHER TO REDUCE A BUILDING'S THERMAL LOAD AND DOWNSIZE THE HEATING AND COOLING PLANT.

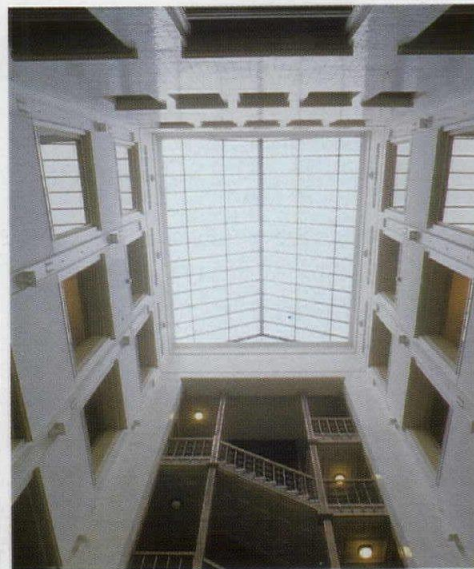
by David Houghton, PE

Once upon a time, buildings were designed to stay comfortable passively. Thick masonry slowed the transfer of heat, walls were bermed to minimize temperature swings, openings were positioned to take advantage of prevailing winds, and roofs were shaded by overhanging trees. Now that there are chillers, ducts, boilers, and pipes, it's easy to rely on artificial means to keep inhabitants comfortable rather than designing the building itself for comfort. But reducing the thermal load instead of going all out on the HVAC system can reduce construction costs and minimize operating expenses by making more efficient, effective buildings.

Although the heating and cooling of buildings is the province of the mechanical engineer, the architect determines many of a building's thermal properties by selecting its shape, color, layout, and composition. Engineers, who are not often consulted on these decisions, may find themselves literally boxed into designing the size and capacity of the heating and cooling system based on the architect's selections.

"Architects don't think in terms of tons of air-conditioning," says Gary Gardner of Gardner & Pope Architects in Pittsburgh. "It's not in their vocabulary." But developing a mutually challenging partnership with the mechanical engineer means the team works together from the beginning to optimize the building's design. Such an approach, he says, results in greater comfort for occupants and energy savings—something that's increasingly important as more clients ask for energy-efficient buildings.

That said, it's important to recognize that most mechanical engineers are mortally afraid of not providing enough cooling in their designs. Thus, they introduce a safety factor—the amount of installed cooling capacity above the anticipated cooling load. Safety factors are expressed as a percentage of the anticipated load. If calculations show 300



Restoring the original light courts in the 103-year-old Portland (Oregon) City Hall included exposing the roof glazing and the white glazed-brick walls. The courts bring daylight into the offices and create a central meeting place.

tons are required, 380 tons might be specified instead. The safety factor is 80/300, or 27 percent. However, the load itself, 300 tons in this case, usually includes its own safety factor. This can compound to produce cooling systems that are oversized by 100 percent or more, significantly increasing energy usage and equipment costs.

Still, engineers know that if there is insufficient cooling, it will be blamed on them. The engineer is therefore liable for corrective action, which may be very expensive. "After a restaurant owner specifically instructed us to cut the cooling equipment down to the bone, he ended up having problems with kitchen ventilation and outside air infiltration," says Jerry Novotny, a mechanical engineer in Boulder, Colorado. "The cost to fix the problem was nearly as much as the entire HVAC system. And there was a lot of scrambling and finger-pointing. It got pretty ugly." While this is a reasonable thing to fear, there is no similar incentive to not oversize, so the safety factor can get quite large. To minimize this wastefulness, architects and engineers need to understand how improving the building's thermal performance introduces a different type of safety factor, one based on the performance of the building itself.

Keeping cool

A building's cooling load is the rate of heat rejection required to keep it cool inside. Conversely, the heating load is the amount of added heat

David Houghton, PE, is president of Resource Engineering Group, a consulting firm based in Crested Butte, Colorado, that specializes in energy-efficient mechanical systems for commercial buildings.

CONTINUING EDUCATION



Use the following learning objectives to focus your study while reading this month's ARCHITECTURAL RECORD/AIA Continuing Education article. To receive credit, turn to page 136 and follow the instructions

LEARNING OBJECTIVES

After reading this article, you should be able to:

1. Work with mechanical engineers to design energy-efficient commercial buildings.
2. Recognize areas where mechanical systems are commonly oversized by engineers.
3. Compare a building's cooling load to its heating load in terms of equipment, cost, and space.
4. Describe sources of thermal load.
5. Describe energy modeling.

needed to keep it warm inside. Of these two, cooling loads are the troublemakers because cooling capacity is more expensive to buy and install; chillers cost more than boilers. Cooling also eats up more building space than heating equipment and costs more to run—pumping 100,000 Btus of heat out of a building with electricity can cost twice as much as adding 100,000 Btus of heat with natural gas, especially during peak load times.

The cooling load, from outside and inside the building, depends on a number of variables, including solar radiation through glazing or thin wall sections, heat gain through the building skin, hot outside air brought in through the ventilation system, lights, people, and plug loads. Commercial buildings need more cooling than heating because they are blocky—internal areas without outside exposure have no windows through which they lose heat in the wintertime.

A useful benchmark for cooling load is cooling density, measured in square feet per ton. If you were to visit 100 commercial buildings and compare their size and the size of the cooling plant, you would find a remarkable cluster at about 350 to 400 square feet of floor space per ton. It turns out that this is the general rule that engineers use; more than 400 square feet per ton and most engineers start getting nervous that there won't be enough air-conditioning.

There are two factors in establishing a commercial building's cooling load. The first is the design load—the worst-case scenario for keeping the building cool. Most engineers use one of several software pro-

grams based on the calculation methods of the American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE) to quantify thermal loading based on window area, interior lighting, plug loads, occupancy, and other factors. The program builds a thermodynamic model of the building using an internal library of weather data, then spits out a load report describing the peak heating and cooling loads for the hottest day of the year, assuming all the building's lights and internal devices are running and the building is occupied at peak capacity. A safety factor of 20 to 100 percent is added for good measure. This total, reflecting a situation that will probably never occur, is the design load.

The second, more practical aspect of cooling load is the actual operating load the building experiences throughout the year. The operating load is what actually reaches the chillers much of the time—usually much less than the design load. It's not unusual for a cooling system to operate at 20 to 50 percent of full capacity. This oversizing is expensive. If the cost of a cooling system plant is \$1,500 per ton, downsizing one in a 100,000-square-foot building from 250 tons (a density of 400 square feet per ton) to 150 tons (a density of 667 square feet per ton) saves about \$150,000.

Energy modeling

Simply downsizing an HVAC system's peak load capacity saves money. But for an accurate picture of where the heating and cooling energy will go before the equipment is specified, architects and engineers are using

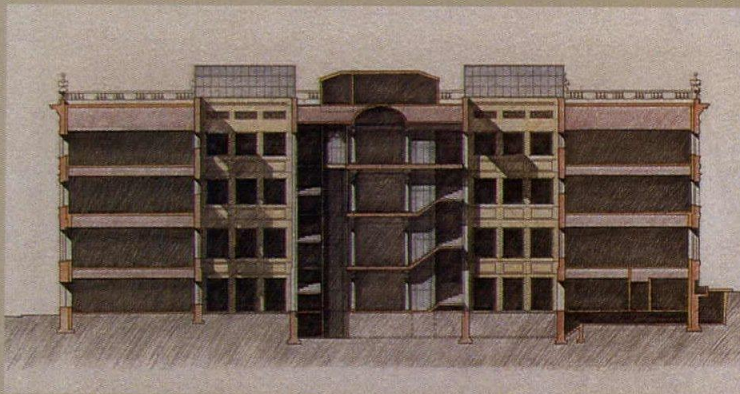
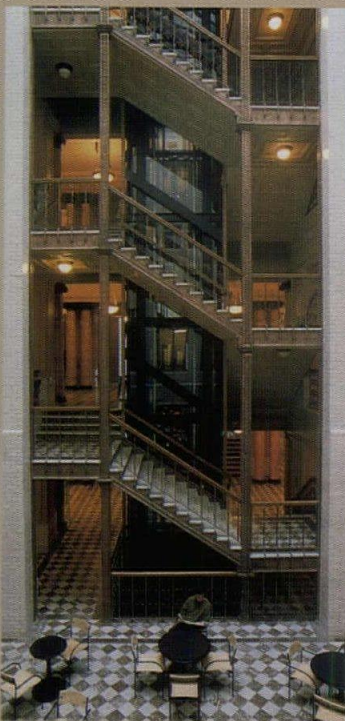
RENOVATING PORTLAND CITY HALL POSES DIFFERENT CHALLENGES

Before renovation, the 103-year-old Portland City Hall in Portland, Oregon, was a maze of dark offices with space heaters, small air conditioners, and fans. Air-conditioning wasn't a huge expense because it

was used only in isolated spaces.

"This was not a nice place to work," says Skip D. F. Stanaway, AIA, principal of SERA Architects. An early energy audit, conducted by the project engineers, System Design Consultants, showed that the massive masonry walls radiated cold in the winter. The roof was uninsulated, allowing heat to escape in the winter and enter in the summer. The building had single-pane windows, which opened to the noisy streets for ventilation, and incandescent lights hanging ineffectively from the 13-foot-high ceilings.

The first step was to reopen the building's two central light courts and expose the original white glazed-brick walls that reflected light into the interior. Transoms and lights in the office doors were restored and the light fixtures were fitted with compact fluorescents. Insulation was added to the walls and the roof, and the windows were replaced with low-e-coated insulated glazing. A new air-conditioning system was also installed. *D.H.*



Adding insulation to the roof and walls, replacing old glass with

low-e glazing, introducing daylight, and using compact fluorescent

fixtures made the Portland City Hall more comfortable.

energy modeling software systems. The best known of these is DOE-2, developed by Lawrence Berkeley National Laboratory in the late 1970s. A new modeling package, EnergyPlus, based on DOE-2, will be available in prototype next year.

Energy modeling software requires time and money to run. Many architects hire consultants who specialize in energy modeling and may charge \$10,000 or more to run these calculations. If carefully done, energy modeling provides an accurate and revealing look at the building.

Sandy Mendler, AIA, sustainable design advocate for Hellmuth, Obata + Kassabaum (HOK) in Washington, D.C., used modeling software to analyze the Environmental Protection Agency Campus, a one million-square-foot complex under construction in Research Triangle Park in North Carolina. She was surprised to learn that in the laboratory area of the building, the envelope accounted for a small percentage of thermal load. Because of the high air-change rate required, most of the cooling energy was going out with the exhaust air. In the office portion, however, the building envelope was more significant. That information allowed HOK to allocate its resources appropriately.

Energy modeling is especially useful and accurate for building renovations. System Design Consultants, who served as mechanical and electrical engineers for the renovation of the 103-year-old Portland (Oregon) City Hall, were able to mimic the actual building's performance, making it easy to see where heat was being lost. "We plugged in real num-

bers based on the building's history, instead of predicting these loads," says Gary Barnes, PE. The resulting design responds to these needs.

Reducing thermal load

There are many sources of thermal load, but the following are the most significant:

Solar load. A building's solar load is determined mostly by its glazing. Often the architectural program dictates the size and placement of glass, and cooling-load considerations take a backseat. By now most architects recognize that glass on the south and west facades of the building introduces heat, while glass on the east side generally provides beneficial morning light and warm-up heat.

Specifying glass with a low solar heat gain coefficient (SHGC), the fraction of solar radiation admitted through a window or skylight, reduces heat gain. The SHGC replaces the shading coefficient as the indicator of a window's shading ability. Glass with an SHGC of 0.20 lets in 20 percent of the solar radiation that strikes its outer face. Most commercial glazing SHGC values are in the range of 0.10 to 0.60; using glass near the bottom of that range keeps cooling loads in check. At the same time, the visible transmittance of the window should remain above 20 percent to avoid a dark and gloomy effect.

Spectrally selective and low-emissivity, or low-e, coatings, which reflect heat, control solar gain while allowing visible light to enter. Tinted

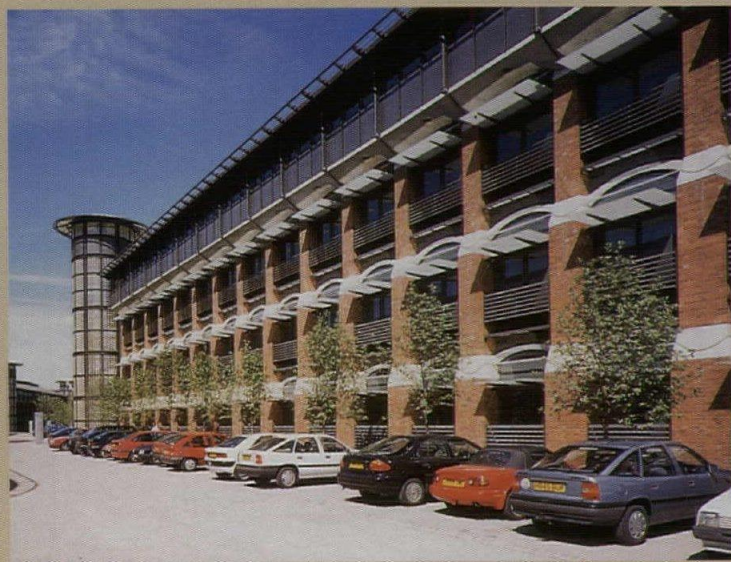
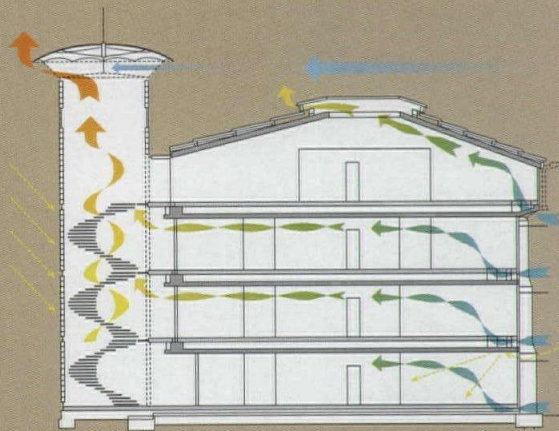
INLAND REVENUE CENTRE COOLED ENTIRELY BY NATURAL VENTILATION

"The most innovative buildings happen when the architect and the engineer start their work together over a blank sheet of paper," says John Thornton, a structural engineer for Ove Arup & Partners in London. Thornton's office, with architects Michael Hopkins & Partners, recently completed the Inland Revenue Centre in Nottingham, England, which is cooled solely by natural ventilation.

The building allows cool air to enter through windows and ventilation grilles, while warm air rises through cylindrical stair towers that act as chimneys and is exhausted

through a movable roof. One of the consequences of natural ventilation is greater internal temperature fluctuations than air-conditioning allows. "The occupants cannot expect temperatures to be perfect," Thornton says.

Windows are low-e, triple glazed with integral blinds. Balconies do double duty by shading the office below and holding metal light shelves that reflect daylight into each office. Prefabricated concrete floor panels provide "cathedral effect" radiant cooling. In the winter, the floors hold heat, keeping occupants more comfortable. *D.H.*



Circular stair towers serve as solar-assisted chimneys, drawing warm air upward and exhausting it out of an operable roof. Cooler air is drawn in from the windows and grilles on each floor.

glass, which absorbs infrared waves, lessens the amount of heat and light entering a space. Tints, low-e, and spectrally selective glazing allow architects to use more glass without sacrificing thermal control.

Broad eaves, awnings, and other shading devices also reduce solar gain. HOK's Mendler took advantage of the existing tree canopy to shade the western facade of the EPA Campus. "This was one solution that was absolutely free," she says. Deeply recessed windows, light-colored pre-cast concrete, and, most important, light-colored roofing material also

IF THERE'S NOT ENOUGH COOLING, THE MECHANICAL ENGINEER IS THE FIRST TO BE BLAMED.

help. Hashem Akbari, a researcher at Lawrence Berkeley National Laboratory, says, "Buildings can typically save 15 to 20 percent of total cooling energy if they have a light-colored roof."

Lighting. A decade or two ago, it was not uncommon to see lighting power densities of two to four watts per square foot. Connected lighting loads in new construction have now dropped to 0.5 to 1.5 watts per square foot, thanks to electronically ballasted T8 and T5 fluorescent systems, an ever-expanding array of compact fluorescent lamps and fixtures, and the decline in overall illumination levels that has accompanied the arrival of computer-based work.

Nearly all the heat generated by lights and other internal loads must be removed by the building's cooling system. Introducing daylighting reduces operating loads, but not the connected load (the building must be operable at night). Few engineers are willing to discount the connected load in their cooling calculations.

Defining a low target for lighting power density—and making sure the engineer uses that value for cooling-load calculations—will make a significant dent in cooling tonnage. "When we tell the mechanical engineer that our lighting load will be one watt per square foot, they often don't believe us," says Nancy Clanton of Clanton Engineering, a lighting design firm in Boulder, Colorado. "There's a fear and trust issue at work here. If there's not enough cooling, the mechanical engineer is the first to take the blame. Why should they take a chance on what we tell them? So they go back to their computer and enter two or three watts. We see it all the time."

Many states now specify maximum lighting power density via the ASHRAE/IES Standard 90.1, Energy-Efficient Design of New Non-Residential Buildings. Some states, including Oregon and California, have their own more stringent requirements. Lighting consultants can also work with the engineer to reduce the lighting load.

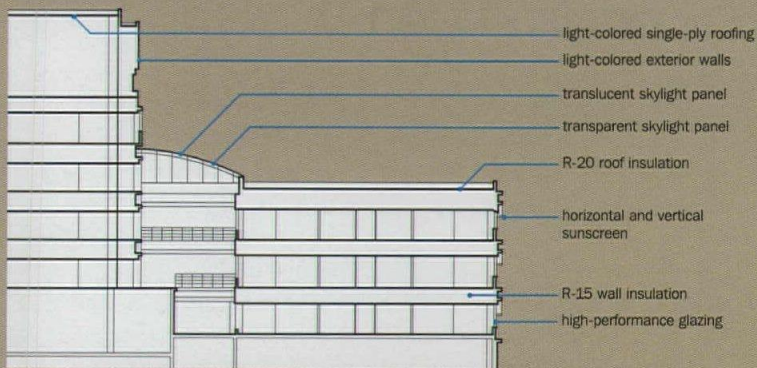
Plug load. A certain mystery surrounds the power density estimates engineers use for plug-in devices, such as computers and copiers. Conventional wisdom holds that as the workplace becomes more com-

DESIGNING AN ENERGY-EFFICIENT BUILDING FOR THE EPA



Since the Environmental Protection Agency is in the business of protecting the environment, designing the agency's campus in North Carolina's Research Triangle Park presented an opportunity to demonstrate responsible energy use. Scheduled for completion in 2002, the building will use 40 percent less energy than a similar design built to "standard practice," says Sandy Mendler, AIA, sustainable design advocate for Hellmuth, Obata + Kassabaum (HOK) in Washington, D.C. Energy consumption by building mechanical systems accounts for about 50 percent of energy costs, Mendler says.

The EPA's Green Lights program outlines efficient use of lamps, ballasts, and smart controls, as well as fixture maintenance. HOK followed these guidelines and used daylighting whenever possible. Subscribing to the agency's Energy Star program reduces plug loads. Low-e, tinted glass with a spectrally selective coating reduces glare and solar gain. Deeply recessed win-



Cooling is a tremendous concern at the new EPA Campus being built in North Carolina. HOK used energy modeling software to predict where the building envelope could be improved to save energy.

dows and the existing tree canopy provide shade. Light-colored concrete and roofing also reduce heat gain.

Energy modeling conducted during the contract documents phase helped the architect and the engineer, R. G. Vanderweil in Boston, see where money would be best spent to conserve energy. "It was important for the whole team to see this," Mendler says. "For an efficient building, we had to work together."

D.H.

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Apprenticeship

No training program compares with the Telecommunications Installer/Technician Apprenticeship program established jointly by IBEW and NECA through their National Joint Apprenticeship and Training Committee (NJATC).

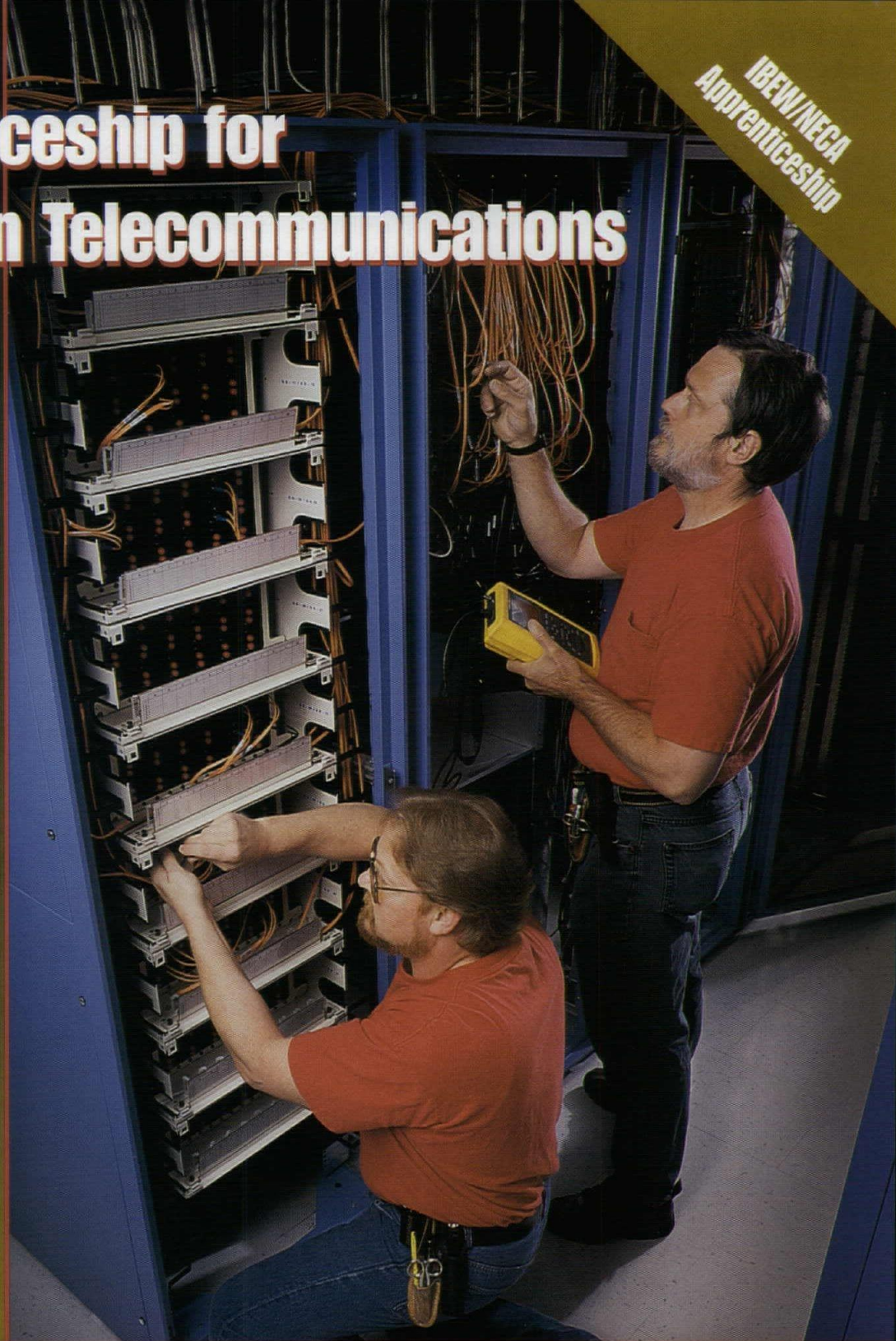
The IBEW/NECA apprenticeship program provides training in a real-world work environment that includes:

- Three years of related classroom training consisting of 160 contact hours per year, for a total of 480 hours of related technical training
- Three years of on-the-job training under the direction and supervision of qualified installers and technicians

This program ensures diversified training through a true apprenticeship program that is approved and registered by the United States Department of Labor's Bureau of Apprenticeship and Training (BAT).

Without question or doubt, the best trained and most experienced apprentice installers and technicians are employed by NECA/IBEW contractors and trained through NJATC programs and courses. The NJATC has partnered with the nation's largest and most recognized manufacturers within the telecommunications industry to ensure state-of-the-art training and to remain on the leading edge of technology.

Take advantage of this superior training today. To find out more information, or to hire the skilled, qualified telecommunications workers of IBEW/NECA, contact your local NECA Chapter, or call the NECA Connection at 1-800-888-6322.



IBEW



NECA

International Brotherhood of Electrical Workers • National Electrical Contractors Association
National Joint Apprenticeship Training Committee

puterized, plug loads increase dramatically. But many plug-in devices now use less power than ever—inkjet printers use a 20th of the power of laser printers, for example. Most engineers settle on an estimate between two and five watts per square foot, just to be safe.

Unfortunately, a “safe” estimate means oversizing the cooling plant. In an eye-opening analysis, building scientist Paul Komor, writing in the *ASHRAE Journal*, researched actual plug-load measurements. He found that they rarely exceed one watt per square foot. That’s because all the electronic equipment in a building is seldom in full use. Shrinking computer storage media and an increasing reliance on laptop computers also reduce plug load density.

People. Population density inside a building affects the design cooling load; each person puts out about as much heat as a 150-watt light bulb. Typical design densities range from 100 to 250 square feet per person, though this depends on the use of the space. In real life, the diversity of work ensures that there are fewer occupants than expected.

Since engineers size for the highest expected density, it’s worth checking the estimate to make sure it’s reasonable. It should include the number of people who will actually be in the space, as opposed to the maximum allowed by the fire code or the capacity of the parking lot.

Thermal mass. Concrete slabs, stone walls or floors, and other massive building elements, when they exchange heat with the ventilation system or the building’s exterior, can buffer peak loads and take advantage of cool night temperatures or warm afternoons. Coupling greater floor mass with night ventilation (which allows cool air into the building when external temperatures drop to a certain level) allowed Ove Arup & Partners in San Francisco to reduce the size of the chiller in an office building by 25 percent. “We always try to use a passive design approach

when the owner is interested in environmental issues,” says mechanical engineer Sarah Nicholson.

Insulation. Although the insulating value of a building’s walls might seem to be a big factor in determining heat gain, it doesn’t matter much for most commercial buildings. That’s because cooling load is dominated by internal loads and solar gain. Also, there isn’t much temperature difference between a 75-degree space and the 95-degree outdoors. Insulation does, however, have an impact on winter heating load. Then temperature differentials between indoor and outdoor air can easily reach 60 or 70 degrees. A typical wall section providing R-19 performance is good enough for most applications. Roof insulation is crucial, since the sun beats on the roof all day. For large single-story buildings in southern climates, heat transfer through the roof can amount to as much as 30 percent of total cooling load, and higher insulation values are warranted.

Engineers as friends

Aside from making better design decisions, architects can work with engineers to avoid oversized HVAC systems by expressing interest in the central plant design. If the engineer knows that the architect and the owner want a realistic system, instead of one that guarantees the absolute comfort of occupants, everyone can work together more responsibly. “Let the engineer know that oversizing is not acceptable,” Clanton says.

Architects can help by providing accurate occupancy and plug load estimates. Postoccupancy measurements of previous buildings provide some real-life examples. Willingness to work with the engineer, to approach the liaison as a way to solve problems and save money, will mean a better, more comfortable building and a happier owner. ■



AIA / ARCHITECTURAL RECORD CONTINUING EDUCATION

INSTRUCTIONS

- ◆ Read the article “Building Comfort with Less HVAC” using the learning objectives provided.
- ◆ Complete the questions below, then check your answers (page 158).
- ◆ Fill out and submit the AIA/CES education reporting form (page 158) or file the form on ARCHITECTURAL RECORD’s Web site at www.archrecord.com to receive two AIA Learning Units.

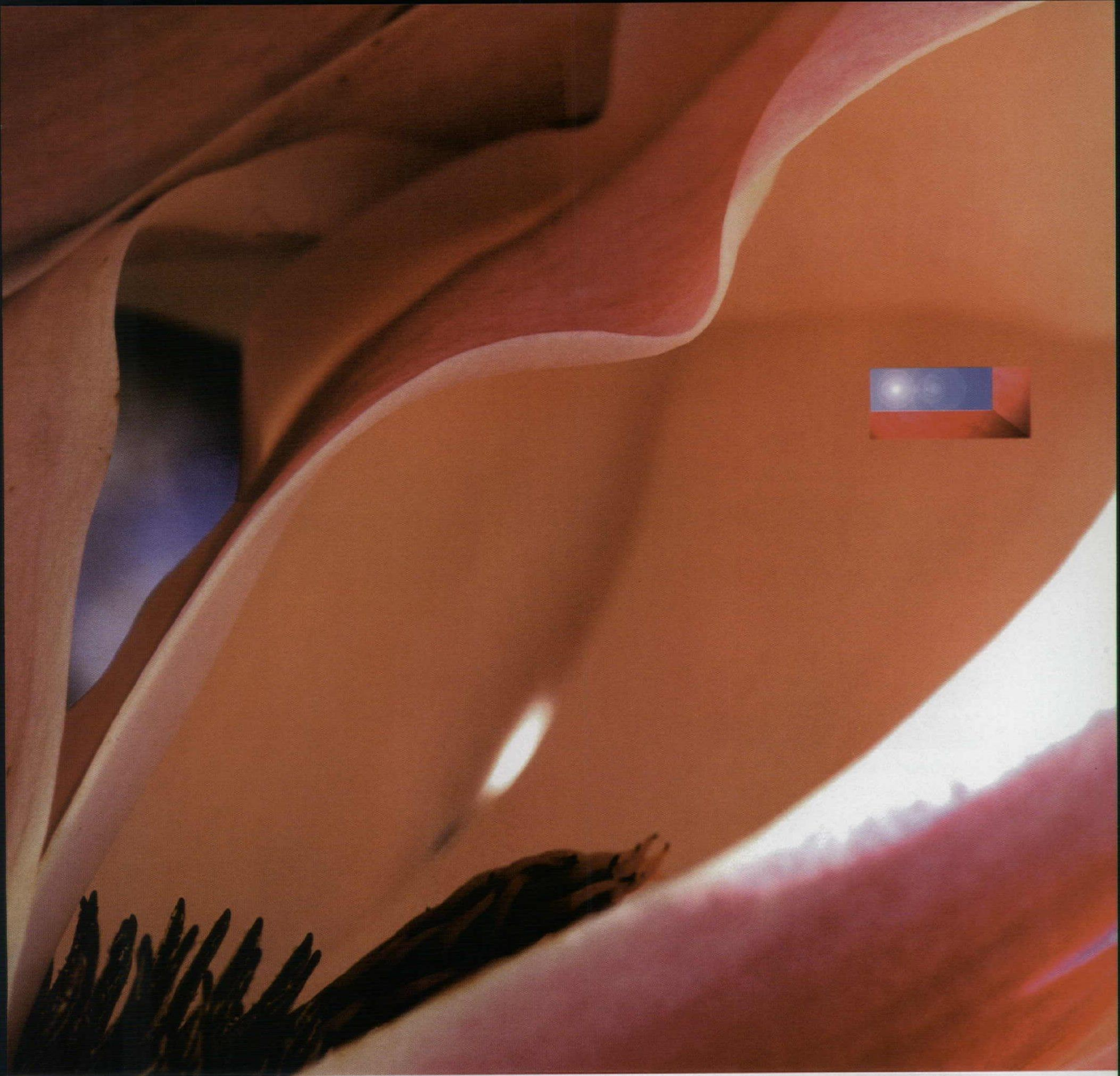
QUESTIONS

1. What are the two factors that are used to establish a building’s cooling load?

2. Why is the cooling load a larger problem than the heating load in designing energy-efficient mechanical systems?

3. What is energy modeling?

4. How could you reduce the thermal load on a building?



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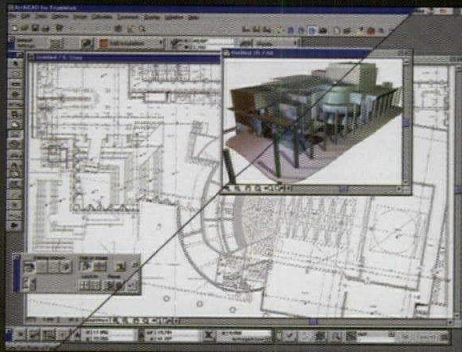


CIRCLE 51 ON INQUIRY CARD

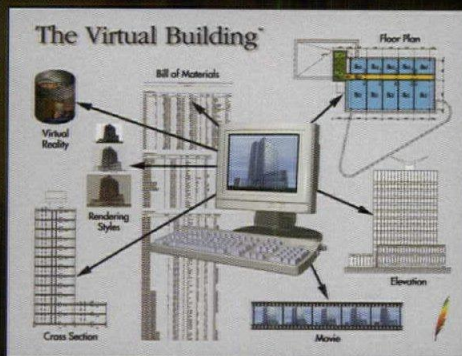
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CIRCLE 10 ON INQUIRY CARD

*Jerry Laiserin, CADENCE Magazine

National Theater, Budapest. Designed by Ferenc Bán and "A" Studio. Graphics by Dune Studio, Budapest. Created with ArchiCAD and rendered with Artisan's Render.

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Look for Higher Technology Benefits

THE REAL ADVANTAGES OF COMPUTER TECHNOLOGY TO AN ARCHITECTURAL FIRM OFTEN GO FAR BEYOND THE EXPECTATIONS AND PERCEPTIONS OF THE FIRM'S MANAGEMENT.

by Kristine K. Fallon, FAIA

W e aren't taking advantage of half the technology we already own," is a common complaint among firm principals when they receive requests for more hardware or software expenditures. Those making the request—typically design teams seeking to meet the needs of a client—are frustrated by this response because, often, a firm is reaping greater benefits from its existing technology investments than its principals realize. Most design teams have moved beyond readily quantifiable, task-level productivity gains, such as spending fewer hours on each drawing, to higher-level professional gains, including better cost estimates and reductions in change orders and errors and omissions. These gains, though not always readily apparent to the principals, indicate that the firm is not just doing things faster and cheaper, but also better.

Earlier this year, Kristine Fallon Associates, a computer consulting firm, concluded a client-sponsored study to document the best information technology (IT) practices among architectural firms. The goal was to find real-world best practices demonstrating business results that could be emulated. Although the study was conducted for a single firm that is growing rapidly and whose principals wanted to insure they were making good use of their technology, the results are applicable to all firms with computers.

The firms that participated in the study are similar in many respects. All design general building types; all use Intel PCs running a Microsoft Windows operating system; and all use computer-aided design (CAD) software, although some firms use more than one CAD system.

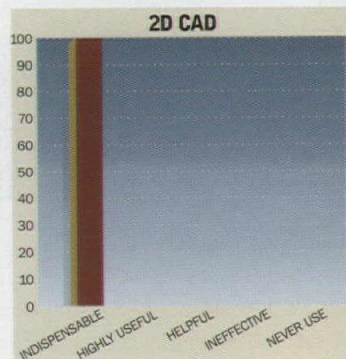
Kristine K. Fallon, FAIA, is president of Kristine Fallon Associates Inc., a computer consulting firm in Chicago.

Firm size ranges from 22 persons to one with 700 employees and offices worldwide. To explore these issues in the kind of depth required, anonymity was required by the participants. What follows are not only the results of the study, but also our observations, extrapolated from the results.

Getting to know them

The study consisted of a two-part survey and interviews. One part of the study concerned the quantifiable aspects of the firms' computer operations: what software products they are using; the technical specifications for their hardware; what types of electronic data they exchange with consultants and owners; and to what extent they are using the Internet. This portion of the survey was directed to the person in the firm in charge of the day-to-day management of the computer systems.

The second was a management survey that was intended to elicit the principals' perceptions of the effects of computer use on their businesses. Principals were asked to judge the importance of a variety of computer applications to their businesses on a sliding scale from "never use" to "indispensable." This portion of the survey also proposed a number of potential technological benefits, which the principals were also asked to rate.



Principals clearly recognize the value of CAD software. It saves time and it saves their clients money.

PRINCIPALS SURVEY: HOW IMPORTANT ARE THESE TECHNOLOGY APPLICATIONS TO YOUR PRACTICE?

	PHOTOREALISTIC RENDERING	3D MODELING	2D CAD	IMAGE PROCESSING	ANIMATION	DESKTOP PUBLISHING	CONTACT MANAGEMENT	DATABASES	PROJECT MANAGEMENT	ELECTRONIC DATA MANAGEMENT	FACILITY SCHEDULING	COST ESTIMATING	CUSTOM SPREADSHEETS	ENGINEERING	CD-ROM PRODUCT DATA	ONLINE PRODUCT DATA	WORKGROUP APPLICATION	WEB SITE CREATION/MAINTENANCE	E-MAIL	
INDISPENSABLE	100%	17%	17%	0%	33%	33%	50%	50%	33%	17%	17%	50%	50%	50%	0%	0%	50%	0%	0%	
HIGHLY USEFUL	0%	67%	33%	0%	33%	17%	17%	0%	50%	33%	17%	17%	0%	33%	33%	33%	33%	0%	17%	
HELPFUL	0%	0%	50%	67%	33%	17%	33%	0%	17%	0%	17%	17%	0%	17%	50%	50%	0%	33%	17%	
INEFFECTIVE	0%	17%	0%	0%	0%	17%	0%	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	0%
NEVER USE	0%	0%	0%	33%	0%	17%	0%	0%	0%	0%	33%	33%	0%	33%	0%	17%	17%	17%	33%	50%

Principals were asked to evaluate the use of computer technology and its benefits within the firm. What was surprising was the number of principals who did not grasp the high-level benefits—including cost savings—that computers provide.

* FIGURES THAT DON'T ADD UP TO 100% INDICATE A LACK OF RESPONSE

SOURCE: KRISTINE FALLON ASSOCIATES, INC.

The final and most revealing part of the study was the in-depth interviews conducted with one project team from each of the participating firms. In these interviews, a standard set of questions was used to determine each team's view of project phases and work processes, how well the firm's hardware and software served their projects, the extent to which electronic communications extended to outside consultants, the perceived benefits of computer use, and the quality of the technology training and support they received.



THE EFFECTIVENESS OF A COMPUTER SYSTEM IS THE DEGREE TO WHICH IT CONTRIBUTES TO THE REALIZATION OF BUSINESS GOALS.

Surprising results

One of the most successful projects, measured by the way computers were used in the design and construction process, was a building designed in the early '90s using a CAD package that did not support reference files—the CAD equivalent of overlay drafting. Without the reference-file feature, the usual practice was to include the architectural base-plan information in the CAD plans of the engineers, landscape architects, and other disciplines participating in a project. This approach was not much different than manual drafting in that every time the architects changed the base plan, everyone had to be notified and every drawing that contained that architectural information had to be updated. In short, there were many opportunities for errors.

But the successful project's team included a CAD expert/programmer who saw the limitations of the system and developed a program that permitted the electronic versions of architectural base plans issued to the other members of the team to be automatically updated when they were revised. The programmer also customized the CAD program to ensure that the project's layering standards were enforced. Team members reported that this degree of automation made it easier to communicate changes among the design disciplines, reduced rework, and, most important, let the team focus on the architecture instead of the logistics. The project manager was adamant that this customization was a major factor in reducing errors and omissions to less than 1 percent of the construction cost.

Yet what is truly remarkable is that this firm's principal, responding to the second portion of the survey, said that he did not know whether the technology used by his firm reduced errors and omissions. This startling admission was, in fact, consistent with the findings of the survey as a whole. Project teams almost uniformly reported improved results with greater technology. And not a single one of the principals interviewed strongly agreed that computer use provided a reduction in the number of field change orders, the cost of these change orders, or the percentage of errors and omissions. Many principals said they were forced into using CAD by their clients. The principals perceived the technology as an annoyance and delegated its management to relatively junior staff, who typically had little understanding of the business of architecture and were unable to identify the performance metrics that really count.

The lesson is clear. Principals must strive to understand how

technology is benefitting their employees and their firms. Conversely, the firm's technology users need to communicate directly with their principals about how technology contributes to their work and the results they achieve with it. In a broader sense, the design firm as a whole needs to align its use of computer technology with its business goals. This requires the thoughtful participation of the principals and their active support of new technology initiatives. Though it may seem ironic, the true measure of the effectiveness of a computer system is the degree to which it is per-

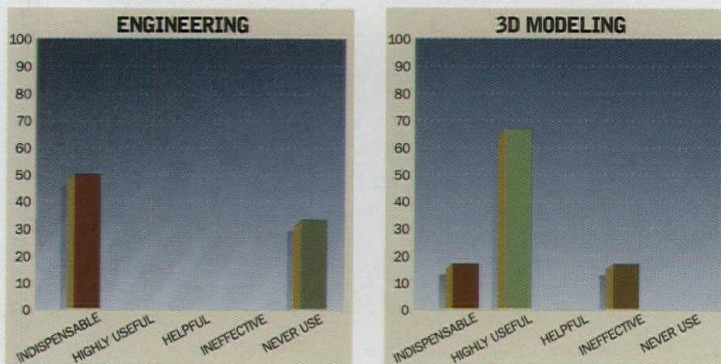
ceived by managers or others to contribute directly to the realization of business goals.

Training and support at the project level

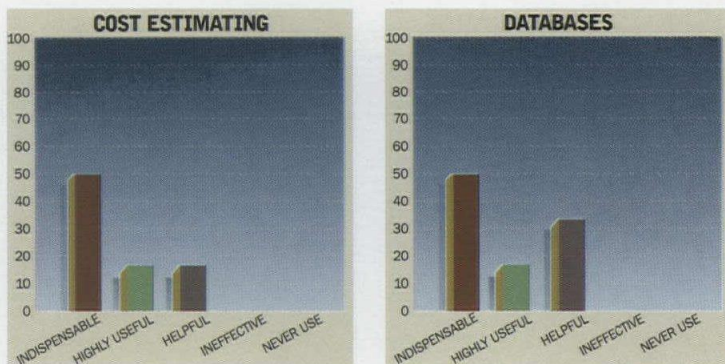
The study revealed three different approaches to technology training and support. The first involved no dedicated computer support and no in-depth technology expertise; informal peer training was the norm. This situation was typical in firms with fewer than 40 people, and it proved to be the least effective. Smaller firms need a technology partner who can provide expert technology evaluation, customization, training, and troubleshooting when needed.

The second approach involved a dedicated computer staff that offers generalized technology training, rather than training within the context of a project. Many firms rely on outside sources for technology training and many of these sources provide excellent instruction. But most people still need help fitting the tool to the work process, and a CAD class will not include instruction in the firm's standards and procedures.

The third and rarest approach involved computer specialists participating as full-time members of the project team. Only one team had a full-time computer specialist, while another team involved IT staff in project-specific software customization. These were the two teams that identified the use of CAD as adding significant value to the design process



Coordinating technology exchange among different disciplines is problematic for most firms, as the engineering chart demonstrates. But principals are catching on to the effectiveness of 3D modeling.



The value of estimating and database creation are clearer to the principals of the firms who were surveyed than the more subtle advantages of computer technology, such as access to online product data.

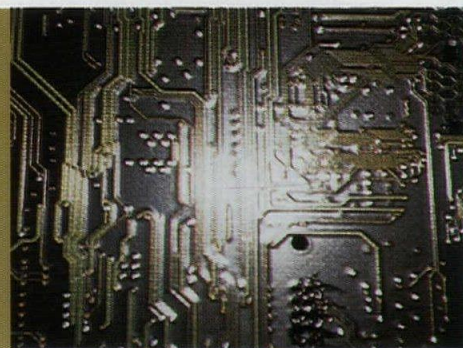
and streamlining communication and coordination activities.

How technology support and training are delivered makes a difference in a firm's ability to utilize technology. The one project team with the dedicated programmer/trainer/support person was by far the most effective in its computer use. It was also the only team that rated computer use as "highly effective" throughout all project phases. This team received two types of training: basic CAD, and instruction in the use of the project-specific customization and standards. Since the project had

munities into the next century. While the conceptual design for the project has been under way since 1996, this summer, the Department of Energy announced that the facility design/construction management contract was awarded to a joint venture of Lester B. Knight & Associates in Chicago and Sverdrup Facilities in St. Louis. The scope of work explicitly requires the design team to use 3D computer-aided modeling; to include sufficient information in the models to permit the extraction of equipment lists, a bill of materials, and drawings; to integrate the 3D models of the scientific equipment already under development at the various national laboratories; and to use the Internet for design collaboration. Schematic design of the facilities is scheduled to begin in the next few months.

While these technology requirements may be more extreme than most, they also show that clients are becoming more demanding about the way a project is managed on the computer. By the time Knight & Associates was notified of the award, the company had already conducted a preliminary computer technology assessment. They also scheduled their own "technology day" when vendors would come in and demonstrate various products to them. Also, key personnel from all of the design and construction team, as well as the client, convened for a full day this fall to evaluate state-of-the-art products for 3D modeling and electronic project communication—the first step in a thorough technology planning effort that will include a 3D modeling pilot program, comprehensive specifications of the hardware, software, and communications

CLIENTS ARE BECOMING MORE DEMANDING ABOUT THE WAY A PROJECT IS MANAGED ON THE COMPUTER.



dedicated technology support, this training was available as needed. This example seems to prove that preparing employees to do things right the first time enhances performance and morale.

Plan automation for each project

The uses and benefits of technology vary on different types of projects. Firms can benefit by exploring how information technology can be applied to their specific jobs. This process, referred to in the technology consulting business as "automation planning," simply means principals and their staff must think about the technology appropriate to the project at hand and be ready to implement it early in the process. The launch of a major project is also the time for a firm to consider a stronger commitment to software or a major technology purchase.

Automation planning requires the participation of those who know the intimate details of the project's requirements, teaming arrangements, and contractual terms. It also requires input from computer specialists. The first must articulate the business issues, and the latter must judge the feasibility of various IT solutions.

An excellent example, though it is not taken from the study, is the technology planning undertaken for the Spallation Neutron Source project at Oak Ridge National Laboratory. This is a \$1.33 billion project designed to meet the needs of the scientific and industrial research com-

ponents required in each office, work process analysis, definition of training requirements, and the development of project data standards and procedures for electronic collaboration.

In contrast to the principals interviewed in the study, management, in this case, is not only championing the technology plan but leading the way. "Intelligent, early planning is required for successful technical and financial results on any project we start these days," says Robert H. Mellott, AIA, of Knight & Associates, design manager for the joint venture. "However, for projects like this one, with a three- to four-year design life, the information technology we select must be able to be integrated with new products as advances in technology occur. The selected software and communications systems must support our customer's objectives for interaction with our design process, and the design data must be usable by the owner for facility management after our work is complete."

In architecture, as elsewhere, it is the business requirements that must drive technology adoption. But the whole team must think creatively to imagine how various technology products can be focused to meet their specific project challenges.

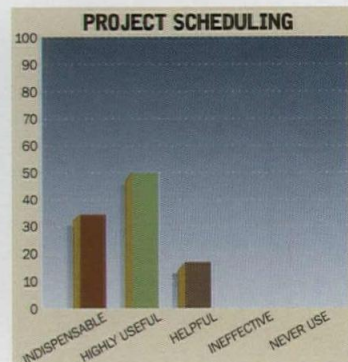
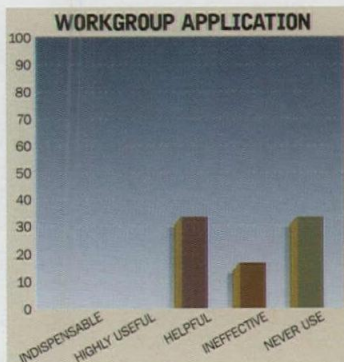
Recycled content

One of the great advantages of information technology is the ability to reuse information. Every firm has grown accustomed to cutting and past-

ing text from proposals. Similarly, reusing CAD data can be a very successful strategy, the study found. The successful team cited above that held errors and omissions to less than 1 percent of construction cost focused on the ability to automatically reuse the architectural base plan information in the drawings of all the design disciplines. The key to this type of information reuse is CAD standards, particularly layering standards, that work for and are adhered to by all disciplines and outside consultants.

The majority of project teams interviewed were unable to share CAD information easily with outside consultants because each firm created its own CAD standards. These met the needs of the individual firm, but did not accommodate other team members.

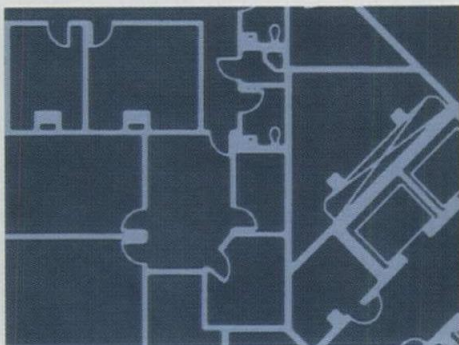
Industry-wide standards that accommodate all disciplines are necessary in order for the design industry to reap the full benefits of electronic communication. Such standardization would not only streamline CAD operations within firms, but also allow a new team member to effortlessly plug into the data flow. An important start to this process is the AIA's Layer Guidelines, which provide recommendations for organizing CAD data into both files and layers, with naming conventions for both. Originally issued in 1990 and revised in 1997, the guidelines cover engineering, architecture, and interior design. It is also one of the foundation documents for the National CADD Standard, now being developed under the auspices of the National Institute of Building Sci-



Once again, the difficulties in communicating to the various disciplines involved in a project is evident in the first chart. But the advantages of project scheduling on the computer are clear.

access to reusable information depended on an individual's knowledge of other projects, rather than on an official library of details or an electronic search capability. No guidance existed to distinguish good details suitable for reuse from less successful ones.

Facility management and maintenance is another important application for the reuse of information. However, none of the partici-



STANDARDIZING CAD WOULD ALLOW NEW TEAM MEMBERS TO EFFORTLESSLY PLUG IN TO DATA FLOW.

ences. Besides layering and file naming, this standard will cover drawing-set organization and sheet-file naming, sheet organization, schedules, plotting guidelines, and drafting conventions (including notations, symbols, diagrams, scale and linetypes, and attributes).

Another kind of information reuse is the ability to transfer portions of drawings or details from one project to another. Two of the projects in the study involved building prototypes. These projects experienced reduced design costs—savings of 50 percent in design development and 40 percent in construction documents were recorded by one team—by transferring information. They also achieved better conformance of actual bids to cost estimates.

Outside of these prototype projects, however, information reuse was not very effective. Although most teams borrowed some information from previous projects, the process was hampered by a lack of CAD standards. CAD files required extensive reworking to produce drawings that were consistent in terms of line weights, text heights, and dimension styles. This diminished the benefits of their reuse. Also,

participants in the study had attempted to apply their experience in CAD reuse to this area.

The future of technology

Object-based, intelligent 3D modeling systems will become even more important in the next generation of CAD products. Object class libraries, now under development by the International Alliance for Interoperability, an organization of software vendors, manufacturers, professional organizations, and consulting firms, will become more vital. These classes will provide a basis for sharing information throughout the construction project's life cycle and across disciplines.

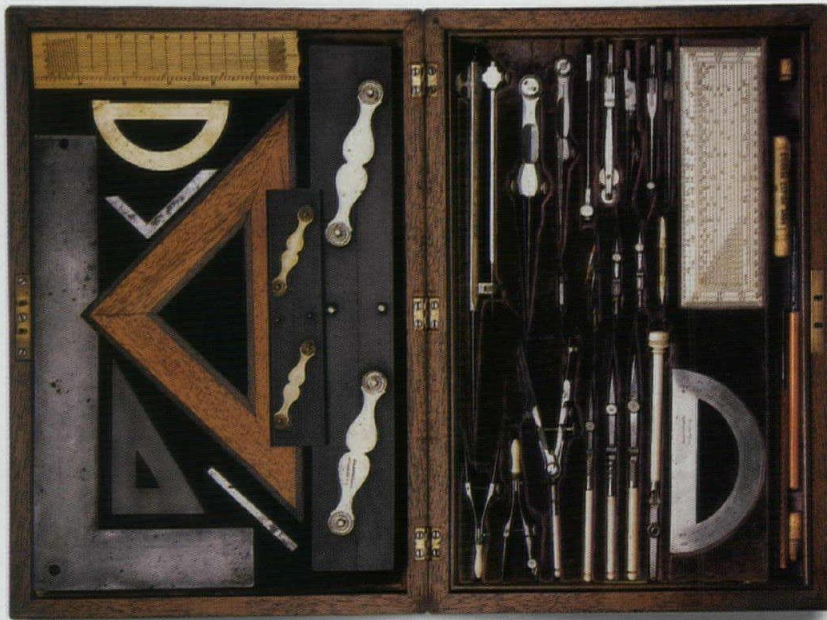
As the more avant-garde CAD systems have demonstrated, design teams will soon be creating computer-based 3D facility models from an assembly of objects. An object will incorporate physical information such as material, color, electrical or thermal properties, and a definition of how it should appear within a space. An object may also encapsulate procedures that can be used to describe how it should relate to other objects—a light switch may record its required height and distance from a door.

It is said that electronic communications can eliminate advantages of size and allow small companies to compete effectively. The typical architectural firm is ready for this; most are small, nonbureaucratic, and full of creative, imaginative people. These firms are poised to compete successfully in the information age, where business strategy will increasingly demand flexibility, creativity, collaboration, and intuition. ■

CAD STANDARDIZATION

- File names and contents
- Restricted entities—what entities to use instead
- Reference-file handling
- Layer names and contents
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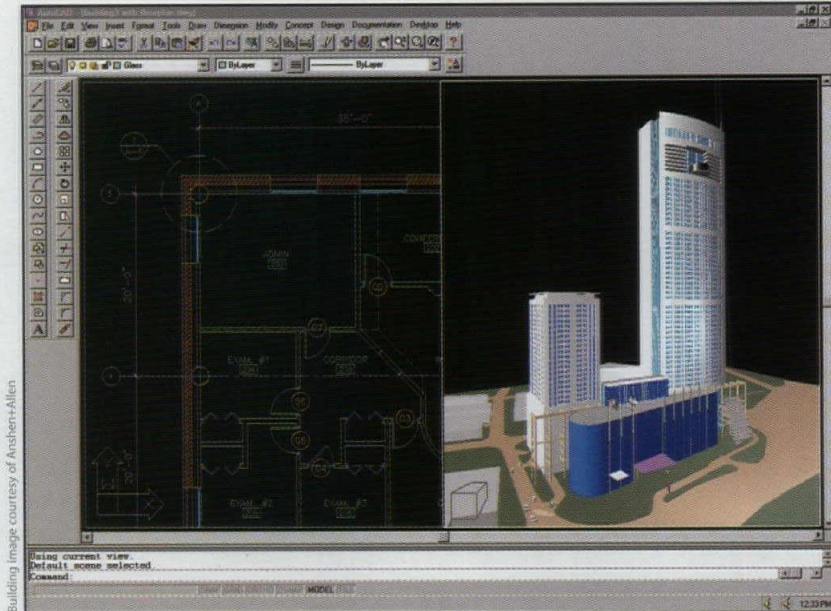
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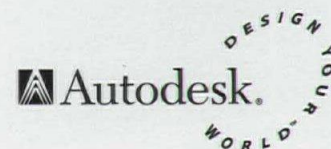
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VERSATILE ALUMINUM WINDOW AND DOOR FRAMES: THE MATERIAL OF CHOICE FOR INTERIOR APPLICATIONS

VERSATILE ALUMINUM

As you walk down any street in any major city, you have to appreciate the role of aluminum in shaping the modern urban environment. Take a moment to note that aluminum is often the material of choice for the framing of exterior entrance doors, windows and curtain walls. It's difficult to imagine the skyscrapers of today in all steel or wood.

As you will learn through this continuing education opportunity sponsored by United States Aluminum, RACO Interior OfficeFronts™, aluminum is a material with special characteristics that make it highly versatile for the construction industry. Most recently, this unique material has penetrated the interior environment and is now used widely for window and doorframes.

MATERIAL ADVANTAGES

Why aluminum? A unique combination of light weight, strength, corrosion resis-



A frosted glass and aluminum frame provides privacy for a conference room at First U.S.A. in Dallas. Designed by The Lauck Group.

tance, electrical conductivity, heat reflectivity, formability, and suitability for a wide variety of durable finishes makes aluminum the most versatile metal used in building construction.

Start with its corrosion resistance. Aluminum's corrosion resistance comes from the metal's naturally occurring oxide coating. As soon as it is exposed to air, the newly smelted metal forms a hard, tightly bonded, glasslike surface film, which protects the interior. If scratched, the newly exposed aluminum surface immediately reforms a protective oxide coating.

The addition of alloys to the raw metal improves aluminum's performance across the entire spectrum of desirable properties—improved strength, corrosion resistance, flexibility, ductility, workability and weldability. Again, think of where you find aluminum—as door and window frames and curtain walls exposed to exterior weather conditions.

Use the learning objectives below to focus your study as you read *VERSATILE ALUMINUM WINDOW AND DOOR FRAMES*. To earn two health, safety, and welfare learning credits, answer the questions on page 150 and follow the report instructions on page 158 or use the Continuing Education self-report form on RECORD's website www.architectural-record.com.

Learning Objectives

- Describe how use of aluminum aids construction time.
- Discuss why aluminum is considered a versatile building material.
- Explain how the use of aluminum is good for our environment.
- Identify the versatility of aluminum window and door frames in specific applications.

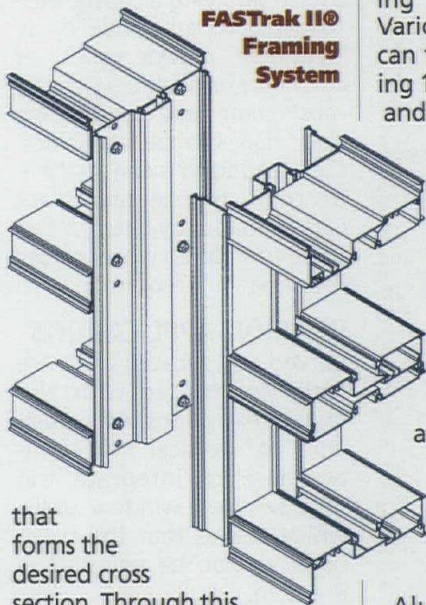
This continuing education opportunity is brought to you by United States Aluminum Commercial Products Group, RACO Interior OfficeFronts. United States Aluminum offers a full range of aluminum entrance doors, storefronts, window walls, curtain walls, and slope glazing systems for both interior and exterior design. In 1998, the company acquired RACO, a company that for 26 years has manufactured interior door frames and glazing systems for commercial construction. The addition of RACO Interior OfficeFronts offers architects and designers a single resource to fully utilize the unique structural properties of aluminum for both interior and exterior design. All glazing systems are tested to the highest industry standards by certified independent testing laboratories. Comprehensive details, installation instructions, and test reports are available for each system.

Aluminum is shaped by a brake press or an extrusion press. Simple low-volume aluminum profiles are usually done on a brake press. Shapes of greater intricacy are put through the extrusion process.

Basically, the process of extruding aluminum consists of pushing aluminum alloy metal through a die to give it its unique shape or profile. In more technical terms, aluminum billets are heated in an 800° F furnace to a plastic state and pushed by a hydraulic ram through a die

file with the head having a 4-inch face profile, the intermediate horizontal having a 3-inch face profile and the sill having a 5-inch face profile. Yet, the frame's appearance is quite crisp having been through the extrusion process. The same principles hold true for large horizontal mullions.

Instead of being raised above the framing with applied stops, the glazing pocket on interior window and door frames is recessed. This eliminates the need to have exposed screws showing on the applied stop. Various thicknesses of glass can fit in the pockets, including 1/4 inch, 3/8 inch, 1/2 inch, and 9/16 inch.



that forms the desired cross section. Through this process the following are made: Fins, grooves and other projections or indentations for glazing, thermal breaks, air-pressure-equalizing channels and other features.

DESIGN PROPERTIES

The extremely intricate profiles of extruded aluminum make the material ideal for interior office fronts. This is most readily seen in the face profiles available as standard on many systems. (The face profile is the side of the extrusion viewed by a person looking perpendicular to the doorframe or window.)

In fact, one window may have many face profiles on it. For example, the verticals may have 1 1/2 inch face pro-

CONSTRUCTION FEATURES

The construction of interior wall and window frames needs to be considered in two parts. The first is the timing of the construction of the partitions and the attachment of the door frames and the windows. The second is the actual assembly or building of the door frames and windows. Aluminum window and door frames are designed to expedite the construction process.

Often, timing is of outmost importance in finishing a construction job. The juggling act of when to order and build can be simplified through the use of aluminum door frames and windows. Unlike welded steel, aluminum frames can be installed after the walls are built and painted, and even after the floor is carpeted. Also, most welded steel frames are painted in the field, adding time to the construction process. Aluminum door frames and windows are factory finished, and so completely eliminate this type of field fin-

ALUMINUM FACTS

- The most abundant metal in the earth's crust, aluminum is called alumina in its natural oxide form. The most common form of aluminum ore is Bauxite.
- The use of aluminum grew after Charles Martin Hall the in U.S. and Paul L.T. Heroult in France almost simultaneously invented the industrial electrolysis and the electrochemical liberation of aluminum from its ore. High strength, heat-treated aluminum alloys were developed during WWI and in 1920 came the development of two critical production processes—*anodizing* and *extruding*.
- The most common alloy for shaped building materials is 6063 T5. In the 6000 series, magnesium and silicon are added to create an alloy with enhanced formability, weldability, and strength.
- Nearly 30 percent of the total U.S. aluminum supply is derived from recycled scrap.

ishing delays.

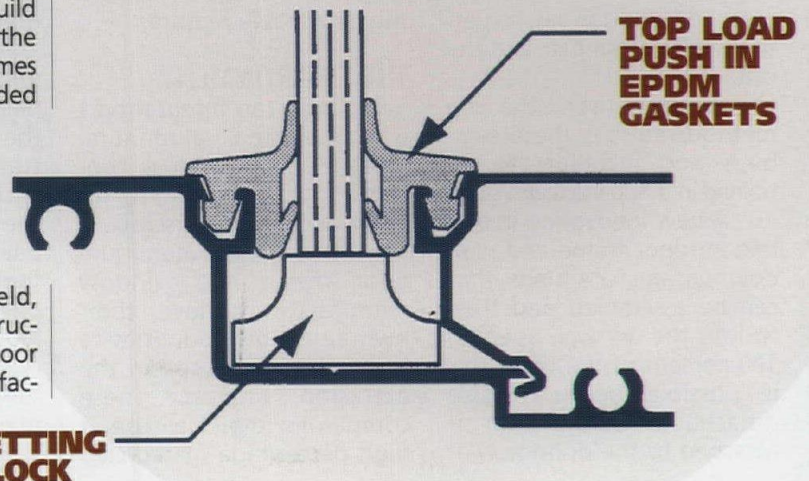
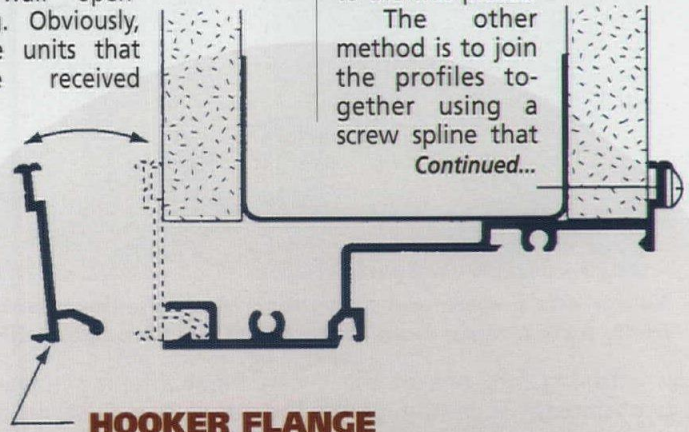
Available door frame and window assemblies vary greatly among manufacturers, ranging from receiving stock lengths that are cut and assembled in the field to receiving preassembled units ready to go into the drywall opening. Obviously, the units that are received

assembled shorten the field installation time.

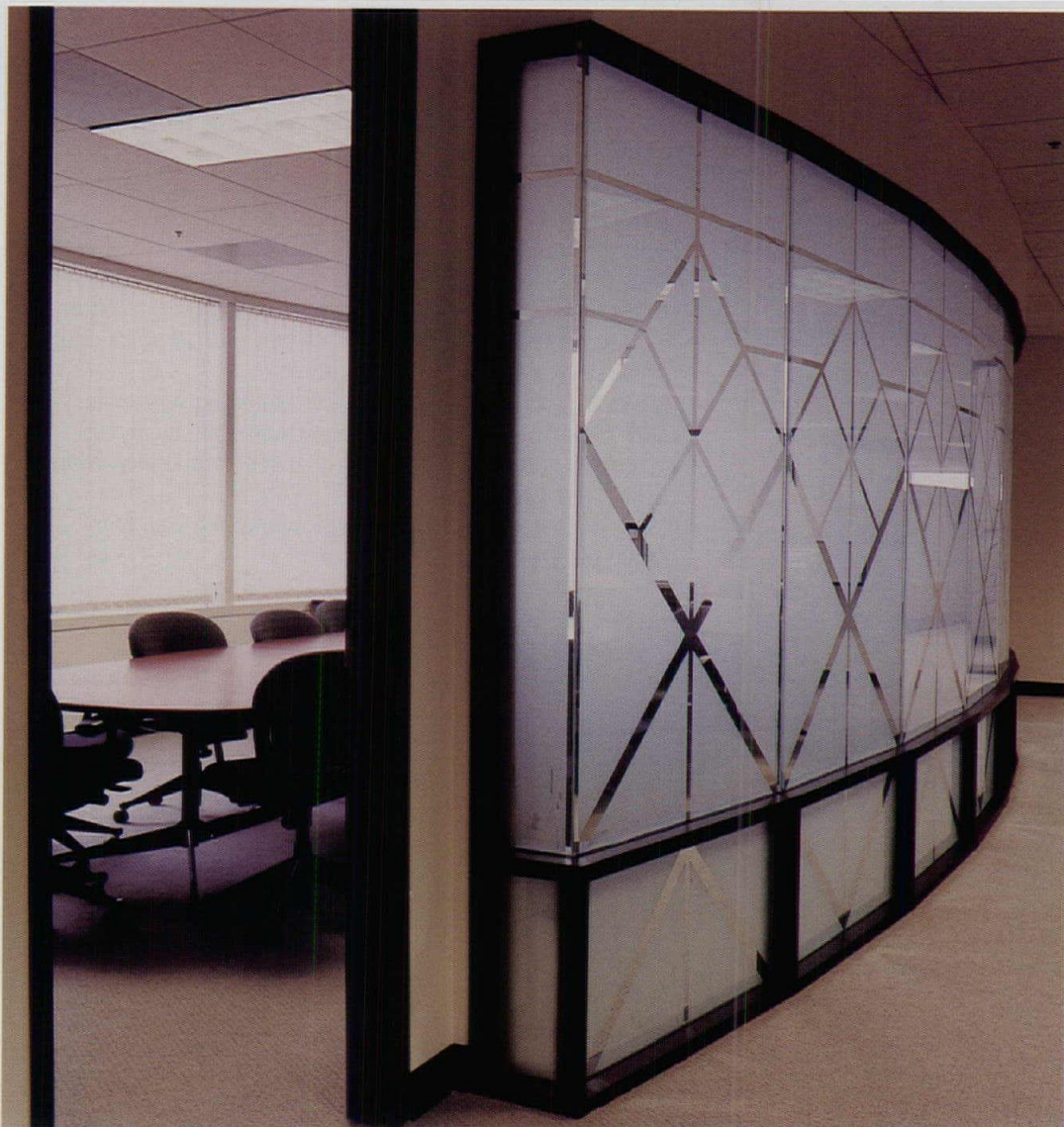
The method of joinery of the door frames and windows affects the construction time. The most common method of joining two profiles together is with clips that are screwed to the two pieces.

The other method is to join the profiles together using a screw spline that

Continued...



VERSATILE ALUMINUM WINDOW AND DOOR FRAMES



An intricate pattern and contrasting black aluminum frame with frosted glass. The system fronts a conference room at Nestle USA in Glendale, Calif. Designed by CHA Architects.

is extruded into one of the two shapes. Then the two shapes are simply screwed together, a much simpler method requiring less expertise by the assembler and the installer.

In comparison, the clip method requires the assemblers and installers to be trained in that particular system.

A new innovation in aluminum door frame and window systems are units that can be assembled and then fit into the dry wall opening 100 percent of the time. This is possible because of a detachable flange that is attached to the door or win-

dow frame after it is in place. The result is a full-throated framing system identical to the systems that do not have the detachable feature.

THE ENVIRONMENT

Recycling is an integral part of processing aluminum. Most aluminum alloys contain scrap aluminum, as much as 50 percent scrap. In fact, the larger aluminum door frame and window manufacturers have their own aluminum foundries to make the billet used in the extrusion process. These companies typically use a high percentage of recycled

aluminum in the foundry to make new billets. A very small amount of the aluminum becomes waste material.

Aluminum door frames and windows are factory painted or anodized under the strict guidelines of local, state and federal codes. Little or no pollutants enter the atmosphere, whereas painting in the field allows fumes to enter the atmosphere as a result of the drying process. Plus in the factory there is no danger of paint fumes affecting the air quality of other tenants.

Paint applied in the fac-

tory is cured during the painting process and its physical properties are set at that point. In addition, interior paint should meet the AAMA 603.8 performance specifications for pigmented organic coatings, something that is not the case in the field.

It's important to note that the curing process of air dry paint requires a significant amount of time and that even though the paint is dry to the touch, it may not necessarily be cured.

Anodizing, the other type of factory finishing, consists of applying a caustic etch followed by an anodic oxide treatment. A wide variety of colors are available, with the most commonly used being clear, dark bronze, and black. Clear anodized is consistent in its color. Bronze and black vary in shades by batch, a fact to be considered when a close color match is required.

INTERIOR APPLICATIONS

Curved and faceted walls are easily constructed with aluminum extrusions. An adjustable 24° vertical mullion is available to integrate the preassembled window units, which means that the curve or facets can be adjusted in the field.

Aluminum interior systems also include door framing for fire doors, pocket doors, biparting doors and bypassing doors, providing for a consistent interior appearance. Some aluminum doorframe manufacturers offer sliding doors that open to mirror sidelights. Doors can also be custom designed.

Aluminum as an interior officefront building material is also validated by its cost when compared to other building materials. Not only is aluminum comparable in material costs to other materials but, when labor costs for assembly, installation, and field painting are included, aluminum is often at a price advantage.

VERSATILE ALUMINUM WINDOW AND DOOR FRAMES



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At First U.S.A. in Dallas, architect The Lauck Group used different paint finishes to bring variety to the aluminum frames (left and below).



At Nokia House (right) in Irving, Tex., aluminum frames and clear windows are integrated into a hall's partition system to create a traditional image. Designed by Good, Fulton and Farrell Architects. Gensler and Associates/Studio Architects achieve a more contemporary aesthetic at Apple Computers, Inc., Research and Development Campus (below) in Cupertino, Calif.





VERSATILE ALUMINUM WINDOW AND DOOR FRAMES

Learning Objectives:

After reading *Versatile Aluminum Window and Door Frames: Material of Choice for Interior Applications*, you should be able to:

- Describe how the use of aluminum aids construction time.
- Discuss why aluminum is considered a versatile building material.
- Explain how the use of aluminum is good for our environment.
- Identify the versatility of aluminum window and door frames in specific applications.

Instructions:

The preceding article *Versatile Aluminum Window and Door Frames: Material of Choice for Interior Applications*, provided by United States Aluminum is part of the AIA/Architectural Record Continuing Education Series. You can receive two continuing education learning units that qualify for health, safety and welfare credits by reading the article, studying the learning objectives and answering the question below. Turn the page upside down to check your answers. Then fill out the self-report form (page 158) and submit it or use the Continuing Education self-report form on Record's website, www.architecturalrecord.com.

QUESTIONS

1. Why is aluminum considered a versatile building material?
Answer

2. How is the use of aluminum good for our environment?
Answer

3. How does aluminum become corrosion resistant?
Answer

4. What are the benefits of using aluminum in construction scheduling?
Answer

aluminum becomes waste material. Aluminum frames are usually painted or anodized in the factory under strict guidelines so that little or no pollutants enter the atmosphere.

3. Aluminum is corrosion resistant naturally when it is exposed to air. It forms a tightly bonded glasslike surface film that reforms if the surface is scratched. Other metal materials corrode easily when exposed to air and water, which is a drawback in construction.

4. In construction scheduling aluminum allows flexibility. It can be finished in the factory so it is not necessary to allow for field finishing and drying time in the schedule. Also, it can be easily installed by screwing two splines together, requiring little expertise by the assembler and the installer. It is lightweight and strong, making transporting aluminum frames easier than other materials.

1. Aluminum is versatile in both design and construction properties. For design, aluminum offers versatility in shapes such as curved and angled windows and walls, as well as intricately designed window or door profiles. It can be constructed so that screws do not show, and can be made for different thicknesses of glass. In construction properties it is versatile because of its easy assembly and it is not limited by time constraints. Aluminum windows or walls can be designed into a project in the beginning, or brought in after the walls and carpet are in place, or later as a retrofit.

2. Aluminum use is a good choice environmentally because it is not depleting a natural resource and its use is not harming the environment. Aluminum is the most abundant metal in the earth's crust and it is widely recycled. Most aluminum alloys contain recycled aluminum. A very small amount of the

ANSWERS

For More Information Contact:



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LOCKING THEM UP *continued from page 71*

attorney at the Youth Law Center in San Francisco. "The only boot camps that have real success," says Chinn, "are ones with a very strong therapeutic focus and that tie people into services when they come out."

The juvenile justice system today is becoming the last resort for children who once were handled in other ways. "You are seeing more suspensions and expulsions from schools," explains Colorado's Adamek. "The schools become safer, but too many of these kids are on the streets with no structure and no supervision. Many of them end up in the juvenile justice system in short order," as do poor youths with mental-health problems, who often have no other options.

Gail Gargiulo, regional manager for Correctional Health Services, which serves 13 adult and juvenile facilities in New Jersey, estimates that 65 percent of the juvenile inmates she sees are either "mentally disabled or emotionally challenged." Most facilities are simply not equipped or funded to take on the variety or seriousness of the disabilities of these inmates, who, Adamek notes, range from the developmentally disabled (with low IQs) to abused, neglected, or abandoned kids, situations often complicated by drug use. One national study documented "suicidal behavior" in 11,000 detained youths annually.

Housing shoplifters and murderers—together

Even new facilities must deal with a wide range of detainee behaviors and needs, especially those that handle people who have been arrested but not yet convicted. The three-year-old Hudson County Detention Center in Secaucus, New Jersey, by architect Ricci Associates with Dean Marchetto Associates, is clean and well maintained. Its architectural niceties include high ceilings, clerestory windows in dayrooms, and windows in

every bunkroom. Residents, dressed in orange uniforms, are permitted to walk in columns down the center of halls only and must be quiet while moving from place to place and pause silently when visitors pass.

You can't judge from the look of the average detainee, but he (or she) may be a sex offender, a violent offender, or disabled. Robert Murray, director of the facility, has six housing units into which he can sort, or "classify," the youths. The facility has held youths picked up for infractions as minor as shoplifting toys to those accused of murder. The housing units are smaller than those in adult facilities, which gives Murray greater control, but he has had to double-bunk most rooms, which exposes smaller or weaker detainees to a higher risk of assault and rape.

More youths are now being waived to adult systems, which don't want them because they become prey to older, stronger inmates. A number of states have begun to build specialized facilities that combine the higher security and more restrictive environment of adult prisons with the education, mentoring, and treatment programs associated with juvenile systems.

Though unprecedented levels of construction and operation dollars have flowed into juvenile corrections in recent years, most jurisdictions find there is a limit to what taxpayers will tolerate. This is giving a higher profile to advocates' calls for better-implemented alternatives to prison, which may divert more kids from crime at lower cost. Architects may have a role in developing emerging models such as what Frank Greene, AIA, of Ricci Associates calls "one family, one court," which tries to forge closer links among family, civil, and criminal courts in order to involve the justice system in trying to solve family issues that foster crime. As Adamek says, "There is no evidence that any jurisdiction has built themselves out of this problem." ■



- ❖ Design
- ❖ Architecture
- ❖ Construction

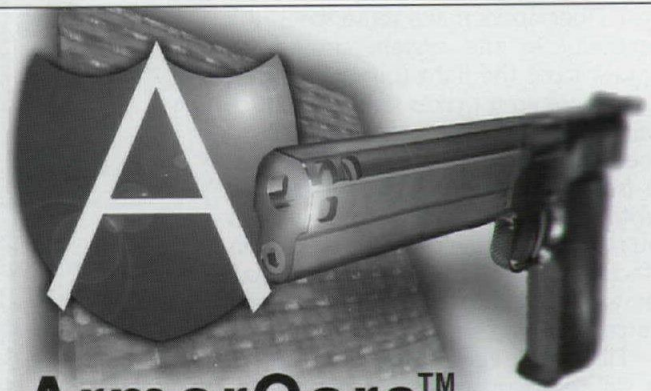
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FIBER OPTICS REVOLUTIONIZES LIGHTING DESIGN

Applying Cutting-Edge Technology to Architectural Applications

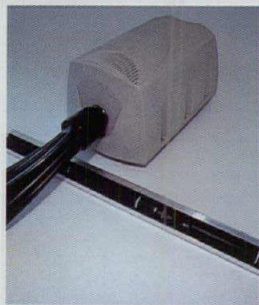
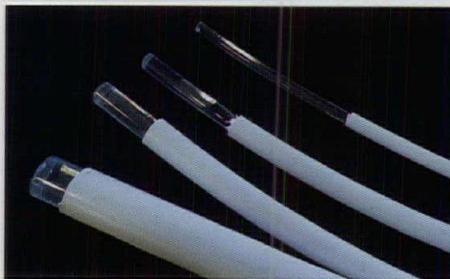
Fiber optic lighting systems are extremely versatile, and theoretically can be used in place of any traditional lighting system. However, the industry is still in its infancy. Given today's level of technology, it makes sense to use fiber optic lighting systems only in certain applications. But don't blink for too long, because the technology is advancing rapidly and in a couple of years it will make sense to use fiber optics even for general lighting.

Fiber optic systems make sense today for application where you must remove heat or UV from the systems (such as in retail displays and in museums). Fiber optics make sense when the electricity in the system should be remote from the light (pools and spas, e.g.). Or when it makes sense to reduce maintenance costs of lighting systems when lamp replacement is a major hassle (some chandeliers). And fiber optic lighting systems make sense when you're trying to achieve special lighting effects based on a number of small points of light, rather than a single large source (signs, accent lighting, etc.).

Fiber optic lighting systems are simply still too inefficient for general lighting to reach uniformly high ambient levels (say, 50 footcandles). And since it's not currently possible to put enough lumens into an individual fiber to carry over long throw distances, fiber optic lighting systems don't make sense when the throw distance (from the output fixture to the object being illuminated) is greater than four or five feet. So, much general room lighting is a poor choice for fiber optic lighting—for now.

What are the basic tenets of fiber optic lighting? How does the technology work? What advantages can architects gain through using these systems?

The following, brought to you by Unison Fiber Optic Lighting Systems, will answer those questions and much more. And by studying the learning objectives,



AIA/ARCHITECTURAL RECORD
Continuing Education Series

Use the learning objectives below to focus your study as you read **FIBER OPTICS REVOLUTIONIZES LIGHTING DESIGN**. To earn two health, safety, and welfare learning credits, answer the questions on page 156 and follow the reporting instructions.

Learning Objectives.

After reading **FIBER OPTICS REVOLUTIONIZES LIGHTING DESIGN**, you should be able to:

1. Describe the advantages of using fiber optic lighting systems, compared to other lighting types.
2. Identify the architectural applications of fiber optic lighting systems.
3. Describe the three principle components of fiber optic lighting systems.
4. Explain in simple terms how a fiber optics lighting system works.
5. Discuss the importance of efficiencies and luminance.

reading the article and answering the questions you can participate in an AIA/ARCHITECTURAL RECORD Continuing Education opportunity.

Unison™ is a joint venture of Advanced Lighting Technologies, makers of Venture Lighting metal halide lamps, and Rohm and Haas, makers of OptiFlex™ flexible light pipe. By combining these technologies, Unison offers a total solution for fiber optic lighting needs, including side and end light fiber, illuminators and fixtures, couplers, and even specially designed cutting and stripping tools.

Unison custom designs and manufactures complete fiber optic lighting systems. Unison's CableLite™ and FiberImages™ Divisions offer product design and application expertise for signs, panels, logos, curtains, and other products that require fiber optic systems.

FIBER OPTIC LIGHTING

In fiber optic lighting systems, a lamp transfers its light through to the end of the fiber or linearly through the fiber's transparent sheathing.

The most noteworthy advantage of using fiber optic lighting systems is that the light is separated from the electricity that generates light. And, too, one source can drive many fibers and produce multiple points or lines of light.

By separating light and electricity, fiber optic lighting can be used to light electrically or chemically hazardous areas, such as pools, spas, fountains, or in environmentally sensitive industrial situations. The reason: the light produces no electrical shocks and will not become a fire hazard. A sidelight fiber can be used in places where the potential of breakage or of contact with a high voltage transformer makes a neon light hazardous.

In addition, nearly all fiber optic lighting systems use both heat (infrared or IR) and ultraviolet (UV) filters at the



FIBER OPTICS REVOLUTIONIZES LIGHTING DESIGN

Applying Cutting-Edge Technology to Architectural Applications

light source. As a result, the output light contains no UV and no heat. This makes the systems especially desirable for lighting retail displays containing products that are sensitive to heat, as well as museum displays of temperature sensitive artifacts and art. Basically, dyes and oil paints won't fade, chocolate won't melt, and fresh flowers won't wilt.

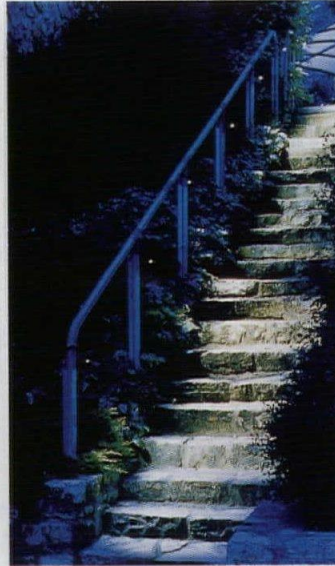
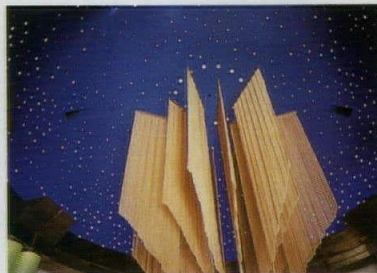
The use of fiber optic lighting systems (FOLSs) can also lead to improved energy efficiency in some cases, particularly through the use of metal halide (MH) light sources. Because a single lamp can illuminate many fibers, maintenance costs can be reduced and maintenance tasks simplified, particularly for the hard-to-reach bulb. In addition there is economy of scale, as one bulb can light an entire chandelier or a ceiling or wall of sprinkle lights.

Overall, fiber optic lighting systems can be used in almost any lighting situation. The Lighting Research Center at Rensselaer Polytechnic Institute and others have tracked the following applications of fiber optic lighting:

- Displays and exhibits—fiber optics replace the traditional linear fluorescent and MR16 lighting in museum and retail displays.
- Water—fiber optics is used in at least 10 percent of the water lighting market and that market is growing.
- Architectural highlights—spots of light from end-emitting fibers can dramatically highlight the architectural features of a room or building. Side-emitting plastic fiber and prism light guides can outline the exterior contours of buildings.
- Signage and visual guidance—fiber optics systems are used to light a variety of signs and are also used in edge-lit exit signs, billboards, and traffic signals. Fiber optics light steps and aisles in theaters and, in turn provide a safer, more accessible environment. Signage projects are perhaps the most dramatic application, in that PMMA fibers can be assembled to create unique and vibrant images ranging from random patterns to intricate designs including logs and animated figures. White light or a variety of colors can be used to achieve versatile

and exciting design. Fiber optic cables with larger diameters produce channel lettering, and perimeter, backlight and outline illumination.

- Decorative—chosen for special effects such as color changes and strobing, FOLS can produce a starlight effect for ceilings and can mimic flickering



candlelight for historic ambiance.

- Downlight and ambient—although the Rensselaer Lighting Research Center found that fiber optic lighting systems are not widely used for downlighting and ambient light in the United States, in Europe such systems are popular for offices and restaurants.

ANATOMY OF AN FOLS

A fiber optic lighting system (FOLS) consists of three principle components—the illuminator, the fibers, and the output fixture. Note that for sidelight applications, the fiber doubles as the output fixture. The color of the emitted light can easily be changed through the use of a color wheel and the intensity lessened with a mechanical dimmer.

Illuminator. The illuminator consists of a lamp, ballast or transformer, and collection optics to channel the light into the fiber.

The **lamp** is most often either halogen or metal halide (MH). The most commonly used is a 150 W MH, although a variety of outputs are available.

The **ballast** or the **transformer** convert the input electricity to the current and voltage required to start and operate the lamp.

The **collection optics** channel the light into the fiber and are usually based on a glass or metal reflector, an UV filter, and if desired, color filters. The reflector captures the light emitted by the lamp and directs it into the fibers. Most illuminators employ a fan to dissipate the heat generated by the lamp, although Unison has recently introduced a fanless model.

Fibers. Optical fibers for illumination are either glass or plastic and at least two layers—an inner core surrounded by a thin cladding. There may be an additional third layer or sheathing for protection of the inner fiber. Bundling individual fibers together is a common practice, with this assembly referred to as bundled fiber. Nonbundled fibers are commonly called solid core fibers, or large diameter fibers.

The core and cladding must be of different materials for the system to function properly. Nearly all

cladding layers are made of some kind of fluoropolymer (an example being Teflon FEP™). The core is either glass or plastic, with the plastic being either an acrylic or methacrylic copolymer. The most common plastic core for bundled fiber is PMMA (poly methyl methacrylate), known by the trade name Plexiglas™. If present, the sheathing is PVC (vinyl) or polyethylene.

Glass fibers. Made thin enough to bend (.05 mm or .002 inch.), glass fibers are inherently brittle. And, because the glass fibers are so delicate, they are always bundled and always completely assembled at the factory. Generally, several glass bundles are gathered together into a "common end," which is attached to the illuminator (the complete assembly is called a harness). When you order a glass fiber harness, you must specify the number of tails, the length of each tail, and the diameters of the common end and of the tails.

Glass fibers are not damaged by heat or UV light like plastic fibers can be—an advantage for using glass. However, as mentioned above, unlike plastic, exact lengths must be specified and factory prefabricated rather than cut at site.

Bundled Plastic Fibers. Made of extruded PMMA, individual plastic fibers

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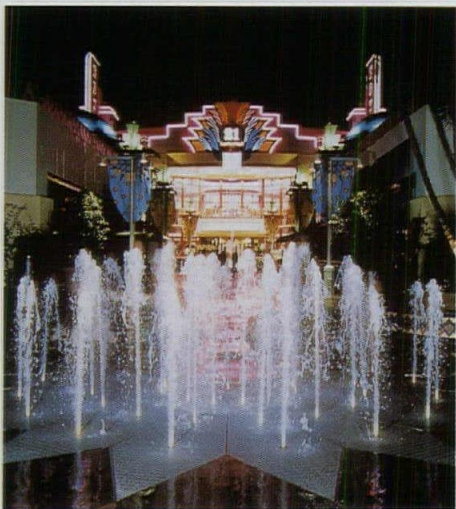


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are commonly .030 inches to .060 inches, or about 20 times the size of glass fibers. The diameter of the individual fiber is determined by brittleness of the PMMA; if the fiber is larger than 1 mm, the fibers may not be bent to a reasonable radius without breaking. PMMA fibers are separated and used individually for such applications as signs, star ceilings, and fiber optic curtains.

PMMA fibers are considered very durable compared to other plastic fibers. The main disadvantage of PMMA fibers is packing fraction loss, in which light from the illuminator inevitably filters into the gap between the fibers, thus decreasing efficiency.

For endlights, the individual fibers



are bundled very loosely in an opaque sheathing. For sidelight, the individual fibers are tightly bundled and twisted around each other and then covered with a tightfitting clear sheathing. The tighter the twist, the more light escapes.

Solid Core Plastic Fibers. Typically ranging in diameter from 3mm (1/8 inch) to 12 mm (1/2 inch), most solid core plastic fibers are cast of copolymers of MMA (methyl methacrylate) and a cross-link/plasticizer to add strength and flexibility. Unison's OptiFlex is constructed of a different, inherently flexible acrylate and a cross-linker to provide more flexibility at room temperature. With either process, the cladding acts to contain the core until the core "cures." Therefore, for solid core fibers, the cladding layer is much thicker than the sprayed or dipped cladding layers on small diameter acrylic fibers.

Output fixtures. The first fixtures used for fiber optic lighting systems were simply standard lighting fixtures with the electrical guts ripped out. The

industry has progressed and now offers fixtures designed specifically for fiber optics; yet, most output fixtures are still based on standard electrical lighting fixture designs.

Coupler. A coupler allows several large core fibers to be attached to a single illuminator. One coupling method is to split the light at the illuminator's main port into several small ports using segmented lenses. Each fiber is then inserted into one of the small ports. Another method is to gather the fibers together in a bundle over the last several inches of their length, which is actually a labor-intensive operation. A third alternative utilizes a short glass fiber harness as a coupler, with the common end joined to the illuminator and each tail joined to a separate fiber.

The coupler is commonly used to randomize both the color and intensity across the faces of the various light pipes attached to it. Intensity variations occur because of the projection of the MH arc—the source of the light—onto a circular port. The color variations result from the chemistry inside the lamps. Basically, different colors are emitted at different angles, especially as you move away from the center of the arc.

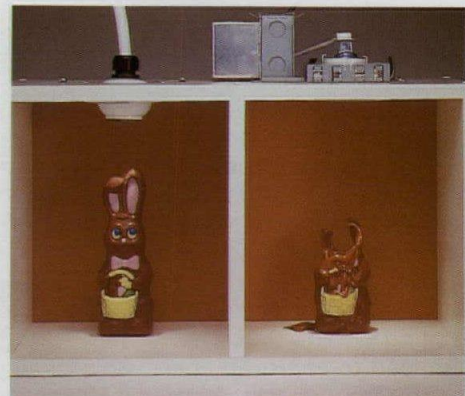
Randomization is easy to accomplish with a glass fiber harness—just mix up the individual strands of glass so that the strands that are going to any given tail go to several different areas of the common end. Another method is to use a glass mixing rod that averages out the angular effects.

HOW IT ALL WORKS

All optical fibers work on the principal of total internal reflection, or TIR. Whenever light traveling in one material approaches another material (such as the movement from the core to the cladding), the light is bent somewhat as it enters the second material. If the light approaches the second material at a shallow enough angle (known as the critical angle), then it is bent so much that it never enters the second material at all. It is totally reflected back into the first material—an amazingly efficient process.

For instance, a typical glass mirror may reflect only about 90 percent of the light that hits it. However, total internal reflection reflects essentially all of the light. This allows the light to travel far distances, undergoing many hundreds of bounces along the light pipe without being absorbed.

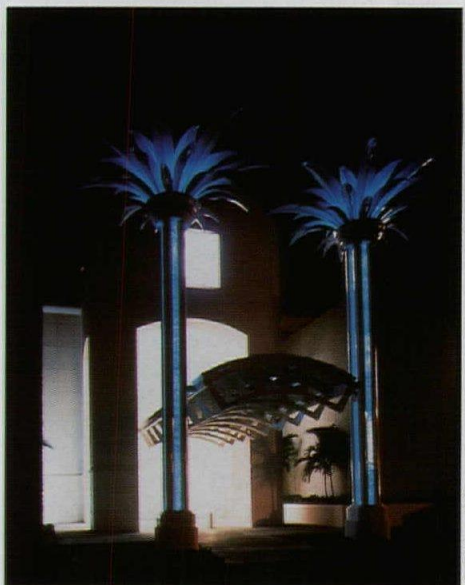
How shallow the light rays must be



in order to be totally reflected is determined by how different the core and cladding are. This is measured by the refractive index, which is essentially a measure of the speed of light in the material. The greater the difference between the indices of refraction, the more light (over steeper and steeper angles) will undergo TIR.

All optical fibers are characterized by an acceptance angle—the maximum angle (away from "straight on") at which light can enter the fiber and be totally internally reflected down its length. The acceptance angle is determined only by what the core and cladding are made of. For plastic optical fibers, the acceptance angle is usually about 35° to 40°. This means that all lighting hitting the face of the fiber in a cone of 70° to 80° (from +35° or +40° to -35° to -40°) will be internally reflected. The rest of the light is reflected back out the face or absorbed by the core, cladding, or sheathing.

Another measure of the ability of a fiber to gather light is the numerical aperture (NA). This is defined as the square root of the difference between



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FIBER OPTICS REVOLUTIONIZES LIGHTING DESIGN

Applying Cutting-Edge Technology to Architectural Applications

the squares of the refractive indices: $NA = \sqrt{n^2_{core} - n^2_{clad}}$ where n is the index of refraction. The acceptance angle is simply the arcsine of the NA. The bigger the acceptance angle (or NA) the better, because the fiber collects more light.

Also note that if the fiber is bent, the angle at which light approaches the cladding from the core changes. For this reason, bending an optical fiber results in some light loss. Tests to measure loss under various bending conditions are not well-defined. In general, though, the more sweeping the bend, the less light is lost. The tighter the bend, the more light is lost.

OPERATING PROPERTIES

When specifying fiber optic lighting systems, the efficiencies, luminance, and color properties should be considered. Unfortunately, only a small amount of comparative data exists, although there is an effort among manufacturers to increase their analyses. In addition, output from any system depends on a number of factors not controlled by the manufacturer, such as the number and tightness of bends the fiber takes in the installation as well as the quality of the fiber end cuts. The quality of installation also affects the system's operation.

To aid in comparison and specification, the fiber optic industry is developing testing standards under the auspices of the National Electrical Manufacturers Association. Meanwhile, check with manufacturers for existing quantitative analyses. As with most lighting applications, a prototype or mock-up to determine system performance is suggested.

Efficiency. A typical fiber optic lighting system is about 15 percent efficient overall. In other words, of all the light generated by the lamp, only about 10 percent to 15 percent is emitted at the end source. Nearly all of the loss happens before the light is directed into the fiber. Fortunately, most FOLS use metal halide lamps, which are highly efficient, so overall efficiency can be higher than with incandescent lighting sources.

The most efficient system in the market is manufactured by Unison. The illuminator is based on a 68 W metal halide lamp that uses no fan. By getting rid of the fan and making the col-



lection optics more efficient, the total system lumens of light per watt (lpw) of electricity used increases considerably and is similar to the efficiency of incandescent systems.

Within a year, Unison expects to introduce a system that will nearly double that efficiency—the system will be in the 25 to 30 lpw range—through a better coupling of the lamps' arc gap to the reflector (more efficient lamp-reflector combinations) and of the port to the fiber (a more efficient coupling mechanism).

Illuminance. To supply a particular quantity of light for a task, one measures illuminance. Illuminance is defined as flux density on a surface, expressed as lumens per square foot, or more typically known as a foot-candle.

Unless the system manufacturer specifies the total lumens emitted from the various output fixtures, the design should assume a MH lamp will produce 80 lpw. Thus, for a 250 W MH system, the designer should have no more than 15 percent of (80x250) or 3,000 total lumens at the fiber ends. (Remember, that's 3,000 total divided by the number of fibers, not just 3,000 for each fiber.) This also assumes a 10-foot-fiber runs with gentle bends only, excellent quality cuts, good connections, clean optics, fresh lamp, etc. Some manufacturers specify lumens available at the port. In that case, the designer should assume about 60 percent of those lumens can be delivered through 10 feet of fiber and the output fixture into the area to be lit.

It's important to note that output characteristics of the system change depending on the installation details—fiber length, number of bends, and the length of the run relative to the number and radius of the bends.

Color. All optical fibers change the color a bit as the light travels through them. Look at the color of light transmitted through 40 feet or more of fiber. Assuming that you start with white light, absorbing red will make the light appear greenish. Absorbing blue will make the light appear yellowish.

All types of plastic optical fibers absorb some red light. The absorption of blue differs, however, and is not fundamental to plastic fibers. This results from broad absorption bands in the UV that "tail" into the visible

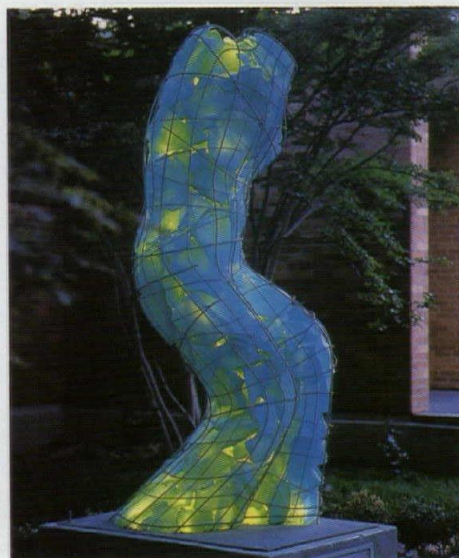
region. These UV absorptions are generally caused by "stuff" in the fiber left over from the polymerization. So, the cleaner the manufacturing process, the less blue is absorbed. Therefore, a greenish cast to the transmitted light implies a cleaner fiber and lower overall attenuation.

THE FUTURE OF FOLS

By all accounts the future for fiber optics lighting seems bright. Look for:

- Higher efficiency.
- Move toward fiber optics for more general room lighting, as seen in Europe.
- Systems cost decrease.
- Greater illuminance.

It's also important to note that manufacturers of fiber optic lighting systems are working to bring a standardization to the industry, which translates into more consumer confidence in a product and more information available to the consumer.





FIBER OPTICS REVOLUTIONIZES LIGHTING DESIGN

Applying Cutting-Edge Technology to Architectural Applications

Learning Objectives.

After reading FIBER OPTICS REVOLUTIONIZES LIGHTING DESIGN, you should be able to:

1. Describe the advantages of using fiber optic lighting systems, compared to other lighting types.
2. Identify the architectural applications of fiber optic lighting systems.
3. Describe the three principle components of fiber optic lighting systems.
4. Explain in simple terms how a fiber optics lighting system works.
5. Discuss the importance of efficiencies, luminance and color properties.

Instructions

Refer to the learning objectives at left. Complete the questions below. Then turn the page upside down and check your answers.

Fill out the self-report form (page 158) and submit it or use the Continuing Education self-report form on *Record's* website, (www.architecturalrecord.com) to receive two health, safety, and welfare AIA Continuing Education units.

QUESTIONS

1. When it is advantageous to use fiber optic lighting systems?
Answer

2. When it is not yet advantageous to use fiber optic lighting systems?
Answer

3. What are some specific architectural applications of fiber optic lighting systems?
Answer

4. Describe the three principle components of fiber optic lighting systems—and how they work.
Answer

5. In simple terms, how does a fiber optics lighting system work?
Answer

6. When specifying a fiber optic lighting system what is the significant of efficiencies and luminance?
Answer

ANSWERS

1. Fiber optic lighting systems (FOLS) make sense when heat or UV is not desired. Fiber optics also makes sense to light electrically or chemically hazardous areas or other places where the electricity should be remote from the light source. FOLS can reduce maintenance costs where lamp replacement is hard-to-reach. And FOLS are desirable when you're trying to achieve special lighting effects based on a number of small points of light.
2. FOLS are still considered too inefficient for general lighting to achieve uniformly high ambient levels.
3. The most common applications of FOLS are for displays and exhibits, to provide light in water, architectural highlights, signage and visual guidance, and decorative lighting.
4. FOLS consists of three components. The illuminator consists of a lamp, ballast or transformer, and collection optics to channel the light into the

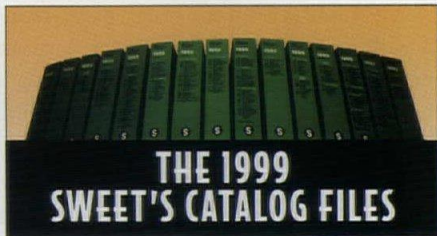
5. All fiber optics work on the principal of total internal reflection. When a light traveling in one material approaches another, it is bent somewhat. If the light approaches the second material at a shallow angle, then it does not enter the second material but is reflected back into the first.
 6. A typical fiber optic lighting system is about 15 percent efficient overall, but that level will increase in the near future. To supply a particular quantity of light for a task, one measures illuminance, which is defined as flux density on a surface or lumens. The designer should assume a metal halide light will provide 80 lumens per watt.
- fiber. Fibers are made of glass or plastic. Single fibers with larger single diameters are used as core fibers. Bundling individual fibers is a common practice. For sidelight applications, the fiber doubles as the output fixture. Most output fixtures used today are based on traditional lighting systems design. In addition, a coupler allows several large core fibers to be attached to a single illuminator.

For more information, contact:



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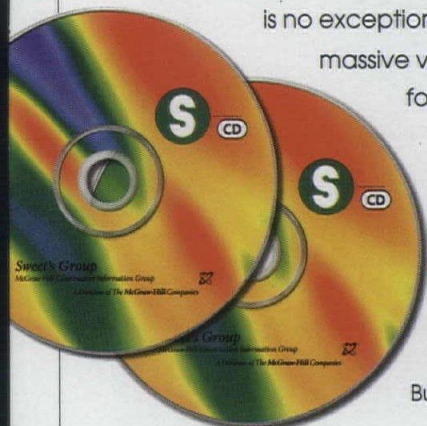
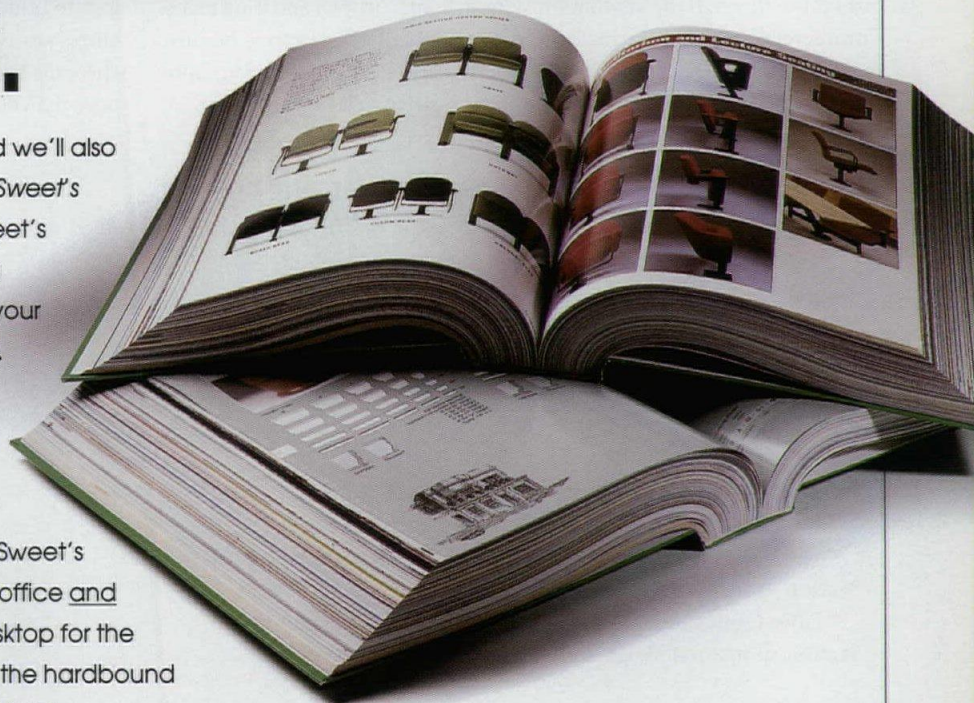
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ANSWERS

Questions appear on page 136. To receive CES credits, fill in the education reporting form below or on our Web site (www.archrecord.com).

1. The two factors in establishing a commercial building's cooling load are the design load and the actual operating load. The design load is based on the design of the building, how many people are expected to be in it, weather data, and solar radiation figures. This information is calculated to come up with a cooling system sized to reject heat gain on the hottest day of the year. Then a safety factor of 20 to 100 percent is added. The actual operating load is usually much less than the design load, since all of the projected figures are maximums that rarely occur at the same time.

2. The heating load is the amount of heat input needed to keep a building warm inside. Heating equipment takes up less space and costs less to buy and install than cooling equipment. The cooling load is the rate of heat rejection required to keep a building cool inside. Cooling loads include solar radiation, heat gain through the building skin, hot outside air brought in through the ventilation system, lights, people, and plug loads. Commercial buildings normally need more cooling than heating because they are often blocky, which means internal areas with no outside exposure have no cool windows in the wintertime to which they lose heat.

3. Energy modeling is a computer-generated projection of where energy will be used within or lost from a building. Software programs re-create airflow and other dynamics within the building and give an accurate picture of where the heating and cooling energy will go. Modeling is especially useful when real figures can be used, as in the case of a building that is being retrofitted.

4. Thermal loads can be reduced with careful design and by working with the mechanical engineer. Most of a building's solar load is introduced through its glazing. Placing glass on the east and north walls, rather than the south and west, reduces solar heat gain. Glass that's tinted or has a low-e or spectrally selective coating has the best solar heat gain coefficient. Shading devices and deeply recessed windows also keep heat outside. Another factor in solar heat gain is roofing color. A light-colored roof saves 15 to 20 percent of total cooling energy. Electrical heat loads normally come from lighting and power outlets. New lighting systems that use compact fluorescent lamps and smart controls generate less heat than incandescents that are left on all day. Plug-in devices, such as copiers, computers, and printers, are a large part of the workplace thermal load. New devices use less energy and put out less heat than older models. Thermal mass, such as thick concrete or masonry slabs, can be used to buffer peak cooling loads and take advantage of cool nighttime temperatures. Insulation improves winter heating loads in cold climates where the temperature differential between inside and outside air is often more than 60 degrees.



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Entries and nominations must be received by 4:00 p.m. E.S.T., Thursday, April 8, 1999.

For Further Information

For an entry and/or nomination form, contact Thomas Grooms at 202-501-1888 or thomas.grooms@gsa.gov.

The Presidential Design Awards program is administered by the U.S. General Services Administration and the National Endowment for the Arts.

(continued from page 52)

James Beard Foundation/Interior Design Magazine Awards

Submission deadline: January 29

Established in 1995 to honor excellence in interior and graphic design for restaurants, these awards are given for projects in the United States and Canada. For more information, write the James Beard Foundation, 6 West 18th Street, 10th floor, New York, N.Y. 10011 or visit www.jamesbeard.org.

Assopiastrelle Design Award

Submission deadline: January 30

Sponsored by the Association of Italian Ceramic Tile Manufacturers, this award honors American

designers or architects who have created interesting and innovative settings using Italian ceramic tiles. Tile dealers may submit projects on behalf of their clients. For further information, contact Christine Abbate at 718/783-3160 or fax 718/398-2591.

Library for the Information Age

Submission deadline: January 31

The first international Web-based architectural design competition, sponsored by the Association for Computer-Aided Design in Architecture (ACADIA), calls for the design of a library that takes full advantage of information technology while still serving the library's roles in culture and society. Proposals may incorporate spatial simu-

lations and/or physical solutions. Open to both student and professional designers worldwide. Visit www.acadia.org/competition/ for more information.

Union Internationale des Architectes Student Competition

Submission deadline: January 31

Student entrants are invited to design a housing project for a city in their home country. In addition to cash, the winner will receive the UNESCO Prize for Architecture. For registration information call Liu Kecheng at Xi'an University, Xi'an, China, 011/86/29/220-29-43, fax 011/86/29/552-78-21, or E-mail LiuKCH@pub.online.xa.sn.cn.

Resort Concept Competition

Submission deadline: February 15

The San Francisco-based Valor Group is sponsoring a competition for the design of an environmentally sensitive, portable tent village. For more information, call 415/276-5958.

Encouraging Neighborhoods of Choice and Diversity

Registration deadline: February 15

Submission deadline: April 15

This competition seeks innovative and sustainable redevelopment strategies for a Baltimore neighborhood that has witnessed a dramatic decline in population. First prize for the winner is \$10,000. For more information, call Rob Inerfeld at the Neighborhood Design Center, 410/233-9686, E-mail him at inerfeld@hotmail.com, or visit www.ndc-md.org.

DuPont Benedictus Awards

Submission deadline: March 8 (professional architects); March 19 (students)

These awards, open to both professional architects and students, recognize the use of laminated glass in commercial and residential projects. Winning architects receive a sculpture by glass artist Hans Godo Fräbel; winning students receive \$15,000 for their programs. Entry forms are available from the sponsoring organizations: contact Stephanie U. Vierra at the AIA, 202/626-7446 or vierras@aiamail.aia.org; Francine Troupillon at the UIA, 011/33/1/4524-3688 or uia@uia-architectes.org; Joanna Hanes-Lahr at DuPont, 202/393-5247 or haneslahr@mcimail.com. More information is also available at www.dupont.com/safetyglass/benedictus/index.html. ■

Please submit information for events and competitions at least six weeks prior to the magazine's publication date (January 15 for the March issue).

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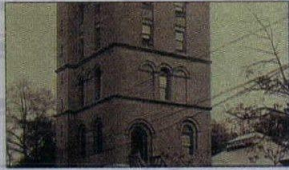
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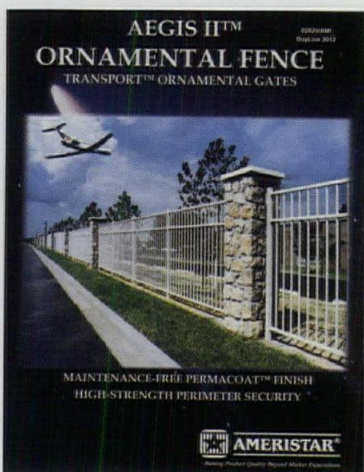
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THE AMERICAN INSTITUTE OF ARCHITECTS

AEGIS II

Aegis ornamental fence systems feature strong Forerunner™ rails, internal retaining rods, & designed panel brackets. Aegis II industrial fence offers the strongest security fence available. Aegis is specified by more architects & builders than any other on the market. Industrial & residential brochures include data on structure, design & options. Easy shipping panel design. (800) 321-8724. POB 581000, Tulsa, OK 74158-1000, F: (877) 926-3747.



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Total Door® is a fire rated door assembly that includes all hardware. Pairs do not require coordinators, vertical rods, astragals, flush bolts, or floor strikes. Will retrofit to any frame. Meets all codes and ADA. Wood and metal faces available to 3 hours. Lifetime limited warranty on locks and panics. For more information call 1-800-852-6660.

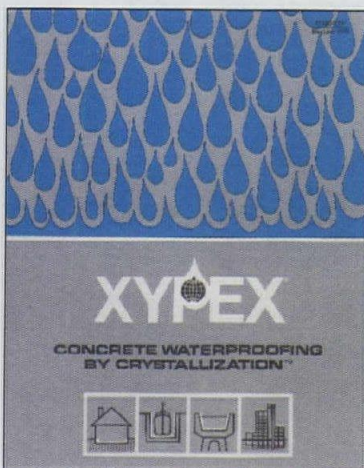


Openings®

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**Concrete Waterproofing
by Crystallization**

Applied as a slurry coating Xypex is a chemical treatment that waterproofs by penetrating the concrete with a crystalline formation that "plugs" the pores of the structure preventing water seepage. Xypex is ideal for use on the "inside" of wet underground structures.



Xypex Chemical Co.

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**Accessible Lavatory
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A full color catalog will explain the different Handy-Shield safety covers offered for the new or retrofit projects that need to comply with the American Disabilities Act. The specific use, sample specifications, drawings and color choice are all summarized in this easy to understand catalog. (800) 475-8629.

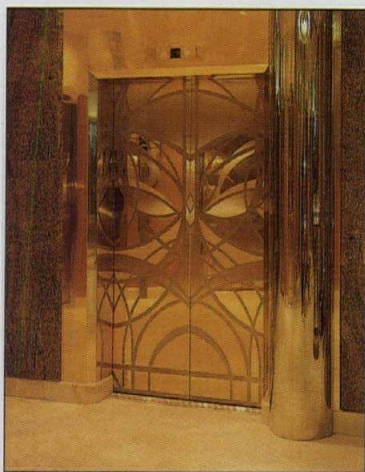


Plumberex

CIRCLE 105 ON INQUIRY CARD

Custom Metal Graphics

These bronze elevator door facings were manufactured by Surface Design + Technology specializing in custom & standard metal graphics. Using sheet metal finishes of a variety never offered before. There is virtually no limit to the types of patterns which can be created by combining multi-directional satin brushing, electroplating of gold, nickel, or copper. For information on custom or standard designs call (800) 537-1127.



Surface Design

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Our products have taken direct-vent technology & incorporated it into a new high performance fireplace. Model 6000 Supreme is a high efficiency fireplace (thermal efficiency up to 74%) & has an AFUE (Annual Fuel Utilization Efficiency) rating of 63%. The 6000 Supreme is standard with a variable regulator to adjust the flame & BTU input with the turn of a dial. Heat-N-Glo, 6665 West Hwy 13, Savage, MN 55378, 1-800-669-HEAT.

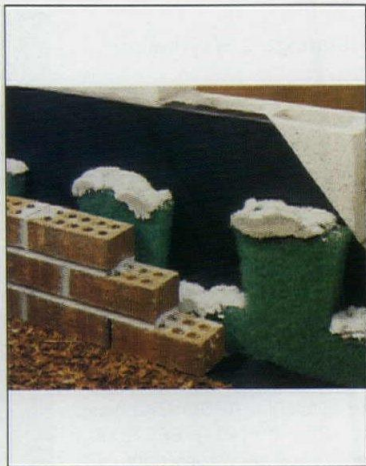


Heat-N-Glo

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Mortar Net

is placed on top of the flashing inside the cavity, where it catches & permanently suspends mortar droppings above the level of the weep holes. Its patented dovetail shape prevents mortar from forming a dam, its shape with its 90% open weave allows water & air to easily move through the net & out the weeps. It's 100% recycled non-degradable polyester and is available in a 2-inch width. For a CAD disk, call (800) 664-6638.

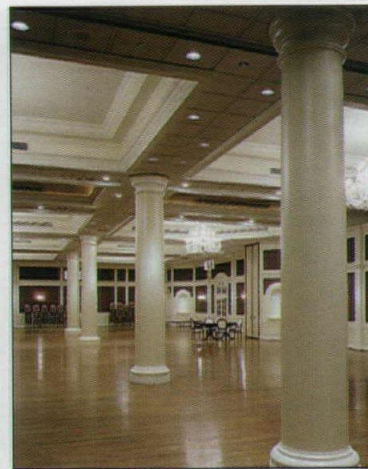


Mortar Net

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**Chadsworth's
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Voted No. 1 in U.S. Columns, pillars, pilasters & posts avail. in wood, PolyStone™ & fiberglass. Interior, exterior. Many sizes & styles. Competitive prices. Job-site delivery. 72-hour Quick Ship Program on stock products. Worldwide shipping. Award-winning Idea Book features a collection of column projects. Includes Columns Product Portfolio, \$15 soft cover, \$25 hard cover. Columns Product Portfolio \$5 (credited to first order). Free flier. www.columns.com 1.800.486.2118 • Telefax 910.763.3191

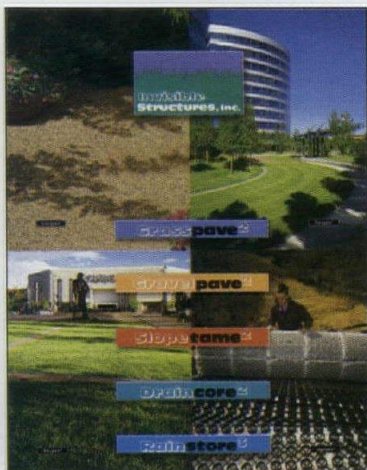


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3 new invisible products have been added to the family of Grasspave2 & Gravelpave2 - Slopetame2, Draincore2, & Rainstore3. For 16 years we have provided grass paving ring structures with 92% void area for root development. Now we're applying this technology to erosion control, drainage, & water storage with easy installation in 9 roll sizes. Call our knowledgeable staff for CADD details, specs, & product specs at (800) 233-1510. Web Site: <http://www.invisiblestructures.com>

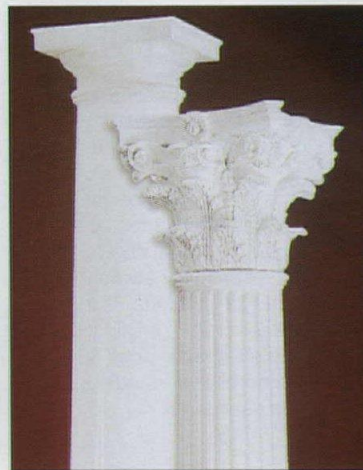


Invisible Structures, Inc.

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Classically authentic yet affordably priced columns and balustrades from Melton Classics, Inc. Quality products include architectural wood columns for paint or stain, fiberglass columns, poly/marble columns and synthetic stone columns and balustrades. Interior/Exterior, Custom Orders, Jobsite Delivery. Call 800-963-3060 for free literature or check out our website at www.meltonclassics.com or see us in Sweet's (06400Mel) or (04720Mel).

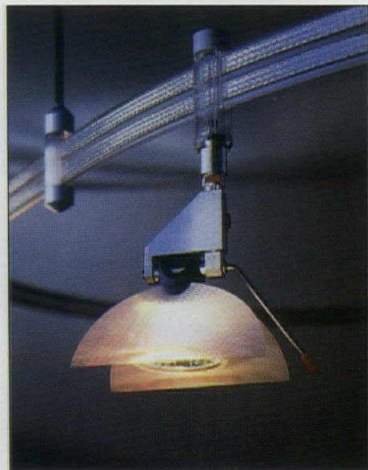


Melton Classics, Inc.

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Bruck, the world leader in the area of low-voltage Track and Cable Systems introduces Flex-Line. A dual circuit rail that flexes to allow for curved or linear installations. Butterfly, shown above attaches by the way of "Plug and Lock". See Bruck at GlobalShop. Stand #5342.

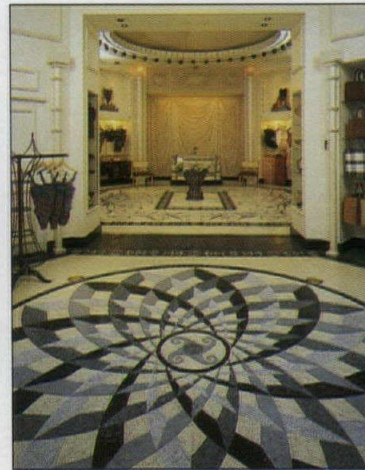


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**The Art of Mosaics.
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Superbly crafted mosaics of Murano glass, polished or tumbled marble are available from Sicis Italy. They will also manufacture your exclusive designs. Suitable for hotel lobbies, spas, decorative murals or as wall veneer. Mosaics are pre-mounted for simple installation. For information and free catalogs Call (212) 829-8341 or Fax: (212) 829-8326.

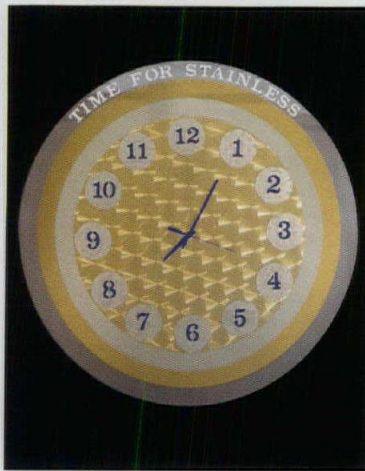


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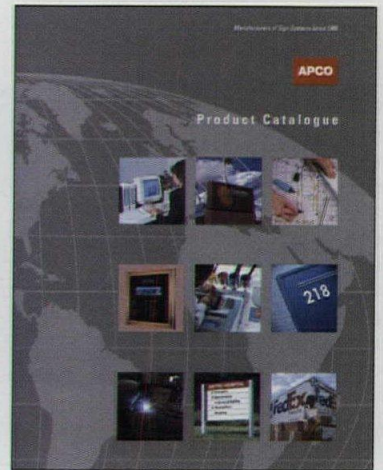


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Signage & Wayfinding

APCO manufactures an extensive line of architectural signage designed to complement any environment. From interior and exterior signs, to directories, displays, ADA compliant and user-updatable signs, we have the solution to your identification needs. Professional services such as wayfinding, sign design, ADA surveys, project management, and factory installation are also available. APCO Graphics, Inc., Phone: (404) 688-9000, Web: www.apcosigns.com, E-mail: sales@apcosigns.com

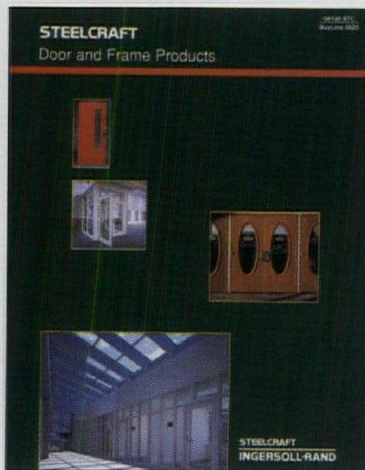


APCO Graphics, Inc.

CIRCLE 115 ON INQUIRY CARD

Steelcraft Product Guide #613

The Steelcraft Product Guide is designed with the architect, & design community in mind. Product specifiers can find basic door & frame specs in a special chart. We have included a "Relative Cost Chart" that shows the cost comparison between various Steelcraft products. We include Steelcraft product specs; fire label charts; door & frame selection charts; handing charts; & info service list.

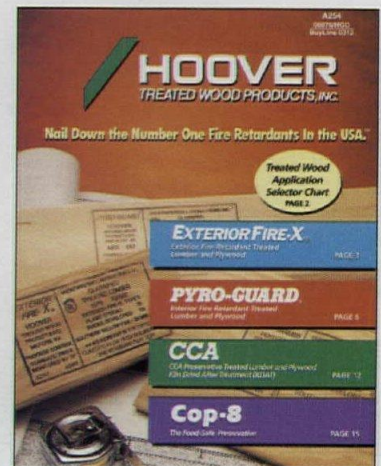


Steelcraft

CIRCLE 116 ON INQUIRY CARD

Fire Retardants and Preservatives

New 16-page Sweet's catalog features Pyro-Guard® interior type FRT lumber and plywood; Exterior Fire-X® FRT lumber and plywood for exterior uses; CCA/KDAT preservative treated lumber and plywood that's Kiln Dried After Treatment; COP-8® the food-safe preservative; PWF treated wood for Permanent Wood Foundations; and PLYWALL engineered wood noise barriers, from Hoover Treated Wood Products Inc, <http://www.frtw.com>

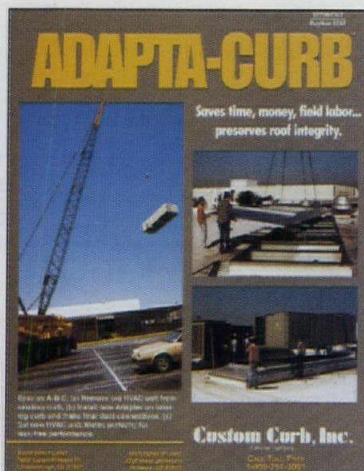


Hoover, Inc.

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Sloped Adapter for Retrofit Solutions

Exclusive sloped adapter is designed for positive water runoff & proper load distribution. Informative Adapta-Curb brochure details the many configurations & options available for easy addition or replacement of HVAC units, vents, plumbing stacks, skylights & other rooftop equipment without disturbing the roof or substructure. The system is a solution for retrofit or for new construction where equipment size will be determined later. 1-800-251-3001.

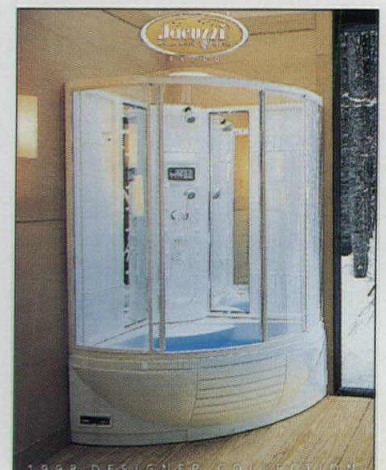


Custom Curb, Inc.

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Jacuzzi Whirlpool Bath

Jacuzzi Whirlpool Bath — presents The 1998 International Designer Collection of whirlpool baths, faucetry and the J-Dream™ Family of shower systems. This full-color catalog features beautifully styled products, integrating the most innovative luxury features. For more information please call 1-800-288-4002. (www.jacuzzi.com). Catalog free of charge.

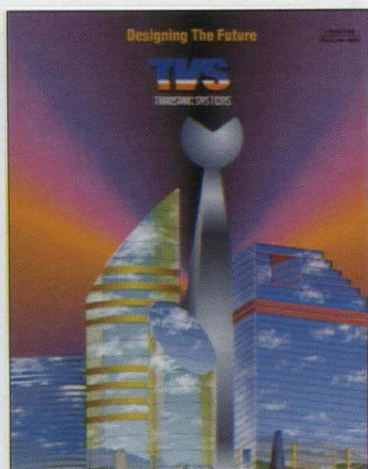


Jacuzzi

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Automated Vacuum Transport Systems

Waste and/or soiled linen. Perfect for large hospitals and similar buildings that serve thousands of people. Improve the building environment, management, and maintenance. Full-vacuum and gravity/vacuum technology. Custom design each system to building specifications. www.transvacsys.com



Transvac System, Inc.

CIRCLE 120 ON INQUIRY CARD

New Pemko Full Line Catalog

Among the new products featured in Pemko's 135 page 1998-9 catalog, are HSS2000 (an intumescent fire life-safety product), FG3000 (an amazing glazing compound which allows for much larger lites in rated doors), security door bottoms to deter lever handle break-ins), new special purpose continuous geared hinges, ADA compliant rubber and aluminum ramps, as well as expanded brush products.

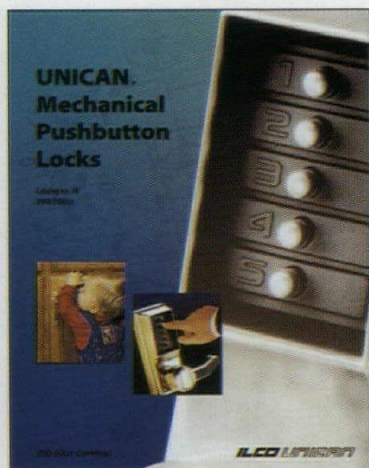


Pemko

CIRCLE 121 ON INQUIRY CARD

Millions of Pushbutton Locks in Use Worldwide

ILCO UNICAN® pioneered mechanical pushbutton locks, & we continue to be the world leader in this type of security. Our locks help secure The Pentagon, US & Canadian embassies, McDonald's fast-food restaurants, plus major universities, banks, & airports around the world. We offer a wide range of models & styles to fit many applications. Most anything presently secured by a key can have the security & convenience of a pushbutton lock. (336) 725-1331.

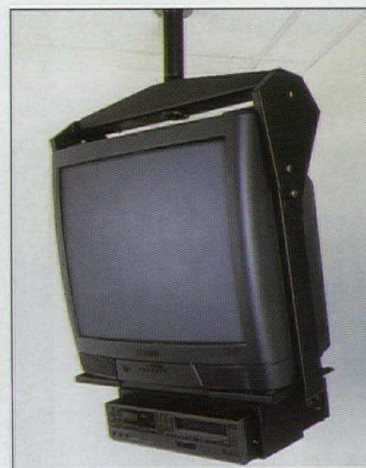


ILCO UNICAN®

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Peerless Jumbo® Mounts

Feature adjustable height, width, tilt & swivel. Mounting plate allows the fine-tuning of gravity in relation to degree of tilt, while top clamps provide stability. Constructed of heavy gauge steel with durable epoxy finish, mounts are avail. in sizes to accom. 13" - 42" screens & 125lb. - 300lb. UL listed & CSA cert. Several OSHPD appr'd. VCR attachments & tamper resistant security fasteners opt.



Peerless Industries

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GRESSCO, Ltd introduces HABA® a new line of children's modular Loft furniture, shelving, platforms and room partitions in addition to our existing array of KinderSystem™ reading furniture. Now you can create a truly unique children's area in your hospital waiting room, daycare center, church or library. Call Gressco today for a FREE catalog at 1-800-345-3480, www.gresscoltd.com.



GRESSCO Ltd.

CIRCLE 124 ON INQUIRY CARD

Commercial Window Treatments

Springs Window Fashions provides the best value in commercial mini blinds with their Bali S3000. Premium features include curved headrail face, rear light blocking lip, aluminum slats with anti-static paint finish, hidden brackets, clutch tilter, all at standard cost. Privacy slat option provides enhanced light control with hidden cord holes. Springs also manufactures Graber and Nanik brand products. Call SpecFAX for information at 800-327-9798.

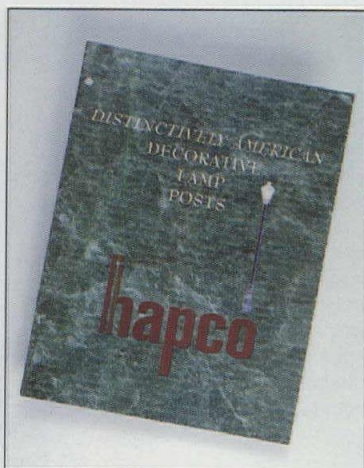


Springs Window Fashions

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**Distinctively American
Decorative Lamp Posts**

HAPCO Decorative Lamp Posts are designed and crafted to rigorous in-house standards using lightweight, durable aluminum castings and extrusions with durable thermoset powder paint finishes. Period lamp posts enhance outdoor lighting for historic preservations, downtown renewals, parks and recreational areas, subdivisions and roadways. 1-800-368-7171 E-mail - www.hapcopoles.com & info@hapco.com

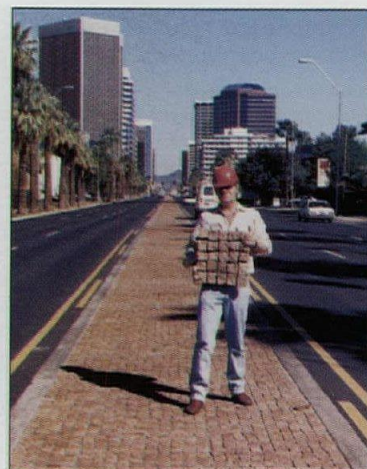


HAPCO

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**Granite Cobblestone
in Modules**

An updated catalog features authentic European cobblestone preassembled in modular form. Modules in square, fan, concentric ring, and custom formats arrive at the jobsite ready for a quick and easy installation. Pedestrian or vehicular application. Eurocobble® has supplied the design community with traditional and customized paving solutions for over 15 years. Call toll free (877) 877-5012.

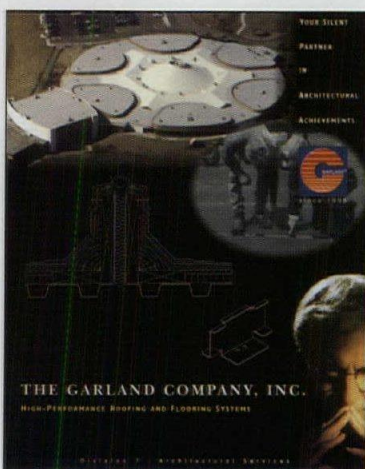


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**Your Silent Business
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Receive a FREE Architectural CD complete with easy-to-use CSI formatted specifications and details. Learn how Garland products and technical services can develop the proper roofing solution for your next project. The Garland Company, Inc. is an ISO 9002 certified company offering high-performance systems that meet today's roofing requirements. Hot and cold built-up systems, modified bitumen and fluid applied systems. For more information contact Garland at 1-800-741-3157 or www.garlandco.com

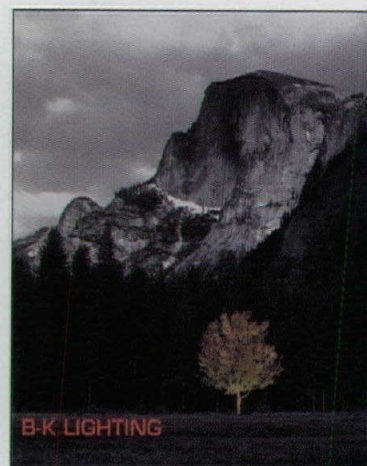


The Garland Company, Inc.

CIRCLE 128 ON INQUIRY CARD

New Catalog

B-K LIGHTING is proud to announce the completion of their new catalog. This catalog features over 100 specification-grade, outdoor, architectural lighting fixtures. Included in the 106 page, four-color catalog is CAD information, lamp data, photometrics & much, much more. To receive one of the most informative, detailed & 'engineering friendly' catalogs in the lighting industry, contact B-K LIGHTING today! B-K LIGHTING, 7595 N. Del Mar Avenue, Fresno, CA 93711. Phone: 209-438-5800 Fax: 209-438-5900. e-mail: bk@attitude.com www.light-link.com



B-K LIGHTING, INC.

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**Presurfaced Finland Birch
Plywood**

Fin Color Ply is a presurfaced multi-purpose plywood used for interior panels, furniture & cabinetry. Constructed with all Finland birch hardwood veneers, presurfaced on both sides with a durable colored translucent finish allowing visibility of the natural wood grain. Available in clear transparent, yellow, light brown, red, green, dark brown & opaque black. Panel size: 96" x 48"; Thicknesses: 1/2" (9-Ply) & 3/4" (14-Ply). Tel (310) 396-9991 Fax (310) 396-4482.

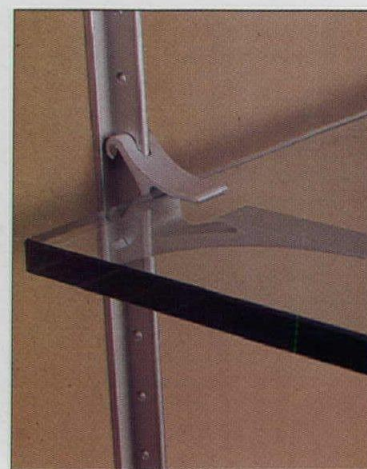


Finland Color Plywood Corp.

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**Parallel Design
Partnership Limited**

"ellen's brackets", and anodized-aluminum shelving system designed by M Ali Tayar, provides an elegant alternative to existing bracket-and-track systems. Cantilevered brackets come in two sizes, for shelves 3/4 or 3/8-in. thick and 10-in. deep. Wall-mounted tracks permit 1 1/2-in. adjustment of wood, glass or plexiglass shelves. For more info phone Parallel Design Tel: 212/989-4959 Fax: 212/989-4977.

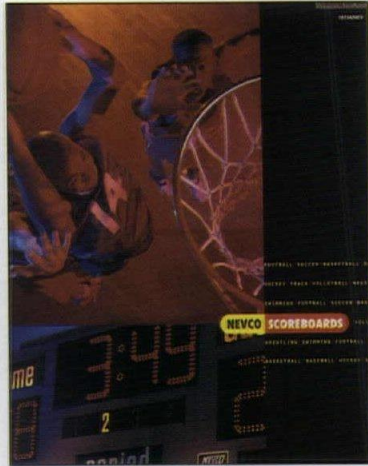


Parallel Design

CIRCLE 131 ON INQUIRY CARD

**Scoreboards For Sports -
Nevco Scoreboard Company**

Nevco Scoreboard Company manufactures scoreboards for the following sports: basketball, baseball, football, soccer, wrestling, volleyball, swimming, track, hockey and in-line hockey. Our indoor scoreboards are available in incandescent and LED (light emitting diodes). Nevco scoreboards carry a 5 year guarantee and are UL Listed/CSA Certified. Call 800-851-4040 for information and a free color catalog.

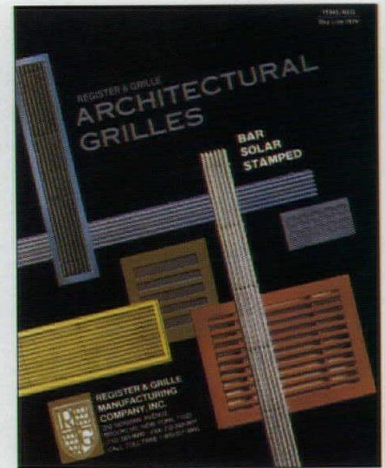


Nevco Scoreboard Company

CIRCLE 132 ON INQUIRY CARD

Decorative Grilles

Unusual visual effects emerge when our grilles are designed for area effects. Versatility is the theme. R&G offers architects and interior designers many ways to express the changing forms of metal with the integrity of R&G's architectural grilles. Custom or standard finishes are available plus any grille can be made in matching color to blend with your deco. 202 Norman Ave., Bklyn, NY 11222. 800-521-4895, Fax: 718-349-2611.

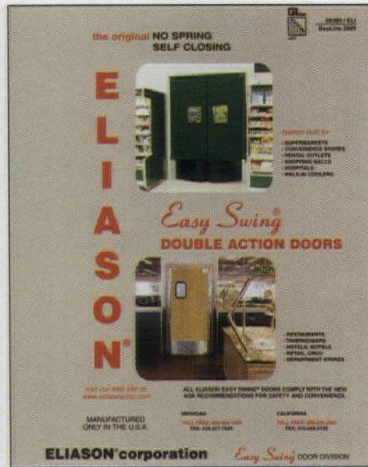


Register & Grille Mfg., Co

CIRCLE 133 ON INQUIRY CARD

**Eliason Easy Swing
Double Action Doors**

Available from Eliason is a new 1999 Easy Swing door Price/Spec catalog. Doors are illustrated in full color with complete specifications, prices and application data. Doors are gravity operated, open to a light assist and close automatically with a safe, gentle time delay action. Many sizes, styles and decor options. Doors are sold direct. Catalog is no charge. Eliason Corporation, PO Box 2128, Kalamazoo, MI 49003. Web: www.eliasoncorp.com T: 800-828-3655 F: 800-828-3577

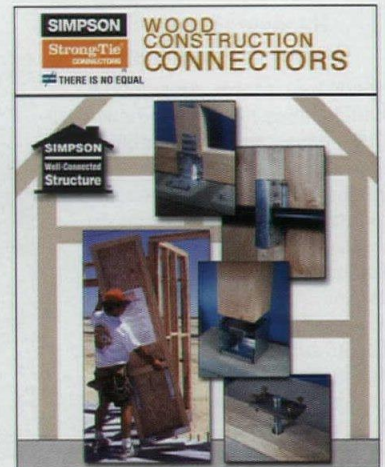


Eliason Corporation

CIRCLE 134 ON INQUIRY CARD

**Wood Construction
Connectors Catalog**

Strong-Tie's '99 catalog, Wood Construction Connectors, introduces fifteen new products. A necessary reference for structural engineers, building officials, and architects, the catalog includes updated specifications, load charts, application drawings, and building code acceptance -- plus information on holdown anchorage design, and available custom hangers. ISO9001 registered. For a copy of the 1999 catalog (C-99), write Simpson Strong-Tie Company, PO Box 10789, Pleasanton, CA 94588.



Simpson Strong-Tie Company

CIRCLE 135 ON INQUIRY CARD

**World's Premier
Manufacturer**

offers structurally engineered, prefabricated monolithic Glass Panel Systems. Preglaced & fully waterproof frameworks of Aluminum, Precast Concrete, Steel & Cast Iron incorporate Hollow Glass Block, Solid Glass Pavers, Glass Bullets & Plank or Insulated Glass. Standard & custom panel sizes are avail. for installation as windows, walls, flooring, stair treads & landings, bridges, sidewalks, skylights, complete structures or virtually any application. 1-800-358-3888



Circle Redmont

CIRCLE 136 ON INQUIRY CARD

Mini-JOMY

The JOMY Safety Ladder Co. proudly introduces the Mini-JOMY, a scaled down version of the JOMY Safety Ladder, specially designed for residential & light commercial applications. The Mini-JOMY looks like a drainpipe but folds out to a 17" wide ladder with slip resistant rungs constructed of extruded anodized aluminum & stainless steel. The Mini-JOMY is maintenance free & will last the lifetime of any building. Call 800-255-2591 for additional information.

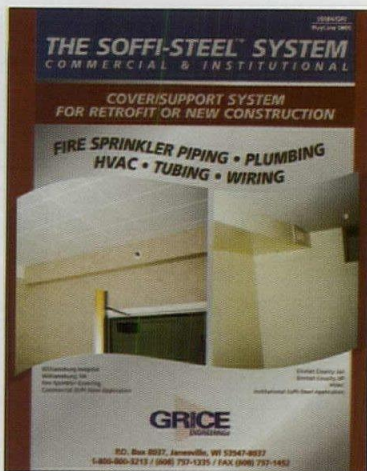


JOMY Safety Ladder Co.

CIRCLE 137 ON INQUIRY CARD

Soffi-Steel™

The Soffi-Steel™ System is available for commercial and institutional applications, a pre-fabricated, rugged, snap-on soffit with an attractive and quick clean installation. Commercial Soffi-Steel for hospitals, dormitories, apartments, etc. Institutional Soffi-Steel is used for jails, and prisons. Custom sizes, shapes and finishes. Contact: Grice Engineering, Inc, 1-800-800-3213, Fax: 608-757-1452. E Mail: gei@mindspring.com

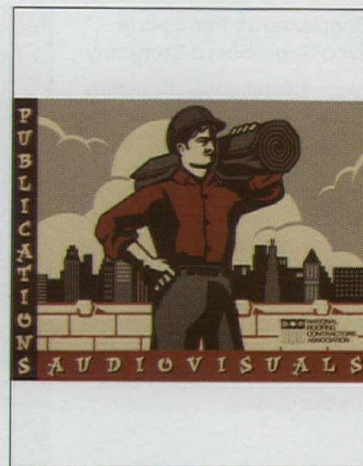


Grice Engineering, Inc.

CIRCLE 138 ON INQUIRY CARD

Catalog of Roofing Publications & Audiovisuals

The National Roofing Contractors Association has more than 90 roofing-related products, including the 1,858-page NRCA Roofing and Water-proofing Manual-Fourth Edition and the NRCA Construction Details on CD-ROM in .DWG and .DFX formats. For a free catalog, contact NRCA Marketing Services, 10255 W. Higgins Road, Suite 600, Rosemont, IL 60018, (800) 323-9545.



National Roofing

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Hanover Lantern Commercial Lighting

Hanover Lantern designs & manufactures high quality heavy duty cast titanium/aluminum commercial grade decorative lighting fixtures, poles & accessories. A selection of design styles, light source options, light distribution systems, mounting options, computer generated photometric data plus a custom design service are available to the architect or engineer. 350 Kindig Lane, Hanover PA 17331. T: (717) 632-6464 F: (717) 632-5039

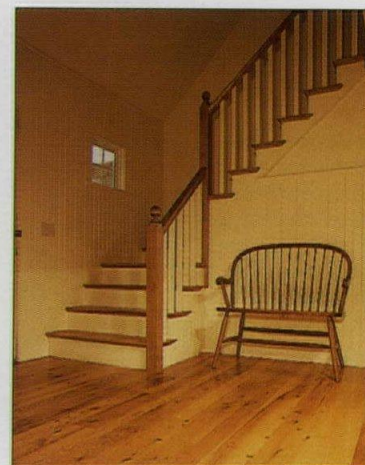


Hanover Lantern

CIRCLE 140 ON INQUIRY CARD

Reclaimed. Remilled. Remarkable.

Vintage Lumber has been manufacturing exceptional antique wood flooring since 1973. Available in 16 species and grades, solid and engineered, for residential or commercial construction. Our extensive selection and consistent quality and service is unequalled in the industry. For more information call 800-499-7859 or email woodfloors@vintagelumber.com. PO Box 104, Woodsboro, MD 21798 www.vintagelumber.com.



Vintage Lumber

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Ornamental Picket Fence with a Purpose

We have given special attention to each & every component of our fence. Every item is designed for strength, durability and low maintenance. No other company builds a complete fence - rail, rivets, brackets, pickets and posts, that are stronger, more durable, have more security or lower maintenance costs than our fences. Monumental Iron Works, 6500 Eastern Ave., Baltimore, MD 21224. Tel: (410) 633-6500, Fax: (800) 239-2963.

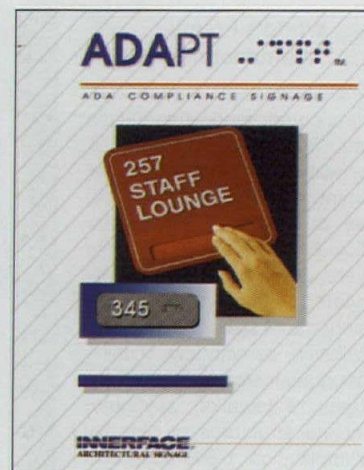


Monumental Iron Works

CIRCLE 142 ON INQUIRY CARD

ADA Compliance Signage

Innerface makes it easier for you to meet the Americans With Disabilities Act (ADA) signage standards. Innerface offers (1) A variety of compliance signage, (2) National distribution (3) Solid 27 year history and (4) Economical, attractive, & highly functional interior and exterior signage. Innerface also offers signage planning and wayfind-ing services. For free literature, please call (800) 445-4796.



Innerface

CIRCLE 143 ON INQUIRY CARD

Building Home Remodeling

Waupaca Elevator has the answer to your Up/Down needs. In business for almost 50 years we have perfected the comfort, convenience, mobility, and safety necessary for the modern home elevator. Look to the 21st Century in home design by installing a Waupaca Elevator in your home today. For further information contact: 1050 So. Grider St., Appleton, Wi. 54914. Tel: 1-800-238-8739.

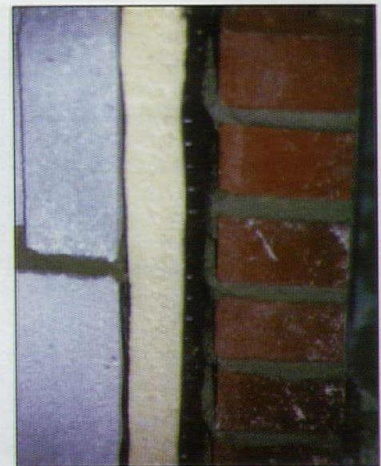


Waupaca Elevator

CIRCLE 144 ON INQUIRY CARD

The Insulated Drainage Board

ThermaDrain® eliminates the need for a clean airspace. Currently, a 2" airspace is the primary means of providing sufficient drainage for cavity walls. However, poor workmanship, mortar blockages and mortar bridging can and does occur in airspaces 2" or greater. This allows water to bridge the cavity before it ever reaches the flashing and weepholes. ThermaDrain® eliminates workmanship problems and provides a continuous drainage path to the required flashing. Call us for a data sheet and a free sample. (800-837-4065) *Patent Pending

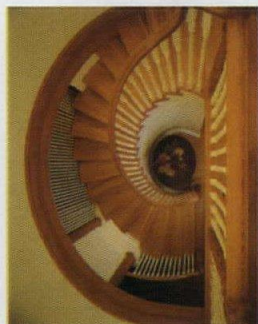


ThermaDrain*®

CIRCLE 145 ON INQUIRY CARD

Wood for Flooring and Architectural Accents

Mountain Lumber: celebrating 25 years of sustainability, reclaiming antique wood for flooring and architectural accents. Product lines include seven grades of Historic Heart Pine®, plus Antique American Oak and Chestnut and Antique Russian Oak. Styles range from formal to rustic, to suit any design project. Free brochure. 1-800-445-2671 or www.mountainlumber.com



Historic Heart Pine™

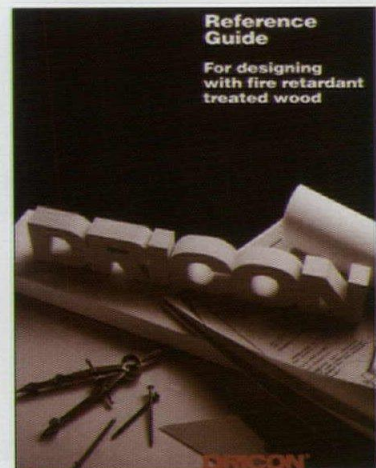
MOUNTAIN LUMBER

Mountain Lumber

CIRCLE 146 ON INQUIRY CARD

FRT Wood & Building Codes

"Reference Guide for designing with fire retardant treated wood" outlines codes-compliant applications for FRT wood. This includes the National, Standard, Uniform, and CABO codes. The recently updated guide also covers design properties, test standards, identification, and specification, and describes the Dricon® brand. Hickson Corp., 1955 Lake Park Dr., Suite 250, Smyrna, GA 30080. Tel: 770-801-6600. Web site: www.dricon.com

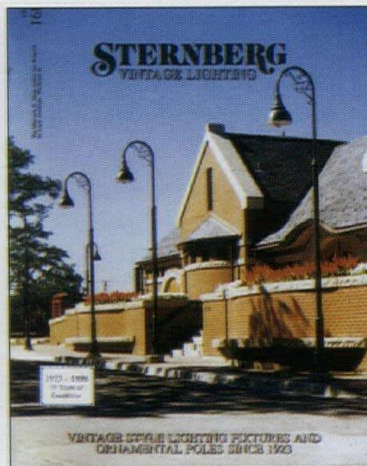


Hickson Corp.

CIRCLE 147 ON INQUIRY CARD

A New 1998 Catalog From Sternberg Vintage Lighting

This 80-page full color catalog is packed with about 500 individual product photos and shots of installations of all types. There are new fixtures, ornamental poles, new bollards, a new fitter and more information to help specifiers choose the right product and options for a specific project. Sternberg celebrates their 75th anniversary in 1998. It is an employee owned company with all products manufactured in their Niles IL plant.

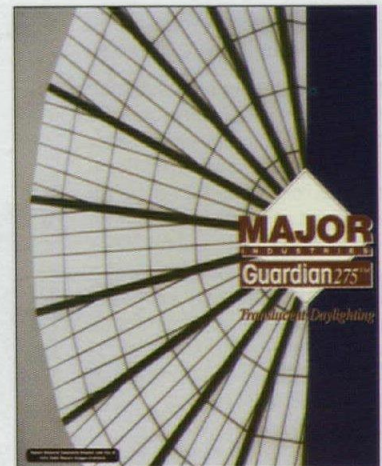


Sternberg Vintage Lighting

CIRCLE 148 ON INQUIRY CARD

Skylights & Translucent Daylighting

Major Industries introduces its newest catalog on translucent daylighting, covering the full range of translucent fiberglass insulated sandwich panel systems. Stunning photography illustrates classic and contemporary applications. If your interest involves skylights or translucent wall assemblies, keep abreast of developments in daylighting. Request a catalog by fax (715) 848-3336 or toll free at (888) SkyCost.

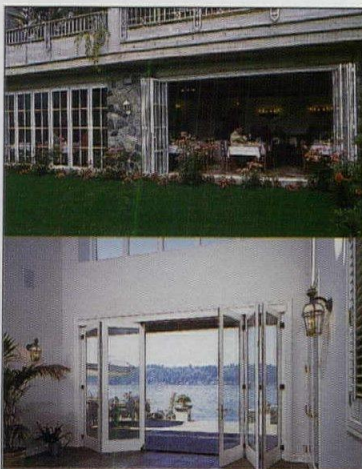


Major Industries

CIRCLE 149 ON INQUIRY CARD

The Opening Glass Wall

A full line of aluminum & wood framed systems that make large exterior openings possible. Expand space with indoor/outdoor areas. Increase business with large, inviting entrances. Ideal for residential & commercial applications. An aesthetic, engineered solution offering weather tightness, security, & ease of operation can be provided for almost any conceivable application. Available are folding, paired & individual panel systems. Call (800) 873-5673 or fax (415) 383-0312.

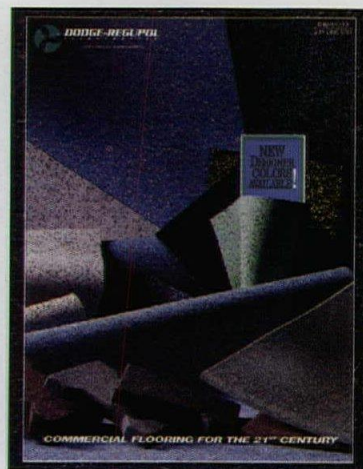


Nana Wall Systems, Inc.

CIRCLE 150 ON INQUIRY CARD

**Rubber Flooring
for the 21st Century**

Dodge-Regupol Inc. (DRI) emerged as the world leader in recycled rubber products technology while developing a full range of recycled rubber flooring for both commercial and sports applications. DRI's commercial line of rubber flooring, dist. by Gerbert Ltd, delivers exceptional resilience and durability, exceeds ADA requirement for slip-resistance and meets designer's objectives for colorful and aesthetically pleasing interior and exterior surfacing at a lower cost than conventional rubber flooring. 1-888-359-5466.

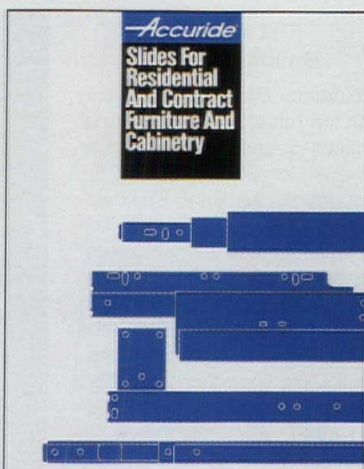


Dodge Regupol

CIRCLE 151 ON INQUIRY CARD

**Enhance the Quality
of Casework**

Accuride offers a variety of superior slides-perfect for lab casework, residential and office drawers. Architectural support available includes suggested specification wording, specification representatives and a complete binder of slides for drawers, specialty applications and retracting pocket doors. Request your free catalog. For more information: 1-888-459-8624



Accuride

CIRCLE 152 ON INQUIRY CARD

**The Look of Alabaster
Without the Expense**

Good look alabaster done in ACRYLIC. White, Faux Alabaster, Faux beige Alabaster. Sizes from 10" to 96" in diameter. Incandescent or P.L. Metal finishes in Chrome, P.B. Brushed Steel, other finishes available. Matching wall brackets. For additional information request #17. Primelite Manufacturing, 407 South Main Street, Freeport, NY 11520. Phone: 516-868-4411 or Fax: 516-868-4609.

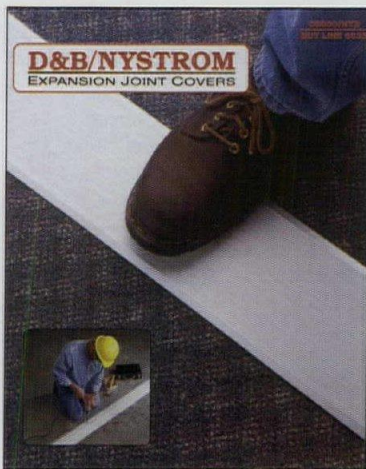


Primelight Manufacturing

CIRCLE 153 ON INQUIRY CARD

**Introducing Nystrom
Expansion Joint Covers!**

Nystrom is pleased to announce the addition of expansion joint covers to our product line. Our new design catalog and binder is an ideal desktop reference for specification information on access panels, louvers, floor hatches, roof hatches, smoke vents and expansion joint covers. For additional information contact Nystrom directly at 1-800-547-2635 or check us out at WWW.NYSTROM.COM.



Nystrom

CIRCLE 154 ON INQUIRY CARD

Peter Pepper Products, Inc.

The Artform™ Collection offers fine German craftsmanship, engineering and innovative design. These elegantly shaped coat racks, hat shelves, hangers and matching wall tables provide a place for hanging garments in any interior. All pieces are impeccably finished using stainless steel, chrome, aluminum, glass and wood. Fax: 310.639.6013 Phone: 310.639.0390 www.peterpepper-products.com

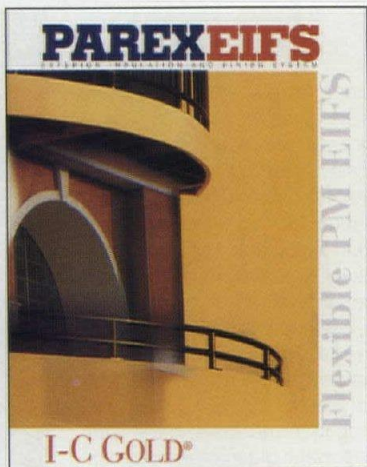


Peter Pepper Products, Inc.

CIRCLE 155 ON INQUIRY CARD

Flexible PM Exterior Insulation & Finish System

Available with drainage option, I-C Gold® incorporates advantages from expensive "hard coat" PM systems, offers superior impact and puncture resistance, plus the superior strength and energy performance of Owens Corning Foamular® Sanded Extruded Polystyrene Insulation. It requires no control joints, and allows complete design flexibility. 800-537-2739 www.parex.com

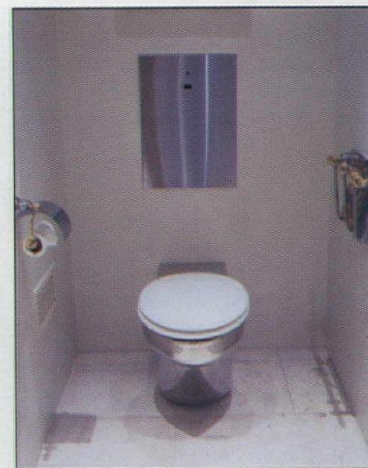


Parex

CIRCLE 156 ON INQUIRY CARD

Meridian Toilets – "One Continuous Piece"

Acorn Engineering Company is proud to introduce a new line of innovative toilets that are attractive, contemporary & vandal-resistant for the commercial & residential market. ADA compliant, the Meridian toilet is fabricated from a heavy gauge stainless steel. This sleek contoured design is available on-floor siphon or off-floor blow-out jets. Optional polished mirror finish & powder coating finishes available. For a product brochure or more info contact Acorn Engineering at (800) 488-8999, or at www.acorneng.com

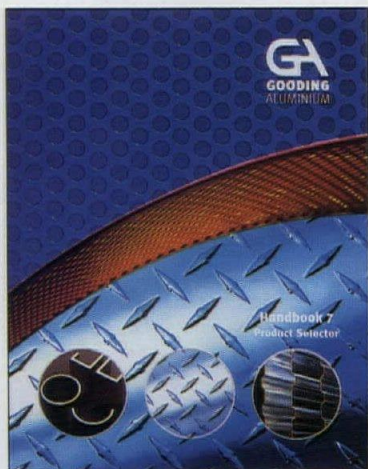


Acorn Engineering Company

CIRCLE 157 ON INQUIRY CARD

Exclusively Aluminum

Compiled to assist the architectural professional, the new and exciting 150 page GA Handbook covers the whole aluminum specification process, from design to on-site supply. Our extensive and unique range of perforated and patterned aluminum panels and accessory trims provide outstanding design solutions. Details are also included for the GA self-select samples service. For your free GA Handbook fax 011 44 181 694 2004.

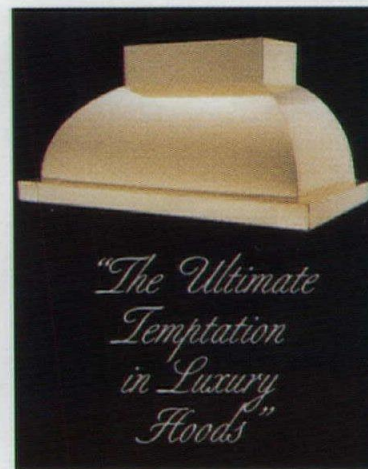


Gooding Aluminum

CIRCLE 158 ON INQUIRY CARD

Elegant Custom Hoods

The beauty of an Independent Hood is breathtaking! A close inspection reveals an exquisite under-hood design that incorporates an easy-to-clean surface with brilliant and ambient halogen lighting. The warmth of copper, the brilliance of brass, and the strength of stainless are the powerful raw materials that capture your attention...our attention is to detail. We ultimately create a hood for the connoisseur.



Independent Inc.

CIRCLE 159 ON INQUIRY CARD

Innovative Solutions for Masonry Designs

CavClear® products are air space maintenance systems that provide a continuous drainage area by preventing mortar obstructions in air space. Ensures water management and improves long-term performance. Prevents mortar from making contact with back-up wythe or insulation, allowing moisture to migrate freely to unobstructed weeps. Call toll-free (888) 436-2620.

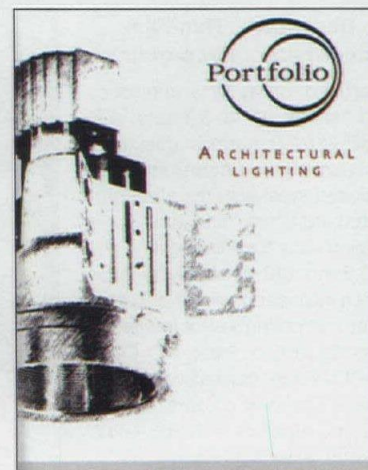


CavClear/Archovations

CIRCLE 160 ON INQUIRY CARD

Cooper Lighting Expands Portfolio

Cooper Lighting's Portfolio brand of architectural-grade recessed downlights has expanded to include over 130 luminaires accepting compact fluorescent, incandescent and H.I.D. lamp sources. Portfolio downlights feature matching apertures for consistent visual appearance, and equal cutoff to lamp and lamp image for glare-free illumination in all optical distributions.



Cooper Lighting

CIRCLE 161 ON INQUIRY CARD

Worthington Group

Research and development has allowed Worthington Group to fill builders' needs with leading products in each category. Products are statically chosen for endurance, precision, ease of installation and price. Columns, Balustrading, Mantels, Moulding, Turnposts, Pediments, Medallions and more. Call for our catalog. Job site delivery and technical support a phone call away. Call 1-800-872-1608.

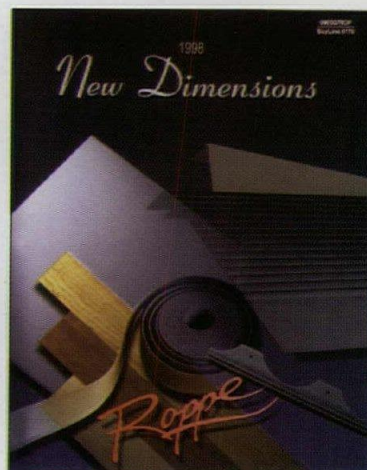


Worthington Group

CIRCLE 162 ON INQUIRY CARD

1998 Catalog

Roppe enters 1998 with more colors & styles of high quality flooring products. The North Coast Collection luxury vinyl tile line features Wood & Terra Naturals. Wood Naturals feature wood-look planks & tiles in many colors & styles. Terra Naturals contain a variety of marble, granite, & stone looks. Our expanded line of stair treads, including abrasive strip treads, meet current access code requirements. Offering more cove base varieties with a broad color selection. Products focus on quality & ease of installation & maintenance.



Roppe

CIRCLE 163 ON INQUIRY CARD

A powerful new idea in accent lighting

ProSpec® Linear combines the versatility of track with the unobtrusiveness of a recessed down-light. Featuring a range of 2, 3 and 4-lamp configurations in line voltage, low voltage and metal halide sources, the compact dimensions of ProSpec Linear allow a significantly cleaner installation while permitting larger focal pools to be created. (800) 215-1068.

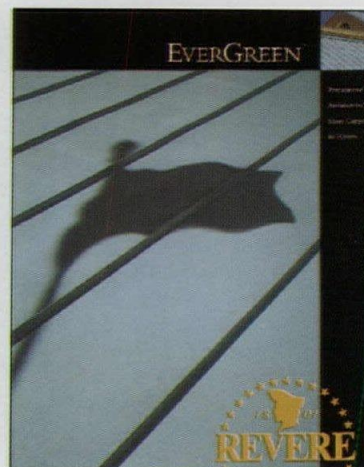


Lightolier®

CIRCLE 164 ON INQUIRY CARD

EverGreenBrochure

New Revere EverGreen™ pre-patinated architectural copper lets you specify the rich, warm look of patina, without waiting decades to fulfill your vision. Completely matures after 4 to 6 rainfalls. Adds striking beauty & character to any roof or accent. New EverGreen brochure. Revere Copper Products, Inc. P.O. Box 300, Rome, NY 13442-0300, 800/950-1776; F: 315/338-2105; <http://www.reverecopper.com>

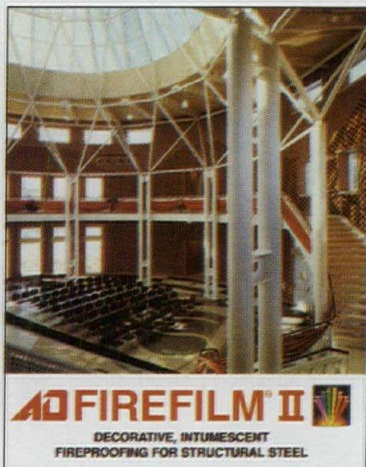


Revere Copper, Inc.

CIRCLE 165 ON INQUIRY CARD

Decorative, Thin-Film Intumescent Fireproofing

Improved spray characteristics and ratings up to 3 hours! A/D FIREFILM®II permits designers to use the appearance of exposed steel with the steel protected from fire. The product is applied as a thin-film coating 0.4 to 3.3 mm (16 to 130 mils) thick. When exposed to fire it expands to form a meringue-like insulating layer up to 4 in. thick. A/D COLORCOAT topcoat is available in a wide range of colours. Call 1-800-263-4087 or 416-263-4087. Internet: www.adfire.com

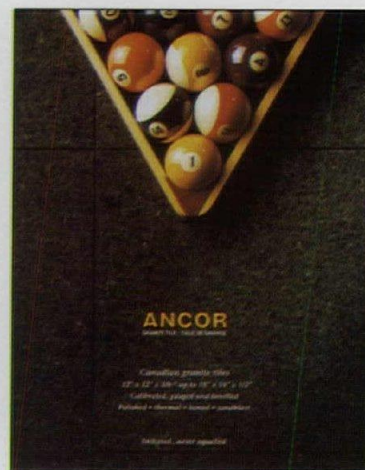


A/D Fire Protection

CIRCLE 166 ON INQUIRY CARD

Ancor Granite Tile

Ancor produces over fifty No. American and Imported granites in a full range of colors and finishes for residential, commercial and institutional use. Standard format is 12 x 12 x 3/8"; other sizes up to 18 x 18 x 1/2" available. Honed finish tile is particularly suitable for high traffic commercial areas, 435 Port Royal West, Montreal, Quebec, H3L2C3, Canada. Ph# (514) 385-9366, Fax# (514) 382-3533.



Ancor Granite

CIRCLE 167 ON INQUIRY CARD

**Vision Control®:
No Strings Attached!**

Custom-made hermetically sealed glass unit consists of rigid pivoting aluminum blinds, manually operated or motorized, no cords or strings attached! Dust-free & maintenance-free, thanks to its hermetic seal. Provides privacy, hygiene, control of light, heat, sound. Endless lighting possibilities available in various shapes, sizes, glazing options. Suited for windows, doors, skylights, interior partitions; for all commercial, institutional, & residential applications. Call 800-668-1580.

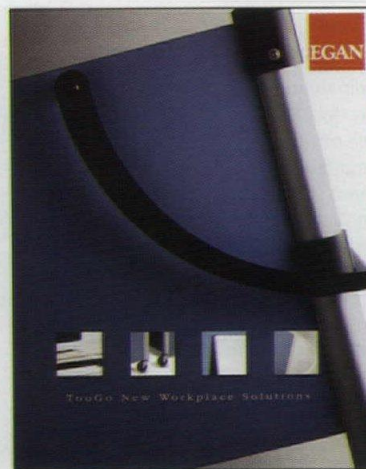


Unicel

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TooGo New Workplace Solutions

TooGo workplace solutions help you create dynamic, flexible office environments that adapt instantly to change. Including hoteling & team spaces which serve to enhance productivity & have created a need for specialized furniture. Designed to meet the needs of these new work place concepts by combining safe, convenient mobility with unparalleled ergonomics. Complimented by a variety of unique mobile & permanent storage solutions, visual presentation tools & privacy screens that move & reconfigure in seconds. Call 800-263-2387 ext. 38, e-mail marketing@egan.com or visit www.egan.com



Egan Visual

CIRCLE 169 ON INQUIRY CARD

Interactive Whiteboard

The Rear Projection SMART Board™ is an interactive whiteboard that allows you to control projected Windows® or Macintosh® applications and other multimedia by pressing on the Board's large, touch-sensitive surface. Write over top of applications and your notes are saved for future reference and distribution. Architects and facility designers can request the SMART Product Kit by calling 1.888.42.SMART or by visiting www.smarttech.com/productkit.

Rear Projection
SMART Board™

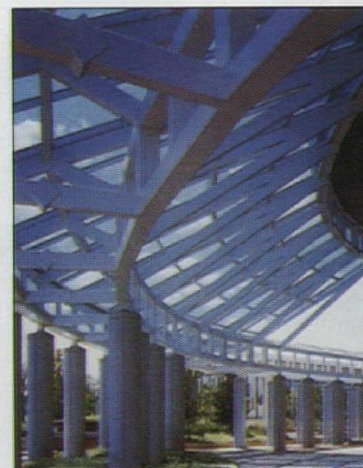


SMART Technologies Inc.

CIRCLE 170 ON INQUIRY CARD

**Structural Steel
An Architect's Guide**

Designing with Structural Steel, A Guide for Architects provides the needed information to design everything from manufacturing facilities to high-rise buildings. Over 300 pages & 100 illustrations, the manual covers design ideas, systems, details, material & a list of industry resources & standards. Published by the American Institute of Steel Construction, Inc., (AISC), & written for architects by practicing architects & engineers. To order call AISC Publications: 800-644-2400 or at: www.aisc.org.

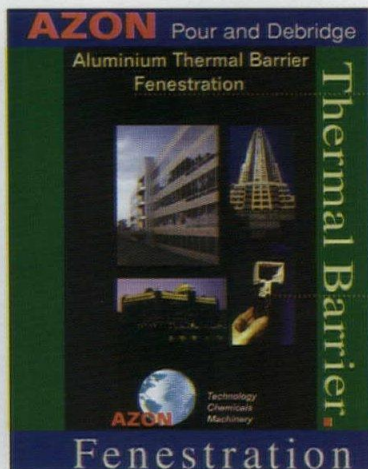


AISC, Inc.

CIRCLE 171 ON INQUIRY CARD

Pour and Debridge - Aluminum Thermal Barrier Fenestration

Brochure features pour & debridge technology, the benefits of aluminum as a construction material & how it's made energy efficient through Azon's technology. This manual graphically illustrates the concepts of thermal barriers in a back-to-the-basics format for architects, construction professionals & others in the fenestration industry. It is an introduction of the materials, machinery & procedures used by producers & distributors of thermal barriers. A leader since 1977 in the production of machinery and polyurethane thermal barriers for aluminum windows, insulated glass spacers marketed as Warm-Light® & high performance grouting compounds.

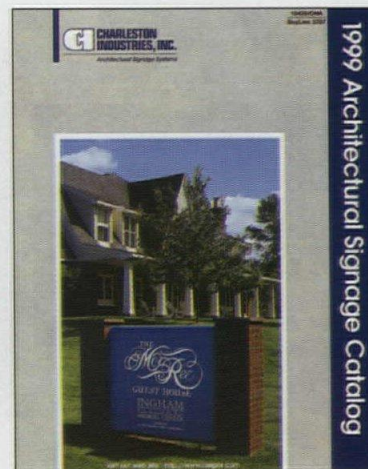


AZON

CIRCLE 172 ON INQUIRY CARD

**New 1999
Architectural Signage Catalog**

Charleston Industries' manufactures a complete line of architectural signage, offering design integrity, aesthetic quality & remarkable economy. The CI system can be adapted to virtually any signage application & features a unique "changeable word bar" sign that allows information to be changed with a minimum of maintenance. Graphics, custom color & logo matching are available at low cost. Call 1-800-722-0209 for assistance or visit us @ <http://www.cisigns.com>. Send Reader responses to Michael Palesny @ Charleston Industries, Inc., 1005 Tonne Road, Elk Grove Village, IL 60007.

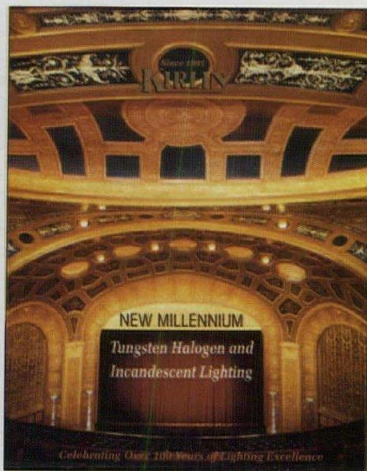


Charleston Industries, Inc.

CIRCLE 173 ON INQUIRY CARD

Tungsten Halogen and Incandescent Lighting

Kirlin introduces over 100 new architectural luminaires in its "New Millennium Tungsten Halogen and Incandescent Lighting" catalog. Three year warranty; U.L. Listing for Wet Locations standard; low brightness; sixteen reflector finishes; efficient. T-4 (quartz) or PAR Tungsten Halogen and Incandescent designs for downlights, direct/indirect, wall washes, directional, open or lensed, round or square, recessed, all mounts.

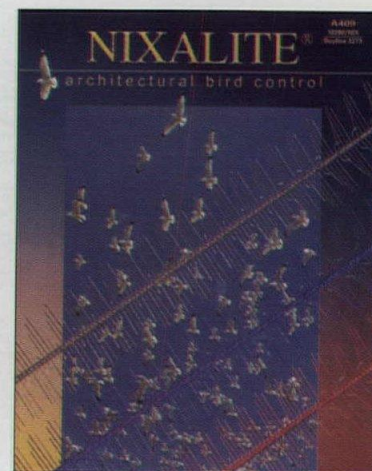


The Kirlin Company

CIRCLE 174 ON INQUIRY CARD

Birds Take Flight From NIXALITE!

Preserve architectural treasures with NIXALITE bird control. Effective and humane, these stainless steel strips provide a protective barrier that is long lasting and inconspicuous. With the addition of COLORCOAT™, a color powder coating option, NIXALITE is almost invisible. For information, call 800-624-1189, fax 309-755-0077 or visit our website at <http://www.nixalite.com>

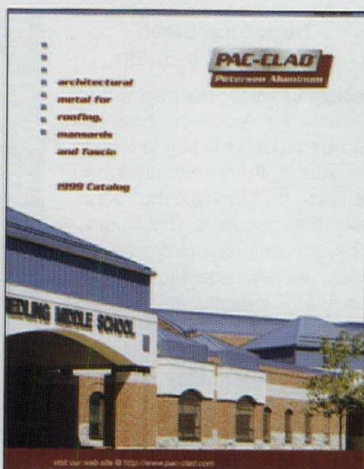


Nixalite of America Inc.

CIRCLE 175 ON INQUIRY CARD

New 1999 PAC-CLAD® Catalog

Petersen Aluminum's 1999 catalog includes their new line of gutters, downspouts and accessories to match their metal roofing products. PAC-CLAD®, a full Kynar 500®/Hylar 5000® paint system, backed by a 20 year non-prorated warranty, is available from stock in 25 standard colors. Three production facilities enable Petersen to offer unmatched service, economy and availability. Call 1-800-PAC-CLAD or visit our web site @ <http://www.pac-clad.com>

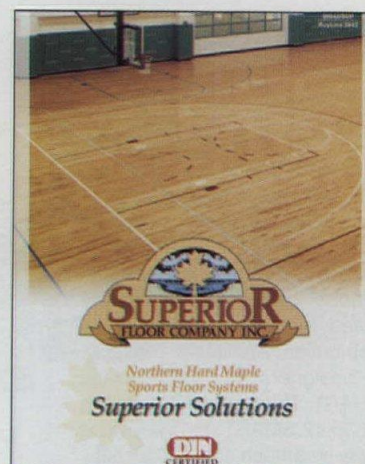


Petersen Aluminum Corporation

CIRCLE 176 ON INQUIRY CARD

Develops Ventilated Wood Gymnasium Floor System

Superior Floor Company, Inc. manufactures the Scissor-Loc Air Flow System, a patented, mechanically ventilated sports floor. This system was developed to move air underneath the entire surface to help alleviate moisture problems and stabilize the floor. It benefits the athlete, owner, and custodian of gym floors. The basketweave subfloor absorbs expansion and contraction of hard maple while allowing airflow underneath the floor. The Scissor-Loc Air Flow has proven itself on subgrade wet slabs that have ruined other floors.

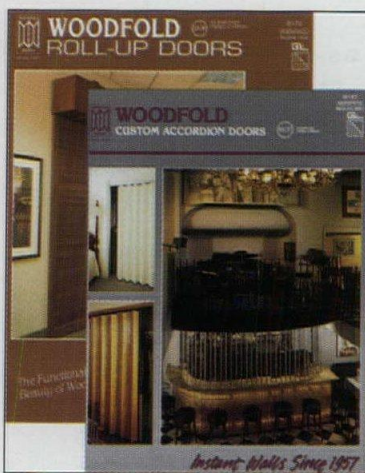


Superior Floor Company, Inc.

CIRCLE 177 ON INQUIRY CARD

Folding & Roll-UP Doors

Woodfold is proud to introduce their 1999 literature. Offering a full-line of custom made accordion and roll-up doors, Woodfold has served the construction products industry since 1957. We specialize in factory finishing these fine wood doors. A complete product catalog including specification information is available upon request. Visit our web site at www.woodfold.com. Please write or call: Woodfold-Marco Mfg., Inc., PO Box 346, Forest Grove, OR 97116, PH: (503) 357-7181, FAX: (503) 357-7185.

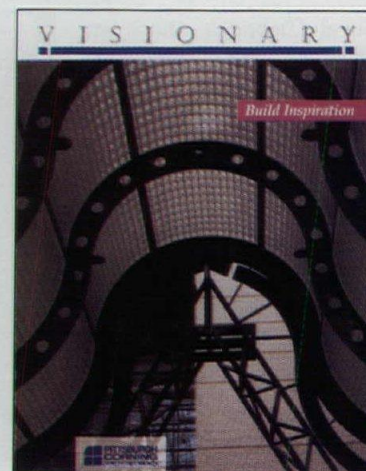


Woodfold-Marco Mfg., Inc.

CIRCLE 178 ON INQUIRY CARD

Pittsburgh Corning™ Glass Block

Featuring commercial and residential applications, our idea book gives you an inspiring, up close look at how architects are using glass block to make their visions a reality.



Pittsburgh Corning™

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For a large progressive and expanding A/E firm, located in the beautiful Finger Lakes area of upstate New York. Must possess a B.Arch or equivalent, with 2-10 years experience (school design a plus). We offer excellent salary and fringe benefits including profit sharing and 401K savings plan. Send cover letter and resume to Thomas Associates, 215 The Commons, Ithaca, NY 14850, EOE. Or fax to (607) 277-1410, E-Mail kjr@Thomasamerica.com.

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Graeber, Simmons & Cowan, an Austin-based architectural firm is searching for registered architect with 10 years experience in Senior Market Services (CCRC, ALF, and SNF). Candidate must possess highly developed design, marketing and interpersonal skills as well as a high profile within the senior living industry. Contact Lea von Kaenel, IIDA, 100 Congress Avenue, Suite 2200, Austin, TX 78701, Fax 512-433-2697, e-mail, vonkaenel@gsc-inc.com.

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Award winning Albany, NY, architectural firm with national practice specializing in historic restoration seeks experienced architect with 4-8 years experience. Proficient in historic building methods and materials, construction documents, building codes, preservation standards, construction administration, and AutoCAD R14. Good writing and verbal skills. Architectural license a plus but not required. Competitive salary commensurate with experience. EOE. Fax resume to John G. Waite Assoc. Architects, at 518-449-5828.

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Wanted by Construction Firm in Englewood Cliffs, NJ. Must have 2 yrs exp preparing detailed drawings of architectural dsngns/plans for bldgs & interiors for Japanese clients using AutoCAD & Micro Station SE. Respond to: H. R. Dept, KAI, 900 Sylvan Ave, Englewood Cliffs, NJ 07632.

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FACULTY POSITIONS VACANT

DEAN, SCHOOL OF ARCHITECTURE
UNIVERSITY OF VIRGINIA

Applications and nominations are invited for the position of Dean of School of Architecture at the University of Virginia. The appointment will be effective on or before July 1, 1999. The four departments of the School of Architecture offer graduate and undergraduate degrees in architecture, architectural history, urban and environmental planning and graduate degrees in landscape architecture. In addition to these major fields, students may enroll in dual degree programs and interdisciplinary certificate programs in historic preservation and American urbanism. Approximately 560 students are currently enrolled in all departments. The fifty full-time and twenty-four part time members of the faculty reflect the commitment of the university to the highest levels of teaching and scholarship. Candidates should possess a record of excellence in scholarship or professional practice and credentials sufficient to qualify for appointment as a tenured professor in one of the departments in the School of Architecture; experience in leadership in an academic setting or comparable environment; a commitment to promoting gender, racial and ethnic equity; a capacity and willingness to support and represent the diverse disciplines within the School; and an understanding of and capability for resource development. Compensation is competitive and commensurate with qualifications and experience. Applications and nominations must be received by January 1, 1999 to ensure consideration and the review process will continue until the position is filled. The University of Virginia is an Affirmative Action/Equal Opportunity Employer. Submit applications and/or nominations, with a letter of interest, resume and references, to: William H. Sherman, Chair, Dean Search Committee, c/o Office of the Vice President and Provost, University of Virginia, P.O. Box 9014, Charlottesville, Virginia 22906-9014.

FACULTY POSITIONS VACANT



**ASSISTANT/ASSOCIATE PROFESSOR
DEPARTMENT OF ARCHITECTURE
BALL STATE UNIVERSITY
MUNCIE, INDIANA**

Tenure-track position in environmental systems available August 20, 1999. Responsibilities: teaching studio as well as courses in built and natural environmental systems and their associated construction technologies in the professional degree program in Architecture. **Minimum qualification:** master of architecture degree by date of appointment. **Preferred qualifications:** registration (licenses to practice architecture or engineering); experience in teaching and/or professional practice; publications and/or appropriate research projects as evidence of scholarly and professional contributions; domestic and foreign travel as related to research and professional involvement; professional degree in mechanical or electrical engineering. Send letter of application, curriculum vitae, three letters of recommendation, transcripts, and samples of professional work to: Search Committee, Department of Architecture, Ball State University, Muncie, IN 47306. (Tel: 765.285.1900; Fax: 765.285.1965) Nominations are also welcome. Review of applications will begin January 11, 1999, and will continue until the position is filled. (www.bsu.edu/cap/)

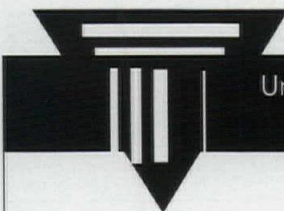
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PLUS URBAN DESIGN**

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**ASSISTANT/ASSOCIATE PROFESSOR
IN ARCHITECTURAL STUDIES**

The College of Applied Sciences and Arts (ASA), Southern Illinois University, Carbondale is seeking qualified applicants for two anticipated faculty positions in Architectural Studies beginning August 15, 1999, or until acceptable applicants are found. Both positions are nine-month, continuing appointments and may lead to tenure. Rank and salary will be commensurate with experience. This is an excellent opportunity to contribute to a new pre-professional program of architecture. Required Qualifications: Earned Master's degree in Architecture or equivalent Master's degree; licensed or eligible to take the ARE in the state of Illinois; demonstrated ability in all phases of architectural practice; teaching experience. Preferred Qualifications: Earned Doctorate; licensed Architect; established research and publication record; demonstrated theoretical, creative design, and graphic presentation abilities; proficiency in computer technologies. Responsibilities: Both faculty members will be expected to teach lecture and studio courses across the curriculum. One position will be required to teach mechanical systems; to engage in research, creative, and scholarly activities; to make professional contributions to the University and the



UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN
SCHOOL OF ARCHITECTURE

The School of Architecture is seeking applications and nominations for four full-time, nine-month teaching positions to begin August 21, 1999. The School of Architecture is comprised of four teaching divisions (Design, Architectural Structures, Practice and Technology and History and Preservation) and a research division (Building Research Council). Individuals who can integrate knowledge from their specialty into design studios will be given highest priority.

The salary for these positions will be determined by qualifications and experience. Candidates must be highly motivated and dedicated individuals who can take advantage of the University of Illinois' resources which include one of the country's largest and finest university library systems and access to associated research programs and computer facilities. A Ph.D. program is in the final stage of development. All teaching positions will have other responsibilities to include research/creativity, committee assignments, and public service.

Although each position indicates specific qualifications, this does not preclude candidates with exceptional research, teaching, or scholarship qualifications from applying.

REQUIRED SUBMISSIONS: Please send a Letter of Application which should state clearly which of the positions you are seeking, a complete Curriculum Vitae, a brief Statement of Educational and Research Objectives and the Names of three (3) referees. Short-listed candidates will be asked for examples of work.

POSITION 1: ARCHITECTURAL STRUCTURES DIVISION

One tenure track position at the Assistant Professor level.

RESPONSIBILITIES: Teaching responsibilities of 6 full time faculty in the division included 4 required courses in structural analysis and design to Junior and Senior B.S.A.S. candidates; 1 required course in structural planning to all two-year MArch candidates; and 7 required courses plus electives in advanced structural analysis and design to MArch candidates pursuing the Structures Option in the graduate program.

QUALIFICATIONS: Candidates must have 1) a MArch, MSAE or MSCE degree and license to practice architecture or structural engineering; or a Ph.D with research experience related to building structures, and 2) the ability to teach undergraduate and graduate courses in the Structures Division and to participate in architectural design studio reviews.

POSITION 2 AND 3: PRACTICE & TECHNOLOGY DIVISION

Two tenure track positions at the Assistant Professor level.

RESPONSIBILITIES: Teaching responsibilities of the division include graduate and undergraduate courses and conducting research in their respective fields. Candidates for each position must show evidence of academic and professional and or research achievement in at least two of the following areas: 1) Building Materials and Construction Technology; 2) Building Thermal Physics and Mechanical Systems; 3) Comprehensive Building Design with Design Integration; and 4) Architectural Practice and Management.

QUALIFICATIONS: Candidates must have 1) a MArch and professional registration or 2) a Ph.D in architecture, engineering, or related field with direct relevance for the position. Professional and teaching experiences are desirable and candidates should have the ability to participate in architectural design studio reviews.

POSITION 4: DESIGN DIVISION, COMPUTER APPLICATIONS

One tenure track or tenured position at the Assistant or Associate Professor level.

RESPONSIBILITIES: Teaching responsibilities include one design studio course each semester, a lecture/seminar course, and participation in design reviews. Ability to teach courses in technology or architectural theory is also desirable. Candidates must be able to demonstrate significant experience using computer applications in architectural design. Candidates are expected to be able to demonstrate their potential to be leaders in the field of computer-based design applications. Candidates must have knowledge of a wide range of computer graphics and three dimensional modeling software and operating platforms including Macintosh, PC, and Unix environments. Individuals who are able to 1) integrate computers into design studio learning, and 2) integrate design issues with building technology will be given highest priority.

QUALIFICATIONS: Candidates must have 1) a MArch and professional registration or 2) a Ph.D in architecture. Professional experience and teaching experience is required.

To receive full consideration applications must be received by **January 15, 1999**. Direct submissions and inquiries to:

R. Alan Forrester, Director
School of Architecture
(Identify which Position number and Search by name here)
University of Illinois at Urbana-Champaign
611 Taft Drive
Champaign, IL 61820-6921 USA
Tel: 217-333-1330
Fax: 217-244-2900
Web site: <http://www.arch.uiuc.edu/school/positions.html>

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discipline at large; to participate in program support activities as well as other assignments as determined. Application Deadline: January 8, 1999, or until suitable applicant is found. To Apply: Send a letter of interest and goals, current vitae, a minimum of 10 varied photocopy

samples of professional work (not to be returned), and names, addresses, and phone numbers of three references to: Mr. Terry A. Owens, Chair, Department of Applied Arts, Southern Illinois University, Carbondale, IL 62901-4337. SIUC is an AA/EEO.

FACULTY POSITIONS VACANT

CORNELL
ARCHITECTURECORNELL UNIVERSITY
DEPARTMENT OF ARCHITECTURE

Assistant or Associate Professor of History of Architecture & Urbanism

The Department of Architecture at Cornell University invites applications for a full-time tenure-track faculty position in the History of Architecture and Urbanism. We seek scholars with expertise in the history of Mediterranean and/or European architecture and urbanism including periods from 1400 to the present. Subfields from other periods or non-European and/or non-American areas are highly desirable. Candidates must be able to teach at the undergraduate level in the Italian Renaissance and Modern.

The HAU unit conducts the Department's BS, MA, and Ph.D programs in architectural and urban history, and is a vital component in its professional B.Arch. and M.Arch. design programs. We seek a scholar of distinction or high promise with the ability to relate historical research to contemporary contexts and design issues. Applicants should have a Ph.D., scholarly publications, and teaching experience. Responsibilities will include teaching at undergraduate and graduate levels, research, and administration. Rank and salary will be commensurate with experience.

Application review begins January 15, 1999; the appointment begins Fall 1999. Submit a letter of application, a curriculum vitae, names of three references, and a brief statement outlining teaching and scholarship objectives to: Professor Mary Woods, Chair, HAU Search Committee, Department of Architecture, 143 East Sibley Hall, Cornell University, Ithaca, NY 14853-6701.

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FACULTY POSITIONS VACANT

COLUMBIA UNIVERSITY
FACULTY POSITIONS AVAILABLE

The Graduate School of Architecture, Planning, and Preservation is seeking candidates for two or three positions in its architecture programs (rank open). Responsibilities will include teaching, scholarship, and administration, including possibly serving as Director of the Advanced Architecture Studios. Professional and/or teaching experience is required. The emphasis will be on Architectural Design and/or Urban Design, with the ability to teach a seminar/lecture on Architectural History/Theory or Building Technologies. Candidates must hold a Master of Architecture or the equivalent. Applicants should respond with a letter of interest, curriculum vitae, illustrations or work or a writing sample not exceeding 35 pages, and names and addresses of three references. Review of applications will begin on January 18, 1999. Material should be sent to: Bernard Tschumi, Dean, Graduate School of Architecture, Planning, and Preservation, Columbia University, 402 Avery Hall, 1172 Amsterdam Avenue, New York, NY 10027. Columbia University is an Equal Opportunity/Affirmative Action Employer. Women and minorities are encouraged to apply.

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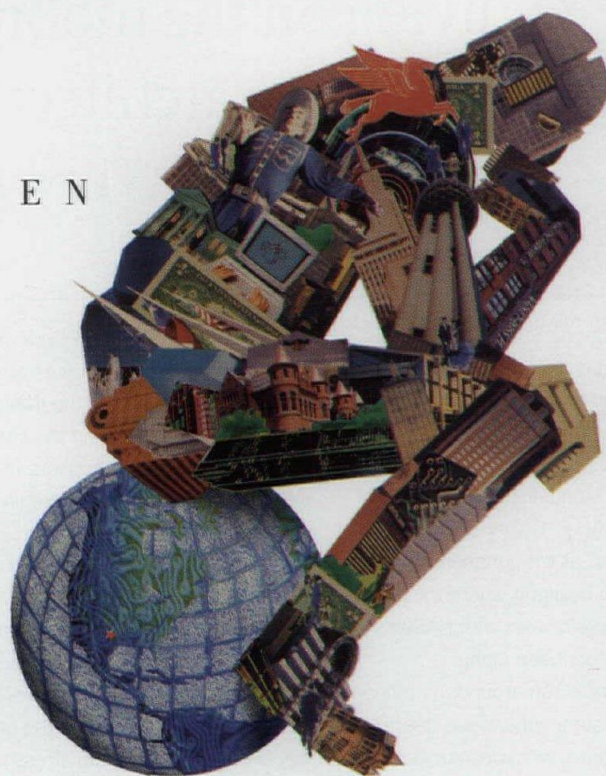


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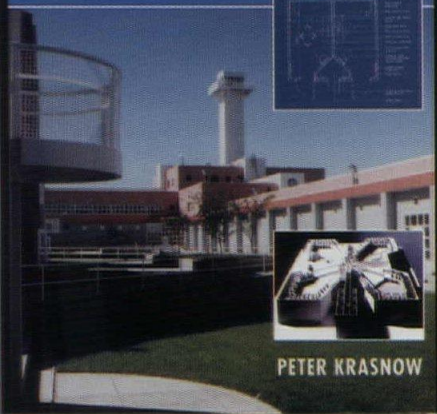
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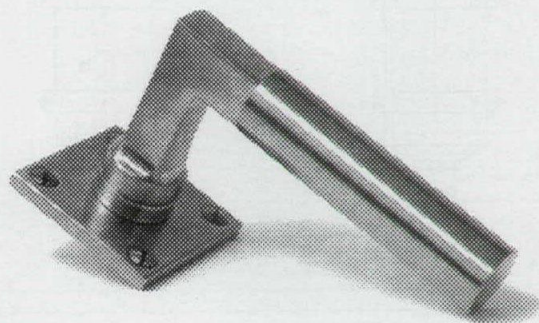


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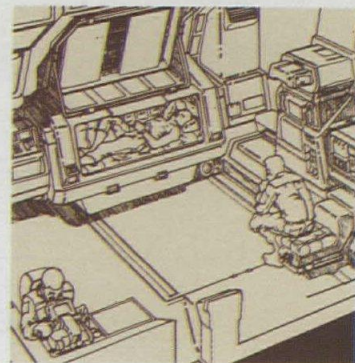
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CIRCLE 61 ON INQUIRY CARD

THE FUTURE In 1999, we won't be living on the moon. But that hasn't stopped some architects from trying.

BY TED KATAUSKAS



Remembering *Space: 1999*, the sci-fi series from my youth, which supposed that by next year, people would be watching soufflés rise in lunar gravity, I recently telephoned Wendell Mendell. I wanted to ask the unofficial “Father of Lunar-based Concepts” at the Johnson Space Center in Houston where things stood, design-wise, with NASA’s version of Moonbase Alpha.

“I could run around my office and find some lunar base designs,” said Mendell, who, despite lacking a mandate or much funding from Congress or NASA, has been doggedly husbanding the design of a manned lunar outpost for the past 16 years. “But these were all done by university architecture students

who needed a project to work on.” As long as NASA’s resources are tied up in the design of the International Space Station and the space shuttle operations, it appears that Mendell’s moonbase will remain an academic project.

Two weeks later, I received a bulging manila envelope. Inside were nearly 200 pages of schematics, drawings, and text relating to a moonbase project called Genesis (see drawings). Included in the package was everything from stress equations for spheres, toruses, cylinders, and cones to sketches of low-gravity furniture and a laundry room, along with plans for a kitchen equipped with a range and convection oven (perfect for soufflés). There

was even a colorful treatise on lunar hygiene, which noted that in an enclosed environment “objectionable body odors can quickly build without adequate personal hygiene facilities” and that “good grooming can enhance self-image, improve morale, and increase productivity.”

Genesis was designed by 20 undergraduate and graduate students at the Center for Architecture and Planning Research at the University of Wisconsin, Milwaukee, one of four architecture schools that participated in the NASA-funded Advanced Design Program in Space Architecture from 1989 to 1995.

One of the students was Janis Huebner-Mothes, whose father had designed rocket equipment for NASA in the Mercury days and instilled in his daughter a love for all things space-related. When she heard that architecture students at the University of Wisconsin were designing a moonbase for NASA, she filled out an application.

John Connolly, one of Mendell’s supporters at the Johnson Space Center’s Exploration Programs Office, the agency’s long-range-planning operation, was the NASA official flown out from Houston to critique Genesis. “Architects were the first to breach NASA’s engineering barrier,” Connolly says. “When we look beyond Earth’s orbit and start talking about space stations and moonbases, we’re talking about something entirely out of the engineering ballpark and more into the experience-base of architects. Ten years ago, architects at NASA were a curiosity; now we don’t think there’s anything odd about them.”

After graduation, Huebner-Mothes moved to Houston and worked as a space architect at Johnson while she completed her master’s thesis on space habitation and privacy. Now Janis Connolly, she is applying her Genesis experience to the design of a self-contained, long-duration test facility that will be used to try out lighting concepts, interior color schemes, crew-habitat configurations, and a bioregenerative life-support system envisioned, Connolly says, for “surface habitats for partial gravity application.” In other words, a moonbase.

“Some architects are skeptical about what I do and say it isn’t really architecture,” Connolly says. “But they don’t really understand the many parallels.” For example, Connolly compares the design of a building in a seismic environment like San Francisco to special building considerations on the moon. “As the lunar night becomes day, temperatures will rise 100 degrees an hour,” Connolly says. “So you have to select materials that will withstand that.”

Even though Moonbase Alpha hasn’t been built, the push to colonize the moon has had at least one effect: it has sparked a quiet revolution within the ranks of NASA, in which the prominence of rocket scientists is being challenged by the emergence of space architects. “The world of space might be difficult for my peers to comprehend,” says Connolly, “but it certainly does stretch architecture to its limits.” ■

Ted Katauskas is a freelance writer in Portland, Oregon.

