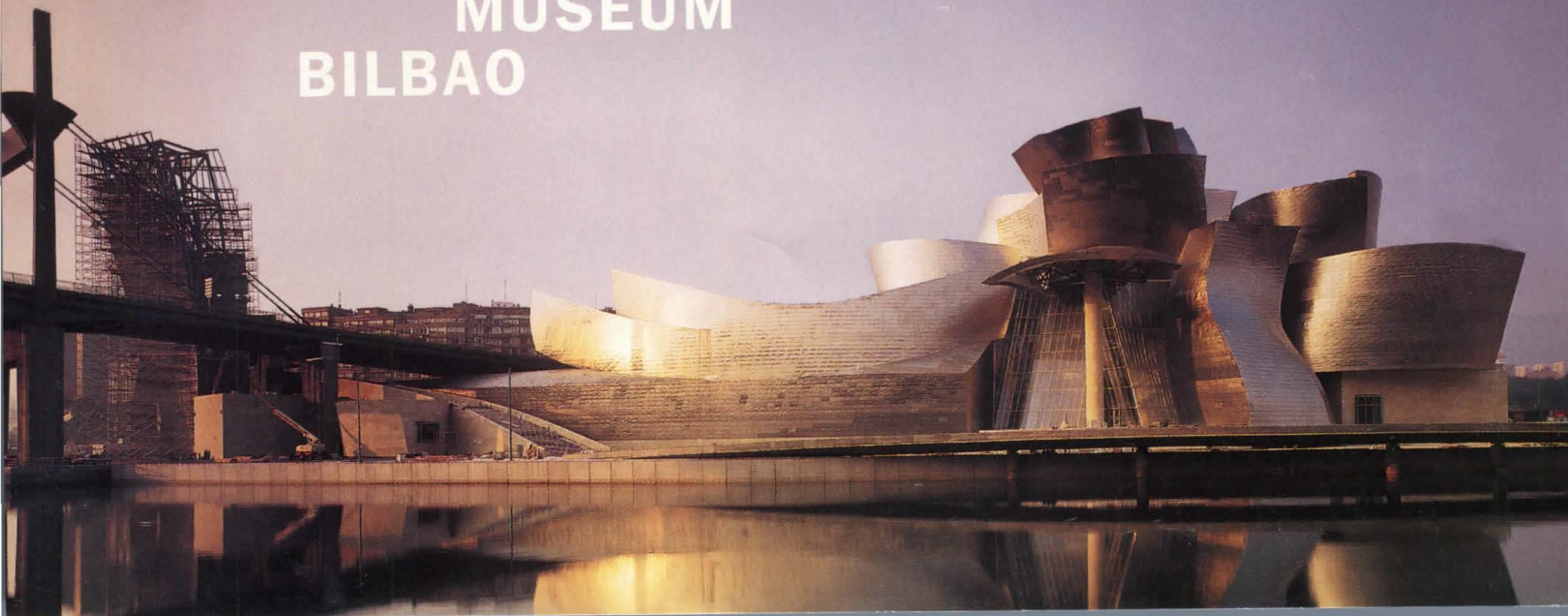


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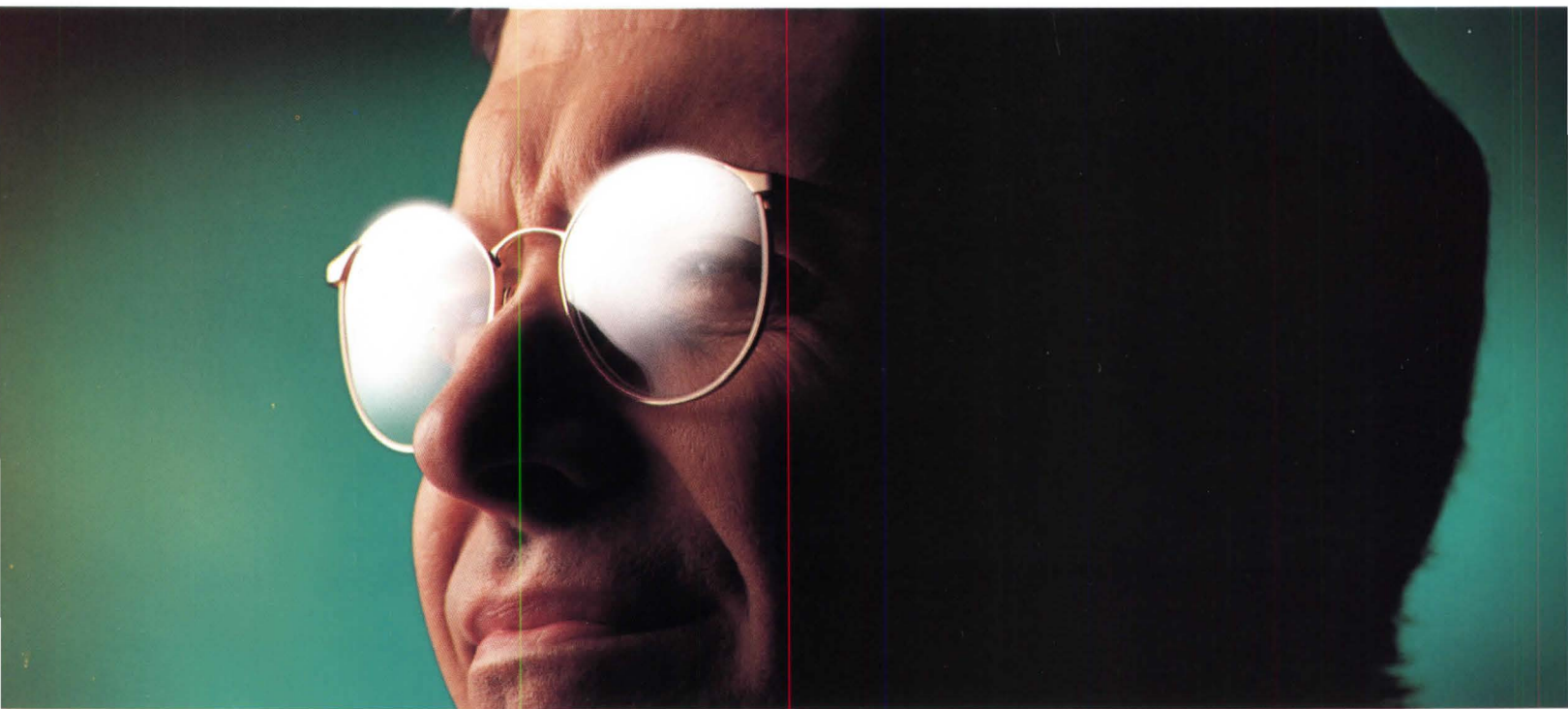
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EDITORIAL

Architectural Myopia

BY ROBERT A. IVY, FAIA



Must we reject what we have embraced? Paul Rudolph's death last month raises that question and provokes speculation on the relationship of our architectural culture to its near past. Though he continued to practice until limited by illness, Rudolph, an architect who had been central to architectural dialogue since his student days, faded away, sharply kicked from stage center and virtually unknown to the younger generation.

In his prime, Rudolph was regarded as a great architect and a great teacher. How many young architects fought their way to New York, hoping for a spot in his office? His students at Yale include a talented, eclectic generation, ranging from Robert A.M. Stern to Norman Foster. Rudolph's massive buildings, with their interlocked, smoky spaces, continue to provoke both admiration and fierce controversy. Yale's Art and Architecture building sums up the firestorm of talent, power, and emotion that surrounds his career.

Granted, our shared interests evolve, sometimes precipitously, but in our effective ostracism of mentors like Rudolph, we limit our field of vision. It is as if we were suffering from the inability to see what has just gone before—a kind of collective myopia.

Pop psychology could produce myriad reasons for this blurred vision: the need for growth demands rejection of an older generation; the human dynamic demands rest and refocusing (myopia literally means "shut eye"). Tastes change, styles shift in all design, whether in skirts or cars or the shape of concrete walls. The phenomenon is encouraged by our insatiable appetite for the new, abetted by media as superficial and frenetic as klieg lights. As soon as the new emerges, the nearly new appears slightly soiled, then gray, then gone.

Clarity comes with some kind of separation, most often the distance of time. Sometimes physical distance offers perspective; in Rudolph's case, the gap was death. A few architects like Wright outlive our fickleness, whereas Louis Sullivan, Wright's own lieber meister, spent his last years consigned to

obscure projects in small midwestern towns. Today, both Wright and Sullivan enjoy canonization. The same lesson applies to popular building. Who doesn't treasure the exuberance of Queen Anne houses, which were reviled by a generation of early modernists? It took half a century to recognize their worth and to salvage them from years of neglect.

The rub comes when we try to focus on the current moment. What buildings from the near past, overlooked or undervalued, are worth a sharper gaze? One of Rudolph's students, Robert Stern, thinks that we have undervalued the parade of skyscrapers along Park Avenue. Not every building or every architectural movement merits praise and consideration. Of more recent work, it seems difficult to value most postmodern architecture today, since it remains poised directly before us, blurred by contemporary rhetoric and a more astringent aesthetic.

It may be that architectural myopia is natural and necessary, not so much a disease as a condition. Buildings, after all, remain constant; it is our ideas about them that change. However, there is so much that we, a younger crowd, could learn from older, living architects, those individuals who created the near past. What other persons of genius remain among us with lessons for today? In the coming months, ARCHITECTURAL RECORD will attempt to redress our nearsightedness, occasionally seeking out masterful architects and architecture, highlighting not only what is newest among us, but, like the work of Paul Rudolph, what is best.

OUR WINDOWS ARE MADE FROM WOOD. AND SOMETIMES,

When architect Bill Becker redesigned this summer retreat in the Berkshire Mountains, the home's setting provided all the inspiration he needed. He used native wood and stone extensively. Fashioned the front porch supports from 8" logs. And for the north end of the home, which looks out over a lake to the mountains beyond, he created a wall of glass using windows and doors with custom-designed

muntins that echo the shape of the surrounding pines. Who did he contact to supply these unique products? Bill Becker's search began and ended with one phone call. To Marvin Windows & Doors.

From Bill's drawings, the company produced three large fixed windows and eight doors, three of which open onto the deck. Marvin's ability to create these custom products inspired similar design elements in the home's interior, including a rustic stairway made from pine logs and branches. Still, as unique as they are, these aren't the only Marvin windows that figured prominently in the design.

To double the home's square footage without violating local zoning codes or overwhelming the surrounding cottages, Bill skewed the second level off the long axis of the first floor by seven degrees to create the illusion of a dormer. Marvin windows which step down in height help further the illusion. And to optimize their energy efficiency, these



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LETTERS

Teamwork in Bosnia

In reference to the brief news item that you published in your August 1997 issue on efforts to rebuild the Bosnian city of Mostar [page 32], Dr. Amir Pasic not only conceived of Mostar 2004 but has been the driving force behind it; he should be recognized as the person who has tirelessly and creatively administered the project. Through his efforts, funds have been raised to allow students and faculty like Judith Bing of Drexel University, Jerrilynn Dodds and Lance Brown of City College of New York, Noman Ahmed of Dawood College, Nedzad Kurto of Sarajevo University, Isik Aydemir of Yildiz University, Zeynep Ahunbay of Istanbul Technical University, Alan Plattus and Ivo Banac of Yale University, Richard Plunz and John Stubbs of Columbia University, and myself to contribute to the effort in meaningful ways. The continuing contributions of Jonathan Calame, Esther Charlesworth, Sebnem Onal, and Hugh Patterson as dedicated graduate students must also be recognized.

—J. Brooke Harrington, Associate Professor of Architecture Temple University Philadelphia, Pa.

The future is now

I have been known as a “lurker” and not a participant in the electronic revolution. Having read your August editorial, the inspiration to do something has struck! Thank you for the insight into the next generation of problems associated with the practice of architecture. I have been drawing for over 40 years—from very primitive to the latest state-of-the-art software and hardware. As a result of the computer improvements, real design can be accomplished now. I am not touting one particular system but supporting your contention that we should “get with it.” The future has been available for several years and is just now able to take advantage of avail-

able hardware. So let the profession get off their collective behinds and work toward the future!

—Lewis Bishop, AIA
Palm Desert, Calif.

Geography lesson

I think we need to listen to geographers as well as landscape architects. In your otherwise fine article “Listening to Landscape Architects” [August 1997, pages 44–49], the Iowa Center for the Arts is identified as being at the University of Iowa in Ames. The University of Iowa is actually located in Iowa City.

—David Arbogast
Iowa City, Iowa

Credit for the RCA Building

Charles Linn’s tribute to Abe Feder [August 1997, page 103] incorrectly credits design of the RCA Building at Rockefeller Center to Raymond Hood’s understudy, Wallace Harrison.

—Jeremy Scott Wood, AIA
Weston, Mass.

Charles Linn responds: *While Harrison had worked for Hood, by the time Rockefeller Center was being designed and constructed, he had his own firm, and Hood was a consultant. The MacMillan Encyclopedia of Architects attributes the design to Harrison, although it states that Hood’s “guiding hand is present throughout.”*

Affordable, not low-budget

I enjoyed the Buildings Types Study on affordable housing in the July issue [pages 106–19]. The focus on how the complexes were integrated into their neighborhoods was an interesting angle. Although the projects were for the low-income market, the construction costs were high. I applaud the ability to do high-quality projects on big budgets; those in your issue ranged from \$66 to more than \$100 per square foot. Funds for low-income housing are, however, extremely scarce and shrinking. Those of us who are active in the low-income housing field must deal with budgets of \$45

to \$50 per square foot on a day-to-day basis. It would have been nice to see some projects that excelled on tight construction budgets.

—Ed Hord, FAIA
Hord Coplan Macht
Baltimore, Md.

Practice makes perfect

Congratulations to Margaret McCurry for her well-written letter regarding Robert Clough’s stance on architectural licensure [June 1997, page 18]. I have been a licensed architect for 30 years and can look back and say that the only academic subjects I needed to pass the licensing exam were architectural history and the theory of structural engineering. It was my nine-year apprenticeship that prepared me for the exam. Unfortunately, NCARB and NAAB have seen fit to limit the “paths” to obtaining a license, without first curing the ills of our architectural curriculum. I agree with McCurry that the A.R.E. should be open to all “qualified candidates,” regardless of “educational pedigree.”

—Steve L. Wintner, AIA
Management Consulting Services
The Woodlands, Tex.

Competition-killer initiative

Someone needs to educate the people of California regarding their state’s competition-killer initiative [July 1997, page 16]. Californians would be better served if they put all public projects out to RFP. If this were the case, California taxpayers would not have to support a bunch of architects sitting around doing nothing in between projects. Hiring competent, practicing professionals would result in better quality buildings and greater value for the money.

—Keith E. Deutscher, AIA
Reno, Nev.

Sacred or sacrilegious?

Based on your lengthy coverage of Steven Holl’s Chapel of St. Ignatius [July 1997, pages 40–53], today architecture must reflect society’s angst. “A stone containing seven bottles of light,” as Holl described

his expressive vision for this chapel, will burden the students of Seattle University for many years to come.

Holl has created a beautiful work of artistic and poetic expression, but he has failed, I believe, to provide the other two requirements for a work of architecture: firmness and commodity. The critique of this building relies on a serious misunderstanding of the value of originality. A chapel must not only provide a “sacred space” as defined by the architect and committee, but a “sacred space” as understood by the body of the Church.

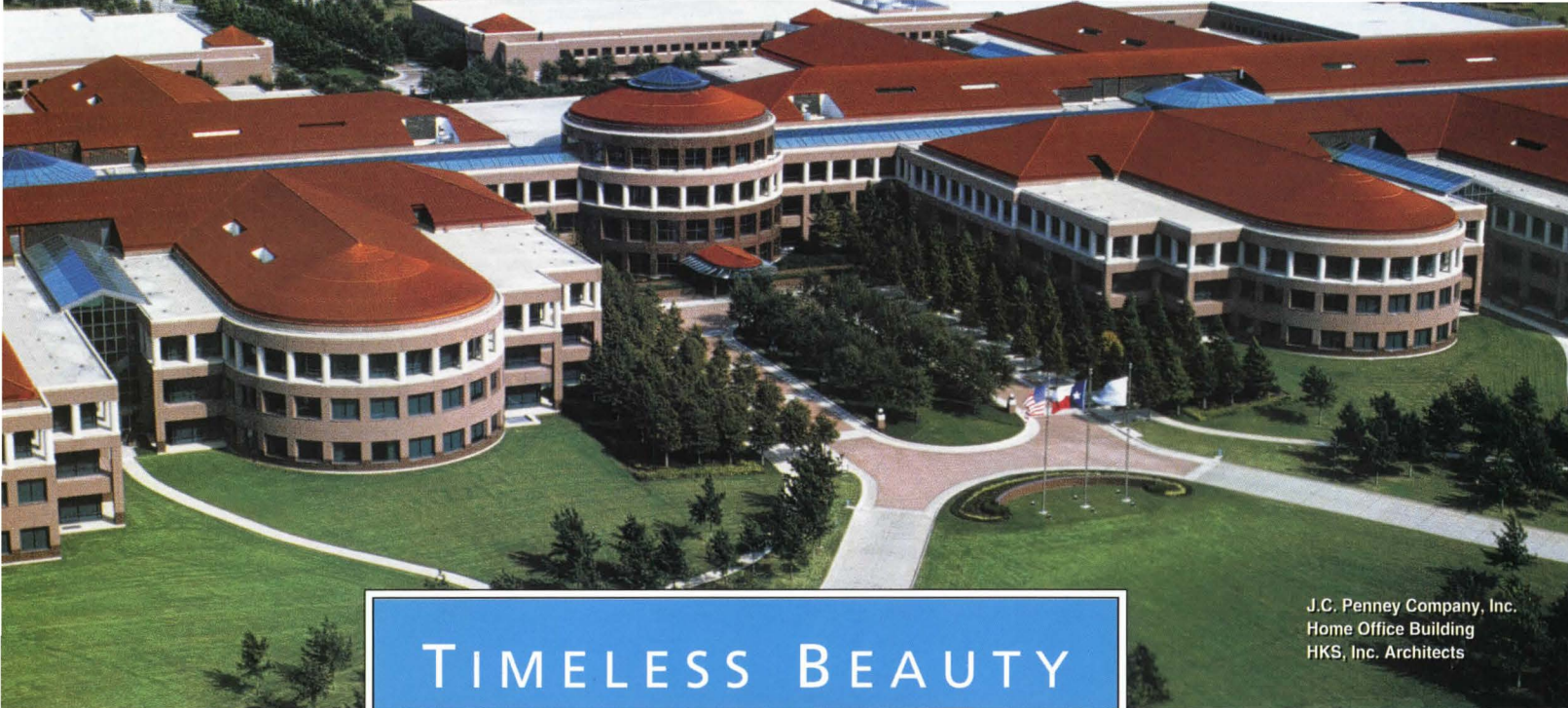
Any quiet place can serve an individual in certain modes of prayer, particularly with closed eyes. A sacramental liturgy, however, requires accommodation of a group of individuals, so that all participants are encouraged and allowed to be an integral part of the liturgy. After the novelty wears off, will anyone want to use this chapel? I submit that the goals of texture, light, and color, together with the desire for a “multisensory experience,” are not enough for a chapel. When combined with arbitrary shapes, “unpredictable ways” of bouncing color, disregard of scale, misuse of art, and a disregard of church tradition, these goals have provided the university not with a chapel but with an experimental theater of the absurd.

—John S. Stroik, AIA
Reston, Va.

I have just looked at the photos of the upsy-downsy chapel by Holl. Painting it Roman ochre to resemble ancient stone churches is about as effective as painting a giraffe gray to resemble an elephant.

—Leon Rosenthal, AIA
Babylon, N.Y.

I think Steven Holl’s chapel is an inspiration to architects and students who are interested in real architecture. It is a case where architecture goes beyond the application of steel and stone. It comprises a duality: a spiritual and physical entity that gives it breath as a living (*continued on page 152*)



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CIRCLE 12 ON INQUIRY CARD

SPEAK OUT Standards of care offer architects real-world applications of the AIA Code of Ethics.

EDWARD K. TAKAHASHI, AIA



Edward K. Takahashi, AIA, CCS, is a forensic architect and partner-in-charge of the Forensic Section of the O'Leary Terasawa Partners in Los Angeles. He is also the Ethics Committee Chairman of AIA/Los Angeles.

Frank Bucaro, a teacher on moral theology and ethics, has said, "Values are what you believe; ethics is what you do." Architects need to be aware that there is a code of ethics available to help guide them through the often confusing world of professional conduct.

When the American Institute of Architects adopted a new Code of Ethics and Professional Conduct in 1987, it was framed around three sets of principles: the canons (the broad principles of conduct); ethical standards (goals that members should be reaching in their professional performance and behavior); and mandatory rules of conduct (whose violation is grounds for disciplinary action by the AIA).

There is often confusion about ethical matters, particularly at the level of standards of care, the rules of behavior that are derived from the entire set of ethics and that apply to the daily practice of architecture. Standards of care help determine questions of liability, particularly where reasonable care, skill, competence, and diligence fall below community standards.

Often there is no simple answer in determining a standard of care. In my work as a forensic architect and member of an ethics committee, I have seen architects judged responsible for falling below the standards of care for many reasons, including the following:

1. They did not properly coordinate drawings and specifications in the architectural and engineering disciplines.
2. They improperly designed roofs, balconies, window and door open-

- ings, and below-grade waterproofing.
3. They did not prepare specifications tailored for a particular project.
4. They prepared ambiguous documents that caused extra work and/or delays.
5. They accepted improper substitutions.
6. They performed improper contract administration observations.
7. They improperly certified payments for the contractor.

How do standards of care apply to the real world? The following overview of complaints received by the AIA/Los Angeles Ethics Committee relating to standards of care provides some examples:

The architect should have been at the job site more during construction. In agreements between architect and owner, the architect should specify the number of visits or number of hours set aside for periodic observations.

The architect didn't give us what we asked for. If an owner presents the architect with a program and specific requirements, the architect must incorporate them. The architect cannot ignore any portion of the program or the specifics.

The architect was found to be unlicensed. Any person discovered to be practicing architecture without a license must be reported to the state board of architectural examiners. That person is committing fraud by impersonating an architect.

A drafting service prepared plans that were stamped by the architect. Any architect who signs or seals construction documents that were prepared by others without his or her direct knowledge or supervi-

sion has violated the state's regulatory rules and an AIA rule of conduct.

An architect did not receive credit on a project. One of the most frequent complaints is failure to acknowledge contributions of colleagues such as designers on the team.

Employees and consulting engineers never received payment from the architect. Lack of compensation is a common problem leading to the filing of an ethics complaint.

An architect was not able to get copies of his or her work. Most architects allow their departing employees to obtain copies of their work, with the departing employee generally bearing the cost of the reproductions. Because of the confidential nature of certain projects, an employee may be asked to sign a confidentiality agreement.

Ethics committees of the AIA are available at all levels to assist architects in interpreting ethical matters. Yet, while colleagues can help architects to clarify the Code of Ethics, in many ways our choices remain personal. As folk singer David Wilcox says: "We answer for the consequences of our choices." ■

Contributions: *If you would like to express your opinion in this column, send submissions by mail (with a disk, if possible) to Speak Out, Architectural Record, 1221 Avenue of the Americas, New York, N.Y. 10020; fax 212/512-4256; or E-mail rivy@mcgraw-hill.com. Essays must not exceed 700 words. The editors reserve the right to edit for space and clarity. Where substantial editing occurs, the author will receive final text approval.*

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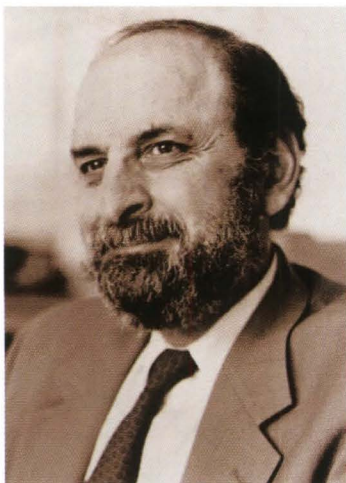


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MENTORS Two answers for an architect working with an important but slow-paying client.

Kenneth Natkin, FAIA, is an attorney and an architect in San Francisco, specializing in mediation of construction disputes. He is chair of the National AIA Risk Management Committee.

Roberta W. Jorgensen, AIA, is president of Robbins Jorgensen Christopher, Architects, with offices in Irvine and San Diego, California. She is also president of the American Institute of Architects, California Council.



I have been working for a client who has become almost impossible to collect from. The situation has become difficult for my practice and is even affecting my credit. Almost \$250,000 is involved. Not only do I require the funds for working capital, but the majority of the dollars are owed to other vendors. And despite the terms of my contract, the client, a hospital, never pays interest on its balance due.

The bulk of my practice is wrapped up in this client. I have enjoyed wonderful work with them for five years and have signed a contract for another project. I am hesitant to alienate the client because they continue to give me good business. But I must draw the line somewhere. What advice can you offer?

—*Unsigned*

Kenneth Natkin, FAIA, responds: As this account receivable gets older and larger, the likelihood increases that the client will decide your fee was too high in the first place and that you were negligent in providing some of these “overpriced” services. A client who is willing to take advantage of you like this is not a client you want to keep. Even at risk of losing the client, you must draw the line.

Go to a knowledgeable lawyer right away. From a legal point of view, there are several possibilities. The most “gentle” is to have the lawyer write a firm letter demanding payment by a certain date. If construction is not yet complete or the requisite time periods have elapsed, the letter might include a copy of a

claim of lien or a stop notice, with an indication they will be recorded if payment is not received. If your lien periods are about to expire, record such a claim immediately. Liens are powerful incentives for payment.

I assume the contract you refer to is an AIA B141 1987 agreement. In addition to the interest clause, that agreement has a number of provisions that can be helpful. If construction is not yet completed, nonpayment constitutes a substantial breach of contract entitling you to stop work. The drawings as instruments of service remain provisions of the B141, and the client cannot use those drawings for completion of the project by others. The demand letter might refer to some of these provisions. If you have added an attorney fee provision (not included in the B141) to your agreement, point that out. Your client will be more likely to pay you if they know they will end up paying your legal fees and costs to collect from them.

If the demand letter is ignored, you must be willing to stop work, to enforce your contractual rights, and, if necessary, to pursue arbitration, as required under the B141.

Roberta W. Jorgensen, AIA, responds: Having one client that can make or break your firm is a situation most architects should avoid. In an ever-changing marketplace, a diverse client base will aid in the solvency of a practice in lean times.

Have you exhausted all methods of collection in a manner consistent with business etiquette? Have you billed at each billing interval and followed each billing with a

phone call asking if the invoice was complete and formatted to their liking? Have you asked when you can expect payment?

If the problem persists, request a meeting with the client representative, with payment as the only agenda item. Ask that the hospital accounting department be represented in the meeting. Explain that you enjoy your working relationship, but inform them that you and your subconsultants cannot continue your services until a payment schedule has been developed and some payment received. Do not start work on your new contract until you have resolved the existing problem and the client has committed to a payment plan for upcoming services.

You have more at stake than your credit: your reputation is on the line. Your subconsultants are looking to you for payment. You will be hard-pressed to find subconsultants to work on future projects if you can't pay your current group.

You say the client has given you “good business,” but I don't believe habitual nonpayment constitutes good business. If you value your practice and are confident in your abilities, surely you can find better business opportunities elsewhere. ■

Questions: *If you have a question about your career, professional ethics, the law, or any other facet of architecture, design, and construction, send submissions by mail to Mentors, Architectural Record, 1221 Avenue of the Americas, New York, N.Y. 10020; by fax to 212/512-4256; or by E-mail to rivy@mcgraw-hill.com. Submissions may be edited for space and clarity.*



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PULSE RECORD readers were asked: Is there a place for high design in affordable housing?

YES: 100%

Yes: Good architecture is a quality-of-life issue. Who's to say that residents of affordable housing should be relegated to a lesser quality in their living environment? Who would choose which residents live in high-design spaces and which live in the undesigned? Everyone is entitled to a well-thought-out, comfortable environment. As illustrated by several successful projects in the U.S., it does not have to be expensive or elaborate, just simple, clean, well proportioned, and easily buildable. As trained, qualified architects, creating such spaces should be our contribution to the betterment of society.

—Lee Bothast, Assoc. AIA
Pasadena, Calif.

Yes: Though residents are the main consideration, high design should be for everyone, including adjacent

neighbors. To associate high design with "upscale" would be to brainwash the public into believing that it is accessible only to those in a privileged socioeconomic position. A shelter with basic amenities is all that may be needed for day-to-day existence, but providing a decent home through high design—or just good design—may offer to residents a greater sense of self-worth, self-respect, and human dignity. That in itself would be worth a try.

—Rory R. Villanueva, AIA
Nader Design Group
Fort Worth, Tex.

Yes: As a firm that concentrates on affordable housing for the disabled, we have no doubt that good, quality design is possible in this market. We design independent-living apartment buildings and group homes for the disabled community; we

have provided services to nonprofit corporations and service providers throughout Southern California. Most cities not only welcome architecture that is well designed and sensitive to context but provide incentives for it.

—Efrain Olivares, AIA
ArquiTaller Inc.
Glendale, Calif.

Yes: Affordable housing deserves the same level of attention to design received by any other work of architecture. Affordable housing must not be treated like an architectural second-class citizen.

—William Lyons
Oakland, Calif.

Yes: Careful consideration must be given to this question. Looming over the profession is a preconception that high design must carry an

astronomical price tag. I believe that nothing could be further from the truth. The question asked by RECORD seems to be whether or not the time should be taken to explore the issues associated with creating space for human habitation. In my mind it is unconscionable to provide affordable housing without considering comfort, habitability, and cost. To create successful affordable housing, the architect must also have an intimate understanding of myriad social issues. If time and effort are expended in an efficient and productive manner, the residents of affordable housing will receive well-designed spaces that are functional, livable, and affordable.

—Mark J. Gettemeyer, Architect
St. Louis, Mo.

This Month's Question

Is \$980 a fair price to pay for the computerized Architect Registration Exam?

The cost to take the exam, which is offered by the National Council of Architectural Registration Boards (NCARB), has risen from under \$500 in 1996 to \$980 this year. In addition to the base cost, other fees can be levied by state and local governments. Higher fees were instituted by NCARB in February 1997, at the same time that the organization introduced a computerized version of the registration exam. Both changes, the computerized exam and the higher fees, have provoked debate within the profession.

Is \$980 a fair price to pay for the computerized Architect Registration Exam?

Yes No

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NO CEASE-FIRE FOR EMBATTLED WORLD WAR II MEMORIAL

We may have won the war, but the World War II Memorial just lost another battle. Set to be built on the Mall in Washington, D.C., the design was returned to the drawing board for major revisions.

In January, architect Friedrich St. Florian won an international competition to design the memorial. His scheme, which must be approved by the Commission of Fine Arts, the National Capitol Planning Commission, and the Secretary of the Interior, has caused many skirmishes since it was unveiled.

The Commission of Fine Arts, historically the artistic arbiter of Federal design projects, voted to reject the current plan.

Despite opposition to the proposed site, on the central axis of the Mall between the Lincoln Memorial and the Washington Monument, the commission refused to consider relocation. While the battlefield may remain the same, casualties include extra exhibition space, 50-ft-high earth berms, and a ring of classical columns.

The chairman of the commission, J. Carter Brown, said the columns had a confusing and not readily accessible set of symbolic functions. If they are to celebrate freedom and portray solidarity, unity,

and the collective will to victory, it is hard to demand that they also convey the tragedy of young lives cut down in their prime. Both triumph and tragedy are appropriately referenced in such a memorial, but it is unrealistic to expect a single design element to elicit two emotions simultaneously, said Brown.

And if that's not asking a lot of a ring of columns, consider that the proposed structure will be close to the Vietnam War Memorial, which contains not a single classical element yet regularly moves visitors to tears. *Ellen Sands*

ADAPTIVE RE-USE TURNS POWER PLANT INTO HOLLYWOOD-STYLE SOUND STAGE

A former coal-fired power plant on the Halifax waterfront will be transformed into four Hollywood-style sound stages for the city's burgeoning film industry.

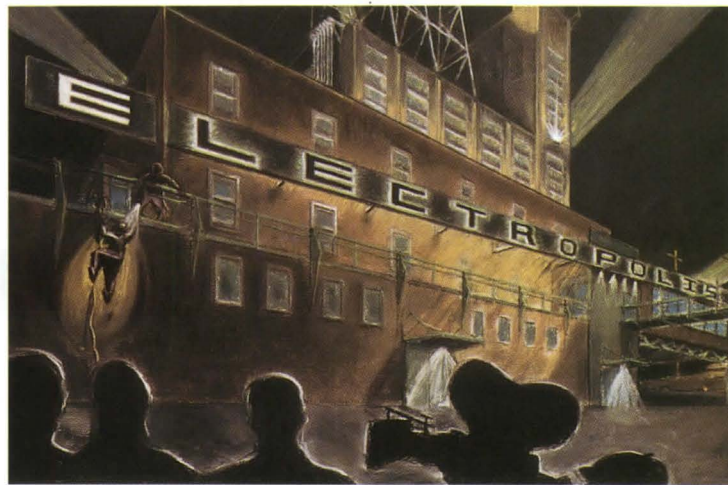
The 29,000-sq-ft project occupies part of a Nova Scotia Power electric generating station that has been idle since 1979. Electropolis, a consortium of film production companies, negotiated a 10-year lease with Nova Scotia Power to update the property's use. Electropolis selected Kassner Goodspeed Architects to prepare the drawings. Completion is slated for November.

The building is well suited to sound stage conversion, says partner Dan Goodspeed. The walls are concrete block, which provides good

sound insulation. Two of the stages are twice the height of the typical Hollywood stage, allowing for more acute camera angles and shots that convey a sense of distance.

The ambient noise of a fog horn on nearby Georges Island and local truck traffic combined with the building's enormous window openings posed an acoustical challenge. The solution was to fill in the 30-by-12-ft openings with layers of solid concrete block, with air space and acoustic insulation in between.

Cruise ships docking nearby generate a steady flow of tourists. To accommodate them without interfering with production, Kassner Goodspeed created an outdoor observation gallery. *Andrew Safer*



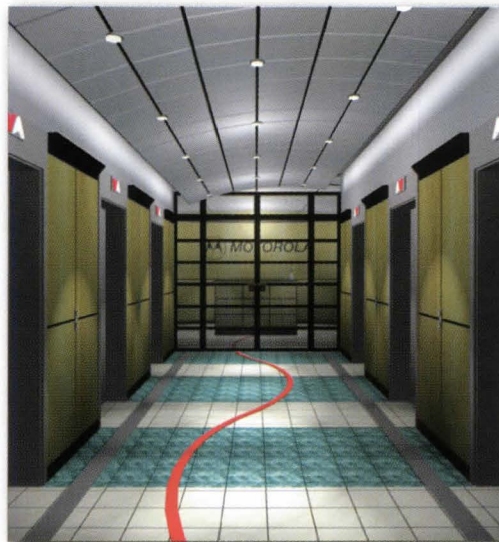
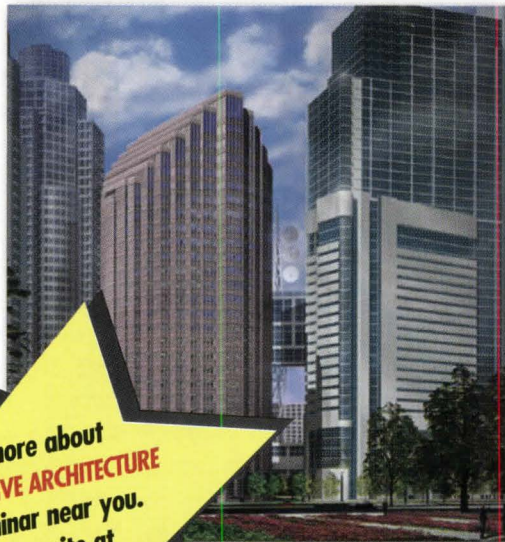
NEW TAX LAW BENEFITS ARCHITECTS How do you spell relief? Architects will find some in the Taxpayer Relief Act of 1997. Approved August 5, the bill provides incentives that could stimulate school construction. It also offers tax breaks to sole practitioners, to family-owned firms seeking to pass down their companies, and to architects working abroad.

The law ends the limit on how much tax-exempt debt private colleges and universities may carry. Former restrictions capped tax-exempt borrowing at \$150 million per institution. Lessening debt service enables colleges to stretch their capital budgets, potentially leading to increased construction. The legislation aids public schools in poor districts by establishing interest-free "qualified zone academy bonds." Eight hundred million dollars in bonds will be offered over the next two years to schools in designated zones. Funds are earmarked for renovations, equipment, and teacher training.

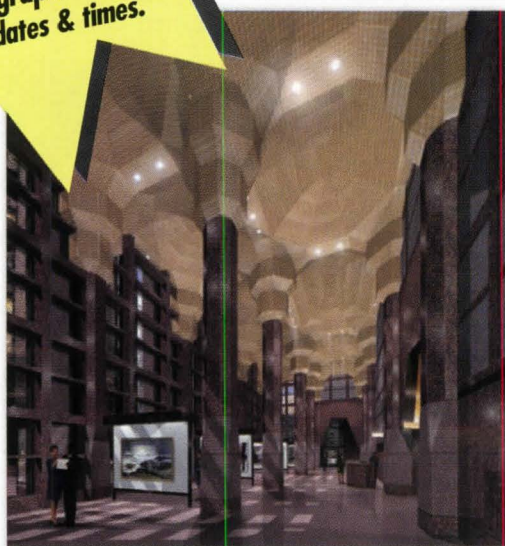
Sole practitioners can increase deductions for health insurance premiums from 40 percent in 1997 to 90 percent in 2006 and 100 percent in 2007. Inheritance taxes ease, excluding estates valued up to \$1 million. Formerly the threshold was \$600,000. For family-owned firms the exclusion jumps to \$1.3 million.

Professionals working abroad can exclude more of their non-U.S. income from federal taxes. The limit increases by \$2,000 per year from the current cap of \$70,000 until it reaches \$80,000. Richard F. Miller of Ellerbe Becket said that increased tax exclusions for overseas workers would influence pricing models and motivate employees to go abroad. "Overall it's not a big change," he said, "but every little bit will help." *Tom Ichniowski*

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CIRCLE 21 ON INQUIRY CARD

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THE CATHOLIC CHURCH PLANS A HOME FOR ROME IN WASHINGTON, D.C.

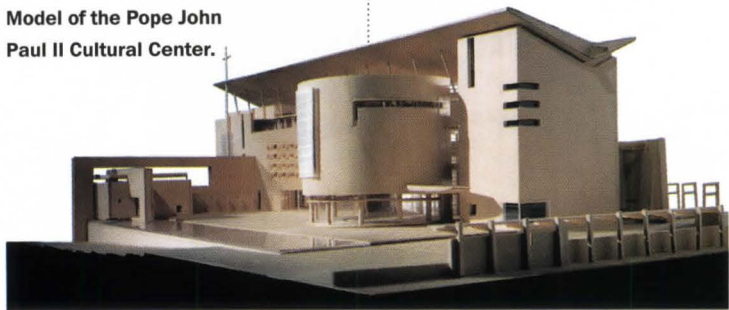
Construction begins this month on the Pope John Paul II Cultural Center in Washington, D.C. Part interactive museum and part think tank, the purpose of the \$50 million center is to foster a greater understanding of the Catholic faith.

The 100,000-sq-ft limestone-clad building, next door to the Catholic University of America, was designed by Leo A. Daly of Washington. The entrance bridges a pool of water, delivering visitors into "a new realm," said Richard Clarke,

director of design. He called the building "a theater for exploring one's relationship to the spirit through the works and papacy of John Paul II."

The center will include conference space, seminar rooms, and a library, plus a museum designed by Edwin Schlossberg. Vatican artworks and other items related to the papacy will be on display. An ancient stone from the tomb of St. Peter, encased in glass, will serve as the building's cornerstone. *Ellen Sands*

Model of the Pope John Paul II Cultural Center.



FLEXIBILITY IS KEY IN DESIGNING FOR ALZHEIMER'S PATIENTS

Understanding the minds of Alzheimer's sufferers is key to designing facilities that maximize independence while minimizing emotional stress. Research convinced the Sienna Architecture Company of Portland, Oregon, that conventional assisted-living facilities were missing the mark.

Patients with Alzheimer's tend to wander and become anxious when confronted with barriers like doors or ends of corridors. Most institutions respond by restricting their movements, but this just increases frustration.

For Regent Assisted Living, Inc. of Portland, a firm that builds and manages these types of facilities, Sienna developed an environment that addresses the problem head on. The plan allows residents to meander along several circular paths without leaving the secured facility. Some walkways wind through outdoor courtyards. All are

designed to direct patients past an activity hub where they can stop and mingle until their wanderlust returns.

Architect Gary Reddick called the 25,000-sq-ft, 48-bed residence "a collection of households," each with its own staff. Living units surround common areas that include a dining room and a day room for patients who do not live in.

Color functions to help patients find their way. Each household has its own color scheme and its own art theme. Doors to public areas are brightly painted, while those to restricted areas blend in with adjacent walls. The architects avoided contrasting floor colors, which could be perceived as barriers.

The prototype will be adapted to local sites and residential styles along the West Coast. Post-occupancy evaluation will help Regent and Sienna fine-tune the scheme. *B. J. Novitski*

ARCHITECTURAL PRESS ROUNDUP

ON THE ROAD TO BILBAO

The New York Times, September 14, 1997 Architects and others who make the pilgrimage to Bilbao to see Frank Gehry's Guggenheim Museum will be pleased to know that this otherwise grimy riverfront city has "great bars and an old quarter rewarding to prow." Gehry's masterpiece-in-the-making has prompted so much interest that the Sunday Travel Section devoted its "What's doing in" column to the Basque town that has long been passed over by tourists in favor of the ocean views of neighboring San Sebastian. But Bilbao's "Dickensian waterfront" is just right for Gehry's "bold and singular creation," says *The Travel Times*.

GONE SWIMMING

The Washington Post, July 23, 1997 The National Park Service is enforcing a no-wading policy at the Franklin D. Roosevelt Memorial after an extreme heat wave prompted visitors to "think of the memorial as their neighborhood pool." In keeping with his experiential approach, designer Lawrence Halprin wanted to encourage visitors to "touch the statues, climb the granite blocks and enjoy the water." But when groups of towel-toting toddlers from local day care centers arrived in swimsuits, the Park Service called a halt. Site manager Eric Broadbent said "dangling is okay, but no more walking in the water."

WELL-MANNERED DESIGN

The New York Times, August 28, 1997 Although he liked the new Arthur Ashe Stadium at the United States Open tennis tournament this summer, veteran sports writer George Vecsey still found the fans to be noisy, pushy, and rude. "A little architecture and landscaping does not noticeably subdue New York manners," the columnist observed.

HOW TO GET A TROPHY HOUSE

Newsday, September 15, 1997 Treating fine homes like fine jewelry, a Chicago-based real estate auction firm, Sheldon Good & Co., will hold its first group auction of "trophy homes." To qualify, houses must be priced at over one million dollars and be in prime locations. More traditional real estate agents question the tactic, noting that "buyers in the high-priced range generally do not make a decision in one sit-down session." But owners see the auction as "the best way of selling quickly while still getting the best price." Bidders must present a certified check of at least \$60,000 in order to participate, but only the winning bidder must pay up.

WHOSE BUILDING IS TALLEST?

Engineering News-Record, July 21, 1997 The answer depends on how you define "tall." The Council on Tall Buildings and Urban Habitat has expanded its classification system, adding three new categories. Previously, a building's height was measured from a sidewalk-level entrance to its structural top. By these criteria, Malaysia's Petronas Twin Towers, which are nearing completion in Kuala Lumpur, will dethrone Chicago's Sears Tower as world's tallest. But when measured to highest occupied floor and to top of roof, two added categories, the Sears Tower is back on top. In the final category, height to tip of spiral or antenna, New York's One World Trade Center wins.

Family Portrait



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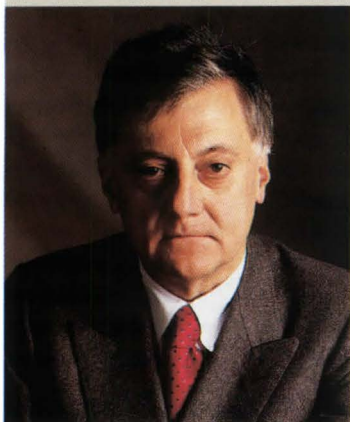
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CIRCLE 22 ON INQUIRY CARD



ALDO ROSSI REMEMBERED Born in Milan on May 3, 1931, Aldo Rossi studied architecture and cinema at the Milan Polytechnic. He edited the Italian magazine *Casabella* in the 1960s and taught architecture in Milan, Venice, Zurich, New York City, and Buenos Aires, cementing his reputation as both scholar and builder. Since 1986 he ran his practice from offices in Milan and Manhattan. Rossi died on September 6 at the age of 66 following injuries sustained in a car crash.

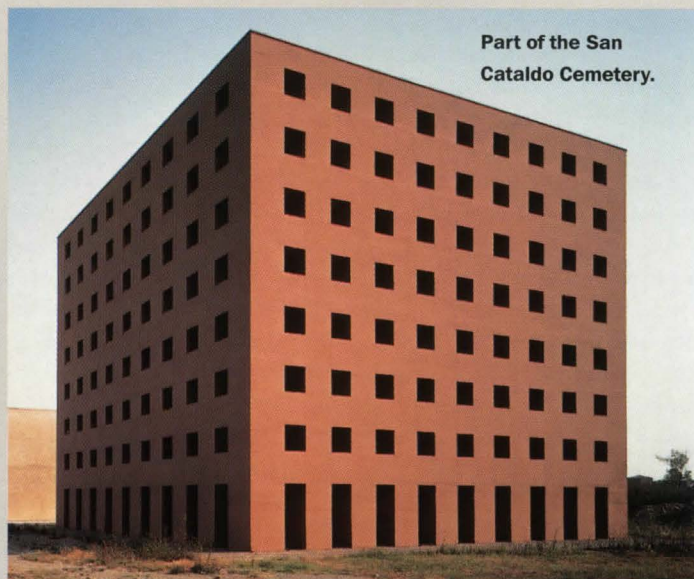
Car accidents figured prominently in Aldo Rossi's life and death. An accident in 1971 influenced his design for the Cemetery of San Cataldo in Modena, Italy. After the accident he recalled lying immobilized in a hospital bed, painfully aware of his bones and their displacement. "I saw the body as a series of fractures to be reassembled," he said, confirming Rossi's theory of architecture as a sum of distinct elements assembled in a rational framework. This became the metaphorical basis of his design for San Cataldo: rows of bone depositories arranged in plan like a skeleton and a mass grave with a chimneylike cap—a shockingly frank assessment of the program as a city for the dead.

Rossi remained faithful to the vocabulary of forms he established at Modena, as if in their recombination he would discover something new. He brought this approach to his architectural practice, composed largely of former students working in offices around the world. For each new commission a different mix of

collaborators was assembled. The monumental simplicity of Rossi's designs makes them at once obvious and fresh. But it is their air of familiarity that makes them, like Rossi himself, seem ever-present and eternal.

Over the years, I've visited many of his buildings, including celebrated works like the town hall in Borgoriccio, Italy, a family tomb outside Milan, and a hotel in Fukuoka, Japan. There is something so direct and powerful yet so serene and elusive about Rossi's buildings that when face to face with one of them, there are no words.

What did Rossi mean to architecture? I think of his own reflections on his buildings, his writings and evocative drawings. "While I may talk about a school, a cemetery, a theater, it is more correct to say that I talk about life, death, imagination," he wrote. And what did architecture mean to Rossi? He answered that question, too, when he accepted the Pritzker Architecture Prize in 1990. Said Rossi, "Searching for truth in my profession, I have ended up loving architecture. Maybe it is a simple but strange satisfaction that makes one love his own profession. So let me call it 'cara architettura,' or in English, 'dear architecture,' or with your permission, 'darling architecture.'" *Karen Stein*



Part of the San Cataldo Cemetery.



HOW MUCH MODERNISM CAN THE CITY OF MUNICH TAKE?

As big as four football fields and costing 200 million marks, Munich's new modern art museum, the Pinakothek der Moderne, has set this Bavarian city on its ear. Located next to the staid Alte Pinakothek and across from the unpretentious 1981 Neue Pinakothek, the museum is Germany's answer to I. M. Pei's glass pyramid at the Louvre. As the city's largest museum commission in the last 30 years, it put designer Stephan Braunfels in the international spotlight.

The gallery will unite four major state collections under one roof. The

collections circle a rotunda that is cut diagonally by a grand staircase, creating a vast, sculptural space. Despite its avant-garde appearance, the design quotes from earlier museums like Friedrich Schinkel's Altes Museum in Berlin and James Stirling's National Gallery in Stuttgart.

Said Braunfels, "I have chosen basic forms, such as the rectangle, cross, and diagonal, and built them into a design that is pure, strict, and contemporary but not trendy. I want people 50 years from now to see the Pinakothek der Moderne as timeless." *Claudine Weber-Hof*

A CHARACTER IN SEARCH OF CRITICISM TURNS TO ARCHITECTURAL RECORD

Readers of the Pulitzer Prize-winning novel *Martin Dressler: The Tale of an American Dreamer*, by Steven Millhauser, are struck by its architectural erudition. The story includes critiques attributed to ARCHITECTURAL RECORD that prompt some soul-searching on the part of the protagonist, a Manhattan developer.

But Millhauser confessed that he never read the magazine. "I came across the name in a publication and thought it sounded solid and plausible," he said.

Millhauser read many period novels and publications to present life and architecture in the early 1900s. A primary resource was the Montgomery Ward catalogue, which he called "an absolute treasure-house of Americana."

In the book Martin Dressler is a successful but lonely developer of the city's early skyscrapers. His first building, the New Dressler, is a 24-story apartment tower with seven underground levels, a zoo, department stores, a roof garden, and a teahouse.

The structure is praised by newspaper critics but panned by RECORD, which calls the New Dressler "a building without definition." A critique of Dressler's second building, the Grand Cosmo, a combination hotel, museum, amusement park, and theater, declares the colossal structure "uninhabitable."

Instead of feeling stung by the criticism, Dressler is transformed by it. Said Millhauser, "He realizes he didn't go far enough in imagining the new structures." *Jessie Mangaliman*



JUST DESSERTS

If only concrete, bricks, and stone would behave the way crystallized sugar, cream, and pastry do. Chef Richard Leach's desserts feature building blocks made of chocolate mousse. Caramelized sugar strands balance like a deconstructed bridge over a river of pear custard and a five-layer rectangular meringue. Clean lines and an authentic use of materials evoke the best in modern form, earning Leach the unofficial title of "The Frank Lloyd Wright of Pastry."

The 31-year-old executive pas-

try chef for the Park Avenue Café in New York City started his cooking career at age 15 as a line cook in a neighborhood restaurant in his native Long Island. He trained at the Culinary Institute of America and worked at Brooklyn's acclaimed River Café.

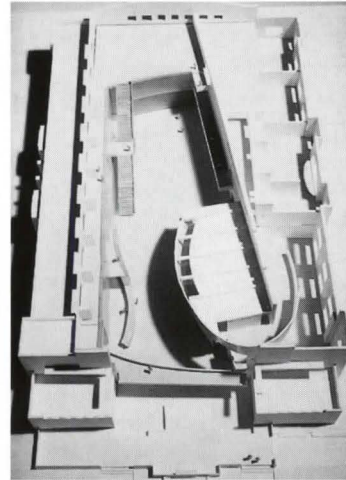
Leach's creations recently earned him two coveted cuisine awards, the James Beard Pastry Chef of the Year and a spot on *Chocolatier* magazine's list of the top ten pastry chefs in America.

Inspiration for his structural desserts is not drawn from architecture, however, but from the shapes of his cooking tools and his penchant for mixing textures with form. He carefully stacks a flaky, delicate caramelized banana tart and then perches star anise at the top, creating a tower as precarious as Pisa.

The real challenge is finding a way to eat one of his eye-catching confections. One jab with a fork and the towering tarts come crashing onto the plate. *Jessie Mangaliman*

DALLAS TO BUILD A CENTER FOR WOMEN AND THE FUTURE

An international Center for Women and the Future has been proposed for Dallas, Texas, as part of the state's millennium celebration. Designed by New York architect Wendy Evans Joseph, the center will occupy a vintage exhibition building at Fair Park, a National Historic Landmark and the last of the great



exposition halls of the 1930s.

Joseph's design includes a curving theater, a women's Walk of Fame and interactive exhibits focused on new opportunities for women in the 21st century, all to be inserted into the restored shell of the exhibition building. "The goal is to create an interplay between the exhibits and the historical structure, like the Musée d'Orsay in Paris," Joseph said.

The Foundation for Women's Resources, an Austin-based organization that addresses the economic and professional status of women, is sponsoring the proposal. The group has already spent over \$100,000 to survey and secure the building and has started to raise the estimated \$20 million needed to renovate it. If the fund raising succeeds, Joseph will begin schematic design next year, in time for an opening in the fall of 2000. *David Dillon*

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PRIVATE ENTERPRISE EMBRACES SUSTAINABLE DESIGN

"The real world of economics has come to sustainable design," announced jurors of the Boston Society of Architect's 1997 Sustainable Design Award Program.

In previous years, submissions depended mainly on grants and public funding, according to Robert Fitzgerald of the BSA. But with corporate submissions from Duracell, Inc., and Patagonia and Security Capital Industrial Trust taking top honors, sustainable design is finding its place next to the bottom line.

The 310,000-sq-ft Duracell World Headquarters in Bethel, Connecticut, shows how corporate and environmental interests can mix. Architects Herbert S. Newman and Partners, PC of New Haven, Connecticut, solicited input from employees and from local wildlife groups at the early stages of design. The building cost \$113 per sq ft.

By using double-pane, low-E

windows and vapor seals on all exterior walls, Duracell expects to save \$125,000 per year in energy costs. In return, Northeast Utilities will provide \$300,000 in rebates.

The project used recycled materials in the bricks, including one of Duracell's own battery by-products, scrap manganese dioxide.

Jurors called the Patagonia Office and Distribution Center in Reno, Nevada, by the Miller/Hull Partnership of Seattle, Washington, "a stunningly good example of sustainable design" supported by "a model corporation that promotes responsible consumerism."

The rehabilitation of the historic Austin Building in downtown Denver demonstrates sustainability in low-income urban housing. Designed and owned by the Northeast Denver Housing Center, the renovation converted a turn-of-the-century structure into 18 energy-efficient units,



almost doubling the density, while preserving original elements like transoms, millwork, cabinetry, and light fixtures.

With awareness of low-impact design on the rise, juror John Abrams of South Mountain Company Architectural Design and Construction sees the next hurdle for clients and designers as "the information gap." A lack of long-term post-occu-

Duracell used one of its own battery by-products to make bricks for its world headquarters.

pancy data and ways of quantifying environmental costs means many project decisions are made in a technical vacuum, he said, adding, "Our work now is to find the numbers and make them available."
Peter Edmonston

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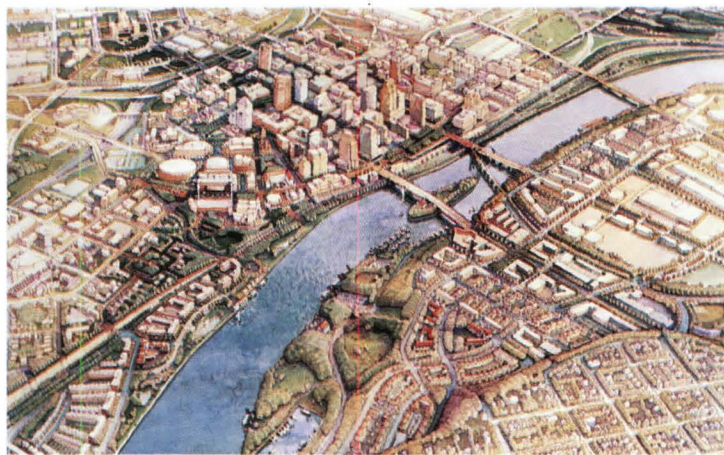
CIRCLE 23 ON INQUIRY CARD

AIA introduces new contracts

Documents A201 (General Conditions of the Contract for Construction) and B141 (Standard Form of Agreement between Owner and Architect) will be released by the AIA this month. The new contracts are effective immediately, although there will be a one-to-two-year phaseout of existing contracts. Two forums sponsored by the AIA and the American Bar Association will assemble contractors, owners, architects, subcontractors, lawyers, sureties, and lenders to consider practical applications of the documents. The first will be held in Atlanta October 23–24 and the second in San Diego November 6–7.

“St. Paul on the Mississippi”

Guided by Ken Greenberg, a Toronto-based architect and urban planner, St. Paul has launched a riverfront development initiative. Like many American cities, as St. Paul grew it turned its back to the Mississippi. But as it lost ground to

**“St. Paul on the Mississippi,” the city’s plan to reclaim its waterfront.**

the suburbs, the city decided to revitalize its core by turning to face its great natural resource. The plan was spurred by legislation obliging the city to clean up the river and clear heavy industry from its banks. A bridge at Wabash Street will provide the first link to the river. Harriet Island is slated for new docks and a plaza is in the works.

Controversial competition A commission to design a headquarters building for the cultural foundation of the Caixa Galicia, a financial institution in A Coruña, Spain, was awarded to Nicholas Grimshaw & Partners, Ltd., of London. Many Spanish architects refused to participate in the contest because of a clause that would allow parts of different solutions to be used in the final design. Additionally, there was no remuneration, no cash prizes,

and the jury at first included no architects. In response to the architects’ objections, many of the disputed provisions were modified.

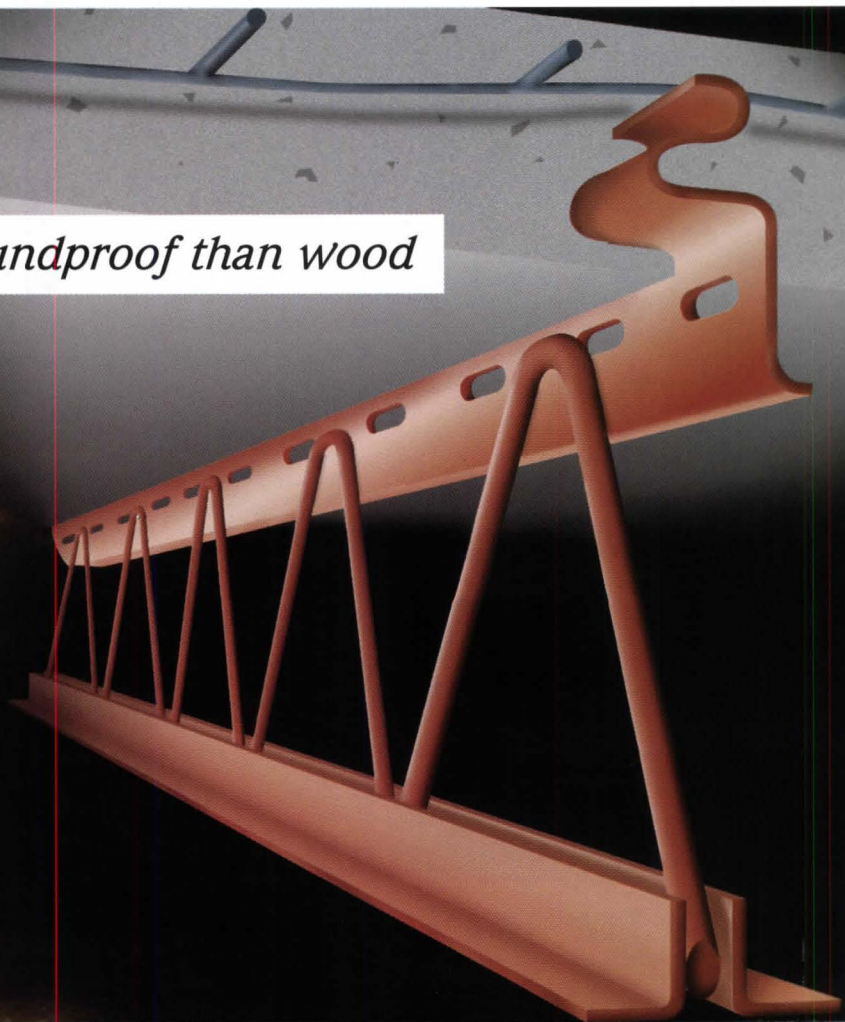
First pedestrian mall reverts to street

Back in 1959 Kalamazoo, Michigan, started a national trend when it turned its traditional main street into a pedestrian mall. Nearly 200 U.S. cities soon followed suit, trying to compete with new regional malls. By now it is well known that the tactic failed: except in a few college towns with lots of walkers, pedestrian malls were perceived as unsafe and shoppers avoided them. This year Kalamazoo came full circle, reopening its main street to cars, as so many other towns have done in the last decade.

Chicago museum to build

suburban branch The Chicago Athenaeum, a museum of art, architecture, and industrial design, is planning a 20-acre campus in the northwest suburb of Schaumburg.

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The \$30 million, 30,000-sq-ft satellite will include a sculpture garden and a futuristic house. An architect will be selected through an international competition.

I. M. Pei presents papers to Library of Congress A collection that documents the work of one of the late 20th century's most distinguished architects will be given to the Library of Congress by I. M. Pei. The library already holds the papers of Benjamin Latrobe, Charles Follen McKim, and Ludwig Mies van der Rohe. Among many other works, Pei designed the East Wing of the National Gallery of Art in Washington, D.C., built in 1978. Although officially retired, he remains active: in 1995, at the age of 78, Pei designed Cleveland's new Rock 'n' Roll Hall of Fame.

Chrysler Award honors architects Several architects were among the winners of the 1997 Chrysler Award for Innovation in

Design. Now in its fifth year, the program celebrates visionaries whose work exemplifies the best in American design. Elizabeth Diller and Ric Scofidio were lauded for their large-scale mixed-media installations, projects in print, and performance works, as well as for architectural commissions. Allan Wexler, an architect/artist who is pleased when critics cannot categorize his work, was cited for "curious hybrids" that reveal the hidden meaning of objects. A revered teacher, he has created sculptures for the homeless and interactive educational museum environments.

Rice University additions Two new buildings at Houston's Rice University offer different responses to existing campus buildings and demonstrate the flexibility of Ralph Adams Cram's master plan. Both form crisply defined shells around open central spaces. Thomas H. Beeby's scheme for the \$8.3 million Baker Institute has a Middle Eastern



The Baker Institute at Rice University has a Middle Eastern feeling.

feeling with gallery arcades that encircle a curving chandelier. In contrast, Antoine Predock's Nano-scale Building acknowledges the campus vernacular of planar buildings. Concealed within is an open court filled with angular forms.

A good neighbor Five firms were chosen to submit designs for a new campus center at the Illinois Insti-

tute of Technology. Nearly half of the school's buildings were designed by Ludwig Mies van der Rohe, who headed the College of Architecture from 1938 to 1958. The finalists are Peter Eisenman, Zaha Hadid, Helmut Jahn/Werner Sobek, Rem Koolhaas/Office for Metropolitan Architecture, and Kazuyo Sejima/Ryue Nishizawa. All participated in a symposium on modernism after Mies, held at the College of Architecture last month.

Students build outdoor classroom A design/build studio at the University of Houston College of Architecture created a classroom in a field for the Red Elementary School. The structure consists of a steel-truss roof embedded in four concrete columns. A low wall serves as both a work surface and as storage for benches, encouraging flexible use of the space. The classroom is designed to provide both protection from and interaction with the outdoors. ■

3

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CIRCLE 24 ON INQUIRY CARD

DATES EVENTS BOOKS

Calendar

October 16–17

Hotel Sofitel

Rosemont, Illinois

"Succeeding in Design Build," a conference series sponsored by the McGraw-Hill Construction Information Group and the Construction Specifications Institute, will provide an overview of design-build as well as in-depth industry-specific information. For registration information, call 800/689-2900.

October 17–19

The Merchandise Mart

Chicago, Illinois

In addition to contemporary furnishings, the first annual Chicago Design Show will include exhibitions on U.K. designer John Makepeace and Vitra's miniature chair reproductions. For information, call 800/677-6278.

October 17–November 29

Couturier Gallery

Los Angeles, California

Architectural renderings produced primarily in the 1950s and 1960s by Richard Neutra and prototypes of furniture designed by the architect in the 1930s are on view. Call 213/933-5557.

October 22–February 1, 1998

Canadian Center for Architecture

Montreal, Quebec

"Other Soundings: Selected Work by John Hejduk, 1953–1997" is the architect/educator's first retrospective. An exhibition of architectural toys, "Toy Town," is also on view, from October 22 to May 31, 1998. Call 514/939-7000.

October 24–25

Parsons School of Design

New York City

The conference "Curtain Wars: Architects, Decorators, and the 20th-Century Interior" explores the traditional rivalry between architects and decorators and its relation to the larger culture. Among the participants are Karen Stein, Managing Senior Editor of RECORD. To register, call 212/229-5488 or 800/709-4321.

October 24–26

Mexico City, Mexico

This annual tour of buildings designed by Luis Barragan is organized by the Fundacion Casa Luis Barragan. It is conducted in English and

costs \$450. For information, call or fax the Casa Museo Luis Barragan at 011/52/5/515-4908; or E-mail fca@hp9000al.uam.mx.

October 25–December 28

Orange County Museum of Art

Newport Beach, California

"Frank Lloyd Wright: Designs for an American Landscape" explores five little-known visionary projects by the architect. More than 150 drawings from the Frank Lloyd Wright Foundation and the Library of Congress are included. Call 714/759-1122.

October 26–29

Hyatt Regency at Union Station

St. Louis, Missouri

"Rail-Volution '97: Building Livable Communities with Transit" is an interdisciplinary gathering of policy makers, citizen-advocates, and planning, design, and transportation professionals. Areas of discussion are linking transit and land use; building citizen and institutional support; and creating a competitive advantage for metropolitan areas. For information, call 800/788-7077 or fax 302/436-1911.

October 27–29

Seattle, Washington

A regional conference and trade show, "Sustainable Building Northwest: Breaking Through the Barriers" aims to provide "real-life solutions" to putting green building theories into practice. Contact O'Brien & Company, P.O. Box 10705, Bainbridge, Island, Wash. 98110; call 206/842-8995; or E-mail obrien@halcyon.com.

October 29–31

Javits Convention Center

New York City

InterPlan, an annual commercial interior design and planning trade show, is to be joined this year by BATIMAT North America, the U.S. version of the European commercial and residential building construction and design show. For information, call 800/950-1314, x2611; to register, visit <http://www.interplanshow.com>.

October 30–November 2

Camino Real Hotel

Mexico City, Mexico

The next meeting of the AIA's Committee on Design will be held in Mexico City. Call the AIA's PIA information line at 800/242-2837.

October 30–November 2

Austin, Texas

"Linking Practice with Place: How To Do Your Best Where You Are" is the theme of the 1997 Green Building Conference. A trade show exhibition and a competition for a low-income, energy-efficient, green home will also be held. Write the Green Building Conference, P.O. Box 90008, Austin, Tex. 78709; call 512/264-0004.

October 31–November 2

University of New Mexico

Albuquerque, New Mexico

The ACSA Southwest Regional Meeting and the AIA New Mexico State Convention are to be held jointly this year. Both organizations will focus on issues relating to codes and the built environment. Call Mary Thomas at AIA Albuquerque at 505/244-3737; or Stephen Schreiber at the UNM School of Architecture and Planning at 505/277-2053.

November 3–6

San Diego Convention Center

San Diego, California

A/E/C Systems Fall, a computer show for design and construction professionals, features product and service vendors and educational events. Contact Pat Smith, A/E/C Systems Fall, 415 Eagleview Blvd, Suite 106, Exton, Pa. 19341; call 800/451-7689; or fax 610/458-7171.

November 5–6

Navy Pier

Chicago, Illinois

The Chicago Buildings and Real Estate Show includes exhibitors of building maintenance, renovation, restoration, and retrofit products and services, as well as educational sessions. Call 213/840-5556 or fax 213/840-9556.

November 5–7

Sheraton New Orleans

New Orleans, Louisiana

"Design-Build 2000: The New Tradition" offers more than 40 sessions covering all aspects of integrated facilities delivery. It is the fifth conference cosponsored by the Design-Build Institute of America and the National Society of Professional Engineers. Call 202/682-5860.

November 6–9

Marriott Biscayne Bay

Miami, Florida

"Environmental and Economic Balance: The 21st Century Outlook" is a conference sponsored by the AIA, the U.S. Green Building Council, and the U.S. (continued on page 155)

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CIRCLE 31 ON INQUIRY CARD

Good Design *is* Good Business

Business Week/ARCHITECTURAL RECORD Awards

by Karen D. Stein

I am really anti-awards these days," says architect Mack Scogin, FAIA, a frequent juror and winner himself of a slew of honors. So why did the Atlanta-based architect and former chairman of the department of architecture at Harvard University's Graduate School of Design agree to participate on the jury for the first annual Business Week/Architectural Record Awards, sponsored by the AIA? Because "it has the potential of being an incredibly important awards program," explains Scogin. "It gets at what architects can do. It's all about challenging clients. It's about how architects can affect a client's need."

The effect architects can have on clients (and vice versa) is exactly what we were hoping to uncover when we launched this program over a year ago. In recent years, ARCHITECTURAL RECORD and *Business Week*, both owned by The McGraw-Hill Companies, had been contemplating some type of collaboration to ferret out the role of design in business. RECORD's ongoing research had shown that end users and the public at large often don't recognize the contributions architects can make. Oft-heard complaints from our audience of architect readers are

that "clients don't understand what we can really do," "we're not seen as problem-solvers on a large scale," and "we're considered a luxury item." In our discussions with *Business Week*, primarily with Editorial Page Editor Bruce Nussbaum, who has become the publication's unofficial design guru, we were reminded of how market forces, globalization, and technological change are continually forcing businesses and institutions to change and restructure their organizations to remain competitive.

With the recognition that creative management practices and creative design solutions go hand in hand to achieve successful business enterprises, the Business Week/Architectural Record Awards were born. Our shared goal is to honor the very best expression of a client's goals through architecture, rewarding the entrepreneurial spirit in both management techniques and physical form: good design is good business.

For RECORD, the allure of launching such an awards program is abundantly clear: not only does it demonstrate the genuine "value-added" quality of architects, our primary constituency; it provides a connection to the readers of *Business Week*, with a circulation of one million readers

HOW DESIGN HITS THE BOTTOM LINE: AN OVERVIEW OF THE 1997 AWARDS

Business will spend about \$66 billion this year on new facilities—offices, factories, stores, warehouses—and yet it is conventional wisdom that little about the architectural design of such facilities actually affects productivity and profits. Decades-old research at Western Electric supports this conclusion. The so-called Hawthorne Effect implied that changes in the physical workplace had an effect on worker performance only because they signaled the interest of management. But attitudes are chang-

ing. The 153 entrants in this year's Business Week/Architectural Record Awards recognize that intellectual capital is the primary asset of business and that the physical environment is a key to employee satisfaction and productivity.

Several of the winning projects were driven by the imperatives of growth, restructuring, and new ways of working. This is a broad trend, explains Jonathan Ryburg, whose Facilities Performance Group, of Ann Arbor, Michigan, tracks the impact on buildings of business changes.

"We find time and time again that as organizations change, they at first stick with their old space standards. As time goes on, they become firmly committed to changing the environment, because their old facilities are not working."

Design the team first: The Gemini and Nortel projects came about specifically as a response to changing tasks and the need for environments to support teamwork. Miller SQA did not see how it could shorten its order-to-ship time without getting line workers and front-office personnel to work more closely. An intensely collaborative

design effort was the common thread among virtually all the winners. While most architectural design requires the participation of at least owners and users, the number of players, and the degree of research that often went into the winning projects are far beyond that which has been common in architectural practice.

Miller SQA united architects, a landscape architect, contractors, and suppliers, as well as company personnel, in designing its manufacturing facility. In Switzerland, the UNITOBLER architects realized that their project could not succeed without the participation of citizens,

worldwide. And then there are the financial implications. According to a report on the anticipated changes in construction markets over the next 15 years prepared by the AIA, the period between 1996 and 2010 will experience modest but steady gains in overall construction activity as compared to 1991–95. Data compiled by F.W. Dodge and the AIA predict that the average annual volume of contract awards in the years ahead (measured in 1987 dollars) will be \$78.4 billion compared to \$68.8 billion for 1991–95, with, most notably, the office building sector rising from \$10.9 billion to \$18.7 billion, industrial buildings rising from \$12.7 billion to \$14.4 billion, and public buildings rising from \$4.7 billion to \$5.3 billion. That's a lot of potential fees for architects.

In evaluating the shared roles of business and design, it was important to have representatives from both sides to consider both aspects of the 153 entries. Entrants were asked to explain how their designs responded to the particular needs of their clients, and the clients were asked to provide concrete data on how these designs allowed the businesses to work better, more efficiently, or more successfully. Our group of jurors included committed business leaders and chief executive officers, knowledgeable clients, and entrepreneurial architects.

How do the members of the jury see the relationship of business and design? "Everyone is running around saying 'collaboration, collaboration' and [these submissions] are trying to get at what collaboration is *really* about," observes jury chair Frances Halsband, FAIA, of the blurring of the line between client and architect. Did these submissions provide true insight into how, in the best conditions, client and architect can be inspired by one another? "The business plans submitted were as complete as they could be under the circumstances," says Terrance R. Flynn, Senior Advisor to the Vice Chairman of MBNA America Bank.

Craig Hodgetts, AIA, principal of a Los Angeles-based firm known for its cutting-edge design, reports that "there was considerable dismay among several jurors that some 'architects' architects' hadn't seen fit to submit projects." While jury members may have been disappointed that more high-profile projects were not submitted, they attributed it to the newness of the program and the traditional separation of business and design. Says Hodgetts of RECORD and *Business Week*, "There's virtually no crossover between the media in which you communicate to these groups."

1997 Business Week/Architectural Record Awards jury:

Stanley G. Boles, FAIA, principal, BOORA Architects, Portland, Oregon

Terrance R. Flynn, Senior Advisor to the Vice Chairman, MBNA America Bank, N.A., Wilmington, Delaware

Robert Frasca, FAIA, principal, Zimmer Gunsul Frasca Architects, Portland, Oregon

Frances Halsband, FAIA, principal, Kliment & Halsband, New York City

Robert Hillier, FAIA, principal, The Hillier Group, Princeton, New Jersey

Craig Hodgetts, AIA, principal, Hodgetts & Fung, Santa Monica, California

Richard Koshalek, director, The Museum of Contemporary Art, Los Angeles

Paul O'Neill, Chief Executive Officer, ALCOA, Pittsburgh

Mack Scogin, principal, Scogin Elam & Bray Architects, Atlanta

And that is the crux of the problem posed by these awards. While the program may eventually focus on accomplishment, so far it has succeeded more in posing a challenge for an idealized client-architect relationship. As juror Robert Hillier, FAIA, notes, the changing role of architects should be taken more seriously in approaching this goal. Says Hillier: "Architects are more than just designers of buildings. Only 52 percent of [an architect's] business is traditional architecture. The rest is consulting, problem-solving. It's front-end stuff: understanding a company's business to organize its real estate more effectively."

Are clients and their architects willing to accept the notion that design can be used as a marketing tool, a way of putting entrepreneurs on the map while improving their businesses? Offers Hodgetts: "Maybe it's considered a compromised position to be a business-oriented architect. But there's greater receptivity on the part of business than architects are aware of—it's leverage architects can take advantage of." That opinion is echoed on the business side. Flynn wholeheartedly endorses the idea of "using architecture to keep businesses and people on the leading edge." Scogin agrees. "Architects have been maligned as businesspeople. We're seen as heavy risk. This is an opportunity to show that we can carry the risk and that we can carry the day."

See *Business Week's* November 3 issue for more on the awards.

users, and local political officials. At Gemini, restructuring happened concurrently with facilities design, so the architects found themselves working with a succession of personnel. As business changed for Nortel, the conversion of a factory to house a limited number of people suddenly became the solution for 6,000 headquarters staff. Every element of the Brew Moon concept was worked out with its entire team, including graphic designers and chefs as well as architects.

Ryburg says such complex teaming is becoming more common as business culture becomes more "high context," that is, "much more

interactive and dependent on getting information from people."

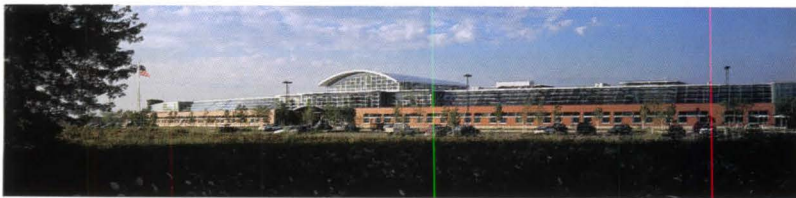
Project delivery: The rapidity of change at winning companies means that the time permitted to bring facilities on line can be breathtakingly short. Design and construction was only four months at Gemini, only 18 months at Miller SQA, and only 11 months at Nortel. But a great deal of dialogue if not design usually preceded the commitment to build, so alternatives to be considered during final design were few and decision making was rapid. Surprisingly, the most common form of construction for these projects

was the negotiated contract and not design/build. In fact, none of the winners were done using design/build, supposedly the quickest method. Nor was it design/bid/build, which offers the highest price predictability but is often the slowest method.

What kind of design firms were winners? Another surprise: relatively few were "experts" in the building type for which they were selected. Gemini, for example, "said they sought a fresh, creative look at the whole enterprise," explains partner Charles Rose. William McDonough, FAIA, had done few projects more complex than a corporate interior

before Herman Miller selected him. Julie Snow, AIA, and her predecessor firm, James/Snow, were virtually untested designers when first hired by Phillips Plastics some 12 years ago. Randy Brown, AIA, transformed the environment of the Greater Omaha Packing Company with almost no commercial-office experience. Most of these clients seemed suspicious of firms who promoted specific restructuring expertise, presuming cookie-cutter solutions.

In general, projects worked when the owners had clear objectives realized by design that opened opportunities for workers to do a better job. **James S. Russell**



Project: Miller SQA
Holland, Michigan

Client: Miller SQA

Building Type: Office/light
manufacturing

Award Category: Private sector,
under \$25 million

Key Players: Miller SQA—Robert
Enders (vice president, facilities man-
agement); William McDonough +
Partners (architect)—William
McDonough, FAIA, Chris Hayes;
VerBurg & Associates (architect of
record)—David VerBurg; Pollack
Design Associates (landscape archi-
tect); Owen-Ames-Kimball (general
contractor)



A DAYLIT STREET HELPS BUILD A COLLABORATIVE CULTURE

In hiring William McDonough + Partners as architects for a new office and manufacturing facility, Miller SQA sought to reconcile the architect's well-established ecological orientation with a need to be innovative in its workplace processes. The budget (\$53 per sq ft) and the 18-month start-to-completion schedule set tight time constraints.

The client assembled a predesign team that included its operations and administrative staff, a general contractor, a landscape ecologist, architects, an HVAC contractor, electrical contractors, glazing suppliers, furniture specifiers, and others. With such expertise readily at hand, the overall design and the materials considered for the project were evaluated for the optimization of resources and energy use.

But the designers were also charged with creating a building that encouraged greater collaboration between the 120 office and administrative personnel and the 600 manufacturing workers. To be competitive in the office-furnishings market required compressing the months-long order-to-ship time to two weeks. (Miller SQA is a division of contract-

furniture giant Herman Miller.) The company felt that consistently meeting this schedule could occur only if sales, management, and production personnel constantly interacted to remove logistical impediments.

In a synthesis of environmental and business goals, the architect designed a wide, skylit "street" that separates office from manufacturing (above) while bringing daylight to both and inviting workers, whether their collars are blue or white, to mix. [For more on facilities that marry manufacturing and front-office functions, including Miller SQA, see RECORD, December 1996, pages 26–33.] Ample provision of daylight in both manufacturing and office spaces became both an energy-conservation strategy (reducing lighting and cooling needs) and a workplace amenity. Fresh-air volume is much higher than code requirements.

A pioneering post-occupancy evaluation funded by the Department of Energy rated the building significantly superior to its predecessor in daylighting, electric lighting, and air quality. Both office and manufacturing workers said job satisfaction, overall work performance, and overall work spirit are better in the new building by a margin of more than 30 percent. The jury also lauded Herman Miller's long commitment to design. Said one, "It's not one building, it's an appropriate culture." *J.S.R.*



Project: *The Origen Center of Phillips Plastics*
Menomonie, Wisconsin
Client: *Phillips Plastics Corporation*
Building Type: *Manufacturing incubator and training*
Award Category: *Private sector, under \$25 million*
Key Players: *Phillips Plastics—Robert Cervenka (chief executive officer); James/Snow Architects—Julie Snow, AIA, Doug Coffler, Jim Larson; PSI Construction*

PHILLIPS PLASTICS INVENTS A NEW BUILDING TYPE TO INCUBATE IDEAS

“The mythology is that you can’t do creative work in a brand-new building, that you have to be in a beat-up old warehouse somewhere,” commented juror Frances Halsband. A long-term client-architect relationship gave both parties the confidence to erect a new type of facility.

Phillips Plastics seeks growth by developing new products and new manufacturing processes. When either is successful, the company spins it off into a new product line or business. Because it was costly to build a new production facility before a product was proven, the company sought a lower-cost method. Phillips chose to drive innovation into manufacturing more efficiently by combining the nurturing of new product lines with a prototype manufacturing and training facility. It also planned that combining these functions would generate new product ideas and help draw in more outside business.

Since such a building type was unprecedented, the company asked the architect to meet performance expectations rather than work to a program or budget. These were completed and approved during the

design process. For flexibility, architect Julie Snow, AIA, designed the project on a 12-by-36-ft structural grid. The incubator and prototype manufacturing areas have long spans, permitting ready reconfiguration.

The entire structure shares a design vocabulary of steel frame with window-wall infill, accented by wood cladding and a granite base. To encourage the company’s collegial approach, the glass walls are carried inside, making even the prototyping and manufacturing areas as visible to workers and visitors as their processes permit. Support areas—including dining and break-out spaces, and an outdoor terrace—are intentionally centrally located, open, and inviting.

The company says the project has “exceeded every expectation.” Three startups have begun operation since 1995, with one already spun off as a new business unit. The flexibility of the workspace and the ability to combine resources have also lowered startup costs. The training services group has exceeded its goal by 25 percent and has created new opportunities for the company by expanding its profile in the community, as local companies and educational institutions have become involved with Phillips. “I really liked the spareness of it,” commented juror Stanley G. Boles. “It looks like every move meant something.” *J.S.R.*



Project: Greater Omaha Packing Company
Omaha, Nebraska

Client: Greater Omaha Packing Company

Building Type: Corporate offices

Award Category: Private sector, under \$1 million

Key Players: Greater Omaha Packing Company—Henry Davis (president), Angelo Fili (vice president); Randy Brown Architect—Randy Brown, AIA; John Luce Interiors, Inc.

MEAT-PACKER'S SALES ASSOCIATES GRADE NEW OFFICES PRIME

Tiny sales offices attached to large industrial facilities are common, but they rarely rate architectural attention. The few thousand square feet designed by architect Randy Brown, one juror concluded, “actually restructured the social organization of the sales force. . . . The architect restructured the way business was done.”

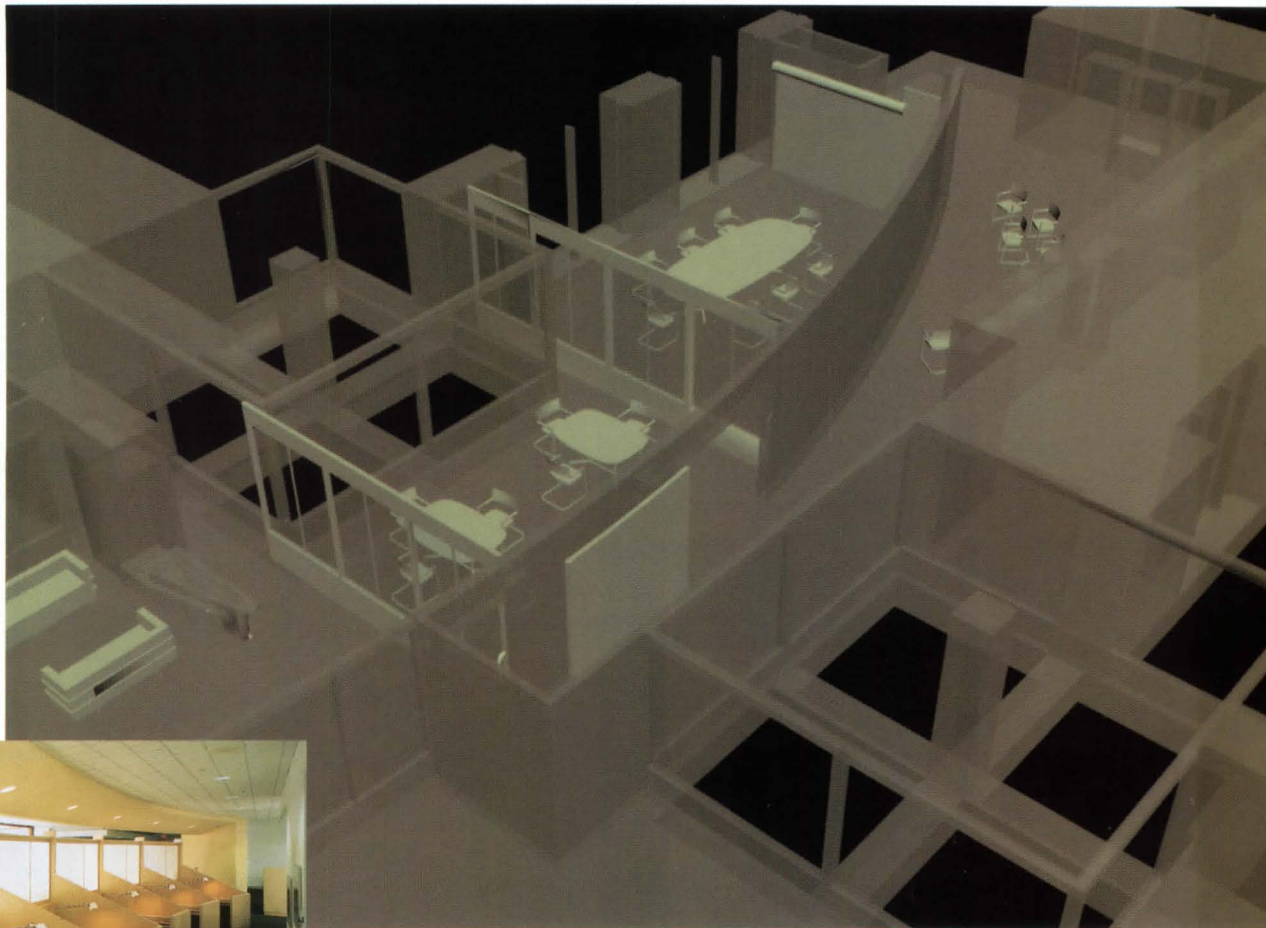
The owner’s mission was twofold: to create a more stimulating, more collaborative, and less fatiguing environment for sales staff and to offer a good first impression to current and potential clients, who visit this meat-packing facility to assess product quality. The design team included not only the architect, but Greater Omaha’s president, vice president, plant managers, and sales associates.

To help the owners understand the concepts under consideration, the architect worked out design ideas using CAD and presented them in wire-frame views, which could quickly be updated. Out of this intense collaborative process came the idea of putting all the sales staff around one 6-by-50-ft table, which would also accommodate the phones,

computers, and monitors that link the associates to prospects worldwide. (In the previous facility, some sales staff used private offices.) Metal mesh screens separate this area from the public reception space. A glass-enclosed conference room with a view into the plant has become a private place that sales staff use to close deals.

The design conveys the company’s commitment to quality—especially cleanliness—through materials carried into the space from the manufacturing area: stainless steel, ceramic tile, glass, perforated metal, and the partially exposed bar-joist ceiling.

The redesign has made such an impression that visitors have come from as far away as China to tour the offices and plant. “What really amazed [president Henry Davis] was the kind of recognition that he was getting by word of mouth,” explained one juror. Davis says it has especially improved the effectiveness of sales staff, who compliment the quality of light (which reduces computer-screen glare), the daylight, and outdoor views. The large table has eased the exchange of vital market information and helped develop greater team camaraderie, yet the conference rooms offer privacy when needed. Sales have doubled in the new space, and Greater Omaha Packing has added new sales associates. *J.S.R.*



Project: Gemini Consulting
Cambridge, Massachusetts
Client: Gemini Consulting
Building Type: Headquarters offices
Award Category: Private sector, under
\$5 million
Key Players: Gemini Consulting—

Richard Strickland, James Monk, David
Teiger; Thompson and Rose Architects,
Reiter & Reiter, a joint venture—
Charles B. Rose, Michael Grant,
Wellington Reiter, AIA; Shawmut
Design and Construction—Tom
Gomat, Charlie Mann

CONSULTANT DOES FOR ITSELF WHAT IT PRESCRIBES TO OTHERS

Akin to what the company does for other businesses, Gemini, a management consulting firm, sought in the design of its own headquarters to “transform the way work is accomplished, encourage creative solutions to business problems, improve communication within the organization, and capitalize on information technology.” Gemini began this project as a means to develop a prototype for the firm’s 22 offices worldwide.

The client selected two firms from among those it interviewed and proposed that they work together. Conventional programming was augmented by focus groups and a review of relevant studies in order to devise optimum working methods for the company. The company evolved as the space was designed, which meant that some participants who began the project had left before it was completed.

The architects and the construction manager analyzed possible sites for suitability and for both fit-out and operating costs. Once the site selection was made, the team held a series of day-long design workshops to define a common design vision for the project. “Everything had to be

done in ‘out-of-the-box’ kinds of ways,” commented Thompson and Rose partner Charles Rose. By doing so much work up front, the final design and construction of the project was completed in only four months.

The project reflects the company’s nomadic working method. There are few private offices or personal cubicles. Rooms are devoted to projects rather than personnel. “Just-in-time” space—temporary homes for consultants who usually work at clients’ locations—is placed at the center of office circulation (above left), where catching up with home-office news is easiest. A café and kitchen area offer other opportunities for casual interaction. Movable walls transform smaller rooms (above right) into a place where the entire staff can meet. “I rated this one fairly high,” commented juror Frances Halsband, “because [the design team] has really gotten into designing special little places for specialized activities.... They really have fitted the environment around a person.”

According to a post-occupancy evaluation, the project-oriented spaces please clients, whose projects now have visible “real estate” within the firm. The nonterritorial nature of the space has made change and expansion easier, since there are no longer fixed business units to uproot. By visibly conveying Gemini’s outlook, the offices help recruiting. *J.S.R.*



Project: UNITOBLER
 Bern, Switzerland
Client: Canton of Bern
Building Type: University
Award Category: Public sector, over \$25 million
Key Players: Canton of Bern—Urs Hettich, Werner Probst, Jürg Siegenthaler, Jürgen Waibel; Architects Associated UNITOBLER—Pierre Cléménçon, Daniel Herren, AIA, Andrea Roost, Gody Hofmann; University of Bern—Elias Köchli, Alfred Lang, Wolf Linder, Kilian Bühlmann, Marianne Aeschbacher

A UNIVERSITY AND ITS HOME CITY COLLABORATE TO INNOVATE

Until the Tobler chocolate company decided to abandon a factory it had on a large site in Bern, Switzerland, it looked like the city's university could not unite facilities scattered over 22 locations without moving to a suburban area. Through the use of an innovative design and consensus-building process, the city took advantage of the unexpected availability of a suitable site. "It brought together the government, the university, and the architects," observed the jury.

The city quickly acquired the Tobler site before private investors did. But it had to do much more. First, it hired three architects—Pierre Cléménçon, Daniel Herren, AIA, and Andrea Roost, each of whom offered specific expertise—avoiding a time-consuming multistage competition and budget-revision period. "They hoped that three pairs of eyes would see more than one," explains Herren. The project was later approved in a local referendum.

Tobler left behind almost 20 structures, the earliest dating from 1898. The architects removed smaller structures to create a treed, gravel

courtyard within the block. (One small houselike building was retained and converted to a student union at the center of the court, above right.) The open space serves both the university and existing housing on the block, which was converted for students. Cléménçon, Herren, and Roost retrofitted the largest factory structure for various departments. They placed the library within the large light court of a 1930 addition (above left). The remodelings were oriented for best breeze and light exposure, which permitted the architects to avoid the use of air-conditioning.

Obtaining this result involved an extensive consultative process. The architects prepared studies for the site that considered public housing or commercial development as alternative uses. The team obtained consensus among university officials and local political officials, convincing them to waive a requirement for 416 parking spaces, for example. The design team also extensively involved users during programming and concept studies.

The project has reinvigorated the neighborhood. New small businesses have begun to establish themselves, and owners are upgrading rental housing. An independent panel lauded the project for its conservation of existing buildings, low energy use, and moderate cost. *J.S.R.*



Project: Dr. Joseph J. Bulmer Telecommunications and Computations Center
Troy, New York

Client: Hudson Valley Community College

Building Type: Academic

Award Category: Public sector, under \$25 million

Key Players: Hudson Valley Community College—Joseph J. Bulmer, Ronald Payson; Einhorn Yaffee Prescott, Architecture & Engineering—John S. Pocarobba, AIA, Lance Fersen, George Marshall, Nick Ferzacca; Shen Milsom & Wilkie (audio/visual consultants)

NEW MEDIA IS HUDSON VALLEY COMMUNITY COLLEGE'S MESSAGE

The jury admired this project because the client, a community college, took an expansive view of how it could serve its vocationally oriented students in an era of rapid business change. It then forged the partnerships that made the project possible. Hudson Valley Community College President Joseph Bulmer had a vision of a facility that would combine training and production in increasingly related television and computer technologies, preparing students for both traditional and "new media" careers.

The jury was particularly impressed with the business plan and program. The program merged training in television production, computer applications, and content creation for such emerging electronic technologies as CD-ROM and the Internet World Wide Web. The business plan anticipated that local companies would rent out the facilities; the college planned to plow back the revenue, using it to update hardware and software. The companies would benefit from access to facilities that were otherwise unavailable locally. The students benefited from production and training opportunities and exposure to possible employers.

The design team provided a teleconferencing suite; video-production and broadcast areas; and an auditorium equipped with extensive audio/visual capabilities, placed near meeting rooms. The center serves a larger community by producing and broadcasting educational programs ("distance learning").

The architect oriented the building's prominent telecommunications tower and multistory atrium to the street, marking a new campus entrance. "It created a symbol for the college," noted one jury member. The atrium acts as a central gathering place and a break-out area for the nearby ground-floor auditorium.

The marriage of college and private sector has been a conspicuous success for the project. Numerous corporate, government, and public and private associations have used various facilities. One company used the building to help launch a new telecommunications product. Within two years the center had met 60 percent of its three-year business-plan revenue goal. The heavy use has also created new public-private collaborative opportunities and has helped students build skills. "They are getting to meet the business leaders of the community at this place, which I thought was really a positive outcome," explained juror Mack Scogin. *J.S.R.*



Project: Brew Moon Restaurant and Microbrewery
 Boston, Massachusetts
Client: Brew Moon Enterprises
Building Type: Restaurant
Award Category: Private sector, under \$5 million
Key Players: Brew Moon Enterprises—Eliot J. Feiner; Darlow Christ Architects—Peter G. Darlow, AIA, Catherine Christ, Paul N. Scanlon, Mary Jo Verde; plus designs inc (graphics); CAFCO (construction manager)

REINVENTING THE BREW PUB PUTS COLLABORATION ON TAP

Since microbreweries and brewery-pubs are not new, the owner chose a collaborative approach to develop a new chain in which every detail would work together to create a distinctive appeal. Among the client's selection criteria was the designers' willingness to work as part of a team that would conceive every element of the restaurant down to the napkins. (Just as the whole group evaluated architect Darlow Christ's work, the architect team members helped name particular brews.)

Three projects were submitted to indicate the responsiveness of the design concept to different settings. The architect and graphic designer were selected first, followed by the food-service consultant, equipment manufacturer and general contractor. Each location's key staff—the general manager, chef, and brew master—was also involved. The owner also asked team members to take 10 percent of their fee in stock options in this startup company.

Typical microbreweries surround patrons with the tanks, pipes, and valves of the brewing process and may include stubelike dark

wood and bright brass trappings. The concept the team hammered out is to make the microbrewery experience less about beer connoisseurship and more casual, contemporary, and relaxing. Beer-making is visible at Brew Moon, but paraphernalia is generally located behind the bar or behind glass. Though graphic friezes and panels pictographically depict the brewing process, it is done as much to lighten the mood as it is to tell the beverage-making story. Walls and ceiling are scalloped and wave-shaped in wheat and barley colors, abstractly evoking beer.

The early outlets of the chain were studied by the Harvard Business School. The results indicated that the design "greatly added to the customer's identifiable satisfaction" and "communicated a sense of quality and uniqueness." The environment was credited with contributing significantly to profitability. The Harvard study found that customers identified the locations as restaurants as much as pubs, offering the owner a broad niche should the microbrewery craze fade. The client also attributes the chain's success to the commitment that came through the team members' financial investment in its growth. Observed one juror, "The architects were brought in at the very beginning. The owner absolutely felt that they were critical to the development of the entire project." J.S.R.



Project: REI Flagship Store
Seattle, Washington

Client: Recreational Equipment, Inc.

Building Type: Retail

Award Category: Private sector, over \$25 million

Key Players: REI—Wally Smith, Jerry Chevassus; Mithun Partners (architect)—Bert Gregory, AIA, Thomas Emrich, AIA, Robert Deering, AIA



HANDS-ON SELLING HELPS COOP BEAT CHAINS AT THEIR OWN GAME

Even a hard-bitten jury could not resist the idea of a sports store that includes a test track for mountain bikes. The corporate structure of Recreational Equipment, Inc. (REI)—a cooperative operated by its members—does not make it naturally equipped to compete with giant retail chains and active-sports apparel makers, but that is exactly what its Seattle flagship store was intended to do. [For more on this project, see RECORD, March 1997, pages 94–99.]

“This is the one time they’ve stepped out,” observed a juror familiar with the company’s older stores. With discounters and retail giants poised to chip away at the cooperatives franchise of “muscle-driven” outdoor sports, such as bicycling, mountain climbing, and camping, the cooperative launched a preemptive strike in the form of this 98,000-sq-ft store in Seattle, its hometown. Even though the cooperative had grown from a small group of climbers in 1938 to 1.4 million active members, such a departure might readily have alienated members, all of whom are empowered to vote for the board of directors.

Several of architect Mithun Partners’ design team were themselves outdoor-sports enthusiasts, and encouraged the cooperative to make a “try before you buy” philosophy central to the store’s design. Hence, the store’s wilderness-evoking garden and waterfall double as a bicycle track (above left). A 65-ft climbing rock was positioned not only to test gear but as a glass-enclosed beacon from adjacent Interstate 5. Though not as prominent, similar testing opportunities dot the store.

The coop outlined specific sustainable-design goals that also were realized in such elements as natural ventilation and heavy timber framing recovered from demolished buildings. Display areas, a café, and meeting rooms offer members noncommercial means for socializing.

The store, one juror commented, “has a lot of integrity from an architectural point of view, without negating the sales objectives.” It opened to wide publicity and immediate acceptance. Store sales increased 212 percent during the first five weeks of operation.

Year-end sales were 60 percent ahead of what REI describes as an aggressive budget. Membership sales were up 31 percent over the previous year. Located at the edge of Seattle’s downtown, it has also proven a top tourist attraction. *J.S.R.*



Project: Nortel Brampton Center
Brampton, Ontario, Canada

Client: Nortel-Northern Telecom Limited

Building Type: Corporate headquarters
Award Category: Private sector, over \$25 million

Key Players: Nortel—David Dunn; Helmuth, Obata + Kassabaum (architect)—Thomas H. Robson, AIA, Tom Harris, Timothy Conroy, Gerald Mueller, Michael Shirley, AIA; Bregman + Hamann Architects (associated architect)—Bill Nankivell

SURPLUS SPACE BECOMES A FACTORY OF “KNOWLEDGE WORK”

In large businesses, the “skunk works”—highly motivated teams who produce wildly successful products from the leftovers at hand within facilities no more glamorous than garages—have reached mythical status. AT&T, General Motors, and other companies have tried to extend such a metaphor throughout the enterprise. Enter Nortel, which has evolved from a manufacturer of switching equipment to a provider of a broad range of telecommunication network products.

“What impressed me the most,” commented juror Mack Scogin, “is the relationship the client and the architect have had over a long period of time.” Explained Michael Shirley, AIA, the project’s design director, who is based in HOK’s Houston office, “This project represented the latest thinking of both companies.”

Nortel wanted to take workers located in three leased downtown towers, which had insufficient space for expansion, and consolidate them in one headquarters. It ended up reworking a surplus factory for office use, putting 3,000 workers into 600,000 sq ft of space on one level—the

equivalent of a 50-story building. Such a large, uninterrupted space offered virtually unlimited flexibility. The company also anticipated facilities-cost savings adding up to \$250 million over 10 years. The conversion design had to overcome the limitations of the huge structure, however, and provide orientation, a sense of place, and amenities to make up for the views and daylight conventional office buildings offer.

The architects chose a city-planning metaphor, breaking the vast space down into “streets” and “blocks” (above), punctuating them with daylight “piazzas” and dotting the floor with street-fronting retail amenities like fitness centers and cafés. Work groups are identified by specific materials, signage, and colors. Each group could choose completely private offices and typical cubicles or team-oriented furnishings and carrel-like accommodations for drop-in field staff. Change, which occurs often, is regulated by a facility “zoning” code.

The company initially met resistance, as the factory was thought to be a lower-quality work environment than the class A office space left behind. Now, it says, acceptance is high, and workers ask to be moved to the new facility. A post-occupancy evaluation, which was not complete prior to judging, validates the scheme, according to Nortel. J.S.R. ■

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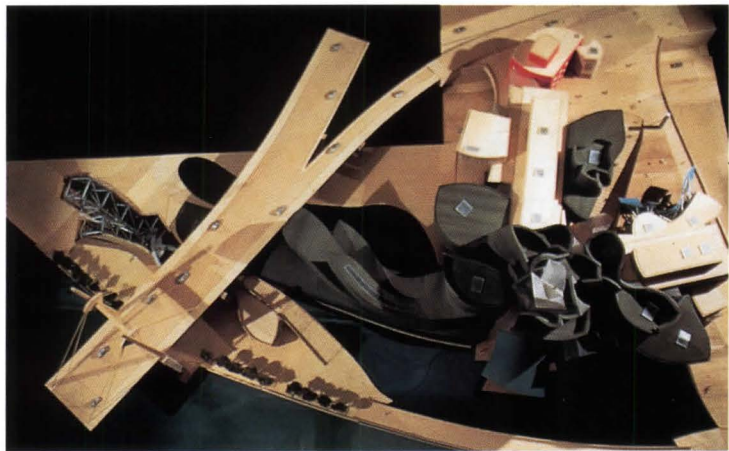
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Frank Gehry's July 1991 sketch of the museum (below). Polaroids and models of the design's progress in his Santa Monica studio (bottom). The final design model (opposite).



PROJECT DIARY: Frank Gehry's dream project, the **GUGGENHEIM MUSEUM BILBAO**, draws the world to Spain's Basque Country.



by Karen D. Stein

Everyone is saying it: Frank Gehry is a genius. It's so much the conventional wisdom these days that even the architect's detractors agree. But don't tell that to Gehry. "I'm being geniused to death," he says. This "genius" is presumed to know nothing of construction schedules and cost. At least that's what was implied when Gehry's ability to complete the Walt Disney Concert Hall in downtown Los Angeles was recently challenged, despite the fact that his 66-person architectural firm routinely prepares working drawings. Simultaneously lauded as a national treasure and dismissed as a creative whirligig unable to focus on the so-called prosaic, to some Gehry has the overall image of an absent-minded professor, an impression only heightened by his shock of Einstein-like white hair. But one of the biggest long-standing misconceptions about the 68-year-old Gehry is that he does things casually. He is, after all, a pioneer in the use of CATIA, a three-dimensional computer modeling system originally developed for the aerospace industry, as a way of translating complex architectural forms into constructible fabrication data. With CATIA acting as interpreter, his sculptural form making has become both more ineffable and more comprehensible. The result is unique: he holds sprouting, colliding, tumbling shapes somehow in repose. At best, a Gehry design maintains dramatic opposites in such exquisite balance that the building itself expresses joyful release from constraint. And controlled release was exactly what Spain's Autonomous Basque Community, known more informally as the Basque Country, wanted. No longer subject to the restrictive policies of Francisco Franco's dictatorship, and hoping to combat the violent impression produced by underground terrorist groups demanding secession from Spain, the Basque powers-that-be sought to ensure the region's vigorous future by remaking its public identity. By the end of the 1980s, the Basque Country had embarked on a \$1.5 billion regional redevelopment plan. In searching for international appeal, Basque officials set their sights on the Solomon R. Guggenheim Foundation and a visible architectural symbol of a new era.

WINTER 1991 The Basque redevelopment plan is based, in part, on the region's location in northern Spain with its proximity to France and Italy and Germany beyond—it's at the crossroads of Europe. Members of the Basque regional government conclude that an international institution of contemporary art would bring them newfound cultural prestige and a steady stream of tourism to their capital city of Bilbao. The Guggenheim Museum in New York City is closed for renovation, but in the meantime the museum's new director, Thomas Krens, is exploring venues beyond its flagship building, designed by Frank Lloyd Wright, to be part of an international "constellation" of institutions where "each plays an individual role that contributes to the [Guggenheim] identity." Hans Hollein, of Vienna, has a scheme for a Salzburg Guggenheim built inside an Austrian mountain, and plans for additional space to relieve the cramped quarters of the Peggy Guggenheim Collection in Venice are considered. Though these projects eventually falter, the word is out that the Guggenheim is in expansion mode.

Project: Museo Guggenheim Bilbao
Bilbao, Spain

Owner: Fundacion del Museo
Guggenheim Bilbao

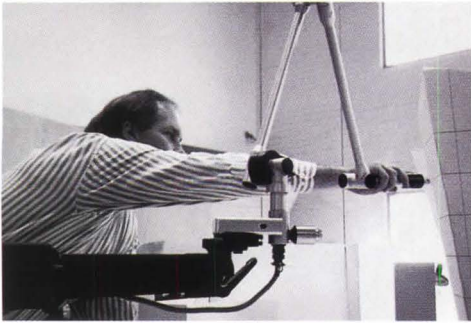
Architect: Frank O. Gehry & Associates—Frank O. Gehry, FAIA, design principal; Randy Jefferson, AIA, project principal; Vano Haritunians, AIA, project manager; Douglas Hanson, AIA, project architect; Edwin Chan, project designer; Bob Hale, Karl Blette, Matt Fineout, Michael Hootman, Naomi Langer, Chris Mercier, David Reddy, Bruce Shepard, Eva Sobesky, Todd Spiegel, Kristin Woehl, Rich Barrett, Tomaso Bradshaw, David Hardie, Grzegorz Kosmal, Mehran Mashayekh, Brent Miller, Marc Salette, Rick Smith, Derek Soltes, Jeff Wauer, project team

Executive Architect/Engineer: IDOM—José Maria Asumendi, project

director; Luis Rodriguez Llopis, project manager; César Caicoya, senior architect

Consultants: Carlos Iturriaga (architectural); Thomas Hut, Andy Klemmer (Solomon R. Guggenheim Foundation); Skidmore, Owings & Merrill, Chicago (structural)—Hal Iyengar, John Zils, Bob Sinn, project team; Cosentini Associates (mechanical)—Marvin Mass, Igor Bienstock, Tony Cirillo, Edward Martinez, project team; Lam Partners (lighting); Peter Muller, Inc. (curtain wall)

Contractors: Cimentaciones Abando (foundations); Ferrovia/Lauki/Urssa (steel, concrete structure); Construcciones y Promociones Balzola (external building); Ferrovia (site work, interiors, building systems)



A study model's curves are traced and digitized using a Faro arm. The data is transferred into CATIA, a three-dimensional modeling system. Gehry's office pioneered CATIA's use for architecture.

Bilbao in May to tour the Alhondiga, a former warehouse selected as the tentative site. Of his initial impression of the city, the architect recalled remarks made by sculptor Richard Serra. "Years ago Serra visited Bilbao and said to me, 'You've got to go to this place. It's amazing,'" recounts Gehry. "I didn't hear about Bilbao again until eight years later, when Krens gave me 24 hours to get there." Impressed by the city's tough industrial appeal but not the site, Gehry reports that it would be difficult to build a museum without destroying the historic Alhondiga. Another potential site along the Nervión River, the central artery of the once-booming port of Bilbao, is identified. By early June, the Basque administration agrees. Site documentation and a preliminary program brief are supplied to all three architectural teams at the end of June. The competition requirements focus on content, not methods of presentation: it's a call for ideas. The contestants are given three weeks and \$10,000.

Basque representatives approach Krens in February while he is attending the opening of an exhibition of the Guggenheim's collection on view in Madrid. The show is funded by a Basque bank, and Krens talks with the Basques, but he's skeptical of the group's ability to make good on an offer to fund the construction of a museum in Bilbao that would have the Guggenheim name and thus would benefit from the museum's collection, curatorial expertise, and access to traveling exhibitions.

After two months of persuasion, Krens agrees to visit Bilbao. When his plane lands at the local airport on April 9, he crosses a red carpet to a waiting helicopter, which takes him to a meeting with the president of the Basque Country. He sees that the Basques are serious. After much discussion, both parties conclude they don't want to waste time in a mating dance. An agreement is made to embark on two parallel processes of discovery: a feasibility study to evaluate the project in economic, legal, cultural, and demographic terms, and an architect search to satisfy one of Krens's key stipulations—that the building be "world-class architecture." A deadline is set for December 1991. At that time, a decision will be made to proceed with the project or terminate the relationship between the Basques and the Guggenheim.

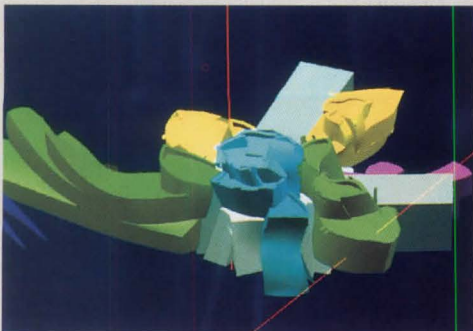
JULY 1991 On his way back to Los Angeles after the official Bilbao site tour, Gehry stops in New York City for Philip Johnson's 85th birthday party. Edwin Chan of his office meets him there with a site model and some pieces of foam representing various programmatic aspects of the project, which calls for 36,000 square meters. The architects discuss Gehry's impressions of the site—a disused former industrial shipyard along the Nervión—and review general massing strategies. They play with the model and the foam shapes, taking Polaroid photographs of different strategies. Back in Los Angeles, Gehry and his team spend the following weeks producing a conceptual model and a book that describes the principles of the project as they envision it: the site as a transition zone between downtown and the riverfront; an architectural language that makes a sculptural symbol for the city, with a blossoming flowerlike form at the center; an internal plan of galleries that is Guggenheim-like in its organization around a grand, multistory central space; a long gallery for large-scale works that engages a vehicular bridge intersecting the site by both going underneath the bridge and seemingly jumping up to meet it; and a tower at the east end that serves as a marquee facing the historic city.

SPRING 1991 From a long list of potential architectural firms, three are chosen to participate in an invited competition: Coop Himmelblau of Vienna, Arata Isozaki & Associates of Tokyo, and Frank O. Gehry & Associates of Los Angeles. At Krens's request, Gehry had already visited

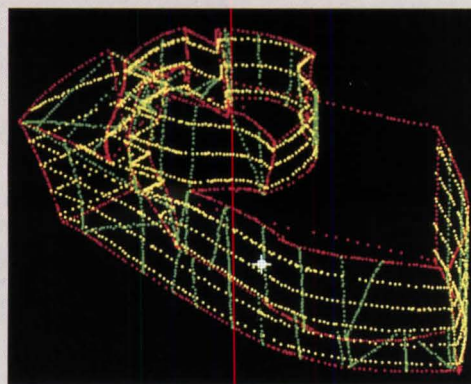
On July 19, after what Krens describes as "two arduous days" of deliberation, a selection committee composed of Basque and

Using CATIA, Gehry's office analyzes the overall design (below).

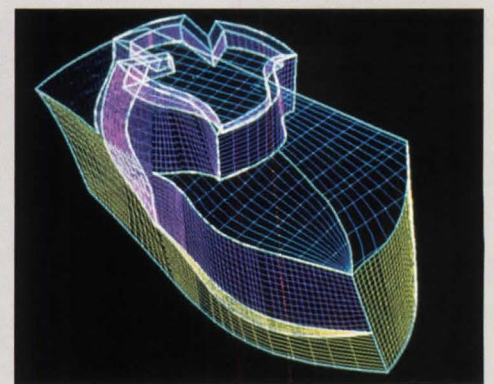
Aspects of the development of one portion of the design (right).



COMPUTER STUDY OF THE OVERALL DESIGN



A PORTION OF THE MUSEUM AFTER IT HAS BEEN DIGITIZED



A SURFACE MODEL IS CREATED IN CATIA

Guggenheim Foundation representatives announces Gehry as the architect of choice. "He was chosen for the strength of his vision," says Krens. What is still unclear is whether building any building at all is feasible.

In mid-September, after an intense six-week design-development period, the Guggenheim's board of trustees gives preliminary approval to draft a long-term association agreement between the Foundation and the Basque administration. The feasibility study is completed the following month, and by the December deadline a joint agreement is reached that "the place makes sense," says Juan Ignacio Vidarte, a Basque regional director of tax and finance, and that "it will cost \$100 million. That is what we can afford." The agreement is ratified by the Basque government two months later.

JULY 1992 The Basque government establishes the Consorcio Guggenheim Bilbao to oversee planning and construction of the museum, and Vidarte, who has participated in the negotiations, is named director. The Basque team is put in place: Bilbao-based IDOM, an engineering firm, is named executive architect to handle governmental regulations, obtaining permits, and contractors. Gehry's office will do the working drawings. While the agreement between the Guggenheim and the Basques says that Krens oversees the design, Vidarte and his group, including Carlos Iturriaga, an independent architect hired by the Basque Country as its representative, are present for design meetings, which occur every six weeks, usually in Los Angeles. The group participates in what Gehry calls "my weird process." "It's slow, time-consuming. It's like watching paint dry." The architect-client relationship is a triangle—Gehry and his team, Krens and the Guggenheim, and Vidarte and the Basque group. While Krens says this is the sixth building project in his career, Vidarte is a first-time client. For Vidarte, however, the mission is clear: "We want the best Frank Gehry building and we want it on schedule and on budget." To accomplish this, he says, "We need to be a team. Gehry is in charge. The Foundation makes sure the program is consistent with its vision. We control the cost." Gehry nicknames Vidarte "the wall" for his stick-to-itiveness and calls Krens "the courage." Krens wants to make sure there is no "aesthetic interference" and says he's pleased that the Basques "let Frank and me design it."

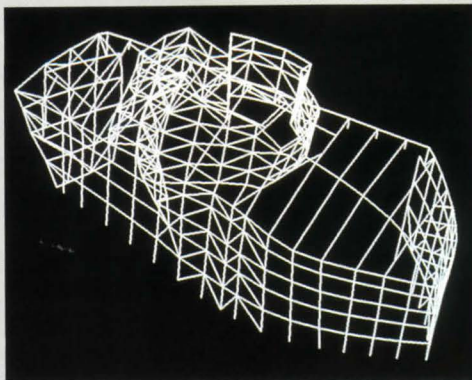
The main ideas of the competition scheme are accepted. A process of refinement and elaboration begins. Models of cardboard and wood are made, dissected, discarded, reinvigorated. CATIA, the computer modeling system, is used to explore and document forms. The curved surfaces of study models are mapped through a digitizing process. The computer mapping is then used to develop and coordinate building systems—from structural steel to exterior cladding. Through a milling machine, CATIA carves a scale model of the building forms, which is used as a comparison with the computer data or to provide dimensional control for the fabrication process.

What Krens calls the "blocky" aspect of the initial design is smoothed as the project develops. Observes Krens, "Frank's the kind of guy that when you say you don't like something, he'll gleefully rip it apart because the second time he starts from a higher plane of knowledge." For budgetary reasons, the project size is reduced from 36,000 square meters to roughly 24,000, or 257,000 sq ft, including 112,000 sq ft of gallery space. But the overall scale is nonetheless enormous: at 165 ft, the central atrium is more than one and a half times the height of Wright's Guggenheim rotunda. Krens champions the long, boat-shaped gallery underneath the bridge, which eventually grows to 450 by 80 ft. "This is Tom's vision," says Gehry. "I wouldn't have concocted a 450-ft-long gallery."

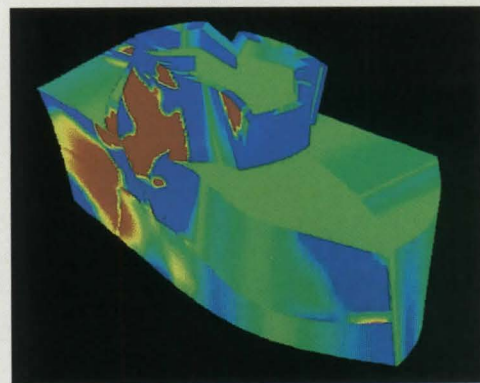
OCTOBER 1993 In Bilbao the local architectural and construction community is overwhelmed not only by the project's size but also by its complexity. "It's not buildable" is what César Caicoya, the architect hired by IDOM to help supervise the project, is told by colleagues who see the finished model of the museum. He and Vidarte, having participated in the design process with their own engineers, feel otherwise. Groundbreaking occurs on October 22, 1993. "Trust builds exponentially," says Vidarte of his confidence that the design is doable. "Gehry's team needs to see things getting done. We needed to see him work with budget and time. He gave us proof of that." The complexity of the construction task, though even more difficult than anticipated, grows into a welcome challenge. It becomes a dare to be met in the Basque Country, which has a "culture of metal" (thanks to its history of shipyards) and "contractors who are



A COMPUTER-CUT MILLED MODEL IS MADE TO VERIFY ACCURACY



A PRIMARY STRUCTURAL WIRE FRAME IS CREATED AND REFINED



A CURVATURE ANALYSIS IS USED TO STUDY SURFACES



Right: A flooring discussion with, from left to right, Juan Ignacio Vidarte, Luis Rodríguez Llopis, César Caicoya, Vano Haritunians, Edwin Chan, and Gehry. Above: Gehry and colleagues on a lower roof. Far right: The boat-shaped gallery. Opposite: Vidarte, author Karen Stein, and Gehry on a construction tour.



proud of their work,” says Caicoya. To realize the design, a high level of contractor commitment is necessary.

During design, members of the architectural team—Gehry, project designer Chan, project principal Randy Jefferson, AIA, project manager Vano Haritunians, AIA, and project architect Douglas Hanson, AIA—shuttle back and forth between Los Angeles and Bilbao. When construction is fully under way, it’s generally Haritunians making the trip, at least once a month. “It’s a fast-tracked project,” he says, “which means we start the foundations without the exterior package being complete. We are still massaging the project while we are drilling the piles.” The first 12 months are spent sorting out site issues: demolition and permits. When Gehry’s office completes the working drawings, there are 565.

Spanish limestone is chosen for some of the exterior surfaces, but the metal to clad the more sculptural forms is a matter of considerable debate. An initial idea is to use sandblasted stainless steel, which is the cladding intended for Gehry’s Frederick R. Weisman Museum in Minneapolis. The Weisman’s cladding is ultimately changed to a satin-finished stainless steel, which is deemed inappropriate for the much larger Bilbao project because of its high degree of reflectivity. “It would be a psychedelic mirror,” says Chan of the anticipated effect. Gehry considers lead-coated copper, which he used on his 1992 Center for the Visual Arts in Toledo, but new environmental concerns make it inappropriate. Chan says a piece of titanium in the office’s sample pile catches the team’s eye, and it is mounted in the office parking lot to see how it responds to light. It becomes the cladding of choice even though its reputation as an expen-

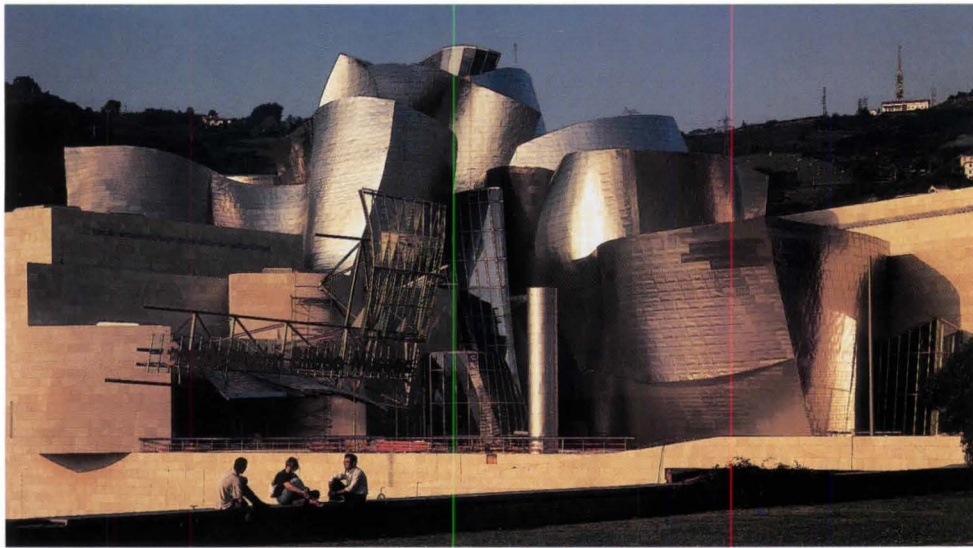
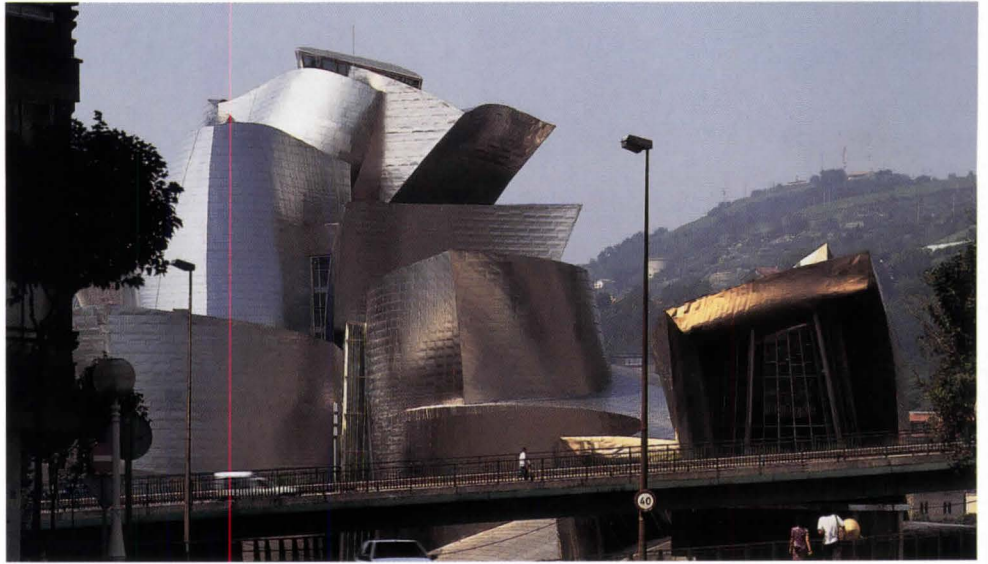
sive material makes it seem an unreachable ideal. But because of its light weight, titanium continues to be considered. When the cost of structures required to support treated stainless steel and a titanium skin are compared on an assembly versus assembly basis, titanium’s cost no longer seems prohibitive. And then economic forces come into play with all the drama and intrigue of a spy novel: the Russians dump large quantities of titanium on the market and for a brief period the price drops. When the cladding for 28 possible samples (mostly stainless steel in a variety of finishes) is bid, titanium, supplied by a Pittsburgh manufacturer, is suddenly available at a cost equivalent to stainless steel, reports Vidarte.

OCTOBER 1994 One year into construction there is “unity among all the team members,” says Vidarte. Gehry agrees, commenting later in retrospect that “it’s obvious that the Basques fell in love with the building. They took care of it through the construction process.” Says Vidarte, “You have to work together a long time, suffer together a long time to realize you need each other.” Gehry, a fan of unfinished buildings, makes frequent site visits, calling Vidarte and the IDOM team “my Basque family.”

In September 1996 the shell is virtually complete. Gehry, Jefferson, Haritunians, and Chan are back in Bilbao to check on progress and to meet with Vidarte and his colleagues. Walking through the empty site on a weekend when workers are there only to turn lights on and remove debris for Gehry to check details in question—the choice of wood for the gallery floors, a paint color for the administration wing—the

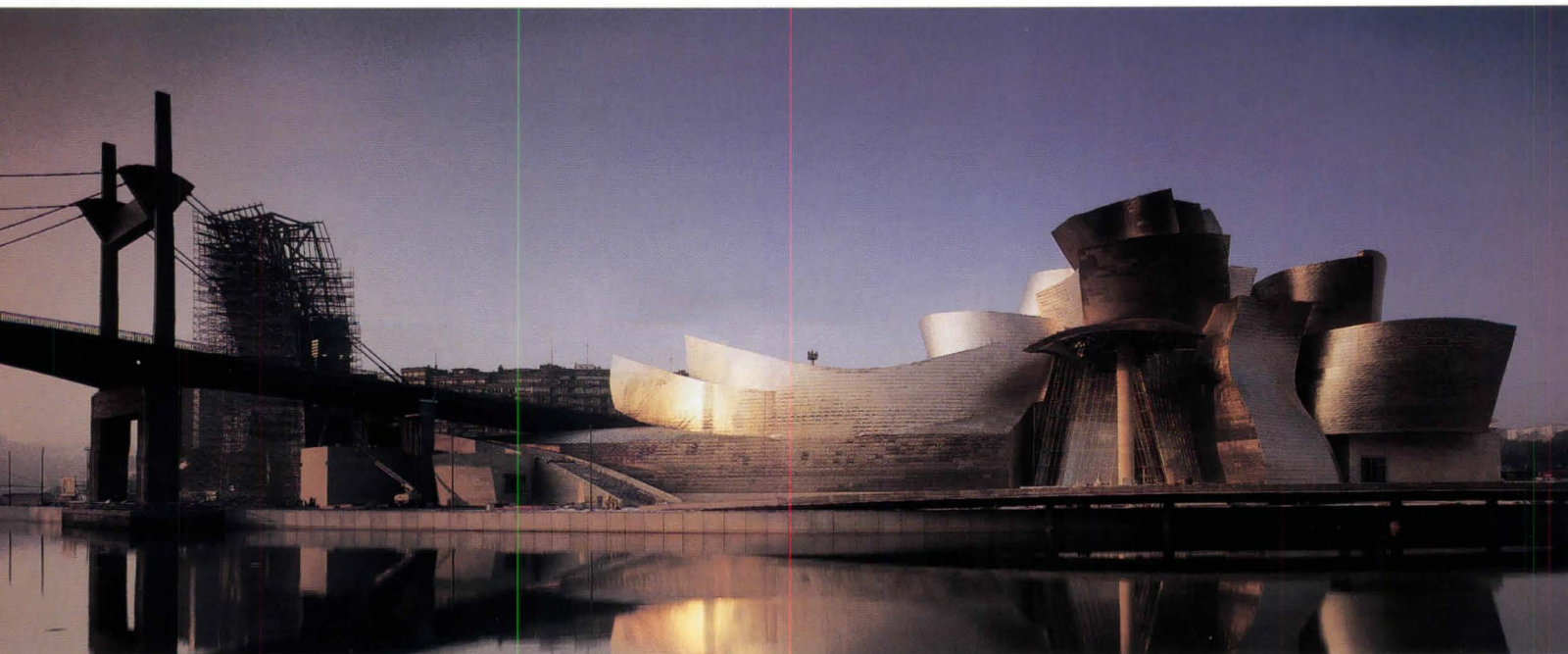


Below: The sloped path to the entrance continues the axis of a main city street.

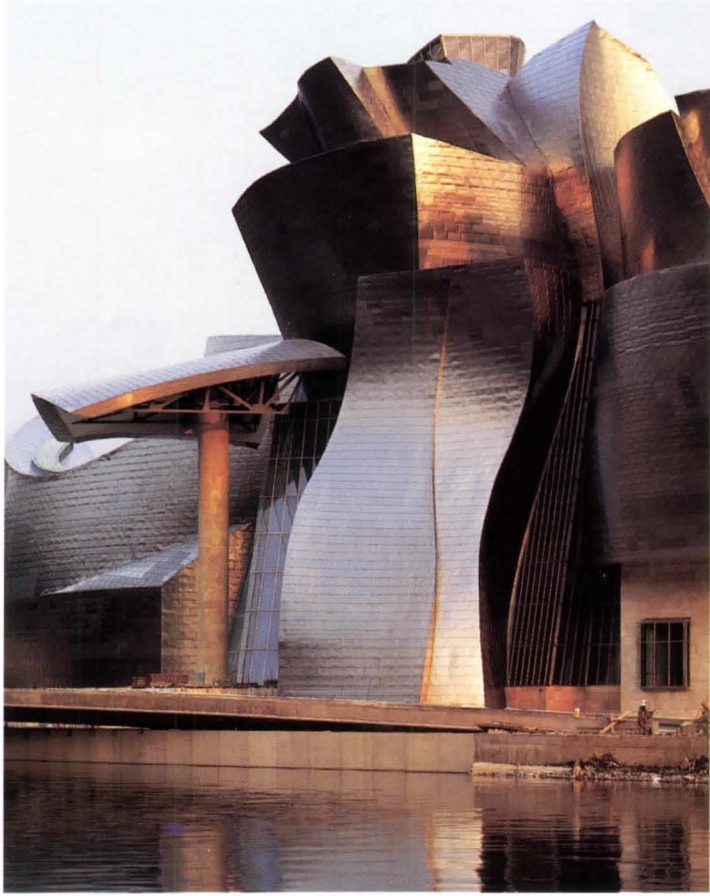


Above: From the east, the giant gallery appears almost separate from the central mass of the museum.

Below: The museum's riverfront promenade extends to the unfinished tower to the east.

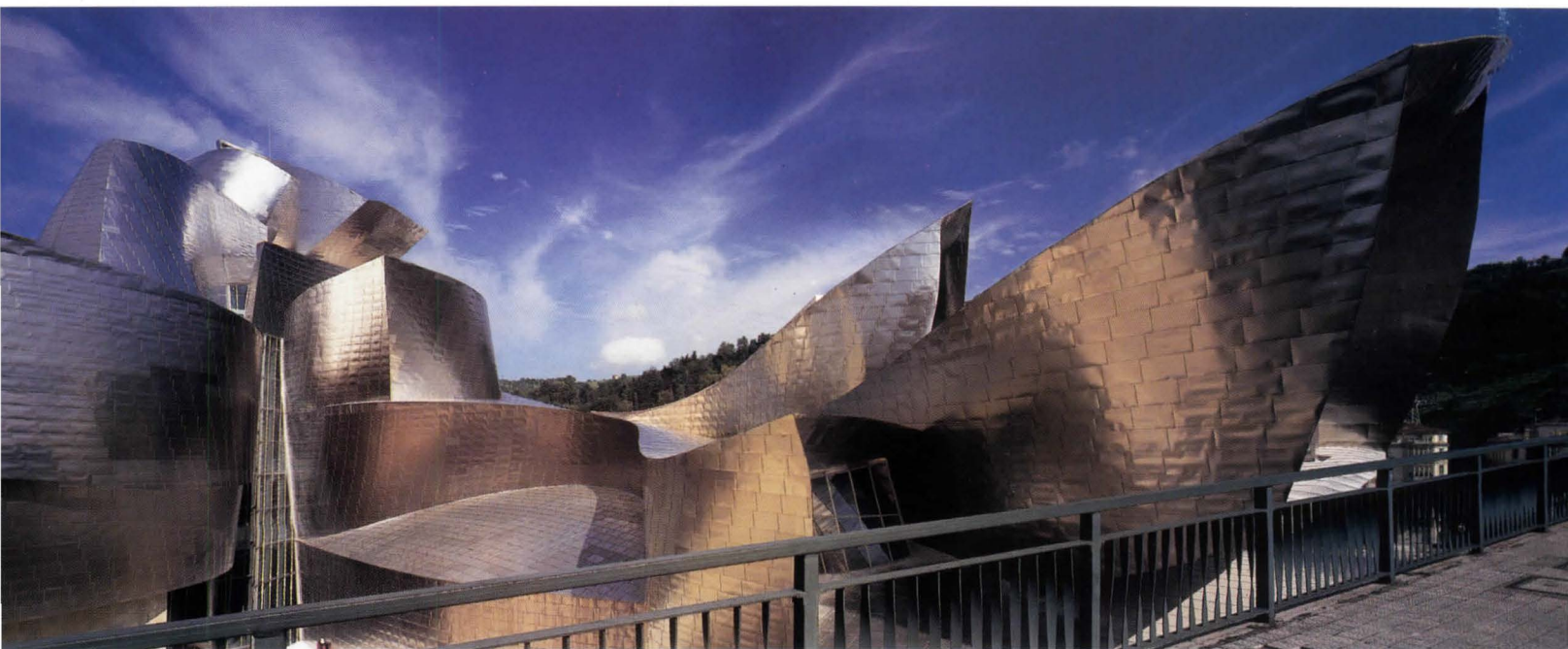


Below: The central atrium—what Gehry calls “the flower”—overlooks the river.

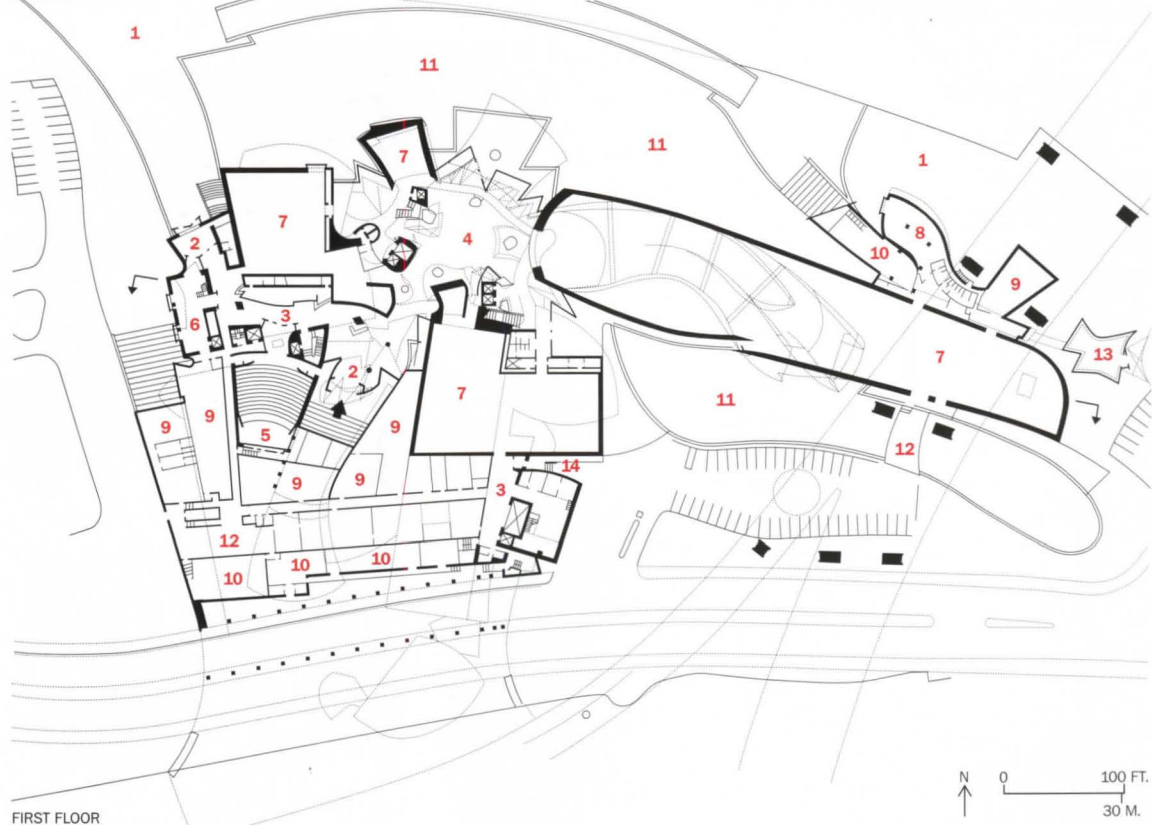


Above: Pedestrians on the bridge can see the titanium up close.

Below: The giant gallery rises up to meet the bridge.

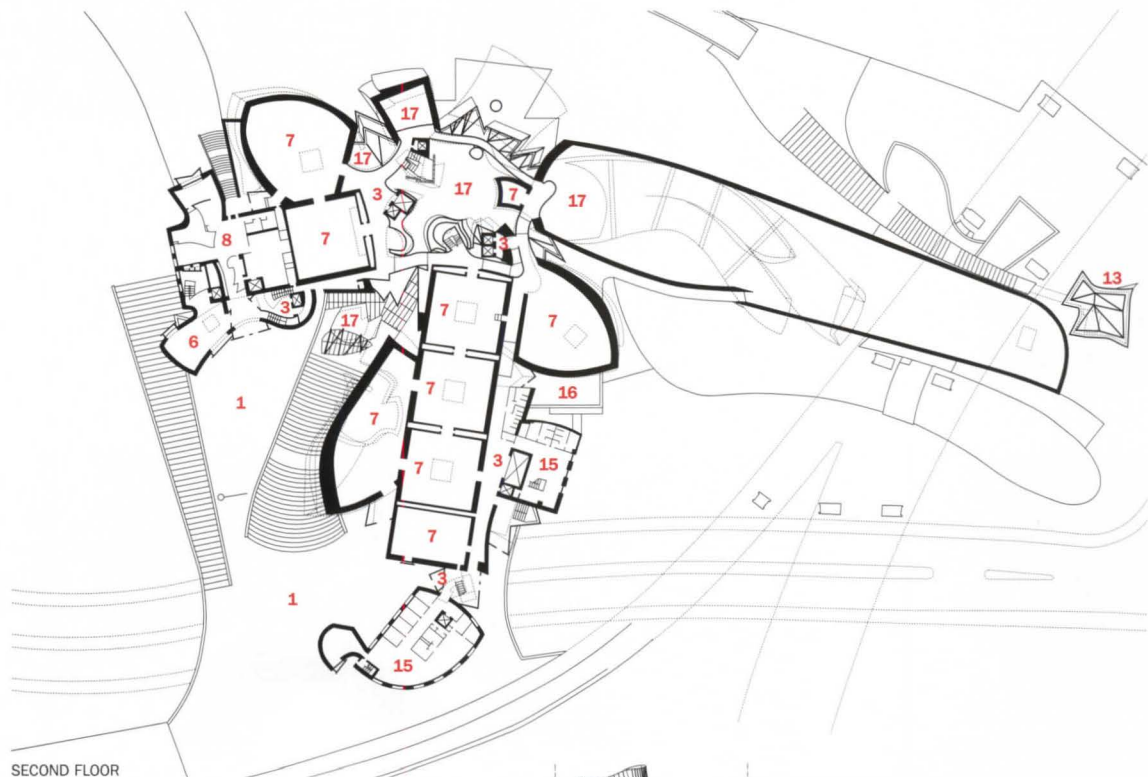


1. Plaza/promenade
2. Foyer/public entrance
3. Lobby
4. Atrium
5. Auditorium
6. Retail
7. Gallery
8. Restaurant/café
9. Storage
10. Mechanical
11. Water garden
12. Loading dock
13. Tower
14. Staff entrance
15. Staff offices
16. Terrace
17. Open

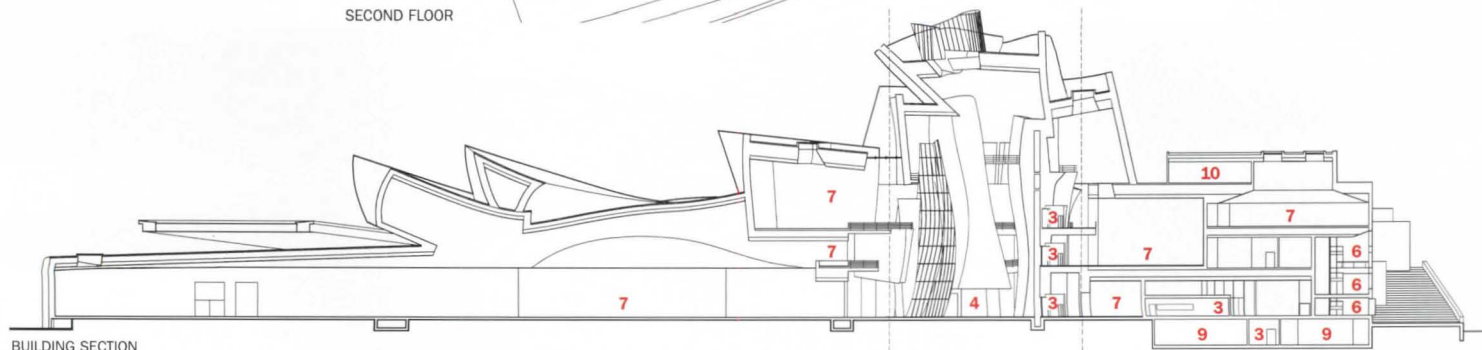


FIRST FLOOR

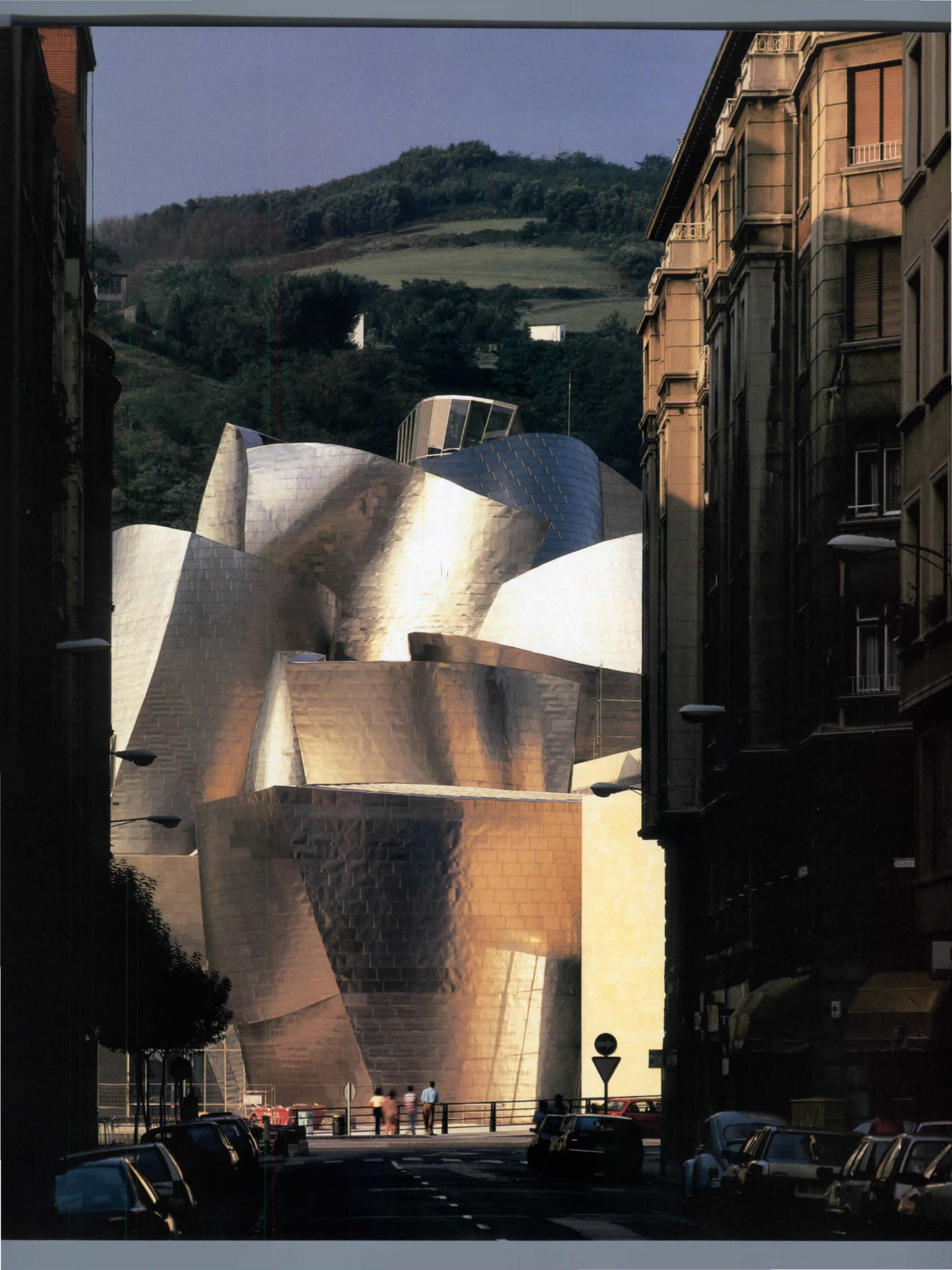
Gehry designed two types of galleries (labeled 7 in plans, right): more traditional orthogonal spaces for permanent collection installations, and curved rooms with dramatic skylights as venues for temporary installations. Old and new Bilbao meet in a collage of limestone and titanium (opposite).



SECOND FLOOR



BUILDING SECTION





Ellsworth Kelly is there, too, hoping to locate a spot for a commissioned work. He admires the place reserved for Pablo Picasso's 1937 painting *Guernica*, which the museum hopes to get on loan from Madrid.

Richard Serra has recently installed his new piece in the big gallery. The undulating steel sculpture is 13 ft 4 in. high and 105 ft long and weighs 180 tons, but in

the space it looks surprisingly diminutive. Gehry wants to erect two walls flanking the front of it to compress views and provide some of the tension that Serra's sculpture thrives on, but Krens vetoes the idea. He wants to fill the space with other large sculptures or paintings—such as works by Carl Andre or Andy Warhol—so that the tension will come from overlapping works of art. Gehry, whose history of collaborating with artists is what led him to designing museums, wonders why on this issue he is overruled. Vidarte is sympathetic to Gehry's opinion, but it's a curatorial decision: it's Krens's turf. For his part, Krens is inured to criticism of his curatorial choices. His entrepreneurial approach to the Guggenheim has been likened to a cultural pyramid scheme. But even the criticism falls within his larger agenda. "Controversy is part of my strategic plan," he says.

In addition to the giant gallery, there are 18 other galleries, which fall into two general types. Gehry distinguishes them as "galleries for dead artists, which have classical [square or rectangular] shapes, and galleries for living artists, which have funny shapes, because they can fight back." The galleries for temporary installations are, he says, "an invitation to confrontation." A third of the art to be installed will come from the New York Guggenheim, a third will come from other European institutions on temporary loan, and a third will be "self-generated," with an emphasis on Basque culture, explains Krens.

Many of the galleries receive natural light through skylights; supplemental light is provided by wall-washer and mono-point fixtures. In some galleries, the lighting system is mounted on catwalks that hang from the ceiling. The goal in all of the galleries is an even illumination of 10 to 20 footcandles at eye level. Vidarte, who has been in the building nearly every day since construction began, says of the play between Gehry's sculptural forms and the Basque sunlight: "Every time you go, you have a good feeling. What could be more rewarding?"

The crowd wandering through the museum also includes architect Alvaro Siza, who has traveled from Porto, Portugal, to see the building he has heard so much about. When asked his reaction, he says softly, carefully, "It's amazing." After a long pause, he ponders the two questions that other architects on the tour are asking themselves and each other, the questions that Thom Mayne, who is also present, posed out loud more than once: "Will I ever design something this good?" and "Will I ever find such a client?" Offers Siza by way of answer: "Maybe you can only have this in Spain. The Spanish ask for things. They have a big wish for new things." ■

Manufacturers' Sources

Laminated-glass curtain wall and entrances: *Umaran*

Titanium-metal cladding: *Timet* (Pittsburgh); fabricated by *Permasteelisa* (Italy)

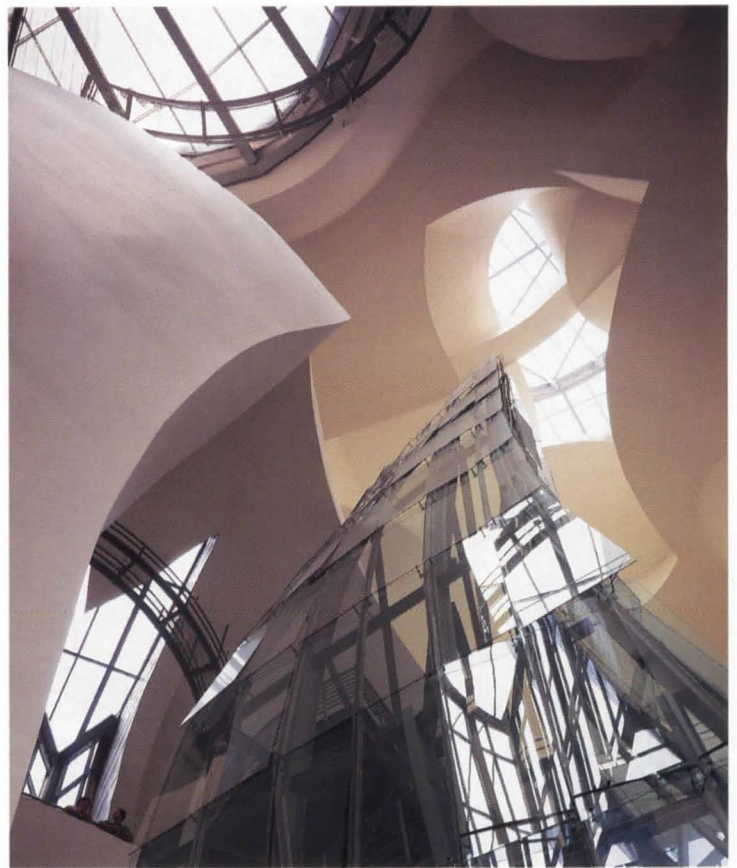
Waterproofing membrane:

W. R. Grace Construction Products (Ice and Water Shield)

Fire-control doors: *Won-Door Corp.*

Interior light fixtures: *ERCO, Lledo*

Lighting controls: *Lutron Electronics*



The central atrium (opposite and above) is more than one and a

half times as high as Wright's Guggenheim rotunda. Some gal-

eries have skylights (below). Catwalks are for access to lighting.





Passengers at the new Washington National Airport check baggage at curbside beneath shimmering steel-and-glass canopies.



Cesar Pelli's new passenger terminal at NATIONAL AIRPORT in Washington, D.C., eases the life of the world-weary traveler.



by Charles Linn, AIA

To attribute any sort of stylistic label or historical influence to the recently completed new terminal at National Airport is to misunderstand the way Cesar Pelli, FAIA, designs. “To me,” Pelli says, “architecture and forms need to follow convictions. Convictions cannot be convictions about forms, because those are not convictions, those are preferences. Convictions need to be about principles.”

The convictions that drove Pelli in the case of National were objectives set by the Metropolitan Washington Airports Authority. The four basic goals were passenger convenience, functional efficiency, budget, and aesthetics. “Aesthetics and budget were really on an equal level,” says the Airports Authority’s design project manager, Dan Feil, FAIA. “It was a question of whether we could get the highest possible aesthetics within a given budget, not whether one was more important than the other.”

Pelli believes that part of what favored the project was the purposeful, measured way the authority supported program analysis for the project before design began. The design team spent two years visiting airports, looking at every functional component at each one, and talking to architects, airport administrators, and airline representatives to discover the best solutions for such mundane chores as passenger drop-off, which, when handled badly, are the bane of every air traveler. “For example, we did lots of solutions for how curbside baggage check-in should be organized,” Pelli says, “without ever knowing what the building was going to look like. We wanted all the problems to be known and understood before we began. The Airports Authority would not authorize one penny for design until we were finished with this work.”

Pelli and his team also had to work within stringent dimensional restrictions that determined the height, depth, and location of the building, as well as influencing its overall footprint. “The most difficult

thing we encountered was the dimensions. We were boxed in from all sides. We could not move the piers [passageways to airplane gates] because the space between them is set by the minimum distance an airplane needs to maneuver, and they barely fit that.

“On the other side, the distance between the Metro rapid-transit lines and the curbside passenger drop-off traffic lanes was set because it was close to the minimum. The heights of the terminal and concourses were set by the ‘sky planes,’ the sightlines required by the air traffic controllers. The heights of the piers were so close to the edges of these imaginary geometric planes they actually determined the shape of the pier roofs. Even the grade level was set. I wanted to go several inches deeper and then I realized we would be under the level of the flood plane.” Even the location of the control tower was intently scrutinized by the FAA, who evaluated some 21 different locations before settling on one at the north end of the new terminal.

Three years after beginning to study the airport design, Pelli presented four schemes to the airports authority. The first was an updated

Project: *New Terminal, Washington National Airport, Washington, D.C.*

Design Architect: *Cesar Pelli & Associates—Cesar Pelli, FAIA, design principal; Fred Clarke, FAIA, project principal; Mark Shoemaker, AIA, design team leader; Phillip Bernstein, AIA, project manager; Anthony Markese, Barbara Endres, Sharon McGinnis DaSilva, Philip Koether, Isaac Campbell, Michael Green, Julann Meyers, Philip Nelson, David Toti, Jennifer Carpenter, Sunny Evangelista Carroll, Alison Horne, Yann Poisson, Bernard Proeschl, Jeanne Smith, Lisa Winklemann, James Winkler, Dewitt Zuse, designers; Jeffrey Paine, AIA, garage design project manager; Axel Zemborain, design team leader*

Architect of Record: *Leo A. Daly*

Associate Architect: *Pierce Goodwin*

Alexander & Linville (new terminal); Sulton Campbell Britt & Owens (south terminal rehabilitation)

Engineers: *Parsons Management Consultants (project management); CBM Engineers; (structural) Urban Engineering (civil); Syska & Hennessy (mechanical/electrical)*

Consultants: *Balmori Associates (landscape); Horton•Lees Lighting Design (lighting); A. Morton Thomas & Associates (surveying); Apple Designs (graphics); Siemens Nixdorf (airline systems); Project for Public Places (signage); Coffeen Fricke & Associates (acoustics); Breier Neidle Patrone (baggage handling); Gage Babcock & Associates (life safety); Hanscomb Associates (cost estimating)*

General Contractor: *Morganti McGaughan & Dick Enterprises*

version of the original airport, with a huge curving glass wall that would overlook the Potomac. The second scheme was a large shed, a variation on Pelli's entry for the Kansai airport competition, in Osaka, Japan, with the concourse split into two parts connected by the Metro. The third scheme was to divide the concourse using a series of small modular structural bays and to fill the hall with colors.

"In doing the three schemes," Pelli says, "I started to realize that I could combine their best ideas into a fourth scheme." This scheme had the large windows facing the Potomac, but the concourse was not curved in plan; it had the modular structural system, but the modules became much larger—45 by 45 ft—and were combined with a split level, also used in the existing terminal (Terminal A in plan). The columns rested at the edge of the split level, and the pedestrian walkways were unobstructed. This is the scheme that the board of directors finally selected.

"That scheme was a distillation of thoughts," says Pelli. "By the time we presented it, we had been working three years. It was a full understanding of the problem, which is the way I like to work. I like to make myself one with the problem, and the problem grows from me as if it was growing from the site. I don't believe that I have the right to impose forms on a place, but if one understands the forces inherent there, they can bloom beautifully."

The layout of the airport addition is simplicity itself. The footprint is in the shape of a capital E, with the terminal forming the vertical stroke of the letter and the three piers forming the horizontal strokes. At the bottom of the E's vertical stroke, a concourse connects the new terminal with the existing terminal, which is undergoing renovation.

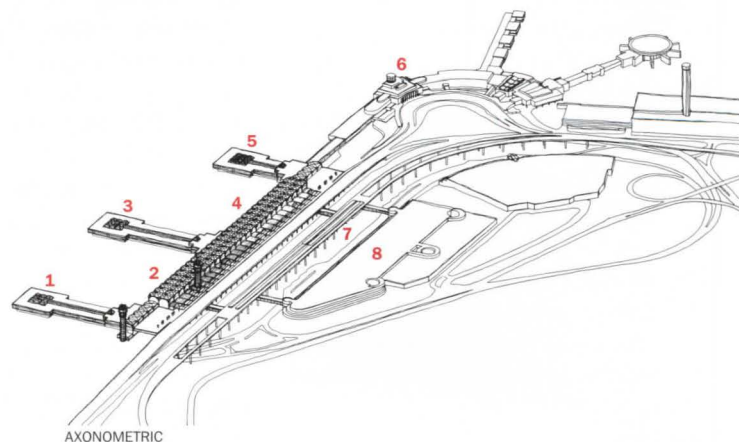
Drivers may arrive from the Washington metropolitan area via several different highways, and either park their cars or drop passengers off at curbside. Other passengers arrive on the Metro and cross to the terminal on a pedestrian bridge. Once inside, on the third level, passengers who need tickets proceed to the ticket counters.

The ticket counters are located inside the terminal's curbside wall, rather than as islands in the middle of the terminal, providing a magnificent view of the planes and the river beyond. "We made a huge effort to accomplish this," says Pelli, "because most airports have no views to the outside. This resulted in a disagreement with the airlines, because they want you to see their names behind the ticket counters as soon as you enter." Pelli and Feil took on the airlines in order to preserve the building's architectural concept. "Now when you come in," says Feil, "you have a stunning view of Washington and the Potomac." Only when passengers turn around do they see the ticket counters.

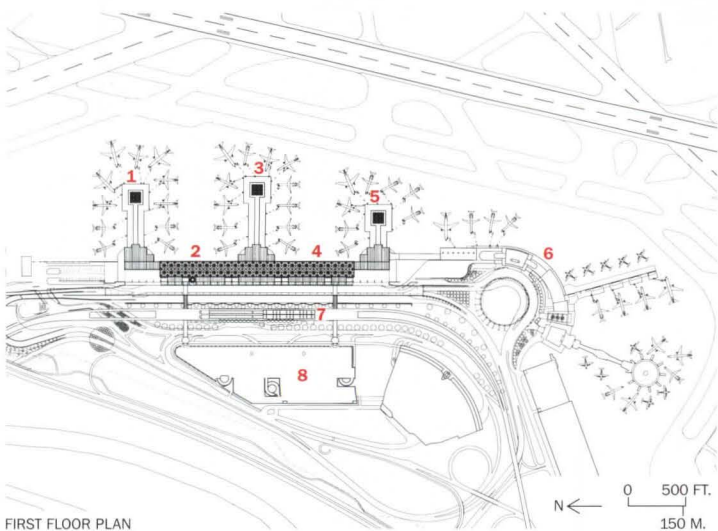
From the third level, which overlooks the concourse level, passengers use one of 32 elevators or 26 escalators to descend to the concourse, through security, and to the gates.

The ticketing and concourse levels are covered by modular cross vaults constructed of steel and painted bright yellow. Each vault is enclosed by a stainless-steel roof and topped by an 18-ft-diameter oculus. The arched segments that connect to form the vaults are trusses with curved top and bottom chords, and they create the effect of two side-by-side allées of trees forming a tall canopy over the travelers. The steel structure was built of standard sections and plates, welded together for economy and to speed construction. "There was nothing custom-made about it," says Pelli. "It's just the way it came from the shop. It's a very straightforward approach. If you can achieve similar facades with less money and less effort, there is a greater level of pleasure which is not aesthetic in itself but contributes to the level of the building's aesthetics.

The 45-by-45-ft structural vaults and the one-and-a-half-acre glass curtain wall that encloses the east side of the *(text continues)*

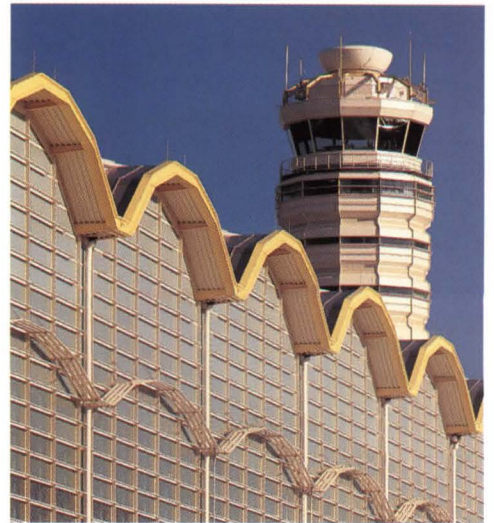


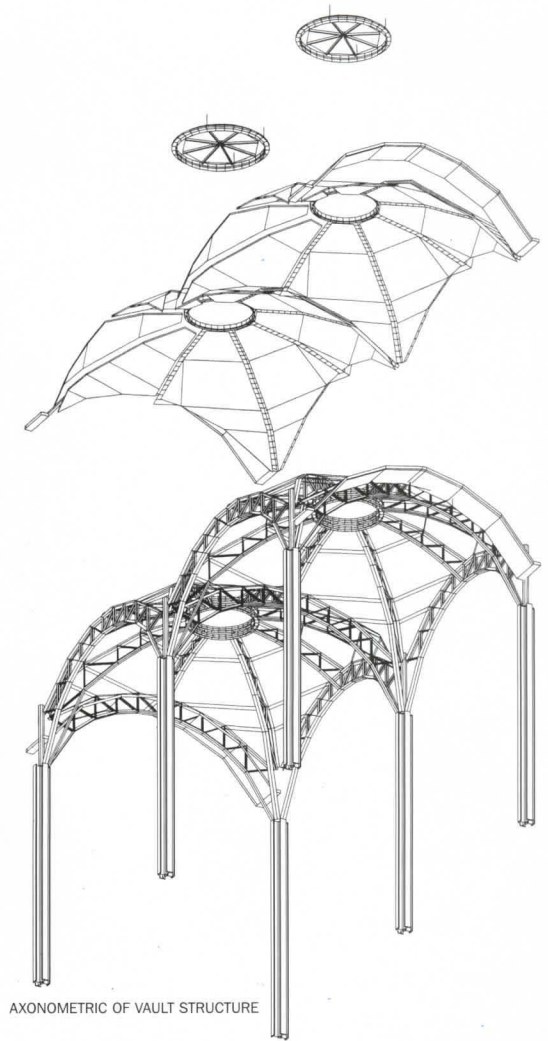
One of architect Cesar Pelli's challenges was accommodating Metro rail and automobile traffic. About 60 percent of passengers flying from the airport are dropped off at the curb.



FIRST FLOOR PLAN

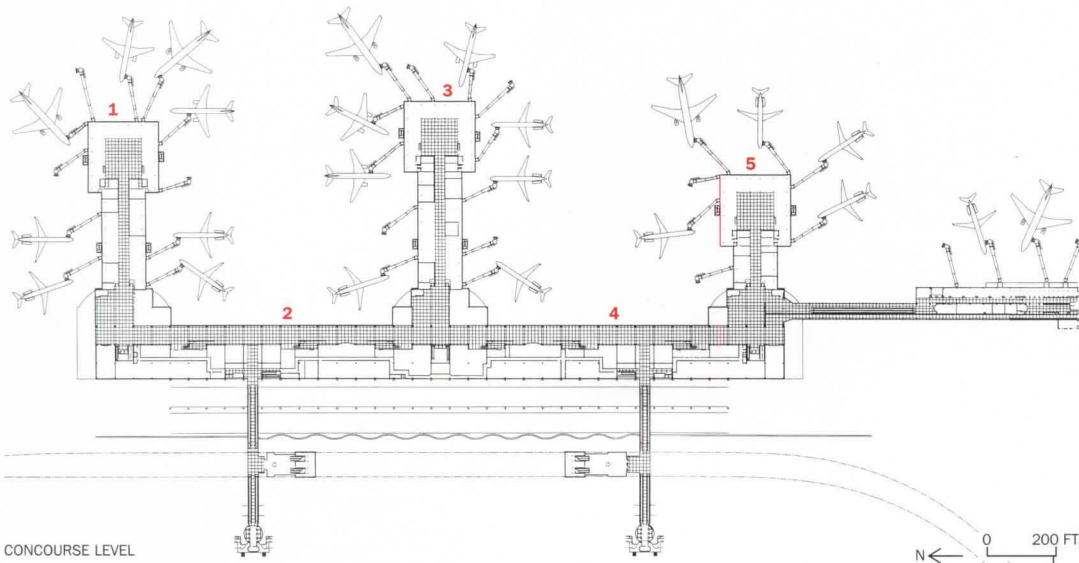
1. North pier
2. Terminal C
3. Center pier
4. Terminal B
5. South pier
6. Terminal A
(original terminal)
7. Metro station
8. Parking garage





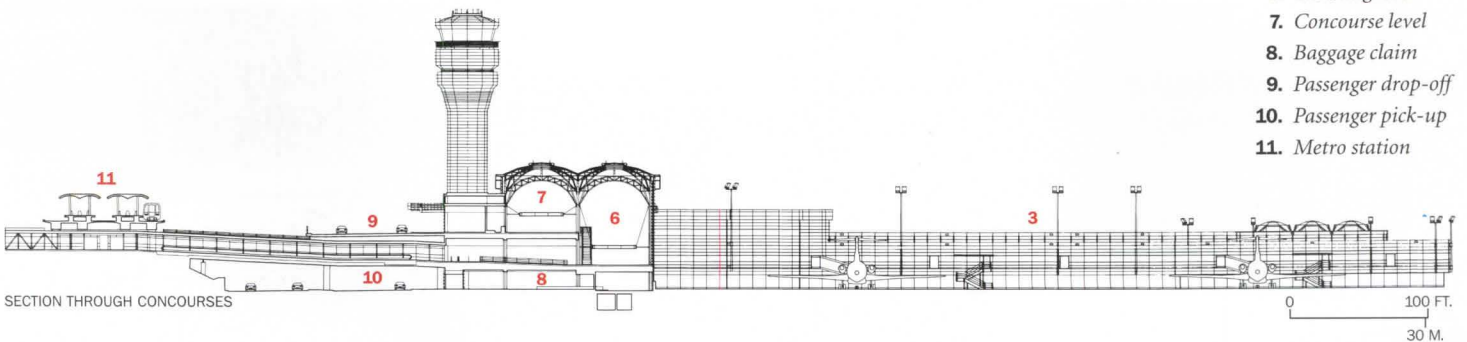
AXONOMETRIC OF VAULT STRUCTURE

The vaulted structure that covers the ticketing and concourse levels is built of standard steel sections and plates. Prefabricated, each module took about three hours to erect.



CONCOURSE LEVEL

0 200 FT.



SECTION THROUGH CONCOURSES

0 100 FT.
30 M.

1. North pier
2. Concourse, Terminal C
3. Center pier
4. Concourse, Terminal B
5. South pier
6. Ticketing level
7. Concourse level
8. Baggage claim
9. Passenger drop-off
10. Passenger pick-up
11. Metro station





William Jacklin's mural (left) is hung in the Metro bridge well. Medallions by Michele Oka Doner (below left), Valerie Jaudon (below right), and Joyce Scott (bottom) appear on the concourse floor.

The architectural enhancement program at National Airport's new terminal includes the work of 30 nationally known contemporary artists, whose designs have been presented as mosaics, paintings, bronze and terrazzo, hammered metal, and art glass. From the very beginning, the work of these artists was planned as an integral part of the architecture of the terminal. This is a reflection of Cesar Pelli's belief that art and architecture are allied arts, and that to decorate a building with art once it has been completed is to continue a traditional split between artists and architects.

"With all of the negative publicity surrounding publicly funded art in recent years, there would be no worse place for an arts program to go wrong than in a public building here in Washington, D.C.," says Dan Feil, the Metropolitan Washington Airports Authority's terminal design

project manager. To avoid problems, he and Pelli took extraordinary precautions in creating National Airport's arts program and in distinguishing it from other public arts programs.

First, the program was named the "architectural enhancement program" so there would be no confusion with the "one percent for art" programs commonly associated with public projects. The architectural enhancements were funded through the construction budget, and Pelli's office assumed all responsibility for selecting and supervising the artists and seeing that they fulfilled their contracts.

Feil researched arts programs to see why they had run into problems in the past. Often, artists did not have the technical expertise to execute their work in the required medium or to furnish work that would withstand the rigors of public

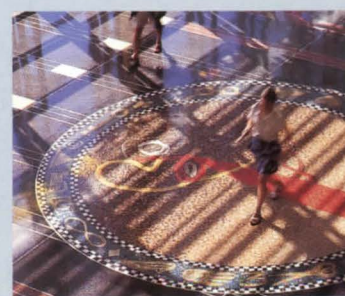


display. Sometimes artists could not keep their designs within budget.

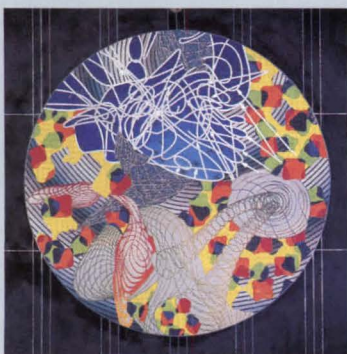
To avoid this situation at National, artists working in media unfamiliar to them were teamed with artisan collaborators who were used to dealing with architectural materials. This ensured that the work would be done on budget, that it could be cleaned, that it would be durable and safe, and that it could be installed by a subcontractor.

The artists were paid in two stages: when the concept was presented, and when the finished design was presented. "This avoided the problem of having Stalin's head suddenly showing up somewhere," says Pelli, laughing.

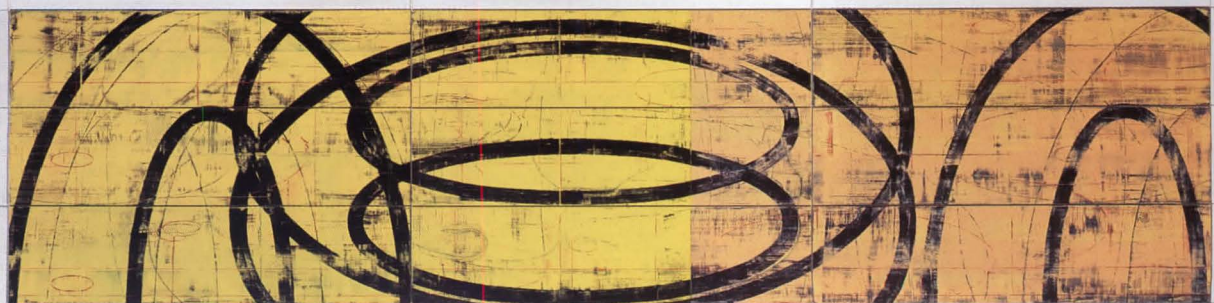
Feil and Pelli are often asked why they did not use a committee to select the artists. "Many artists are uncomfortable with selection committees," Feil responds. "They see them as unwilling to choose



anything but 'safe' art. Pelli was able to get some of the best artists in the country because they knew he would accept art that wasn't necessarily 'safe.' Pelli didn't intend that every piece of art would be liked by everybody. But in years to come National Airport's architectural enhancement program will serve as a time capsule of the state of contemporary American art in the mid-1990s, just as public art produced for Rockefeller Center captured the state of painting and sculpture in the 1930s.



Floor medallions by Frank Stella (above left) and Joyce Kozloff (above right) are installed with eight other medallions on the concourse level. A mural by David Row (right) hangs in the Metro bridge well.



concourse are the primary elements of Pelli's attempt to establish a sense of scale and orientation for passengers. There is no mistaking where the planes are: they are beyond the glass. "I was trying in my design to answer questions that I have had about many airports. For example, why must there be disorientation of the passengers? In many airports when you leave the plane, you go left, right, left again. After a short while you don't know where you are. That adds to anxiety and unpleasant feelings."

Pelli has also attempted to raise travelers' spirits by using bright yellow paint on the structural system, brushed stainless steel on the roof and trim, and extensive daylighting throughout the building. The airport's architectural enhancement program (see sidebar, opposite) provides an array of captivating mosaics on the concourse floors, as well as art-glass friezes, paintings, and sculpture. "I find most airports are painted gray," Pelli says. "They may be very nicely composed shades of gray, but they are all gray. Even though they may be airy, they lack warmth. I asked, 'How can one make something that will be airy and lovely and heartwarming?' Then this color scheme fell into place very quickly."

National Airport's main concourse includes 38 stores and 22 restaurants, leading some critics to say that the building is more like a shopping mall than an airport. But Feil argues that retail brings excitement and energy into the terminal. "Why should it be pure architectural form and nothing else?" he says. Design control zones prevent overzealous retailers from projecting signage and displays into the concourse. Several retailers that have never had a store in an airport before—including Victoria's Secret, National Geographic, and Waldenbooks—were impressed enough to lease space here. Other critics have said that the Airports Authority went overboard in leasing retail space in order to make the airport pay for itself quickly. Feil says, however, that retail provides only 5 to 10 percent of the airport's income (landing fees provide approximately 72 percent). "The retail is really there to add to the travelers' convenience," he adds.

And passenger convenience was, after all, the foundation of Pelli's mandate at National. It is also a fact that the Airports Authority did not stop with the building in accommodating users. Other services and features—such as two customer service centers equipped with ATMs, faxes, copiers, computer printers, and other business-travel amenities; two staffed information counters; improved accessibility for disabled users; and a well thought-out system of informational video monitors and signage—greatly enhance the airport. This focus on convenience can diminish the anxieties of travel to a point where the colors, public art, and views of the Potomac at National Airport may make the often excruciating work of air travel enjoyable. ■

Manufacturers' Sources

Metal curtain wall: Harmon Contract, Midwest Curtainwalls

Insulated and decorative glazing: Viricon

Stainless-steel roofing: Overly

Skylights: Metoe

Stainless-steel doors: Stanley

Acoustical tile: Armstrong

Perforated-metal acoustical panels: Environmental Interiors

Exposed steel: Ameron

Steel frame: Cives Steel Co.

Terrazzo tile: Wausau Tile

Carpet: Prince Street Technologies

High-impact wall panels: C/S Group (Acrovyn)

Metal panels in concourse: Custom Enclosures, Baker Metals

Epoxy-based terrazzo: David Allen

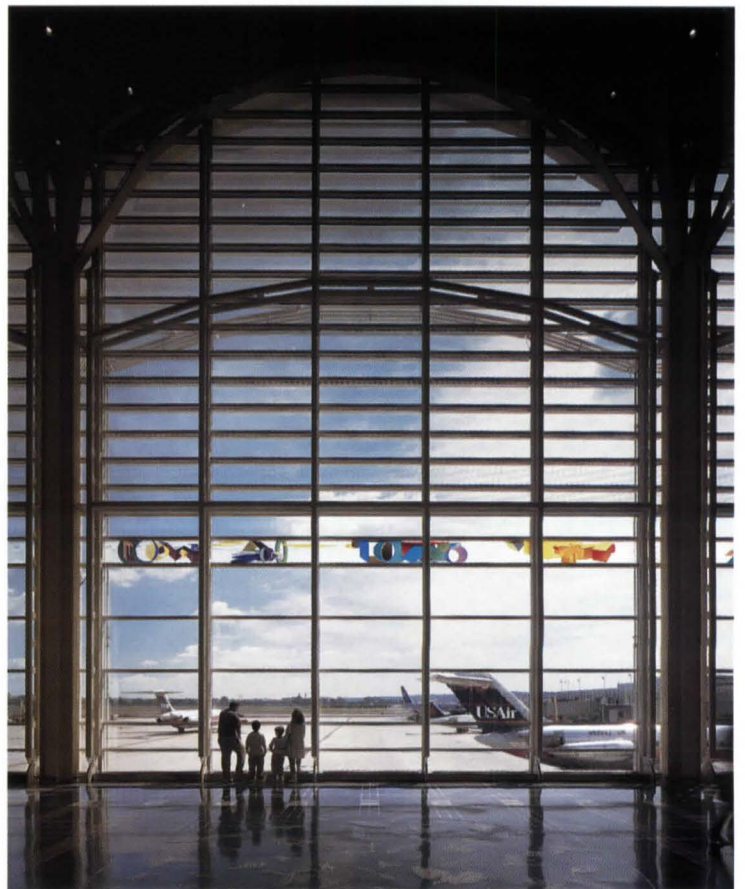
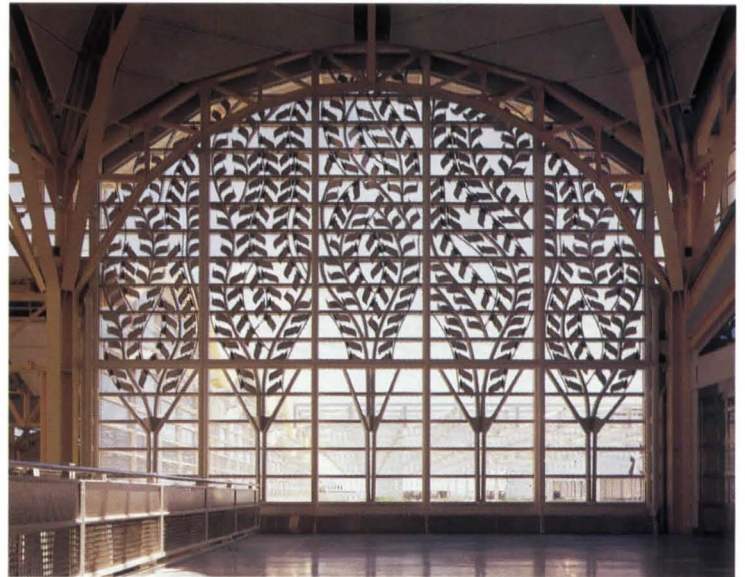
Elevators, escalators: Schindler

Contract furniture: Herman Miller, Knoll, Johnson, Tables & Surfaces

Custom lighting: Forum

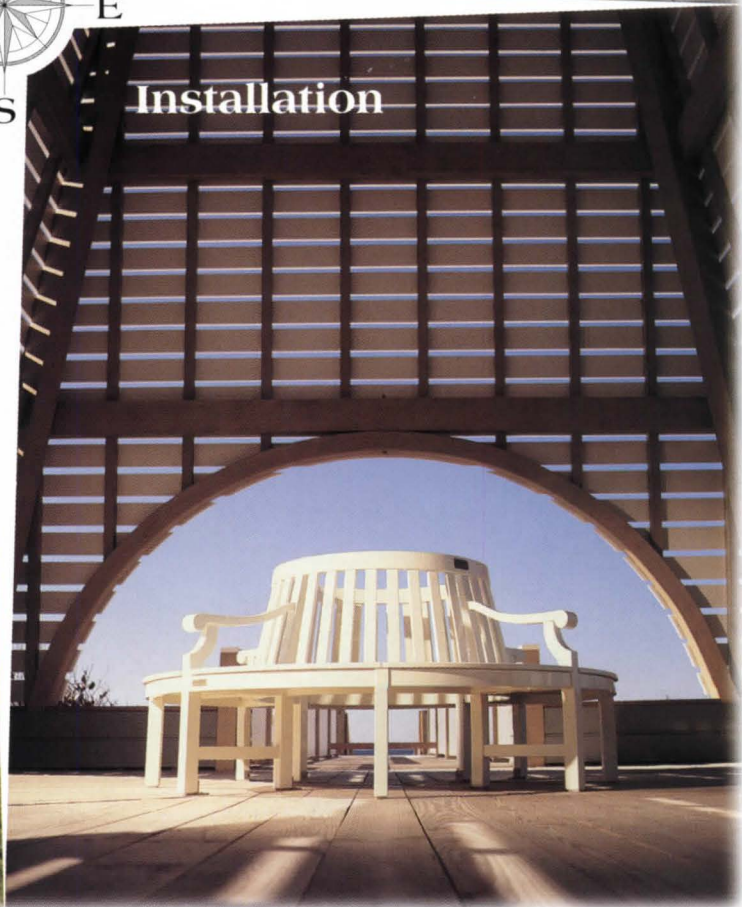
Custom stainless-steel casework: Environmental Interiors

The height of the pier roofs (right) was determined by air-traffic controllers' sightlines. Artwork by Kent Bloomer (below) and Al Held (bottom) are part of the architectural enhancement program.





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SCHOOLS

No Cure-Alls for K-12

WILL PRIVATIZATION, COMMUNITY FOCUS, OR NEW TECHNOLOGY FIX OUR SCHOOLS?

PROBABLY NOT, SAYS THOMAS FISHER, AT LEAST NOT BY THEMSELVES.

by Thomas Fisher



1

Chicago, Illinois

Designed by Ross Barney + Jankowski, Little Village Academy is a bridge between the Hispanic culture of its students and an Anglo-American society.



2

North Fort Myers, Florida

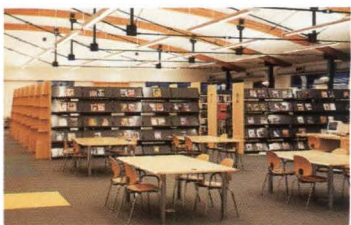
Through addition, subtraction, and renovation, Perkins & Will transformed an existing high school and gave it a focus it never had.



3

Tavernier, Florida

In the Florida Keys, Jersey Devil designed a small Montessori school that stays cool without relying on air-conditioning.



4

San Francisco, California

A master plan and a new library/arts center by Simon Martin-Vegue Winkelstein Moris help a private high school to move into a new era.

We are in the midst of a minor boom in school construction. More than \$12 billion went into the construction of schools in 1996, 16.6 percent more than in 1995, while existing schools need an estimated \$112 billion in repairs. School enrollment will hit a record high of 52.2 million this year and will keep growing until 2007, when it will peak at 54.3 million, according to a U.S. Department of Education report. At the same time, schools themselves are changing. Privatization, computerization, and decentralization are among the more visible trends affecting the design and operation of K-12 facilities.

While these trends have been widely discussed in the architectural literature, the ideologies driving them have not. If anything, the discourse about school design has had a distinctly anti-ideological flavor: much of what gets written focuses on the functional issues of schools, such as the best ways to accommodate technology, achieve flexibility, or provide community access.

An avoidance of ideological discussion also exists among educators. As educational critic Neil Postman writes, "In tracking what people have to say about schooling, I notice that most of the conversation is about means, rarely about ends. . . . It is as if we are a nation of technicians, consumed by our expertise in how something should be done, afraid or incapable of thinking about why."

Functional and technical issues are obviously important. But the architectural community has been blindsided in the past by the utopian ideas of educators, ideas whose physical outcomes, such as open-plan schools or windowless classrooms, have later fallen out of favor. We need to understand these ideas if only to be aware of their limitations.

Three ideologies—three utopian visions that are sometimes presented as cure-alls to the problems of education—have had a direct impact on school design in recent years. Each of these visions has some merit, but when proposed as a panacea, each deserves a critical look.

The Adam Smith approach

The expansion of free markets around the globe has helped give rise to the belief that capitalism can determine all value and solve all social problems. While they do not present themselves as cure-alls, organizations

Thomas Fisher is dean of the College of Architecture and Landscape Architecture at the University of Minnesota. He was executive editor and then editorial director of Progressive Architecture.

such as The Edison Project and Educational Alternatives, which apply private-sector management practices to schools, have been held up by some as the marketplace's answer to public education.

Working mainly in troubled urban schools, these particular organizations have had relatively little impact on the design of schools so far. The Edison Project began with the idea of building new schools, with prototypes to be designed by Venturi Scott Brown & Associates, Frank O. Gehry & Associates, Billes/Manning Architects, and William Rawn Associates, but it and other private ventures have since focused on the efficient operation of existing buildings.

If privatization has had little effect on school design, it also has had little effect on the ways in which public districts look at their schools. "It's surprising," says Bake Baker, AIA, leader of the educational design group at the architectural firm of Hammel Green & Abrahamson, "that more school districts haven't done what companies do: rent high-bay, column-free space for as long as needed. Despite all the talk about privatization, most districts seem determined to build amenity-filled megaschools."

School as marketplace

Educational reform, however, has begun to reflect marketplace models. The "micro-society" concept in education, for instance, creates a simulated marketplace in the schools, where students interact as they would in the larger society to the point where some schools have miniature versions of streets, stores, and banks adjacent to or surrounded by more traditional classrooms. The concept itself seems sensible, a controlled version of John Dewey's belief in learning through experience. But it raises a question about the role we want schools to play in our society. Should schools "educate for the status quo," as Dewey asked, or should they "take an active part in directing social change, and share in the construction of a new social order?"

Architecturally at least, schools have long expressed a difference between education and the marketplace. One-room schoolhouses recalled the noncommercial form of domestic architecture, and early-20th-century urban schools the monumental forms of civic buildings. In recent years, however, schools have increasingly adopted the commercial vernacular of suburban office and light-industrial buildings: one-story, flat-roofed, long-span, nearly windowless structures. The low cost and ease of constructing such buildings helps explain their popularity among cash-strapped school districts. These educational warehouses look more like places of vocational training, though, than places in which the intel-

lect might take flight. The challenge for architects, observes architect William Moore of Roth & Moore, is to "break down the scale and make something memorable even though school districts, wanting efficiency, will scrutinize every decision."

A conceptual sketch by Robert Venturi for The Edison Project shows how a school's identity can be established.

The school as community

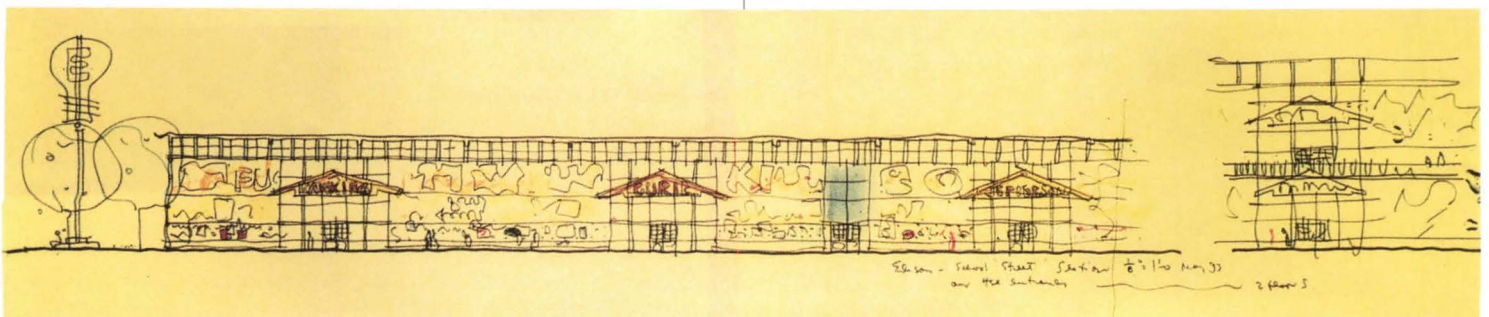
A second ideology driving education is, in many ways, the opposite of the first: it sees community, rather than capitalism, as a cure-all for what ails our schools. While connecting school and community has been a goal at least since the progressive education movement of the early 20th century, the two have become almost indistinguishable since the 1970s, with the community schools movement. That movement sought to bridge the boundaries between school and community. "Community schools," wrote educator Larry Molloy, "do not differentiate between school hours and public hours because the entire building is operated for the benefit of people of all ages in the community."

That notion has obvious appeal—the extension of learning to all people and the conversion of schools to neighborhood centers—but it overlooks the paradoxical nature of community, which must exclude some in order to include others. The Latin root of the word *school* underscores its being both a part of and apart from its surroundings: *schola* means a place for desultory conversation, a loitering place. Community members as well as students, of course, need a place to loiter or recreate, which is why public access especially to school gymnasiums and auditoriums has long been important. (It doesn't hurt, either, in convincing voters to support school levies.) At the same time, schools in impoverished urban areas have become safe havens as daycare centers, clinics, and other social services have begun to find their way there, accessible to both students and the community.

Yet the difficulties of accommodating those functions reveal the conflict in the community ideology. In providing access and community service, schools must also provide a secure place for students, teachers, and their property. Jeffrey Lackney, assistant director of the Johnson Controls Institute for Environmental Quality in Architecture, points to research showing that most districts "want a clear separation between the community and the school with lockable doors." The community they really want in the school, he adds, "are the kids' parents, the cornerstone of improved education." Communities succeed, in other words, by being selective; a completely open community is no community at all.

Understanding that would have saved us other troubles, such as open-plan schools. Widespread in the 1960s and 1970s, these schools sought to provide teachers with flexibility and "to instill in students the quality of independence that we admire in our forefathers," as a 1973 educational report quaintly put it. Beneath those justifications, though, lay the ideal of the singular, harmonious community, carrying on "the tradition of the one-room schoolhouse," according to the same report. The appeal of open-plan schools began to decline in the late 1970s in part because of the noise and disruption their lack of walls created. But these open plans also failed by misjudging the effect that a change of scale can have on a community. A one-room schoolhouse is simply the wrong metaphor for a building containing 1,000 students.

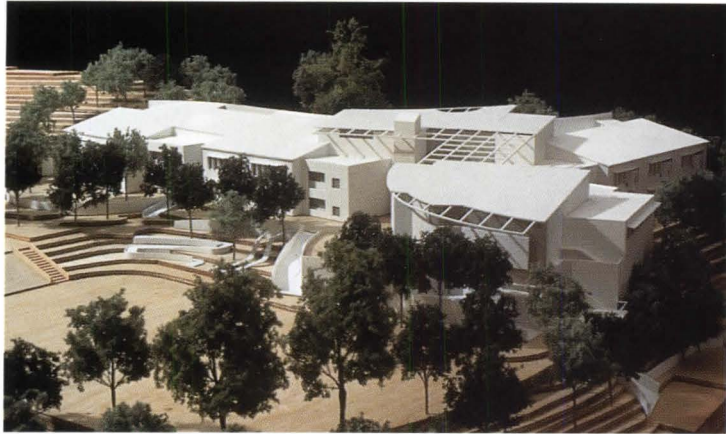
The more appropriate metaphor is that of a town, which school



Cragmont Elementary School in Berkeley, Calif., designed by

ELS/Elbasani & Logan, will have a data network linking computers

in each classroom and administrative area to a central server.



designers in the last few years have interpreted in different ways. Some schools have followed a suburban model, with culs-de-sac of classrooms strung like single-family houses along a corridor and with common facilities—gymnasiums, cafeterias, libraries—functionally separate in an adjacent block. While familiar, this configuration has some of the same drawbacks of the suburbs: increasing the isolation and reducing the interactions among people. Other schools have embraced a more urban form, creating identifiable classroom neighborhoods or “houses” along street-like corridors that have common functions along them or at least at opposite ends. At its most extreme, the metaphor of the urban community has led some architects to create educational hilltowns, with corridors or courtyards of various widths along which stand classroom clusters and common facilities. This new urbanism in schools may revive some of the noise and distraction of the old open plans, but it does create the conditions—a rich texture of public and private space within a bounded perimeter—necessary for students to build a real community.

A brave new world

A third ideology in education sees technology, especially communications technology such as television and computers, as a savior. Contrary to the bounded nature of communities, this ideology recalls the yearning in open-plan schools for doing away with walls, indeed with buildings altogether. As former Assistant Secretary of Education Diane Ravitch enthused, “In this new world of pedagogical plenty, children and adults will be able to dial up a program on their home television to learn whatever they want to know, at their own convenience.”

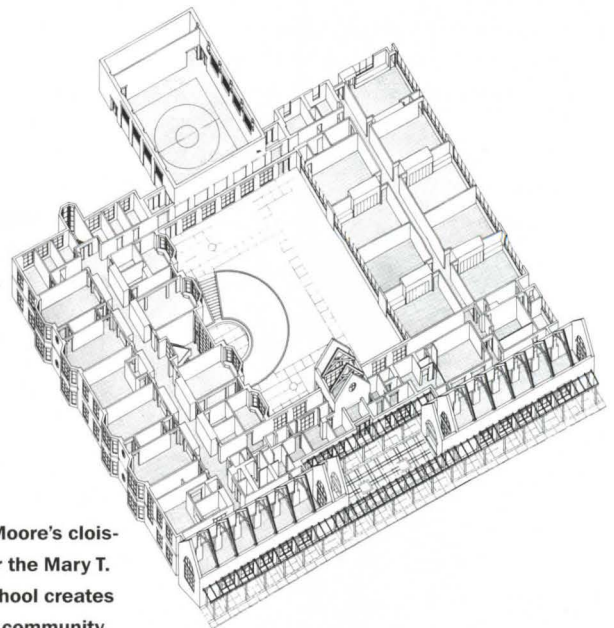
This ideology becomes utopian when it assumes that place doesn't matter, that technology-aided learning can happen anywhere and anytime, ignoring the fundamentally social aspect of education. “Educators,” writes Postman, “must guard against computer technology's undermining some of the important reasons for having the young assemble in school, where social cohesion and responsibility are of preeminent importance.” Social cohesion, of course, doesn't only happen in an 800-sq-ft classroom with desks all directed toward the blackboard. Some highly computerized schools, like their office equivalents, have begun to provide smaller-scale, more conversation-oriented spaces both in the classroom and in common areas. And if, as some argue, the computer will eventually replace the lecture as a way of transferring information, school buildings will take on an even more important role: the place where information is converted through human interaction into knowledge.

If the computer won't replace schools, neither does it provide an appropriate metaphor for them. One school district, for example, has envisioned building new schools with portable classrooms plugged into a small “core” facility like laptops to a server. Students, however, have enough impermanence and portability in their lives, and a growing body of research shows that students do best, especially those from troubled families or impoverished neighborhoods, in smaller-scale, homelike settings, with longer-term relationships with teachers. “In almost all cases,” notes Baker, “test scores go up and behavior improves.”

Those who see communication technology creating a brave new world would do well to consider Modern architecture, which had the same aspirations, only to be rejected by those who it sought to save. The same will undoubtedly happen to technology's true believers until they see the computer, as architects have buildings, as a means to educational ends rather than as an end itself. “Schools still put computers in a shrine,” says Baker, “which is counter to the world students will move into. Until the computer is seen as almost dispensable, it will not be fully a tool.”

It may come to pass, though, that architecture serves as a critical link between the educational community and electronic communications. When students log on to their computers, they leave one space, the school, to enter another, that of Web pages and CD-ROMs. That spatial continuity suggests that the building and the computer ultimately offer the same thing—an educational environment—in different form. Indeed, designing the relationship and interaction between these two types of spaces, the architectural and the virtual, may be one of the greatest challenges facing school architects over the next few decades.

Each of these ideologies promises to improve education, be it through the efficiency of the marketplace, the solidarity of a community, or the efficacy of technology. But when offered as a final solution, a utopia, each position ends up deforming education. “Architects can be real agents of change here,” says Lackney, “because most educators do not think enough about the interactions of the physical environment and learning.” Knowing when to attend to efficiency and when to ignore it, knowing how to create community and what can destroy it, knowing where to use technology and when to avoid it: these are lessons architects have learned, sometimes the hard way. And there is no better place to share that experience than in our schools. ■



Roth and Moore's cloister plan for the Mary T. Murphy School creates a sense of community.

1 Little Village Academy Chicago, Illinois

ROSS BARNEY+JANKOWSKI DESIGNED AN ELEMENTARY SCHOOL WITH A CIVIC PROFILE IN A HISPANIC NEIGHBORHOOD AND ON A TIGHT BUDGET.

by Clifford Pearson

Project: Little Village Academy
Chicago, Illinois
Client: Public Building Commission of Chicago for the Chicago Public Schools
Architect: Ross Barney + Jankowski Architects—Carol Ross Barney, FAIA, principal-in-charge of design; Susan Budinsky, AIA, project manager; Eric Martin, construction observation
Engineers: D'Escoto, Inc. (mechanical/electrical); Salse Engineering Associates (structural)
Contractor: Paul H. Schwendener, Inc.

Project Statistics

Size: 68,000 sq ft
Cost: \$7 million
Cost per sq ft: \$103
Number of students: 688 capacity; 570 in attendance now
Number of teachers and staff: 31/26
Grades: K-8

It would be hard to find a public building that packs more architecture onto a constrained urban site than Little Village Academy in Chicago. With a soaring stair tower slicing through its primary elevation, bold forms articulating key spaces such as the cafeteria and library, and a starburst playground, the three-story, 68,000-sq-ft public school has become a landmark in the Little Village neighborhood since it opened last year. "When politicians visit this district, they always come to our school," states Fredric Arana, the principal of Little Village Academy. "That's not true of other neighborhoods."

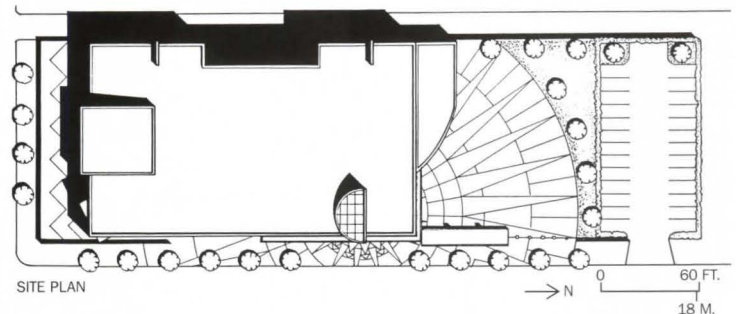
Equally remarkable is that all this architecture costs just \$103 per sq ft, about the same as prototype schools being built in Chicago to save time and money, says Carol Ross Barney, FAIA, the principal-in-charge of design for Ross Barney + Jankowski Architects. Part of a major building program in Chicago that included 14 schools completed at the same time, Little Village stands out for its vibrant design and as an emblem for the mostly immigrant community it serves.

Community roots

Like Cesar Chavez Elementary School, originally called Seward Hedges [RECORD, August 1993, pages 92-95], which Ross Barney + Jankowski also designed, Little Vil-



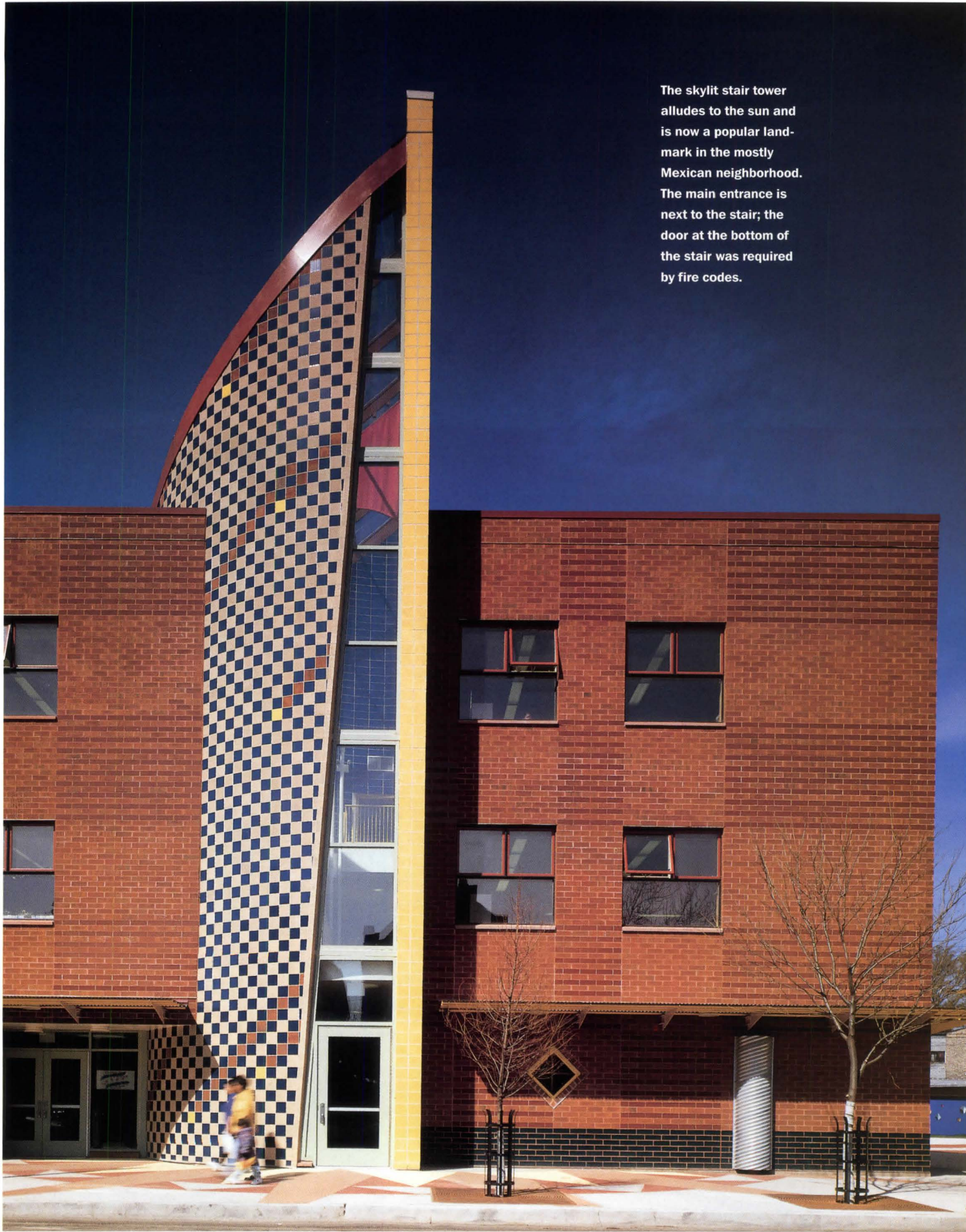
The school occupies most of a 400-by-120-ft lot, with room for a small play area behind a blue and yellow fence on the south (above) and a larger playground on the north (plan below).



lage is in a Hispanic neighborhood where a school is an important symbol of both assimilation and cultural identity. In predesign meetings, community members told the architects they wanted a building that recognized their Mexican heritage.

As she did at Chavez, Ross Barney used strong colors arranged in geometric patterns to recall Latin American design at Little Village.

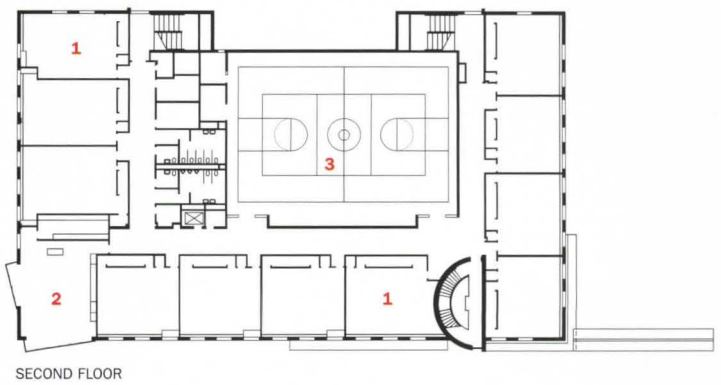
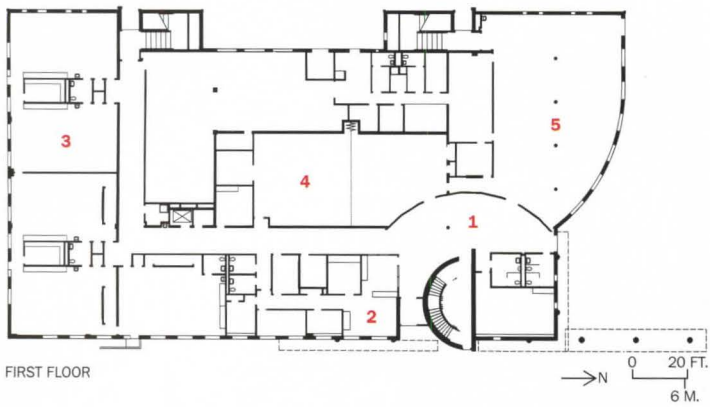
But she also introduced a sun motif that explodes on the surface of the playground and entry lobby and is expressed as a skylit, vertical sundial in the main stairwell. "What could be more Mexican than the sun?" asks the architect. "But at the same time, the dial has to be calibrated to the angle of the sun in the school's particular location, so it ties the project to Chicago." At first,



The skylit stair tower alludes to the sun and is now a popular landmark in the mostly Mexican neighborhood. The main entrance is next to the stair; the door at the bottom of the stair was required by fire codes.

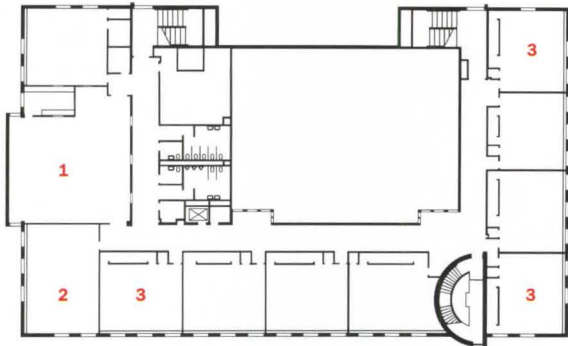
- 1. Lobby
- 2. Offices
- 3. Kindergarten
- 4. Community room
- 5. Cafeteria

- 1. Classroom
- 2. Science
- 3. Gymnasium



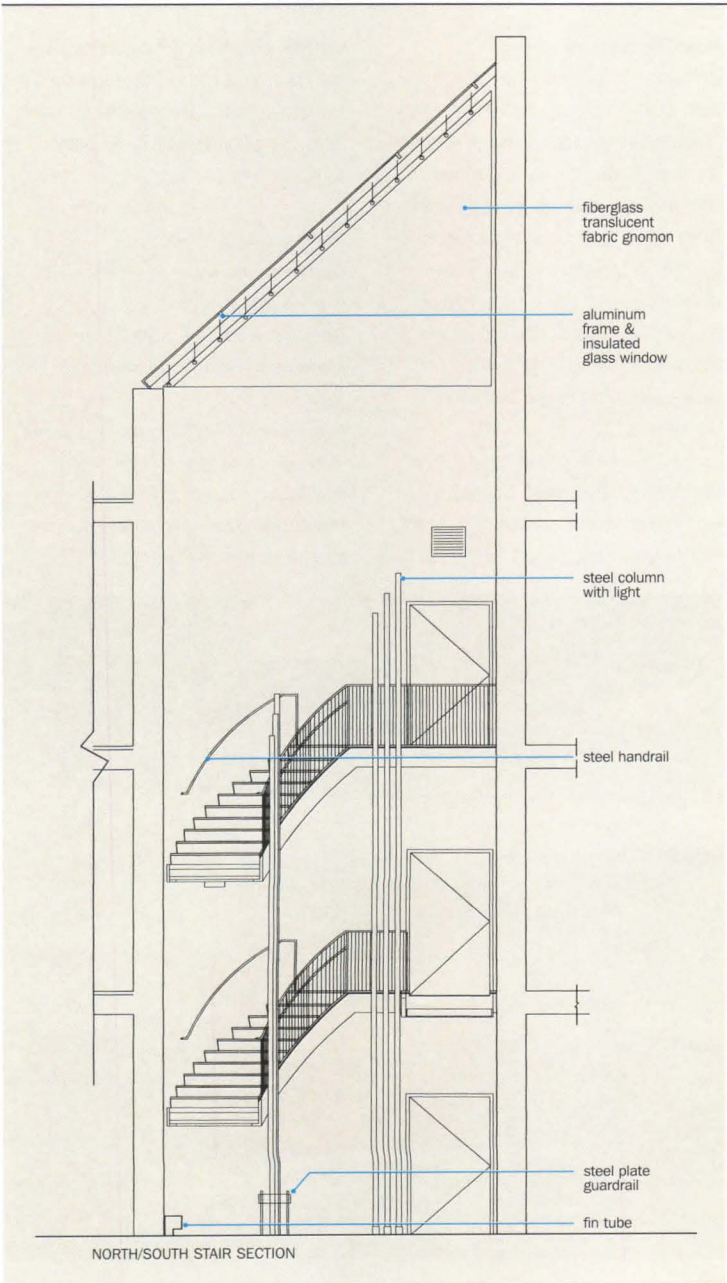
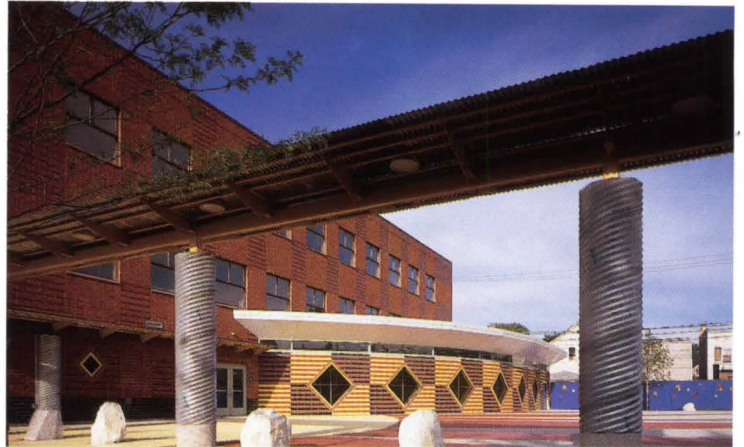
The main playground was designed as an urban plaza, open to views of the street but stamped with its own identity, seen in the sunburst pavement.

1. Library
2. Computer
3. Classroom



THIRD FLOOR

A bus stop and a row of limestone bollards protect the playground from traffic without creating a fortresslike barrier.



Chicago's Public Building Commission, the client for the project, wanted the architects to replicate their award-winning Chavez design in Little Village. "But this is a different neighborhood," explains Ross Barney. Commercial structures lie to the south and east, while residential properties are on the north and west.

Planning strategy

The 400-by-120-ft lot is small for a K-8 school, so the architects brought the building envelope right to the sidewalk on the east and west, leaving room for a large playground on the north and a small play area for kindergarten classes on the south. Since the school fronts on a commercial street, "we designed the main play area as a plaza, rather than a lawn," as had been done at Chavez, says the architect.

Architectural features

Wanting to give the building a civic presence that could be easily read from the street, the architects added a few dramatic elements to a relatively simple building envelope. The most memorable component of this design strategy is a curving three-story stair tower with an angled skylight at the top. The tower has practically become the school's logo and also serves as its social hub. To meet the fire-code require-

ments that have made such grand stairs rare these days, the architects enclosed the stair structure so it has a two-hour fire rating and provided a direct exit outside. Three sets of white steel columns support the stair, which is a less expensive solution than cantilevering it, notes Ross Barney.

Pulled out beyond the building's masonry shell and rising above its flat roof, the third-floor library is a porcelain-and-glass box suspended in the larger structure. Clerestory windows on all four sides and vertical shafts of floor-to-ceiling glass at two corners bring plenty of sunlight into the room without resorting to large expanses of glass. In fact, throughout the school, glazing is used sparingly to reduce construction and energy costs and to limit visual distractions.

On the southeast corner, grids of translucent fiberglass panels allow sunlight into a science room without the glare or heat that might interfere with science experiments. Directly above the science room is a computer lab, whose projecting metal sunshades announce the space on the outside of the building while reducing glare on the inside.

On the ground floor, a curving cafeteria breaks free of the school's masonry box, offering views through diamond-shaped windows to the playground beyond. A narrow band of clerestory windows and a couple



In the main lobby (far left), terrazzo, brick, and corrugated metal are tough but playful. In the cafeteria (left) and the library (below), daylight comes from above, the edges, or diamond windows.

of extra feet of ceiling height add a sense of spaciousness to this room.

Keeping costs down

To free up money in the budget for the project's architectural highlights, Ross Barney + Jankowski designed the base building as a simple rectangular box with a compact floor plan. Using a load-bearing masonry structure rather than a steel frame saved some dollars as well. "Steel-frame construction is a little faster, but we had enough time on this project and decided that saving the money was more important," explains Ross Barney. To dress up the exterior at low cost, the architects combined rough-faced brick with burnished brick and used bold colors such as blue and yellow in strategic locations.

Efficient floor plan

The school's simple rectangular footprint and standardized classrooms make for efficient floor plans. Wrapped around the building's perimeter on three sides (the fourth side is an alley), the 900-sq-ft classrooms can accommodate 30 students each. Kindergarten and preschool classrooms, which are on the first floor, are 1,200 sq ft and have access to play areas directly outside. Other public functions, such as a community meeting room, are also on the first floor.

To break down the experience

of long hallways, the architects used several strategies, including changing ceiling heights and light fixtures at intersections and traffic nodes, and using color and texture to add visual variety. Angled stripes of color, for example, shoot along some hallway walls. Corridors are all interior spaces, but sunlight seeps in from the main stair hall and from windows at two ends.

Color and materials

Ross Barney employed splashes of color to enliven the school's interior surfaces, most of which are neutral yellows and off-whites. For example, checkerboards of glazed colored tiles adorn the hallway side of the curved staircase wall and an irregular pattern of colored, glazed, and rough-faced blocks brightens the hallway wall of the gymnasium.

To create a sense of progression from lower grades to upper ones, Ross Barney + Jankowski varied the colors used for trim and elements such as chalkboards and bulletin boards—moving from primary colors on the ground floor to more "adult" colors above. Because the wall of the gym is long, the architects studded it with a few glass blocks and put windows at the two ends so people in the hallway could see inside. On the third story, these windows, affectionately referred to as "skyboxes," offer views down to the gym floor below.

Reaction from users

Principal Arana, who had been the assistant principal at Chavez, says, "I think Little Academy is even better than Chavez. We had more money here and we learned a lot from the first school. As a result, I think this building is more conducive to learning." Arana is also pleased with what he has heard from people in the community. "They tell me it looks Mexican," he says.

One of the challenges for the architects, says Ross Barney, was giving the school a Mexican feeling without making it look foreign to its

surroundings. By using local brick and echoing the massing of nearby buildings, Ross Barney made sure that the school "still looked like Chicago." ■

Manufacturers' Sources

Glazed masonry unit: *Trenwyth*

Glazed brick: *Elgin Butler*

Aluminum curtain wall: *Pittco*

Aluminum-clad wood windows: *Weathershield*

Translucent glazing panels: *Kalwall*

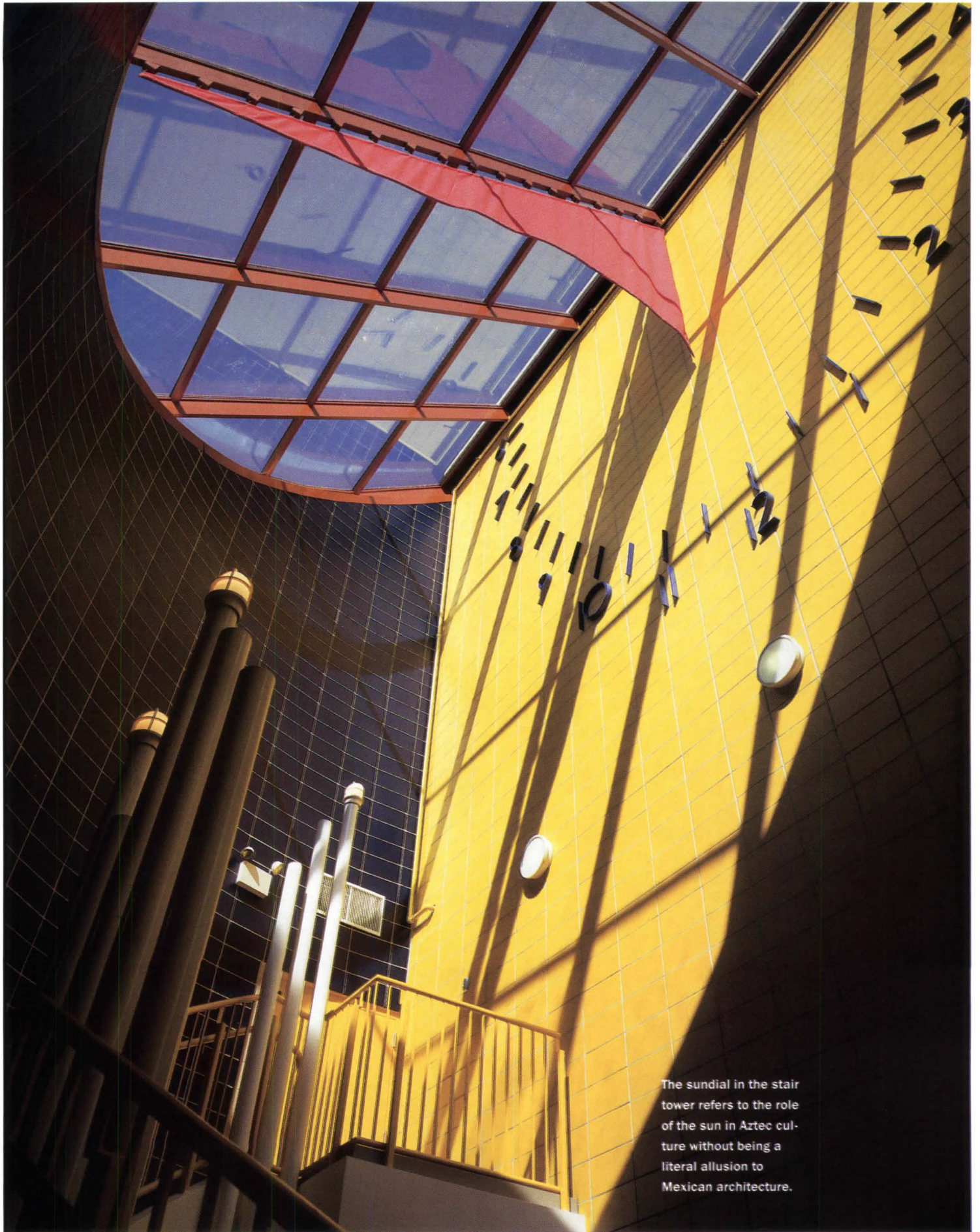
Wire-glass windows: *Pilkington*

Skylights: *Mirage Skylights*

Insulated glazing panels: *Robertson*

Unglazed mosaic tiles: *Dal-Tile*





The sundial in the stair tower refers to the role of the sun in Aztec culture without being a literal allusion to Mexican architecture.

2 North Fort Myers High School North Fort Myers, Florida

BY ADDING SOME MAJOR NEW BUILDINGS AND RENOVATING OTHERS, PERKINS & WILL TRANSFORMS A SCHOOL THAT GREW OVER THREE DECADES.

by Beth Dunlop

Project: North Fort Myers High School
North Fort Myers, Florida

Client: School District of Lee County,
Florida

Design Architect: Perkins & Will—
Ralph Johnson, FAIA, design principal;
C. William Brubaker, FAIA, managing
principal; Jerry Johnson, AIA, senior
designer; Jim Woods, AIA, project
manager

Architect of Record:
Parker/Mudgett/Smith Architects—
Wiley Parker, AIA, principal-in-charge;
John A. Hendry, project manager

Engineers: Butler Engineering (civil);
Jenkins & Charland (structural); Til-
den Lobnitz and Cooper (mechanical/
electrical)

Consultant: Burner & Company
(landscape)

Construction Manager: Brown & Root
Building Co.

Project Statistics

Size: 183,000 sq ft (includes 137,000
sq ft of new construction, 33,000 sq ft
of renovated space, and 13,000 sq ft of
unchanged space)

Cost: \$18 million (includes site devel-
opment, \$14 million construction, and
fixed equipment)

Cost per sq ft: \$98

Number of students: 1,600

Number of teachers and staff: 91/43

Grades in school: 9–12

Many new high schools—especially those in urban areas—tend to take on a fortresslike appearance. Security becomes a dominant factor, and the academic buildings end up behind high walls. At North Fort Myers High School on Florida's Gulf Coast, the effect is the opposite. Though the project's courtyards are gated and can be closed at night, the school is essentially open. For Perkins & Will, the country's most prolific school-design firm, this is fundamental. "If you treat students as prisoners, they act as prisoners," says design principal Ralph Johnson, FAIA. "You've got to give them a sense of dignity and pride in their environment."

Existing conditions

For this project, Perkins & Will did not start with a clean slate. On the site were school buildings from the 1950s, 1960s, and 1970s, a collection of disparate styles and structures. The architects were asked to use what they could, create a fully up-to-date facility, and plan it so that construction would not interrupt the operation of the school, which is a specialty, or magnet, high school focusing on mathematics, science, and environmental studies in this fast-growing city.

Beth Dunlop is a contributing editor of RECORD and was the architecture critic of the Miami Herald for 15 years.

Design strategy

"We wanted to give the place a heart," says Johnson, who worked on the project along with managing principal C. William Brubaker, FAIA, as he has done on many schools over the past two decades. "It didn't really have a central space, a gath-

ering space. We wanted to add some spatial hierarchy, add some symbolic qualities."

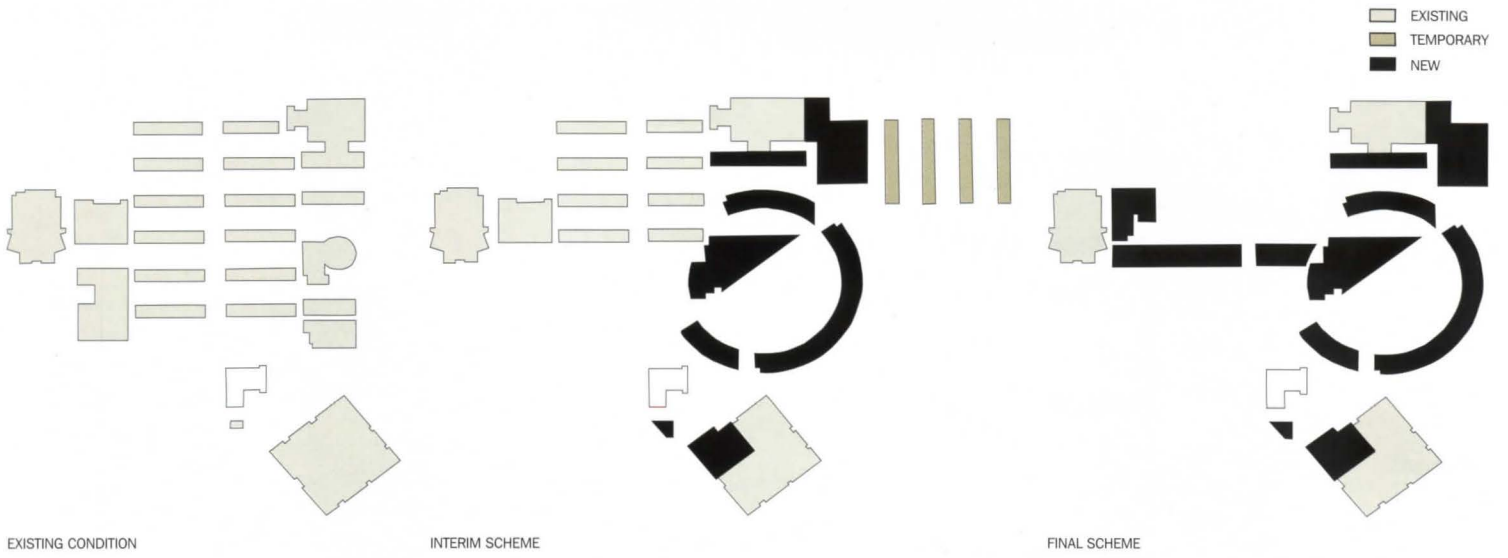
Planning strategy

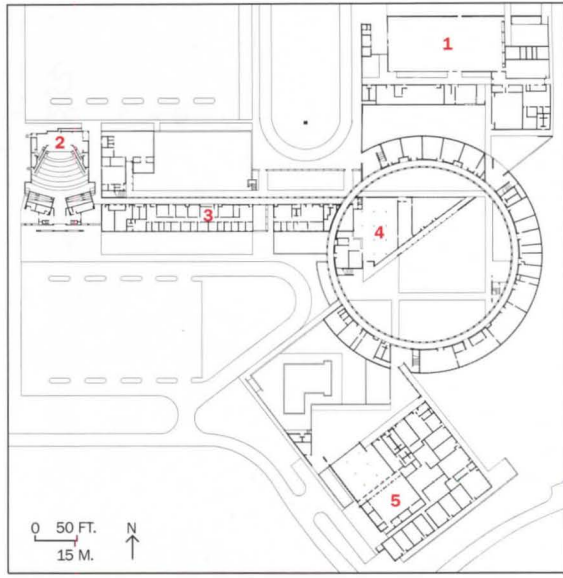
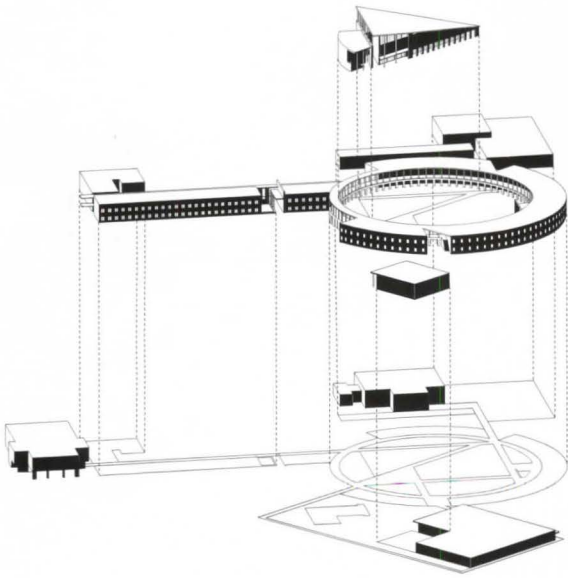
Existing buildings still in good condition were to be kept, while others were to be demolished. For exam-



Although the campus is gated for security, the architects established a vocabulary of breezeways, covered walkways, and slender columns that presents the image of openness (above and left).

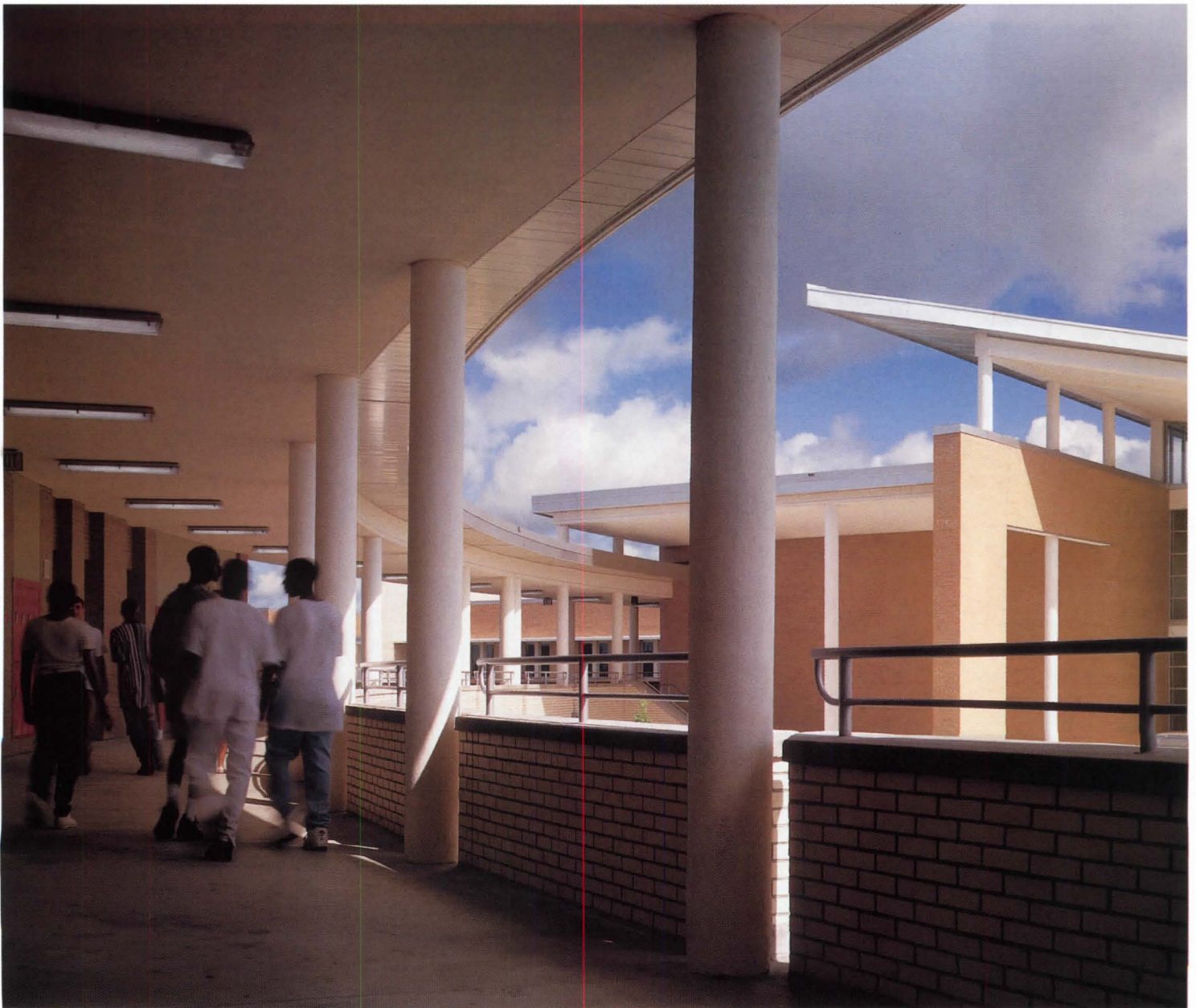
New buildings define a large circular courtyard that gives the sprawling high school a focal point that it lacked before (plans and photo opposite).

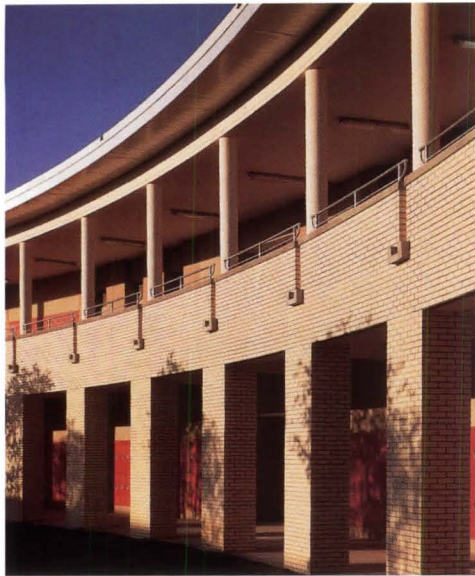




1. Gym (existing)
2. Auditorium (existing)
3. Sciences (existing)
4. Media center (new)
5. Classrooms (new)

A new media center (right in photo below) is housed in a triangular-shaped, sloped-roofed building surrounded by a two-story circular classroom building.





Covered corridors on the classroom building (far left) reduce energy-consuming air-conditioned space. Overhanging eaves on the media center (left) protect the interior (below) from direct sun.

ple, the auditorium, built less than 20 years before, “was in reasonably good shape,” Johnson says, but the gym—from the 1950s—was not. Furthermore, the parts of the school that could be saved were scattered across the campus, all of which posed logistical as well as architectural difficulties.

To solve this tricky set of problems, Perkins & Will chose “a simple composition that would have some power and pull everything together again,” explains Johnson. The idea was to use a “collage strategy,” superimposing new spaces and buildings onto the existing plan. The buildings became means to an end, “like arms stretching out to pull the pieces together again.”

From those ideas came the simple geometry of the new buildings: basically a bar and a circle. The new media center is housed within the circular classroom building, cutting the courtyard at an angle. The media center is considered the academic heart of the school—it houses a library, computer classrooms, and a radio/television laboratory—while the courtyard is the social and cultural center of the complex. The angle of the media building not only gives the courtyard a distinctive shape but also ties the new buildings in with the old. An existing building was already set askew on the site.

The gym was renovated and expanded. One older classroom building was renovated to include a new cafeteria and art studios.

Materials

The client, the Lee County school district, asked for brick, which is not a typical tropical cladding but is used as trim for the school’s existing stucco buildings. Perkins & Will chose to use several hues of brick—beige, buff, and terra cotta.

Environmental concerns

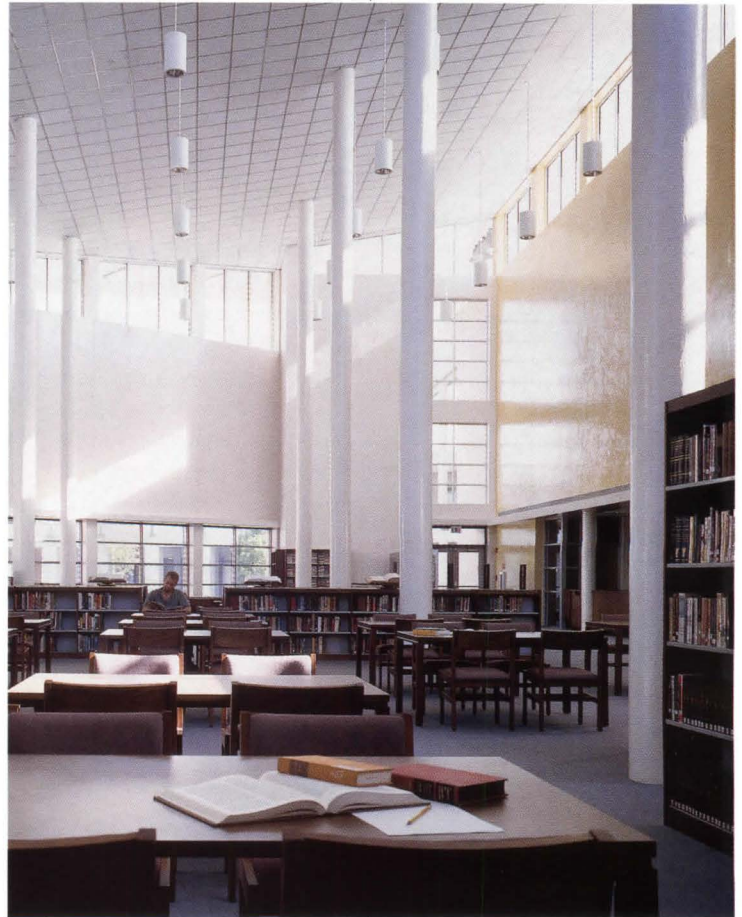
The school takes good advantage of the generally amenable Florida weather. All circulation is out-of-doors: covered walkways connect classroom buildings, and public spaces are either courtyards or covered walkways. The covered walkways have the added advantage of letting natural light into the classrooms but shielding students from the sometimes fierce sun. The metal-roofed media center building has a row of clerestory windows that infuse it with light.

Though the school’s classrooms and laboratories are conventional—designed to meet the Florida Department of Education standards—there are some unusual aspects to the school design that are intended to reinforce the environmental studies program. There is a preserved wetlands area adjacent to the parking

lot that serves as both a study area and a reminder of the swamplands that once dominated southern Florida. The school also has an environmental science yard and an experimental garden for explorations of native plants, xeriscape (desert landscape), and other ecological studies. ■

Manufacturers’ Sources

- Built-up roofing:** Johns Manville
- Standing-seam Galvalume roofing:** Berridge
- Acoustical ceilings:** Armstrong
- Casework:** American Laminates
- Plastic laminate:** Wilson Art
- Ceramic tile:** Dal-Tile
- Resilient flooring:** Kentile



3

Montessori Island School Tavernier, Florida

JERSEY DEVIL SURFACES IN THE FLORIDA KEYS TO DESIGN A SMALL SCHOOL THAT RELIES ON NATURAL VENTILATION AND SHADING TO STAY COOL.

by Beth Dunlop

Project: *Montessori Island School
Tavernier, Florida*

Client: *Noseeum, Inc./Montessori
Island School, Inc.*

Architect: *Jersey Devil—Jim Adamson,
Steve Badanes, partners-in-charge and
project designers*

Architect of Record: *Taxis
Architects—Brad Schiffer, partner*

Engineer: *Lenny Fonticciellia
(structural)*

Consultant: *Anita Jorgensen (lighting)*

General Contractor: *C+E
Construction*

Project Statistics

Size: *8,500 sq ft, including covered
outdoor space*

Number of students: *120*

**Number of teachers and administra-
tors:** *8/1*

Grades included: *ungraded
Montessori school for ages 2 to 9*

Though the Florida Keys have long attracted iconoclasts, they have never been known as a place for progressive education. Thus, the brightly colored new Montessori Island School stands out in several ways. For one, it is the first institutional building for the nomadic design-build firm of Jersey Devil, which has earned its reputation and renown for handmade houses and public art installations. For another, this school in the tiny, historic town of Tavernier may be the first Florida school built without air-conditioning in well over three decades.

Environmental goals

“It has a vernacular design that is environmentally responsible and sensitive to the needs of the kids,” says Jersey Devil partner Steve Badanes. “The school is passively cooled and naturally lighted.” To achieve its environmental goals, Jersey Devil used radiant barriers in the external walls, a vented roof, and vented eaves. Time-tested techniques, such as facing the building toward the prevailing southeastern trade winds and placing more windows to windward than leeward, also came into play here.

History with the clients

The clients for the school, Ron Levy and Beth Kamenstein, had worked with Jersey Devil before—on their own house in the Keys. Because

Jersey Devil partners Badanes and Jim Adamson generally live on site and build their projects by hand, Levy and Kamenstein knew the partners in the firm quite well.

Educational program

Levy and Kamenstein, who have two small children of their own, learned about the Montessori method of education from a friend who oper-

ated some of these schools in California. Developed in Switzerland by Maria Montessori in the early years of this century, the method tries to encourage the creativity and individual talents of young children.

In a Montessori school, children are not grouped by age the way they might be in a typical school; at the Island School, 2-to-5-year-olds are in the same

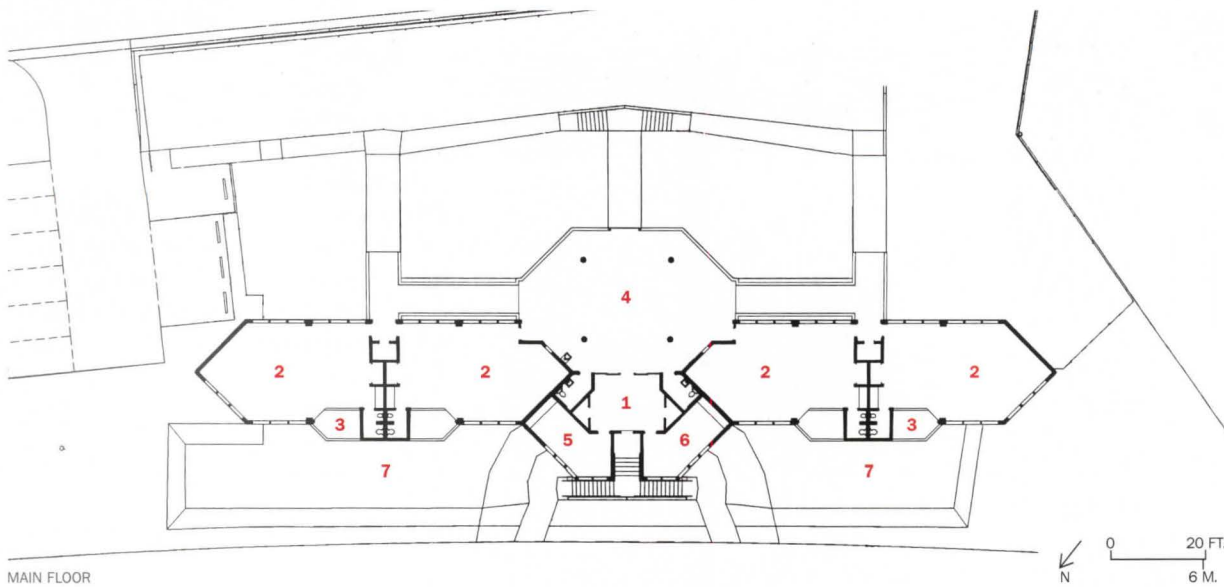




Rather than being air-conditioned, the school relies on natural ventilation and sun shading. The front of the school (opposite top) faces north and includes small screened porches off each classroom. The south elevation (oppo-

site bottom and this page) has canvas awnings to shade windows. A second phase of construction will include another building to the south that will create a thermal wind chimney and eliminate the need for the current awnings.





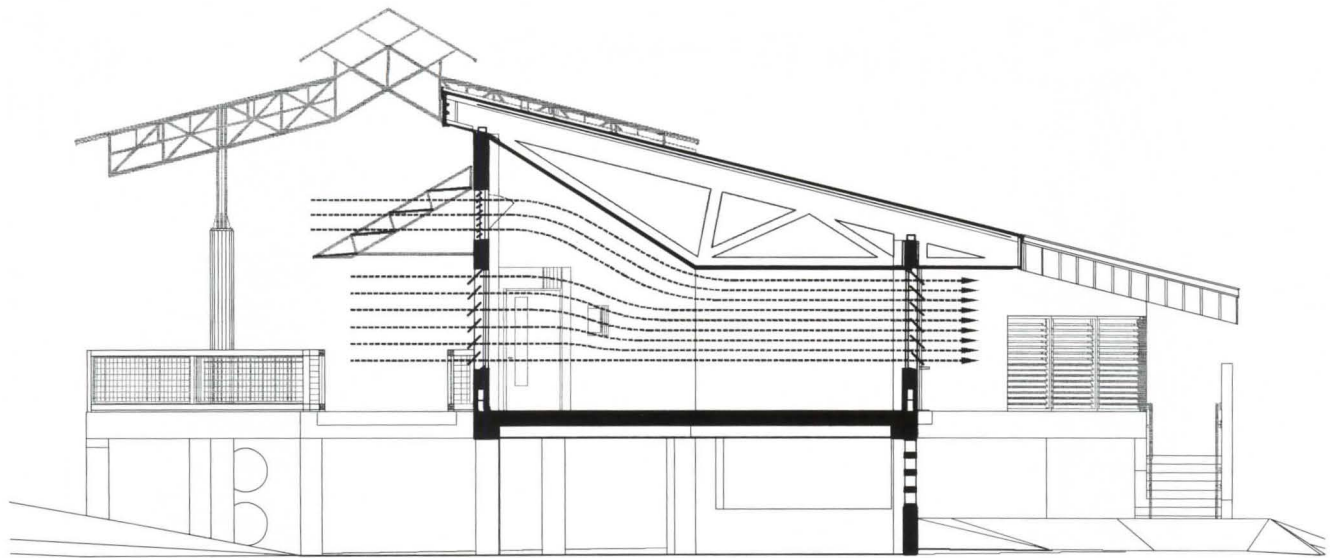
1. Reception
2. Classroom
3. Screened porch
4. Covered deck
5. Teachers' lounge
6. Administration
7. Septic berm

MAIN FLOOR



A drawing (opposite top) shows how air moves through the school. High ceilings, louvered windows, and fans promote natural ven-

tilation in classrooms (opposite bottom). Under the deck, an outdoor classroom is protected from the sun and rain (this page).



NORTH-SOUTH SECTION

classrooms and 6-to-9-year-olds study together. The school is now at its capacity of 120 students, 30 to a classroom, with two teachers per room. "The philosophy," says Levy, "is that of the children's house, that the classrooms should have the comforts of home, especially since the children stay in the same classroom for three years."

Working method

The time frame was tight, so Jersey Devil worked with Taxis Architects of Miami as associate architects and used what Levy terms "the typical construction of the Keys—concrete block, awning windows, and a 5-V crimp metal roof." Badanes lived and worked on the site for a month but then turned the final execution over to others.

Architectural approach

The school design is simple: four classrooms raised off the ground. The classrooms have ceiling fans and shaded louver windows covered with canvas awnings. Each classroom has a little screened porch to bring the outdoors even closer. The lighting in the school is fluorescent, selected for energy savings and designed for no heat gain. The classrooms are reached through a system of ramps and walkways, and they flank a covered hexagonal deck. This shaded outdoor space, covered with a vented canvas top,

functions as a "big central piazza," says Kamenstein.

Because the school is up one story, there is covered play space under the building where the children produce plays and install art exhibits. The playground—designed by artist/builder James Talbot of Austin, Texas—is partially under cover, as well. South Florida's cli-

mate is so amenable that the children can be outside most days.

Environmental pay-off

Badanes points out that the result of the design is that the electric bill is less than \$1 per child per month. Soon, a second phase will be built—a mirror image of the first, enclosing the piazza—and will com-

plete the environmental program of the building as hot air is pulled under the building and recirculated up through the central corridor. ■

Manufacturers' Sources

Concrete sealant and stain: *Okan*
Awnings, fabric roof, sunshades:

Cross Key Canvas

Interior paint: *Benjamin Moore*



4

Lick-Wilmerding School San Francisco, California

A MASTER PLAN AND NEW LIBRARY/ARTS CENTER BY CATHY SIMON BRING A PRIVATE SCHOOL UP TO DATE WHILE RECALLING ITS ORIGINAL MISSION.

by **Eric C.Y. Fang, AIA**

Project: *Library/Arts and Humanities Center, Lick-Wilmerding High School San Francisco, California*

Architect: *Simon Martin-Vegue Winkelstein Moris—Cathy Simon, principal-in-charge; John Long, project manager; Liza Pannozzo, project architect; Stephen Phillips, Dan Cheetham, project team; Alyosha Verzhbinsky, master plan; Donald Cremers, interiors*

Engineers: *Steven Tipping + Associates (structural); O'Mahony & Meyer (electrical); JYA Consulting Engineers (mechanical)*

Consultants: *Illumination Design Collaborative (lighting); Richard Vignolo (landscape); Wilson Ihrig & Associates (acoustical)*

General Contractor: *Plant Construction Co.*

Project Statistics

Size: 17,000 sq ft

Cost: \$2.95 million

Cost per sq ft: \$174

Number of students: 345

Number of teachers and staff: 40/20

Grades in school: 9–12

Lick-Wilmerding High School was founded as a vocational school in a lower-middle-class district of San Francisco in 1895. Today, while focusing on college preparation, Lick-Wilmerding maintains a strong commitment to technical arts, requiring students to take at least five semesters in wood, metal, and machine shop, or drafting and design. This belief in the enabling potential of technical skills is summed up in the school's pragmatic motto, "Education for the head, heart, and hands"—leading one educator to describe Lick as "John Dewey come alive."

But with its academic program and reputation long since having outpaced its utilitarian 1955 campus, a new library was a top priority on the school's long list of physical needs. Familiar with the work of Simon Martin-Vegue Winkelstein Moris (SMWM) at other local prep schools (such as the Urban School and University High School), Lick-Wilmerding's board of trustees hired the firm in 1989 to develop a master plan for the school.

Planning strategy

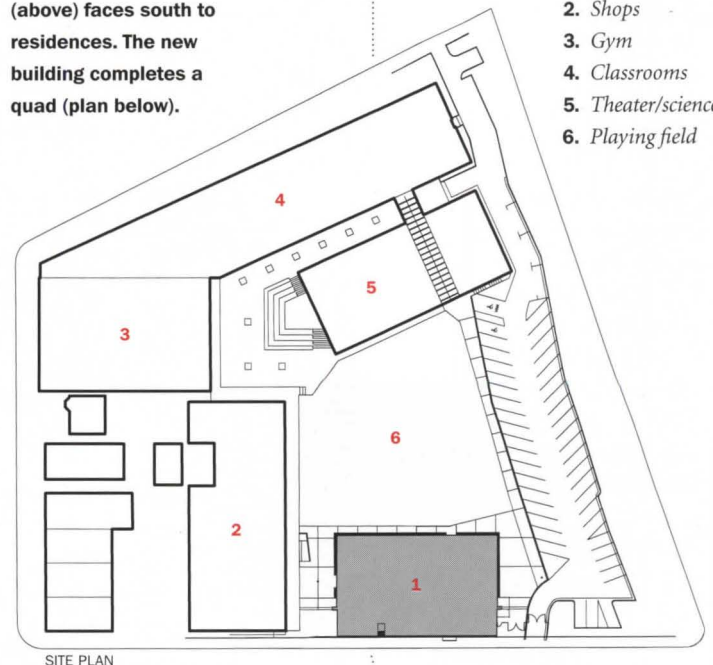
SMWM's plan established a quadrangle facing out toward the city to serve as the symbolic heart of the school. By terracing a new faculty

Eric C.Y. Fang is an architect with SOM in San Francisco.



A classroom wing (above) faces south to residences. The new building completes a quad (plan below).

1. Library/arts
2. Shops
3. Gym
4. Classrooms
5. Theater/sciences
6. Playing field

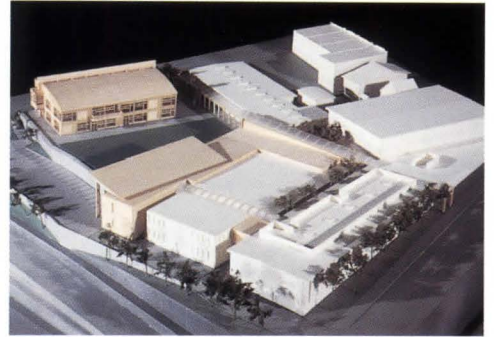


SITE PLAN



A model shows the entire school as envisioned by the SMWM master plan (below). The library portion of the new building, along with studios tucked

underneath, faces the quad to the north (left). Smooth and corrugated cement panels are used as exterior finish on the north and east facades (bottom).



parking lot 13 ft below the quad on the east side of the property bordering a freeway, the plan banished cars from sight within the campus. SMWM's plan also recentered the school on the shops (metal, wood, and machine) located on the west side of the existing L-shaped complex by placing the new library on the south side of the school.

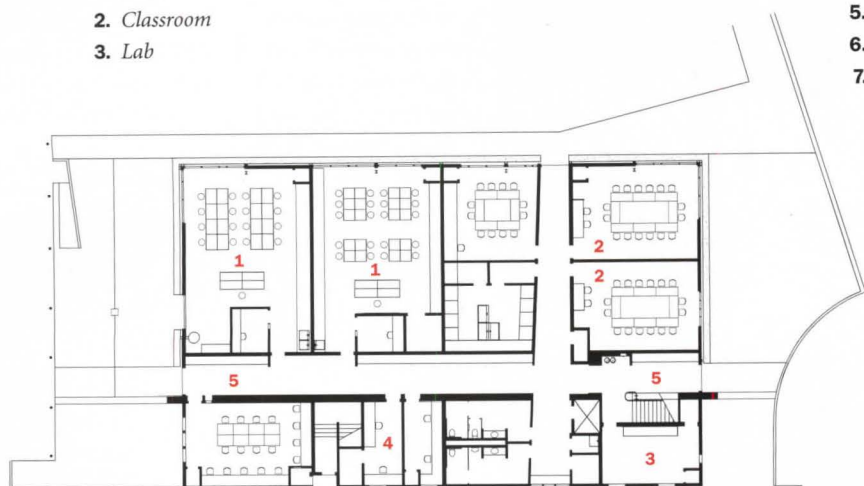
Architectural strategy

The new library, which SMWM was hired to design in 1994, mediates between a neighborhood of primarily single-family houses on the south side and the quad to the north. SMWM exploited this duality by adopting an "inside-outside" massing strategy with a flat-roofed classroom wing facing the street and shielding a vaulted structure on the campus side that contains the studios and library. Separation between these two components is articulated by a brightly colored 38-ft-high wall running the length of the building. The street side of the classroom wing is a carefully composed and residentially scaled, if conventional, stucco box. Shading devices, intended to reduce solar loads and provide articulation to the south-facing windows, were eventually eliminated to save money.

The designers focused their energies on the campus side, where they deployed flat and corrugated cement panels in a grid to provide



1. Studio
2. Classroom
3. Lab



FIRST FLOOR

4. Office
5. Gallery
6. Audiovisual
7. Library



SECOND FLOOR

an interesting play of light. The panels themselves (which other architects such as Jim Jennings and Mark Horton have experimented with in Bay Area residential projects) allude to the industrial characteristics of the existing buildings around the quad. At approximately \$8 per sq ft, SMWM's face-fastened, caulk-joint system for the cement panels is a cost-effective alternative to other comparable exterior finish systems such as stucco and EIFS.

Interior detailing is disciplined by a proportioning system derived from the exterior grid. This system carries through to the SMWM-designed furnishings, carpeting, and signage. As a result, the design works together at different scales, while an overlay of freely disposed primary colors keeps the grid from becoming overbearing—a pronounced *de Stijl* influence.

The "head, heart, and hands" trinity is felt throughout: from SMWM's decision to expose the structural elements at the library's vaulted roof and cement-panel fasteners, to the choice of materials such as Italian artisan plaster and stained concrete, which evidence technique and weathering.

Programming

The library building was originally intended to house fine arts studios on the ground level with a 7,100-sq-

ft library located on a piano nobile above. Classrooms were subsequently added to the program to keep the new building from becoming the exclusive domain of the arts. SMWM sought to maintain a workshop atmosphere below with stained-concrete floors and corrugated aluminum ceilings (later cut to save money) while providing a gallery for student projects along the main circulation spine.

Plans call for the library to eventually expand from the present 9,000 volumes to 25,000 volumes. To entice students to spend time at the library, the programmers drew from popular retailing concepts such as all-night copy centers and Barnes & Noble superstores. Thus the library is equipped with scanners, CD writers, a sound-dubbing system, a copy center nicknamed "mini-Kinko's," and a lounge with a balcony and views of the city. ■

Manufacturers' Sources

Flat cement-board panels: *Eternit (Eflex)*

Corrugated cement-board panels: *Cemfort (SupraCem)*

Composite-metal building panels: *Alucobond Technologies*

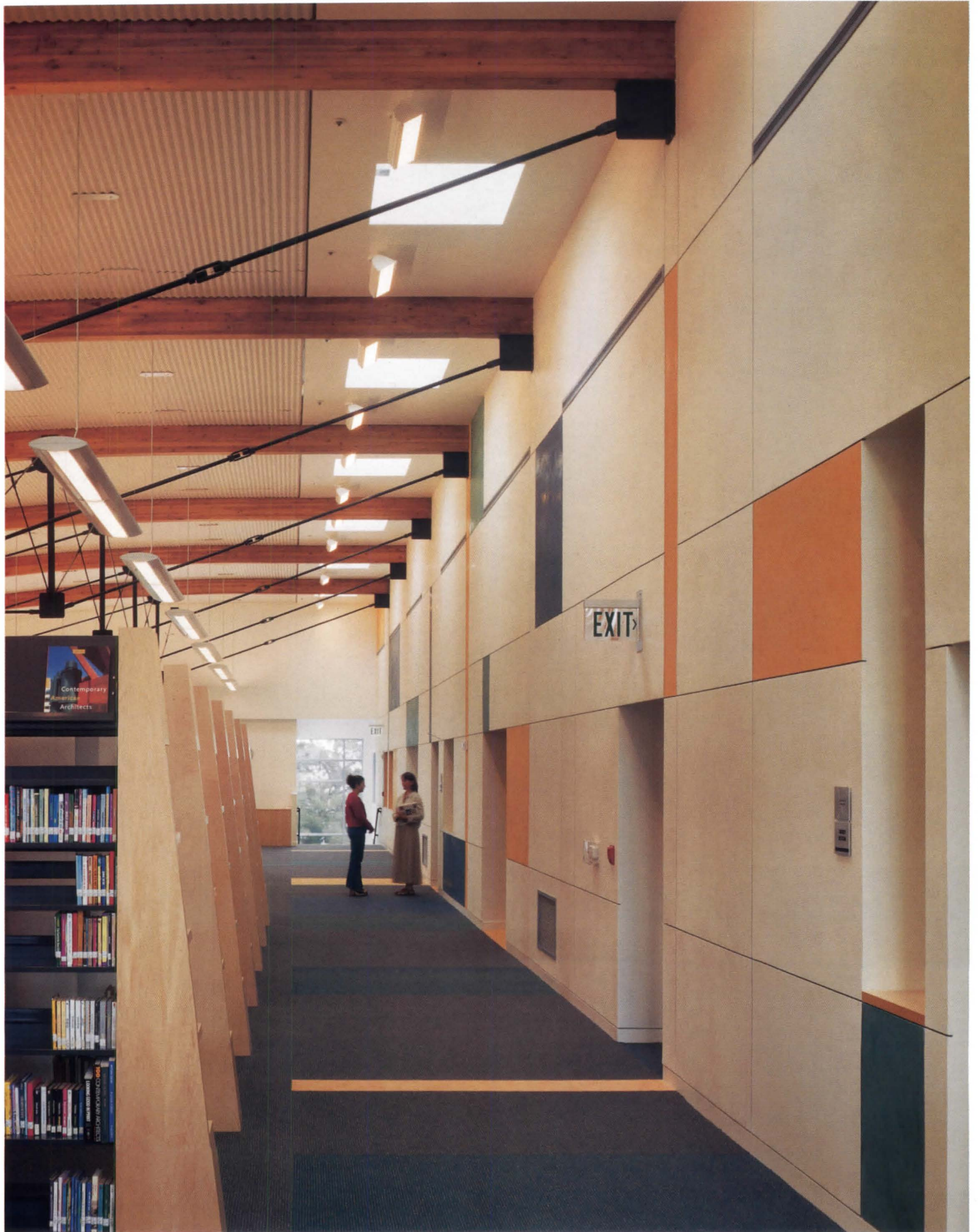
Preformed-metal roofing with zincalume finish: *BHP*

Aluminum windows and entrance system: *Vistawall*

Corrugated-metal ceiling system: *USG Interiors (Donn Centricitee)*



A wood-frame building with plywood shear walls, the library has composite glulam-and-steel-rod roof trusses exposed in the main reading room (above). The colorful panels included in the gridded library walls give the composition a distinctive *de Stijl* flavor (opposite). The east-west corridor on the ground floor was designed with lighted alcoves to function as a long gallery for the exhibition of students' work (left).



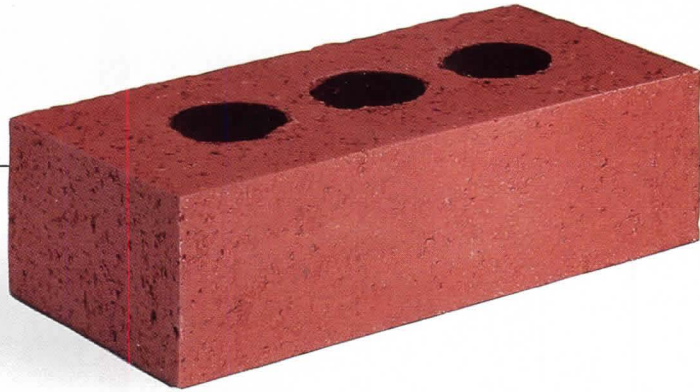
Sixty second guide to Belden Brick:

COLORS



Belden Brick is made in over 116 colors that include 2 choices in black, 28 browns, 7 tans, 8 buffs, 3 creams, 18 grays, 16 pinks, 26 reds, and 8 whites. In addition, it is made in 12 different textures, although not all our brick is made in the same range of textures.

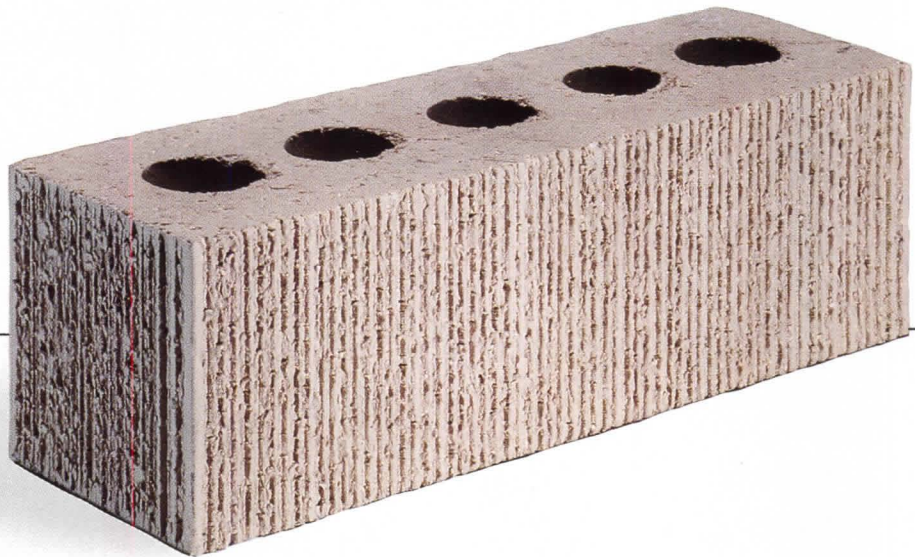
Belden also offers a choice of extruded brick or molded brick (with the character of hand-made brick.) Each category includes a wide range of colors and textures providing more than adequate design latitude.



SIZES



Belden Brick is predominantly made in thirteen different sizes, representing the spectrum of Belden Brick colors and textures. Your design opportunities are broadened by the availability of virtually every Belden Brick color choice as pavers.



SHAPES



We've made hundreds of different shapes to provide special structure details, and a week seldom passes without our custom-making a new special shape to meet individual design requirements. If you need an "impossible" special shape to complement the brick structure you're planning, call Belden. We've seen the impossible become reality.



CIRCLE 49 ON INQUIRY CARD

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The Maturing of Metal Framing

IN RESIDENTIAL CONSTRUCTION, METAL-STUD FRAMING HAS BEEN AN ALSO-RAN. BUT NEW PRESCRIPTIVE STANDARDS, CODE ACCEPTANCE, NEW PRODUCTS, AND TRAINING MAY MAKE METAL AN EVER-MORE VIABLE ALTERNATIVE TO WOOD.

by Nancy B. Solomon, AIA



Several years ago, scared by the volatility of wood prices, a handful of architects and contractors began turning to cold-formed—also called light-gauge—steel to frame their residential projects. Proponents of the material touted its advantages over wood, but designers and builders found a dearth of established standards and a scarcity of trained workers. The steel industry has worked hard in recent years to develop a framework of building codes, training programs, tools, and a standardized network of material suppliers nationwide to support the technology. These improvements may well help advance cold-formed steel further into the market.

The various cold-rolled profiles used in residential framing—including structural C studs, U-shaped track, angles, and “hat” furring sections—are fabricated out of coils of galvanized (zinc-coated) flat sheet steel. Stud walls, floor joists, and roof trusses can be assembled in a fashion similar to corresponding wood products. Cold-formed steel members are typically fastened with screws.

Contributing editor Nancy B. Solomon, AIA, based in Beltsville, Md., writes on a wide variety of architectural subjects, including technology and professional practice.

Continuing Education This month's installment of the ARCHITECTURAL RECORD/AIA Continuing Education Series looks at steel framing for residential construction. After reading the article, complete the questions (page 160) and check your answers (page 162). AIA members may fill out the self-report form (page 162) and send it in for two AIA Learning Units.—Mark Scher, AIA Director Professional Products and Services

Learning Objectives After reading this article, you will be able to:

1. Describe stud-wall, panel, and pre-engineered assembly approaches.
2. Identify at least ten pros and five cons in specifying steel.
3. Relate four major developments in codes and standards that have affected the use of light-gauge steel in construction.

Cold-formed steel is not a recent invention. As early as the 1940s, industrial buildings were being constructed with it, prompting the American Iron and Steel Institute (AISI) to develop its first specification for the design of cold-formed steel structural members in 1946. By the 1970s, many commercial projects were being erected with the material. Although there were regional attempts to frame homes with steel in the past, a broad-based effort began only five years ago when wood prices began to escalate. “The fluctuations of the lumber market held us hostage,” recalls Hank Mailand, the research and product development manager at Taylor Woodrow Homes in Laguna Hills, California.

According to Larry Williams, managing director of the Light Gauge Steel Engineers Association of (LGSEA) in Nashville, Tennessee, “stick” construction and panelization are the two prevailing methods of building homes with steel. Stick construction is comparable to traditional wood construction in that the studs are assembled on site in the familiar platform framing system. The studs are typically placed 24 inches rather than 16 inches on center and are connected to steel tracks at the bottom and top. Panelization differs chiefly in that entire wall sections are built in the factory. These panels are then shipped and erected in the field. Less common are pre-engineered systems, in which all the pieces of the house are sized, cut, and shipped to the site as a kit of parts, not unlike the houses once sold through catalogs by Sears Roebuck & Company. Many of the pre-engineered systems incorporate post-and-beam construction. Any of these methods may rely on larger, hot-rolled steel shapes for members carrying particularly large loads.

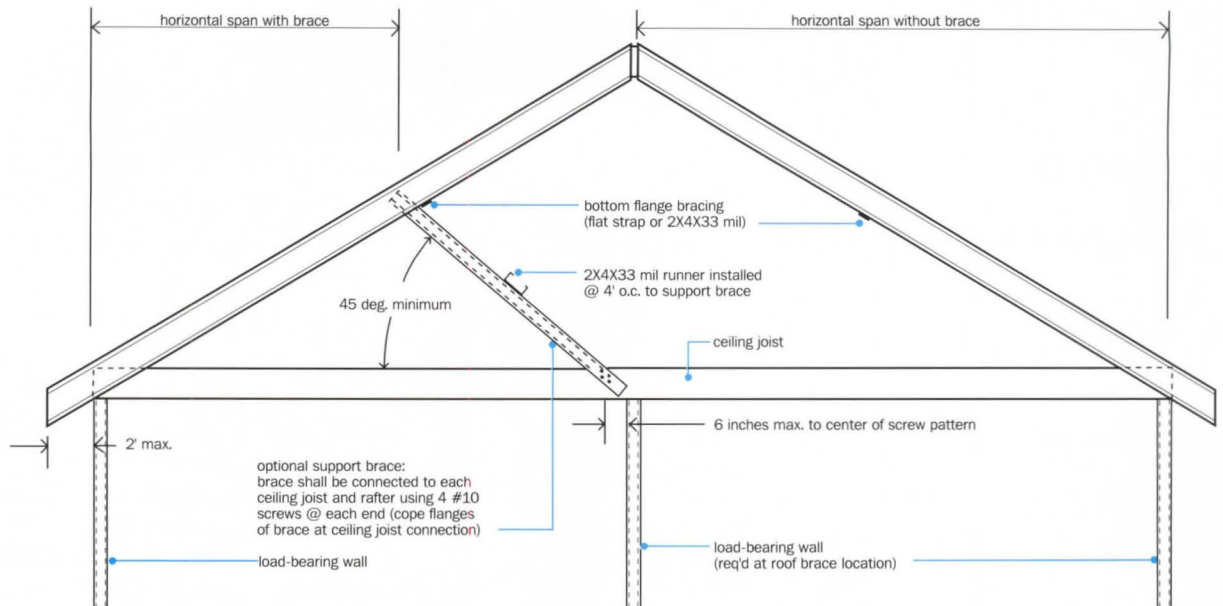
Steel proponents cite a host of benefits of steel over wood. For one, steel remains in abundant supply. According to consulting engineer

INSULATION EQUIVALENT FOR STEEL AND WOOD FRAMING

	STEEL	WOOD
WALL R VALUE 13		
CAVITY INSULATION R VALUE	11	12
EXTERIOR SHEATHING	1 IN. EXPANDED POLYSTYRENE	1/2 IN. PLYWOOD AND ALUMINUM SIDING
WALL R VALUE 13.5		
CAVITY INSULATION R VALUE	13	11
EXTERIOR SHEATHING	1 IN. EXPANDED POLYSTYRENE	5/8 IN. CEDAR AND 4 IN. BRICK
WALL R VALUE 15		
CAVITY INSULATION R VALUE	11	11
EXTERIOR SHEATHING	1.5 IN. EXPANDED POLYSTYRENE	1 IN. POLYISOCYANURATE AND STUCCO
WALL R VALUE 20		
CAVITY INSULATION R VALUE	15	12
EXTERIOR SHEATHING	2 IN. EXPANDED POLYSTYRENE	1.5 IN. POLYISOCYANURATE AND ALUMINUM SIDING

SOURCE: AMERICAN IRON AND STEEL INSTITUTE

Roof section (right) and window-head detail (opposite) are shown as they appear in the prescriptive method for metal framing. Code organizations have already accepted elements of the method.



Steven H. Walker of Windemere, Florida, "If you converted every stick of wood currently installed in U.S. housing to steel, residential construction would consume only 5 percent of the steel produced nationwide." Timber, on the other hand, has suffered from supply disruptions related to diminishing reserves of old-growth timber in the Pacific Northwest. Users have questioned whether quality has been lost as sources shifted to the much younger forests of the Southeast. This dramatic disruption in supply, fueled largely by environmental concerns, has triggered tremendous volatility in lumber prices, although costs have been relatively stable in recent months. Steel quality and prices, on the other hand, have exhibited relatively little fluctuation all along.

Steel is dimensionally stable, while lumber can twist, warp, or split, though engineered-wood products are increasingly seen as answering these criticisms. The metal exhibits a high strength-to-weight ratio, it can accommodate longer spans, and it is lighter to handle in the

field. It can be purchased to specific lengths, minimizing job-site scrap. And it is noncombustible, is immune to insect pests, and can be stored indefinitely.

Stable and consistent, isn't steel better?

Does a homeowner need to worry about rust? Generally not, if the metal is galvanized, says architect Eric Lund of the National Association of Home Builders Research Center. The zinc coating will protect the metal, and zinc is self-sacrificing, meaning that it will react with water before the steel can. Power tools, such as electric shears, cut light-gauge steel in such a way that the galvanizing is essentially pulled over the exposed edge. Cuts from other tools and penetrations from screws can remove a small portion of the galvanized coating, but the adjacent zinc should prevent rust from spreading.

Steel is a versatile framing material, but fastening techniques vary from wood.

Still, metal-framing members in some large buildings have rusted to failure where they sat in leaked water and where the salty air in marine climates attacked the metal. There are currently too few low-rise residential projects framed in steel to know if the exposure is comparable.

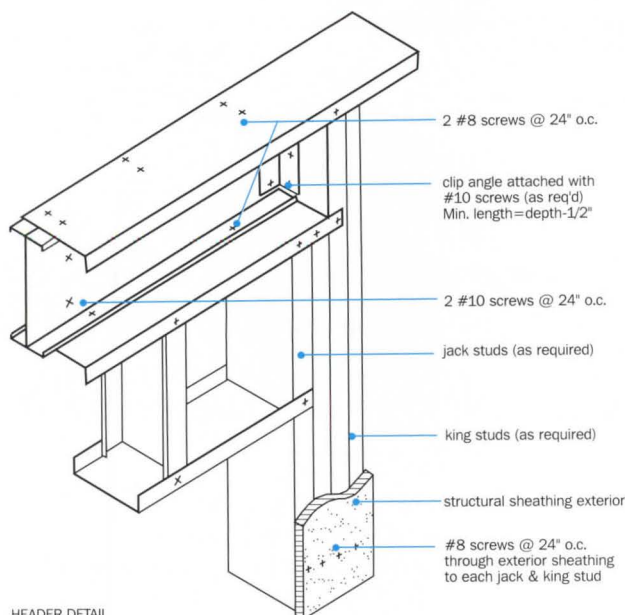
Typically, light-gauge steel is covered with a zinc coating thickness designated G-60. Along the coast, the designer should specify the thicker G-90 or greater. Builders must also take precautions to avoid galvanic action, the corrosive effect that occurs when two dissimilar metals (such as steel and copper pipe) come in contact with each other.

Using metal studs for wall- or ceiling-hung items requires some adjustment for the homeowner. Heavier objects must be attached to a framing member with screws, not nails. (A magnet makes finding metal studs easy, though.) "Steel-framed houses may rattle while still under construction, but not once com-



Manufacturers have forged agreements to standardize strengths

and sizes, permitting ordinary metal-framing design using load tables.



HEADER DETAIL



pleted," reports George Richards, principal of BORM Associates, an engineering firm in Irvine, California. The sound is absorbed by the drywall, he explains. The differences between the sound-transmission coefficients (STC) of wood and steel assemblies are negligible, according to the Gypsum Association's rating system.

Metal's thermal drawbacks

Steel has much to offer from an environmental point of view: it has substantial recycled content, is itself easily recycled, does not off-gas or require chemical treatment for termites, and minimizes cracks due to shrinking or warping, thus preventing energy-consuming air leaks. Ecolo-

that steel may have much lower insulating value for roof, ceiling, and floor assemblies compared to similar ones framed in wood. But this research has yet to be codified and therefore little guidance is available for the proper insulation of these components.

According to the most recent Department of Energy (DOE) Insulation Fact Sheet, prepared by Oak Ridge National Laboratory, metal-framing members should be insulated even in the warmest parts of the U.S.—where batt insulation in the cavity wall may be unnecessary—to avoid ghosting. (The 1997 fact sheet is available through DOE's Energy Efficiency and Renewable Energy Clearinghouse at 800/363-3732.) The document also suggests that continuous insulative sheathing may be

STEEL IS DIMENSIONALLY STABLE AND IS LIGHT, HAVING A HIGH STRENGTH-TO-WEIGHT RATIO. IT CAN BE PURCHASED TO SIZE, MINIMIZING JOB-SITE SCRAP.

gically speaking, however, its one glaring weakness is thermal bridging. Unlike wood, steel is very effective in transferring heat, which compromises the effectiveness of batt insulation installed between studs. According to the 1995 Model Energy Code, which is referenced by the three model codes, the effective R value of R-11 cavity insulation is halved, to 5.5, in a wall framed with 16-gauge 2-by-4 steel studs spaced 16 inches on center. During winter, heat more readily travels through an uninsulated steel stud to the outdoors, resulting in cold spots on the inside wall surface. This can lead to higher heating bills, condensation and mold growth on the inside face of the drywall, and vertical ghosting or discoloration on the interior walls as dirt and dust adhere. In summer, unwanted heat can enter from outside, increasing air-conditioning loads and, in humid regions, exacerbating condensation potential.

The industry recommends sheathing the outside of metal studs with a rigid-board insulation such as extruded polystyrene, expanded polystyrene, or polyisocyanurate foam. "This forms an effective thermal break and increases R values significantly," according to AISI's *Thermal Design Guide for Exterior Walls*, published in January 1995. According to a recent paper by the NAHB Research Center, initial research indicates

appropriate between metal joists and ceiling drywall to reduce heat loss. "Those joists go right to the eaves," explains Therese Stovall, a researcher at Oak Ridge. "They are perfect fins. You couldn't design a better heat exchanger." Insulating the attic diminishes heat transfer to the roof but doesn't improve the radiative effect of the eaves. Since attic rafters or trusses may also conduct heat out, it may be prudent to sheath the roof in rigid-board insulation as well.

Alex Wilson, editor of *Environmental Building News* in Brattleboro, Vermont, lists the disadvantages of the insulating boards commonly used: "They are more expensive than cavity insulation, they are developed from a petrochemical base, and all but expanded polystyrene are made using HCFC blowing agents. These deplete the stratospheric ozone layer and are slated for phaseout early in the next century." Fiberglass batt insulation does not share these drawbacks. Wilson sees steel's usefulness primarily as an interior framing material.

New products claim to improve steel performance at lower environmental cost. U.S. Building Technology (USBT) in Natick, Massachusetts, has developed Snap-Cap, a rigid foam that hugs only the exterior flange of the stud. Several thicknesses will be available beginning in

October. Insul-Stud—a steel stud onto which similar insulation is adhered at the factory—is expected to be available in 1998. The company claims that these two products can reduce the amount of rigid foam needed by more than 80 percent while still providing the necessary thermal insulation. Joseph A. Charlson of USBT estimates that the products will reduce the cost to insulate a wall by 25 to 50 percent. The Snap-Cap product can also attach to the face of roof-truss members and the bottom face of floor joists.

Bringing framing costs down

Though steel framing has become common in commercial buildings, it still costs more to frame a house in steel than in wood. Wayne Parker of Parker Engineering in Redding, California, estimates that a 1,500-sq-ft wood home actually costs \$2,000 more in steel. A small and inexperienced

STEEL'S ECOLOGICAL WEAKNESS IS ITS POOR INSULATING QUALITIES.

supply of framers and other subtrades is largely to blame. And, once in the field, framers find that fastening techniques are generally slower than those for wood. Says Parker, "The commercial drywallers who do a lot of light-gauge framing for commercial office partitions and curtain walls don't necessarily know how to build a house." Residential applications differ: walls are more often load-bearing, requiring greater attention to sizing and attachments. And the complex shapes and roof geometries of houses are not often found in the commercial sector. Commercial framers also command a higher labor rate.

Until very recent building-code changes, steel framing had to be designed by an engineer. Since few design professionals are well versed in the technology, many projects are simply oversized and therefore not cost competitive. "The engineers need to know how to specify as light as possible so everyone else can do their jobs as easily as possible," explains Walker. "For example, a mere 1/8-inch increase in the diameter of an anchor can double the difficulty of drilling. There is an art to knowing how to make it user-friendly."

Progress in code acceptance

Code officials, lacking familiarity with metal-framing techniques, have also hindered acceptance. But an infrastructure is beginning to develop around the material. The NAHB Research Center has prepared a prescriptive method for residential steel framing under the auspices of the U.S. Department of Housing and Urban Development with additional funding from NAHB and AISI. It provides detailed guidance so that ordinary metal structures, like wood ones, can be designed without the assistance of a design professional. The prescriptive method was published in May 1996. The Council of American Building Officials (CABO) One and Two Family Dwelling Code has accepted the wall and floor portions of this method. Rafter standards are being considered by CABO this fall. According to AISI's Northeast regional director Jonathan Humble, based in West Hartford, Connecticut, about half of the states in the U.S. have adopted the CABO code in some fashion. None of the code's steel-framing standards are currently applicable to areas subjected to strong seismic activity or high wind forces.

In the process of developing the prescriptive method, the roll-forming industry, which fabricates the basic steel members, agreed to standardized shapes, thicknesses, coating thicknesses, and yield strengths. In the past, these could vary among manufacturers. The roll formers adopted the same dimensions as lumber for the web depth of wall studs,



so a nominal 2-by-4 will now be 1 5/8 by 3 1/2 inches and a nominal 2-by-6 will be 1 5/8 by 5 1/2 inches. "This is very important if the product is going to be compatible with window and door frames manufactured for the U.S.," says Walker.

Builders are mixing metal and wood, though differing characteristics, such as wood shrinkage, must be taken into account.

In addition, the CABO code stipulates that steel be labeled by manufacturer, minimum uncoated metal thickness, yield strength, and thickness of galvanized coating. "All the studs in light frame will have a pedigree so there will be accountability. This allows contractors to use the product with confidence," continues Walker.

In another recent code development, architects and engineers will have greater options in providing lateral resistance to wind and earthquake loads. In the past, the building codes recognized only steel-strap bracing for lateral resistance. Shear values for attaching plywood, oriented-strand board, and gypsum board to steel framing are now included in two of the three model codes: the 1997 Uniform Building Code and the 1997 Standard Building Code. A similar approval is pending with the National Building Code.

AISI sponsors a steel hotline (800/79STEEL), which is run by the NAHB Research Center, to answer any questions about the use of cold-formed steel in residential applications and to make available a recently developed series of technical data sheets. Tool and product manufacturers have begun to develop methods to speed installation. Innovations include improved sawblades that cut steel more quickly and quietly; pneumatically driven pins to attach sheathing products to steel framing; and hand-held clinching devices that quickly join steel members without screws or pins. (Pins have the same basic geometry as nails but are made of high-carbon steel and are heat treated so that they can pierce steel framing without buckling. They also have a ballistic point and a special texture on the shank, called knurl patterning, both of which improve the pin's grip on the the stud.)

Though entirely steel-framed houses account for a fraction of all those built, steel may make inroads in combination with wood. A developer may opt for cost-effective wood trusses supported by steel-stud walls, for example. Or an engineer may feel more comfortable with wood walls in load-bearing applications and light-gauge steel elsewhere. Framers may build complicated stairs out of wood in an otherwise steel-framed house because carpet installers prefer to fasten tack strips to wood. And a wood header may span an opening in an otherwise metal-framed structure because the architect wants the material to be exposed. The builder or designer must recognize such differences as wood's tendency to shrink as it dries. Steel won't. ■

NEW PRODUCTS

NEW METAL-FORMING TOOLS PRODUCE A CURVACEOUS CEILING

Ceilings Plus in Los Angeles used 60 years of sheet-metal experience in creating Radians, a curved-metal ceiling introduced to the architectural market in January. With this new system, integrally formed curved returns are set into the panels in a way that strengthens them sufficiently to permit large individual panel dimensions, which in turn reduces the number of joints in a given ceiling.

Company president Nancy Mercolino claims that the firm's proprietary computerized, numerically controlled metal-forming technology can curve panels and form edge returns without creating dimples, waves, oil canning, or other visual distortions in the face of the panel. The crimps in the returns are evenly spaced and stop short of the surface plane so dents and dimples are not visible from within the space. The return bends are 1 1/2 in. deep, stiffening even tightly curved sheets

half or a third of what conventionally fabricated curved panels might cost, according to Mercolino.

Design capabilities

A standard Radians panel is 2 or 2 1/2 ft wide and can be specified in lengths up to 10 ft. The convex or concave radius can be anywhere from 6 to 200 ft; different radii can be combined to create serpentine, vaulted, or undulating shapes. Finish options include round and square perforations in various patterns to suit specific acoustic or light-distribution needs. Panels can be ordered in aluminum, stainless steel, or painted steel in solid-color or metallic finishes.

Each panel is mechanically attached to a concealed steel grid with torsion-spring clips and can be swung down to access plenum space as needed. The Radians ceiling meets the most stringent Zone 4 seismic codes.



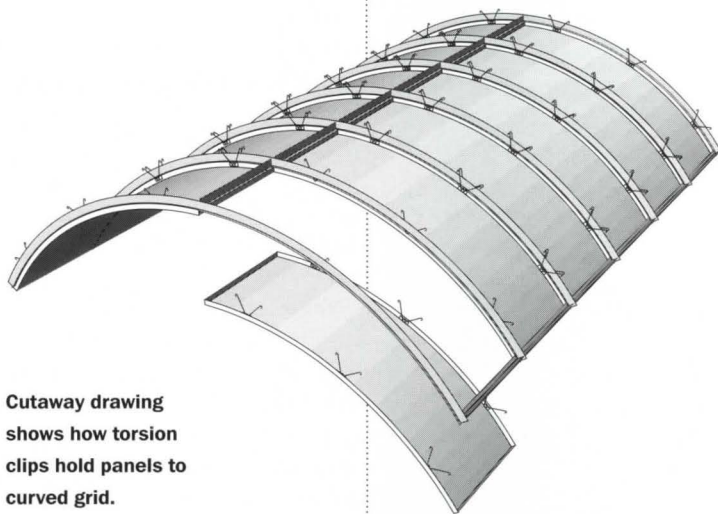
enough so that no welds or other fasteners are needed to maintain the contour.

Eliminating costly hand labor takes a lot of the expense out of creating custom ceilings, including those with complex, undulating configurations. Made with lighter-gauge metal, the panels can be priced at a

The computerized manufacturing process is said to insure a relatively short lead time on even the most complex projects. For example, DPA Architects, Inc., of Tempe, Arizona, converted a tilt-up concrete warehouse into office space for the Dial Corporation in just six months, including a custom, 11,000-sq-ft

October's product coverage features a perforated-metal ceiling assembly made with a new forming machine that lowers the cost of custom-curved panels. A page on Division 2 products—site furniture and amenities—includes new colors in an old paving product: asphalt block made on a high-pressure steam press that was built in 1888. The Product Briefs page has a fan- (and fanny-) pleasing stadium seat, a design-your-own-escalator CD-ROM, and a "hurricane-proof" garage door. Want to know how to specify sealants correctly? See the Literature pages.

—Joan F. Blatterman, *New Products Editor*



Cutaway drawing shows how torsion clips hold panels to curved grid.

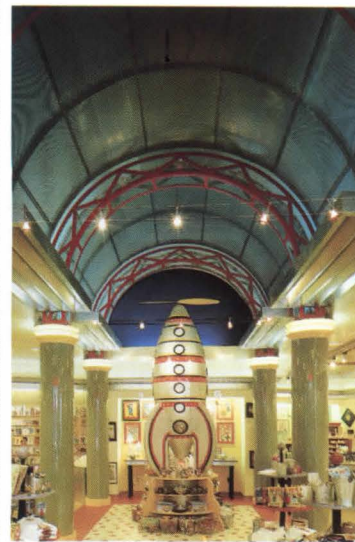
ceiling (below left). Indirect lighting of the huge, computer-intensive back-office space was an objective of project architect John Szafran, who designed a vault 40 ft wide by 300 ft long that brought the ceiling height down without loading the roof structure. (Gypsum board, originally considered, would have been too heavy for the warehouse's frame.) Light from 400W metal-halide SPI pendants is reflected off the perforated panels, which have a white-colored acoustic backing to dampen conversation noise.

The ceiling floats above decorative drywall arches that visually divide work zones and step the vault up incrementally from 14 to 20 ft. Individual panels 7 ft long arch end to end across the 40-ft-wide span; panel joints are only 1/16-in. wide and almost disappear, giving a monolithic appearance to the completed ceiling.

Barton Choy Architects used Radians panels in an exposed grid system, another suspension option, to create a tightly curved ceiling in a retail space (right).

Sales support

A sample kit provides perforated-metal pieces to suggest the design possibilities of various open patterns and finishes. The company will supply full-scale mockups to demonstrate how the suspension and attachment components work and to show the smooth, consistent character of the finished panel. 800/822-3411. Ceilings Plus, Inc., City of Commerce, Calif. **CIRCLE 250**



**NEW EMPHASIS ON
OUTDOOR FURNISHINGS**

A trend in landscape amenities like benches and ash urns is that there seem to be more of them nowadays. As smoking prohibitions prod smokers outside, building managers feel compelled to provide a few benches to create an attractive setting instead of just letting employees huddle around doorways. And thanks to a new generation of UV-resistant powder coatings, furniture can be coordinated with architectural trims and hard surfaces or provide a colorful accent. A good place to see new pavings and site furnishings is the annual meeting of the American Society of Landscape Architects, November 8-10 in Atlanta.—J.F.B.



▲ Comfortably correct

Arlington benches have a contoured seating area laser-cut from a single sheet of 1/4-in.-thick steel to replicate the effect of individually wrought straps. A supportive curve to the back and a gradual waterfall treatment of the seat edge add ergonomic comfort; an intermediate armrest can be specified to prevent campouts. 205/997-5207. Ultrum/GameTime, Inc., Fort Payne, Ala.

CIRCLE 251

► Bench as bridge

Set on an arched frame that resembles an inverted Golden Gate, the 72-in.-long, 19-in.-high Bridge bench is scaled for use indoors and out. Metal may be specified in stainless steel, as shown, or in a range of powder-coat colors. Prices start at \$700, depending on the seat material selected: a choice of wood, concrete, or metal. 800/451-0410. Forms+Surfaces, Carpinteria, Calif. **CIRCLE 252**



▼ Interlocking concrete pavers

A huge plaza fronting Toronto's National Trade Center incorporates integrally colored concrete pavers in an undulating, wavelike pattern created by Virginia artist Jerry Clapsaddle. Paving is made of high-compressive-strength 8-in. squares of concrete 2.3 in. thick set in sand, creating a permeable surface that is extremely resistant to heavy traffic loads, freeze/thaw cycling, and de-icing salts. A video and design software are available: 800/241-3652. Interlocking Concrete Pavement Institute, Sterling, Va. **CIRCLE 253**



► Problem-solving planters

To create a garden on the roof of the new San Antonio Library, architect Ricardo Legorreta used lightweight planters with a low-maintenance built-in irrigation system. Customized planters and liners are offered to solve interior and exterior plantscaping problems. 800/542-2282. Planter Technology, Mountain View, Calif. **CIRCLE 254**



▲ Traditional American style

Made in a historic Virginia foundry and designed to stay in a garden or courtyard all year long, this camelback four-seat bench is crafted in wrought iron, then powder-coated in black, as shown, or in white, green, taupe, bronze, or pewter. 804/358-2385. McKinnon and Harris, Richmond, Va. **CIRCLE 255**

▼ Du temps perdu

John Danzer fabricates classically detailed garden furniture, orangerie boxes, urns, and other pieces inspired by the historic homes and landscapes of the Hudson Valley, but this settee echoes one bought by Edith Wharton for her home in Ste. Claire du Chateau, France. 212/717-0150. Munder Skiles, New York City. **CIRCLE 257**



◀ Chilling out

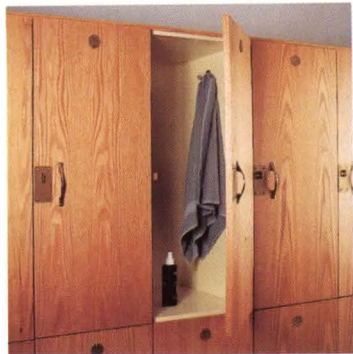
Designed by Kipp Stewart and built by his son Brad, new Poolside furniture can cross over from residential use to the more rugged requirements of resort, club, and hotel settings. Pictured is the Wide Arc lounge chair and matching ottoman constructed from extruded aluminum finished in an automotive-type powder coat in bronze or pewter, upholstered in Sunbrella weather-resistant fabric. Dining chairs, glass-top tables, chaises, and bar stools are also offered in Stewart's updated-Moderne styling. 415/431-8386. Bradford Stewart & Co., San Francisco. **CIRCLE 256**

▼ Easy on the feet

Made on a 100-year-old steam press, hexagonal or square asphalt pavers come in natural aggregate colors that disguise stains and provide a comfortable walking surface. 800/426-4242. Hanover Architectural Products, Hanover, Pa. **CIRCLE 258**



PRODUCT BRIEFS



◀ Clang-free storage locker

Described as "an upscale locker alternative," the Famous locker can be specified in a range of materials, including the solid wood shown, as well as veneers and plastic laminates, for the storage needs of schools, clubs, and fitness centers. Doors and interiors can be customized for specific equipment, such as golf clubs or skis. 847/524-6926. Famous Lockers, Schaumburg, Ill. **CIRCLE 261**

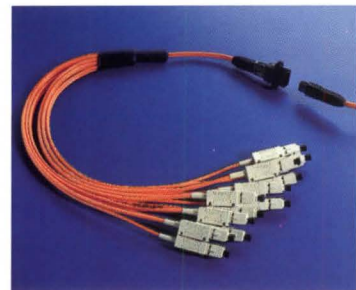
▼ Open-office cabling

Flexible Netconnect zone-cabling power and data-distribution systems are said to make it easy to add new users or to re-configure equipment within a modular, open-office environment. "Plug-and-play" components include Lightray fiber-optic connectors (below), which deliver the full bandwidth of optical fiber. In the space of a traditional single-user cable and connector, the Lightray system provides up to 6 fiber pairs to connect desktop equipment such as computers and fax machines. 800/835-7240. AMP Incorporated, Harrisburg, Pa. **CIRCLE 259**



▲ Custom column covers

A new product line for Fry, these column covers can be curved to meet an architect's exact specification. Available in stainless, aluminum, Muntz metal, or painted galvanized, they are formed on a pyramid rolling press. There are two reveal styles: a 1/2-in. vertical joint and a "v" butt joint; a "seamless" cover needs field finishing. 800/237-9773. Fry Reglet Corp., Alpharetta, Ga. **CIRCLE 262**



▼ Sidewalk/driveway sealant

For concrete flatwork and other paving in architecturally sensitive areas such as malls, Lithoseal Trafficalk seals horizontal joints in any of over 100 colors. The caulk is said to perform with excellent adhesion and elongation characteristics and to withstand solvents. 800/800-9900. L. M. Scofield Co., Los Angeles. **CIRCLE 260**



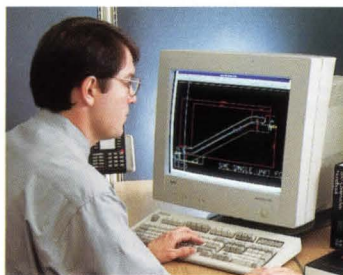
▼ Part of the fan experience

Hussey employed an ergonomics consultant and focus groups to develop the user-comfort program for the new Medallion chair. A sleek, contemporary style (the company also makes a Legend chair for nostalgic-theme baseball parks), the chair can be ordered in widths up to 24 in.; seats are self-rising to achieve code-compliant row distances. Comfort features include lumbar support, a "pelvic brake" that prevents users from sliding forward in the seat, and contoured edges that let legs move easily. Available in 24 standard colors. Hussey Seating, North Berwick, Me. **CIRCLE 264**



▼ Interactive escalator design

Free drawing tools eliminate manual escalator and elevator detailing and offer realistic equipment and space parameters. Download at <http://www.US.Schindler.com> or request the CD-ROM. 201/984-9500. Schindler, Morristown, N.J. **CIRCLE 263**



▲ Simple shape with character

Rugged enough for use in hospitals, colleges, and hotels, these table and floor lamps are tapered columns of American cherry, maple, and oak finished in ivory, burgundy, and green. All metal parts are solid brass. 805/966-7536. Stellar Lighting, Santa Barbara, Calif. **CIRCLE 265**

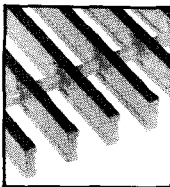
▼ Storm-proof sectionals

Roll-lite upward-acting sectional and sheet-style doors, shown here undergoing wind testing, meet SSTD-10-93 (hurricane-resistant residential construction) of the Standard Building Code. Commercial applications include airplane hangars, storage buildings, and workplaces. 407/857-0680. Roll-lite Storage Systems, Orlando, Fla. **CIRCLE 266** ■

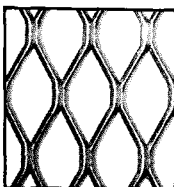


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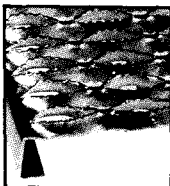
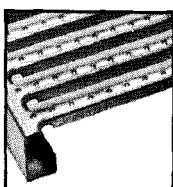
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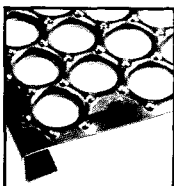
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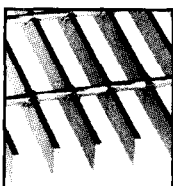
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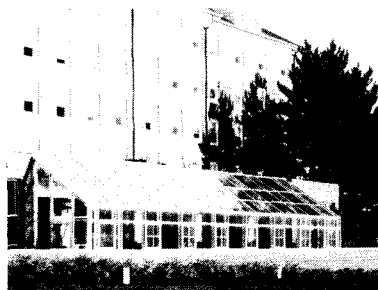
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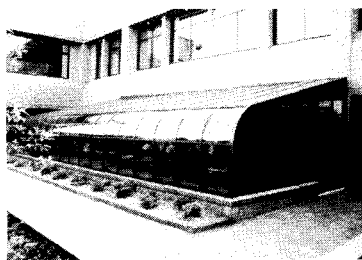
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PRODUCT LITERATURE

Custom site furniture

An illustrated folder highlights design, engineering, and custom-manufacturing capabilities offered to meet specific project requirements for tables, benches, and amenities built to architectural specifications. Constructed of solid wood using boatbuilding techniques, the furniture may be finished in any of over 60 Awlgrip paint colors. Weatherend Estate Furniture, Rockland, Me. **CIRCLE 267**

Concrete-materials guide

Full-line catalogs provide selection and application information for such concrete products as grouts, levelers, fast-set mixes, and hydraulic cement, as well as elastomeric, acrylic, and cementitious coatings for masonry substrates. A "Thermal and Moisture Protection" catalog covers the Surewall EIFS product line, which includes a fiber-reinforced stucco. 800/334-0784. W. R. Bonsal Company, Charlotte, N.C. **CIRCLE 268**

Display and aeration fountains

Vertex water features, illustrated in an eight-page brochure, are attention-getting water displays ranging from the small FunnelJet, a ring of sparkling water 25 ft wide but only 5 ft high, to dramatic multiple columns of water jetting 50 feet in the air. The fountains float on the surface, and can be ordered complete with lights for night-time illumination. Besides adding a focal point to man-made lakes or runoff-water sumps, these fountains add oxygen to the water and prevent the

growth of algae and mosquito larvae. Vertex, Division of Aquatic Systems, Inc., Deerfield Beach, Fla. **CIRCLE 269**

Curtain-wall details

Responding to suggestions from architects, Vistawall, a manufacturer of curtain-wall systems, storefronts, and sloped-glazing assemblies, offers product information in free electronic formats. A CD-ROM, the Detailer, lets designers transfer standard details to project drawings; a new Web site (www.vistawall.com) supplies a downloadable version of the Detailer, three-part specifications, installation profiles, and links to related sites. 972/424-1951. Vistawall Architectural Products, Terrell, Tex. **CIRCLE 270**

Public-area seating

A catalog on Kenworthy wood benches includes the southwestern-influenced Cimmaron and a Prairie design. Furniture may be specified in red oak, maple, and jarrah for interior applications; benches for outdoors come in jarrah with a clear sealer intended to weather to a warm gray. 800/521-2546. Landscape Forms, Inc., Kalamazoo, Mich. **CIRCLE 271**

Traditional-style amenities

Found in sites from the Faneuil Hall Marketplace to Ellis Island, a classic bench is made with cast-iron standards and slats of solid hardwood. A four-page brochure illustrates seating, matching trash receptacles, and clocks. 800/378-3080. American Site Furniture, Concord, Mass. **CIRCLE 272**



For more information, circle item numbers on Reader Service Card

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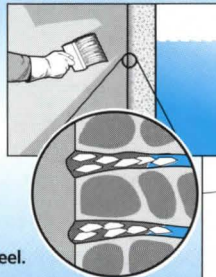
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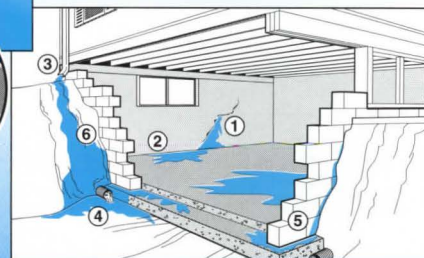
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Registration Deadline

Telephone Workshop:
Register before November 7, 1997

WWW Workshop:
Register before December 5, 1997

(continued from page 20) thing. In an age of architectural senselessness, I think this chapel should be an inspiration for architects and students alike.

—Carwel Dera
Everett, Mass.

Thank you for enriching us all with your article about Steven Holl's chapel. Through the use of light, his approach to creating a place of worship has succeeded. There is, however, an exquisite detail that was omitted from the story: the handrail leading to the white cedar baptismal. Your next article on the subject of religious build-

ings should include a view of what I consider simple, perhaps austere, faith-inspiring details.

—Juan Lobet, AIA
Port Angeles, Wash.

Clarifications: where credit is due

Your article regarding the creation of the Memphis Center for Architecture [August 1997, page 34] inaccurately referred to the collaboration of Coleman Coker with the University of Tennessee. The center was formed through an equal partnership between the University of Arkansas and the University of Tennessee. Dean Daniel Bennett of Arkansas and I worked

together to help establish the center; we have been very gratified by the strong support of the local professional community.

Dan Bennett and I approached the creation of the center in an entrepreneurial spirit, as one way of continuing to diversify the educational experiences available to our students. Furthermore, the center itself, as you reported, should be an important bridge to the professional community in Memphis.

—Marleen Kay Davis, Dean
College of Architecture and Planning
University of Tennessee
Knoxville, Tenn.

A news item in the July 1997 issue [page 27] refers to the International Design conference held in Jackson Hole, Wyoming. We were pleased to see mention of the conference in your magazine but sorry that certain information was missing. Your article lists the event's cosponsors, Steelcase and *Fortune* magazine, but does not make mention of the host: the International Interior Design Association (IIDA).

—Karen Guenther, FIIDA, President
International Interior Design Association
Chicago

RECORD may edit letters for grammar, style, and space availability, taking care not to change the author's meaning.

Corrections

In the July 1997 issue [page 84], the lead architect of the veteran's housing project was referred to inaccurately. The firm is Fei & Cheng Associates Architects and Planners.

Due to erroneous information published in a press release, a news story on the Lester B. Pearson International Airport in the July issue [page 26] misreported that Skidmore, Owings & Merrill had worked on Hong Kong's Chek Lap Kok and London's Heathrow airports. These airports were designed by Hellmuth, Obata + Kassabaum.

Due to a misunderstanding in the editing process, Diehl Graphisoft's MiniCAD was mischaracterized in "Getting Your Feet Wet in CAD" [July 1997, pages 129–32]. It was grouped with entry-level, 2D-only programs, but though it has an entry-level price, it is an integrated 2D/3D general-purpose, cross-platform product and can be usefully compared to DataCAD or ArchiCAD. The image of AllPlan in the same CAD article [page 129] was inadvertently printed upside down. *RECORD* regrets the errors. ■

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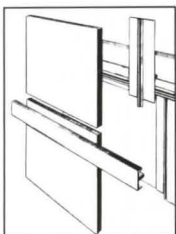
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(continued from page 42) Department of Energy. Call the AIA's PIA line at 800/242-3837.

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Educational sessions and a new product exhibition will be offered at the Center for Health Design's Tenth Symposium on Healthcare Design. Contact Center for Healthcare Design, 4550 Alhambra Way, Martinez, Calif. 94553; call 510/370-0345; or E-mail CTR4HD@aol.com.

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**Chicago Architecture Foundation
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"SOM at Sixty" is a show of 200 models developed over the past 15 years by Skidmore, Owings & Merrill. Call 312/922-3432.

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Competitions

The **London/UK Chapter of the AIA is sponsoring its Fourth Annual Excellence in Design Awards**. The program recognizes work, both built and unbuilt, in any location by U.K.-based architects or by architects outside the country who have a project in the U.K. Contact Karen Cook, Kohn Pedersen Fox, 13 Langley Street, London WC2H 9JG; fax 011-44-171-497-1175; or E-mail Kcook@KPF.co.uk.

New, restored, or rehabilitated theaters of any size, located anywhere, and completed after January 1, 1988, may be entered in the **1998 architecture awards program sponsored by the United States Institute for Theater Technology**. Submissions, due November 10, should be sent to Architecture Awards, USITT, 6443 Ridings Road, Syracuse, N.Y. 13206. For information, call Timothy Hartung, USITT Architecture Commissioner, at 212/807-7171.

Proposals for advanced study in any area of investigation that will contribute to the knowledge, teaching, or practice of architecture may be submitted to the **Brunner Grants program**. Sponsored by the AIA New York Chapter, the program is open to any U.S. citizen engaged in architecture or a related field who has a background more advanced than is implied by five

years of architectural training. Proposals are due November 15. For an application, write AIA New York Chapter, 200 Lexington Avenue, New York, N.Y. 10016; or call 212/683-0023.

The Environmental Design Research Association and the journal *Places* announce an awards program for **environmental design research and practice**. There are two categories of awards: "design research" awards for projects that investigate the relationship between physical form and human behavior; and "place design awards" for completed projects that demonstrate excellence as human environments. Open to designers and researchers in a range of fields, from architecture and planning to environmental psychology and sociology. Deadline for nominations is November 15. Write Janet Singer, EDRA, P.O. Box 7146, Edmond, Okla. 73803; call 405/330-4863; or E-mail edra@tepath.com.

The competition for the **\$20,000 James Harrison Steedman Traveling Fellowship** for study/travel abroad is geared to the theme "of water and ground." Candidates must have received a professional degree from an accredited architecture program no earlier than 1989 and must be working for an architectural firm or have at least one year of practical experience. Contact Steedman Governing Committee, Marianne Pepper, Washington University School of Architecture, Box 1079, One Brookings Drive, St. Louis, Mo. 63130; call 314/935-6293; or E-mail Steedman@arch.wustl.edu/steedman/.

The **Great American Main Street Awards**, cosponsored by financial services firm Edward Jones and the National Trust for Historic Preservation, recognizes five downtowns and neighborhood commercial districts each year for their outstanding revitalization efforts. Communities wishing to apply for the program may write the National Main Street Center, National Trust, 1785 Massachusetts Avenue NW, Washington, D.C. 20036; or call 202/588-6140. The entry deadline is November 1.

Books

Abstracting Craft : The Practiced Digital Hand by Malcolm McCullough. Cambridge, Mass.: MIT Press, 1996, 309 pages, \$30.

Reviewed by Norman Weinstein

Abstracting Craft is a philosophical essay on the computer as a design medium, written by an author who teaches architectural design at Harvard and has produced two widely

respected books, *The Electronic Design Studio* and *Digital Design Media* (with William Mitchell). In his latest book, McCullough suggests that we look at computer-mediated design in the same way we view traditional crafts like pottery or weaving. As he writes, "Our use of computers ought not be so much for automating tasks as for abstracting craft."

This book should be read by every architect, if only for its first chapter, entitled "Hands," which is one of the most thoughtful reflections ever on the complex relationship between the physical act of using a computer and computer-assisted design. McCullough makes a strong case for viewing a skilled CAD user as consider-

ably more than a technically sophisticated mouse-clicker.

The excitement created by the book's opening is somewhat dampened by middle chapters long on theory and short on real-life cases. McCullough's writing is consistently challenging, packed with unconventional design notions drawn from a wide range of disciplines beyond architecture. Not the most graceful of prose stylists, he nevertheless offers a compelling, paradigm-shattering read worth close attention.

Architects making the transition to CAD sometimes pine for the "old days" and remember colleagues "who could make a pencil sing!"

McCullough's book, despite its shortcomings, points to a day when we will praise those who can make computers likewise serenade.

Norman Weinstein writes about technology and art for Wired, MIT's Technology Review, and other magazines.

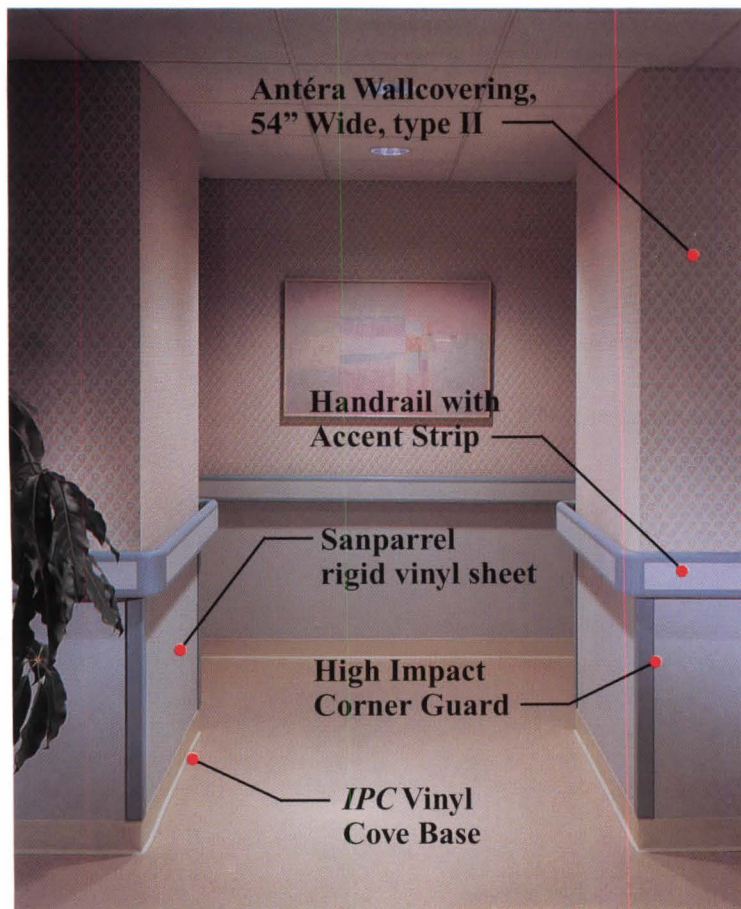
Terra-Cotta Skyline: New York's Architectural Ornament by Susan Tunick. New York: Princeton Architectural Press, 1997, 175 pages, \$45.

From Louis Sullivan's Bayard Building to Raymond Hood's turquoise McGraw-Hill Building, terra cotta has played a colorful role in New York architecture. But remarkably little has been published on the material. Susan Tunick, who is president of the Friends of Terra Cotta, fills the information gap with this handsomely produced and clearly written book. Sections on terra cotta's history, its manufacture, and its artistic uses are well researched and illustrated with archival photographs and new color photos by Peter Mauss.—*Clifford Pearson*

Snelweg: Highways in the Netherlands by Theo Baart, Cary Markerink, and Tracy Metz. Amsterdam: Idea Books, 1996, 175 pages.

Imagine filmmaker Jim Jarmusch, television journalist Charles Kurault, a highway engineer, and a correspondent for ARCHITECTURAL RECORD collaborating on a book and you'll get a sense of what this fascinating production is like. The book is exactly what its title promises and—believe it or not—it grabs, then holds your attention. Photographs by Theo Baart and Cary Markerink, in color and black-and-white, capture the mundane, the bizarre, and the quirky facets of highways in a flat country: everything from aerial views of flyovers to close-ups of teddy bears that the Dutch highway patrol give to children involved in car accidents. The text by Tracy Metz (who indeed is a correspondent for RECORD) covers equally unusual ground: from interviews with the straitlaced civil engineers who design and maintain highway tunnels to quotes from motorists who have struck up momentary flirtations with other drivers going 100 kilometers per hour. There are also fun facts on the percentage of Dutch land occupied by highways, the history of Dutch highways, and the top 10 traffic jams in Holland in the first quarter of 1996. The book is designed in a snazzy Euro style with yellow and white type on blue paper, a matte finish, and several gatefold spreads.—*C.P. ■*

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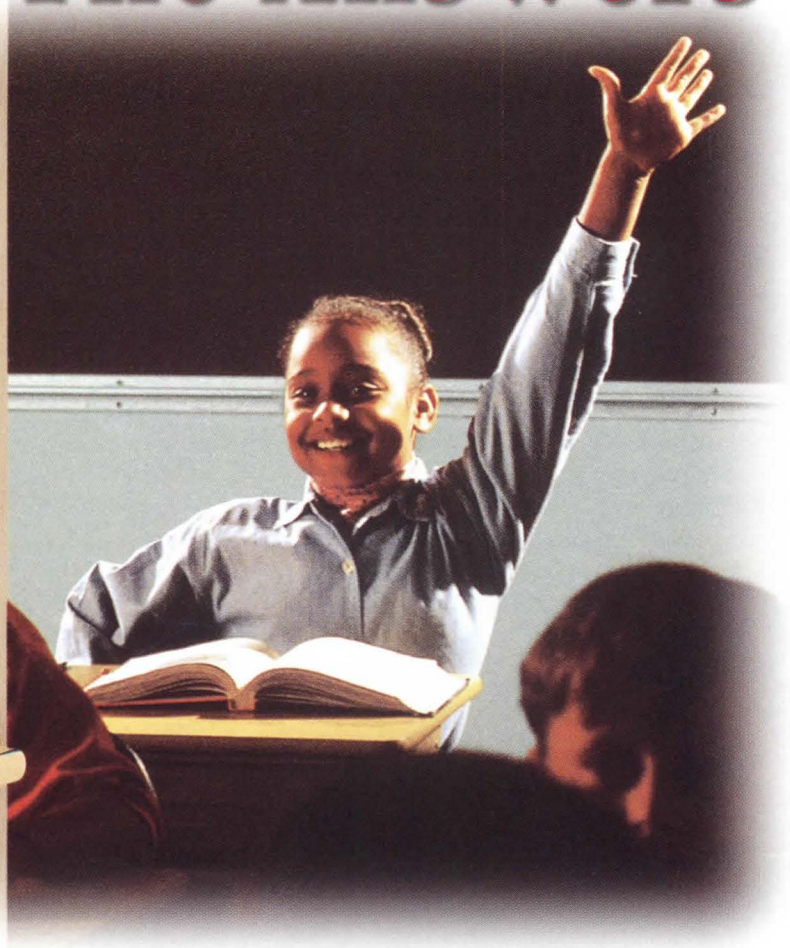
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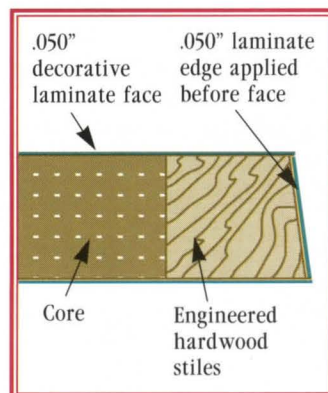
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ANSWERS

Answers refer to the article "The Maturing of Metal Framing" (pages 133–36). To receive CES credits, fill in the self-report form below.

1. Though attachment and sizing methods differ, steel framing can be assembled on site in a manner similar to that for wood framing. Vertical spacing is usually at 24 inches rather than wood's standard 16. Panelization is a similar approach, but wall sections are preconstructed in a shop and assembled on site. A third method utilizes presized and precut post-and-beam-like assemblies that may have increased horizontal span and greater strength.
2. There is an abundant supply of steel with consistent quality and steady pricing. Steel is dimensionally stable, accommodating long spans with its high strength-to-weight ratio. In the field, it can be purchased in specific lengths, resulting in less scrap. It is noncombustible, is not prone to attack by insects, and can be stored forever. Steel is easily recycled and does not release toxic gases.
3. Installation can be costlier. There is a shortage of experienced installers, and engineers unfamiliar with the system may overdesign. Acceptance may also be impeded by code officials who are not familiar with residential steel framing. Fastening techniques are slower than in wood framing. Insulation commonly used requires blowing agents that are known to deplete the ozone layer and are scheduled for future

phaseout. The fiberglass batt insulation used in wood framing is environmentally more benign.

4. Provide a thermal break between the metal studs and exterior sheathing on vertical walls. Consider placing insulation between metal joists and ceiling drywall (though experts have not yet endorsed this method). Consider new products that offer a higher level of insulation while requiring less of the environmentally problematic board insulation.
5. Funded by HUD, NAHB, and AISI, a prescriptive-framing standard facilitates sizing and specification of ordinary framing without the assistance of a design professional. Currently, the CABO One and Two Family Dwelling Code, which has been adopted by half the states, accepts the wall and floor components of the NAHB prescriptive method. The code prescribes that the steel be labeled by manufacturer, minimum uncoated metal thickness, yield strength, and thickness of galvanized coating. Though CABO's code is not applicable in seismic areas or where there are high winds, design shear values for attaching some engineered woods to steel framing are included in the ICBO's 1997 Uniform Building Code and SBCCI's 1997 Standard Building Code. Steel-framing code approval is pending for the BOCA code.
6. The NAHB prescriptive method provides guidance for one- and two-family metal-stud-frame residential construction. The agreement of the roll-forming industry on product standardizations and dimensions has made steel framing compatible with U.S.-manufactured window and door frames, and should promote accountability and growth in residential steel framing.



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"The Maturing of Metal Framing" (pages 133–36)

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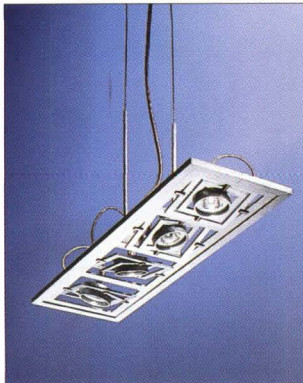
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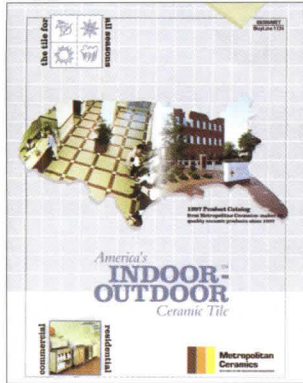


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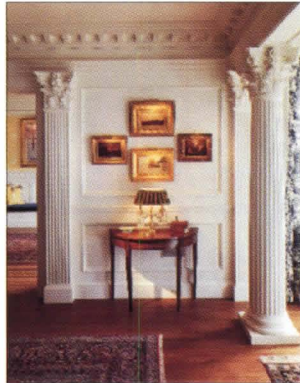


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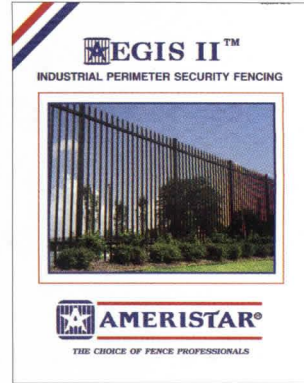


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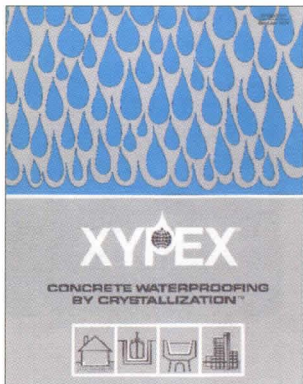


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CIRCLE 154 ON INQUIRY CARD

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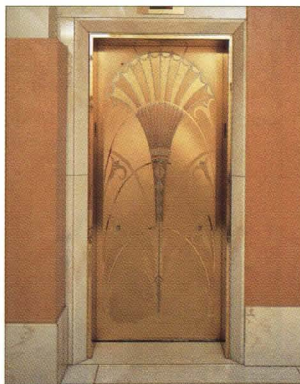


Applied as a slurry coating Xypex is a chemical treatment that waterproofs by penetrating the concrete with a crystalline formation that "plugs" the pores of the structure preventing water seepage. Xypex is ideal for use on the "inside" of wet underground structures.

Xypex Chemical Co.

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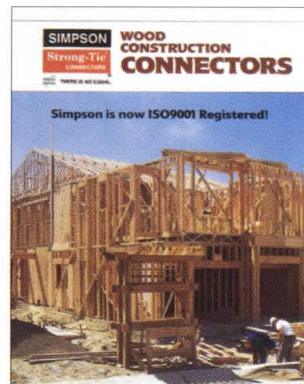


These bronze elevator door facings were manufactured by Surface Design + Technology specializing in custom & standard metal graphics. Using sheet metal finishes of a variety never offered before. There is virtually no limit to the types of patterns which can be created by combining multi-directional satin brushing, electroplating of gold, nickel, or copper. For information on custom or standard designs call (800) 537-1127.

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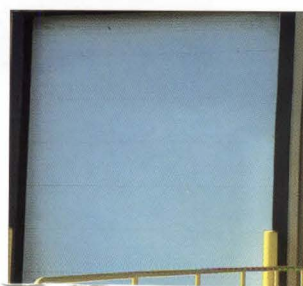
**Accessible Lavatory
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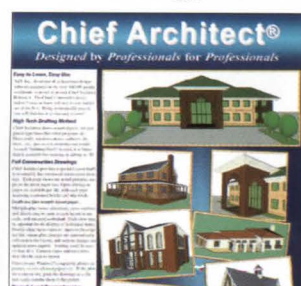
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THE FUTURE Eyeball to eyeball: Will iris recognition be the lock and key for the 21st century?

BY JOAN BLATTERMAN

There seem to be a lot more crooks out walking around, and they're a lot smarter than they used to be. From the electronic whizzes who clone computer passwords to divert bank deposits, to the same-name frauds who create false identities from credit-card receipts fished out of the trash, there are far too many impostors these days. In the next few years, biometrics will be used to

physical features such as fingerprints, voiceprints, or scans of an entire hand. But there are interpersonal difficulties with some biometric techniques. Fingerprints, used for decades as a unique determinant of individual identity, have acquired an aura of criminal suspicion. Messy and intrusive for the "donor," they can be altered, either deliberately or by circumstance (bricklayers have pretty worn fingerprints). Hand scans, which compare hand geometries, require physical contact by the user with the machine, and the hand must be exactly placed on the scanner. Voice recognition, now used to monitor felons under remote supervision (such as house arrest), can be tricked. And these technologies require the user's active cooperation.

Eyes don't lie

A start-up firm in New Jersey named IriScan thinks it has the biometric access-control and identification device for the next century: iris recognition. The technology is based on the ophthalmic research done in the early 1980s by doctors Flom and Safir, which demonstrated the unique characteristics of the random patterns within a human iris, the pigmented part of the eye that contracts in response to light. In the entire human population, no two irises are alike in their mathematical detail, even among identical twins. Dr. John Daugman, a computer-science professor at Cambridge University, developed the algorithms that permit the comparison of a living iris to its matching image already "enrolled" in a database. He describes his invention as a way of

encoding, and confidently recognizing, the complex, random patterns that make the iris a veritable human bar code. This person-matching technology needs only a glance into an ordinary video camera to record the unique aspects of an individual's iris; it takes only two seconds for a PC with IriScan software to search for the match within its system and verify (or deny) identification.

Because the iris is an internal organ of the eye, protected from environmental insults by the cornea and the aqueous humour, it does not change over time. Access-control units made by IriScan are user-friendly, and no physical contact is needed. A door- or wall-mounted box holds a video camera and a filtered red-light source, such as a tungsten bulb. The user simply looks at an image of his or her own eye displayed on a miniature TV screen set at a distance of 10 or 12 inches, as in the photo, left. Movements of the pupil confirm that it is a living eye, so that the device can't be fooled by a photograph or a glass eye.

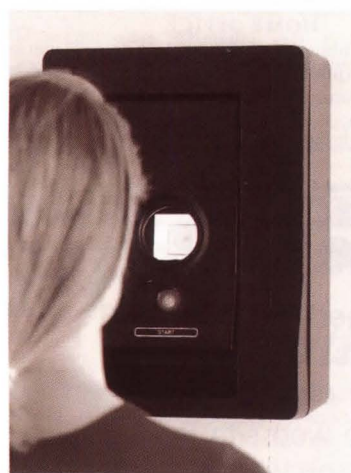
Iris recognition today

Prisons in Pennsylvania are now using iris-recognition entry-control units to secure inmate movements and enhance the physical security of personnel by reducing the temptation of prisoners to overpower an unarmed guard in order to grab his keys. Iris-scan techniques are also being used in some new ATM machines and check-cashing kiosks. Soon, small, portable iris imagers will enhance user security in such remote applications as stock sales over the Internet or point-of-sale

transactions in stores: thieves can steal Social Security numbers and forge credit cards, but they can't pretend to have your eyes.

Architectural applications

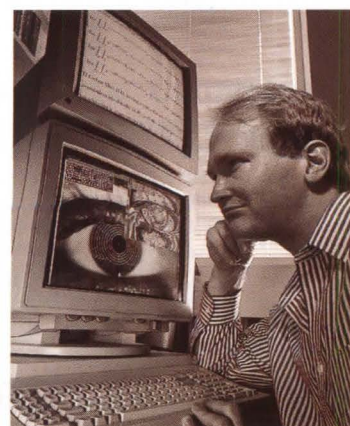
As new technology and competition drive costs down, electronic access control is fast becoming the norm in even budget-sensitive applications like colleges and healthcare. According to *Doors and Hardware*, an industry trade journal, a turf war is emerging between distributors of standard door-hardware products and the manufacturers and installers of electronic access-control systems. The security aspects of a given entry are starting to overwhelm traditional hardware concerns. Mark Olmo of Kolram Security Group cites a recent large project where the owner demanded electronic access-control devices on each of over 400 doors, showing how security concerns have top priority in the selection of door hardware. While handles and pulls will still be needed, keys may vanish. ■



The eye-scanning camera is a super-accurate electronic gatekeeper.

solve more and more of these identity problems—and architects will have to accommodate new ways of unlocking doors.

Biometrics, the statistical measurement of biological phenomena, compares physical characteristics—such as a human's fingerprints or a bird's white-tipped wing feathers—across a given population. High-speed computers can make such comparisons virtually instantaneous, matching the person at the ATM machine with information already entered in the database containing



Daugman stares at an encoded iris; the upper screen shows the math.

ARCHITECTURAL RECORD



A Tour of Meier's Getty Center

The Competition Game by *David Dillon*

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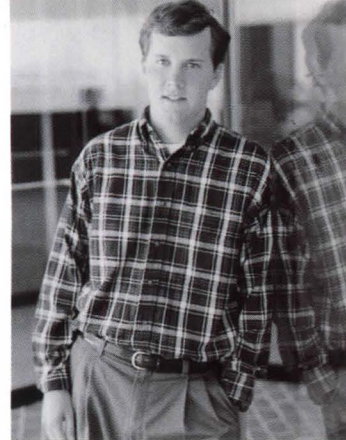
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SPEAK OUT *Becoming an architect: motivation to fail?*

ROBERT L. MORGAN



Robert L. Morgan is president of the American Institute of Architecture Students (AIAS). The AIAS is an independent professional student organization that promotes excellence in architectural education, training, and practice. It has a membership of more than 5,000 students, interns, and professional affiliates. For more information, contact the AIAS at 202/626-7472 or aiasnatl@aol.com.

In August 1993 I entered the Clemson University School of Architecture with 72 other students. These individuals were among the top academic achievers entering Clemson, with an average SAT score of 1,115 and an average rank in the top 20 percent of their high school classes.

When I was awarded my Bachelor of Science in Architecture last spring, only 35 of my original classmates stood beside me.

An attrition rate like this is alarming, but in the course of becoming an architect, not unusual. Students and interns face an eight-year-plus process that includes acquiring a degree from an institution accredited by the National Architectural Accrediting Board, participating in the Intern Development Program, and passing the Architect Registration Examination (A.R.E.).

College tuition is increasing, compensation during internship remains appallingly low, and the A.R.E. is now one of the most expensive professional exams in the country. Together, these factors have prompted many students and interns to opt for alternative careers.

While the AIA increases its efforts to restructure the profession, the educational environment drives away the very people who could implement change.

From the start, architectural students encounter a hazing mentality in which the success or failure of their design-studio performance, frequently harshly and subjectively judged, overrides all other educational experiences.

The hostile studio environment and lack of educational diversity pushes many students away from architecture. Some leave because they cannot handle the rigorous training, but many more leave because they do not see the ultimate reward for their efforts in either professional compensation or ultimate job satisfaction.

The college years should be a time when students expand their horizons while receiving an intense but well-rounded education. This cannot occur in a demeaning studio environment that demonstrates little sensitivity to personal and professional development. In an increasingly globalized economy, this educational approach discourages creative thinking just when we need it most.

Rather than motivate students to embrace the greater artistic, technological and social mission of architecture, today's training sustains an outmoded atmosphere of learning by public humiliation rather than by collective and constructive criticism.

This mind-set carries into the workplace as students become interns. Practitioners pay low wages, demand long hours, and generally assign unrewarding work. Architects are less interested in mentoring—continuing the educational process and filling the educational gaps that schools do not provide—than in interns' hours and billing value. In so doing, they turn their backs on the future of architecture, forcing interns into a stilted environment that stresses production over professional development.

If they survive school and internship, aspiring architects must then take the A.R.E. to become licensed. This past year the National Council of Architecture Registration Boards added insult to injury by almost doubling the price of the A.R.E. to \$980. In a profession that regularly complains that it does not get enough respect, little respect is paid to its fledgling members.

How can we work to redefine the profession when so little effort is dedicated to refining the process by which architects are made?

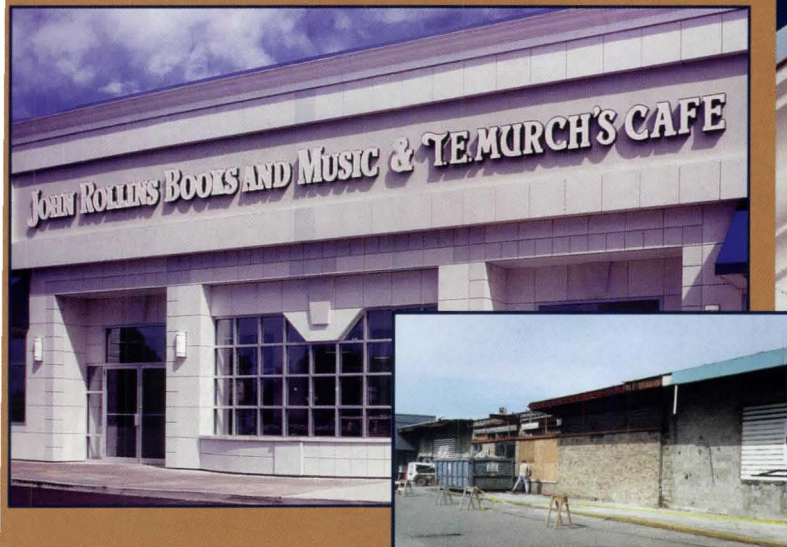
Talented and intelligent students are entering schools, but the training process fails to provide them with the necessary skills to become leaders in society and proponents of the profession. At worst, it steers them away from architecture altogether.

Until students, educators, interns, and practitioners break from this destructive tradition and redefine this moribund educational process, the profession of architecture will never be able to maximize its potential. ■

Contributions: *If you would like to express your opinion in this column, please send submissions by mail (with a disk, if possible) to Speak Out, Architectural Record, 1221 Avenue of the Americas, New York, N.Y. 10020; by fax to 212/512-4256; or by E-mail to ellen_popper@mcgraw-hill.com. Essays must not exceed 700 words. The editors reserve the right to edit for space and clarity. Where substantial editing occurs, the author will receive final text approval.*

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CIRCLE 12 ON INQUIRY CARD

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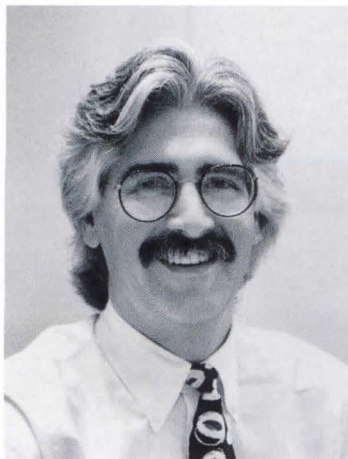


**Exterior Technologies
Group, Inc.**

MENTORS When wooing a new client, should you charge for conceptual design?

Belinda Stewart, AIA, is principal of Belinda Stewart Architects of Eupora, Mississippi. Her firm focuses on historic preservation, restoration, and new construction within historic environments.

R. K. Stewart, AIA, is a vice president with Gensler, in charge of the firm's Technical Steering Committee. Past president of AIA San Francisco, Stewart is Vice President for Professional Practice and Education, AIA California Council.



My husband and I, both architects, run a design firm. When a client approaches us with a project we start working right away. But we do not charge a fee until a design has been approved. Unfortunately, we have worked for weeks refining a plan, only to have the client take the drawings and have it executed by someone else. If we charge a retainer, we fear we may lose clients. Is there a solution? —T. A. Rahman

Belinda Stewart, AIA, responds: Communicate clearly with prospective clients. Describe in detail the services you are going to provide. Emphasize your creativity and professional training. Show how you have assisted other clients in this manner. Make every effort to be hired before preparing any design schemes. If you believe that the services you offer are valuable, it is up to you to impress this on your clients.

If, after full consideration, you choose to provide services up front, one alternative is to make a limited scope of work part of your marketing budget. Establish strict limits for what you will do. Set a specific time frame, number of schemes, or other quantifiable limit, and be sure it is agreed upon before you start. Define limitations on the use of the product if you are not hired.

While you may be concerned about alienating clients by charging them for design ideas, in fact subconsciously they may be thinking, "You get what you pay for." You need to ask yourselves, "Will a few lost clients have significant impact on

our firm's success?" You may not have received commissions from them anyway—and you will have gained valuable, remunerative time.

R. K. Stewart, AIA, responds: The question of compensation for design concepts is a difficult one, faced by all architectural and interiors practitioners. In general, there is no legal prohibition against providing free design services. Some states, like California, have requirements for a written contract defining scope of services and method of compensation prior to starting work. But this is the exception, not the rule.

Copyright laws provide some protection for your ideas. Design concepts are legally protected, but this safeguard is easy to surmount with a few design changes. Your question is really a business decision that each practitioner must make.

Architects tend to be optimists, believing our designs to be so compelling that clients will gladly pay us what we are worth. The reality is far different. As a profession we have not done a good job of convincing consumers of our value. Arguments raised about architects' worth are undercut when practitioners perform design services at no cost. Why should prospective clients pay for design concepts when we give them away?

Here are some factors to consider when deciding the business question of compensation: If you hope to cultivate a long-term relationship with this prospect, as a sign of your interest you may waive compensation for conceptual design. But while this may draw the client in, it

also sets up expectations that you will forego compensation on future projects. Unwittingly, you may cause the client to question your business sense. They may wonder, "How will these architects look after my money in managing the construction budget?"

For a new project type you may waive compensation as a research investment. Other options are to forego part of your fee, use lower billing rates, or develop other fiscal strategies to achieve your professional goals.

Whatever you decide, you can still take steps to protect your design concepts. Make your ownership of the copyright explicit. If you do not use a contract, then at least write a letter making your position clear. Or affix a rights ownership statement to the drawing. Establishing ownership may afford you legal recourse if the client asks someone else to execute your design. The most effective means is also the easiest: Do not give any drawings or electronic files to a potential client.

Compensation is a critical issue for architects. Is a client who does not want to pay you a client you really want to have? ■

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, 1221 Avenue of the Americas, New York, N.Y. 10020; by fax to 212/512-4256; or by E-mail to ellen_popper@mcgraw-hill.com. Submissions may be edited for space and clarity.*

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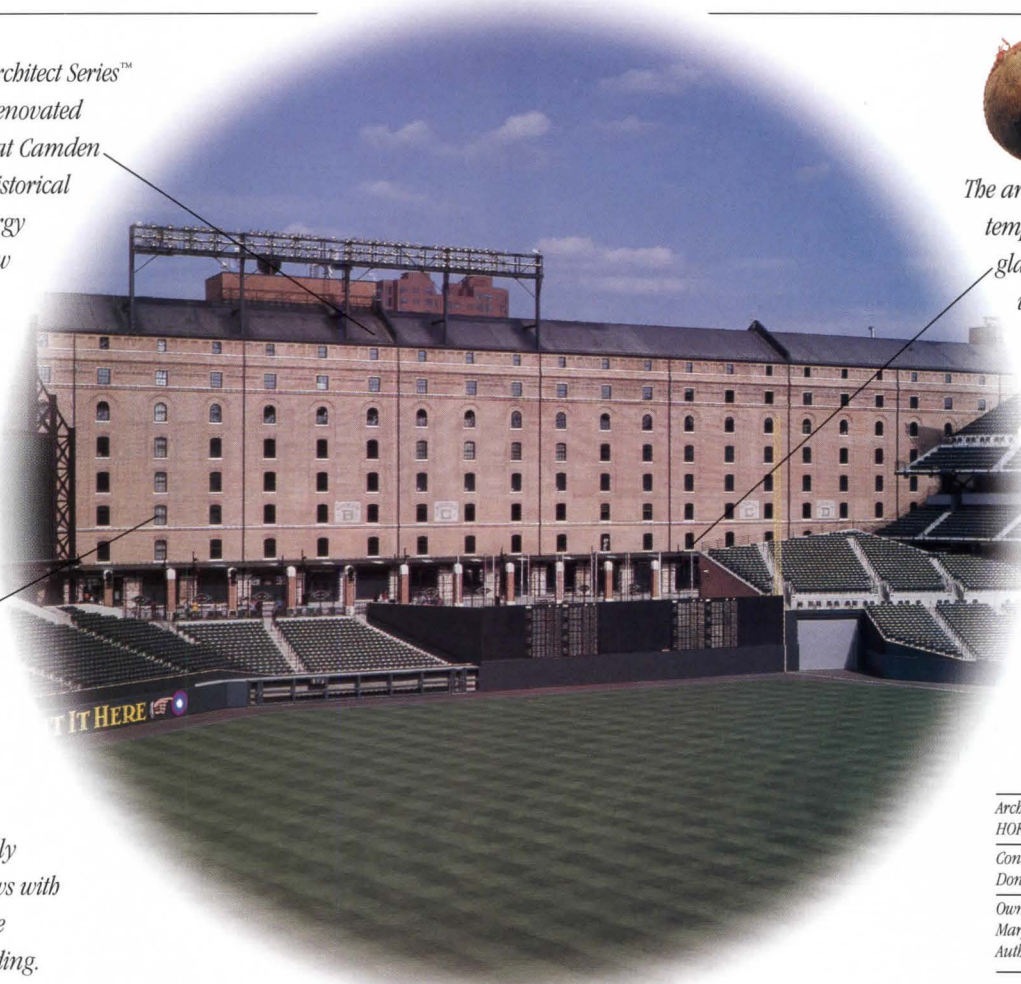
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CIRCLE 13 ON INQUIRY CARD

PULSE RECORD readers were asked:

Should the master's degree be designated as the first professional degree for all architects?

NO: 65%

YES: 35%

No: An architect practices by virtue of a license issued by a state. The same is true in law, dentistry, medicine, and engineering. Architecture has been practiced successfully for generations by those armed with no more than a baccalaureate degree. The university that educates and hires degreed graduates certainly adds the luster of professionalism and credibility to its programs, but the public need for licensed professionals is not met one millisecond sooner or to a higher degree of effectiveness by the practitioner with the master's or Ph.D.

Why subject a student to two degrees and seven years of effort only to enter a highly competitive profession that features low wages, limited job security, and an uncertain career path? And, yes, I have a master's degree.

—Unsigned

No: Single designation is absurd. The B.Arch. should be the first and only degree. The M.Arch. degree is for theorists.

—John A. McCormac, AIA
St. Petersburg, Fla.

No: There is much evidence that we are moving toward plurality in society. The energy of this pluralism drives our culture and the evolution of the architectural profession. The profession requires individuals who have different educational experiences, abilities, and cultural traditions. The notion that a single professional degree at the master's level will enhance prestige and reduce confusion is an illusion.

—Marvin J. Malecha, FAIA
Dean, School of Design,
North Carolina State University
Raleigh, N.C.

Yes: I firmly believe that the first professional degree should be a master's. I attended Kent State University's five-year, NAAB-accredited program. At KSU, the B.S. in architecture is awarded after four years of study. The B.Arch. is earned in the fifth year, which is considered a graduate-level year and requires graduate-level tuition. Explaining this process to the public and to parents is difficult. I now work for a firm and teach at a community college. Without a master's degree, it is virtually impossible to find a full-time position at a university without attending college for two more years, which is unlikely.

—Christopher Smith, Assoc. AIA
Gilberti Spittler International
Cleveland, Ohio

Yes: Five-year degrees have no academic credibility; they have been

dropped by most other professional fields of study. The five-year degree is technical training. Students should acquire a liberal arts education before pursuing a professional education.

—Robert L. Bliss, FAIA
Salt Lake, Utah

Yes: I believe that the key to this question is that all architects are human beings first and architects second. The advantage of obtaining an architectural degree in a graduate school is that you are surrounded (hopefully) by more mature people.

In most states, we do not even allow young people to drink until they reach the age of 21.

—Henry Chao, AIA
Payette Associates Inc.
Boston, Mass.

This Month's Question

Should more architects lead design-build teams?

Some proponents of design-build suggest that architects not only participate as collaborators but as prime contracting parties, employing general contractors as subcontractors to produce projects within agreed-to budgets and schedules. The compensation supposedly includes higher fees and greater potential for control of the entire process.

Should more architects lead design-build teams? Yes No

Copy and fax this form to 212/512-4256, or respond by E-mail to rivy@mcgraw-hill.com. Please include address and phone number if responding by E-mail.

Let us know your opinion:

May an editor contact you for comments?

Yes No

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NEW PUBLICATIONS ANALYZE DESIGNING FOR DISASTER

Publications emerging from two recent conferences will help architects accommodate the forces of nature. The National Multi-Hazard Institute, which convened in August and was funded by the Federal Emergency Management Agency (FEMA), addressed the design implications of flood, fire, wind, and earthquakes. Building technology and performance texts produced by FEMA for the conference include "Seismic Design Basics for Practicing Architects," "Wind Design Basics," and "Flood Protection Basics." For copies, call AIA headquarters or

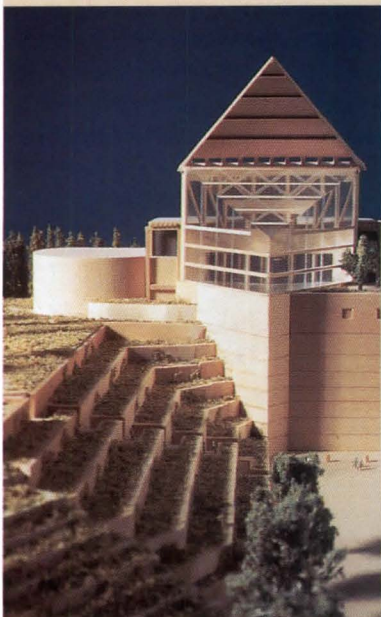
800/365-ARCH. A second conference, co-sponsored by the AIA and the Japan Institute of Architects, analyzed the Great Hanshin-Awaji Earthquake which rocked Kobe, Japan, in January 1995. The conference addressed response strategies, infrastructure damage, effects on earthquake-resistant buildings, and retrofitting for seismic stability. It produced a pamphlet entitled "Architectural and Planning Lessons from the Great Hanshin-Awaji Earthquake." To order, contact Deane Evans at the AIA. *Ellen Sands*

RABIN MEMORIAL ARCHIVE WILL RISE ABOVE TEL AVIV

On a promontory overlooking Tel Aviv and the Mediterranean Sea, a symbolic cornerstone was laid for the Yitzhak Rabin Center for Israel Studies. Israeli-born architect Moshe Safdie was selected to design the Rabin Center. Its stated purpose is to commemorate a singular leader by teaching the basic values of peace, democracy, equality, and tolerance, and to honor the ability of people of vision and courage. Moshe Safdie also designed Yitzhak Rabin's tomb, located on Mt. Hertzal in the National Cemetery, Jerusalem.

The Rabin Center will be built atop an underground war-time emergency power station, now abandoned. It will include a museum presenting Rabin's life and times, an auditorium, a research institute devoted to the history of the era, a library and archive, and a Great Hall for multipurpose use. The structure will incorporate the old power station

in its foundation. Looming above will be a seven-foot-tall glazed pyramid, the roof of the Great Hall. It will open and close with pivoting counterweights according to the season and the time of day. "Though serene in form, the Great Hall is in fact incomplete," said Safdie. "Its severed, ever-shifting shape bespeaks Rabin's disrupted life and the mission which he began, a mission which is yet to be completed." Construction on the 2,667-sq-ft complex is scheduled to begin in the summer of 1998, with completion expected in the year 2000. *Sally Brown*



ITALIAN EARTHQUAKE RECONSTRUCTION: AN OPPORTUNITY FOR BROADER VISION

The September 26 earthquake, registering 5.5 on the Richter scale, caused grave damage in the Umbria and Marche regions of central Italy. While repair to major monuments and works of art, such as the Basilica of San Francesco in Assisi and its important frescoes by Cimabue and Giotto, will be left to restoration professionals, the great challenge for Italian architects will be to rebuild the hundreds of small towns that give shape to this part of the Italian landscape.

Each town's historic center is encircled by perimeter walls, and has its church, municipal building, piazza, palazzo, and medieval street system. Each represents an urban microcosm of the larger and better known towns of Assisi, Foligno, Gubbio, Camerino, and Urbino. Together, these centers constitute a network of towns that seem to communicate with each other from one hilltop to the next. This structure contributed to the formation of a unique landscape that was strati-

fied, layer by historic layer, over time, a typological recurrence that should inspire professionals dealing with reconstruction to treat the region as a unified and coherent architectural artifact.

Shortly after the initial tremors, art historian Carlo Arturo Quintavalle, in an editorial in the Italian daily *Corriere della Sera*, proposed the designation of an Umbria-Marche National Park to protect the region's extraordinary medieval heritage. "At stake here is the future of the most illustrious urban fabric in Italy, of the landscape that inspired Saint Francis; at stake here is our history," he wrote.

The architects, engineers, and urban planners involved, as well as the hundreds of local governments administering the public funding that will certainly be designated for the area's reconstruction, have their work cut out for them. Will they develop strategies and tools to rebuild this comprehensive regional system? *Ilene Steingut*



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MEMORIAL USES GLASS AND LIGHT TO HONOR WOMEN IN THE MILITARY

After an eight-year campaign, the memorial to Women in Military Service to America was dedicated October 18 in Arlington, Virginia. The commission had been awarded in 1989 to Weiss-Manfredi Architects of New York City after a two-stage competition.

Intended to commemorate contributions of women from all branches of military service throughout the nation's history, the project was hampered by less-than-successful fundraising, an indication, some think, of the attitude toward women in the military.

The scheme takes an existing design element, the hemicycle at the end of the Memorial Bridge, and resculpts it. The original structure was a decorative retaining wall designed by McKim, Mead & White. Its statuary and inscriptions were

meant to be viewed while crossing the Memorial Bridge.

In the new scheme, an area behind the wall was excavated to create exhibition and theater space. The wall was also perforated to create exterior stairways leading to a roof plaza. Now visitors move over, above, and through the wall.

The architects etched the names of women onto skylights, through which light falls, casting the shadows of the names on vertical marble panels lining the interior space. Depending on the season, time of day, and cloud coverage, the light becomes a source of movement and mood.

The shadows of people walking on the roof deck cascade onto the panels below, in a poetic rendering of notions of the past and the temporality of this world. *Ellen Sands*



NEW MARKETING MATERIALS WIN THE STAMP OF APPROVAL

As the Society for Marketing Professional Services (SMPS) approaches its 25th anniversary, architects no longer shy away from the concept of marketing. In fact, this year's SMPS awards show that, having accepted brochures and direct mail as a matter of course, architects are looking for new ways to catch the attention of clients.

A whimsical set of stamps featuring portraits of firm personnel wearing building projects as hats did just that for Seattle-based GGLO, an

architecture and interiors firm. The stamps were so original they also won "Best of Show," a discretionary category reserved for unique and unusual entries. Another atypical submission was a mug of Irish breakfast tea, complete with tea bag, announcing a merger between John Ireland and Harrison Associates of Auburn, Maine.

Recognizing the expanding field, this year's awards included two new categories, special events and Web sites. *Gerald Moorhead*

ARCHITECTURAL PRESS ROUNDUP

ARCHITECTURE AS CORPORATE IDENTITY

The New York Times, September 17, 1997 Once again, architecture is functioning as corporate logo, and Big Blue is leading the way. IBM's sprawling new headquarters in Armonk, New York, signifies "the postmodern, postdownsizing, employee-empowerment era that the company now represents." The solemn old IBM building, designed by Skidmore, Owings & Merrill, "was a classic example of the corporate architecture of the cold war era," its design giving few clues to what went on inside. The new building, by Kohn Pedersen Fox, announces, "We're creative, we're innovative, we value our people."

HOMEOWNERS EVICTED BY MALL

U.S. News & World Report, September 15, 1997 When America's Founding Fathers framed the Constitution, they included the concept of "eminent domain," which allows government to take private property for public use. That concept is being stretched to its limit now as the difference between the public and the private realms blurs. In Hurst, Texas, a suburb of Fort Worth, the local government voted to condemn the property of 100 homeowners so that the town's biggest taxpayer, the North East Mall, could expand. But is this what urban theorists meant when they noted that private malls have become America's new main streets?

WHAT BECOMES A LEGEND MOST?

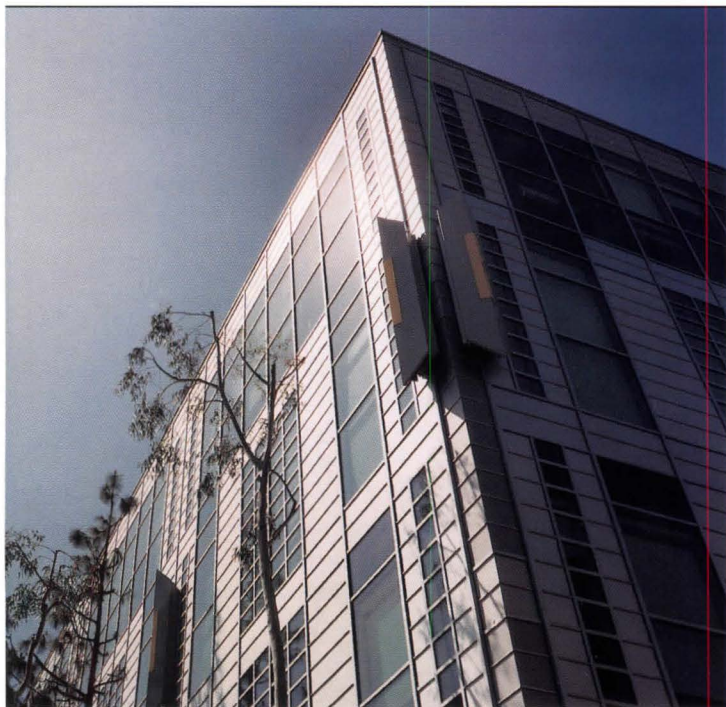
The Philadelphia Inquirer, October 2, 1997 Eighty-seven-year-old urban planner Edmund Bacon, whose ideas guided a generation of development in Philadelphia and whose book *The Design of Cities* helped to educate a generation of architects and planners, seems determined to go out with a bang, not a whimper. At a public hearing about Philadelphia's Independence Mall, Bacon shouted down a moderator who tried to curtail his negative comments on the latest scheme designed by landscape architect Laurie Olin. Bacon left by a side door before the meeting ended, telling a reporter that he'd rather spend his time on his memoirs, whose working title is *How it Happened*.

THE TALK OF L.A.

The New Yorker, September 29, 1997 Critic Kurt Andersen gave high praise to Richard Meier's Getty Center, opening this month on a hilltop overlooking Los Angeles. According to Andersen, Meier successfully avoided the oppressive sense generated by the "machined-looking repetitiveness" of many big modernist buildings. But he had help: a complex and composite program underscored by an enormous budget. The critic concluded "that the terrible thing about most postwar modernism was not the style but the budgets (too small) and the scale (too big)."

HOW TO UPDATE A MODERNIST ICON

The Atlantic Monthly, October 1997 Noting that "architectural modernism is now more than seventy years old," historian and critic Witold Rybczynski cautioned architects not to confuse Modernism with newness, as some of the entrants in the Museum of Modern Art's recent design competition for its own expansion seemed to do. Though it may sound like an oxymoron, "modernism does have a tradition—a rather long one," he wrote.



SKUNK WORKS BUILDING RENOVATION: FROM AIRCRAFT TO ANIMATION

It was where some of the world's most advanced airplanes were designed when Lockheed Aircraft owned the Burbank, California, site. After renovation by The Landau Partnership, Santa Monica, the Skunk Works building, as it was formerly known, is now home to the Disney Feature Animation unit.

The transformation of the 225,000-sq-ft, four-story building, which was nicknamed after a dark and magical place in the 1940s Li'l Abner cartoon, was called the best renovation in the West by the California Building Industry Association's Gold Nugget Awards.

"Our goal for this building," said architect Thomas Landau, "was to design an environment conducive to creativity. And for an occupant such as Disney, this immediately translated into an ambience of whimsy and informality."

The architecture is playful, with colorful, decorative lighting on the building exterior and canted interior corridor walls. The interiors were designed by Lauren Rottet of DMJM/Rottet. In addition, imaginative new fenestration was created to generate maximum light in a structure that formerly had minimal windows

due to stringent security requirements.

The maverick design approach that prevails at the Skunk Works Studio, as it is now known, extends to the executive suites. Sun-illuminated corner spaces are utilized for stairwells, not reserved for high-powered executives. The reason: the energetic Disney folks are more interested in speedy, pleasant journeys from floor to floor than they are in corporate hierarchy.

The building is the first phase of a \$220 million, 16-acre corporate entertainment campus being developed by M. David Paul & Associates.

CULTURAL LANDSCAPES QUALIFY AMONG WORLD'S ENDANGERED SITES

It's not just buildings and monuments. That's one of the messages coming from the World Monuments Fund (WMF) 1998–99 List of 100 Most Endangered Sites. Three cultural landscapes and four historic city centers are on the latest World Monuments Watch, which includes sites in 55 countries.

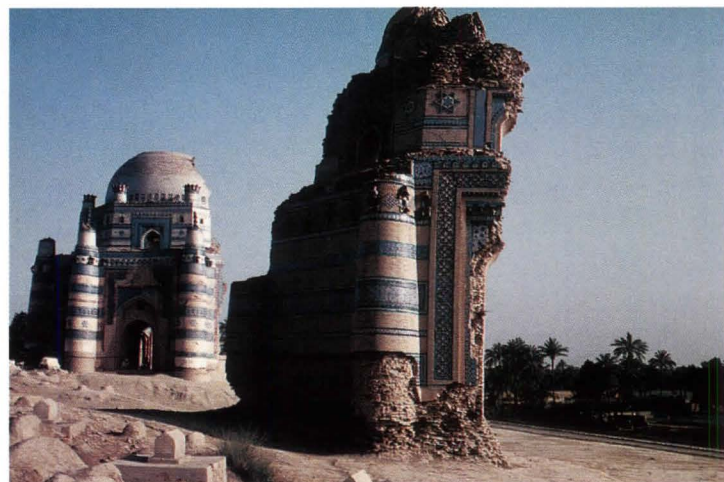
Today, commercial development threatens unique places such as Lancaster County, Pennsylvania, where the Amish have built and farmed for three centuries; the South Pass Cultural Landscape in Wyoming; and the Abava Valley Cultural Landscape in Latvia. The historic centers of Prague, Czech Republic; Tbilisi, Georgia; Irkutsk, Russia; and Kampung Cina, Malaysia, also made their way onto the latest Watch, the second listing since the WMF created the program in 1996.

Just as remarkable as the sites placed on the list are the ones removed because they have been repaired and therefore are no longer considered "endangered." Out of the 100 sites on the first list, only 25 remained on the 1998–99 roster.

"It's tremendously important, as we issue our second List of 100 Most Endangered Sites, to let people know that the World Monuments Watch has been a success," said Bonnie Burnham, WMF president.

The WMF, with funding from American Express, the Samuel H. Kress Foundation, and other groups, provided \$3 million in grants to 48 sites on the first list, prodding governments to join community groups in rebuilding. *Clifford A. Pearson*

The endangered Uch Monument Complex, Punjab Province, Pakistan.



CONTRACTORS (RELUCTANTLY) ENDORSE NEW AIA DOCUMENTS By a 130–67 vote, the Associated General Contractors board endorsed a revised version of AIA's A201—The General Conditions of the Contract for Construction, a basic document for owners and contractors. The vote came September 29 at AGC's mid-year meeting in Albuquerque. The new A201 was highly controversial among contractors and required a roll-call vote, a rare event for the AGC board. The provision drawing the most criticism dealt with delegating design responsibilities to contractors. Officials at AGC and AIA agree that design delegation has been increasing for some time, affecting areas such as curtain walls, precast concrete, and steel connections. "This isn't like new doors are opening," said Robert F. McCoolle, president of J.S. Alberici Construction Co., St. Louis, an AGC member who supports the new contract. Still, a vocal minority of AGC board members opposed the rewrite, worried that architects are shifting risks to them. McCoolle said opponents tended to be from smaller firms. But Dale Ellickson, counsel to AIA's contract documents program, denied that the new provisions transfer risks. Instead, Ellickson said, the document attempts to provide more certainty over delegation. The document says that the designer-of-record must establish required criteria for delegated design. It also prohibits delegation unless contract documents require it, and it says delegation cannot take place in a state where a statute prohibits it. *Tom Ichniowski*

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COLORADO MINING TOWNS ARE GAMBLING ON PRESERVATION

Seven years ago Colorado voters approved a plan to bring gambling to three moribund mining towns: Black Hawk, Central City, and Cripple Creek. A percentage of the gaming receipts was to be used to restore and maintain the towns' historic buildings.

Business is now booming, especially in Black Hawk. Many of the town's Victorian buildings have, indeed, been restored, at least superficially.

But preservationists are crying foul. Eagle Gaming, owner of Black Hawk's Canyon Casino, wants to move the town's oldest building, the Lace House, in order to expand its parking lot. The company offered the town, which owns the house, nearly \$3 million to move it and three other old homes 300 feet away to a "historic village." The city council approved the deal, setting the stage for a fierce battle between preservationists and developers.

Built in 1863, the house is an example of a vernacular style known as Carpenter Gothic. "It's a little jewel," said Edward G. White, Jr., AIA, who helped restore the building in 1976.

White was friends with Jack Kerouac in the 1940s and 1950s and is something of a legend in

Colorado. For the Lace House restoration he enlisted the help of the late poet Allen Ginsberg. White says the house should stay put. "That's where the history happened," he says. "Anywhere else, it just becomes an exhibit."

The move seemed like a done deal until former Black Hawk mayor Frances Olson remembered a \$10,000 grant from the National Park Service to help restore the house. To get the money, Olson signed a 30-year contract agreeing that the Colorado Historical Society would have to approve any changes made to the house. The society took the matter to court, and in October a judge issued a temporary injunction preventing the house from being moved until a permanent decision can be reached.

But for the preservationists, a victory in court may turn out to be a Pyrrhic one at best. Eagle Gaming says if it can't move the Lace House, it will build the new parking lot around it.

"Even if the building stays where it is, it's going to look awful," admits Lane Ittelson of the historical society. "And when the contract expires in 2006, Black Hawk can tear it down, if that's what they want to do." *David Hill*

Preservationists battle casino owners over relocation of the Lace House, a historic structure in the former mining town of Black Hawk, Colorado.



FOR ARCHITECTS IN THE PANHANDLE, NEW URBANISM WITH A TEXAS TWANG

Several recent New Urbanist projects in Texas have drawn upon indigenous ideas to create a sense of place and forge a connection with local history. Alliance Development recently held a design charrette to develop building prototypes for the 2,500-acre Texas Town in the expanding area north of Dallas/Fort Worth. Larry Speck, Dean of the University of Texas School of Archi-

while other commercial activities are developed.

On the Gulf Coast adjacent to Galveston, the 220-acre Beachtown project by Duany Plater-Zyberk & Co. uses a modified grid to continue the flavor of the historic neighborhoods nearby. Since the project is beyond the protection of the sea wall and close to sea level, houses and other buildings are designed with a raised first floor and breakaway ground floors, another native characteristic. Near the center of the scheme is Main Street, lined with mixed-use retail and anchored at the shore with a beachfront hotel. The neotraditionalist design standards for front porches, metal roofs, and picket fences will fit in well with Galveston's Victorian vernacular. As in Texas Town, mixed-use commercial buildings will be built along with the housing to improve the chances of success in community building.

On a much smaller scale is the 38-acre Traditional Neighborhood project in the Woodlands north of Houston by Peter Brown Civic Design. Adjacent to existing town homes and a shopping center, the plan incorporates a core of narrow lots served by rear alleys, pedestrian promenades, and a small neighborhood commons. Although it includes only single-family lots, the scheme provides an example of new urbanist infill within a typical suburban district. *Gerald Moorhead*



Texas Town, in the rapidly growing suburb north of Dallas/Fort Worth.

ecture, challenged a group of practitioners from around the country to consider orientation and use of local materials to find concepts that reflect an architecture suitable for Texas. The plan for the town, sited on the shore of a 40-acre lake, is a simple grid focusing on a town square typical of settlements planned by the Spanish settlers. Stone facades, metal roofs, and covered sidewalks lend a small-town atmosphere. The lake side of the square is anchored by a resort hotel that will provide a destination

Family Portrait

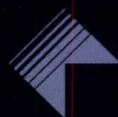


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CIRCLE 21 ON INQUIRY CARD

NEWS BRIEFS

Yale names architect for art school building

The office of Deborah Berke, AIA, has been selected to design a building for Yale University's School of Art, to be located at 1156 Chapel Street. The site, formerly occupied by the Jewish Community Center, was purchased by the University in December 1996. The project is expected to be completed by the spring of 1999. Berke is an associate professor of architectural design at Yale, where she has been on the faculty since 1987.

The healing environment that lived in a shoe

Enhancing children's awareness of the link between health and the built environment is the goal of the ShoeBox Adventure, part of the Tenth Symposium on Healthcare Design, held November 20-23 in San Diego, California. One thousand fourth graders will assemble at the San

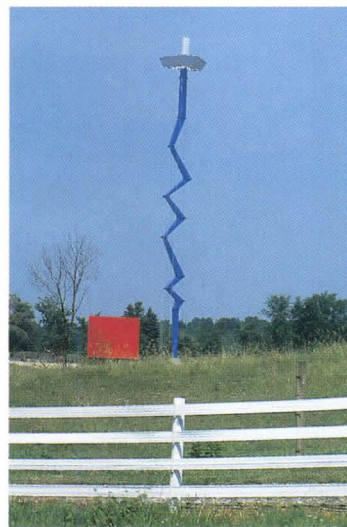
Diego Children's Museum to design shoebox-sized healing environments for exhibition at the symposium. The museum will host a reception for the project on Friday, November 21. The shoeboxes will not be graded, according to Annette Ridenour, chairperson of the Local Host Committee, but trends and themes that emerge will be discussed.

Architects hold a virtual debate

"Excellence in Design Online" featured Peter C. Pran, AIA, of NBBJ, William Pedersen, Jr., FAIA, of Kohn Pedersen Fox Associates, and Graham Gund, FAIA, of Graham Gund Architects, in a virtual lecture series about the impact of Internet technologies on the future of design. Sponsored by Autodesk, Inc. and Cornish Productions, the four-part series included a real-time question-and-answer session and a virtual tour through design drawings. Highlights of the event can be found at www.autodesk.com and www.cornishproductions.com.

Lightning strikes in Michigan

What telephone poles were in the past, cellular-phone relay towers are today. They dot the landscape, where they are placed to satisfy transmission requirements, not aesthetics. When Airtouch Cellular sought to build a tower in Ann Arbor,

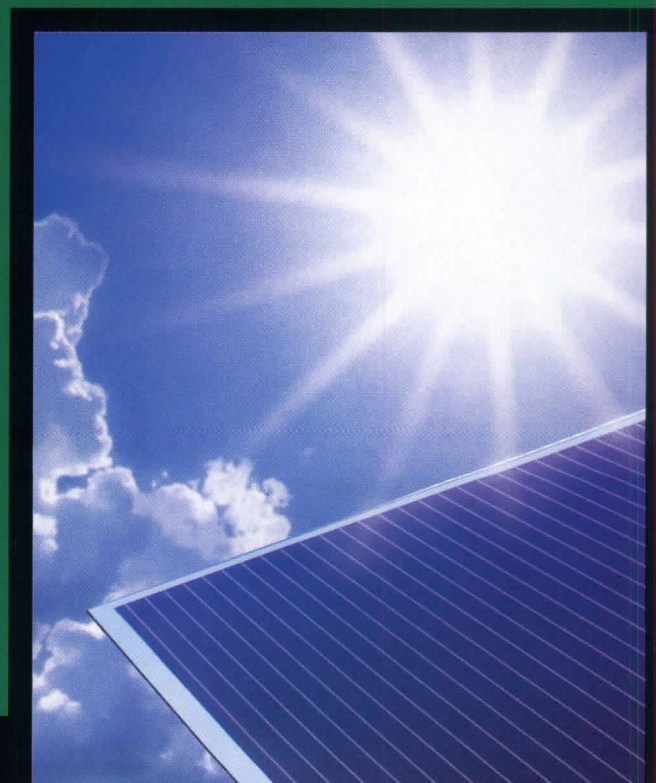
Cellular tower, Ann Arbor, Michigan, designed by Gunnar Birkerts, FAIA.

Michigan, their site fell in the midst of Domino's Pizza World Headquarters. Domino's President, Tom Monaghan, agreed to lease the land on the condition that the tower be designed by Gunnar Birkerts, FAIA, the architect for the pizza company's complex. The result: a cobalt blue steel tower shaped like a bolt of lightning, metaphorically connecting the earth to the sky.

Future shock What form will the work surface of the future take?

The question was posed in a competition for under-forty-something design professionals by the Young Architects Committee of AIA Chicago. The answers say a lot about the future of work. First place went to Mark Gee of Venice, California, for a combination drafting screen, multiple input stylus, view control remote, and goggles designed to facilitate three-dimensional design. Keith Moskow of Boston took second place with an earth-berm lawn chair that provides

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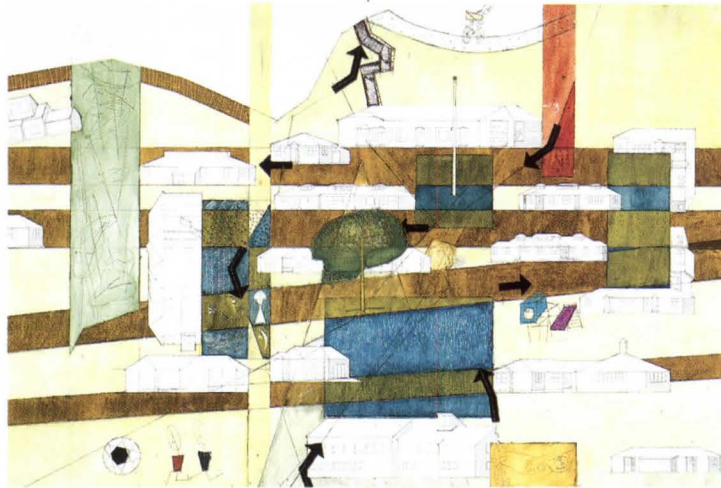


Solar Energy (by BP)

a place to connect with nature as you work. Third place went to The Flip 360 by Robert Chambers and Paul Somers of Chicago, a desk that folds into itself for home office use and other places where space is at a premium.

Research consortium formed

Ten workplace industry leaders recently joined to create the Center for the Built Environment (CBE) at the University of California's Berkeley campus. The consortium will provide resources for building-related research. Initial efforts will focus on building performance evaluation and new technology. The CBE plans to develop new tools to evaluate occupant satisfaction, indoor environmental quality systems, operating conditions, and energy efficiency. Participants include the International Facility Management Association, the Bank of America, Herman Miller, Inc., the U. S. Department of Energy, and the U. S. General Services Administration.



Rendering of Shaker-inspired Shady Hill School, Cambridge, Mass.

Shaker village inspires school design

The Shady Hill School of Cambridge, Massachusetts, consists of one-story classroom buildings loosely organized around a series of greens. When Perry Dean Rogers & Partners Architects were commissioned to expand the campus, they turned to an 1836

rendering of a Shaker village for inspiration on how to integrate a new upper school into this tightly knit educational village. The program calls for the replacement of three buildings and the renovation of a fourth to house 12 classrooms and related support functions.

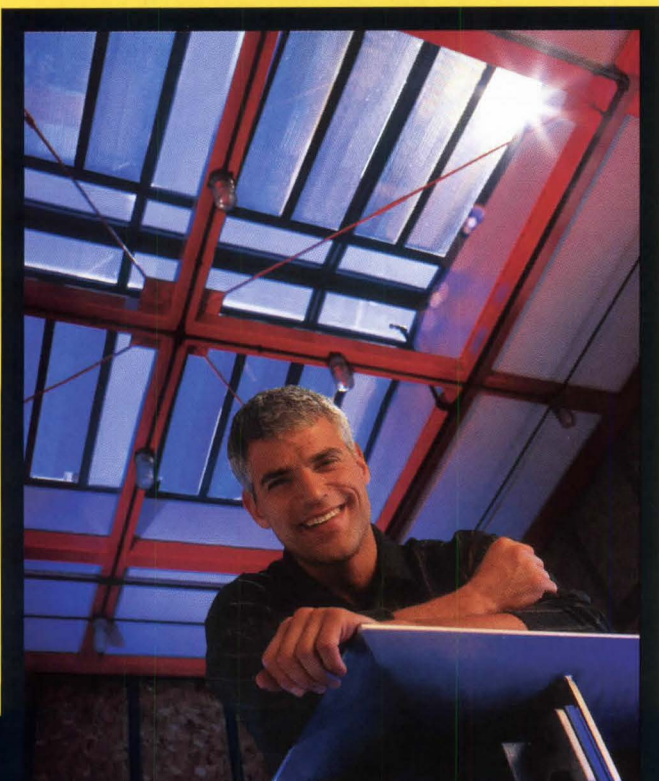
Ellerbe Becket to appeal ADA ruling

Ellerbe Becket, Inc. will appeal a federal judge's decision

that paves the way for a U.S. District Court in Minnesota to determine if architects can be held liable for their designs under the Americans With Disabilities Act. On September 30 Judge John R. Tunheim denied the architect's request to dismiss a lawsuit brought by the Justice Department. The government alleges that six arenas designed by the firm are not in compliance with the ADA and that architects, like project owners, are responsible for compliance with the law.

From warehouse to museum in North Dakota

The former home of the International Harvester Corp. in downtown Fargo, North Dakota, was transformed into the Plains Art Museum by Hammel Green and Abrahamson, Inc. of Minneapolis. The challenge was to take a structure with very little heat and humidity regulation and create within it an environmentally controlled core for storage, preparation, and exhibition of works of art. ■



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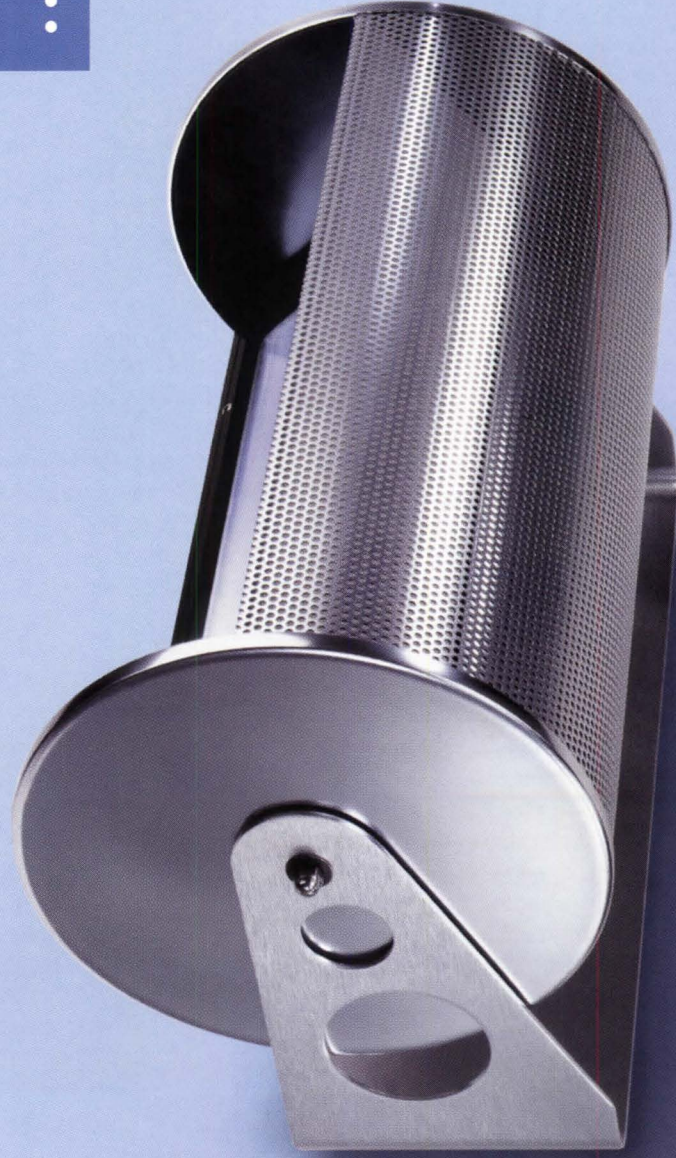
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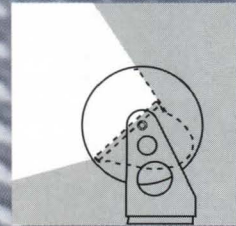
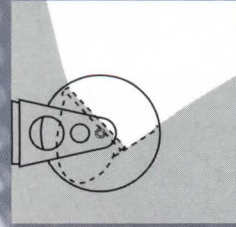


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CIRCLE 24 ON INQUIRY CARD

DATES EVENTS BOOKS

Calendar

November 3–28

**Gund Hall Gallery, Harvard University
Cambridge, Massachusetts**

"Dan Kiley, Landscape Architect: The First Two Decades," presented by the Harvard University Graduate School of Design, covers early works by the legendary designer. In conjunction with the exhibition, a symposium is scheduled for November 14. For further information, call the GSD Office of Lectures and Exhibitions at 617/495-4784.

November 6–December 5

**Arthur A. Houghton, Jr., Gallery,
Cooper Union
New York City**

"Joze Plecnik and the Prague Castle" documents the proto-postmodernist architect's extraordinary 15-year renovation of a pre-Romanesque Czechoslovakian castle. The fortress was destroyed and rebuilt several times before being resuscitated by the leader of the country's short-lived democracy, President Masaryk, in 1920. Call 212/353-4232.

November 11–January 18, 1998

**American Craft Museum
New York City**

"Four Acts in Glass: Installations by Chihuly, Morris, Powers, and Vallien" presents the work of four artists who have moved beyond the making of glass objects to examine the medium in larger spatial, architectural, and theatrical settings. For the exhibition Dale Chihuly, William Morris, Pike Powers, and Bertil Vallien have created site-specific installations that encompass all of the galleries of the museum, including a multistoried glass structure in the atrium. Call 212/956-3535.

November 12–December 19

**Van Alen Institute
New York City**

"Designing Islands: The Public Future of New York's Archipelago" offers the first New York showing of entries from "Ideas Afloat," an international competition for the design of Davids Island (off New Rochelle). It also places the entries in the context of design initiatives for New York's other islands, including projects for Governors Island and Randall's Island. Call 212/924-7000.

November 12–March 1, 1998

**Philadelphia Museum of Art
Philadelphia**

"Philippe Starck Designs/Reinventing the American Hotel" provides a sampling of the French designer's objects and interiors, featuring everything from furniture to utensils. Also on view will be elements from a guest room at the Paramount Hotel. Call 215/763-8100.

November 18–20

**World Trade Center
Boston**

More than 8,500 architects, engineers, builders, contractors, facilities managers, specifiers, and other industry professionals are expected to attend the 13th annual Build Boston trade show, sponsored by the Boston Society of Architects. Among the topics to be covered in more than 180 workshops are "Making Main Streets Come Alive: Solutions for Street Trees in Urban Projects," "Multimedia Innovations in Retail Design," "What Getting 'Wired' Really Means," and "Firestopping: Changes and Challenges." More than 250 suppliers of building products and materials will present their wares. Among the event's other presentations is "Bringing the Past into the 21st Century: Policy, Materials, and Systems," a conference series on preservation and restoration issues. For information, call 800/544-1898.

November 19

**National Institute of Building Sciences
Washington, D.C.**

The use of sustainable building insulation materials will be the focus of discussions at a one-day symposium sponsored by the Building Environment and Thermal Envelope Council (BETEC) of the National Institute of Building Sciences. Presenters will address findings and the practical application of indigenous, recycled, and waste materials such as pumice, flyash, sawdust, perlite, wood fibers and agricultural straw for sustainable and efficient insulation. Topics include design approaches, construction techniques, laboratory field testing, case studies, and code issues. For information, call Pat Cichowski at BETEC at 202/289-7800; fax 202/289-1092; or E-mail pcichowski@nibs.org.

November 20–23

**San Diego Hyatt Regency Hotel
San Diego, California**

Educational sessions and a new-product exhibi-

tion will be offered at the Center for Health Design's Tenth Symposium on Healthcare Design. Contact Center for Healthcare Design, 4550 Alhambra Way, Martinez, Calif. 94553; call 510/370-0345; or E-mail CTR4HD@aol.com.

Through November 25

**Chicago Architecture Foundation
Chicago**

"SOM at Sixty" displays more than 200 building models of projects by Skidmore, Owings & Merrill from the last 15 years, documenting the Chicago-based firm's design process. Call 312/922-3432.

Through November 29

**Couturier Gallery
Los Angeles**

Architectural renderings produced primarily in the 1950s and 1960s by the modernist architect Richard Neutra are on view, as well as prototypes of furniture he designed in the 1930s. Call 213/933-5557.

Through December 3

**Architectural League, Urban Center
New York City**

"An Architecture of Independence: The Making of Modern South Asia" celebrates four pioneering architects whose work has largely defined the contemporary architecture of South Asia: Muzharul Islam of Bangladesh and, from India, Charles Correa, Balkrishna Doshi, and Achyut Kanvinde. City planning and residential projects, universities, and cultural and institutional facilities are presented through drawings, models, and photographs. A symposium, "An Architecture of Independence: Modernism and the Next Generation," will be held November 15 at the Asia Society, New York City. Call 212/753-1722.

Through December 7

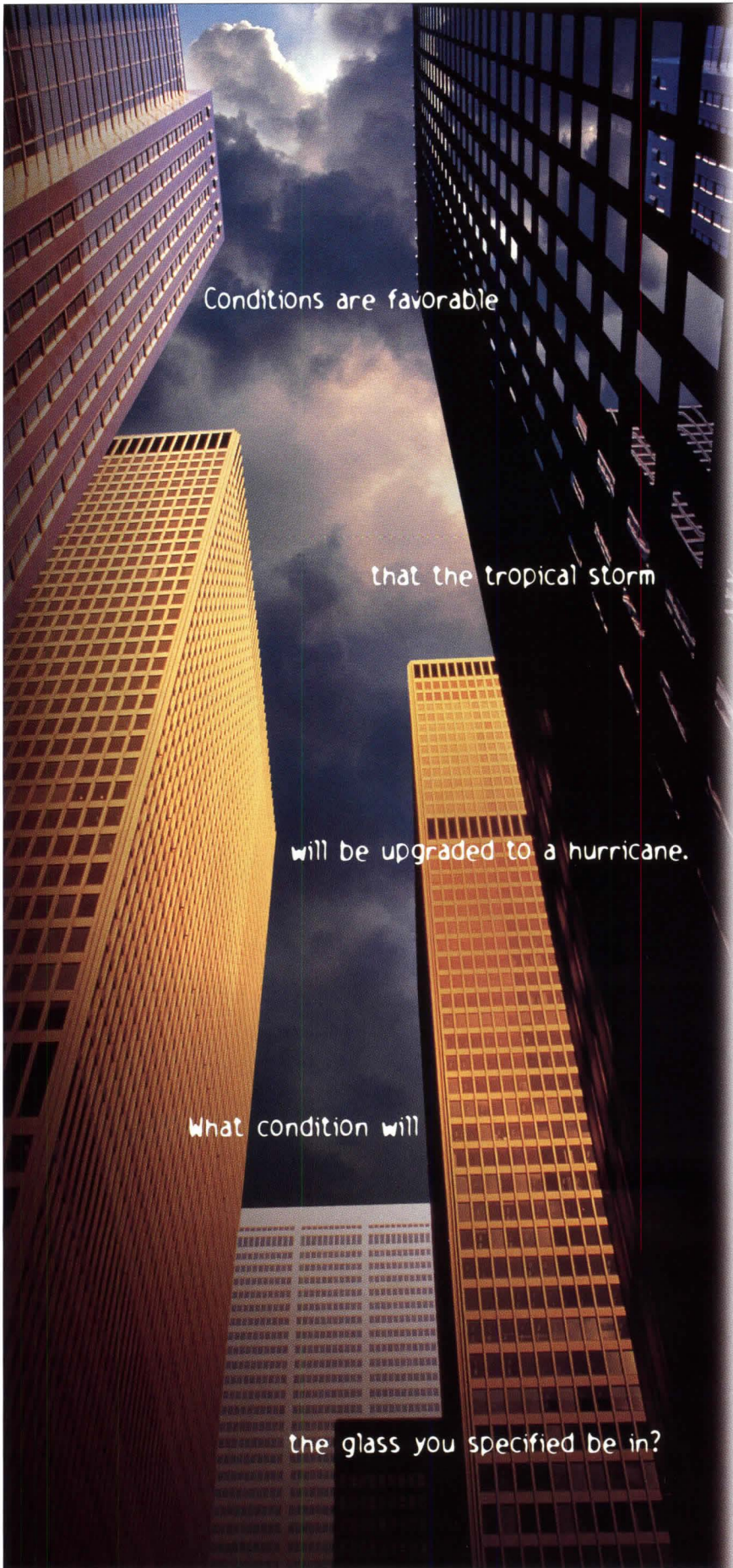
**National Building Museum
Washington, D.C.**

"Sheltered by Design" presents exemplary low-income housing projects from across the country, including Cleveland's Renaissance Village and Boston's Harbor Point. Through photographs, renderings, and floor plans, the exhibition illustrates the relationship between good design and the success of public housing. Call 202/272-2448.

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Building” includes models, drawings, and photographs of the celebrated skyscraper, and examines its role in the life of New York City. Call 212/534-1672.

December 9–January 17, 1998

**Storefront for Art and Architecture
New York City**

An exhibition of projects by Gordon Kipping documents his work revitalizing urban structures, particularly on New York’s Lower East Side. Call 212/431-5795.

December 11–February 8, 1998

**Municipal Art Society
New York City**

“The Bronx Community Paper Company: Designing Industrial Ecology” chronicles the design evolution of a state-of-the-art recycling plant and paper mill by New York architect Maya Lin. Call 212/935-3960.

December 12–January 24, 1998

**Architectural League, Urban Center
New York City**

The work of 20th-century modernist Charlotte Perriand, who began her career working in collaboration with Le Corbusier and Pierre

Jeanneret on interiors and furniture, is the focus of a retrospective exhibition. Furniture, lighting, and photographs will be displayed. Call 212/753-1722.

December 19–March 10, 1998

**San Francisco Museum of Modern Art
San Francisco**

“Zaha Hadid: Painted Projects” is the first solo museum presentation of the work of the Iraqi-born British architect. The exhibition includes two dozen of the architect’s paintings, which depict cities and buildings in assemblages of exploded lines and planes. Her competition-winning designs for The Peak Club in Hong Kong and the controversial first-place scheme for the Cardiff Opera House in Wales are among the works on view. Call 415/357-4000.

Through December 28

**Orange County Museum of Art
Newport Beach, California**

“Frank Lloyd Wright: Designs for an American Landscape” explores five little-known visionary projects by the architect. More than 150 drawings from the Frank Lloyd Wright Foundation and the Library of Congress are included. Call 714/759-1122.

Through December 31

**Baltimore Museum of Art
Baltimore**

Paintings and decorative arts objects by Baltimore artists, silversmiths, and cabinetmakers completed between 1790 and 1820 are on view in “Celebrating Baltimore’s Birthday.” The exhibition honors the 200th anniversary of the incorporation of the City of Baltimore and inaugurates the reopening of the museum’s John Russell Pope building. Call 410/396-7100.

Through January 4, 1998

**Fogg Art Museum, Harvard University
Cambridge, Massachusetts**

“Rome and New York: A Continuity of Cities,” an exhibition of prints from Piranesi to the 20th century, examines Rome’s image as an ancient center of power and religion and New York’s as the epitome of the modern city. It also demonstrates how each city has at times embodied the qualities associated with the other. Call 617/495-2397.

Through January 4, 1998

**Katonah Museum of Art
Katonah, New York**

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Playing the Competitions GAME

DESIGN COMPETITIONS GENERATE A LOT OF PUBLICITY. BUT ARE THEY WORTH THE EFFORT?

by David Dillon

Nineteen ninety-seven may be remembered as the year of the competition, or at least the year when competitions made more architectural news than anything else. In January, the Museum of Modern Art (MoMA) in New York City announced an international designer bake-off for the renovation and expansion of its West 53rd Street building, with the winner to be named—perhaps—in December. That would coincide bicoastally with the opening of Richard Meier's Getty Center in Los Angeles, the most coveted competition prize of the 1980s. In May, the Modern Art Museum of Fort Worth presented Tadao Ando with his first major American commission, only a few weeks before three young architects from Berlin won the international competition to design a memorial to the victims of the Oklahoma City bombing.

The winning proposal for the World War II Memorial on the mall in Washington, D.C., by Friedrich St. Florian, received the same angry critical reception as the neighboring Franklin Delano Roosevelt Memorial, which opened in May, a mere 23 years after Lawrence Halprin won the final competition. Major competitions are under way for a new student center at the Illinois Institute of Technology in Chicago, across from Mies van der Rohe's Crown Hall, and a new campus for the University of San Francisco, as well as for assorted new towns, town centers, and government buildings around the country.

While nobody is keeping score, the consensus is that 1997 has been a very big year for competitions.

omy is bad. In good times you may pick up the young firms that don't have a lot of work. But this year even the stars are participating." Whether this is evidence of bottomless optimism or hopeless naivete is unclear. Enthusiasts consider competitions an essential tool for raising public awareness of good design while also bringing young talent into the spotlight.

"Competitions that are well done are enormously beneficial to the profession," explains architect Paul Spreiregen, another professional advisor whose competitions include the Vietnam Veterans Memorial. "Because of the power of the magazines, the real breadth of American design doesn't get the recognition it deserves. We have a distorted view of what's out there. Competitions can present the whole spectrum."

The argument against competitions

Robert Venturi, speaking for the disaffected wing of the profession, compares architectural competitions to doctors prescribing for patients they haven't examined. "Good buildings emerge only after extensive dialogue with a client, and that is difficult to have in most competitions these days. Many are determined by advisors who haven't made it as architects and try to make themselves look good by making your life miserable. You're expected to arrive at an answer before the client has even formulated the question."

An informal AIA survey several years ago showed architects evenly split on the value of competitions. Yet the division had nothing

IF LOCAL COMPETITIONS PROVIDE MAJOR OPPORTUNITIES FOR YOUNG ARCHITECTS, THE SPLASHY INTERNATIONAL ONES CAN BE SWAMPS OF POLITICAL INTRIGUE.

Bottomless optimism or hopeless naivete

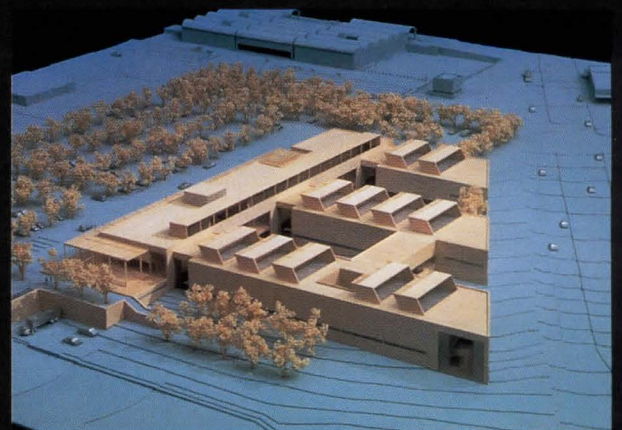
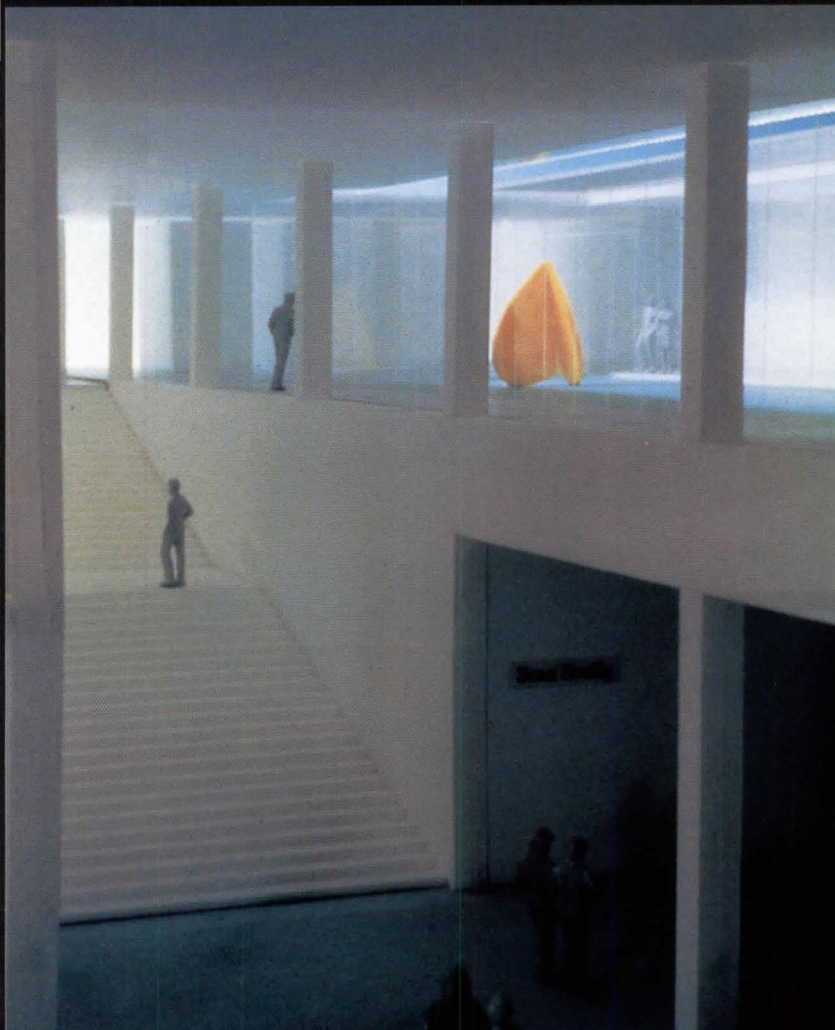
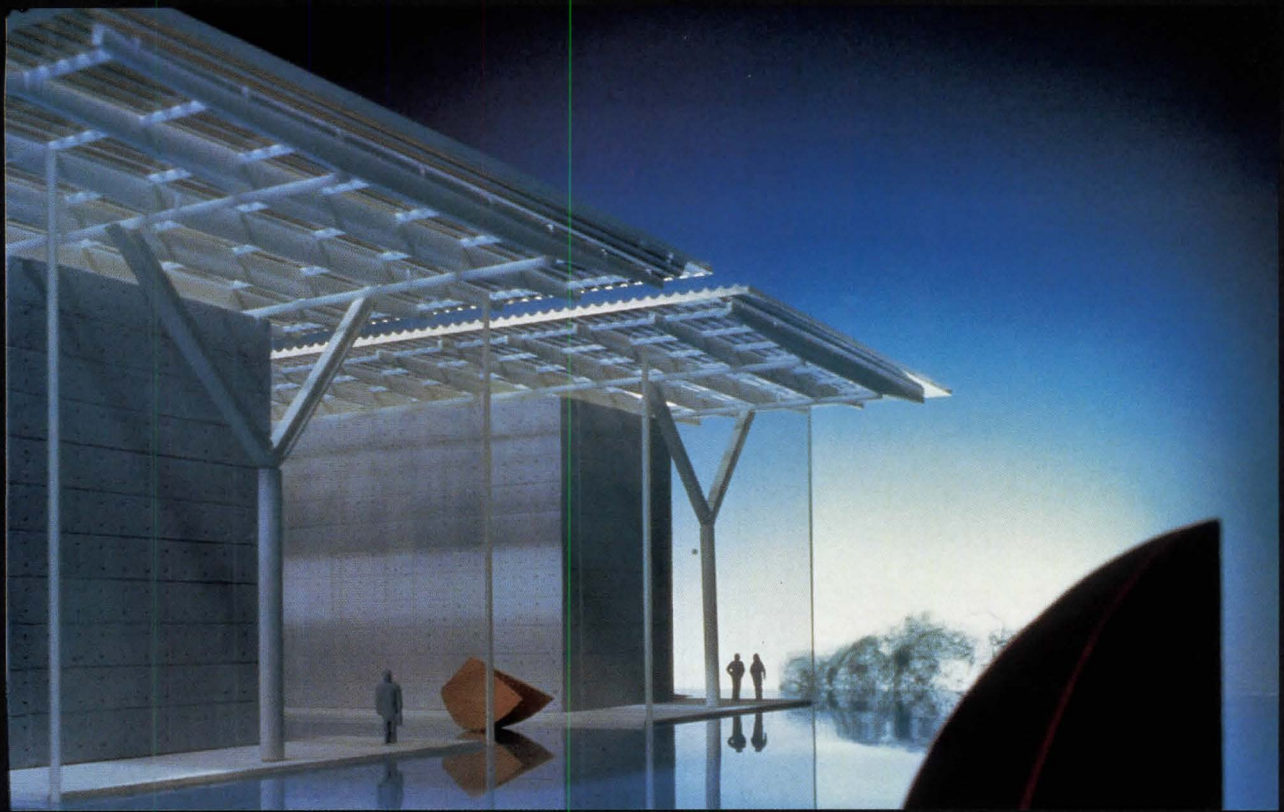
"It's surprising and somewhat anomalous," says architect Donald Stastny of Portland, Oregon, a professional advisor on Oklahoma City and other major competitions. "Usually you see a lot of competitions when the econ-

to do with the age of the architects, the size of the firm, or the kind of work they did.

Such ambivalence is rare in Europe, where competitions are both a way of life and an instrument of public policy. Libraries, schools, daycare centers, bus stations, virtually every public project is fodder for competitions. Many are restricted by region, town, even neighborhood to give local talent a chance. Alvar Aalto's first public commission, a bus shelter in Helsinki, was won by competition. The enduring legacy of the 1992

Contributing Editor David Dillon is the architecture critic for the Dallas Morning News and has written a book on the FDR Memorial, which will be published by Spacemaker Press in 1998. He is also the author of the new plan of Washington, D.C.

Winning the competition for the Modern Art Museum of Fort Worth, Tadao Ando earned his first freestanding commission in the U.S. Model shots show what Ando designed for the museum (right and below left). Among the other entries were schemes by Richard Gluckman (below right) and Carlos Jimenez (bottom right).

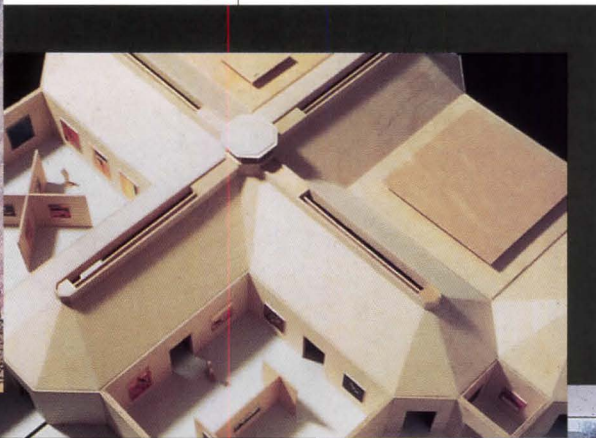
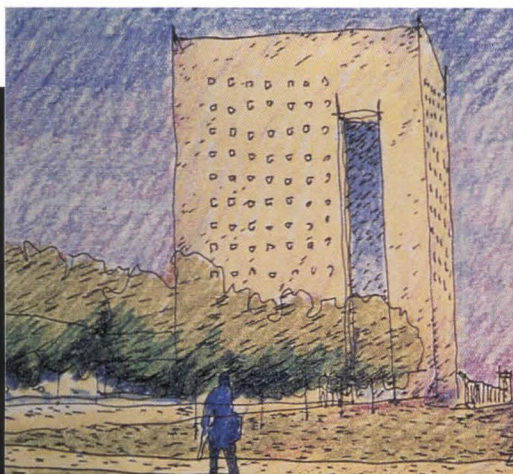


Barcelona Olympics lies not only in the monuments by imported designers but also the dozens of plazas, soccer fields, and marinas created by home-town architects. The games enfranchised an entire generation of local practitioners.

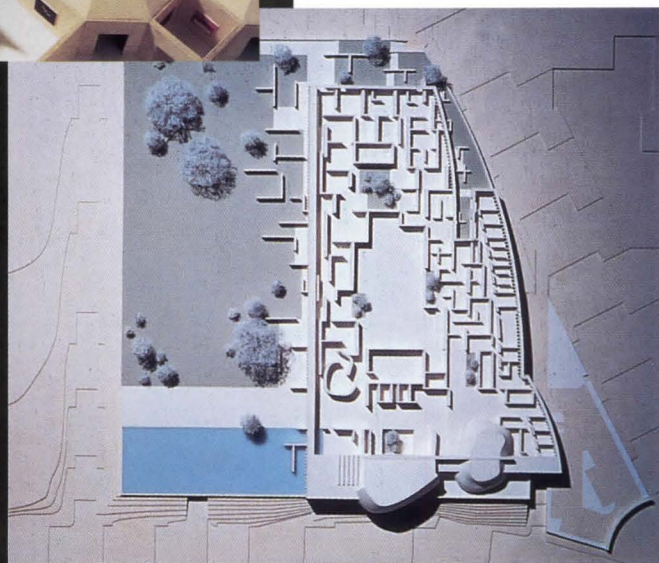
But if local competitions provide major opportunities for young architects, the splashy international ones can be swamps of political intrigue in which jury decisions are capriciously overturned by outside forces.

An international fiasco in Berlin

Consider the 1988 competition for an addition to the American Memorial Library in Berlin, which went three rounds, produced two winners, plenty of bad blood, and no building. And it was a *goodwill* competition, sponsored by the German government to repay Americans for building the original library in 1950.



The runners-up in the Fort Worth competition included Ricardo Legorreta (left and above left), David Schwarz (above), and Arata Isozaki (right).



The first jury named three co-winners: Steven Holl, Lars Lerup, and Karen Van Lengen, all of whom were asked to revise their schemes for a second round. Holl emerged as the unanimous choice, until Berlin's minister of buildings, Wolfgang Nagel, voided the results on the grounds that Holl's design was unbuildable and unresponsive to community needs.

Nagel then called for a third round, with a planning and urban design component, which was won by Van Lengen. "It was all corrupt,"

says Holl. "I felt like I was being robbed. If an international board had overseen it, the competition would have been rejected." Holl considered suing, and also tried unsuccessfully to persuade the other finalists to boycott the third round. Van Lengen, now chair of the architecture department at Parsons School of Design, worked three years on the project, only to be overtaken by events.

Communism collapses, and so does a competition

"The whole situation changed when the wall came down," Van Lengen says. "The original library was a symbol of Berlin's resistance to Communism. Suddenly, unification with the East became a priority. We couldn't move fast enough to keep up."

Though still bitter about the outcome, Holl remains a supporter of competitions. "I wouldn't negate the whole process just because of a few corrupt politicians." Lerup, who says Holl did his share of politicking too, isn't quite so sanguine. "My sense is that the big competitions have always been manipulated, more or less openly. 'I'll never do another one unless the client has the check written before I show up.'"

America sponsors fewer competitions, and most tend to be for glamour projects—museums, city halls, national memorials—that can make careers or at least produce years of free publicity for competitors through books, lectures, exhibitions, and interviews.

Michael McKinnell was only 26 when he and his partner Gerhard Kallmann won the 1962 Boston City Hall competition. It

made them overnight stars and shaped the course of their practice. "Everything was determined by that one event," says McKinnell, now 61. "We could neither ignore it nor do without it. It gave our practice a tremendous jump start, yet when you start your career with something so large and prominent you're immediately typecast as doing a particular scale and style of building. It took a painfully long time before we could get a small project in the office. I've only just completed my first house."



Michael Morris and Yoshiko Sato, New York City

Michael Morris and Yoshiko Sato are following the path of hundreds of aspiring young architects in New York, Los Angeles, and other design-saturated cities. They teach—at Parsons School of Design—do exhibitions and installations, and enter competitions. Idea competitions, portfolio competitions, competitions sponsored by institutes and foundations. Both have won Paris Prizes from the National Institute for Architectural Education, and have

done well enough in other competitions to garner a bit of publicity, more invitations, but so far no work.

“Competitions have helped us focus our energy and develop a philosophical direction in our architecture,” explains Sato. “They’re also tools for getting grants, which produce research, which leads to teaching jobs. It’s all interconnected.

Morris, 35, and Sato, 36, met as students at Cooper Union and became partners in 1991. They share an interest in light as both a physical and theoretical resource and have made it the subject of several projects and exhibitions. They also admit to being jealous of their European counterparts, who generally have an easier time getting major commissions. Morris recently renewed his Irish/EU passport in hopes of opening doors abroad.

“In New York, you have so much less opportunity to build

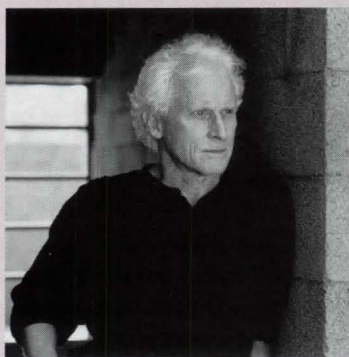
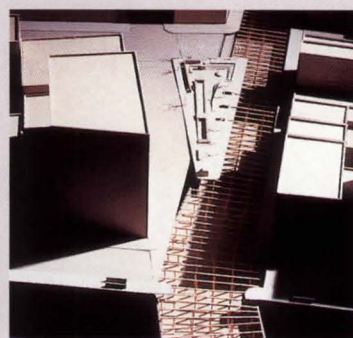
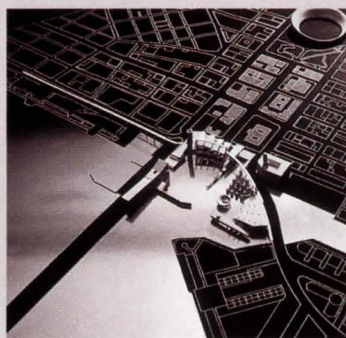
something freestanding,” says Sato, “whereas in Europe a young architect with some hard work and good fortune has a chance of designing something significant before 35.”

Morris and Sato have recently completed an addition to a Manhattan penthouse, their first “above-ground” project, and are collaborating with artist Jodi Pinto on a footbridge for the Central Artery project in Boston and another in San Antonio. This recent spurt of work has allowed them to strike what they consider a healthier balance

between competition and practice.

“The competition format reduces the scope of what you can make visible,” says Morris. “So many issues of construction can’t be described in broad graphic strokes. So now we use competitions to test the ideas we come up with in the studio at a larger scale. They’ve become a supplement to our practice instead of the focus.” *D.D.*

Morris and Sato’s competition entries for the Yokohama waterfront (left) and Petrosino Park (right).



Antoine Predock, Albuquerque, New Mexico

In the 1980s, Antoine Predock was a respected regional architect, pushing 50, with a number of impressive houses and institutional buildings to his credit, but nothing big and virtually nothing outside New Mexico. So in 1985 he and his team, all six of them, decided to bet the hacienda by entering the competition for the Nelson Art Center at Arizona State University. It was larger than anything the firm had done, with a complex program, and comparatively far from home.

“It was all or nothing,” Predock recalls. “We didn’t worry about the

hours or the costs, although we realized that if we lost we’d probably be designing gas stations.” But they won, beating out Edward Larrabee Barnes, Arthur Erickson, and several other international firms. More competition wins followed: The American Heritage Center in Laramie, Wyoming, the Las Vegas Library and Children’s Museum, the Laboratory and Administration Building at Cal-Tech, Pomona.

“Mr. Adobe” suddenly became “Mr. Competition,” a fixture on the national lecture circuit, profiled in *Vanity Fair*, courted by prestigious clients, including Disney. The Albuquerque office swelled to 40, with a branch in Los Angeles.

Predock has mixed feelings about his manic “L.A. phase,” but not about the decision to roll the dice in competitions. “Competitions bring out unexpected qualities in the work,” he says. “It’s a totally different situation from sitting across the table from a client. The anonymity of the process introduces elements of danger and risk-taking that help make a critical practice possible.”

Predock continues to enter competitions, wins his share, but has become more selective. No open competitions. No competitions without stipends, or that lack what he terms “investigative potential.” But he still relishes the electricity

generated by competitions and its ripple effect on his other work. The faceted glass skin of his entry in the Atlantis Hotel and Casino competition (which was never built) reappears in the entrance and lobby of the Spencer Performing Arts Center in Ruidoso, New Mexico, which opened October 4. The dramatic wedge and intersecting volumes of the Las Vegas Library show up in his new Mesa Public Library in Los Alamos, New Mexico. And he expects to find a place for the metal exoskeleton of his recent submission for the National Archive of Denmark.

“The thrill isn’t winning,” says Predock. “What matters is what lives on in the drawings and models and the spirit of the office. We made a tremendous event happen among ourselves, out here in Albuquerque. It sounds too Mary Poppins, I know, but that’s how we feel!” *D.D.*

Predock’s competition entries for the National Archive of Denmark (top) and the Atlantis Hotel and Casino in Las Vegas (bottom).



American architectural history is filled with similar stories. Eero Saarinen got out from behind his famous father's shadow by winning the Centennial Gateway Arch competition in St. Louis. Albuquerque architect Antoine Predock escaped his reputation as "Mr. Adobe" by winning a series of major competitions in the mid-1980s [see sidebar, page 65]. Maya Lin might be just a struggling artist were it not for winning the Vietnam Veterans Memorial competition.

The payoff—even for losers

Yet in prestigious international competitions, winning isn't everything. Eiel Saarinen got more mileage out of a second-place finish in the Chicago Tribune Tower competition than Raymond Hood did by finishing first. Houston architect Carlos Jimenez, a finalist in the Modern Art Museum of Fort Worth competition, has seen his visibility shoot up dramatically. "It brought my work to a national level almost overnight," he says. "I'm getting calls I never would have got before. The competition was a real turning point for me."

Competitions come in various guises, from idea competitions

two boards, perhaps, and a few paragraphs of text. But they attract hundreds of entries, which reduces the odds of winning. Invited competitions offer better odds and more focus, and usually include a stipend. But the stipend never covers the costs, which may include perspectives, a dozen boards, a model, a report, and a public presentation.

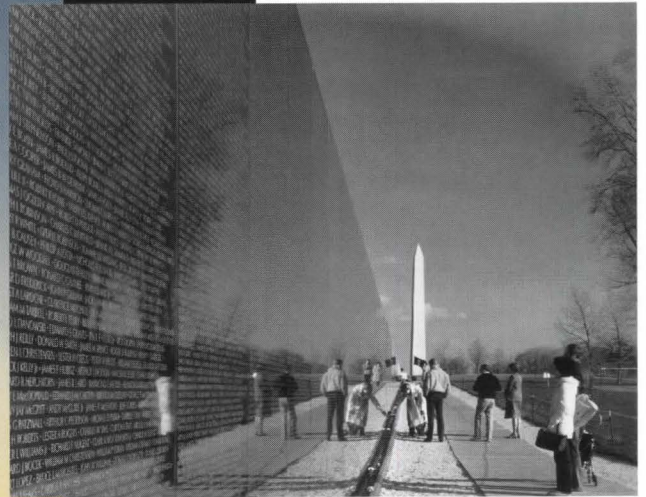
The Modern Art Museum of Fort Worth's competition for its new building, across the street from Louis Kahn's Kimbell Art Museum, offers valuable insights—mostly reassuring—into the process.

In the beginning the director and chief curator put together a master list of approximately 25 plausible candidates, which they presented in detail to a committee of trustees and friends of the museum. The committee cut the list to six, considered a manageable number, and issued invitations for a one-stage competition consisting of six boards, a dozen drawings, and a formal presentation, for which the architects were each paid \$25,000. All the architects visited the site. One came eight times.

Telling the public what the project is about

The staff and committee, in turn, visited the major buildings of each of the finalists. There was no professional advisor or outside jury. Before announcing the winner, the museum exhibited the designs for a month to raise public understanding and expectations about the project. A book and a video will follow.

Left to right: Kallmann McKinnell's Boston City Hall, Eero Saarinen's Gateway Arch, Maya Lin's Vietnam Memorial.



("What to do about Times Square?") to interview competitions, portfolio competitions, and design-build competitions, a favorite of city managers. But the fundamental division is still between open competitions—such as the Oklahoma City Memorial and the Vietnam Veterans Memorial—and invited competitions, in which a handful of architects are preselected on the basis of previous work.

The first usually have low fees and limited requirements: one or

center of the country for modern art. What artist wouldn't want to show in an Ando building?"

The clarity of the Fort Worth competition contrasts sharply with the muddle of MoMA's, which already has gone through two rounds, 10 architects, and a baffling exhibition. The competition's stated intentions were commendable—to focus on concepts rather than design, and to highlight the work of a new generation of modernists. Instead, the 10

schemes, each packaged to fit into a green shirt box, proved to be timid, repetitious, and so uniformly inscrutable that not even the cognoscenti could decode them. Leading museum architects in New York and elsewhere felt stiffed. In short, what should have been a stimulating public discussion about the future of an enormously important building turned into an esoteric insider affair that has left the public out in the cold. And there's at least one more round to come.

Competing isn't cheap

Yet even an impeccably organized competition represents an enormous gamble for an architect. The estimated minimum cost of participating in a major invited competition is \$40,000, of which the stipend may cover a quarter to a third. Most architects exceed the minimum by a factor of four. Richard Gluckman calculates that he spent more than \$150,000 on the Fort Worth competition, much of it on sophisticated models. Another competitor went into debt.

Paul Spreiregen's solution to this problem is "to pay architects in

FOR SOME ARCHITECTS COMPETITIONS ARE NOT ABOUT WINNING AT ALL. THEY ARE OPPORTUNITIES TO EXPLORE A NEW IDEA OR TO TAKE A CHALLENGING POSITION.

a competition what they would be paid if they were commissioned. The first stage is just to get a viable idea, and should be a back-of-the-envelope kind of thing. But at the next stage, which is really preliminary design, architects should be paid for what they do." The finalists in the American Memorial Library competition were paid approximately \$60,000 each. But most competition sponsors are reluctant to pay even that much. Young, small firms, without access to a large staff, find themselves at a dramatic disadvantage against big firms, which can throw money at a proposal. Yet even big firms that come up empty in two or three major competitions in a few years can be looking at Chapter 11.

Despite the meager compensation and the onerous conditions, few competitions are cancelled for lack of applications. The architects who complain the loudest are often the first to sign up. This could be evidence of either professional masochism or the persistence of a lottery mentality among architects that says sooner or later your number will come up.

For young architects, particularly in major cities such as New York, Boston, and Los Angeles, a competition is still a good way of getting recognition. Maybe you win; maybe you make a creditable showing. Either way, you may find yourself on the A list for future invited competitions. From that may come a job or two, eventually perhaps a career. [See sidebar on Morris and Sato, page 65.]

The rules of engagement

For seasoned practitioners, the rules of engagement are more complex, and the reasons for entering more idiosyncratic. Yet at some point or other, every architect who considers entering a competition probably asks some version of the following questions:

Is it a worthwhile project? Meaning, is it a project that will stretch my skills and expand my mind, or is it just another job? One reason to enter a competition is to experiment with a different type of building or, like Gluckman, to design a familiar one at an entirely new scale. "We didn't win in Fort Worth," he says, "but I'm enormously grateful for the chance to do a whole museum from scratch and place it before

the public. That's a tremendous gift for a small firm like ours."

Is it a real project? In other words, is there a chance in hell of its getting built? Many competitions are merely publicity stunts for the sponsor, a way of acquiring a reputation for sophistication and seriousness without expending much effort. Of the numerous competitions that Venturi, Scott Brown and Associates has won, only one, the addition to London's National Gallery, has been built. "Ours is a profession and an art in which one becomes accustomed to disappointment," Robert Venturi has written, "but you always die a little bit when the product of your labor is rejected and your dream remains unbuild."

Who's competing? Architects are known in part by the company they keep; the better the company, the more glory there is to bask in. In good competitions, an architect makes a mark just by being invited. Sometimes, unfortunately, the list *is* the competition. According to Stanley Collyer, editor of *Competitions* magazine in Louisville, Kentucky, "Many institutions hold invited competitions because they have to sell an idea to trustees or fund raisers. A short list of well-known architects is a

way of saying, 'We count.' It's the architects, not the design, that's really important."

Who's on the jury? Trying to second-guess a jury can be self-defeating, but knowing the predispositions of jurors is only prudent. You may not win, but you still want to be heard. "The important thing is to lose with dignity," says Carlos Jimenez. "The project has its own mission and its own integrity. If you play to the jury, you've already lost. You have to make a move, as in chess, and what comes out is your stewardship."

Can I afford it? The time. The money. The despondency that inevitably goes with losing.

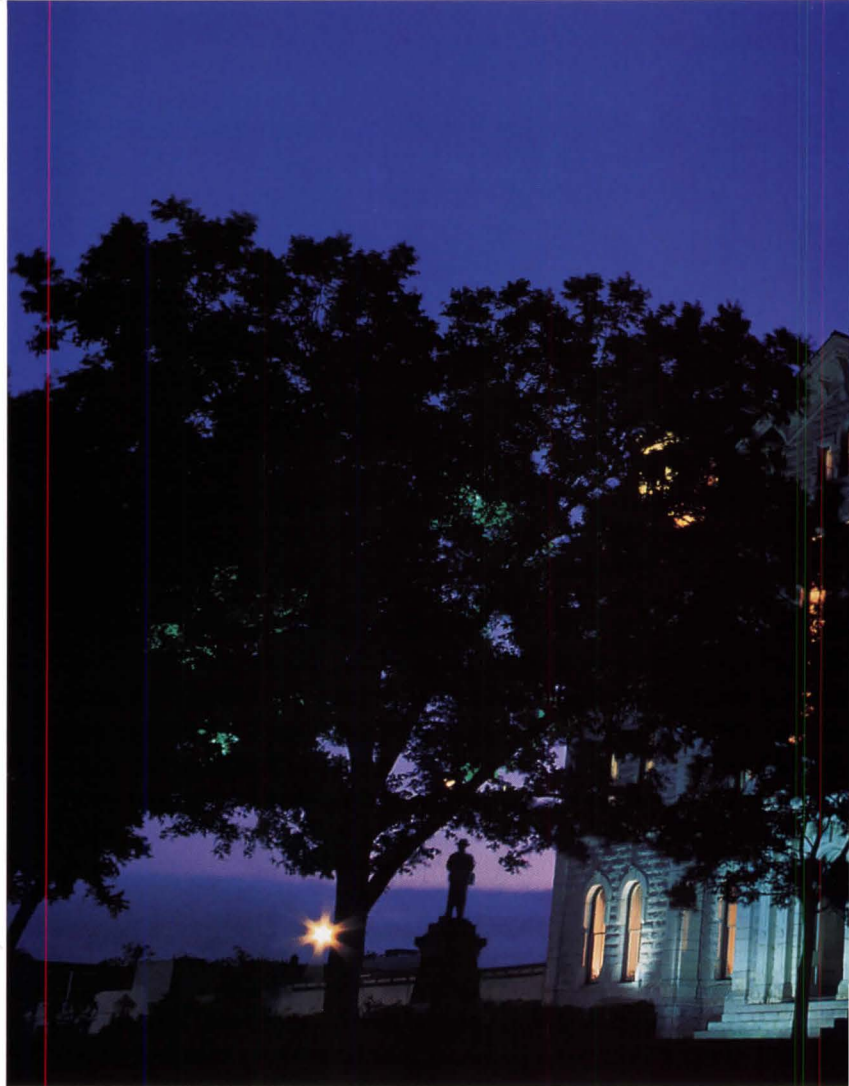
What do I get out of it? Attention, money, a place on the right lists, the requisite 15 minutes of fame: these are the obvious reasons for entering a competition. Predock talks about competitions creating a "spiritual savings account" that can be drawn on later for other purposes. "A competition is like putting a slow charge on a battery," he says. "The collective energy that builds up in making a building lives on and pops up in other things, maybe in materials, a form, or maybe in an attitude. That's very healthy."

Am I out to win the competition, or solve the problem? Perhaps the toughest question of all, and one that divides architects down the middle. Winning often means producing stunning poetic images that capture the imaginations of the client, even as they avoid the practical problems. Tadao Ando won the Fort Worth competition on the strength of his rhapsodic images and his intuitive understanding of the site, rather than his gallery plan.

Beyond winning and losing

But for some architects competitions are not about winning at all. They are opportunities to explore a new idea or to take a challenging theoretical—or rhetorical—position. "We've never entered a competition with the idea of winning," says Michael McKinnell. "That takes all the fun out of it. You're no longer your own master, which is the great joy of a competition. You have nobody to answer to but yourself. That's exceedingly rare in our profession." ■

WHEN IT CAME TO RENOVATING THIS HISTORIC COURTHOUSE, EVEN THE



In 1964, The Parker County Courthouse in Weatherford, Texas was designated a Texas Historic Landmark. And thus began the slow, methodical process of restoring it. First to receive attention was the structure's limestone stonework. Later, the roof was replaced. Then came the windows, which proved to be one of the most challenging aspects of the project.

The Historical Survey Committee mandates that if nothing remains of a historic building's original windows, the new ones must be faithful reproductions, right down to the last detail. Since the courthouse's original wood windows had been replaced by aluminum ones some years back, that meant that all 105 of the new windows had to be virtually identical to those made and installed over a century ago.

Bids were sought, but only two manufacturers felt qualified to respond. One of them, Marvin Windows & Doors, had actually been recommended by a company that was asked to bid but declined.

Though underbid by the other finalist, Marvin's figures were based on building the largest windows with structural muntin bars to withstand the winds that buffeted the building's hilltop site. Intrigued, the architect asked each company to build a sample window. One look at the prototypes and the job was immediately awarded to Marvin.

For the next several weeks, Marvin's architectural department busied itself recreating the past. Working from turn-of-the-century photographs



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After almost fifteen years of design and construction, **THE GETTY CENTER** is ready for the public. How has **RICHARD MEIER** succeeded with the project many call the “commission of the century”?





In a view south (above), the Getty Center is perched atop a promontory on the edge of the Santa Monica Mountains.

The east side of the complex (below) stretches from helicopter pad (for fire fighting) to museum gardens (opposite).



These are the facts, or at least some of them: 14 years and 3 months from site acquisition to public dedication; 1 million sq ft of construction (505,000 sq ft of program areas and 440,000 sq ft of food service, storage, and equipment); approximately \$1 billion spent (more than \$115 million for site preparation, some \$600 million for direct construction, over \$30 million for fixtures and equipment, and nearly \$200 million for permits, engineering, testing, and architectural fees); 295,000 pieces of Italian travertine, each weighing 280 pounds; 40,000 painted aluminum panels; 25 million pounds of rebar; 340 miles of conduit; 165,000 sq ft of exterior glass; 8.1 million cubic ft of concrete; 4.4 million linear ft of steel stud; 151 miles of plumbing and sprinkler piping; 8,000 new trees; a construction crew of 1,200 at its peak. Much has been said, speculated, predicted, and promised about the Getty Center over the years. Now, as it finally nears its public unveiling in December, it's worth reviewing the numbers, not because they tell the whole story, but because, despite their illusion of precision, they don't.

The real story begins with the elusive J. Paul Getty, once known as "the richest man in the world," who changed his will 21 times before dying in self-imposed tax exile in England on June 6, 1976. His final testament, dated March 11, 1976, left the bulk of his personal estate, mostly in the form of Getty Oil Company stock, to the J. Paul Getty Museum and a trust established in his name. By the time his estate was settled six years

adjoining 600 acres were purchased by the Trust as a natural preserve.)

After a year-long architect selection process, Williams and his trustees hired New York City-based Richard Meier & Partners in late 1984 to design what many at the time grandly called "the commission of the century." But a lot had to happen before design could even begin. Planning for programs still in formation proved to be one of the key challenges faced by Stephen D. Rountree, then the building program director. "A lot about the missions of the various programs and their physical requirements was unclear. It took a leap of faith," says Rountree of the 16-month programming phase of the project. Meier struggled with the exact siting of the project: what spot on the 24 buildable acres would be suitable for the Getty Center? His earliest sketches of the project, schematic plans of September 1986, place major buildings along two ridges that intersect at a 22.5 degree angle, a major theme of the final design. During design Williams, Rountree, and Meier faced a host of seemingly irreconcilable forces. The Getty's various programs, in only a few years time, had established separate identities and were diverse in their spatial needs. Meier had to figure out how to accommodate the different programs in one place: how to create both diversity and unity, distinction and inclusion, and not least of all how to reconcile the views of all the directors with those of Williams and the Trust, much less his own.

Seven years after Meier was selected as architect, his final design

THIS IS A STORY OF AN ARCHITECT, A CLIENT, AND A CONTRACTOR WHO DEMANDED MORE OF EACH OTHER THAN THEY EVER IMAGINED POSSIBLE.

later, the four million shares of Getty Oil had increased in value from \$760 million to \$1.2 billion. In the early 1980s, the newly appointed head of the J. Paul Getty Trust, Harold M. Williams, former chairman of the U.S. Securities and Exchange Commission, set about inventing a mission for the organization. Recalls Williams: "The estate was, in effect, a billion dollars with a broad mandate and a lot of flexibility. Particularly for the visual arts, it's a lot of money. It was possible for the Getty to make a difference."

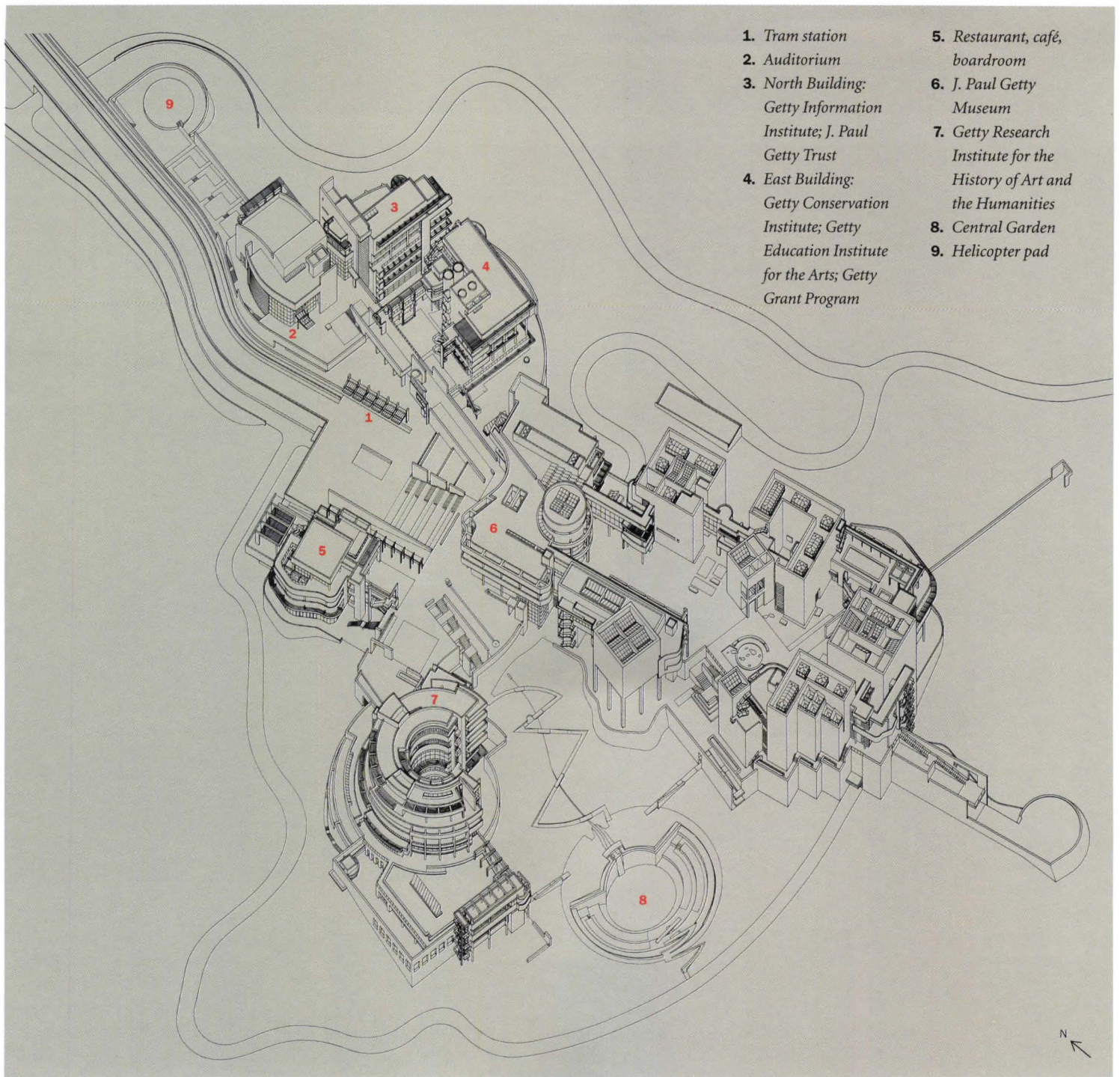
Williams tried to determine *how* to make the difference. After extensive discussions with professionals in the arts and humanities, the Trust identified three general areas—scholarship, conservation, and education—that had "pressing needs not adequately addressed by other public or private sources," Williams says. The Trust formed a group of programs that individually and collectively responded to those needs. After some name changing and development, over a period of years the Trust produced six Getty entities: the Research Institute for the History of Art and the Humanities, the Conservation Institute, the Education Institute for the Arts, the Information Institute, the Leadership Institute for Museum Management, and the Grant Program, each with its own director.

As these institutes and programs began to flourish, a key unanswered question was where they should reside for the long term. The J. Paul Getty Museum in Malibu, modeled on the Villa dei Papiri in Herculaneum, Italy, already had restrictive access and limited potential for large-scale development, not to mention a lush estate ambience that would have been destroyed by the new Getty's program requirements. Moving in or adding on was not an option. The new directors and their staff members were mostly scattered in office buildings around Los Angeles, so Williams started looking for a parcel of land large enough to bring all of the Getty pieces together in one campuslike environment. By the fall of 1983, he had found what he was looking for: 110 acres on a promontory on the southernmost edge of the Santa Monica Mountains, overlooking the Pacific Ocean to the west and downtown Los Angeles to the east, with convenient access to the San Diego Freeway. (An

of the Getty Center was unveiled. More than six years of construction later, the project awaits its public. While this new city on a hill clearly represents the authority of a singular architectural vocabulary with its overlapping grids and dominant and subordinate axes, a strictly calibrated system of proportions, and a controlled palette of materials and colors, the architect's commanding presence—the project's very Meierlike appearance—belies the aches of the communal process it took to get there. In addition to the demands of multiple clients, neighborhood groups played an usually intensive role in the design: rejecting cladding choices as too reflective, prescribing limited access to the site, imposing a height limitation of 65 ft for the museum and 45 ft for the remainder of the project, monitoring the replanting of the hillside. Their "reasonable" needs had to be satisfied before the city would grant the Trust a Conditional Use Permit. What's more, Meier's vision did not always coincide with that of the end users. Museum staff, for example, did not want stark white galleries, but favored colored and textured walls to complement the paintings.

The design conflicts were many and vociferously fought over for years. While some battles did not go Meier's way—"I still think the paintings are six inches too high," the architect said on a recent gallery tour—his legendary persistence remained intact. Jokes Rountree, "Over all these years, he came out here every month, even though at times we wished he'd have stayed in New York." Echoes Williams: "He had a real attention to detail all the way through. There were times in this process when I would have enjoyed a little less attention to detail." But the eye for things small as well as large and the indefatigable persistence came hand in hand. For all the stone, metal, dollars, and time, this story is of an architect, a client, and a contractor who demanded more of each other than they ever imagined possible. Facts and figures aside, making the Getty Center has been a human drama. *Karen D. Stein*

The interviews and chronology on pages 78–81 were compiled by Karen Stein, who also contributed additional reporting throughout.



- | | |
|---|---|
| 1. Tram station | 5. Restaurant, café, boardroom |
| 2. Auditorium | 6. J. Paul Getty Museum |
| 3. North Building: Getty Information Institute; J. Paul Getty Trust | 7. Getty Research Institute for the History of Art and the Humanities |
| 4. East Building: Getty Conservation Institute; Getty Education Institute for the Arts; Getty Grant Program | 8. Central Garden |
| | 9. Helicopter pad |

Project: The Getty Center
Los Angeles, California

Client: The J. Paul Getty Trust

Architect: Richard Meier & Partners—Richard Meier, FAIA, Michael Palladino, AIA, Donald E. Barker, AIA, James Crawford, partners-in-charge; John H. Baker, John Eisler, AIA, Tom Graul, Michael Gruber, Dennis Hickok, Richard Kent Irving, Christine Kilian, James Matson, AIA, James Mawson, AIA, Milena Murdoch, A. Vic Schneider, Timothy

Shea, Richard Stoner, Aram Tatikian, Lazlo Vito, J. F. Warren, AIA, project architects

Landscape Architects: Olin Partnership/Fong & Associates; Emmet L. Wemple & Associates; The Office of Dan Kiley

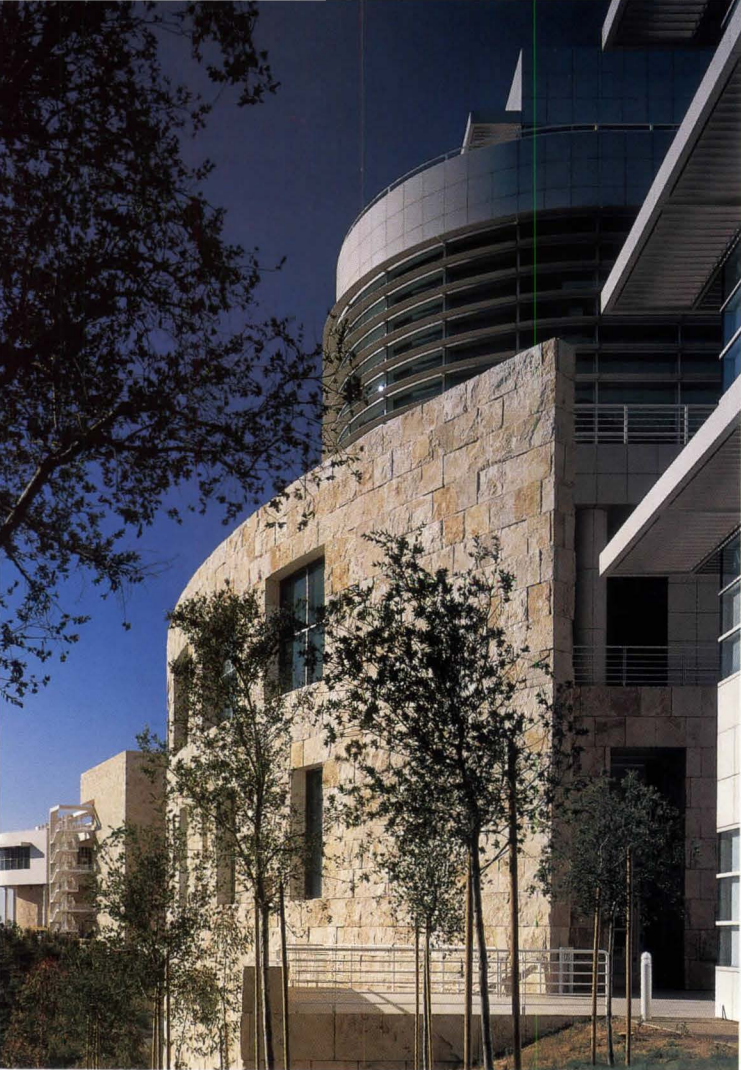
Engineers: Robert Englekirk Consulting Structural (structural); Altieri Sebor Wieber, Hayakawa Associates (mechanical/electrical); B&E Engineers, RBA Partners, Inc. (civil)

Consultants: Paul S. Veneklasen & Associates (acoustical); Paoletti Associates, Inc. (audio/visual); Kaufman/Dahl, Inc. (color); Hanscomb Associates (cost estimating); The Office of Thierry Despont, Ltd. (decorative arts galleries/gallery design consultant); Hesselberg, Keesee & Associates (elevators); CDC, Inc. (exterior enclosure); Rolf Jensen & Associates, Inc. (fire protection); Cini-Little International (food service); Woodward-Clyde Consultants, Pacific Soils Engineering, Inc. (geotechnical);

Earl Walls Associates (laboratory); Fisher Marantz Renfro Stone, Inc. (lighting); Karsten/Hutman Margolf (project management); Poulsen Construction Management, Inc. (scheduling); American Nova Co. (specifications); CMS Collaborative (water features)

Key Subcontractors: Harmon, Ltd. (exterior enclosure); Air Conditioning Company, Inc. (HVAC)

General Contractor: Dinwiddie Construction Company



Above: From the East Building, looking south toward the museum. More than 8,000 new trees, including 3,000 California oaks, were planted on the site, so in the next few years foliage will become increasingly dense.

Below: A grassy wedge of lawn between the East Building (left) and the museum seems to cantilever over the San Diego Freeway.



Left: View looking north, with the auditorium (left), the North Building (right), and the East Building (right foreground). The various buildings are connected by walkways and exterior stairs.



Left: On a clear day, views from the Getty Center reach as far as the snow-capped mountains to the east. Brise-soleils provide much-needed sunshading to the East Building.

Below: A lavender-colored painted trellis along the east side of the restaurant/café/boardroom building will soon be covered with wisteria. Second-floor walkways overlook the Pacific Ocean.



Left: At night, the Getty Center lights up. The tram drops off visitors beneath a series of canopies in the central plaza, which is adjacent to the grand staircase to the museum.

OF THE THOUSANDS WHO HELPED MAKE THE GETTY CENTER, COMMENTS FROM KEY PLAYERS



Harold M. Williams

President and Chief Executive Officer, J. Paul Getty Trust

J. Paul Getty was wise enough not to try to rule from the grave. His will talks about a museum, a library, and the diffusion of artistic and general knowledge. It also stipulates that the museum "shall bear my name," not an unreasonable request, and that the trustees shall serve without compensation. That's it: a museum and an operating foundation. Within those parameters, yes, there could have been a lot of different things. As a private foun-

dation we could take risks and make long-term commitments. The question [in formulating the Trust] was: where's the leverage? where are the interstices?

We learned from the field: traveling in Europe and America, interviewing scholars, conservators, anyone in the visual arts. We kept asking questions to find commonalities in the issues expressed. Then we came back to the trustees and said, "Here are the areas where the Getty stands a good chance of making a substantial difference." Since then, a number of programs have developed.

From an endowment of some \$1 billion we now have an endowment of over \$4 billion, and as you can see, we spent a few dollars along the way.

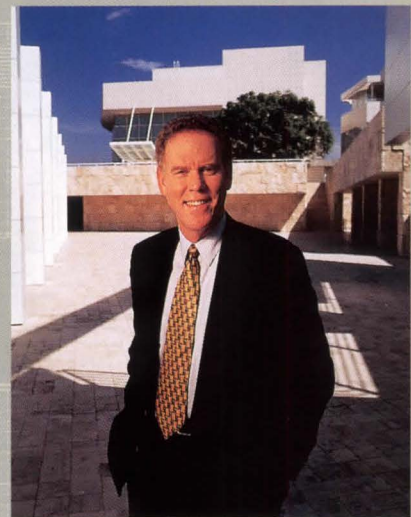
Many things led us to the selection of Richard Meier. This is a man who has a passion for museums and books. He was the most articulate of the many architects we interviewed in conceptually and materially understanding the site, appreciating the quality of light. And he made a larger commitment of self to this project than any of the other architects were prepared to do.

Stephen D. Rountree

Vice President, J. Paul Getty Trust

I worried about representing the project to the community. The main topics were size, traffic, noise, and visual and acoustic privacy. The Brentwood homeowners [who live down the hill] had two architects review all the drawings. The Bel Air homeowners [who live across the freeway] had a broader view. They were concerned about street parking, the new freeway

exit, signage. I think the process was healthy. The group heads were able to translate to the neighbors what was happening. They got us to redesign the location of food-service exhaust vents, night lighting, and so on. When J. Paul Getty built the Malibu villa, he was indifferent to the neighbors. It was perceived as a secret deal. Harold [Williams] said from the start, "We're going to be here for 100 years. We need to be part of the community."



1983

1974



1981

1982

1953

1976

CHRONOLOGY

The J. Paul Getty Museum is established as a California charitable trust.

The Getty Villa opens in Malibu.

J. Paul Getty dies, leaving the bulk of his personal estate in trust to the J. Paul Getty Museum.

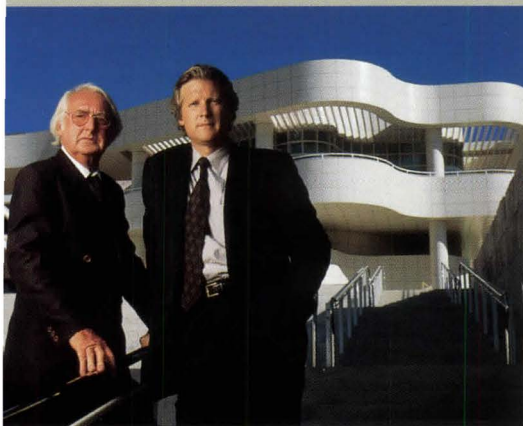
The Trust hires Harold M. Williams as its first president and chief executive officer.

The J. Paul Getty estate is settled; the Trust receives \$1.2 billion.

SEPTEMBER The purchase of a 110-acre site in Brentwood is announced. Another 600 acres are purchased as a natural preserve.

OCTOBER Thirty-three architectural firms are invited to submit qualifications to design the Getty Center.

NOVEMBER Seven firms are selected as semifinalists: Henry Cobb of I. M. Pei & Partners; Fumihiko Maki & Associates; Richard Meier & Partners; Mitchell/Giurgola; James Stirling, Michael Wilford and Associates; Venturi, Rauch and Scott Brown.



Richard Meier (left) and Michael Palladino
Principals, Richard Meier & Partners

RM: The Getty Center is a completely program-driven design. Each entity has its own architectural identity closely reflecting its program. The underlying concern is an idea of permanence. The Getty stands for a different vision of Los Angeles—one of stability and continuity. It's not a place to ask "Who am I?" but rather "Who are we?" It's an ideal version of social space.

MP: Many people say that the Conditional Use Permit and its 107 exceptions tied our hands in terms of design. But where would we have been without it? Where would one have drawn the first line? In the early discussions about the project, we began to develop the duality of the site. The museum, being the most public of the buildings, is positioned as the most visible to the city. Other buildings are more contemplative in function and face the mountains or ocean.

John Walsh (below left)
Director, J. Paul Getty Museum

Deborah Gribbon (middle)
Associate Director

Barbara Whitney (right)
Associate Director

JW: A well-developed idea for the museum existed before Meier was hired. The main principle is embarrassingly simple: galleries that make works of art look wonderful. The idea was about the quality of light and the proportions of the spaces. Also, people learn a lot more in a place they enjoy, so the spaces can't all be the same kind and the informational and educational aspect of the program can be built in and not added on. After observing the Malibu museum, it was clear that it's not just about intense gallery experiences, it's also about relaxing outdoors. We thought we'd build a quirky museum. This is a loose-limbed building with all kinds of seemingly private corners and captured spaces.

DG: The driving force in the design of the museum was striking a balance between giving visitors options about the route they might take through the galleries, encouraging an exploration, and creating an easily understood floor plan. John [Walsh] has always had a strong voice about the essential elements of a museum. There was also an understanding on his part that a museum is a very complex building in that it has galleries and other public spaces that have to be very specifically purpose-filled. But then it has very narrow tolerances in

terms of HVAC, etc. Having established the basic outlines, John was willing to let the users speak for themselves with equally strong voices about their needs. **BW:** Observers of the gallery-design process such as the lighting consultants say it was the most truly collaborative effort across a wide range of people they had ever seen. The director and chief curator were actually having a real dialogue with the people who work with the objects, and these opinions were communicated to Richard Meier and Thierry Despont.



1984

1983-84 The Getty Trust creates five institutes in addition to the museum—the Getty Research Institute, the Getty Conservation Institute, the Getty Information Institute, the Getty Education Institute, and the Getty Leadership Institute—and the Getty Grant Program.

APRIL Three finalists for design of the center are selected: Fumihiko Maki & Associates; Richard Meier & Partners; James Stirling, Michael Wilford and Associates.

OCTOBER Richard Meier & Partners is chosen as architect of the Getty Center.

NOVEMBER First meeting of the Getty planning committee, which includes Harold Williams, Stephen D. Rountree (newly named building program director), and others.

1985

Getty staff, including Museum Director John Walsh, and architects travel to some 50 sites in Europe and North America to study museums, research institutes, and gardens. Rountree works with internal groups to draft the program.

MARCH The architectural program for the Getty Center is completed.

SEPTEMBER Richard Meier & Partners opens a Los Angeles office, headed by Michael Palladino.

1986



Elaine Gerdeau
Manager, Bel Air Association

We were most influential on the subject of traffic, but the color of the building was also particularly important to us. We understood Meier's museum in Frankfurt has a high-tech look with white panels. I haven't seen it, but I heard that it's shiny and really stands out and that he had something similar in mind for here. We were opposed to that because we wanted something that fit in the Santa Monica Mountains. Now I think it's terrific, though some of the neighbors are horrified.

Robert Barnett
Director, Brentwood Homeowners Association

The city of Los Angeles said it would grant the Conditional Use Permit only upon the approval of the homeowners associations. The issue we labored on most intently was color. We were concerned about reflection off of a white building. Meier would bring in a metal panel and say, "It's beige," and we'd say, "It's white." After a lot of negotiation, we finally agreed. We are pleasantly surprised at the way it's turned out and that the Getty considered our needs and concerns.

Greg Cosko (below right)
President and CEO, Dinwiddie Construction Company

Ron Bayek
General Superintendent

GC: Dinwiddie has a relationship with the Getty that goes back to 1959, when we did an office building for Getty Oil. Later we built the Malibu museum. What we had to offer the Trust was a substantial amount of preconstruction and logistical planning. From the beginning, our supervision and management teams were able to assess and provide information to Meier's team and the Trust regarding feasibility and cost and the practicality

and impact of various systems. There were a lot of unanticipated geological conditions in the soil that we were constantly having to react to.

A challenge particular to this project is that it's a balanced site: no export or import of soil was allowed under the permit. That was done partly for the neighbors' benefit, so that there were no semi-trucks coming and going with earth. It created challenges in terms of how the work was sequenced.

RB: Not everybody gets along with Richard [Meier], but I get along very well with him. At the beginning of the project my boss said to me, "I

don't care what it takes, I want you to get inside Richard's head." Once you get in there and find out what he's really looking for, it makes part of the challenge go away.

Working with Richard is like designing jewelry. He wants you to deliver perfection. Until you can deliver perfection, he is not happy with you. Costs went up as a result of that. For every handrail, every piece of metal, he wanted crisp corners. It was difficult to indoctrinate the subcontractors who were used to development work downtown. Without total team effort on this job, we couldn't have pulled it off.



1987

CHRONOLOGY

FEBRUARY Dinwiddie Construction, which built the original Getty Museum in Malibu, is named general contractor to oversee the 1,200-person daily work force.

AUGUST The master plan of the Getty Center is approved by the Los Angeles Planning Commission. A Conditional Use Permit is granted with 107 exceptions on issues ranging from the scale of the buildings, to the cladding color, to site access, all concerns raised in meetings with community groups.

JUNE Thierry Despont is hired to develop the interiors of the decorative arts galleries.

NOVEMBER Construction begins at the parking facility.

MAY The Trust approves the choice of Italian travertine and off-white metal panels for the exterior.

MARCH The L.A. Planning Commission grants final design approval.

OCTOBER The Trust unveils final design to the public.

1989

1990

1991

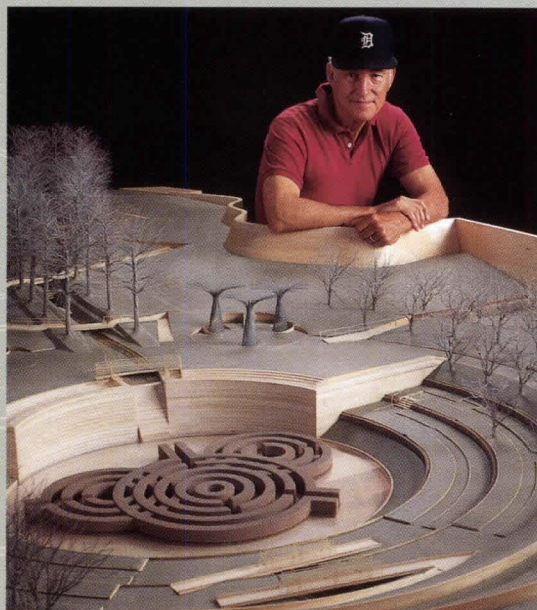


Thierry Despont

Gallery Design Consultant, J. Paul Getty Museum
 First the museum contacted me to design the decorative arts galleries. The curators thought they could not display the collection in a stark, modern white environment and that the galleries should be sympathetic with the collection. I was involved

early on. Construction had not started. Richard [Meier] had defined the envelope, but I could order the series of rooms and work with Richard on transitions between spaces to give a sense of coherence to the period rooms. It worked well.

The painting galleries were a different story. Richard designed the spaces. John [Walsh] wanted someone to help design the interior finishes: textures, colors, fabrics, flooring. One of the good things about [this part of the commission] was that by then I had a good working relationship with Richard. He would have preferred to do it completely, I think. But I feel I introduced textures, colors that are best for the paintings yet respect Richard's work.



Robert Irwin

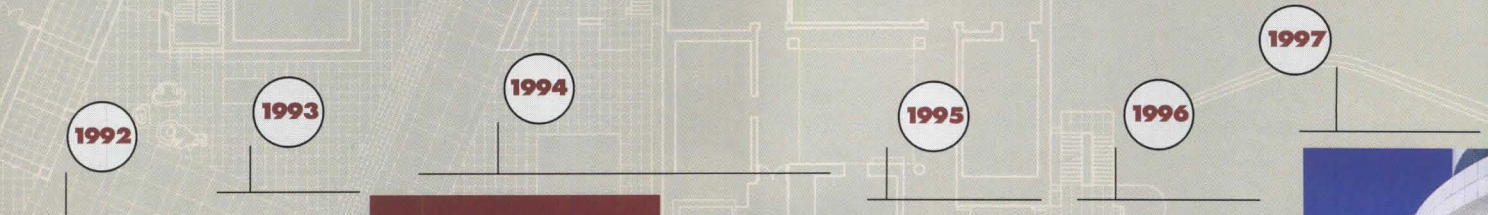
Artist, Central Garden

The garden is almost a living room. It happens in this very powerful architectural setting, and it takes all its cues from the architecture, which is the main event. How do you

get from Meier's geometry to my texture? Everything in the garden starts with a geometry, but in most cases it's so compounded that at first you experience it as pattern or texture.

I've been gathering plants for years. I've hand-picked every single plant here myself—over 1,000 varieties and species, not to mention the numbers. We've been budding trees for about two years. In about four years we'll start shaping them, but it will be seven years before they're done. At first I'll have a sun garden and later a shade garden.

The focus of modern art for me is the phenomenal, the idea that things are not concrete: our world is transient. A garden is a great place to exercise that argument.



1992

1993

1994

1995

1996

1997

JUNE The Trust commissions artist Robert Irwin to design the Central Garden.

OCTOBER Hanna/Olin, now the Olin Partnership, is brought in as the landscape architect.

JANUARY 17 The Northridge earthquake causes hairline cracks to welded joints in the steel, necessitating a reexamination of welding procedures.

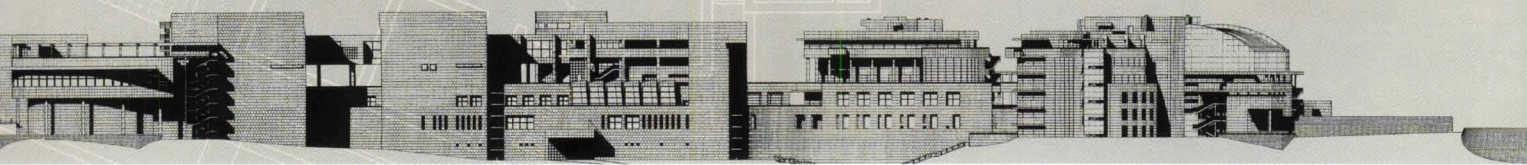
MAY Despont is commissioned by the museum to work with Meier on the gallery finishes.

JANUARY The museum approves the gallery skylight and lighting systems.

SEPTEMBER The Getty staff begins moving in to the North and East Buildings. The first board meeting is held at the Getty Center.



DECEMBER The public dedication is held.



RECOGNIZING CITY, MOUNTAIN, AND OCEAN: SITING THE GETTY

Richard Meier established a site strategy by orienting buildings on two overlapping grids (diagrams, opposite). One aligns with the predominant north-south orientation of the site's mountain ridgelines and adjacent I-405 (San Diego Freeway), offering drivers a vista of the entire eastern elevation. The other, tilted 22.5 degrees to the northwest/southeast, aligns with the predominant grid of nearby Santa Monica.

Meier arranged groupings of buildings at the three high points of the mountain, tying them via axes to the museum rotunda, which hinges the two grids. The topography in part shaped the buildings: they are widest where the land is flattest.

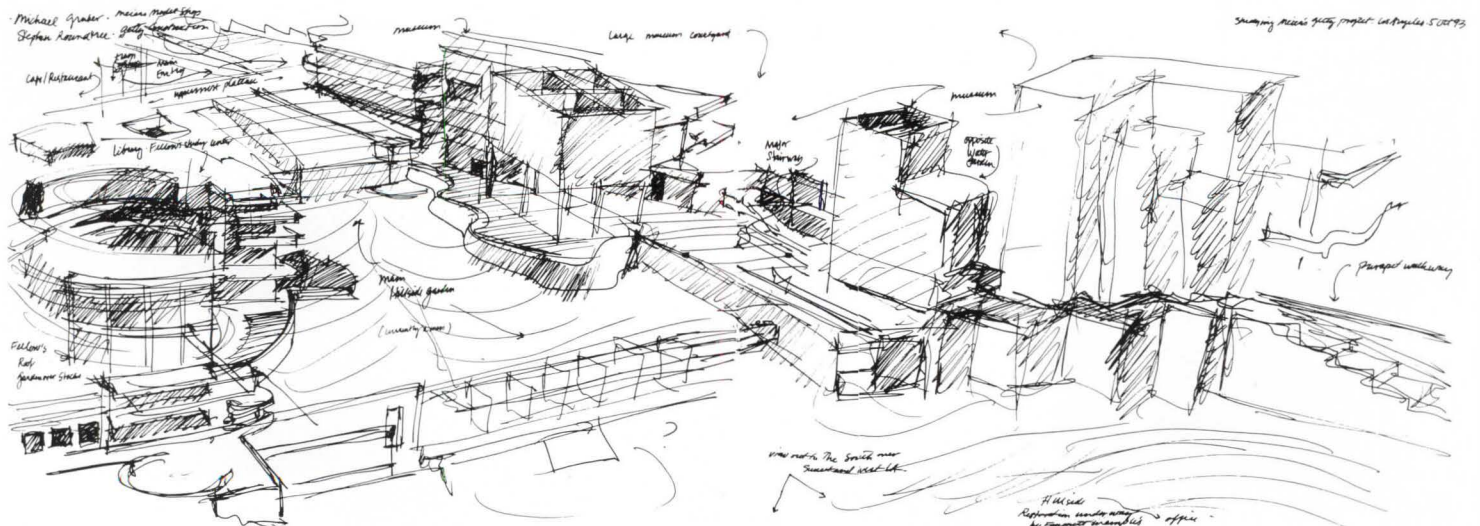
A series of plazas at elevation 856 unites the Getty's disparate structures. This datum is expressed architecturally as the height of the stone-faced base that surrounds the entire complex. (With a few exceptions "for compositional reasons," according to Meier's partner Michael Palladino, only the galleries are clad in stone above this datum.) The most spatially complex program elements are contained in the glass-and-metal structures that rise from the stone base. These are by intention visually lighter, and sculpturally complex.

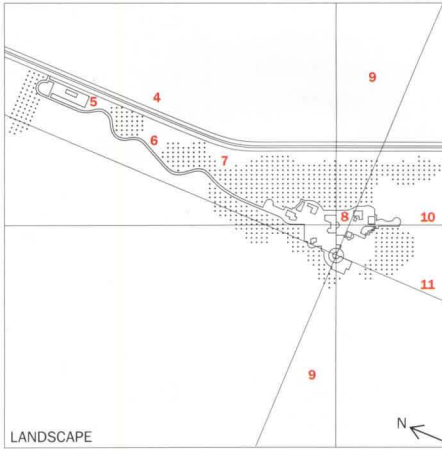
Having decided that visitors should leave their cars at a seven-level, 1,200-car parking structure,

the Getty had to figure out how to transport as many as 1,200 people an hour to the hilltop. "We looked at buses, funiculars, various types of people movers," explains the Getty Center's Stephen D. Rountree.

The center chose a cable-drawn, air-cushioned tram, which visitors board after passing a security checkpoint. The tram is quiet (its machinery is at the center, not in the cars), and it is fail-safe: with the power off, it loses its air cushion and settles onto brakelike pads. The single carriageway, which hugs the hill as it ascends, is much less obtrusive than an entrance drive would be, and its long cast-concrete spans minimized earth disturbance. (There is a service drive, which the tram's route parallels.)

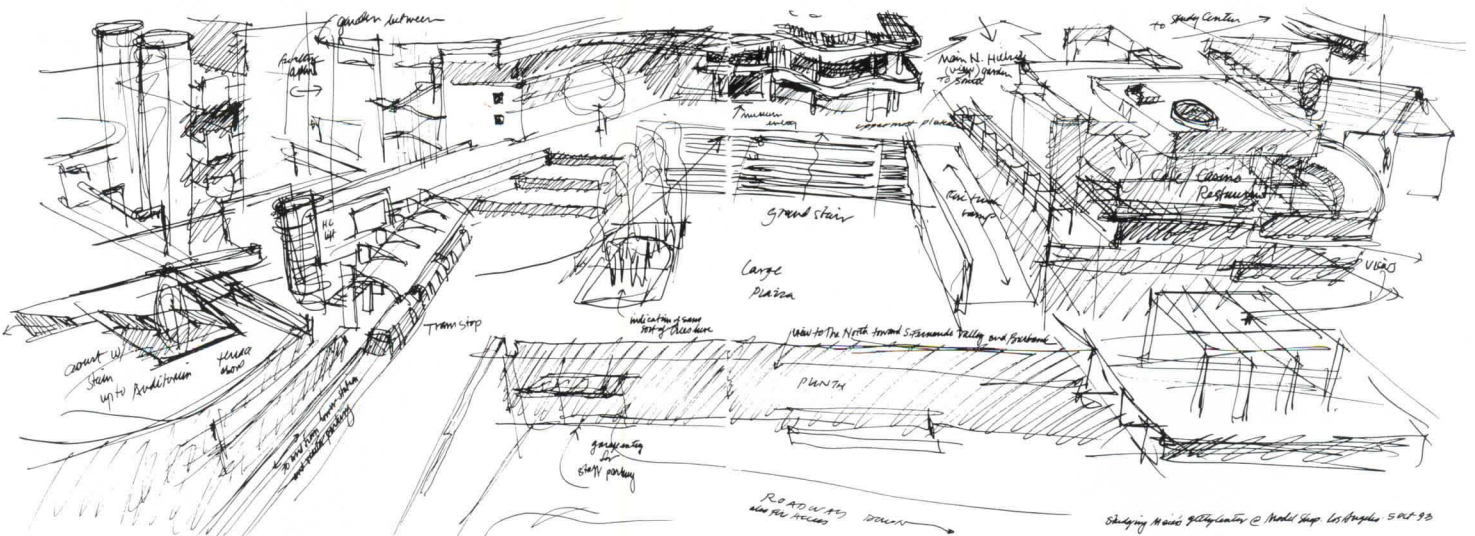
On its way to the Getty Center, the tram passes through a landscape with tens of thousands of native oaks and other plants, specified by landscape architects Emmet L. Wemple and Associates to a grid plan conceptualized by Dan Kiley. These trees are more resistant to wildfire and offer better erosion control during the area's periodic bouts of fire and flood than the native flora that would otherwise gradually grow in. As additional wildfire protection, the Getty features external sprinklers and a million-gallon fire-fighting water reservoir. *James S. Russell*

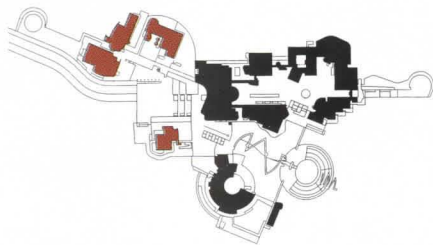




1. North Quadrant
2. Museum
3. Humanities Institute
4. San Diego Freeway
5. Parking structure
6. Tram
7. Replanted trees
8. Rotunda
9. Vista along Santa Monica Mountains
10. Vista to Santa Monica
11. Vista to Pacific Ocean

The Getty Center beckons from the driverless tram's canopied platform (opposite top; arrival plaza opposite bottom). Trees planted in a grid make the transition from the naturalistic site plantings to the Mediterranean-inspired landscape of the center (early sketches by designer Laurie Olin, below).





THE NORTH QUADRANT SERVES AS A GATEWAY TO THE GETTY CENTER CAMPUS

Surrounding the central plaza of the Getty Center, the four buildings of the north quadrant are the first ones visitors see when they arrive on the tram. While each building has at least some public component, the auditorium and the restaurant/café are the ones that visitors will have the most reason to frequent. The North and East Buildings, on the other hand, house mostly offices and support space for programs including the Getty Conservation Institute, the Education Institute, the Grant Program, the Getty Trust, and the Information Institute.

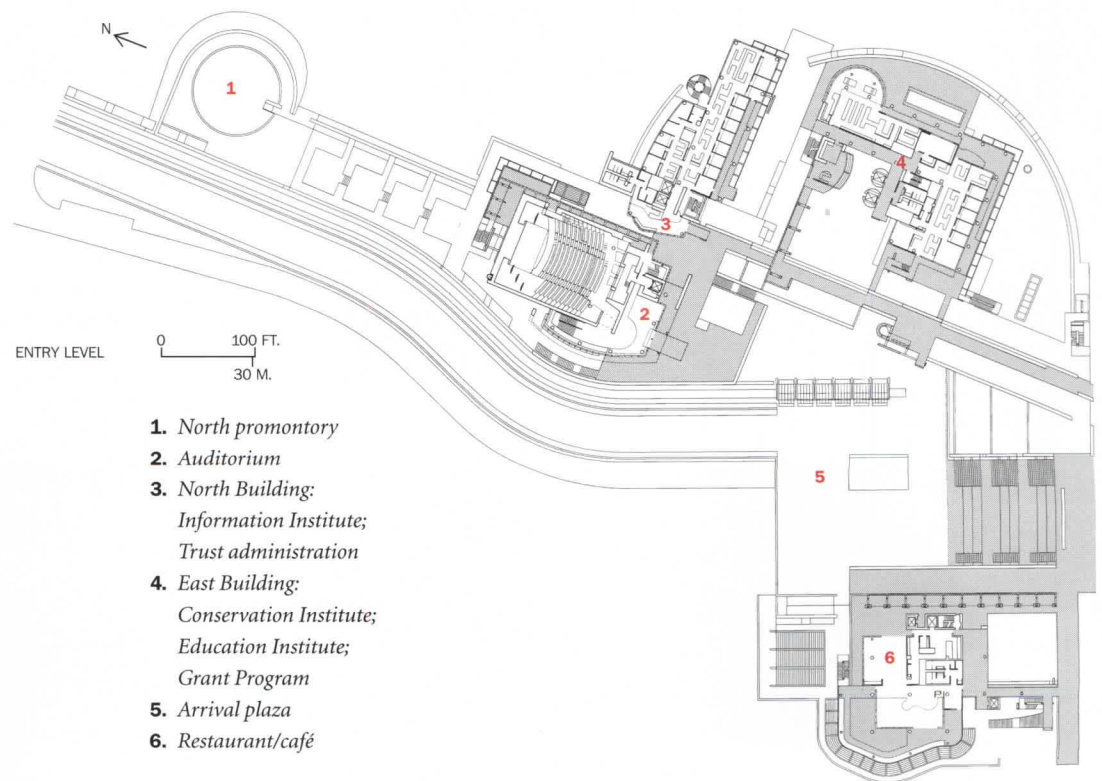
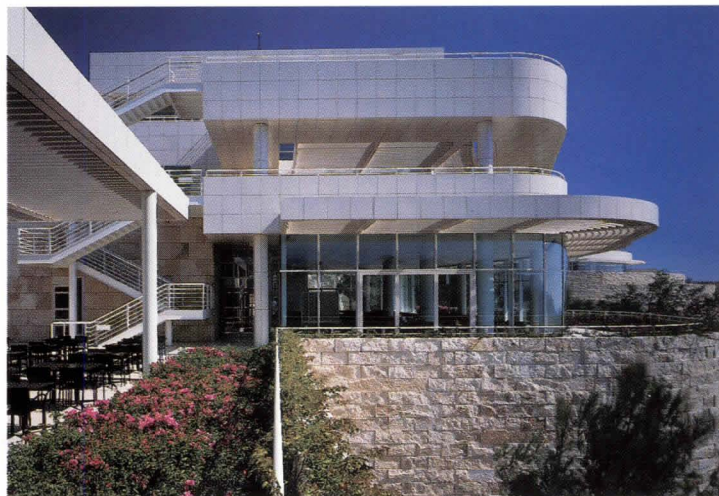
Because the North and East Buildings have similar programs, the architects and client once considered combining them into one structure. But a two-building scheme broke down the scale of this part of the campus and provided each institute or program housed inside with a more distinct identity, says Richard Meier partner Michael Palladino. It also allowed the architects to take advantage of the natural topography, separating the two buildings with a ravine that the Olin Partnership landscaped with palms and lush planting.

The L-shaped East Building (this page top and opposite page bottom) is anchored by the Getty Conservation Institute, whose mission is to preserve cultural monuments, historic sites, and works of art around the world. With three floors of offices and two floors of laboratories, the Conservation Institute occupies the largest portion of the 80,000-sq-ft building. The other two tenants are the Getty Education Institute for the Arts, which promotes arts education in K-12 schools, and the Getty Grant Program, which funds projects in the

fields of art history, museum practice, and conservation. The most public component of the building is a two-story cylindrical space used as a library and information center.

Because the building is nestled into a ridge overlooking the San Diego Freeway, floors that are below grade on the west have windows on the east. Terraces on three sides, balconies, and outdoor stairs and corridors make this building the most “Californian,” or open to the environment, of the entire Getty complex.

Essentially an office building with long bands of horizontal glazing, the East Building, says Miguel Angel Corzo, director of the Conservation Institute, “is the only building that doesn’t reflect its function [on the outside]. What happens inside is that we think.”



1. North promontory
2. Auditorium
3. North Building:
Information Institute;
Trust administration
4. East Building:
Conservation Institute;
Education Institute;
Grant Program
5. Arrival plaza
6. Restaurant/café



One of the key characteristics of the Getty campus is the diversity of outdoor spaces—from the palm-studded “ravine” between the North Building (left in photo above) and the East Building (right in photo) to the grassy lawn in front of the East Building (right). Stone-clad plinths support the metal-and-glass structures of the East Building (opposite top) and the restaurant/café (opposite bottom).



And inside, the portion of the building used by the Conservation Institute reflects what Corzo thinks. Although the building was originally designed with traditional closed offices, Corzo changed the program to open offices when he became director midway through the project. "What you see inside is a philosophy based on teamwork. I was against [private] offices," he says. Colored walls are another unusual aspect of the building's interiors. Meier worked with designer Donald Kaufman to develop colors ranging from a grayish blue to peach and brown, which were used to emphasize procession through certain spaces and as transitions between areas with plenty of sunlight and ones that are darker.

The 64,000-sq-ft North Building is home to the Getty Information Institute and administrative offices of the Getty Trust. The Information

Institute, which occupies two of the building's six floors, makes resources on the arts and humanities more accessible through digital technology. "We explore how networking technology can overcome the limitations of physical space," explains Eleanor Frank, the institute's director. The physical space occupied by the institute is traditional in layout, with managers in offices on the perimeter, staff in open areas adjacent to the managers' offices, and computer programmers in private offices in the center of each floor. Extra cabling for heavy computer use was one of the special needs of the staff.

With its arching roof and location at the north end of the hilltop campus, the 450-seat auditorium is a landmark that helps orient visitors when they arrive on the tram. The largest indoor assembly space at the Getty Center, the 31,000-sq-ft

A variety of sun-shading devices, including metal fins, brise-soleils, and overhangs, are used on the south

elevation of the North Building (bottom). The lobby of the building is a clear-glazed, two-story space (below).





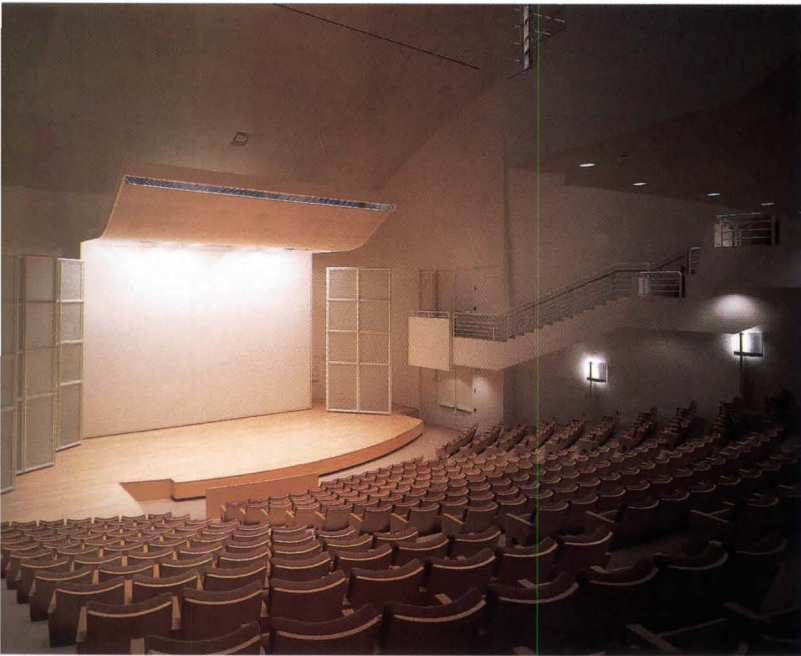
All of the buildings at the Getty Center have their main entrances on a common "plaza" level, which often is a middle floor. Visitors enter the East Building from a bridge (left in photo above), crossing a courtyard cut into the hillside. Two floors of offices are above the entry level, two floors

of laboratories below. In the East Building, the Conservation Institute worked with Meier's interiors team, headed by senior interior designer Christine Kilian, to create open offices (right) with conference rooms on the perimeter. Curved perforated-metal panels above workstations reflect light.



Arriving at the hilltop campus by tram, visitors see the auditorium (bottom) and a helipad for firefighters (lower left in photo bottom).

Solid on its north elevation, the auditorium is more transparent on its south side (bottom right). Inside, the facility seats 450 (below).



auditorium serves the entire campus and can be used for a variety of events, including symposia and small-scale musical performances. Simultaneous-translation equipment allows the auditorium to accommodate people from different cultures.

Diagonally across the arrival plaza, the 29,000-sq-ft restaurant/café building is another amenity shared by everyone at the Getty. Approximately equidistant from the North and East Buildings, the museum, and the Research Institute, the 650-seat food-services facility offers three levels of dining: a cafeteria on the plaza level, a restaurant above, and a boardroom with private dining on the top floor.

The restaurant/café building caters to Getty staff as well as visitors. Taking advantage of the mostly benign Southern California climate and great views to the south and west, the facility offers extensive outdoor dining areas. On the plaza level, the cafeteria-style operation

has 270 seats indoors and dining for 150 on a wraparound terrace. Pivoting glass doors can open the indoor area to the outside. One floor above, the restaurant has seating for 150 people indoors and 120 outdoors. Even the boardroom and private dining area on the top floor have their own outdoor space.

Brise-soleils and pergolas provide shade, and the architects are experimenting with outdoor screens to protect diners from the winds that often kick up. Indoors, gray translucent fabric shades offer another layer of sun protection when necessary.

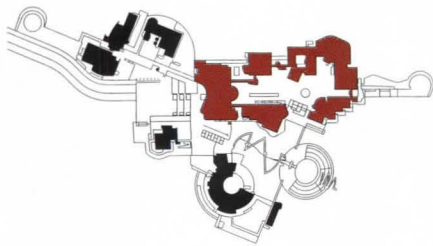
On the plaza level, a metal pergola painted lavender (a color not usually found in Meier's palette) highlights the white wisteria flowers that will grow on it. A small café at the museum with outdoor seating is connected to the restaurant/café building's main kitchen by an enclosed service corridor on the plaza level. *Clifford Pearson*



Opposite page: The restaurant/café (top) offers three levels of service: a café on the first floor (bottom left), a restaurant on the second, and private

dining, including a boardroom, on the third (bottom right). The floors in the café are old-growth hemlock, and the ceilings are 15 ft high.





THE NEW J. PAUL GETTY MUSEUM SHOWS THE BEST OF ART AND OF LOS ANGELES

Next year, more than 1.5 million people are expected to visit the Getty Center and its most public part, the J. Paul Getty Museum. But the museum is more than a single building. In fact, it consists of five two-story-high gallery pavilions surrounding a central garden courtyard for a total of 55,000 sq ft of exhibition space. Richard Meier's design of the new museum was influenced by the ease of passing back and forth between gallery and garden courtyard at the Getty villa in Malibu. (The villa, now closed for a renovation and addition project being designed by the Boston-based architectural firm Machado & Silvetti, is currently scheduled to reopen in 2001 as a center of ancient art.)

Meier contends that the openness of the multistory entry rotunda quickly communicates the museum's unique spirit to visitors. "Because of that lobby, visitors are able to see at a glance that the museum is not really a single building," explains Meier. "They might walk through the pavilions clockwise, which will let them see the collection in chronological order. But they might just as easily go straight into the central courtyard and start on the right-hand side, with the pavilion for temporary exhibitions."

The arrangement of the pavilions offers a variety of informal outdoor spaces, Meier explains. "It

is not something we imposed. We drew it out of the topography."

The windowless lower-floor galleries are reserved for drawings, illuminated manuscripts, and photographs. Also on the lower floor is a suite of 14 galleries devoted to the decorative arts collection, which includes several complete rooms based on designs from the 17th and 18th centuries. Upstairs, the sculpture and painting galleries have skylights and a specially designed louver system, and they are interconnected by glass corridors. Conservation studios, staff offices, and below-grade art registrar offices and art-handling areas comprise the remainder of the museum's 360,000 gross sq ft.

"It's as if there are two different buildings," says Associate Director and Chief Curator Deborah Gribbon of the vying functional demands of the galleries and the three floors below grade. "First we talked [with Meier and his architectural team] about the galleries—what the nature of those spaces should be—and then we shifted our attention to the nitty gritty of the floors below ground, which are intensely complicated and must accommodate many different users and were in fact given Richard's complete attention. That occupied several years. Then we turned our attention back to the specifics of the galleries." Adds Barbara Whitney, Associate



Meier says he studied the Spanish Steps in Rome for the approach to the museum (opposite). The entry rotunda dominates the central courtyard (right).



Director for Administration and Public Affairs, "We were always working from the inside out."

Meier also designed transition spaces for each pavilion, which allow for visitors' eyes to adjust from the sun-drenched courtyards to the much lower light levels in the galleries, and which also help control fluctuations of heat and humidity from visitors entering and leaving. Each pavilion has a skylit two-story lobby and an adjacent room with interpretive information on each collection on view and computer terminals offering access to in-depth information about the collections overall.

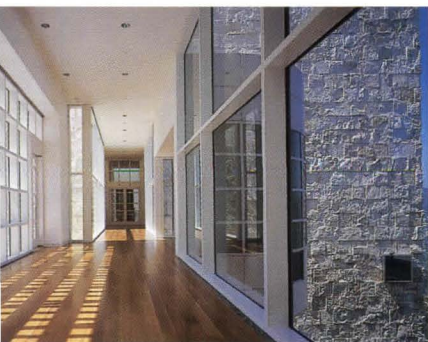
Museum Director John Walsh had specific ideas about how best to present the works of art inside the galleries. Of Meier's response to the museum's mandate, Walsh says: "Because he was required to take a functionalist view of lighting in the galleries, where the light had

to behave in certain ways [so it didn't overexpose and potentially damage the paintings], you couldn't splash the walls with it, which he does brilliantly in the public spaces." For the daylight galleries, "The whole idea is repose, naturalness," explains Walsh. Says Meier's partner, design architect Michael Palladino, "Walsh's idea of lighting was a revelation to me. I had always heard from museum directors and conservators that there was a perfect light level. Here there is a range."

To achieve the desired lighting levels and overall spatial effect, a gallery mock-up was built on site a year in advance of the actual spaces. "We learned as much as they learned," reports Jim Hearn, Dinwiddie Construction Company's superintendent in charge of the museum. And when the time came to build the real thing, the subcontractors "were more at ease," says Hearn. Palladino agrees. "The mock-up gallery and the lighting testing took out a lot of the guesswork. It was invaluable in getting consensus. And the contractor knew what the expectations were."

Meier's tendency to generously splash light through interiors served him and the museum well in other spaces. "Below grade was the place that Richard's love of light and his desire to have it penetrate every single space was, to us, an added bonus. He got all that light in three levels below grade where in most museums there's never any daylight," observes Whitney.

The elaboration of the gallery spaces was also a *(text continues)*



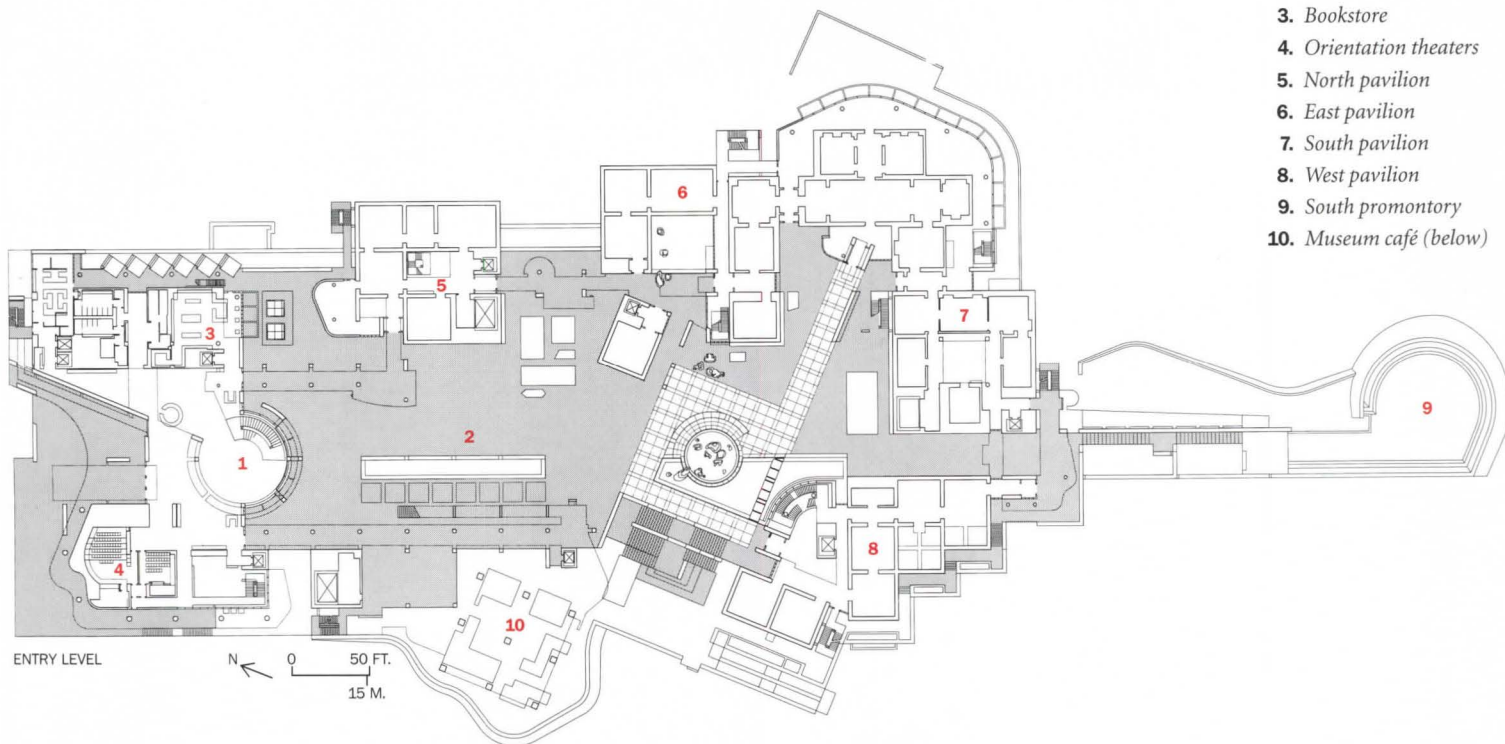
Travertine-clad gallery pavilions grouped around a courtyard (below and top right) are connected by glass corridors (above).



The central rotunda will remain mostly open, allowing visitors to pass easily between inside and outside.



1. Museum lobby
2. Courtyard
3. Bookstore
4. Orientation theaters
5. North pavilion
6. East pavilion
7. South pavilion
8. West pavilion
9. South promontory
10. Museum café (below)



TECHNOLOGY

Precise control allows Pacific daylight to illuminate art.

Richard Meier's office wanted to keep the blue sky visible in otherwise windowless art galleries. This may not seem much to ask, except when curators desire lighting that is beautiful but does not damage extremely precious artworks. Getty officials agreed they would like to see the sky, too, as long as no direct sun fell on works of art.

Working with the curatorial staff, Meier's office developed "standard" galleries of cube and double-cube proportioned rooms. The ceilings slope up to skylights (section, opposite) glazed in neutral-tinted glass of only 35 percent transmittance. (Similar criteria applied to the shed and inverted-V skylight variations.) Lighting designers Fisher Marantz Renfro Stone built mockups to test daylight and electric lighting schemes. And one actual gallery was completed early to verify design assumptions.

The Fisher Marantz team had worked with Venturi Scott Brown and Associates on London's Sainsbury Wing, where the galleries had a similar shape, inspired by Sir John Soane's Dulwich Gallery. Using a combination of skylights, operable louvers, translucent glass, and clerestories, the London galleries provide daylight in a far more diffused way, and lighting for the art depends more on electric fixtures. With light in Southern California both more plentiful and more dependable, the Getty designers devised a simpler system. Outside the glass, between stone-clad parapets, an automated louver system, custom designed by C/S, protects all the gallery skylights. (The blades run east-west so that they open north-south.) The louver system is timed to open as much as 45 degrees depending on season and time of day. The blades open northward, but they can rotate 135 degrees to open southward when needed.

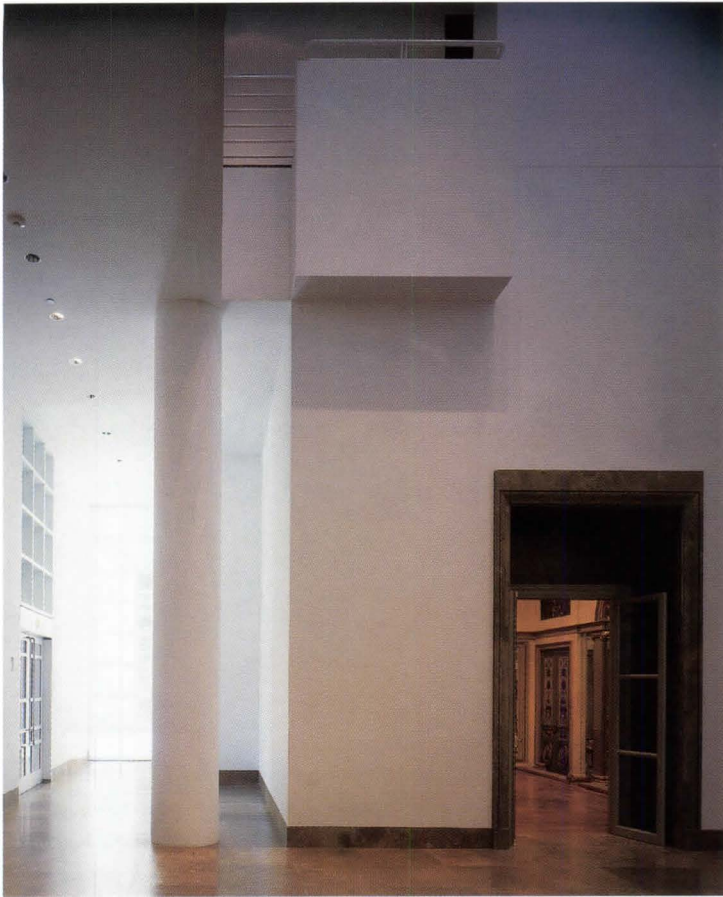
Three photocells per gallery measure the actual ambient light

and override the preset levels as needed. With the diffusing effect of the sloped walls, the paintings are entirely lit by daylight, and the light levels vary throughout the day, maintaining an average exposure of 250 lux (about one-fourth the level of a brightly lit office). When light levels fall at dusk or on cloudy days, the photocells cue a gradual dimming-up of a set of special low-voltage 100W quartz lights filtered blue to match the color of daylight. The fixtures and photocells are recessed on tracks below the skylights (detail, right). At night a second set of matching unfiltered lights comes on as well as exterior lights that bounce light off the closed louvers into the galleries.

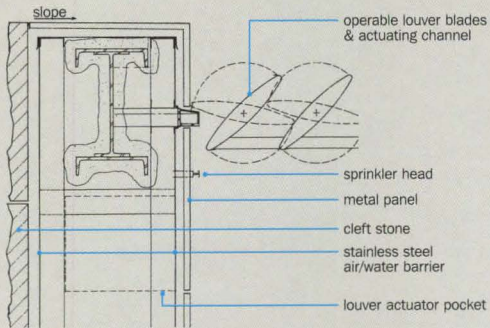
Lights must throw beams an unusually long 40 ft, but manufacturer Edison Price was able to meet both California's strict energy requirements and the Getty's required lighting levels using 100W lamps. The company devised a special yoke that angles the lamp over the edge of the recess and lock-

downs so that lamp replacement would not compromise the fixtures' precise focus. Lamps are replaced through a roof access panel. Lutron routed controls through the museum's building-management system; both curatorial and operations staff may monitor gallery status. *James S. Russell*

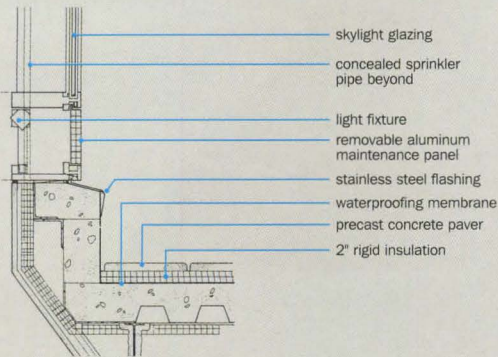




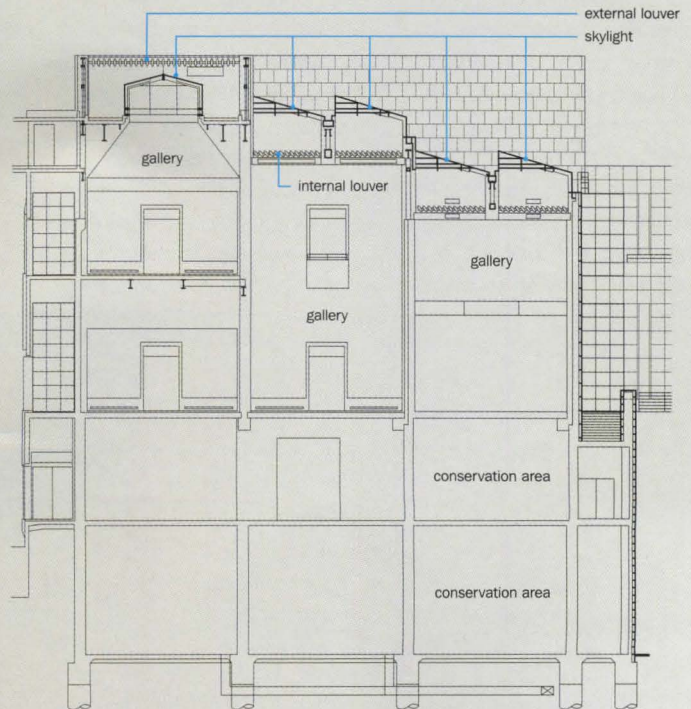
A skylit lobby in the North Pavilion (right) provides a visual break from the colors, textures, and artwork of the galleries. The South Pavilion atrium (left) gives a view into a Neoclassical panel room. The museum's generously daylit conservation laboratory is located in the saw-toothed portion of the east facade (below).



SECTION AT GALLERY SKYLIGHT PARAPET



SECTION AT GALLERY SKYLIGHT SILL



SECTION THROUGH GALLERIES

C/S prebuilt 17-in. louver sections as long as 17 ft (detail, top left). Lighting and photocells were set in a recess

below the skylights (detail, left). Gallery building section (above) shows varying skylight and louver conditions.

matter of considerable debate. As Stephen D. Rountree, the building program director during the design process, recalls, "I knew early on that there was a tension between what John [Walsh] wanted and what Richard [Meier] wanted for the galleries. There came a point when we weren't making progress, so I asked Thierry Despont [who had already completed his design of the lower-floor decorative arts galleries] to be a facilitator in the upper galleries in terms of the finishes and colors for the gallery walls. The result is more Richard than John, who became more comfortable with a modern vocabulary."

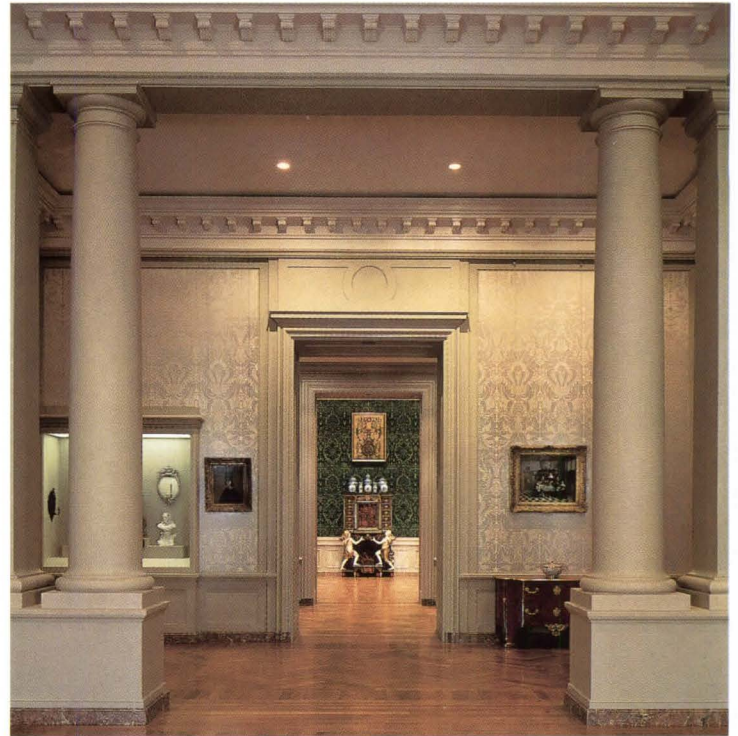
Of his choice of finishes for the painting galleries, Despont says, "I thought the fabrics should be fairly flat or very stretched so that they would respect the quality of Richard's space. For sculpture, I thought it would be nice to have the naturalness and classic quality of plaster walls."

Despont worked with the museum staff to choose a range of lush wallcoverings: from "Medici Red" cotton velvets for the 16th-century paintings and "Belgian Green" wools for French and Flemish paintings, to "Rembrandt Brown" cotton blends for the Rembrandts and other Dutch paintings and "Getty Blue" silks for the French, British, and Italian "grand paintings." Yet the fabric choices, unlike the tinted plaster finishes in

other galleries, are by no means final, at least for Despont. "The fabric and painted rooms are meant to be able to be changed after two years," claims Despont. "Are the fabrics frightfully expensive? No. Is the detailing such that they are easy to replace? Yes. Taste changes so fast; taste evolves. Why think that you forever have to have galleries that are in the 1997 opening state?"

What's more, the collection itself is in a constant state of transformation. Since J. Paul Getty's estate was settled in 1982, the museum has spent nearly \$1 billion on art acquisition and it continues to add to its collection. While some significant purchases were made while the Getty Center was being designed and built (most notably, perhaps, Vincent van Gogh's *Irises* and more recently a coveted Fra Bartolommeo panel), the pace has not been as frantic as outsiders might speculate, say museum authorities.

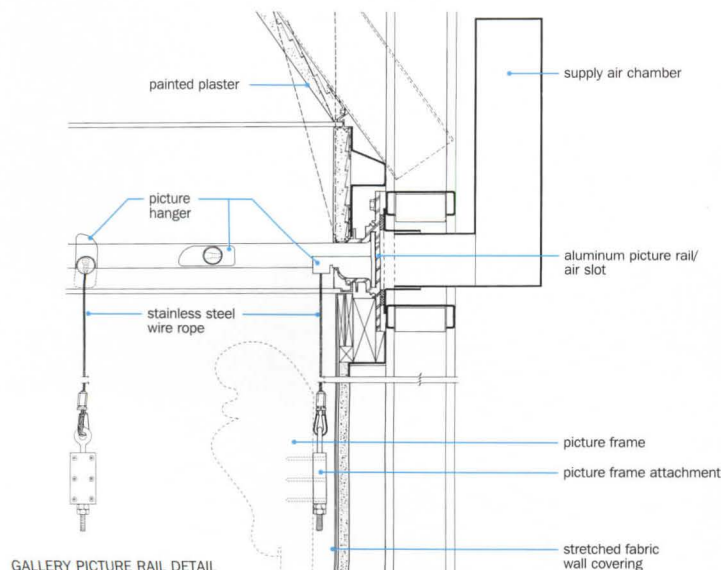
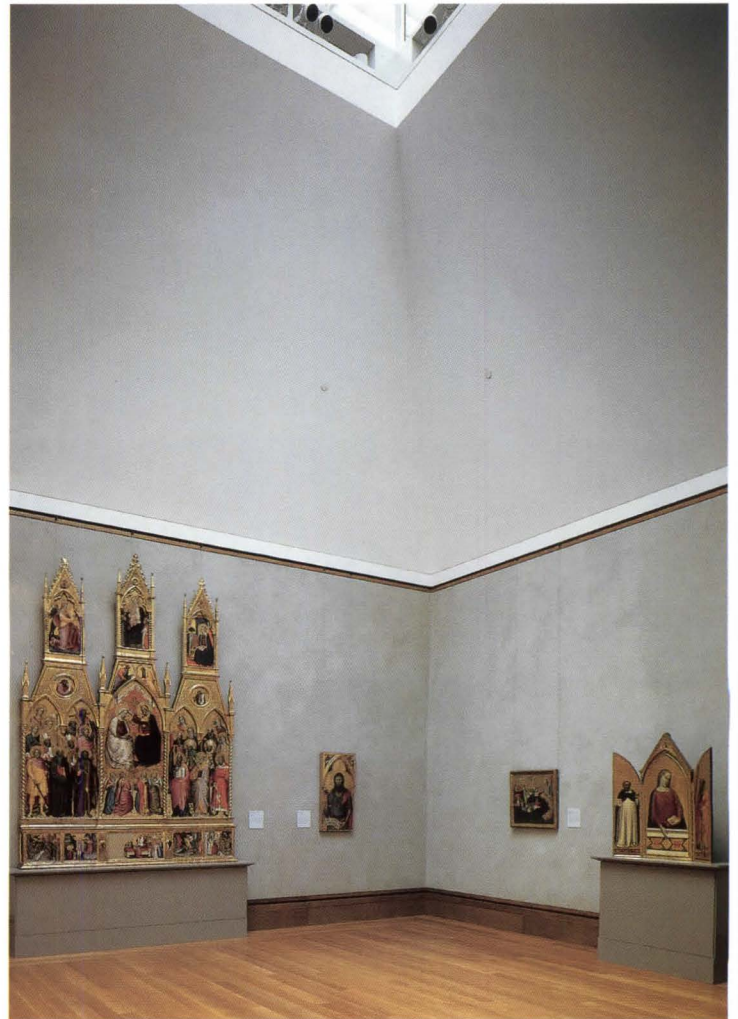
"The collection didn't grow as rapidly as we thought," explains Gribbon. "We collect opportunistically, depending on what's available." Important purchases did and will continue to influence the arrangement of artwork within the galleries. "There was some calibration [following significant acquisitions]," says Gribbon. "Overall, we've been generous in allocating space for the paintings. Here we have an opportunity for long vistas." *Karen D. Stein*



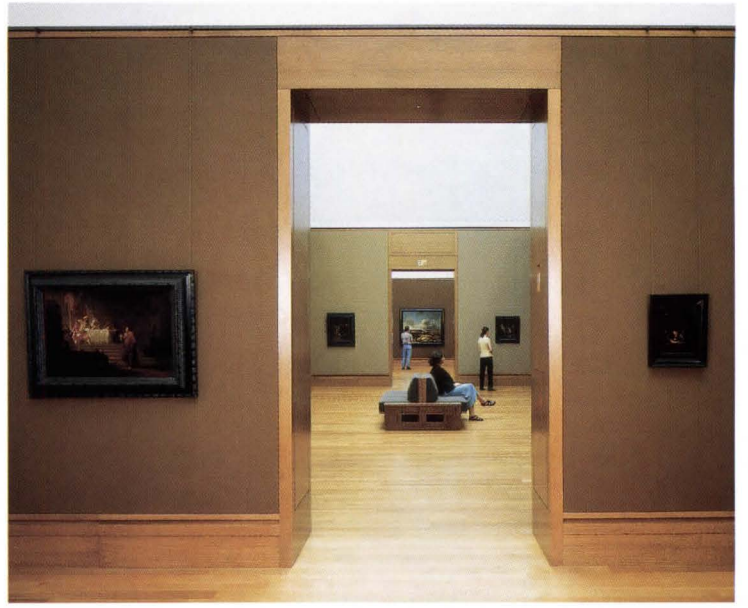
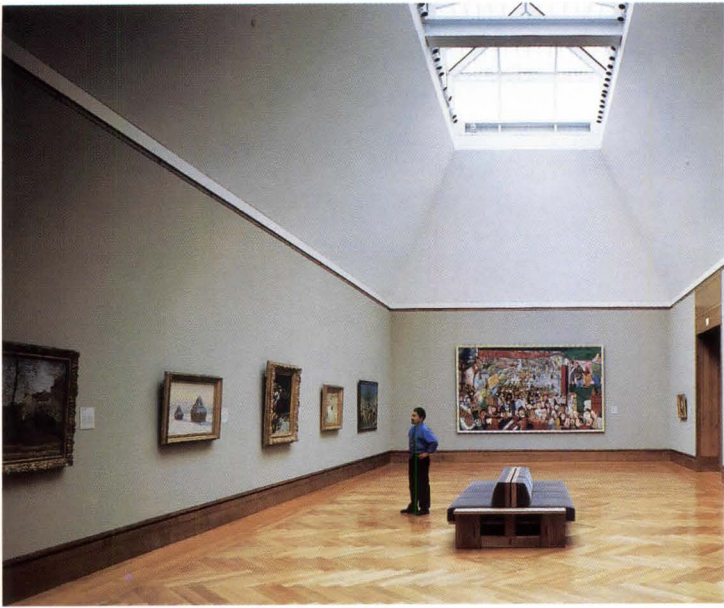
The decorative arts galleries (above; opposite page, middle and

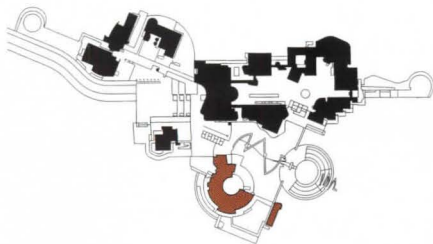
bottom left) are in windowless spaces on the ground floor. The sec-

ond-floor painting galleries have custom skylights and louvers.



GALLERY PICTURE RAIL DETAIL





A “SECULAR MONASTERY,” THE RESEARCH INSTITUTE SETS ITSELF APART

The scholarly arm of the Getty, the Research Institute for the History of Art and the Humanities houses a library with 840,000 volumes and offices for a staff of about 150. In addition, the 201,000-sq-ft building has offices for 30 visiting scholars, study carrels for guests using the library on a day-to-day basis, seminar rooms with views of the Central Garden, a 120-seat auditorium, and a small exhibition space.

While the Getty Museum had a strict program due to the special needs of the artwork, the Research Institute offered Richard Meier and his associates a chance to be more free with their architectural forms, explains Thomas Reese, deputy director of the institute. The result is a building that is more typical of Meier’s work than the museum but also is more visually expressive, says Reese.

Because the Research Institute is the Getty building closest to a residential area, homeowners in nearby Brentwood were particularly concerned about its design. Rigid guidelines negotiated with the Getty’s neighbors established setback, height, and view-line requirements that helped shape the massing and design of the building.

The architect’s response was to tuck all of the closed book stacks and some of the library’s other functions into a “plinth” terraced into the site’s west-facing slope, explains Meier partner Michael Palladino. Skylights along the perimeter of these terraces bring daylight into the spaces below without reflecting light into neighbors’ homes.

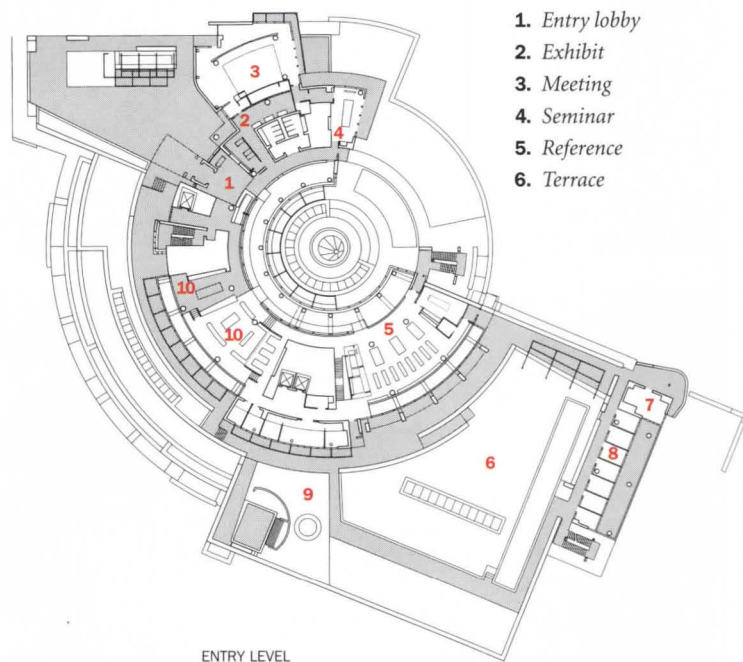
A multidisciplinary center that attracts scholars from many different fields, the Research Institute needed a building that would

encourage interaction between staff, scholars, and visitors. Given a pie-shaped diagram showing which functions need to be close to each other, the architects turned the simple drawing into the building’s parti—a circle allowing easy access from one section to another.

As the design developed, the architects sliced a wedge out of the southeast quadrant of the circle to open views to the Central Garden and glazed the interior perimeter of the building so people could see at a glance what was happening in other parts of the institute. “The building reflects a sense of integration,” says Salvatore Settis, director of the Research Institute. Visiting scholars, who spend up to a year at the institute, can set up shop in one of three locations: on an upper floor where offices form “an academic village,” in a “scholar’s tower” separated from the circular building by below-grade book stacks, or in a part of the stacks area itself.

Less public than the museum or the auditorium, the Research Institute is set slightly apart from the rest of the Getty campus by a stone-clad gateway and by its inwardly focused circular form. According to Reese, former director Kurt Forster used to refer to the institute as “a secular monastery.”

Once inside the building, though, a sense of transparency takes over. Floor-to-ceiling clear-glass curtain walls provide views of the central courtyard from the upper floors, while book stacks on lower floors are arranged in a radial pattern to provide views to a central skylit space. The architects had wanted to create an interior ring of space extending from the lower level of stacks to the upper floors of



ENTRY LEVEL



COURTYARD LEVEL





The west facade steps back to reduce the impact on neighbors. Skylights and courtyards bring sun below grade (below).





offices, but fire codes restricted what could be done. Though the upper office floors ultimately had to be separated from the tall space by glazing, a sense of openness remains—thanks, in part, to daylight coming from above and a dramatic curving glass ramp that leads from the entry to the courtyard level.

To one side of the ramp, a series of rooms for periodicals and reference materials flow one into the other, each a couple of steps down from the previous one. On upper floors, curving bookcases line the circular corridor, encouraging scholars to browse in this common space and interact with others.

The circular plan with non-structural partitions separating different areas was designed for flexibility. Indeed, even before the building was completed, its ability to adapt to changing needs was tested when the clients decided they needed seminar rooms on each of the floors above grade. By shifting interior walls along the building's great curve, the architects carved out space at the open end of each floor for a seminar room.

Reviewing the Research Institute's new home, director Settis states, "It's powerful and flexible, and it gives us a strong image."
Clifford Pearson

Steel framing over a concrete plinth makes the building lighter, an advantage in a seismic zone. Clear-glass curtain walls (opposite) are protected from sun-

light by gray fabric scrims. A ramp made of two layers of glass planks (right) leads from the entry. Stacks are laid out radially to preserve views (below).



NINE MONTHS OF RESEARCH AND DEVELOPMENT YIELD STONE FABRICATION INNOVATION

The battered stonework at the Getty Center is Richard Meier's biggest departure from the elegantly sheer language of metal and glass that has been his signature for 30 years. It is through the stone that Meier wanted to "ground" the Getty complex in the blond tones of the site's prevalent Santa Monica sandstone.

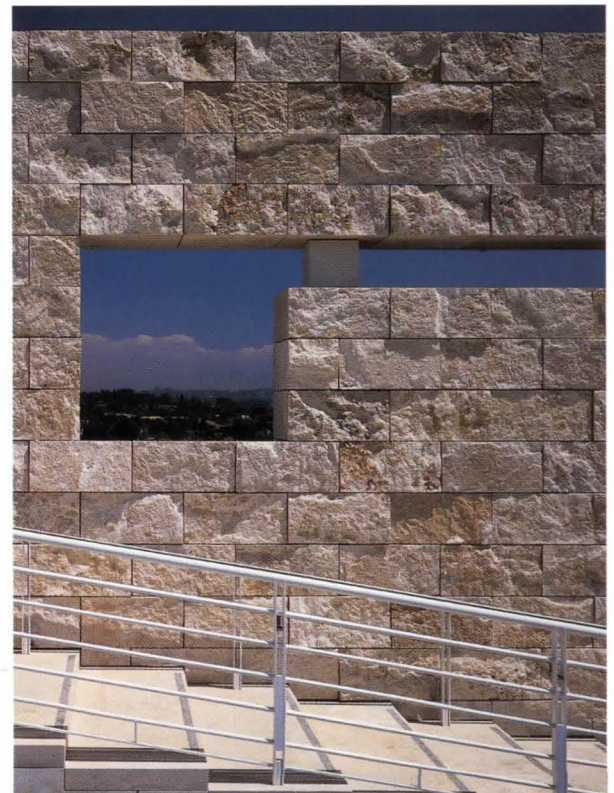
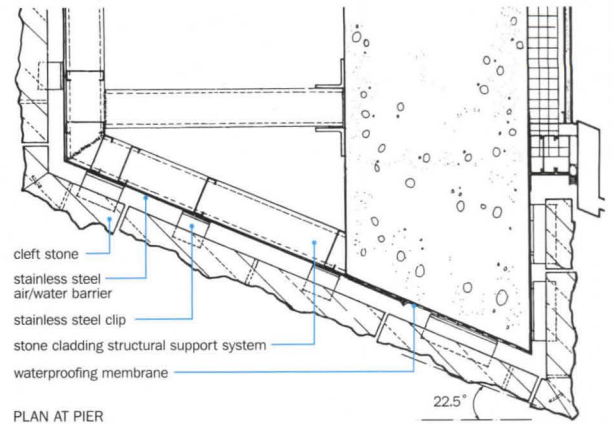
As early as 1989, "stone samples began to arrive from all over the world," says principal James Crawford, of Meier's office. Granites, sandstones, and limestones were all considered before the team settled on a supplier, DBM Hatch, and "Roman classic" travertine.

The standard honed finish of the travertine when seen at great distances and across vast wall areas "looked like wallpaper," says Crawford. It took almost nine months of work with Carlo Mariotti, of the

Italian stone firm Carlo Mariotti and Family, in Bagni di Tivoli, to devise a suitable fabrication technique. Mariotti used a guillotine to split the 30-in. square stones along their bedding planes, giving them the texture Meier sought (below).

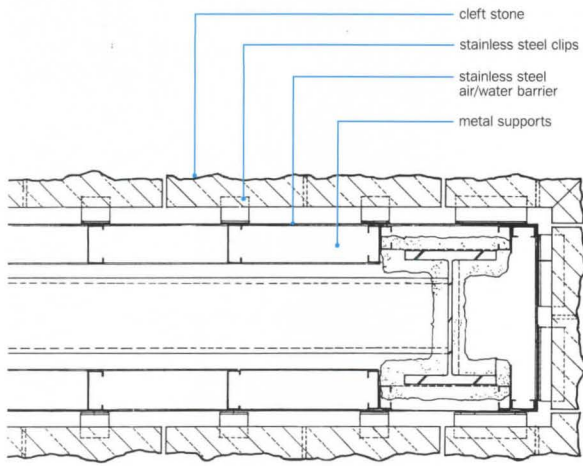
Because the guillotine would crush all but large stones, pavers were sawn out from the middle after clefting. Outside corners were made by laminating matching cleft faces onto the sides of pieces. The mitered joints are all but invisible.

Open joints and air space behind the stones allow drainage from the waterproofed cavity (details, right and opposite). Lacking sealants that require maintenance, pick up dirt, and may stain stone, the open joints also allow the stones to move independently in an earthquake. *James S. Russell*

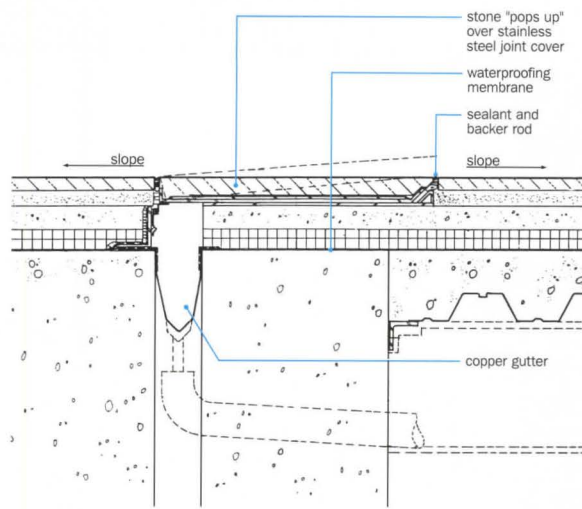


Each stone's cleft surface varies as much as 7 cm, or 2 3/4 in. Stones bearing the many fossils revealed during the cutting process were reserved for positions where

they could readily be seen by passersby. The stone was clipped to a waterproofed backup of concrete or metal, depending on the support condition (details, top).



PLAN AT PIER



PAVING SECTION AT SEISMIC JOINT

The Getty was constructed to high seismic standards. A pop-up stone paving panel avoids a metal-plate cover over a drained 5-in. seismic joint (left).

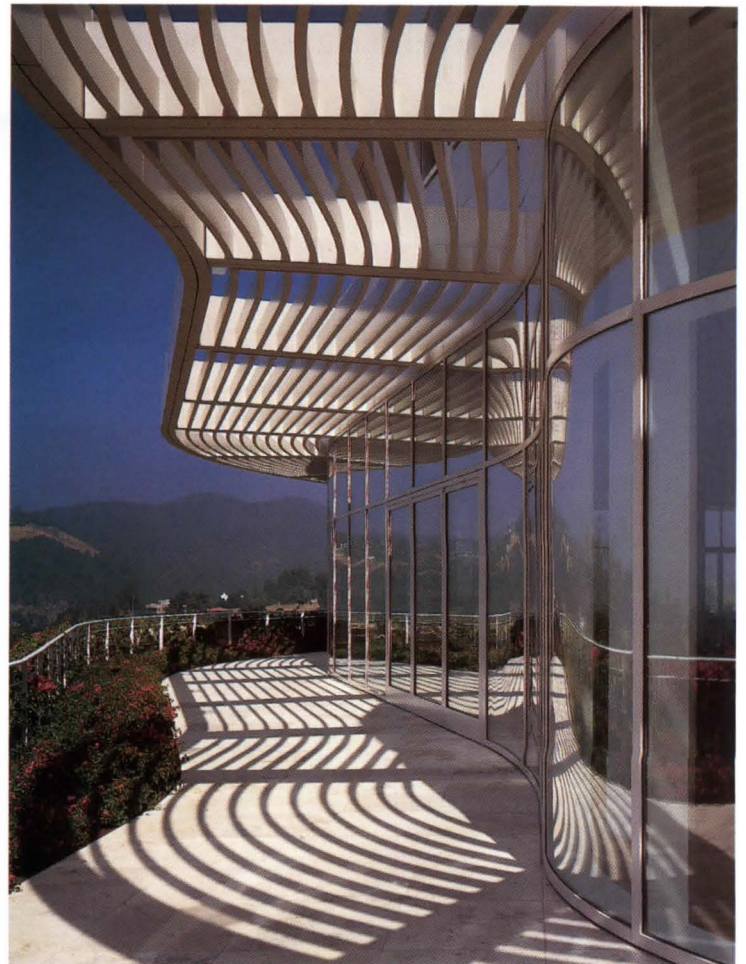
A CURTAIN WALL'S CRISPNESS BELIES COMPLEX INTEGRATED SYSTEMS

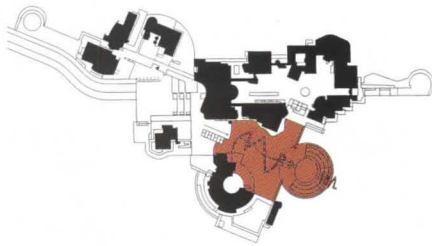
Like the Getty Center's stonework, the curtain-wall system is open-jointed, separated from the waterproof backup by a ventilating air space. The open joints permit lateral motion in earthquakes. If they had been joined with sealant, the joints would need to be twice their 3/8-in. width to meet seismic requirements.

Getty management supported Meier's desire to coordinate the location and appearance of the enormous variety of visible mechanical and electrical items. Both Meier's office and Getty management credit Harmon, Ltd., a curtain-wall fabricator and subcontractor, for handling the logistics such close coordination entailed. Skylight mullions in the galleries, for example, not only contain a sprinkler pipe and heads but also include wiring and nearly invisible heads for motion and smoke detectors.

One example of Harmon's inventiveness is the fact that instead of cantilevering the brise-soleils from the building's structure, the company fastened cantilevered tubular aluminum screens to the

reinforced curtain wall itself, thereby avoiding leak-prone penetrations. (At 5 by 15 in., these are the largest tubes yet extruded, says Harmon's Brad Kumbera.) Especially challenging was the one-story-high sliding museum rotunda entrance wall, made by a firm in Tacoma, Washington, that manufactures sub-assemblies for Boeing airplanes. The curved glass had to be extraordinarily accurate, says Kumbera, because "it is integral to maintaining the 'squareness' of the doors." J.S.R.





GARDENS AND COURTYARDS FILL THE SITE, WHILE ARCHITECTURE TAKES CENTER STAGE

Of the 110 acres of the Getty Center site, only 24 are part of the main campus, and out of those some 19 acres were left as outdoor space. Landscaping not only creates a link among the buildings but also makes a park that is itself an attraction for visitors.

Many professionals in addition to Richard Meier & Partners have contributed to the site plan, including Dan Kiley, who early in the project did conceptual studies. Emmet L. Wemple and Associates landscaped the sloped areas requiring remedial grading and the zone of the north entry parking facility. Hanna/Olin, now called the Olin Partnership, joined in 1993, creating an overall scheme for the complex that combines formal and informal courtyards (opposite) planted with trees, shrubs, and flowering plants, many native to California.

In 1992 San Diego-based artist Robert Irwin was commis-

sioned by the Trust to design the Central Garden (below right), a 134,000-sq-ft work of foliage art that reestablishes a natural ravine between the new J. Paul Getty Museum and the Research Institute. Working with Richard Naranjo, the Getty's gardens and grounds manager, and the San Diego landscape architecture firm of Spurlock Poirier, Irwin devised a tree-lined walkway that leads visitors through a variety of garden experiences. The walkway crosses a stream, which flows over a rocky waterfall into a pool beneath a maze of azaleas.

Says Irwin: "This garden is going to have seasons, something you don't see much in this area. The real planting starts next spring, and that's going to take three years of coming here almost every other week to see what's working and what's not. That's part of the nature of this institution: doing research on how one maintains certain things." *Karen D. Stein*



Manufacturers' Sources

Aluminum cladding, aluminum windows and curtain wall: Wausau Metals
Aluminum finish: The Valspar Corp.
Stainless-steel windows: A. Zahner Sheet Metal
Ornamental metals: Blakeway Metal Works
Elastomeric roofing: American HydroTech
Balanced-door entrances: Ellison Bronze Co.
Travertine cladding and pavers: Carlo Mariotti
Sealant on stone: ProSoCo, Inc.
Weatherproofing seals: Dow Corning
Fire-control doors, security grilles: The Cookson Co.
Operable louvers: C/S Group
Laminated vision glass: Viracon

Special glass: Hehr, Downer, Sumiglas
Curved glass: Dlubak
Custom glass: GlassTech, UltraGlas, Architectural Glass Design
Architectural coatings: Tnemec
Top pivot hinges: NT Dor-O-Matic
Locksets: Schlage
Stainless-steel door pulls: Trimco
Custom-color panic bars: von Duprin
Closers: Norden, LCN
Other hinges: Rixon, Stanley
Weatherstripping: Ultra
Acoustic gasketing: Zero International
Hollow-metal doors: Pacific Steel
Wood doors: Anemostat, Brochsteins, Inc.
Fire-rated vision lights: TGP (Firelite)
Wood flooring: Kentucky Wood Floors
Plastic laminates: Pionite, Formica Corp.

Architectural woodwork: Wigand Corp., Fink & Schindler, Brochsteins, Inc., R.S. Bacon Veneer Co.
Window-shading systems: Levolor, MechoShade Systems
Furniture: Donghia, Knoll, Herman Miller, Lowensteins
Upholstery: Unika Vaev, Pallas Textiles, Maharam, Spinneybeck, Gretchen Bellinger
Kitchen equipment: U-Line, Sub-Zero Freezers
Stairwell gates: Washington Iron
Floor tile: Graniti Fiandre
Resilient flooring: Armstrong, Burke, Deutsche Linoleum Werke
Carpeting: Shaw Contract Group
Wall fabric in galleries: Rogers & Goffigon, French Needle, Yoma Textiles, Cooks Mills

Display cases: Helmut Guenschel, Inc.
Lateral files: Steelcase
Millwork: Wigand Corp., Brochsteins, Inc.
Signage: Carlson & Co., Neiman & Co.
Tram-stop canopies: C/S Group, Rudy Art Glass
Auditorium seating: Poltrona Frau
Acoustic ceilings: The Celotex Corp.
Skylights: O'Keeffe's, Inc.
Elevators: Fujitec
Tram: Otis Elevator
Recessed downlights: Edison Price
Illuminated exits: Lithonia
Interior fixtures: Zumtobel/Staff, Prudential, Lightolier
Exterior fixtures: BEGA/US
Dimming controls: Lutron
Faucets: Kroin

The Palm Garden between the East and North Buildings is one of the contributions of the Olin Partnership, which planned the series of gardens

based on elevation and sun exposure: cool greens and purples on lower levels and lighter or hotter-colored flowering plants on higher terraces.



CRITICISM Robert Campbell takes a personal tour through the GETTY CENTER and finds old and new analogies.

It's been said before, and I'd rather be original, but I've got to say it again. The Getty Center is a feast of breathtaking photos and marvelous small moments, but it fails to cohere into a completely satisfying whole. This isn't a pan. Under any normal circumstances, you'd say the Getty was a wonderful building. The problem is the level of expectation. Here are a world-class architect at the top of his game, a great site, a billion-dollar budget, and a program rich in functions that often inspire distinguished architecture: an art museum, a library. And the museum is terrific, and so is the library. But the many brilliant architectural instruments don't quite build to a satisfying chord.

An immediate qualification: at the time I made my visit (to meet RECORD's deadline), the landscaping was far from complete. Artist Robert Irwin was still installing his site piece, most of the trees and other plants were yet to come, and there was no water in the big reflecting pool. Like much good Southern California architecture, the Getty is partly an exploration of all the ways you can relate indoors to outdoors. The landscape was designed by titans in the field—Dan Kiley, later replaced by Laurie Olin—and I'm sure it will help, but it's hard to believe it will completely solve the problems. Richard Meier had hoped for much more water—he wistfully mentions the Villa d'Este—a hope that was vetoed by the client, who didn't want to appear to be abusing natural resources in water-starved California. A mistake.

It isn't easy to describe the Getty. The Getty people, including Meier, refer to it as a campus. But I found two other analogies more helpful in thinking about it.

The first analogy is Hadrian's Villa. The same description applies to both: each is a sprawling villa sited on high ground, with a long view, but with higher land in the background. In each, water features are the strongest accents. And each is organized by two grids that collide at an angle of about 20 degrees (22.5 at the Getty), with cylinders acting as pivots from one grid to the other.

The grids, says Meier, respond to the street grids of downtown Los Angeles to the east and of Santa Monica to the west. But you're unaware of any such geometric context when you're on the site, and Meier has often employed rotated grids. They are a device that grew from the

need that was felt, in the 1960s, to create complex form without using applied ornament or symbolism.

Hadrian's Villa offers one way of thinking about the Getty. It existed in order to be appreciated: a retreat for a romantic longing to wander and think poetic thoughts amid caves and pools and sculpture. Meier imagines you behaving that way, too: strolling in and out of galleries and gardens, in and out of the sun, on an isolated Olympus far from the city. The Getty's dark but skylit galleries are the architect's equivalent of the underground cryptoporticus at Hadrian's Villa, which is daylit as well. Instead of capturing sunlight with marble figures, Meier grabs it with his own architectural sculpture. Both buildings are places to be probed and explored over time, places in which you come unexpectedly on one feature or another.

The crucial corollary: There can be no single large ordering principle, no master narrative that governs your experience of the Getty. In his museums in Atlanta and Barcelona, Meier uses the act of procession as such a principle. Your movement through space, intensely choreographed, becomes the story of the museum. At the Getty Center, Meier chooses not to focus your perception in any such dramatic manner. You're attracted this way and that without ever arriving at a place of centrality or rest. It's the opposite of an epiphany like Louis Kahn's perhaps rather self-conscious courtyard at the Salk Institute in La Jolla, California.

The second helpful analogy is to a hospital. That is, in fact, what the ignorant stranger will surely assume the Getty is, as seen from below on the freeway. Like a hospital, it's mostly white and sanitary. But there's more to the resemblance. The Getty is a fiction in the sense that even though it was all designed and built at once, it appears additive and accretive, as hospitals always are. The lack of any big formal organizing idea makes the Getty look as if it was built one wing after another, donor by donor, over a period of time. From many viewpoints it looks random, even confused.

Admittedly, this quality solves a couple of problems for Meier. For one thing, it saves the Getty from the danger of appearing to be a single overwhelming object. That fact raises an obvious question, and I posed it to Meier: Wouldn't the Getty have been better if several different architects, working within, say, a framework established by Meier, had designed its different parts over time, each one relating carefully to what was already built but each also expressing an individual direction—

Robert Campbell, FAIA, a contributing editor of ARCHITECTURAL RECORD, is the Pulitzer Prize-winning architecture critic at the Boston Globe.

wouldn't the Getty have gained variety and tension and surprise? He replied, "I might answer that question the same way if I hadn't been selected as the architect."

The accretive technique also solves a practical problem. During the design phase, the Getty's six separate institutions were still figuring out what they wanted to become. The additive design method allowed each part to rethink its needs independently of the others. They share a Meier design vocabulary, but they don't have to fit into a formal composition.

There's a third hospital parallel. It's the organizational idea of the horizontal sandwich of functions. Served and servant spaces tend to occupy horizontal layers, linked vertically by many elevators. A huge service basement, which the public visitor will never see, occupies nearly half the volume of the Getty complex. Here toil the Morlocks, so to speak, serving the Children of Light who flit through the galleries and other public realms. Sometimes there's a third still higher layer of offices, rather like the superstructure of a ship. And indeed there are some views from which the Getty looks like white decks and rigging atop a huge stone hull run aground in the hills. Those are ways of understanding the Getty as a whole. Let's look more closely at particular aspects.

First, the galleries. They're the soul of the Getty, the place you'll

the wall colors often take their hue from a fashion of that era, or from a dominant painting in the space. It's an approach that risks a too-easy nostalgia, as in the Wedgwood blue walls of a gallery displaying 18th-century English art, but it generally works and the paintings have never looked better. Where the paint is integral, the wall surface achieves an amazing optical depth, reminiscent of the backdrops of portraits by the photographer Irving Penn: the paintings seem to drift against a background fog.

I liked the galleries here better than the similar, much-admired ones by Venturi, Scott Brown and Associates at the Sainsbury Wing of the National Gallery in London, where the light is a little too unvarying, and the monotone architecture, failing to assert itself sufficiently as a frame of space, leaves the paintings on the walls as isolated as slides in a lecture (an effect the media-maven Venturis probably like). The Getty hits the right balance: just enough architecture (oak detailing, changing shapes and colors) to articulate space and give the paintings a place in which to exist.

Next, the materials. Above a certain height, the Getty is made of the familiar Meier panels and painted pipe rails. They're a little off the usual pure white, but that makes no real difference. What is different is the travertine. Last spring I had a chance to visit the Mariotti stoneyard



SOMETIMES THE LIGHT IS SO TANGIBLE IT SEEMS TO BE A VOLUME INSIDE A SPACE, PUSHING OUT.

spend the most time, where you go to look at the great art (and it certainly is great). The skylit top-floor galleries, the ones that display the paintings (objects are lower down), are magnificent—as good as any of recent decades, on a par, say, with Kahn's at the Mellon at Yale. They are four-walled, roomlike spaces, as befits their traditional contents. They open to one another, but they're very different from the modernist flow of space, measured only by freestanding panels, that you find in Meier's High Museum in Atlanta, a place where the art can seem superfluous in the architectural collage. The Getty galleries are hip-ceilinged and lit from above in the manner of Sir John Soane's Dulwich Gallery, the model for so many museums. You hear endless stories about how Meier was often at loggerheads with the Getty staff and other consultants over these spaces. But however messy the process, the result is successful. The computer control of natural light is sophisticated, both as to color and brightness (a constant 22 footcandles), but the light isn't so heavily modulated that you forget there's a changing, moving sun up there somewhere: you can see blue sky through the operable louvers.

Walls in the various spaces are surfaced in different materials and textures: flat or corrugated linen, applied paint, or paint mixed integrally with the plaster. Each room displays the art of a particular era, and

near Tivoli, Italy (just a few kilometers from Hadrian's Villa), source of the Getty's travertine. It was a huge job: two containers of stone every day for two years. The stone was split with enormous industrial guillotines to create the roughest possible surface. I guessed then that the split-face wouldn't work aesthetically. The surface is extremely irregular, as much as three inches deep from the outermost protuberance to the innermost recess. The scale seemed overwhelming, and the natural organic variation of the limestone surface seemed lost. But the Getty is so big that the roughness falls comfortably into place. No surface less bold would have succeeded in reading as texture.

The Getty reminds me of Frank Lloyd Wright's Fallingwater (a building Meier has spoken of as a huge influence on his choice of career, although not, so far as I know, in connection with the Getty). The travertine is the same pinkish ocher color as the land around the Getty, and it seems to heave itself up out of the ground like a natural eruption, just as do Wright's stone piers. And then, in both buildings, you get a white, cubist, obviously man-made superstructure. You get the opposing yin and yang of architecture: cave and promontory, nature and geometry. At the Getty, the smooth metal and rough stone kiss like baby and grandpa. Meier doesn't allow himself to (*continued on page 197*)

*From Day One at the Getty Center
the Exterior Doors of Choice ...*

Ellison Balanced Doors

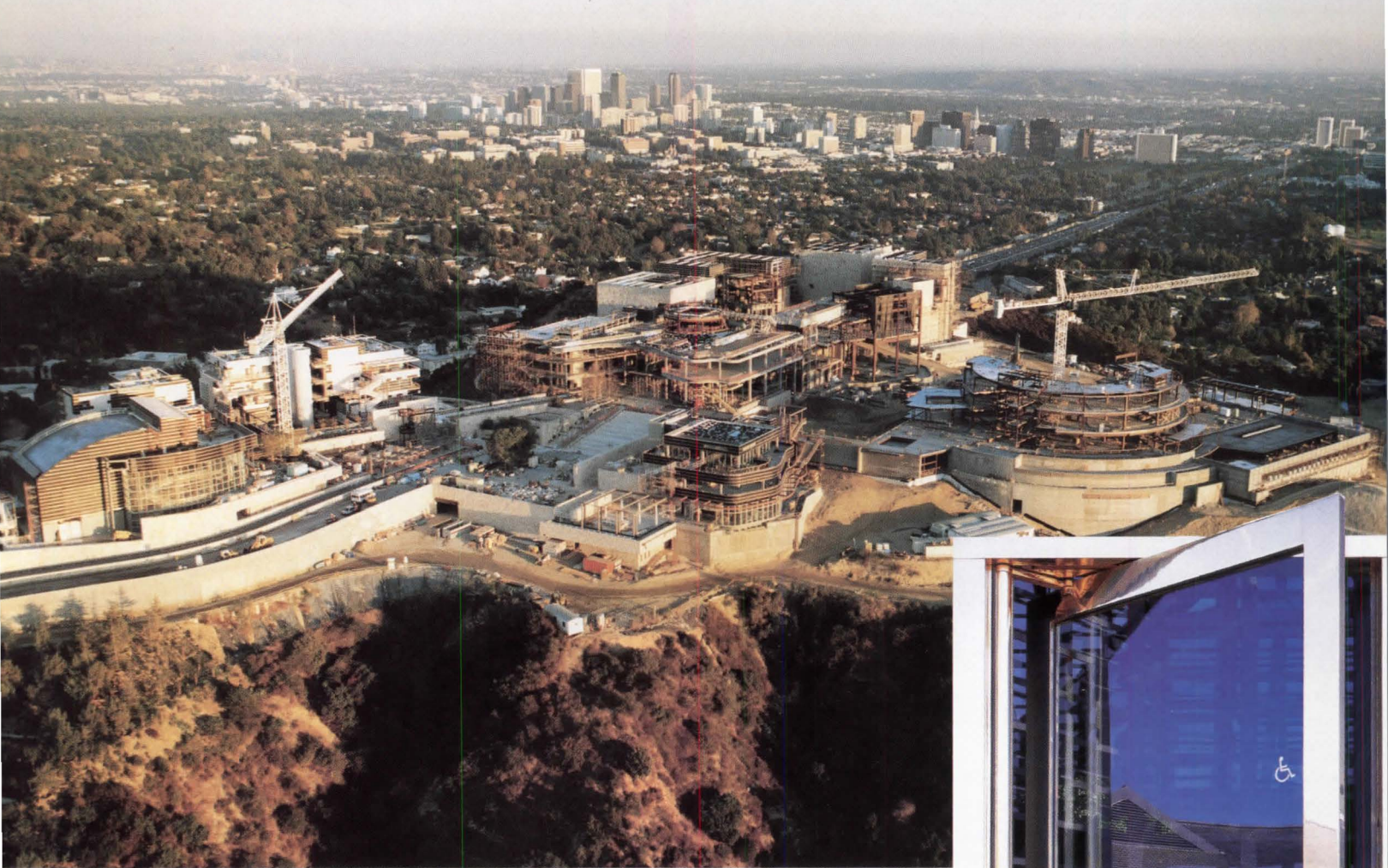


Photo: Warren Aerial Photography Inc.

*And Ellison Hinged Doors...and Ellison
Sliding Doors...and Ellison Pivoted
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CIRCLE 36 ON INQUIRY CARD

RESIDENTIAL REMODELING

Who Needs an Architect?

THE REMODELING MARKET IS BOOMING, BUT ENTREPRENEURS AND OTHER DESIGNERS ARE TAKING THE LION'S SHARE OF THE BUSINESS FROM PROFESSIONALS.

by Wendy Moonan



1

Fire Island, New York

To transform a sad 1950s beach house into a light-filled place for entertaining, architects Roger Hirsch and Susan Frostén had to gut most of the old.



2

Los Angeles, California

After the Northridge earthquake shook things up, Ferguson-Ettinger Architects repinned a cottage to its site and added a series of outdoor elements.



3

Charlotte, North Carolina

Architect Kenneth Hobgood took inspiration from an old pergola in designing a glass-and-steel addition to an early-20th-century home.

The residential rehabilitation business is huge, but architects are getting just a small slice of the pie. Sitting at the table are a range of hungry entrepreneurs and other professionals such as remodelers, interior designers, and contractors, all busy convincing the public that architects aren't needed for remodeling projects.

"Many architects do not accept smaller projects," warns a new glossy consumer's remodeling guide published by the National Association of the Remodeling Industry (NARI). In fact, the 88-page booklet, called "Master Plan for Professional Home Remodeling," is not architecture-friendly at all. Architects are not mentioned until page 16, and there only in a paragraph that reads: "In cases where your professional remodeler does not provide design services, you may wish to seek the assistance of a professionally trained architect." The NARI recommendation? "Your best bet may be to hire a design/build firm."

Almost 40 percent of homeowners plan some type of home improvements this year, according to a Fannie May survey. The National Association of Home Builders reports that the remodeling market in this country grew from \$112.6 billion in 1995 to \$118.6 billion in 1996. But architects' net billings for remodeling single-family projects was just \$265 million in 1996, reports the American Institute of Architects. In comparison, architects billed \$1.1 billion for new single-family homes that year.

What is the \$118 billion being spent on? House additions, bathrooms, kitchens, great rooms, media rooms, attic bedrooms, and home offices. Who is remodeling? Baby boomers, of course. A 1996 Yankelovich study says the mean age for remodelers is 42.2 years, that 51 percent are male, 74 percent are married, and 12 percent are divorced, separated, or widowed. Some 69 percent work full- or part-time, 80 percent are white, and their average mean annual household income is \$45,300. In the survey, 81 percent of the remodelers said they were "furnishing their home so that it is comfortable and easy to take care of."

Remodeling magazine reports that 80 percent of home remodeling is done by professionals, not by homeowners; busy consumers seem to prefer spending money—not time—on their houses. Some of the work is being done by national franchisers like ServiceMaster Residential Commercial Services (of Memphis), some by contractors, and some by architects. There's a lot of business to be done, if architects are interested.

Wendy Moonan is an editor-at-large of *House & Garden* and a frequent contributor to *RECORD*.

1 Fire Island House

Fire Island, New York

ROGER HIRSCH, DREW SOUZA, AND SUSAN FROSTEN GUTTED AN OLD BEACH HOUSE, THEN TURNED IT UPSIDE DOWN AND INSIDE OUT.

by Wendy Moonan

Project: *Fire Island House*
Fire Island, New York
Owners: *Roger Hirsch and Drew Souza*
Designers: *Roger Hirsch, AIA, Architect; Susan Frostén Architect; Drew Souza Designer*
Consultants: *Kugler Tillotson Associates—Suzan Tillotson, principal (lighting); Designscaapes (landscape); Charles Southard Jr. (structural); Reed Karen and Glen Johnson (cabinetry); Art & Design Works of Oregon (metalwork on interior fixtures and furniture); Studio 40 (metalwork on dining table, beds, and balconies)*
General Contractor: *Vincenzo Pepe*

Project Statistics

Size: 1,600 sq ft (renovated), 1,400 sq ft (originally)

Cost: \$178 per sq ft

Design challenges: *Building on a car-free island with strict noise ordinances; executing a gut renovation on a 1950s beach bungalow that had been long neglected.*

New York City architect Roger Hirsch, AIA, gives new definition to the word “renovation.” In 1993 he bought an abandoned 1950s beach house on a tree-filled, 60-by-160-ft lot on Fire Island, a sandy strip of land in Long Island’s Great South Bay, and decided to turn it into a four-bedroom house for weekend entertaining. The house had a sad past. One previous owner had begun a renovation, then stopped after falling ill. The banks took back the house, and just left it—without plumbing or electricity.

Site constraints

“We had to design everything with the island in mind,” says Hirsch, who designed the house with his former partner, architect Susan Frostén. “Building on a car-free island with pedestrian boardwalks forces you to transport equipment and materials via ferry and electric cart. Major building work can only be done in the winter. Noise codes forbid loud power tools on weekends. This added to the time and expense.”

Hirsch loved the house for its leafy, private site—and for the “total challenge” it presented. “It was really like building a house from scratch,” he says. First, he decided it was upside down. He didn’t like having the kitchen, living room, and dining room on the second floor, above the bedrooms. He wanted the public areas to open onto the pool

and deck “like a real beach house,” and he wanted the bedrooms up, “so they would feel like treehouses.”

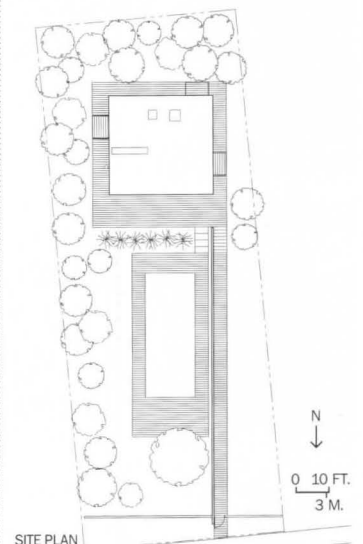
Design approach

“We kept what we could, to save money and time. We reconfigured the entire house, peeled off the northern facade and substituted it with glass, added eight feet and a new pool,” explains Hirsch. “I wanted you to experience the space, feel the texture of the floor on your bare feet, and see the trees, the stars when you look out the window,” he adds. “This house is all about the tactile nature of the materials,” adds Frostén. “The form was just one aspect of the design; the physicality and materiality were equally integral to the design.”

Expanding the house

Hirsch dismantled the house, keeping only the roof and the foundation elevated on wood piles. By expanding the house on two sides, he was

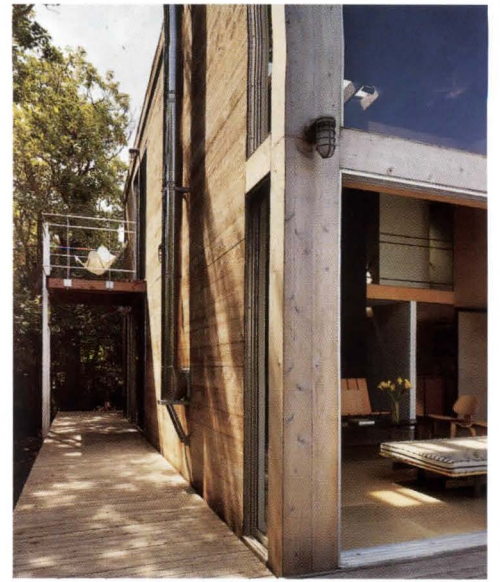
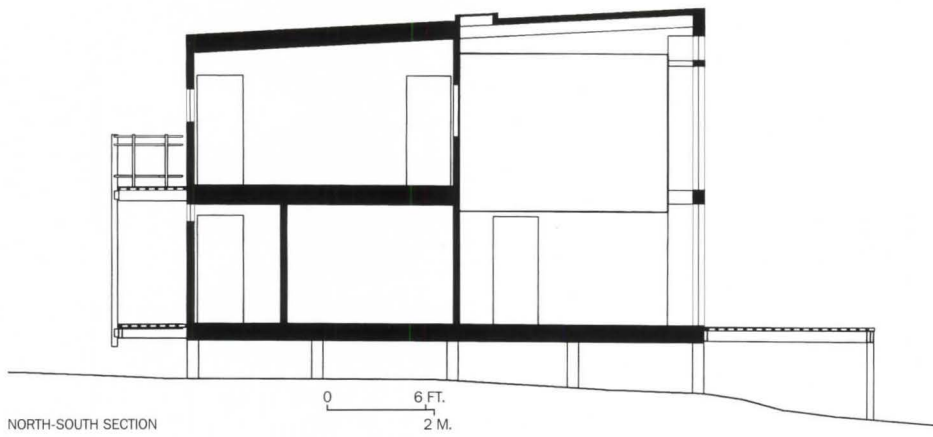
able to fit three small bedrooms and two bathrooms into the second floor and still have a double-height living room. A narrow skylight was installed in the roof so “the sun can streak into the living room, but in a very controlled way”—through the rafter beams. One second-floor bedroom has a window overlooking the



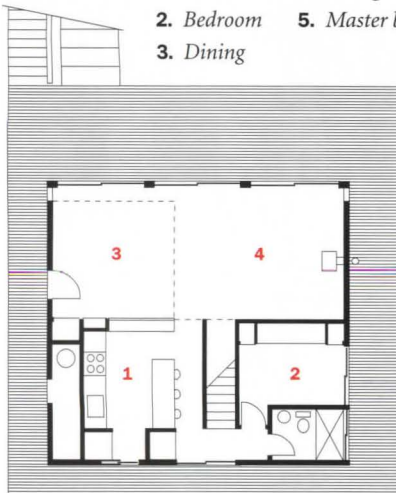
A new facade for the back of the house opens the rebuilt living

spaces to a new pool and deck (below and right), eliminating most

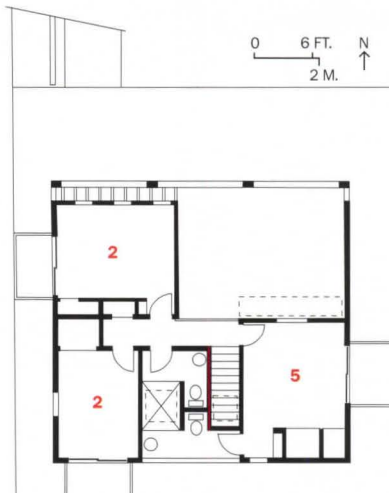
evidence of the neglected 1950s house (opposite bottom).



- 1. Kitchen
- 2. Bedroom
- 3. Dining
- 4. Living
- 5. Master bedroom



FIRST FLOOR



SECOND FLOOR



Before renovation, bedrooms were on the first floor of the house and kitchen, living, and dining rooms above. Hirsch and his partners reversed this order (plans, top), so the pub-

lic rooms would have access to the outdoors. Now views are provided through the stair hall and kitchen (above) to the deck and pool area. A mural enlivens a kitchen wall (top right).

living room and the trees beyond. Another is tucked into a cube that is recessed from the glass facade and appears to float over the dining room.

On the first floor, the dining room is separated from the kitchen by a translucent theatrical scrim. An open stair with stringers hidden in the walls divides the ground floor into public areas (living room, dining room, and kitchen) and private spaces (bedroom/study and bath).

A narrow boardwalk surrounds the house, connecting it to the pool deck and providing access to the pool from all four sides.

Materials and colors

The architects' palette is neutral but offset by a few brightly colored volumes: the bedroom cube is a muted yellow, to accentuate its form, and the poolside wall is a soft, Barraganesque orange. Most materials are left natural, including gray cedar siding, maple floors, jute sisal bedroom rugs, French limestone living-room pavers, and one-ft-sq Vermont slate bathroom tiles.

While the forms seem simple, the design is compact and disciplined. To continue the treehouse theme, Hirsch added a small balcony to each of three sides of the house, making the bedrooms seem bigger and giving each its own private terrace. The glass facade has doors on both floors that slide open

to increase air circulation. In order to have one generous shower on the second floor instead of two tiny ones, Hirsch built a large shower room that can be entered from bathrooms on either side. The shower has two sandblasted translucent glass doors with offset pivot hinges to allow for both access and privacy.

Apart from two molded plywood Eames lounge chairs and six New York City public school chairs in the dining room, all the furniture was designed for the space. Hirsch designed the maple dining table, which has eight small holes in the center that can accommodate candles or test-tube flower vases.

Hirsch's friend Drew Souza, a graphics and product designer, created a sofa with leather straps suspended, hammocklike, from its steel frame. Together, Hirsch, Souza, and Frostén designed the beds, coffee table, daybed, kitchen island, and cabinets.

Would Hirsch change anything? No, he says. "It came out as I envisioned it. But we thought it would be a renovation job, easier than doing something from scratch. In truth, it was a gut job." ■

Manufacturers' Sources

Skylights: Velux-America, Inc.

Exterior lights: Stonco

Living room ceiling lights: Elliptipar

Bathroom lights: BEGA/US



A bedroom (left) overlooks the living room. Extending the front of the house by two feet and the side by eight feet, the architects were able to carve out a two-story space for the living room (below).



2 Follows Residence Los Angeles, California

FERGUSON-ETTINGER ARCHITECTS ATTACHED A SERIES OF OUTDOOR ELEMENTS TO A BUNGALOW AFTER SECURING IT TO THE GROUND.

by Wendy Moonan

Project: Follows Residence
Los Angeles, California

Architect: Ferguson-Ettinger
Architects—Pamela Ferguson, Brett
Ettinger, principals

Engineers: B.W. Smith Structural
Engineers (structural); Kurily
Szymanski Tchirkow (structural);
Parmelee-Schick and Associates (soils)

General Contractor: R.A.C.
Construction

Project Statistics

Size: 520 sq ft (addition), 1,644 sq ft
(existing)

Cost: \$78 per sq ft

Design challenges: Security concerns
and a tight budget, much of which had
to be spent on the concrete caissons.

Manufacturers' Sources

Transparent oil finish: Penofin-
Performance Coatings

Exterior lighting: Guth, B.K.

Connectors: Simpson Strong-Tie Co.

Cantilevered pots: Deroma

When the Northridge earthquake hit Los Angeles in 1993, it damaged not only a small 1910 Craftsman-style cottage in the Silverlake district but also the psyche of its owners, an actress and her husband, a film lighting technician. The couple weren't sure they wanted to live with their two children atop a seismic time bomb.

Neighborhood context

Not that they didn't love Silverlake, a middle-class area long favored by film people. "It first bloomed in the 1920s and 1930s as a residential neighborhood for the Hollywood crowd," explains their architect, Brett Ettinger of Ferguson-Ettinger Architects, a four-year-old, Santa Barbara-based team. In the 1940s and 1950s, Silverlake became the site of houses designed by Rudolf Schindler, Richard Neutra, John Lautner, Allyn E. Morris, and other mid-century architectural legends.

"After the earthquake, we had to convince our clients that we could design something that would make them feel safe both physically and psychologically before they would reinvest in the property," says Ettinger. "We decided we'd try to make something architectural out of something modest and vernacular."

First, they secured the house by sinking three 30-ft concrete caissons into the rock to repin it. After \$40,000 worth of concrete founda-

tion work, "we decided to leave the rest of the house alone," says Ettinger's partner, Pamela Ferguson, who liked the original shiplap siding and bungalow charm. "We added appendages instead." A new 520-sq-ft redwood deck gives the dark, confined house some breathing space. "We wanted to take advantage of the California environment and make a place to sit outside."

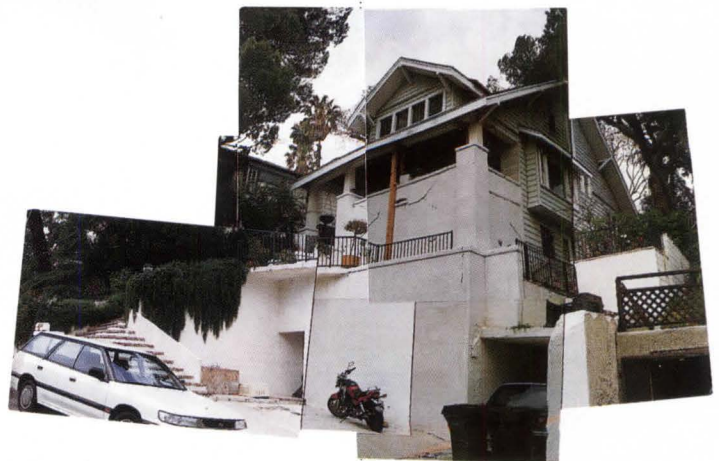
"The deck is like the prow of a ship," she explains. "From it the owners can see the Hollywood sign." The deck is supported by massive supports, 8-by-14-in. redwood beams, which are exposed to show their size and strength.

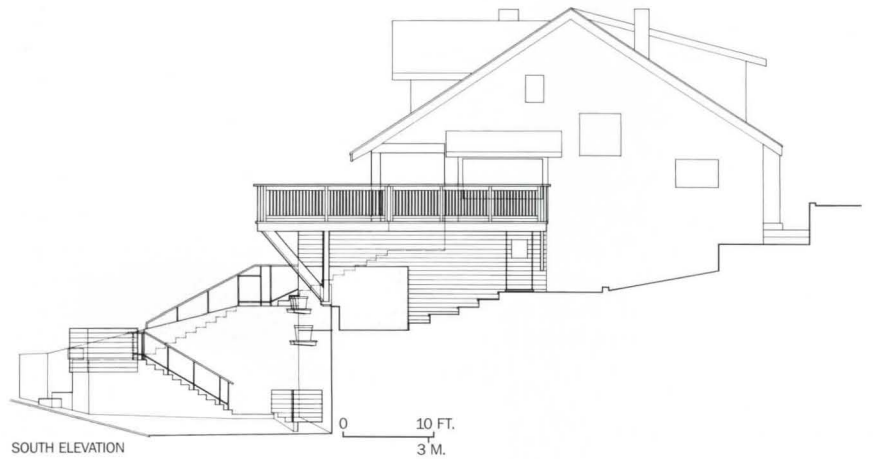
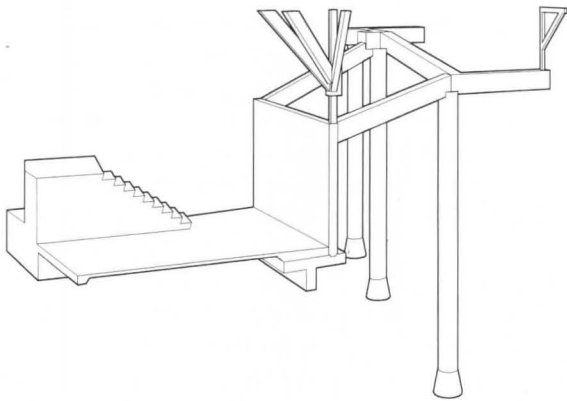
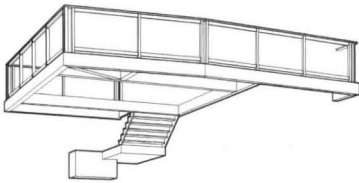
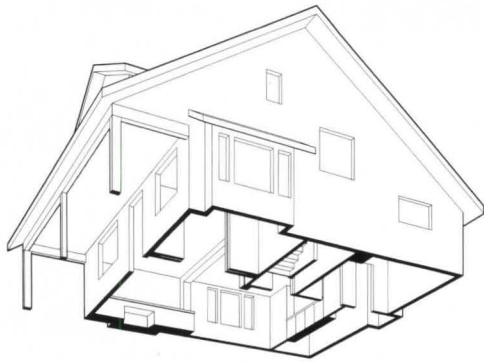
Defensible design

The 1,644-sq-ft house is only two blocks from the site of the recent L.A. riots. "Our strategy was to

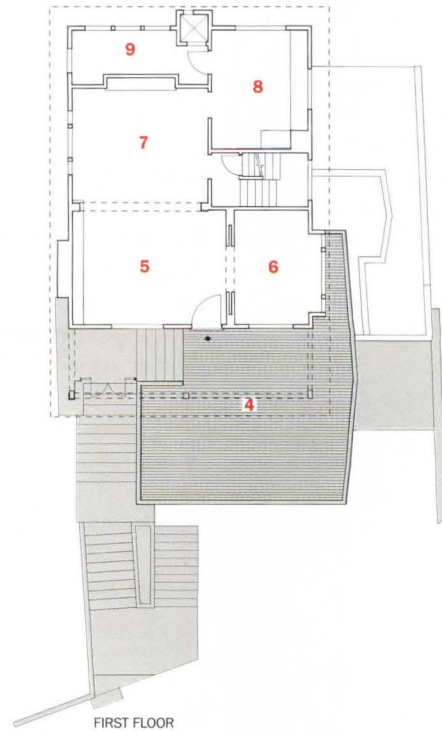
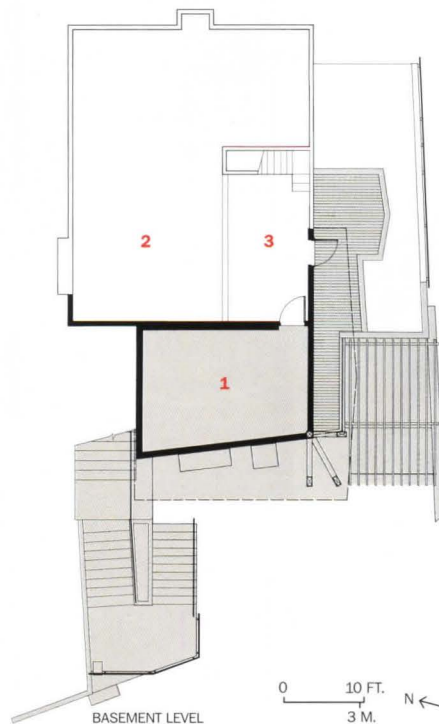
make it a refuge off the street," Ettinger says. The steep facade between the street and house is now a collage. "We wanted to break down the scale of the vertical wall," Ferguson says, "so we put the horizontal landing in the steps. Then we reoriented the stairs so they wouldn't be open to the street. It gives you a feeling of safety; there is no open invitation to climb the stairs."

"From the floorline of the house down to the bottom of the stairs is almost a building in itself," Ettinger adds. "We wanted the house to be gritty at the ground level, so we used blackened steel-rails, redwood boards, graffiti-proof cement, and white stucco." The result is a place that feels secure—against both human and seismic intrusions—without looking like a fortress. ■





- 1. Storage
- 2. Crawl space
- 3. Basement
- 4. Deck
- 5. Living
- 6. Den
- 7. Dining
- 8. Kitchen
- 9. Bath



Concrete caissons were used to repin the house to its steep hillside (axonometric drawing, above) after it was damaged in the 1993 earthquake (opposite). A deck and small insertions create a new entry sequence.

3 Hobgood House Charlotte, North Carolina

USING NEW MATERIALS BUT INSPIRED BY OLD FORMS, KENNETH HOBGOOD RENOVATED AND ADDED TO A STATELY OLD HOME.

by Ken Friedlein

Project: *Hobgood House*
Charlotte, North Carolina
Architect: *Kenneth E. Hobgood,*
Architect—*Kenneth E. Hobgood, AIA,*
project designer; *Mark Reyer, Chadwick*
Robertson, Roger Cannon, Alan Bolzan,
design team
Engineer: *Morrison and Sullivan*
(structural)
Consultants: *Jay Smith (landscape);*
Shepherd Electric Co—Robert Jordan
(lighting)
General Contractor: *Dorset*
Construction

Project Statistics

Size: 880 sq ft (new), 3,950 sq ft
(renovated)

Cost: \$792,000 (\$164 per sq ft)

Design challenges: *Zoning setbacks,*
relating the new addition to an old
house while using a Modern design
vocabulary, and accommodating a
multifaceted program.

Steel and glass is a language hardly spoken in Myers Park, a tranquil, oak-shaded neighborhood in Charlotte, North Carolina, where the houses tend to be stately versions of one period style or another. So when architect Kenneth Hobgood, AIA, added a white metallic pavilion onto the back of a hip-roofed, stucco house here, he was introducing a foreign element. Part of an extensive remodeling project, the addition establishes its identity by contrasting the old with something unmistakably new.

Located on a prominent corner, the property had been little changed since it was built in 1914. But in 1993, Hobgood's brother, Thomas, a custom furniture maker, bought the house and acted on a long-held wish. "I've always wanted to have Kenneth design something for me," Thomas Hobgood says, recalling that he summoned his brother to Charlotte as the purchase of the house was pending. "Can you do something with it?" he asked.

Old elements inspire the new

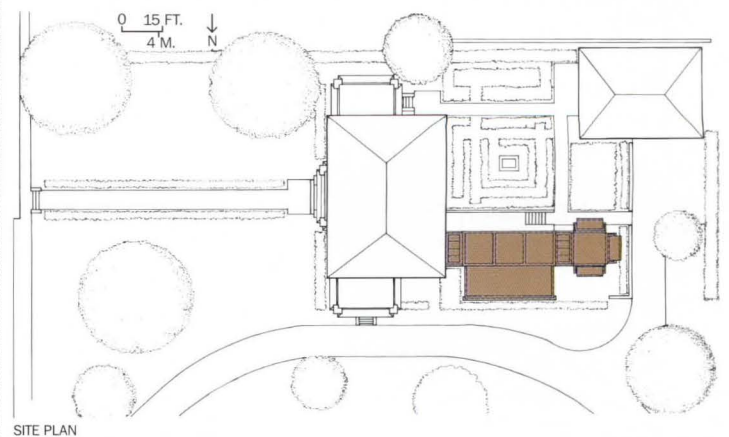
A deteriorating masonry-and-timber pergola off the rear of the house and the remains of an adjacent formal garden served as the genesis for the new scheme—to replace the

pergola and its repetitive framing with a raised pavilion and create a topiary garden in the yard.

Designing the new pavilion by merely replicating the pergola form, though, would not have provided enough space to accommodate all of the functions envisioned for the addition—an up-to-date kitchen, a sitting area, and a breakfast room.

Hobgood's solution was to configure the kitchen as a galley

contained in a supplemental, solid volume along the exposed street side of the addition. That left the sitting room open on the garden side while providing privacy from the street. The form came from repeating 11-ft-4-in. steel-frame cubes, three of which combine to make the sitting area. At the end, the breakfast room continues the line of cubes beyond the protection of the adjacent kitchen, making a glassy



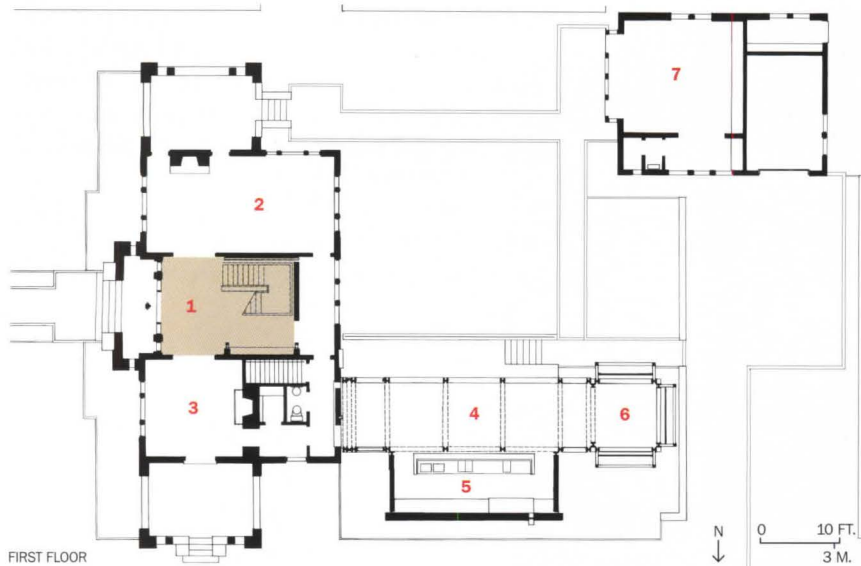
Ken Friedlein is a journalist and intern architect with Dixon Weinstein Architects in Chapel Hill, North Carolina.



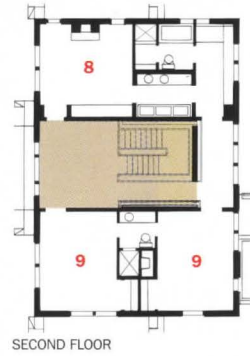
The 880-sq-ft addition looks onto a new garden that is still maturing (left). The breakfast room at the end of the addition (below) enjoys views on three sides, while the new kitchen on the

north side has a solid wall that provides privacy from the nearby street. The steel framing of the addition recalls the repetitive form of a masonry-and-timber pergola that was once on the site.





FIRST FLOOR



SECOND FLOOR

1. Stair hall
2. Living
3. Dining
4. Sitting
5. Kitchen
6. Breakfast
7. Guest
8. Master bedroom
9. Bedroom

A new stair hall with 20-ft-high maple-paneled walls enlivens the old house (opposite top left). A new kitchen and sitting room are in the addition (opposite top right and bottom).



room open to the garden and street on all three of its exterior exposures. Mechanical louvered screens riding in angled, exterior tracks can be lowered to provide varying degrees of privacy, or raised to allow full views. In any position, they provide high-tech punctuation marking the end of the extension.

Renovating the existing house

The project also involved a thorough renovation of the existing house—leaving the front with its original arched, centered entry and twin flanking porches, but redoing the stucco finish, replacing windows and floors throughout the interior, and updating major spaces such as the master bedroom and bath. Part of the detached two-car garage was converted to guest quarters.

To open up the front of the house, Hobgood removed the existing cramped stairs and created an airy stair hall. Though less evident to passersby, the stair hall is as significant an installation inside as the garden pavilion is outside.

Bringing the language of the steel-and-glass pavilion indoors, the architect designed the staircase as a steel construction with open risers and a carefully detailed metal railing. “We wanted something inside the house to tie back to the addition,” says Hobgood.

That the new construction would evolve as a sharply contrast-

ing piece rather than a continuation or evolution of the existing house was not surprising, given the architect’s preference for clean, Modernist solutions. Formerly a senior designer for O’Brien/Atkins Architects, Hobgood formed his own firm in 1993 with O’Brien/Atkins colleague Roger Cannon. (Cannon has since left and opened his own firm.)

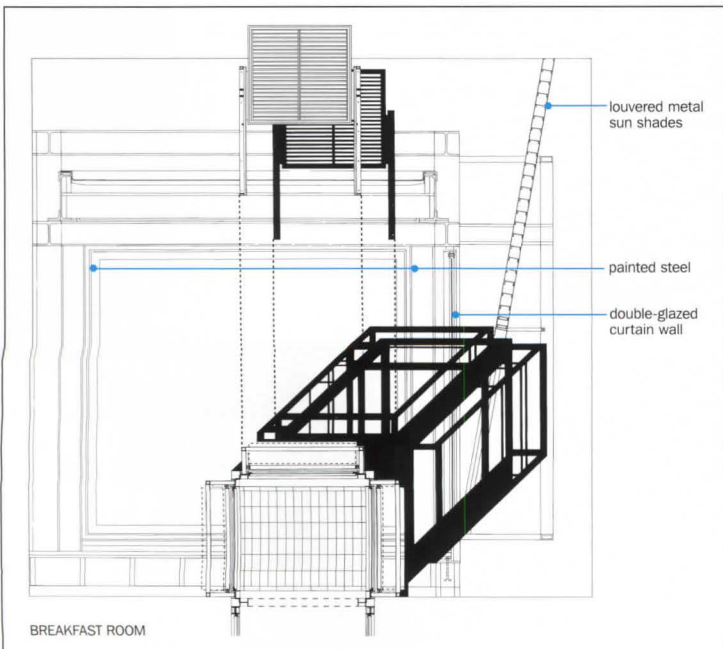
Respectful approach

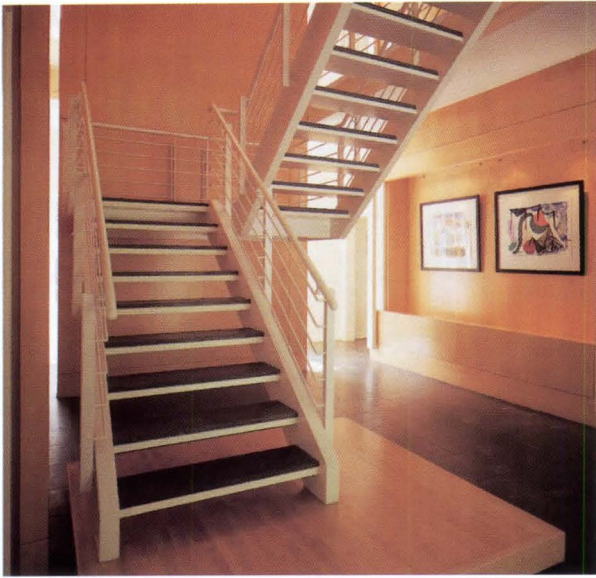
Hobgood acknowledges that “some people may take it as a jarring addition” but says his approach sprang from a respectful attitude. “The house had that nice front elevation and those porches. It was complete, really, and to try to add to it in that style wouldn’t do. We wanted to add something simple that made the house and the addition two different things, so they would talk to each other.”

One of the challenges that the addition had to overcome was the thermal swings associated with exposed glassy volumes. The owner says the combination of passive shading devices and beefed-up air handling has achieved comfortable heating and cooling levels. ■

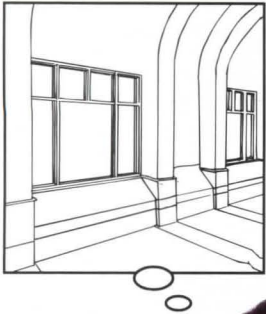
Manufacturers’ Sources

- Steel frame:** North Carolina Steel
- Steel window wall:** Hope’s Architectural Products Inc.
- MR16 downlights:** Reggiani; Halo
- Exterior wall lamps:** BEGA/US





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The Architecture of Cyberspace

SEVERAL ARCHITECTS ARE CHANGING THE LOOK OF THE WORLD WIDE WEB,
AND CREATING METHODS THAT OPEN NEW OPPORTUNITIES FOR THE FUTURE OF PRACTICE.

by B. J. Novitski

No sooner had architects discovered that the graphically appealing World Wide Web was of limited value for marketing purposes, than practitioners and university researchers began exploring ways to make it useful in more practical ways. The Web is not simply a medium for viewing pretty pictures; it is becoming a serious tool for collaboration between design professionals, their clients, and builders.

Traditional design processes cannot always be transferred wholesale into new media, however. Computer technology makes it easy to accumulate vast amounts of information, so new methods for managing and retrieving it must be invented. Technologies that support collaboration between designers who live in different hemispheres and/or who do not know one another can sometimes emphasize cross-cultural misunderstandings that would not be an issue in traditional business. So, as they seek ways to utilize new media, technological explorers are also devising methods to solve the new problems they encounter.

Web-based design and construction data

NBBJ, the large Seattle architecture firm, has been working with digital technology for years to present project visualizations to clients. Now, with the convergence of the Internet and interactive three-dimensional software, they are exploring ways to extend this capability. For the Seattle-based Virginia Mason Research Center, for example, NBBJ has set up a private Web site that will enable clients and subcontractors to "tour" the proposed building. The clients will study functional and experiential aspects of the space, while the fabricators will retrieve dimensional data about building components.

B. J. Novitski is a freelance writer specializing in architectural technology, practice, and education. She can be reached at bjn@efn.org.

Continuing Education This month's installment of the ARCHITECTURAL RECORD/AIA Continuing Education Series focuses on electronic design collaboration. Use the following learning objectives to focus your study. After reading the article, complete the questions (page 190) and check your answers (page 192). AIA members may fill out the self-report form in this issue (page 192) and send it in for two AIA Learning Units.

—Mark Scher, AIA Director Professional Education Products and Services

Learning Objectives After reading this article, you should be able to:

1. Explain at least three challenges and opportunities offered by electronic technologies for diverse and long-distance design projects.
2. List two ideas about the electronic design process and project information management that can contribute to project success.
3. Contrast the utility of videoconferencing and E-mail as international communication vehicles.



The client group for this project is itself very sophisticated technically. The staff scientists have high-powered workstations for "walking through" molecular structures in their own research. Thus, they have both the necessary equipment and an appreciation of the importance of visualization. NBBJ staff designer Dace Campbell (dcampbell@nbbj.com), who has worked on several virtual-reality projects at the University of Washington, has been developing the Virginia Mason Web site to study the function and construction of staircases in the research facility. He rendered a three-dimensional model with the highly realistic Lightscape software to give the clients a clearer picture of what it would be like to navigate the stair and surrounding lobby.

When the clients first toured the digital space, Amy Baker, an NBBJ interior designer, was on hand with material samples to give the colors in the image a greater sense of realism. (The best communications often occur through the proper balance of modern and traditional media.) As the project develops, the clients will be able to "tour" updates on the Web from their own offices by invoking the model built in Virtual Reality Modeling Language (VRML).

Arguably more important than the design visualization is the role the Web site will play in communicating construction information to the subcontractor who will ultimately fabricate the stair. Project principal Richard Dallam (rdallam@nbbj.com) believes that concentrating technology on the construction-documents phase could bring about the greatest benefits in quality along with more savings in cost and time. If the fabricator can get precise dimensional data directly from the model and bypass all the conventional intermediary steps in shop-drawing reviews, the chances of error are fewer. Virginia Mason often negotiates contracts in order for the contractor to get on board early, so the architects can design details around the systems the builders like to use.

Thus, working directly with the subcontractor results in fewer

Elements of Planet 9's Virtual-TOKYO offer clickable Web links.

problems and tends to limit rather than jeopardize the architect's liability. Furthermore, because the model is accessible from the Internet, Dallam has more choice when selecting fabricators. He can look to other states, where labor costs are lower, because he does not need to meet the builder face to face to explain design details. Architect and fabricator can discuss a project by telephone while touring the same 3D model on the Web. Dallam expects the Virginia Mason staircase design and documentation to be virtually paperless.

In other projects, he and Campbell have experimented with using a 3D Web-based model as an interface to a collection of 2D drawings. Sectional slices are preset within the model; the user clicks on a section marker to call up the pertinent plan or section.

One challenge they foresee is in making this Web site appropriate for different user groups. While clients will be more interested in the Lightscape-rendered models, the contractors will have a greater need for clear and precise construction documents.

Another challenge emerges from the opportunity to collaborate with clients from other cultures. Dallam cites a recent example with an Asian client group, which had a stronger sense of hierarchy than a comparable Western group might have. Because the group's most senior member was unwilling to interact directly with the walkthrough model, the junior members were reluctant to try it. So the interactive version of the design proposals went unseen. Though he does not claim to have solved the problems yet, Dallam says, "Learning how to deal with differences in cultural conventions will be absolutely key to making these technologies effective."

Managing an ocean of information

Another major challenge facing architects and engineers who use the Web as a medium for collaboration is management of the huge quantities of material they generate. Any design process produces a formidable amount of sketches, photographs, drawings, memos, schedules, calculations, and so on. These elements can be stored more effectively in an electronic format, but the amount of information is no less voluminous. Tracking all this material and making it easily retrievable is crucial if designers are going to make the technology efficient.

This problem and others in the area of collaborative design have been the focus of engineer and Stanford professor Renate Fruchter. For several years, she and her colleagues have been developing software and design methods that will enable multidisciplinary, geographically distributed design teams to work on a shared design model and use the Web for collaboration and communication. Fruchter has established, for example, a change-notification system that alerts each team member to any design changes by others that might have some consequences on the member's own work. She has her engineering students—who work in teams with architecture students at the University of California, Berkeley—set up a project Web site divided into shared and private workspaces. Whenever a student wants to present a drawing, for example, to the larger team, he or she establishes a link from the public space to the new drawing. With a system of passwords and permissions, different members of the team have access to different kinds of data. Fruchter notes: "The whole workspace becomes like a living organism that grows with the project."

Fruchter and her students use the Internet and Web tools as the

VISITS TO VIRTUAL CITIES

A new specialty service gives technology-savvy architects a field of practice that was unheard of 10 years ago. Architects David Colleen, of Planet 9, San Francisco, and Mike Rosen, of Mike Rosen and Associates, Architects, Philadelphia, have committed their firms to the modeling of cities. They create 3D models of buildings, streets, and other structures, and render them realistically with "textures" taken from digitized photographs of the real buildings. With fast enough hardware, Web users can "navigate" through one of these models and experience the city as if they were

actually walking, driving, or flying through it.

Colleen and his colleagues have modeled approximately 15 cities, including Austin, San Francisco, Tokyo, New York, and San Diego, which can be found on the firm's Web site at <<http://www.planet9.com/>>. To begin a project, Colleen sends a staff photographer to take up to 2,000 photographs of the city. Back home, the staff creates simple massing models, onto which the photographic imagery is applied. They work with the Virtual Reality Modeling Language (VRML) so that

models on the Web may be navigated by any user with the proper VRML plug-in. Colleen's staff adds detail incrementally as it becomes available. Often, city planning departments will contribute data in exchange for free use of the resulting database.

Architecture firms may license a model and insert their own proposed building for design and sightline studies, for example. The model of San Francisco is so complete and precise that it is accepted by local authorities for use in environmental impact reports. The models are also licensed by tourism promoters as an interface to information for visitors. For example, Mardi Gras Productions uses the VRML model of New Orleans to provide data on local attractions. A visitor can navigate through the city, click on a restaurant, and call up that restaurant's Web page, which might include hours, menus, and so on. Some city models are being used as an index for real-estate listings. Facilities departments of some large compa-

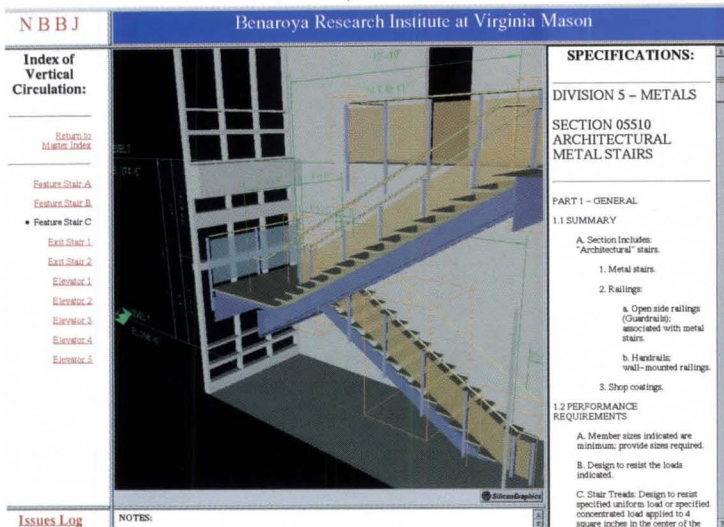
nies are using them to manage leasing and space planning.

ModelCity Philadelphia takes the concept one step further. Besides the visible built environment, the model includes the city's hidden, engineered infrastructure. Built by Bentley Systems with their new ModelServer Publisher software, the navigable model is also a link to a massive yet integrated database of street trees, other landscape elements, and overhead and underground utilities. Architects will not only be able to place proposed buildings in the site for client and public evaluation, they and their consultants will have access to the city's entire infrastructure. Laypeople will be able to tour the city on the Internet in preparation, for example, for a real visit to Philadelphia. The Web site's location is <<http://www.bentley.com/modelcity/>>.

Mike Rosen is now leading the ongoing development of the model, which is expected to be unveiled at the AIA conference in Philadelphia in 2000. *B.J.N.*



A 3D, Internet-based model of Philadelphia is now under development. The navigable model will contain realistic cityscapes as well as the city's precisely mapped engineering infrastructure.



Seattle's NBBJ is experimenting with 3D design and construction documents on an extranet. Clients and contractors can view the design of a stair in a Lightscape-rendered image (below). Another model view associates specifications data (left); clicking on individual stair elements brings up further information (right).



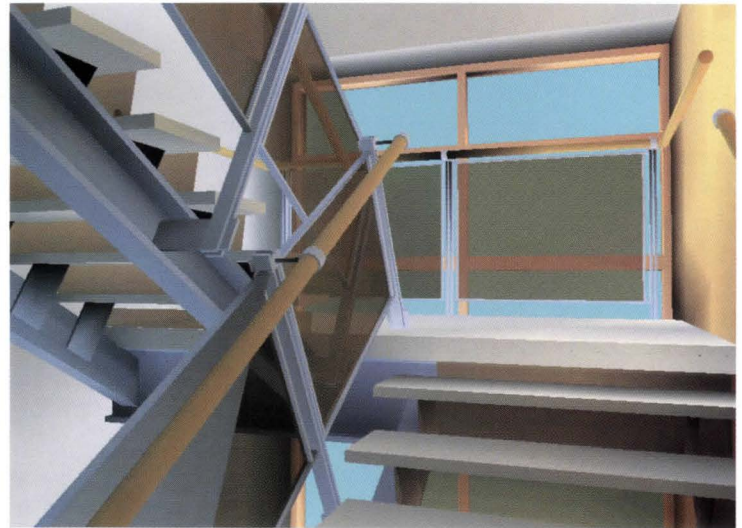
indexing system to keep track of all the drawings, data, change notifications, E-mail correspondences, and so on. They have programmed scripts that launch AutoCAD within the Web browser, so a user can move seamlessly from perusing the database to working on a drawing. In a recent project, a VRML model was the central organizing mechanism for finding information. The user was able to click on a picture hanging in a "virtual gallery" and get transferred to a Web page corresponding to that icon. As an upcoming feature, clicking on a structural member will bring up a page of related structural calculations. And, of course, users can navigate the VRML model to evaluate the space visually.

An important reason for maintaining and saving this vast amount of design information is that it will be useful during construction and afterward for facilities management purposes. But how to retrieve pertinent data for particular uses? Fruchter has developed a system for creating what she calls a "cyberarchive." A user can pose a query to the system for information selected by discipline, level of detail, and phase of design. The result of the query is not only a collection of the requested data; it is an automatically created, customized Web site assembling all this data. Even users who don't know how to set up Web pages can instantly create a site that is specific to their interests. Fruchter says: "It's like having a secretary. You can ask for 'all the information on architectural details' and the system will collect it, wherever it is." Fruchter says she hopes the software needed to make all this work will eventually be made available to the public. For more information, see her course Web site at <<http://www.leland.stanford.edu/group/CIFE/ce222/index.htm>> or send E-mail to fruchter@ce.stanford.edu.

Design collaborations

For the past several years, professors, students, and researchers at the Massachusetts Institute of Technology (MIT) have been grappling with the technical and social issues of collaborative design. Led by the School of Architecture's dean, William Mitchell, MIT's Design Studio of the Future has been conducting design projects with schools all over the world. This interdisciplinary studio, run in conjunction with MIT's School of Engineering and found at <<http://alberti.mit.edu/dsof/>>, is supported by a state-of-the-art collection of computing and videoconferencing equipment. More importantly, the studio has become an international "aggregate of expertise," working to understand and solve the challenges of electronically supported collaboration.

In the summer of 1996, three MIT graduate students teamed up



with six Japanese architecture students, three each from Kumamoto University and the Kyoto Institute of Technology. They divided into three teams, with one individual from each school represented on a team, to work on a structure for the Kumamoto ArtPolis '96 International Architectural Exhibition. A primary goal of the project was to explore the nature of communications between design partners separated by space, time, language, and culture. Each team established a Web site for posting images, drawings, text, and other digital data. They also shared ideas through videoconferencing; at prescheduled times they would hold conversations where they could see and get to know each other while discussing design ideas. Spoken-language difficulties eventually made this form of communication less common than typed E-mail. The students also shared ideas through sketches on electronic whiteboards. All these technologies were used during the final review presented to distinguished jurors from both the U.S. and Japan.

The teams were asked to designate specific roles for each participant: a Web master to maintain the team's Web page, a minutes taker to record discussions, and a schedule coordinator to determine meeting times. "Although these roles seemed time-consuming and mundane," says Mitchell, "they were important in establishing a common understanding of the development of the design as well as in the making of a coherent presentation to critics." From there, the teams diverged in process, each developing its own modes of communication. One team divided the



At MIT's Design Studio of the Future, students prepare Web sites to share ideas (right) and hold videoconference review sessions (left).

Virtual Design Studio Homepage <http://www.morozumi.arch.kumamoto-u.ac.jp/VDS96/vds-index.html>

インターネット時代の国際共同設計

～九電跡地のアートポリスモニュメント～

- ・各大学から1人ずつ、3人で1チーム
- ・A B C、3チームでデザインを競う
- ・8月1日から9月5日まで5週間の共同作業

	熊本	京都	MIT
Team A			
Team B			
Team C			

2/20

design concept into parts and delegated a part to each individual. Another team used a relay approach, whereby the entire project was passed successively from one member to the next. Ultimate success in design depended more on a student team's consensus about which process to use than on the particular process chosen.

The students discovered frustrations in communicating electronically that would not have been an issue if they were working in the same physical space. Because of the great difference in time zones, real-time videoconferencing was often not available. They came to rely far more on E-mail messages. They quickly realized they needed a system for acknowledging whether a message had been received, a formality that would not have been necessary in face-to-face discussions.

Over time, the students developed their own studio culture. To overcome linguistic differences, for example, and the lack of body language in text-based communications, the students developed sets of keywords that were abstractions of the more subtle and complex design ideas that emerged from the project. Terms like "rural reflections," "crickets," "beacon," and "whirlwind" became an invented shorthand to designate larger design concepts. The social bond reinforced by this understood vocabulary contributed to the success of the design teams.

Mitchell expects that the higher bandwidth and computing power that will be available in the future will greatly increase the interest of architects in this type of collaboration. "We'll see an 'internationalization' of design practice," he predicts, "a context in which services can be exported with increasing ease. It will become very common for geographically distributed design teams to work together." In anticipation of that day, his goal is to give his students the practical, hands-on experience of working in an environment that explores technical and social issues.

Beyond the building

Other issues about the future of the profession are the focus of architect and visionary Peter Anders. He and his students at the New Jersey Institute of Technology and, more recently, at the University of Michigan have been studying the existing appearance of cyberspace and the potential for turning it into a design service opportunity for professionals. In RECORD's October 1996 issue [pages 48–51], he discussed the multi-user domains first found in on-line games as primitive precursors to graphi-

cally richer, architect-designed Web-based "spaces" we can look forward to working with in the future.

Imaginary spaces form powerful images in our minds, he argues, citing the "memory palaces" used by orators to memorize and recall long passages of text before books were common. Each "room" in their mental palace brought forth the memorized material. The strong connection between mind, memory, and architectural imagery can be exploited by those who design the "structure" of the increasingly vast amount of information we'll need to deal with in the future. And who better to do this work than those trained in architectural design?

Now that tools for designing three-dimensional Web sites are readily available, Anders claims, any architect can be doing this kind of design work today. For example, any new building could include an accompanying database designed to organize the client's corporate or institutional information. Anders calls these auxiliary designs "cybrids": they have no physical manifestation, yet they may visually resemble the actual building. From home, telecommuters could navigate a cybrid to find their filing cabinet at work; geographically remote consultants could "meet" in a conference room without having to travel to the same city.

HIGHER BANDWIDTH WILL FURTHER INTERNATIONALIZE PRACTICE.

"It's a way of achieving 'green architecture,'" Anders says, "a building with the least impact on the land. If a client knows they can supplant a lot of their buildings' functions with a cybrid equivalent, this becomes pretty important economically." And by mimicking the imagery of the real building, architects can draw on the power of memory palaces to help users find and remember the information they need. "This goes way beyond architecture as something that just keeps the weather out," Anders concludes. "We're learning that architectural space is a medium and it's the way we relate to a lot of complex information."

So far there are few practitioners actively designing the architecture of cyberspace. But like the Web itself, their number will quickly grow. It's an uncharted path, and architectural explorers are anticipating some of the pitfalls. As a result, the rest may be able to travel more safely and look for the tremendous opportunities available in expanded services and improved design. ■

LIGHTING...



The latest buzz in the lighting industry is about all the research being done to prove that productivity can be improved by providing workers with illumination that is glare-free, not too bright, and user-adjustable. Ergonomically correct furniture and acoustical dampening are also helpful. There is no question that I would be happier in an office with these amenities.

But the idea that someone would put me in such an environment with the expectation that I would become more productive makes me very uneasy, not because I'm unproductive but because I'm not sure the research applies to me. Suppose my output were measured by something quantifiable, say the number of keystrokes I make in a day. I type almost as many backspaces as I do letters and spaces, so I'm already half as productive as I would appear to be. And, if I recognize more quickly that I'm writing misspelled words that make no sense, then replacing them with new words faster, have I become more productive?

What if at the end of each day I filled out a survey in which I assessed how I felt about my productivity? This might be more appropriate for me than counting keystrokes, considering that here at the magazine, coming up with ideas and expressing them well is valued more highly than how fast people type. But there's the rub: I do agree that productivity can be measured either by counting how well or fast people do certain things, or by documenting feelings of well-being caused by an environment. But how can I measure the quality of my ideas?

Everyone has their own way of conjuring up the muse. Let's say mine is to procrastinate as long as possible and go into action at the last moment. In a productivity survey, it would look like I'm doing zip most of the time. That would tend to make me grade myself down on a subjective survey most days—

a depressing proposition. But in the eleventh hour, when I've been threatened within an inch of my miserable life if I don't produce, and my adrenaline is pumped and my blood pressure is sky high, I always seem to be blessed with my best ideas. Some people get their boosts from cola drinks, others from sunshine. Some people couldn't get a good idea if it came to them in the mail. My point is, productivity measures would seem to have their limitations.

That doesn't mean a good environment couldn't make me more creative. Oddly enough, architects have provided me with the worst working environments I've had in my whole career. That's probably where I started procrastinating in the first place, which led me to Linn's Law. It states: Bad lighting, poor ventilation, back pain from ergonomically incorrect seating, and extraneous noise all decrease in direct proportion with the proximity to the deadline. Ergo, when under extreme pressure to complete an important task, for limited amounts of time the brain is able to screen out pain, odors, noise, and visual distractions, and will do whatever it takes to capture the muse.

Can great lighting in office environments improve productivity? I'm convinced. Creativity? I hope so. But right now I've gotta go. I'm late for the ophthalmologist, and the printer needs this page in five minutes.—Charles Linn, AIA

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153 Parasailing Fishes

Take Aqualuminescence Below Sea Level

Dorf Associates, architect;
Johnson Schwinghammer
Lighting Consultants Inc.

158 The Very Fine Art of Lighting Basic Black

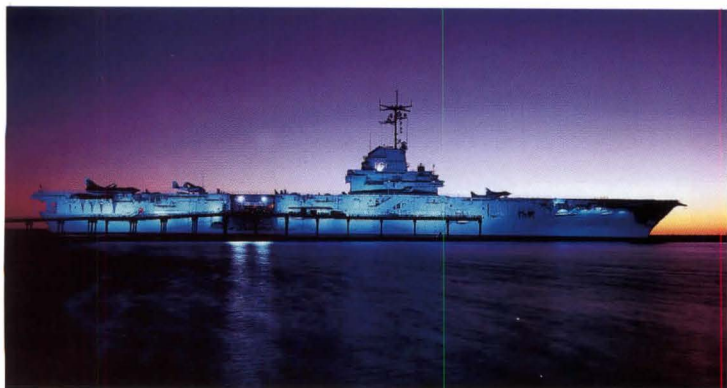
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designer

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CREATIVE USES



THE RETURN OF THE U.S.S. BLUE GHOST

Tokyo Rose first called the U.S.S. Lexington, an Essex-class aircraft carrier, the Blue Ghost during one of her famed World War II radio broadcasts. The Lexington earned its nickname because on four occasions Japanese forces reported with great fanfare that they had sunk the “great blue ship,” only to have it reappear in subsequent battles.

When it was finally decommissioned in 1991, the Lexington was moved to Corpus Christi, Texas, and placed in the harbor there for use as a museum. The ship was anchored parallel to a pier that is about 50 ft away and accessed by means of a gangway.

As a community project, the local utility company, Central Power and Light, and an electrical distributor, American Light, furnished fixtures and lamps to illuminate the aircraft carrier at night.

Forty “sports lighters,” fixtures commonly banked together at the tops of poles for stadium lighting, were installed along the edge of the pier. These were aimed horizontally toward the hull and bridge of the 910-ft-long ship. A number of other metal-halide fixtures were placed on outriggers to light the bow of the Lexington.

For the first three years of operation, the lighting system was lamped with 1000W white metal-

halide lamps. Then, David Thomas, of American Light, saw a sample of a new 1000W blue metal-halide lamp at a trade show.

This lamp produces blue light chemically, by blending different elements in the lamp’s arc tube, rather than by coating the lamp with dye or placing gels over the fixtures. Producing the colored light inside the lamp’s tube is more energy-efficient than producing it with a filter, since using a filter means that other portions of the visible spectrum are produced by the lamp and then absorbed by the filter, requiring more lamps to light an object.

When samples of the lamp, which is also being used in new architectural applications, were installed in the existing fixtures, they were enthusiastically received. “Two weeks later,” says Richard Hormuth, of American Lighting, “we got the blue lamps in, relamped the fixtures, and the job was done.”

The new lamps debuted during a reunion of the Blue Ghost Association, a group of former crew members of the Lexington. According to Jerry Chipman, the director of the Lexington Museum, “The members were extremely pleased. The new lights give the Blue Ghost a very eerie appearance, even from five miles away, especially when there is a little fog on the water.” ■

UNITING A CHURCH ENTRY WITH LIGHT

Trinity Lutheran Church, of Shawnee Mission, Kansas, having experienced tremendous growth in its membership over the years, had decided to remodel.

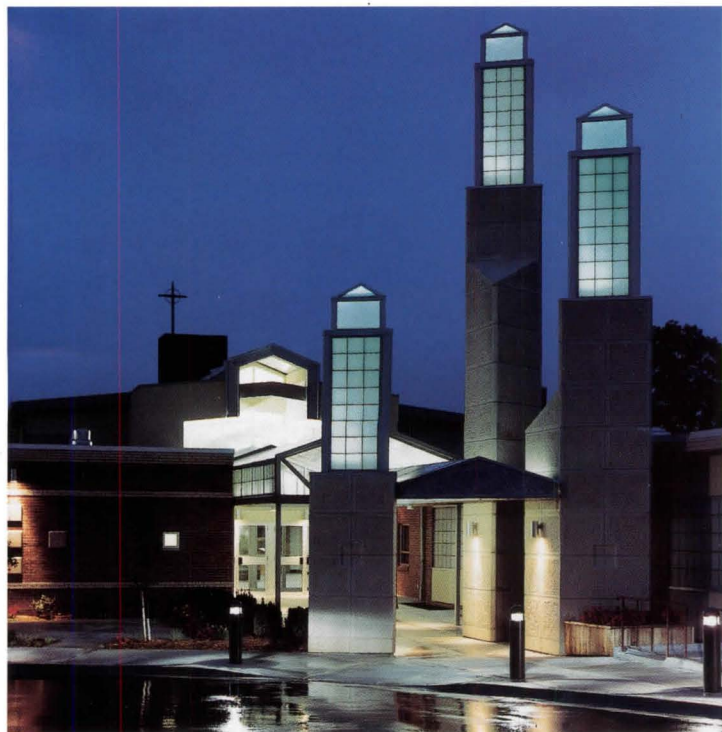
“We find that a consistent problem with churches built in the 1950s and 1960s,” says architect Tom Devine, of Devine deFlon Yaeger Architects of Kansas City, Missouri, “is that they have a number of entrances.” This church had four entrances, and it was confusing to decipher which was the main entry. The architects’ first chore was to try to make all the circulation uniform and to identify a real, proper entrance. “We wanted an entrance that could be seen from an automobile approaching from a few blocks away,” says Devine. “You start the procession into the church from your car, driving into the parking lot, walking through the parking lot, under the canopies, and into the main gathering space.”

A row of bollards illuminated by metal-halide lamps leads night visitors to the new church entry. The entrance is marked by three towers

of varying heights, which represent the Trinity. The base of the spires is made of concrete panels and grazed with warm-colored downlight from PAR30 spots in cans hung from wall brackets. The upper half of the spires is made of translucent fiberglass panels lit internally by 70W metal-halide fixtures placed on two platforms. “We didn’t use just a single fixture, because we wanted the light to be even from top to bottom,” says Devine.

The spires support a pair of canopies made of translucent fiberglass panels. These are uplit on each side by a row of tubular T8 fluorescent fixtures; additional PAR30 cans light the sidewalk. The fluorescent tubes also glow through the fiberglass panels onto the spires.

Two design themes established by the new entrance are carried inside to the congregation’s renovated gathering room: the shallow, gabled profile of the canopies establishes the pitch of the multilevel ceiling; and, like the canopies, the ceiling is indirectly lit. ■



Parasailing Fishes Take Aqualuminescence Below Sea Level

by Gareth Fenley

To enter the Flying Fish Café is to enter a fantasy within a dream world. The restaurant is in the prime position on the village green at the first mixed-use development at Disney World, called BoardWalk, designed by Robert A.M. Stern, FAIA. BoardWalk conjures up the atmosphere of Coney Island 40 or 50 years ago. The famed Brooklyn amusement parks inspired architect Marty Dorf in his choice of the restaurant's primary themes.

"Coney Island was incredibly eccentric," Dorf says. "It celebrated the spirit of excess in our humanity. It titillated and scared you and made you so happy you never wanted to leave." Blended with the evocation of Coney Island is the restaurant's emblem, the flying fish. "It's an image that embodies energy, joy, and fantasy. Yet the restaurant appears fairly sophisticated, not cartoonish. It has serious, understated elegance even though it's kind of funny."

The exterior of the Flying Fish is decorated in neon, with animated fish that appear to flap their wings. The entry is more subtle and mysterious. Just inside the front door, the lighting and surface materials create the impression that you are entering an underwater environment, with lights mounted above cobalt-blue glass and shimmering on a silvery textured wall.

Inside the restaurant, sculptured fishes play overhead. The main apparent light source is a series of custom-made indirect luminaires that feature fishes and a parachute, inspired by Coney Island's Parachute Jump attraction. Dorf initiated the concept, which was implemented by lighting consultant Bill Schwinghammer, of Johnson Schwinghammer. "We placed a double-ended 200W halogen lamp in the tube that uplights the parachute, which is made of poured and molded fiberglass resin," Schwinghammer says. "It gives a glow of yellowish white incandescent light when dimmed down."

The main source of ambient light comes from slots housing AR111 low-voltage lamps with black honeycomb louvers. The AR111 has an aluminum reflector and is 111 mm in diameter. "It's a very controlled light source, a European version of the PAR36," says Schwinghammer. "I like to use it because of the control it provides. I used a light pink filter on the lamp here, to cut the whiteness and make it more flattering to people at the tables."

Sirmos, the company that fabricated the parachutes, developed another unique custom feature for the Flying Fish: cast-resin imitations of small incandescent lamps, which are lit by fiber optics. The original restaurant design called for walls studded with incandescent channel

Gareth Fenley is an Atlanta-based freelance writer who writes frequently about architecture.

Neon fish flap their wings like an old Coney Island attraction, beckoning diners to sample the café's delights.



strips. But not only would the channel strips have been expensive to fabricate; they would have been too hot and put electrically powered sockets too close to the reach of children. The fiber-optic solution avoided these problems and was accomplished at about the same cost. Some of the faux bulbs are blue and others are an incandescent-like yellow.

A more conventional application of fiber optics occurs in the ceiling, where "stars" twinkle through pinholes in a deep blue field. A blue

Project: *Flying Fish Café at Disney's BoardWalk*
Disney World, Florida

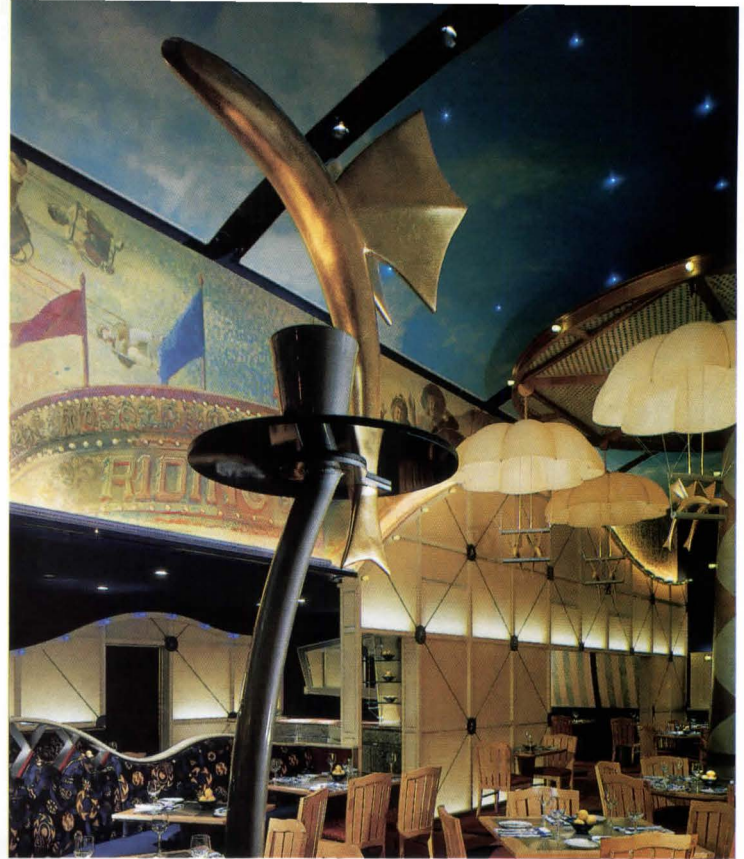
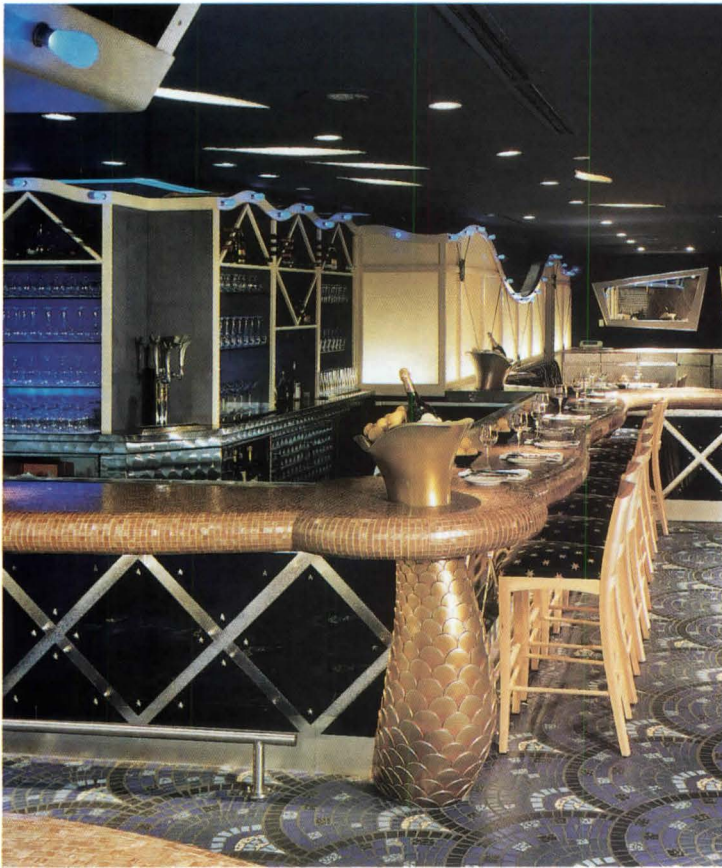
Architects: *Robert A.M. Stern (Disney's BoardWalk); Dorf Associates (Flying Fish Café)—Martin Dorf, principal*

Lighting Consultant: *Johnson Schwinghammer Lighting Consultants Inc.*

Electrical Engineer: *Thompson Company*

General Contractor: *McDevitt Street Bovis*





The blue “incandescent” lamps that march over the bar (left) in a wave are actually lit by fiber optics. The flying fish uplight (above) is one of the restaurant’s many custom fixtures.

filter on the metal halide illuminator gives the stars a blue cast, and the contrast between the ceiling and the warmly lit parachutes in the foreground helps create a sense of depth.

Even an ordinary-looking detail was solved with a custom fixture. The uplight on a wall-graphic “billboard” is a custom railing fitted with 10W low-voltage halogen lamps. The billboard lights, like other incandescent sources throughout the project, are on a dimming system.

“There were so many details,” says Schwinghammer. “It took a lot of work to get it to look like it does. There are a lot of remote transformers and lightboxes and fiber-optic cables. We had to plan it well in

advance and work with the electrical engineer, or this would have been a nightmare in the field.”

Schwinghammer does not give fiber optics a blanket recommendation. “Fiber optics has limited use,” he says. “It’s really hard to find a use for it in retail spaces, which is the application for which it is often

THE APPARENT LIGHT SOURCE IS THE FLYING FISHES’ PARACHUTES.

recommended. Fiber optics will work where you have very, very low ambient light levels; it’s perfect for museums, for instance. But in many places it doesn’t work.

“In this job fiber optics was good because of the design criteria. We took the technology and used it appropriately. It didn’t cost any more to use it than to light it the old-fashioned way, with hundreds of S14 lamps and custom mounting channels. Disney had the vision to achieve this design.”

“It came off as well as we wanted it to, even better,” says Paul Katen, Senior Development Manager for Walt Disney Imagineering. “It was a challenge to make it whimsical but elegant, with fine millwork and sophisticated layers of finishings. I’ve done a lot of work for Disney and this is one of the most totally integrated designs I’ve ever worked on. And it was fun.” ■



Manufacturers’ Sources
Custom decorative luminaires:
Sirmos Fiber Optics
Track and track heads: *Lightolier*

Recessed accent lights: *Prescolite*
Billboard uplight rail: *Starfire*
Cast blue-glass ceiling fixtures:
Prism

A black and white photograph of a woman with a short bob haircut, seen in profile from the side. She is wearing a dark, long-sleeved top. Her hands are positioned behind her back, holding a large, dark, circular object, possibly a hat or a piece of fabric. The lighting is dramatic, highlighting the contours of her face and hands against a dark background. The overall mood is contemplative and artistic.

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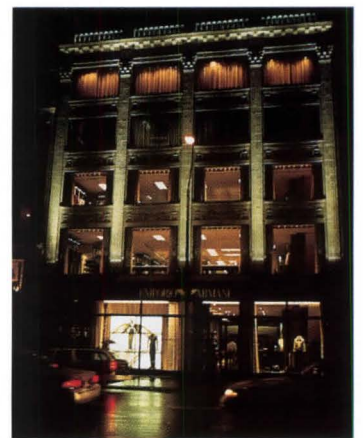
by Charles Linn, AIA

Pilasters grazed by uplights and backlit balusters are shown in an early concept drawing, left, and in finished form, below.

While the clients wished to avoid overstatement, Emporio Armani is not unlike other stores in that the storefront must be attractive, memorable, and substantial in its visual impact. This was accomplished by installing pods of 70W metal-halide spotlights that graze the pilasters, their capitals, and the soffit above. A balustrade on top of the roof is backlit by a high-output fluorescent sign-lighter with a straw-colored gel.

The front windows on the ground floor are framed by a backlit glass box. This band of brightness draws attention to the clothing, as well as providing ambient light for the mannequins. The glass in the box, held together by a chrome-plated steel frame, is called “seed glass” because of the tiny bubbles that texture its surface. The glass is lightly sandblasted on the reverse side to more evenly diffuse the light that comes from 10W incandescent lamps spaced on 6-in. centers. A similar detail is used to encase the columns at the ceiling. A theatrical projector mounted on a soffit inside the front door projects the Armani logo onto the sidewalk.

Accent lighting for the front window mannequins is accomplished using PAR38 track lighting that is recessed into a pair of troughs parallel to the display windows. The troughs are spaced far enough apart so that the displays can be front- and backlit and are wide enough to allow plenty of room to move the fixtures through their maximum possible range of adjustment. The track heads are made of solid milled aluminum that matches other light fixtures throughout the store, and they are fitted with stainless-steel honeycomb louvers.



Display cases and vitrines on the first floor of the store are illuminated by the same aluminum PAR38 fixtures used in the display windows. Here the track is also recessed into troughs to keep the ceiling plane clean. The vitrines behind the cash-and-wrap counter are illuminated by T8 fluorescent lamps built into a soffit.

Emporio Armani, the Italian design firm’s Madison Avenue store in New York City, occupies a magnificent, five-story stone town house. This conservative, elegant setting is filled with sleek showcases and vitrines made of black lacquered wood and glass that display the designer’s classic men’s and women’s clothing. Almost all of the fashions shown here are either black or in neutral tones, and Paul Gregory, principal of Focus Lighting, says that the biggest challenge to lighting the store was “getting in enough light to make the basic black sparkle, to bring out its richness.”

Gregory and Carlos Inclan, the project manager, presented their lighting concepts to the client using renderings done in yellow and white colored pencil on black illustration board (above). Inclan, who created the renderings, used white to simulate edges, corners, and surfaces of objects and yellow to indicate the direction and distribution of light rays coming out of fixtures and the way they will strike the objects. According to Gregory, showing the objects in white outlines and allowing the yellow lines to represent the way light will “fill” the lines can give clients a reasonably accurate simulation of the lighting concepts, provided that the distribution of light from lamps and fixtures is accurately represented.

Project: *Emporio Armani*
New York, New York

Architect: *Aero Ltd.—Thomas O’Brien, project architect*

Lighting Designer: *Focus Lighting—*

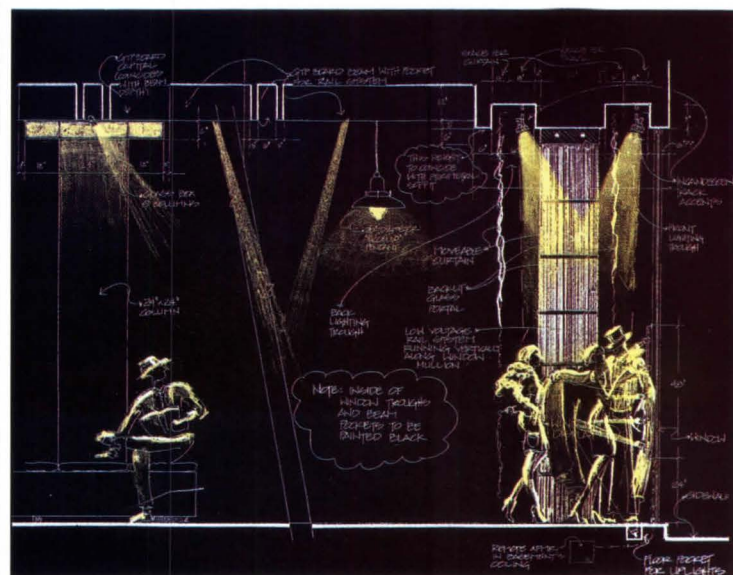
Paul Gregory, principal; Carlos Inclan, project manager

General Contractor: *Vista of New York—Phil Arnold, project manager*

PAR 38 track lighting is recessed into light troughs, devised to help keep the ceiling free of clutter while providing plenty of positions for fixtures.



Low-voltage tracks in fluorescent-backlit troughs illuminate clothing in the upper floors (left). Concept drawings (right) show how the front windows and column capitals are lit.



Low ceiling heights on the second and third floors were a challenge. To achieve high levels of ambient light while accommodating accent lighting, special ceiling troughs were developed. The 6-in.-wide troughs were cove-lit from the sides by recessed T8 fluorescent lamps and covered by matte-finished pieces of acrylic sheet, faux painted to resemble parchment. The acrylic sheet, installed 3/4 in. above the finished ceiling plane, has a row of 3-in.-square holes cut into it to allow MR16 accent lights to be attached to a track inside. The track heads have long stems so that they hang far enough below the recessed acrylic sheet to be easily adjusted. The custom-built shades are made of steel spun into a bullet shape, which is finished in brushed nickel, and they are also fitted with honeycomb louvers.

Windows on the second and third floors also serve as display areas, and the track fixtures used are identical to the solid aluminum type on the first level, except that they are of the PAR30 size.

“The light levels in the store are relatively high,” says Gregory. “This allows us to bring out the many colors that are present in a piece of black fabric and to make the most of the neutral colors of the clothing.”

In the unlikely event that Armani’s clothing line should one day shift to bright colors—in fashion, almost anything is possible—substituting lower-wattage lamps could easily adapt the store to change. “You just don’t need as much light when you are lighting objects that have bright colors,” says Gregory. ■

Manufacturers’ Sources

Track lighting, monopods:

LiteLab, Tech Lighting

Backlit glass boxes and column capitals:

Lightmakers

Fluorescent cove lighting: *Starfire*

Fluorescent sign lights: *Legion*

Metal-halide uplights: *Hydrel*

Incandescent and fluorescent lamps:

General Electric, Osram Sylvania

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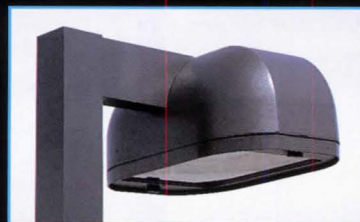
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CIRCLE 62 ON INQUIRY CARD

Forest and River Are Metaphors in Vancouver Airport's Light



by Gareth Fenley

of Vancouver. We had creative jam sessions that were very dynamic and exciting.”

On a walk through the facility, arriving passengers are taken up—as if to the treetops—on suspended skybridges that afford spectacular views of the Vancouver skyline and the mountains. Indirect fluorescent fixtures are hung overhead in a chevron pattern, pointing the way as passengers proceed to customs. From the flying walkways, arriving passengers drop down two floors to the arrivals level, traversing a three-story atrium illuminated by fixtures integrated into the suspended bridge overhead.

A regular pattern of indirect fluorescent fixtures around the perimeter directs the visitor to the baggage claim area. The guiding regional metaphor for the fluorescent fixtures was logs floating in a river. As passengers move further into the baggage claim area, the pattern begins to fracture, eventually forming a logjam of fixtures heading toward the exit.

In the double-height main ticket concourse, fixtures are suspended in each bay on custom hanger frames. Frames are organized in configurations of six, four, and two fixtures, depending on the size and shape

The skybridge is lighted by a chevron of fluorescents above and metal-halide downlights below.

Designers of the new international terminal at Vancouver International Airport wanted it to be much more than a functional processing plant for passengers. “We wanted to take it beyond that and introduce strong regional themes that would celebrate the heritage of British Columbia,” says architect Clive Grout of Architectura. That meant taking advantage of fabulous vistas across the sea to the mountains, using a natural color palette and day-lighting, and drawing on local and regional design influences wherever possible.

Lighting designers from Auerbach + Glasow were an integral part of the team that searched for design solutions. “We would begin here [at the architect’s office] and try to get really clear on the feel, character, and shape of the spaces,” Grout says. “The lighting designers came in and we closed ourselves away for a couple of days and had a charrette.”

The design team went through drawings of the building and did a preliminary lighting design, which the lighting designers took away to develop more technically, until the design was very clear. The electrical engineer, Robert Freundlich & Associates, then took Auerbach + Glasow’s work and prepared drawings for bidding. “It was very collaborative and very invigorating, because we interacted on more than just lighting fixtures,” says Grout.

“We were very much a part of early conceptual design,” says Len Auerbach, principal in charge of the project. “Our mandate was to design lighting that would play a principal role in the structural look and feel of the building, while adding a strong visual element in the interior design theme of the space.”

“Right from the initial massing studies, there was discussion about how to introduce integrated elements,” says Larry French, the project manager. “And there was a very strong emphasis on trying to find metaphors that would relate the design to the natural landscape



Project: International Terminal, Vancouver International Airport Vancouver, British Columbia

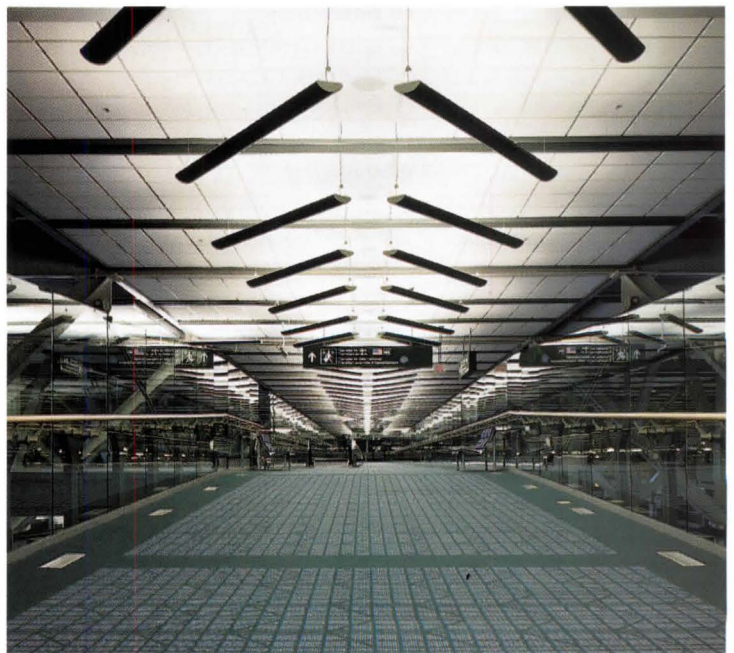
Architect: Architectura—Clive Grout and Stanis Smith, project architects

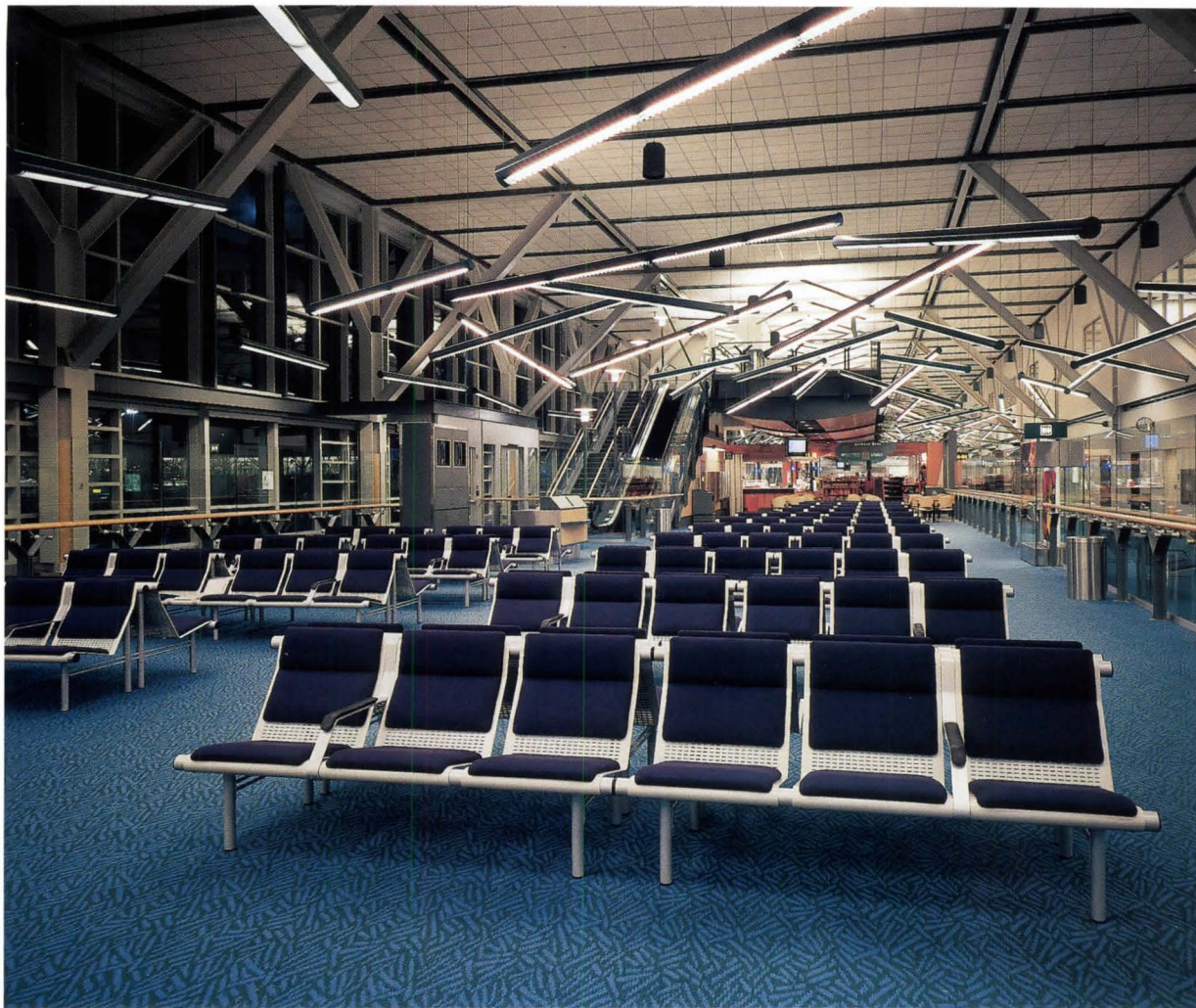
Lighting Designer: Auerbach + Glasow—Len Auerbach, principal in charge; Larry French, project manager

Electrical Engineer: Robert Freundlich & Associates



In the terminal's ticketing concourse (above), downlight cans with indirect-uplight components are suspended from steel hanger frames. In the food court (right), clusters of glass globes with compact-fluorescent lamps arch from poles reproduced from an earlier era, giving the space the feel of a seacoast village. On the skybridge, linear fluorescents hung in a chevron pattern direct passengers to customs.





The guiding metaphor for the fluorescent fixtures in the baggage claim area is logs floating on a river. As passengers leave the baggage area and proceed toward the exits (left), the logs gradually become a “logjam.”

of the bays defined by column locations. Each fixture combines uplighting and downlighting components. The designers preferred to use indirect lighting alone, but downlighting was necessary in areas with high ceilings.

At the food court, lighting takes the form of clusters of molded glass fixture heads mounted to floor poles. The historic fixture heads, similar to those found in seacoast villages around Vancouver, were modified to accept compact fluorescent lamps. Grout says that the manufacturer filled the order using fixtures that apparently had been kept in inventory for 45 years. “When we found the fixtures,” he says, “some were wrapped in newspapers from 1952.”

THE PHILOSOPHY IS THAT LIGHTING IS INTEGRAL TO THE ARCHITECTURE.

At the departure gates, perimeter lighting uses suspended fixtures that again combine direct and indirect components. They were specially modified with a 50-percent-open perforated metal shield on the uplight to minimize glare for patrons on the overhead skybridges.

Energy use in the new terminal is 40 percent less than in its predecessor. “The goal for the entire building was to keep consumption to 1.0 watt per square foot,” says French. “It clocked in at 0.8, an extremely low figure for a building of this size.” Photocell-based daylighting controls and cycled switching systems contribute significantly to the energy savings.

Maintenance concerns were not forgotten on the project. French says, “We kept the number of different lamp types down. The lamp inventory they have to keep on hand is very small for a building of this size.” The terminal has more than 750,000 sq ft of lighted interior space.

Grout calls the project “a custom job within a commercial budget.” To save money, bulk purchases were made directly from the manufacturers, an unusual procedure for this government client. The owner negotiated purchase prices for luminaires and supplied them to the contractor. “We also got price commitments for a planned future expansion that will use the same fixtures,” Grout adds. “Otherwise, the situation would leave us very vulnerable to paying more the next time around.”

The terminal’s lighting system demonstrates the value of an integrated design process. Says Grout, “We were searching for the lighting that was appropriate for each space, not just laying a grid over the whole facility.” Adds Auerbach, “The project relied on the philosophy that lighting is integral to architecture. It is not a pasted-on thing.” ■

Manufacturers’ Sources

Recessed metal-halide downlights:
Kramer Lighting, Inc.
Recessed compact-fluorescent downlights: *Lightolier, Inc., Zumtobel/Staff*

Linear fluorescents: *Ledalite, Inc.*
Freestanding poles in metal halide:
Poulsen, Holophane
Compact-fluorescent task lighting:
Zumtobel/Staff
Glass shades: *Holophane*

AIR DOWN

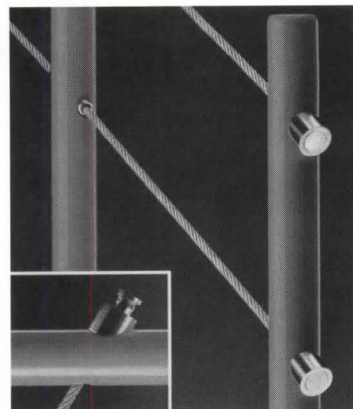
LIGHT UP

AURORA

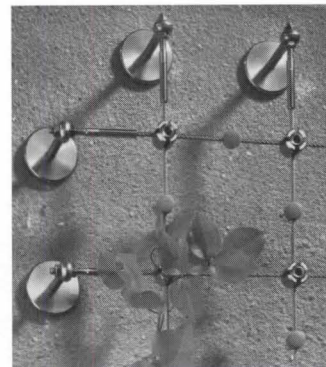
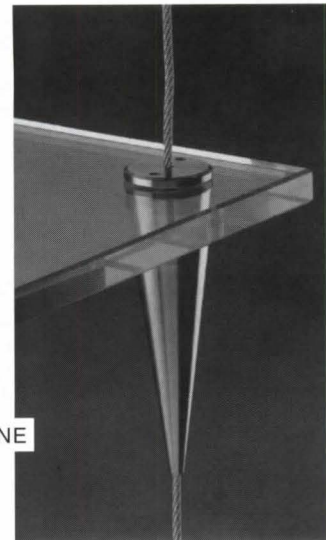
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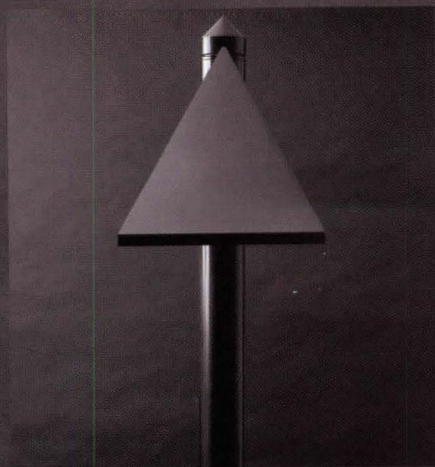
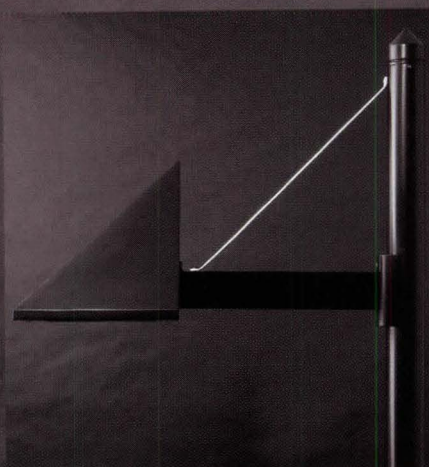
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ProLight, Holland, Mich. **CIRCLE 230**



▲ **Simplify your ceilings**

A brand-new design, the ExitLite downlight combines the functions of a corridor downlight, an exit sign, escape-route signage, and emergency-egress lighting in one low-profile, recessed luminaire. It produces over 10 fc in the emergency mode; UL-approved fixtures need only a 5-in. recess. 305/652-1600. WILA Lighting, Inc., Miami. **CIRCLE 232**

▼ **Dual-function museum fixture**

The Gallery version of the Exotrack joins lighting and picture hanging in a wall-mounted railing. Cantilevered brackets hold the flat conductor; lampheads can be moved at will. 203/367-5188. Tortran, Bridgeport, Conn. **CIRCLE 233**



▲ **Low brightness parabolic troffer**

The TE3P troffer, a shallow fluorescent fixture said to provide a high degree of visual comfort in VDT-intensive work spaces, comes in 2-by-2-ft and 2-by-4-ft configurations. The steel framing is painted black to give the low-iridescence louvers a floating appearance. The fixture takes three T8 lamps; electronic ballasts are standard, and the troffer may be specified with options such as master/

satellite wiring and dimmable ballasting. The unit meets the "preferred" requirements of the IES-RP1 when fitted with an optional specular-finish reflector. Steel housing is only 3 3/4-in. deep, and can be installed in NEMA type F or G ceilings. An architectural catalog covers all specification grade products. 800/523-3602. Simkar Lighting, Philadelphia.

CIRCLE 234

► **Tihany sconce**

The Ori sconce is part of a new lighting collection the well-known restaurant and hotel designer Adam Tihany developed for Baldinger. An Art Deco-influenced collaboration with project designer Rafael Alvarez, the ADA-compliant fixture resembles M. Hercule Poirot, with a polished-nickel "moustache" set under a 12-in. disc of frosted glass. 718/204-5700. Baldinger Architectural Lighting, Inc., Astoria, N.Y. **CIRCLE 231**

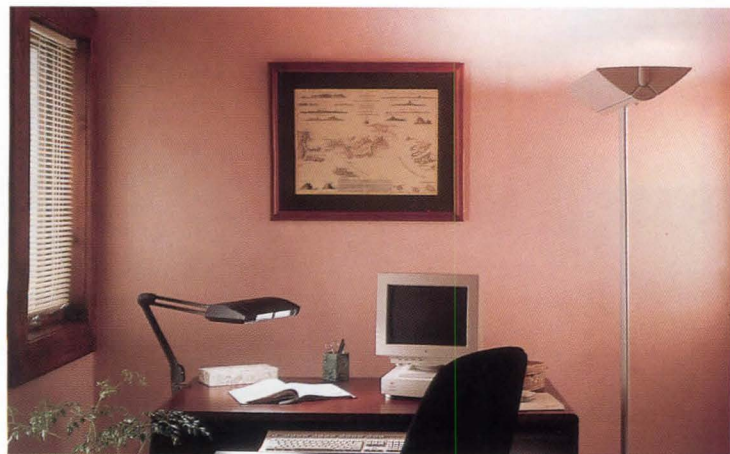


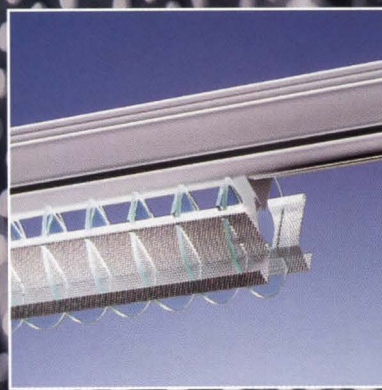
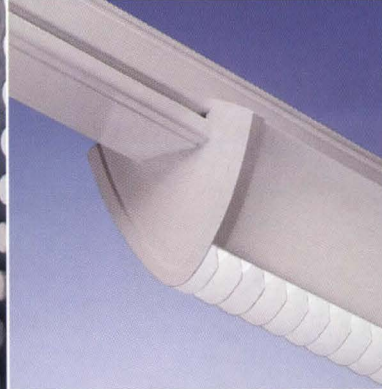
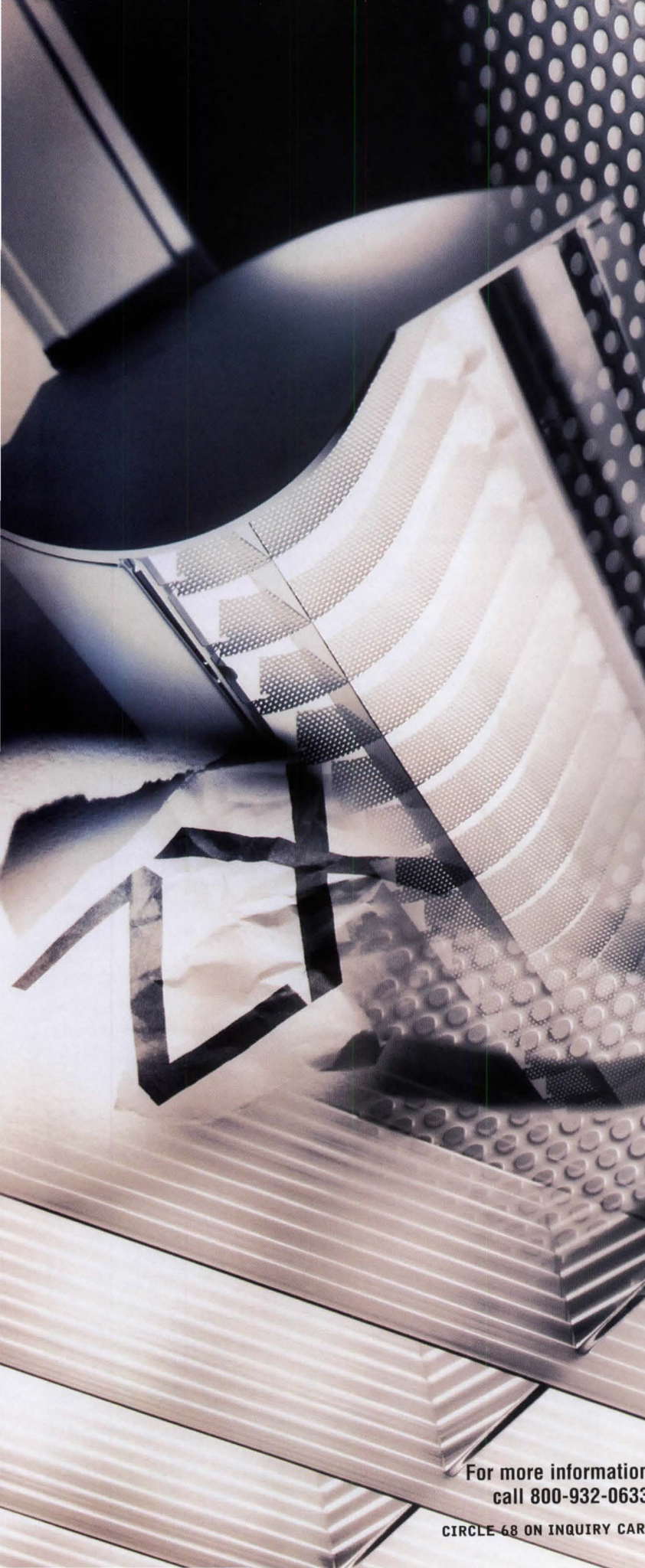
◀ **Problem-solving duo**

Luxo's new Two Component luminaire line addresses two office-lighting jobs: providing a comfortable level of indirect, ambient illumination without glare on computer screens, and supplying the right light for paper-based desktop tasks. Options include freestanding floor lights and ceiling-, furniture-, and wall-mounted ambient luminaires. There are eight models of portable, personally adjustable task lights for compact-fluorescent or halogen sources. 800/222-5896. Luxo Corp., Port Chester, N.Y. **CIRCLE 235**

▼ **Updated "schoolhouse" light**

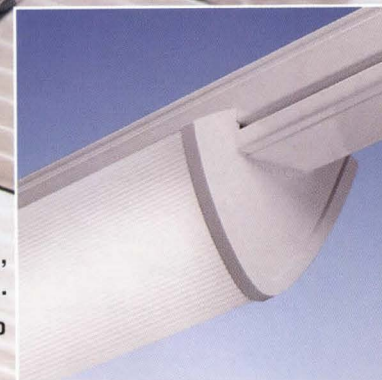
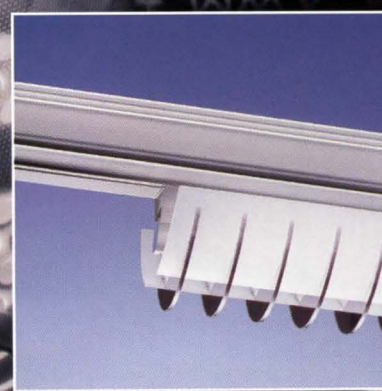
Berkeley ceiling fixtures have shades of satin-etched glass suspended from an hourglass-shaped canopy in an oil-rubbed bronze finish. 415/778-4300. Boyd Lighting, San Francisco. **CIRCLE 236**





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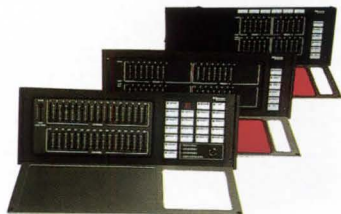
▲ Theatrical exterior floods

The Ecodome is a weatherproof, tamper-resistant housing for Studio Color automated luminaires. The polycarbonate dome allows full use of the luminaire's

360 degrees of movement, letting designers illuminate 20-story-high buildings like a stage set, with roaming spots and vivid colors. High End Systems, Austin, Tex. **CIRCLE 237**

▼ Commercial dimming

Macro describes its Designers Series as the industry's first family of compact, affordable, multifunction light-dimming and control systems for small to medium-size commercial lighting applications. Each panel is easy to program for multiple presets of all dimmable light sources, on multiple circuits, indoors and out. Preset scenes are held in memory until reprogrammed, or manually overridden as needed. The control unit fits nearly flush into building walls; slider controls are illuminated behind a lockable viewing door. 800/99MACRO. Macro Electronics Corp., Austin, Tex. **CIRCLE 238**

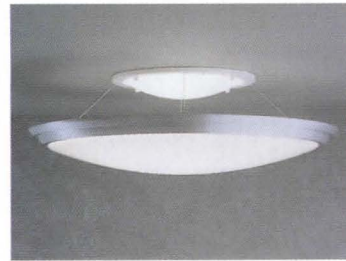


▲ Cove and accent-light combo

Developed as a sleek fixture for reception areas, conference rooms, banks, and galleries, the Flap Wall System consists of extruded-aluminum sections that work as an architectural cove, concealing T8 fluorescents. Modules can be ordered with a hidden low-voltage track for snap-in MR Spots to illuminate artwork. 516/694-9292. Artemide, Inc., Farmingdale, N.Y. **CIRCLE 239**

▼ Spread lens line

New spread lenses soften the distracting striations from bare PAR floodlamps, widening the beam of light and producing a more even illumination suitable for museum and gallery applications. For PAR38, PAR36, and AR111 lamps, lenses come in three versions: 30- and 70-deg linear, and a 40-by-70-deg wallwashing lens. 212/521-6900. Edison Price Lighting, New York City. **CIRCLE 240**



▲ Pendant for low ceilings

Visa's new Ovation luminaire takes advantage of a shallow (3-in.-deep) recessed housing that can hold two 26W quads or a single 42W triple fluorescent, illuminating a low-profile diffuser with the look and feel of a pendant. Shade and trims match larger-scale pendants for a uniform look even in 8-ft-high hallways. Visa Lighting, Milwaukee. **CIRCLE 241**



◀ Exterior line-voltage MR16

The Cambria 353 incorporates an electronic transformer in its stem assembly that allows the MR16 fixture to connect directly to 120-volt power. Made of a noncorrosive composite material used in spacecraft, the light's 20-50W source is recessed to reduce glare. Suitable for exterior accent or flood lighting, the Cambria 353 is the same size as its 12V counterpart. Fully adjustable, the fixture offers versatile mounting options. 805/496-2003. Lumière Design & Manufacturing, Westlake Village, Calif. **CIRCLE 242**

▼ "Built-in" bath lighting

The first of Lightolier's new Specialty Decorative fixtures, Alice is intended as "an integrated architectural treatment."

The 2- or 3-ft-long surface-mounted fixtures fit alongside a mirror or between cabinets. 508/679-8131. Lightolier, Inc., Fall River, Mass. **CIRCLE 243 ■**



NEW PRODUCTS



CUSTOM-MADE FOR THE GETTY: PRODUCTS SET A HIGH STANDARD

Complex curtain wall

Nothing about the almost 120,000 sq ft of aluminum-framed curtain wall at the Getty Center (above) was standard. According to Denny Mootz, the project manager for manufacturer Wausau Metals, no two walls on any of the six buildings were identical.

The company designed and fabricated three different sizes of pressure wall and reinforcing to span openings of 60 ft or more in height, and mocked up six shades of "Getty White" to obtain the eventual choice for the fluoropolymer-painted aluminum panels. Meier & Partners associate partner James Crawford specified the white-painted panels in 4,500 distinct shapes, sizes, and configurations, all of which had to meet an extraordinarily high architectural standard. Where the distance between two buildings required an extra measure of fire resistance, the company designed a steel-reinforced wall section. Wausau also custom fabricated window systems for the Getty project, including one configuration that allowed the attachment of stainless-steel cladding to window openings recessed into travertine. *Wausau Metals, Wausau, Wis.* **CIRCLE 250**

Modular ceiling treatment

The ceilings in many office and lab spaces in the Getty were designed to meet project architect Richard Irving's concept of a clean, "non-competitive" surface that would reinforce the architecture's 30-in. basic module. Working with Meier team member Ron Musser, lighting designers Fisher Marantz Renfro Stone, and Gil Hasler of the ceiling contractor Hutchinson Corp., Irving detailed a coordinated system based on a custom-sized Cashmere acoustic tile made by Celotex (below left). The acoustic material had to achieve a flat, uniformly white color appropriate to the color temperatures of the fluorescent sources



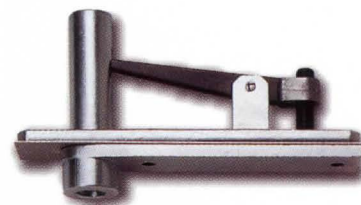
November's Products section starts with a look at four components developed to meet the stringent aesthetic and performance standards demanded by the architects of the Getty Center. This massive project tapped the skills of hundreds of manufacturers, artisans, and subcontractors, and fostered new building technologies that will be marketed as standard assemblies. On the next page, we show some products from Europe, where long-term performance is also vital. Product Briefs, pages 182-83, includes gates of hand-forged steel and wall protection that complements interiors.—*Joan Blatterman, New Products Editor*

specified. Linear fixtures were stretched from 48 to 60 in. in a custom housing, creating a 6-in. pan at each end to hold fire-sprinkler heads and life-safety speakers. The edges of the light fixture function as intermediate grid members, supporting tiles like a cross tee. Another special-size panel, 30 by 26 in., is used where light fixtures and air units share the same module, and recessed downlights are centered in 30-in.-square tiles. Each of the 156,000 sq ft of tile supplied matched the exact shade of white specified by the architects. *The Celotex Corp., Tampa, Fla.* **CIRCLE 251**

Shading preserves the view

Many of the dramatic windows in the Getty, including 50 30-ft-tall windows in the food-service building, 45-ft-high windows in the auditorium, and the 25-ft-high radiused wall of the library, are shielded by a roller-type MechoShade using ThermoVeil shadecloth in a custom gray color (below right). The system was selected for its ability to handle the large lengths of fabric required for the huge glazed areas with a chain- or motor-operated clutch

mechanism capable of positioning the shade at any desired point. The fiberglass fabric allows views through the material while reducing heat gain and glare. A specially configured recess for the roller mechanism was needed to install the shades. *MechoShade Systems, Inc., Long Island City, N.Y.* **CIRCLE 252**



Seismic top-throw pivot

The overscaled size and weight of the Herculite-glazed center-hung doors at the Getty required a pivot with sufficient capacity to restrain the panels during earthquakes. Working with hardware consultant Frank Falletta, Dor-O-Matic developed an extended-throw pivot (above) to keep doors securely hung through anticipated seismic movement, and is now marketing it in earthquake-prone regions of the country. *NT Dor-O-Matic Architectural Hardware, Shepherdsville, Ky.*

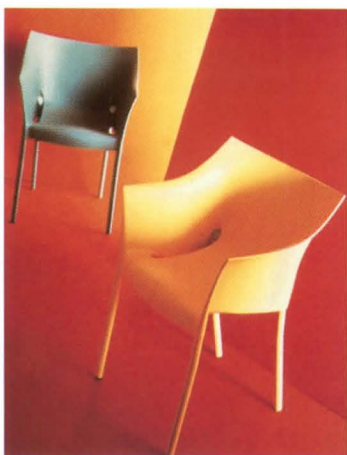
CIRCLE 253 ■



EUROPEAN PRODUCTS GET A U.S. SHOWING

Building products are serious business in Europe. And a good place to get a feel for the kind of design and technology represented by this business is at Batimat, the massive trade show held in Paris every two years. Attracting over 600,000 visitors, the event claims to be the world's biggest exhibition in the construction sector, nearly twice the size of its nearest

competitor. The 4,000 exhibitors expected in this month's exhibit were drawn from all the countries of Europe (half from France itself), as well as large delegations from Asia and North America, including about 250 U.S. firms. For the first time, a satellite Batimat was held in New York in conjunction with the Interplan show. And in 1998, the trade-show giant goes to Russia, Turkey, and China. If you can't get to the show, here's a look at some new European products.—J.F.B.

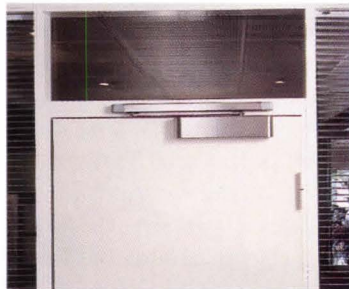


▲ Form-fitting

Designed by the Frenchman Philippe Starck and made in Italy by Kartell, the Dr. No stacking chair is fast becoming a furniture star in the U.S. All seven colors are shown in a 1997-98 catalog. I.L. Euro, New York City. **CIRCLE 254**

▼ Danish door closers

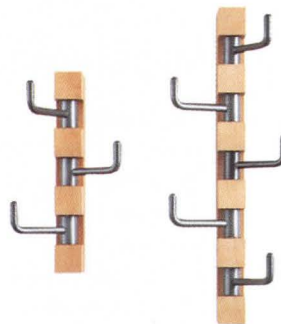
Winner of several prestigious design awards in Germany, D Line hardware includes bath fittings such as towel bars and cup dispensers; door pulls, lever handles, and cabinet knobs; signage; and door closers. Said to close doors securely every time, without slamming, these sleek stainless-steel units use mineral oil to quietly shut doors. The closing force is adjustable. D Line International, Copenhagen, Denmark. **CIRCLE 256**



▲ Indoors or out

For high-profile projects with a budget to match, the cantilevered-seat Butterfly bench is meticulously crafted of perforated and solid-sheet stainless steel.

Designed by Gabriele Bertossa and Costanzo Marchi, the rugged piece is made in Switzerland. 800/568-2585. Design Link Int'l., Boston. **CIRCLE 257**



◀ Birch from Sweden

Unlike Swedish furnishings with cute names like Olaf or Beatnik, these coat racks of solid birch with adjustable metal hooks are called Quasimodo. A hat-shelf/hanger bar unit called Sancho P. was created by the same designer, Jonas Lindvall, for David Design, Malmo. www.totemdesign.com (Web page). Totem Design, New York City. **CIRCLE 258**

▼ Radiator as Slinky

Designed by Briton Paul Priestman, Hot Springs are wall-mounted hot-water radiators formed of a continuous spiral of steel tubing. Manufactured in England by Bisque, units put out as much as 3,717 Btu. For vertical mounting, Hot Springs come in 25-, 49-, and 76-in. heights, with flexible connections that fit standard 1/2-in. pipe. Finish options include over 1,500 colors as well as nickel and other metals. 212/219-2120. 3-D Laboratory, New York City. **CIRCLE 259**



▲ Dry-joint rainscreen

Developed in France, lightweight Carea cladding is made of a fiber-reinforced mineral composite formed in an autoclave into 1/4-in. thick tongue-and-groove panels that interlock to prevent water infiltration without caulking. Integrally colored panels meet all appropriate building codes. Productions Carea, Inc., Saint Jerome, Que. **CIRCLE 260** ■

► Simple from Sweden

Stockholm-based Cbi makes furniture, lamps, and furnishings like this upholstered chair that remind you of why you always liked Scandinavian design. Totem Design, New York City. **CIRCLE 255**



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▲ Deco look in new glass

The renovation of a landmarked, 1937 Manhattan post office meant re-creating missing lights in the backlit lobby ceiling, a major design feature with 20 different sizes of Deco-style glass. Cesar Color created a custom ChromaFusion laminate that captured the special translucency, optical distortion, and imprinted striations of the original amber-colored rolled glass. 800/275-7272. Cesar Color, Inc., Burlingame, Calif. **CIRCLE 261**

▼ Architectonic shapes

Former New Yorker Jay Reynolds, AIA, uses building shapes, materials, and geometries in the furniture he designs. Pictured below: the 4-Pod table in cherry with a stainless-steel top, an angular volume set on sturdy, tapered legs. 310/559-6722. Office of J. M. Reynolds, Architects, Los Angeles. **CIRCLE 262**



▲ Vandal-resistant glazing

The architect for a New England school district didn't want to use prisonlike exterior grilles to curb an epidemic of glass breakage; instead, all windows in this school were refitted with Acrylite AR

acrylic sheet. Installed in an insulating unit with tempered glass on the inside, the acrylic sheet needs an abrasion-resistant coating on only one side, lowering its cost. 201/442-6044. CYRO Industries, Rockaway, N.J. **CIRCLE 263**



◀ Residential metal roofing

The developers of the Aston Wood steel panel say its light weight—60 lbs/sq—means significant cost savings. Coated with a fade-resistant fluoropolymer, the "lifetime" interlocking roof panels come in cedar-shake and slate-look patterns. 519/858-9937. MetalWorks/Centria Joint Venture, Moon Township, Pa. **CIRCLE 264**

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◀ **Patterned wall protection**

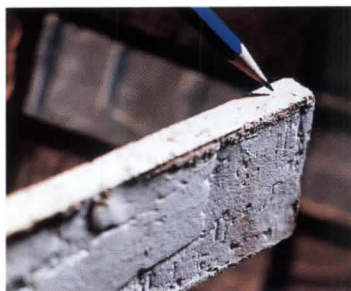
With over 160 stone, wood-grain, and graphic patterns, the Acrovyn Chameleon Collection permits a wide choice of decorative options in handrails, corner guards, impact-resistant wall panels, and wall-covering for heavy-traffic environments.

800/233-8493. C/S Group, Lebanon, N.J. **CIRCLE 265**

▼ **Real, thin brick**

A clay brick only 1/2-in. thick weighs 20 percent as much as a standard brick. For use as an accent such as a fireplace surround or a backsplash, ThinBrick comes in dozens of colors.

303/783-3000. Robinson Brick Co., Denver. **CIRCLE 266**



▲ **Architectural wrought metal**

A hand-crafted gate of forged steel highlights the dramatic flair metalwork can give even utilitarian settings. Catalog shows rails, fire screens, and gates from this atelier. 415/550-9328. Jefferson Mack Metal, San Francisco. **CIRCLE 267**



▲ **Right chair for the right spot**

Influenced by the great designers of American Streamline Modernism such as Raymond Loewy, Paul Frankl, and Gilbert Rohde, Luis Henriquez fabricates interesting, comfortable furniture with the flair of the 1940s. Pictured: a generously pro-

portioned lounge chair by Rohde, upholstered in tangerine-colored Zax mohair. Seating, tables, and casegoods are made for both contract and residential use; trade and quantity discounts are offered. 800/367-3003. Design America, Coral Gables, Fla. **CIRCLE 268** ■

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PRODUCT LITERATURE

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Solid-phenolic toilet partitions

An ultradurable material said to have good flame-spread and graffiti-resistant properties, Hoechst Celanese's Trespa phenolic can be specified in washroom compartments that meet many design and occupancy requirements. A four-page brochure illustrates various hinging, mounting, and privacy options available and shows phenolic sheet made into storage lockers and laboratory counter-tops. 800/4-TRESPA. DesignRite, Poway, Calif. **CIRCLE 270**

Accessible washrooms

Stating that space for people in wheel-chairs is a fundamental design consideration, Bobrick's revised planning guide includes captioned details and layouts illustrating critical dimensions and recommended fixture and accessory

placements for public washrooms. The 20-page brochure was prepared under the direction of Ronald Mace, FAIA, the president of Barrier-Free Environments, Inc., and a leading proponent of universal design. 818/982-9600. Bobrick Wash-room Equipment, Inc., North Hollywood, Calif. **CIRCLE 271**

Water-mist fire suppression

A new fire-suppression system for Aisle-Saver's compact library storage shelving uses fine water sprays to control fire situations, minimizing possible water damage. 908/272-8888. White Systems, Inc., Kenilworth, N.J. **CIRCLE 272**

Aluminum window sourcebook

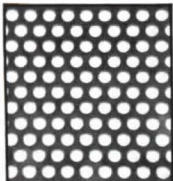
A 24-page brochure describes custom aluminum windows and wall systems, including projected, rolling, and double-hung windows, storefronts, entrance systems, and curtain walls. Case histories describe specific architectural problems and illustrate window and wall solutions. 715/845-2161. Wausau Metals, Wausau, Wis. **CIRCLE 273**

Office cable management

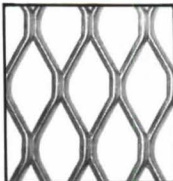
This 48-page report provides a guide for those who seek a basic understanding of good cable-management practices, explaining how voice and data cables can be interfaced with office furniture in a way that preserves their signal integrity. Fax 800/563-7128. Office Specialty, Holland Landing, Ont. **CIRCLE 274**

Metal with Holes!

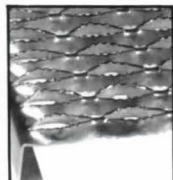
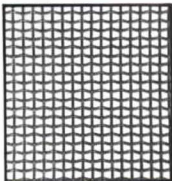
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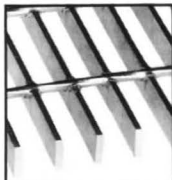
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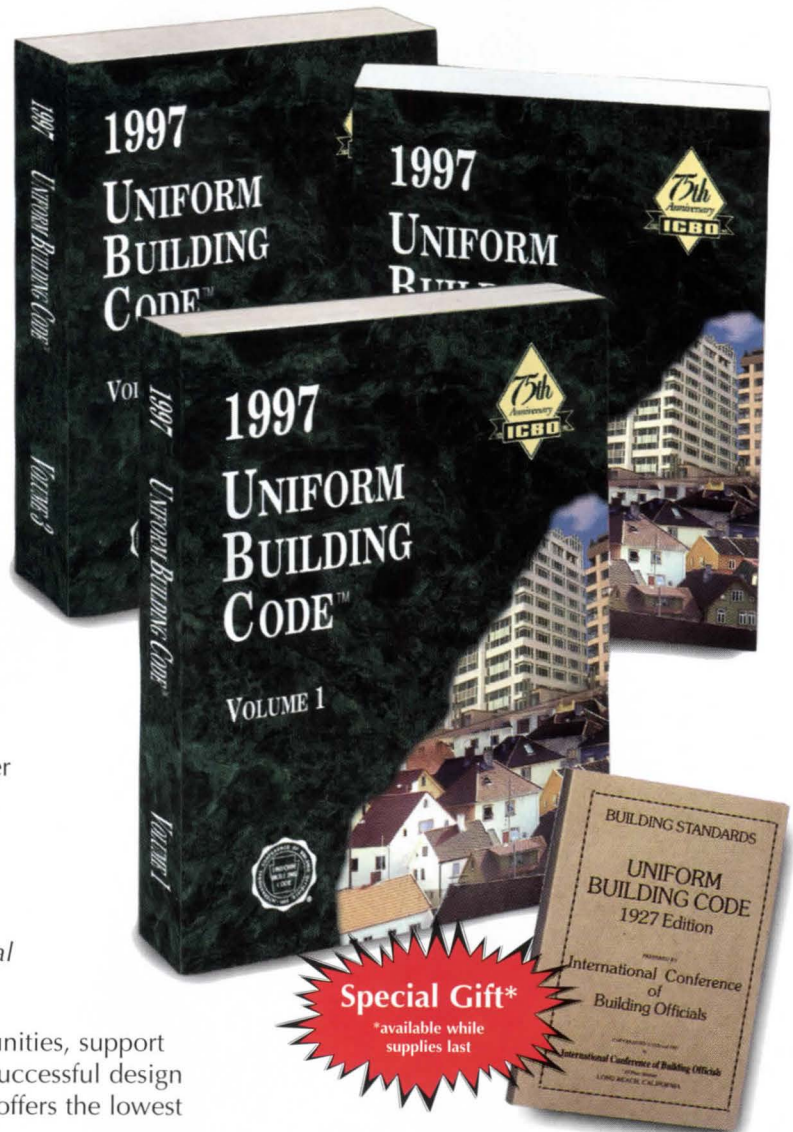
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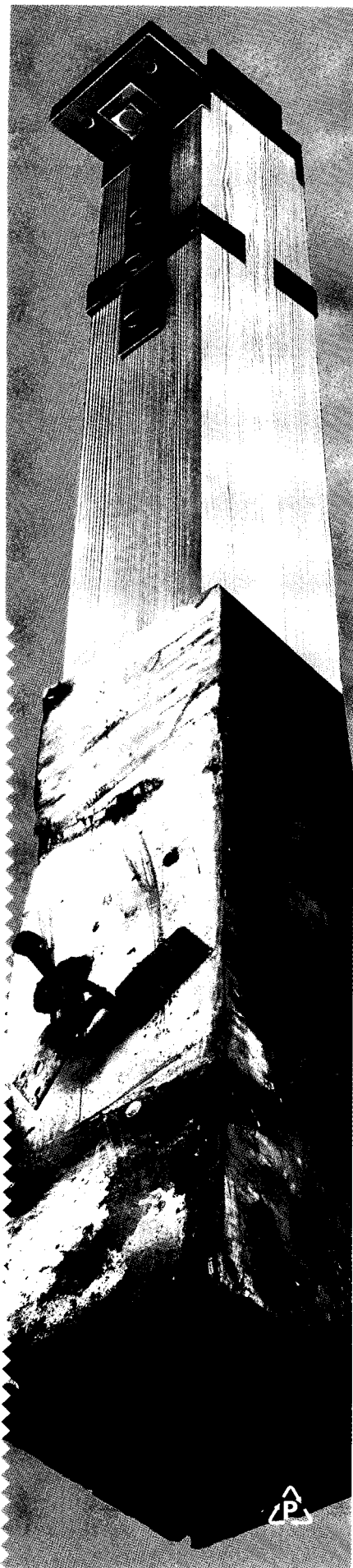
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Romance of Italian tile

The Craft of Tile Making in the Emilia Romagna, a 22-page booklet, discusses the origin of certain distinctly Italian historical design trends, shows both handcraft and high-tech production facilities, and explains the unique features of modern Italian tile. No charge. Tile Heritage Foundation, Healdsburg, Calif. **CIRCLE 276**

Grout-color guide

A pocket-size chart holds true-to-life, textured swatches of all 27 Renaissance grout colors and describes installation systems on a good-better-best basis. 800/243-4788 x235; www.laticrete.com (Web page). Laticrete International, Inc., Bethany, Conn. **CIRCLE 277**

Building-code library

The 1996 BOCA National Building, Fire Prevention, and Property Maintenance Codes have been computerized to provide reviewers, architects, and code

officials quick access to any topic. Available in two formats—3.5-in. disk (sections or the entire code) and CD-ROM (entire code only)—the software offers such features as sticky notes for adding on-screen text, and highlighters for marking related sections for quicker access. All programs are Windows based; a demo can be downloaded from www.bocai.org (Web page). To order, call 708/799-2300, x242. BOCA, Country Club Hills, Ill. **CIRCLE 278**

Pine floor tips

A 20-page *Guide to Southern Pine Flooring* shows the patterns and grades of flooring available and discusses installation, finishing, and floor maintenance. www.southernpine.com (Web page). Southern Forest Products Association, Kenner, La. **CIRCLE 279**

How to beat mildew

A manual prepared by environmental engineers CH2M Hill and the Disney Development Company gives tips on how to significantly reduce the incidence of moisture and mildew in a structure to avoid possible indoor-air-quality problems. Suggestions cover each stage of design and construction, and should not add extra cost to a project. Binder price is \$70. To order, call 407/423-0030. CH2M Hill, Orlando, Fla. **CIRCLE 280** ■

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CIRCLE 88 ON INQUIRY CARD



(Letters, continued from page 26)

My compliments to Jeff Goldberg, especially, for the most spectacular photographs to appear in your magazine in years.

—Steve Schuller
via E-mail



I applaud Gehry's design of the Guggenheim Museum Bilbao. However, I am professionally amused at the article's undertone defending Gehry's ability to have his

projects come in on time and within budget. Since the article does not have a project schedule, I can only assume this building was constructed on schedule.

However, within the budget? Although I (and I am positive thousands of other practicing architects) have never been fortunate enough to design a project that cost \$389 a square foot, I have to note that this princely sum was attained after the project's size was reduced by 33 percent. I have fought many a budget battle, but never one where the client reduces the programmed space by 33 percent in order for the project to meet the budget. No wonder Thom Mayne said, "Will I ever find such a client?"

—Peter Krawchuk, AIA
Chapel Hill, N.C.

Cyber thoughts

It was with great interest that I read Robert Ivy's editorial, "Witnessing the Birth of the Cyber Age," in RECORD's August issue [page 9].

The editorial covers a topic that is all too infrequently discussed, given the tremendous impact it is having on our professional and personal lives. There seems to be an endless stream of articles on the latest innovations in hardware, software, graphics, and associated gadgets. Pensive words evaluating the global impact and value of the cyber world are all too rare.

With the generation gap so strongly felt in our offices (staffers often seem to speak a different language than principals and job captains), the proliferation of do-it-yourself 3D CADD for homeowners, the impact on presentations and other issues, the architectural cyber age is here with a bang, but without the appropriate dialogue to help us make the transition to an age that seems to have arrived so quickly.

—Thomas L. Grassi, AIA
Dumont, N.J.

I share the thoughts Ivy expressed about technology and its evolving

impact on our work as architects. I am a principal of a Mexican company that has been providing support services to American architectural firms since 1995. I was pleasantly surprised to read in Ivy's editorial of the architectural process in the cyber age: "One firm produces its designs by the San Francisco Bay, zaps the data to Mexico for construction documents, then blasts them eastward toward construction projects in Japan." He describes exactly the kind of work done by my office.

Thanks to the advantages of communications technology and Mexico's low-cost labor, many architects in the U.S. have found this arrangement to be very appealing. It results in business opportunities for architects in both countries.

—German Noreiga, Architect
Consultoria y Diseno
Hermosillo, Sonora, Mexico

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Kudos for RECORD

I would like to congratulate you on your magazine. In my country, there are very few architectural publications as highly appreciated as yours. Your presentation of information and new ideas and developments by the best-known architects is magnificent.

—Luis Alberto Barria
Panama City, Panama

Theory and practice

Robert Ivy's editorial in the September issue of RECORD [page 17] was very thoughtful and provocative. Yes, I also subscribe to the belief that theory (there must be a better term—theory suggests things like $e=mc^2$!) is important to the growth and creativity of architecture.

However, I disagree that theory is important only as an academic exercise. The best theories in architecture have *always* been buildable. Mies struggled to find the best way to build, and in the process

he developed an extremely valid philosophy that echoes in academic halls and offices even today. And think of Palladio!

In pure science, theories that go nowhere are at least tested by the scientific method. Theories in architecture that go nowhere are usually divorced from practical application; consequently, they remain untested and must be judged irrelevant.

—James A. Gresham, FAIA
Tucson, Ariz.

Your editorial on theory and practice is I think very important. Architecture to me is about transcendence and transformation—without leaks! I think this is a critical time both for educators and practitioners. We have new possibilities and of course with that come new responsibilities.

—Cynthia Weese, FAIA
Dean, School of Architecture,
Washington University
St. Louis, Mo.

The next Reston

From all appearances, the new city of Modi'in, designed by architect Moshe Safdie and now taking shape in Israel [August, page 34], promises to be the Reston of greater Israel. Hopefully, RECORD will present the project in greater detail after its completion. Perhaps it can serve as an example to America, where government efforts to build housing for all of our citizens are thwarted, I believe, by a Republican agenda.

The reference to Israel as a "construction-happy nation" in RECORD's news article on the project suggests misplaced envy.

—Frederick A. Lee, RA
New York, N.Y.

Corrections

An August news story [page 38] failed to identify the student winners of the ACSA/Otis Elevator competition. They were Augusto Roman Moncagatta, Federico Pastor Soto, and Sharif Kahatt Navarrette of the

Universidad Ricardo Palma, Peru; and Giovanni de Benedittis and Giovanni Palermo, of the Università degli Studi "G. D'Annunzio" Pescara, Italy.

The project credits for Antoine Predock's Music Center, University of California, Santa Cruz [August, pages 72–75], should have included the names of the following members of Predock's team: W. Anthony Evanko, AIA, and Geoffrey Beebe, AIA, associates in charge.

Contrary to a news item in the September issue [page 37], it is the *Chicago Tribune*, not the *Tribune Tower*, that celebrates its 150th anniversary this year. The *Tribune Tower* itself is only 72 years old. ■

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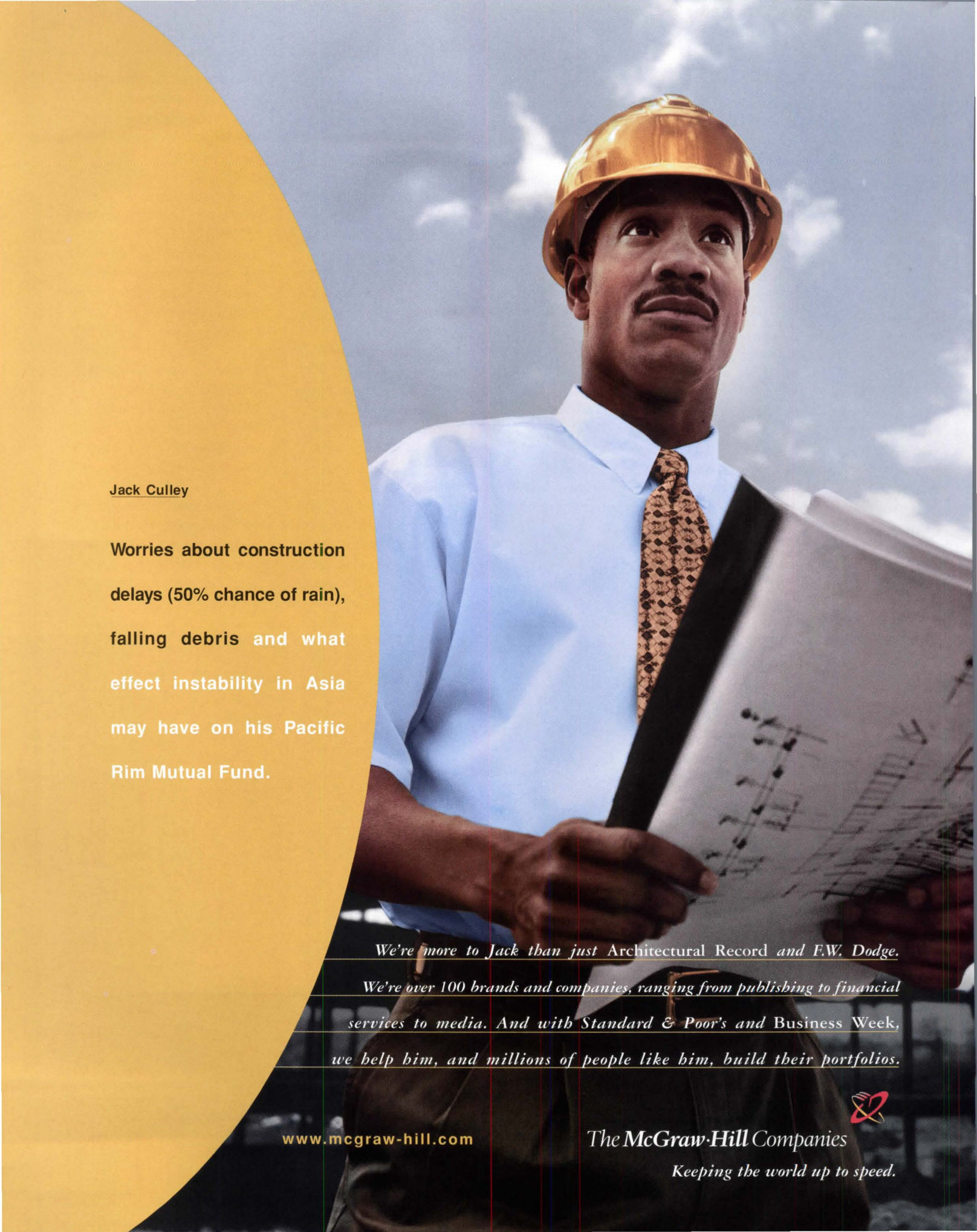
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(continued from page 107) be quite so romantic as Wright. He wisely abstracts his stone as a checkered quilt of panels separated by open joints. Meier says he wanted a signature stone, one you'd identify with the Getty, the way red sandstone becomes a symbol of Arata Isozaki's Museum of Contemporary Art in downtown Los Angeles. He succeeds.

The biggest issue at the Getty is one that goes beyond architecture and has nothing to do with Meier. Should the Getty, which congratulates itself on its outreach programs, have consolidated itself into this elite monastic hilltop campus, this Mount Athos of art? Christopher Alexander says somewhere that an American college in an idyllic rural setting will always feel like a high school because the students, not being physically part of the larger community, can never feel like citizens or, therefore, like grown-ups. What if the Getty, instead, were integrated into the city, like an Oxford or a Harvard—fully itself at the center, but mingling into its surroundings at the edges? Wouldn't everybody benefit? Won't the staff get tired of meeting at the cafeteria? Wouldn't a bigger schmooze pool be more stimulating to them?

And in spite of a nearby bus stop, the Getty is hopelessly car-dependent: another gated community. It seems safe to predict the visitor parking and the access tram will be hopelessly oversubscribed in the early months after the public opening; reservations will have to be made long in advance. Worse yet, on this site the Getty can never legally expand. A setting in the city would have allowed for inevitable growth and change. The Getty's huge financial investment, by attracting further development around it, might have spun off some benefits for someone besides itself. The choice of site is an expression of institutional ego and self-importance.

But, as noted, that's not the architect's fault. Meier is a perfec-

tionist sculptor of light and space, a great fan not only of the early modern movement, but also of Borromini and of the central European Baroque. You hire him, you know you're going to get that. You know the minuses: everything will be so perfectly detailed that the first time anyone picks up a hammer to make a change, the result will look as messy as muddy tracks on virgin snow.

You also know the pluses. The Getty is a textbook of ways to embody light in architecture. Like Rudolf Schindler in this same sunny climate, Meier employs stepped forms and cantilevers to model light and shade. Stairs and canopies, clipped on the outside of the main masses, cast intricate patterns of shadow. Curved surfaces are crescents of light. Transparencies create luminous collages. Long views are framed in white tracery. Sometimes the light is so tangible it seems to be a volume inside a space, pushing out, rather than the reverse. The dark painting galleries, so un-Meierlike, only make the light more magical when you emerge from them. It's all very accomplished and, at the scale of each separate initiative, it's often very beautiful.

Which brings us back to where we started. The English poet Coleridge offered a famous definition of poetry as opposed to prose. Poetry "is discriminated by proposing to itself such delight from the whole, as is compatible with a distinct gratification from each component part." The Getty is poetry in its insistence on gratifying us with each part, each architectural rhyme and image. But the whole is less happy. We've got an anthology, not an epic. The Getty is like a pile of marvelous white Richard Meier houses, dropped helter-skelter from a helicopter onto the site. That's no bad thing. But it's a step short of the masterpiece we all, probable unfairly, hoped for from this client, this program, this architect. ■

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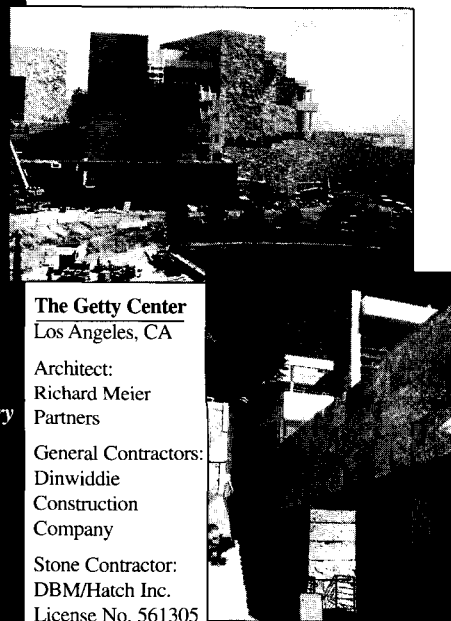
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(continued from page 55) thinker. The exhibition gathers together some 500 examples of his work, including drawings, models, books, and photographs. Call 514/939-7000.

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The Architectural History Foundation announces the **Vincent Scully Research Grant**, a \$10,000 biannual award to facilitate the publication of a monograph on American architecture. Preference for the grant will be given to projects that are substantially complete and/or under active consideration for publication. The deadline for applications—which must include a book proposal, an outline of how the award will be utilized, and other materials—is February 2, 1998. For further information about application, contact the Architectural History Foundation, 350 Madison Avenue, New York, N.Y. 10017, or fax 516/944-5961.

Exhibitgroup/Giltspur, an exhibition marketing agency, invites design students to enter its **'97 Launch Your Career in Exhibit Design** competition. Entrants, who must be sophomores and juniors enrolled at an accredited college or university, are asked to design a trade show exhibit for a young company that is introducing a revolutionary new product at an upcoming international trade show. First-, second-, and third-place prize winners will receive tuition scholarships of \$7,500, \$5,000, and \$2,500, respectively, and a paid internship at one of the sponsor's design studio/production facilities. Entry deadline is December 1. Write Launch Your Career, Exhibitgroup/Giltspur, 201 Mill Road, Edison, N.J. 08817; or E-mail launch-career97@e-g.com.

The American Society of Architectural Perspectivists (ASAP) invites entries to its **13th annual International Competition and Exhibition of Architectural Illustration**. Entries in two categories—formal and sketch—must be in the form of 35mm slides of original work

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(including computer renderings), representing proposed buildings, interiors, or architectural environments. Winning entries will be presented in a traveling exhibition that will open in Atlanta in 1998 in conjunction with the ASAP's national convention. Entry deadline is January 16, 1998. For more information on the competition or ASAP membership (a requirement of entry), write Architecture in Perspective 13, Alexandra Lee, Executive Director, American Society of Architectural Perspectivists, 52 Broad Street, Boston, Mass. 02109; call 617/951-1433 x225; or fax 617/951-0845.

The **Tile Promotion Board's Spectrum International Ceramic Tile Design Competition** honors creative excellence in residential and commercial ceramic tile design. Architects, interior designers, contractors, builders, retailers, manufacturers, distributors, and others who have influenced the specification or installation of ceramic tile may enter projects completed between January 1996 and December 1997. Submission deadline is January 31, 1998. Winners will be announced during the International Tile & Stone Exposition's All-Industry Awards in Orlando, Florida, next April. For more information, call the Tile Promotion

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The competition for the **\$20,000 James Harrison Steedman Traveling Fellowship** for study/travel abroad is geared to the theme of "water and ground." Candidates must have received a professional degree from an accredited architecture program no earlier than 1989 and must be working for an architectural firm or have at least one year of practical experience. Contact Steedman Governing Committee, Marianne Pepper, Washington University School of Architecture, One Brookings Drive, St. Louis, Mo. 63130; call 314/935-6293; or E-mail Steedman@arch.wustl.edu/steedman/.

An international, open competition is being held for the design of the **Office for the Fundacio Mies van der Rohe, Barcelona**. Sponsored by the Barcelona City Council, Editorial Gustavo Gili SA, and the Fundacio Mies van der Rohe, it is open only to architects under 40. The competition is for the design of the foundation's headquarters and proposes as its design theme a building linked to the pavilion designed by Mies for the Barcelona Exposition in 1929. The brief includes a multipurpose

hall, an auditorium, and areas for management, administration, and archives. Deadline for registration documentation is November 15; submission deadline is March 31, 1998. To register, write Editorial Gustavo Gili, Rossello 87-89, 08029 Barcelona; call 343/430-5435; or fax 343/430-4653.

Upcoming deadlines for the **1998 AIA Honors and Awards** program are as follows: Young Architects Citation (nomination by AIA component required), submissions due November 21; Architecture Firm Award, Henry Bacon Medal for Memorial Architecture, Institute Honors, Thomas Jefferson Awards for Public Architecture, and ACSA/AIA Topaz Medallion for Excellence in Architectural Education, submissions due December 12; Honorary Memberships (nomination by national board member required), nominations due December 19; AIA/NCMA Design Awards of Excellence, entries due January 16, submissions due February 20. For more information, call Robin Lee at the AIA at 202/626-7390.

Please submit information for exhibitions, conferences, and competitions at least six weeks prior to publication date. ■

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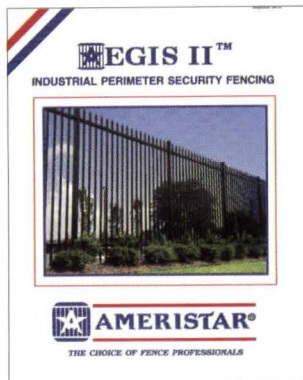


44-pg color "Idea Book" featuring a collection of column projects from classic to contemporary for interiors & exteriors. Includes Columns Product Portfolio. \$10 + \$3 p/h from the column co. selected #1 by Professional Builder Readers. Product Portfolio \$5. Wood, fiberglass, polyester, E.P.S., & stone, round, square, octagonal w/ plain or fluted shafts. Job site del., worldwide shipping. 1.800.COLUMNNS (1.800.265-8667).

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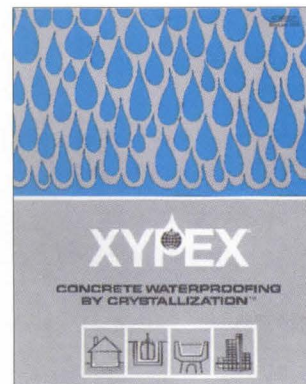


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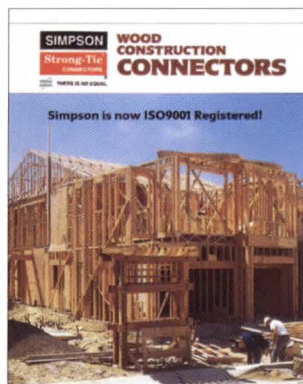


These bronze elevator door facings were manufactured by Surface Design + Technology specializing in custom & standard metal graphics. Using sheet metal finishes of a variety never offered before. There is virtually no limit to the types of patterns which can be created by combining multi-directional 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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**12 New Products Featured
in 1997 Catalog**



12 new products are introduced in Strong-Tie's '97 catalog, Wood Construction Connectors. A necessary reference for structural engineers, building officials, & architects, it includes updated specs, load charts, application drawings, & building code acceptance—plus info on holdown anchorage design, & avail. custom hanger options. ISO9001 Reg. For 1997 catalog (C-97), write POB 10789, Pleasanton, CA 94588

Simpson Strong-Tie

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**Accessible Lavatory
Insulation**



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.

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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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Clopay Building Products Company acquires Dade County wind code approval on several of its insulated thermally broken steel doors. These upward-acting sectional doors not only meet the most stringent wind load considerations, but provide maximum energy efficiency and long service under the most demanding applications. 800-526-4301.

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Proves that top quality architectural software can be easy to learn. Straight out of the box, Chief simplifies the process of creating full working drawings. Over 300,000 people worldwide prefer ART's architectural software with its full 3-D capabilities. Advanced Relational Technology, Inc. 3731 N. Ramsey Rd, Suite 150, Coeur d'Alene, ID 83814. T: (800) 482-4433, F: (208) 664-1316, artchief@chiefarch.com www.chiefarch.com

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Raymond Enkeboll Designs



Architectural Elements carved in solid woods. 104 pg. catalog shows a selection of capitals, corbels, moldings, onlays, panels also New equestrian series. Stocked in Maple and Red Oak. Spiral Bound catalog \$20.00, Special binder version \$30.00. Visa, MC & AMEX welcome. Complimentary Brochure Available. Raymond Enkeboll Designs 16506 Avalon Blvd AR107 Carson, CA 90746. T:(310)532-1400 F:(310)532-2042

Raymond Enkeboll

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has been sheltering America for over two centuries. As a roofing material, it is prized for its high mica content, natural cleft and texture, as well as its non-fading and distinctive hand-made quality. Because of its permanence and natural beauty, it was specified by Thomas Jefferson in the 1800's and remains today the roofing choice of eminent architects. Buckingham-Virginia Slate, P.O. Box 8, Arvon, VA 23004. T: 1-800-235-8921.

Buckingham-VA Slate

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Mortar Net Green

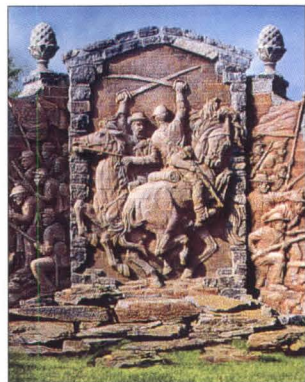


is placed on top of the flashing inside the cavity, where it catches & permanently suspends mortar droppings above the level of the weep holes. Its patented dovetail shape prevents mortar from forming a dam, its shape with its 90% open weave allows water & air to easily move through the net & out the weeps. It's 100% recycled non-degradable polyester & is avail. in a 2-inch width. For a CAD disk, call (800) 664-6638.

Mortar Net

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For maximum impact and appeal, crown your work with a signature art piece from Brickstone Studios. Applications of brick or caststone sculpture are unlimited - exterior and interior murals designed to bring architectural focus to entrances, foyers, facades and imagework. Quality craftsmanship and design are distinguishing services our company guarantees. 800-449-6599.

Brickstone Studios

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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 164 ON INQUIRY CARD

PORCH-LIFT® Vertical Platforms

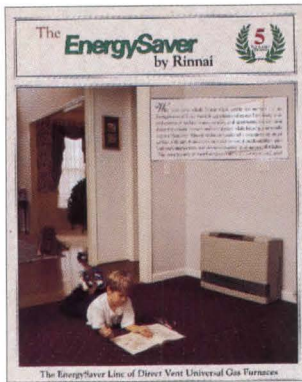


PORCH-LIFT® Vertical Platform Lifts from Access Industries are designed to raise and lower a wheelchair user from one level to another indoors and outdoors for public buildings of all kinds. Easy to install and operate, the lifts require little to no site modification to install next to stairs or a landing. Standard models can be installed in a custom hoistway (shown above) to blend with any building design or accessibility plan.

Access Industries

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Universal Gas Furnace

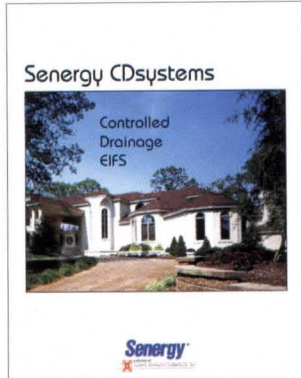


Rinnai's EnergySaver direct-vent gas-fired univ. furnace combines contemp. styling w/ exceptional energy efficiency. Features: cool-to-the-touch cabinetry, quiet twin fans, electronic ignition, no open flame, & humidifier. Energy Saver models 431,556 (shown) & 1001 heat areas up from 1100 to 1700 sq. ft. w/ Natural or LP gas. These Rinnai furnaces also carry the industry leading 5 yr. ltd. warranty. (800) 621-9419.

Rinnai America

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Senerflex CDsystem and QR-CDsystem



Senerflex CDsystem and QR-CDsystem are two new exterior insulation and finish systems from the Senergy Division of Harris Specialty Chemicals, Inc. CDsystems provide a sure means for controlling drainage of incidental moisture that may enter the wall. CDsystems offer a wide color selection, variety of textures, interesting aesthetic options, reduced energy costs, and low maintenance.

Senergy

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Truebro, Inc. Basin-Guard™ Undersink Enclosure

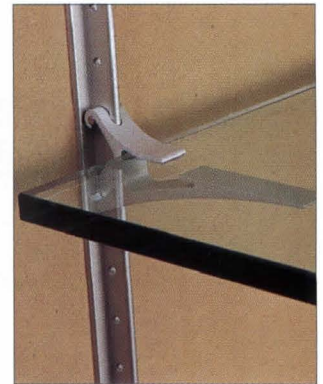


The Basin-Guard™ undersink enclosure attractively conceals unsightly plumbing and mechanical connections while maintaining knee and foot clearances mandated by A.D.A. It can be installed under kitchen sinks or restroom lavatories where countertops and sidewalks are present. The Basin-Guard™ is offered in 36" and 42" widths in white or beige and is easily trimmed down with common tools.

Truebro, Inc.

CIRCLE 168 ON INQUIRY CARD

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 169 ON INQUIRY CARD

Columns & Balustrades

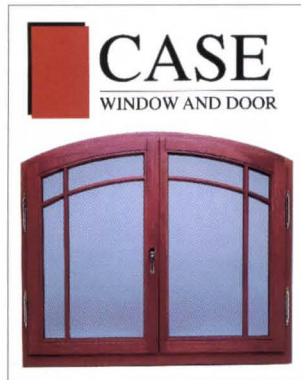


DuraClassic Poly/Marble load bearing columns are affordably priced and backed by a lifetime warranty. Other quality products include authentic architectural wood columns for paint or stain, fiberglass columns and synthetic stone balustrades and columns. For a free catalog call 800-963-3060.

Melton Classics, Inc.

CIRCLE 170 ON INQUIRY CARD

Case Window and Door



At Case, we combine American craftsmanship with German engineering to produce windows and doors, window walls and rolling glass walls, for luxury residential and commercial projects. A wide selection of wood species and metal cladding make possible countless interior and exterior finishes. Superior hardware systems and multiple glazing options provide security, acoustical control, and protection from the elements.

Case Window and Door

CIRCLE 171 ON INQUIRY CARD

Mantelart™ Fireplace Systems

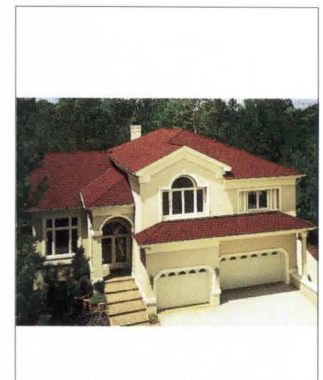


Detailed to perfection, an elegant one-piece cast stone mantel forms the foundation of this striking fireplace. Adding a truly distinctive touch, a Brickstone Studios Limited Edition Mural crowns the mantel. Choose from several styles available through our dealer network or direct from Brickstone Studios. For the ultimate in exceptional fireplaces call Brickstone Studios (800) 449-6599.

Brickstone Studios

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Carriage House Shingle



Utilizes CertianTeed's exclusive Super Shingle® construction with two full-size base shingles, resulting in virtually four layers of shingled protection and 8-inch exposure when applied. This super-heavyweight shingle (355 lb per square) also features a unique chamfered cut for scalloped appearance. Fiber glass composition. UL Class A. Lifetime limited, transferable warranty. Algae-resistant. Meets ASTM D3462 Tear Strength.

CertainTeed Corporation

CIRCLE 173 ON INQUIRY CARD

**Wood Products
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A brochure produced by major N. Amer. wood products trade associates highlights the many environ. benefits of wood. The brochure, titled "You'll never run out of ideas, we'll never run out of trees," offers info on reforestation, efficient use of nat. resources, recycling, energy use & other environ. issues for architects, engineers, builders, remodelers, furniture manufacturers, & retailers. For a free copy of the brochure, fax Wood Works at (503) 224-3934.

Wood Works™

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**Decorative, Thin-Film
Intumescent Fireproofing**

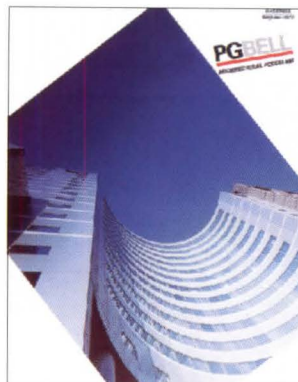


Certified for beams & columns for ratings up to 3 hrs.! A/D Firefilm permits the designer to use the appearance of exposed steel with the steel fully protected from fire. Applied as a thin-film coating 0.4 to 3 mm (0.02 to 0.12 in.) thick. During a fire it expands to form a meringue-like layer up to 100 mm thick. The topcoat is avail. in a wide choice of colours. 416-292-2361. 1-800-263-4087

A/D Fire Protection

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PG Bell

CIRCLE 176 ON INQUIRY CARD

Fence Systems

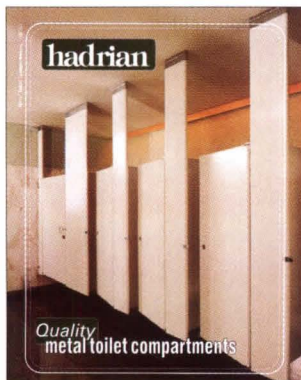


This new aesthetically appealing Euro-design fence system combines see-thru good looks with strength and durability of 6-gauge galvanized steel mesh. Powder-coated in a large variety of colors to suit any design & enhance the appearance & security of any property it surrounds, this fence system is virtually unclimbable, rugged maintenance-free and easy to install. 1-800-836-6342. www.mania.com/omega.html

Omega Fence Systems

CIRCLE 177 ON INQUIRY CARD

**Hadrian Toilet
Compartments**



Hadrian's double pan panels & doors are honeycomb-cored for impact resistance. Available in anti-corrosion zinc-coated Galvanneal sheet steel or Stainless Steel, panel parts are permanently sealed for strength & hygiene. Eighteen standard colors in easy maintenance powder-coated polyurethane, plus graffiti resistant textured finishes. Door latch meets handicapped requirements. Call 216-974-7120 F.1-800-536-1469

Hadrian Inc.

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Pan-Tech



manufactures composite building panels in a variety of different face materials and finishes. Aluminum: two, three and four coat Kymar finishes, anodized, colour & brushed. Stainless Steel: 304, 316 grades, #4, #8 finish, coloured stainless and patterned. Zinc: Rheinzink pre-weathered. Porcelain: for Spandrel applications. Copper: pre-patinated.

Pan-Tech, Inc.

CIRCLE 179 ON INQUIRY CARD

Interior Components

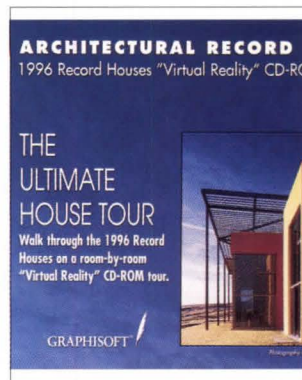


Design I is our new 60 page catalogue showing architectural components with existing molds, including columns, capitals, domes, moldings, light coves, ceiling & wall panels, etc. All items available in Formglas G.R.G. (Gypsum), QuarryCast® and MetalCast®. Request our printed version or, view our web site: <http://www.formglas.com> Tel: 416-635-8030 Fax: 416-645-6588 Email: djohnson@formglas.com

Formglas Inc.

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**Record Houses
"Virtual Reality" CD-ROM**

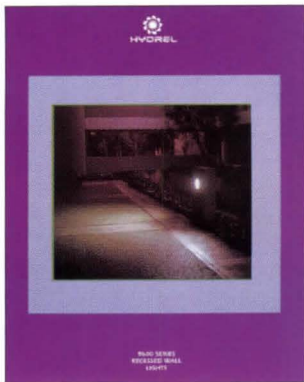


A room-by-room tour, with architects discussing their creative and product decisions. Click and zoom and move around objects via QuickTime®VR. Architectural Record worked closely with Graphisoft®, using ArchiCad®, to produce an interactive CD-ROM house tour that includes photos and excerpts from the articles from the April '96 issue. For Windows and Mac. \$19.95. Record Houses CD-ROM, Rm 1448, 1221 Ave of the Americas, NY, NY 10020.

Record Houses

CIRCLE 181 ON INQUIRY CARD

**Avoid Annoying Glare
10 to 1 MH spacing**

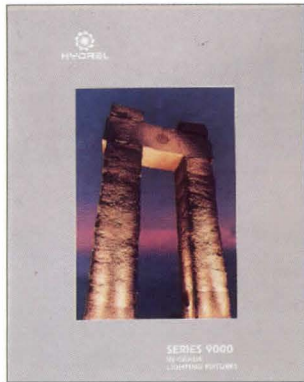


Hydrel's new 9600 Series Recessed Wall-Step Lights with improved beam patterns and unique internal glare control achieves remarkable 10 to 1 mounting height to spacing ratio. Patented sealing technology and modular construction provide air cooling for reduced size and simple installation/maintenance. Up to 100 watts HID. Hydrel, Sylmar, California.

Hydrel

CIRCLE 183 ON INQUIRY CARD

In Grade Up Lights



This 36 page catalog covers the new, innovative 9000 series Ingrade Lighting fixtures. See how modular design makes a difference in performance, installation, maintenance, and durability. Available in a variety of configurations, this series accepts lamps to 175W HID, 250W incandescent. Architectural and landscape illustrations include recommendations for the most common applications. Hydrel, Sylmar, California.

Hydrel

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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. 470 High St., Hanover PA 17331. T: (717) 632-6464 F: (717) 632-5039

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Flourescents**



Save energy, create the right look. Hubbell Lighting introduces the easiest and most dramatic way to reduce energy costs and improve the esthetics of a room, office, or retail space. A complete line of compact flourescents and attractive trims feature the latest in efficient electronic ballasts combined with Triple or Quad lamp technology.

Hubbell Lighting, Inc.

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**Ushio Ultraline™ 10,000
Hour MR-16 Lamps**



At 10,000 hours average—twice the life of standard MR-16's—the Ultraline's™ titanium reflector coating provides consistent color throughout the life of the lamp. Now with upgraded quartz burner, ultraviolet emissions are reduced at UVA, UVB and UVC wavelengths. Medium and wide beam versions available: 35W and 50W. Product Inquiries: (800) 218-7446.

Ushio America, Inc.

CIRCLE 186 ON INQUIRY CARD

The "ID Series"



The "ID Series" is specifically designed for lighting Computer Environments with 8' ceilings where low reflector brightness is essential. Enjoy the comfort of indirect light with nothing below the ceiling plane. The precisely stepped and formed reflectors in our new "ID Series" provide revolutionary glare control. The 2'x2' and 2'x4' fixtures utilize efficient, long life 40, 50, or 55 watt Biax fluorescent lamps. Call (818) 579-0943.

Engineered Lighting

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**The AR5 Interior
Luminaire by IRIDEON**

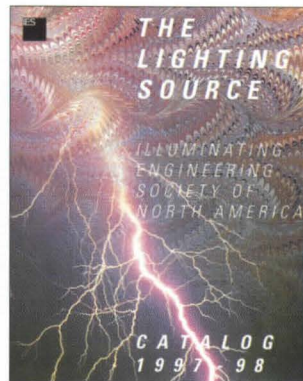


awarded Best New Product of the Year at Lightfair Int. 1996. It features a computer-controlled, dichroic color-changing assembly, robotic 360° pan & 270° tilt capabilities, & diffuser/douser option. Control is achieved w/ Irideon Composer™ Control System allows system config. & programming from a PC. Irideon, Inc. 201 Regal Row, Dallas, TX 75247. T: (214) 819-3208, F: (214) 630-5867. www.irideon.com

Irideon, Inc.

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**Illuminating Engineering
Society of North America**



The LIGHTING SOURCE by the IESNA offers a vast selection of standards and publications for the lighting professional. The IESNA has 10,000 members and offers many benefits. If you wish to receive a complimentary copy of the catalog, please call Albert Suen at T: (212) 248-5000, F: (212) 248-5017, or e-mail bethbay@aol.com.

IESNA

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SPHERIS Wall Sconce



SPHERIS Wall Sconce provides direct/indirect lighting and an attractive luminous glow from a translucent faux alabaster diffuser. It is ADA compliant and available plain or with brass accents. Other finishes and white acrylic diffusers available. SPHERIS uses 2 PL-13 lamps or an Osram Sylvania DULUX F 36-watt fluorescent lamp. Excelite Inc., 4500 6th Ave., Altoona, PA 16602. T: (814) 943-1155. F: (814) 946-0157.

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Complete Light Distribution



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Primelite Manufacturing

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Primelite Manufacturing

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Lightframes Vertical Pendant



Add a bright new look to your installation. The Vertical Pendant offers a unique design and delivers high-tech performance lighting. Designed by Charles Loomis, the Lightframe Vertical Pendant provides a new direction in lighting -- functional style.

Charles Loomis, Inc.

CIRCLE 193 ON INQUIRY CARD

Recessed Compact Fluorescent Downlight



"FANCY FREE", the 1997 APEX lighting award winner. The concept of this new design was to create an aesthetic, 12" square recessed compact fluorescent downlight that eliminates the harsh visual contrast between the ceiling and the fixture aperture, and offers designers numerous variations in lighted appearance. At the heart of this innovation is the design of the translucent louver cell assembly. T: (718) 456-7400 • F: (718) 456-5492 • <http://www.neoray.com>

Neo-Ray Products

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Tivoli Industries, designer and manufacturer of a wide range of specialty and custom lighting products utilizing low and line voltage, including: Cove, decorative/performance illuminated ceilings, linear task/accent, tube aisle/step, topiary and landscape lighting products. Exclusively provides Targetti's high performance systems, including low voltage track, open conductor and truss support systems. 800-854-3288. Fax 714-957-1501.

Tivoli Industries, Inc.

CIRCLE 195 ON INQUIRY CARD

Cast Aluminum Lighting

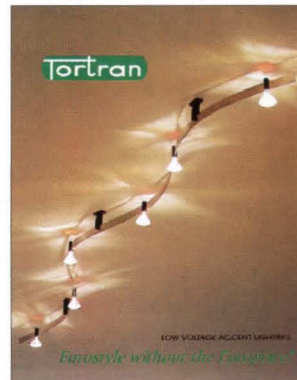


Sun Valley Lighting manufactures an extensive line of Standard & Custom cast aluminum lighting poles & fixtures in all period styles. Our 50 years of design & manufacturing experience provides you with unexcelled product quality. Our staff of designers, engineers, and tool makers are here to assist you. Our in-house foundry assures quality and prompt delivery at competitive costs.

Sun Valley Lighting

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Low Voltage Accent Lighting



Tortran, Inc. presents the EXO-TRACK™ low voltage halogen lighting system. Straight, rolled into circles, or shaped into undulating forms, the Exotrack provides accent and illumination for miniature chandeliers, exciting free-form sculptures, and can even be suspended in space. For more information call (203) 367-5188.

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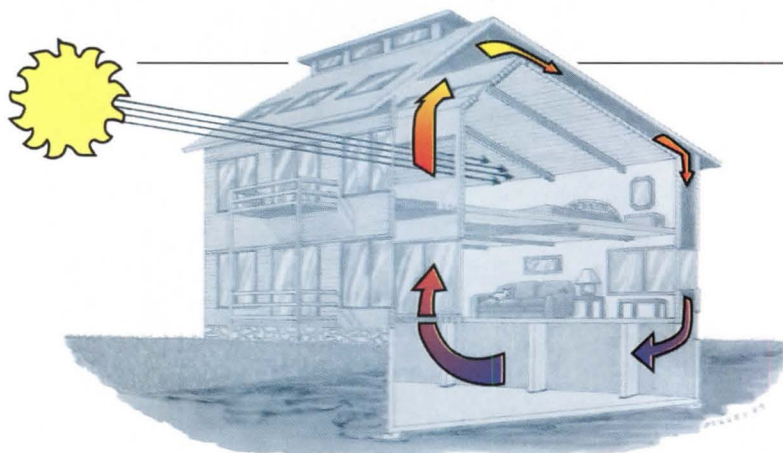
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THE FUTURE A dynamic building is positioned to meet the energy crisis of the next century.

BY JOAN BLATTERMAN



The log cabin of the 21st century? A spacious, 3,000-sq-ft home that generates its own heating and air-conditioning? A structural envelope that can maintain an even, comfortable interior—cool in summer and warm in winter, even in a rugged climate like Kansas—without either furnace or air conditioner?

That's what Michael Sykes claims for his Enertia building system. The Wake Forest, North Carolina, engineer/entrepreneur has developed a sustainable, closed-loop building system made entirely of renewable and recycled materials. The homes are constructed with double walls of solid wood timbers that combine structural and thermal storage characteristics. In contrast to the myriad components of a stick-built home, with nails, vapor barriers and tar paper, synthetic insulation, OSB or other sheathing, tape, siding, and paint, the Enertia home has walls made of squared logs tightly connected with 10-in. Ardox spikes, gaskets, and a connecting spline of recycled polyethylene.

The wood used, Southern yellow pine, is a resinous species that grows to maturity in 30 years, and

Solar-derived heat circulates itself within the home.

is planted at the rate of 3.1 million seedlings per day by timber interests in the southern U.S. A building material created by photosynthesis, pine might be a "perfect" sustainable product, one that cleans the air of pollutants such as carbon dioxide as it grows.

Sykes uses this local resource in a unique way, assembling logs into a dynamic building envelope. Essentially, it is a house within a house, a double-walled building that encourages air movement completely around the structure in an interior cavity.

Solar-heated air moves on its own from an atrium of south-facing windows up over the interior "roof" of the house. As this air cools, it sinks down past the north side, and over the concrete slab of the ground level. The mass of the 6-in.-thick walls and solid-timber rafters gains, holds, and releases heat throughout the night-day cycle, a phenomenon of thermal inertia. The house becomes a living and breathing thing, says Sykes.

Siting is vital

Site parameters—topography, seasonal mean temperatures, the thermal capacity of the glazing selected—are reflected in the design of individual Enertia homes. Large window-walls and clerestories are placed to admit the largest amount of low-level solar radiation in winter, and the least amount of higher-angled summer sun. The foundation level is bathed in sunlight from windows in its partially excavated southern side. Houses must be oriented to a southeast-to-southwest solar "window"; however, the Enertia building is not as sensitive to south as other solar homes. The house depends for its heating on the solar energy falling on it, and for its cooling on the geothermal reserve of the earth below it. The concept is a new approach to home construction, and the structure must be built fresh from the ground up. Components cannot be integrated into or grafted onto an existing home.

Enertia efficiently uses solar power in two ways: passively, receiving the sun's energy, as in a traditional solar home; and actively, using solar heat as the driving force that circulates that energy. Though some configurations may require a small motorized fan or geothermal heat pump, most homes—even very large ones—can derive all needed heating and cooling without any utility-grid power at all.

Architectural aspects

Floor plans of Enertia homes are generous, open, and flexible. The exterior face of the squared logs

This solar porch is the "thermal battery" powering an Enertia home.

can be milled to mimic wood sidings such as lapped cedar planks or rough-sawn boards; roofs can be metal, asphalt shingles, shakes—whatever is desired. The heavy timbers used have an ignition point far above that of framing lumber, and the Enertia house can qualify for lower fire-insurance premiums. The company sells plans for homes from 2,000 to over 4,000 sq ft. Custom designs are also available; Enertia homes as large as 6,500 sq ft are being built. Homes may include such design elements as Craftsman-style corbels, kingposts, balconies, and projecting framework that are natural to the timber structure. Once designed, homes are milled to order and the wood is shipped numbered for fast on-site erection on a prepared foundation.

The future of the future house

The inventor anticipates infusing the wood with desiccant salts to further lower the humidity of the interior air, thereby improving the assembly's cooling performance in tropical climates. The firm now uses CAD to translate site-specific criteria—log dimensions, glazed openings, even cut-outs for junction boxes or shelving—into detailed shop drawings. The next step will be computer-aided manufacture, using site criteria to direct the actual milling of parts from a solid block of wood. The architectural and embodied-energy aspects of this "thermal flywheel" are demonstrated in the company's Web site at <http://enertia.com>. ■

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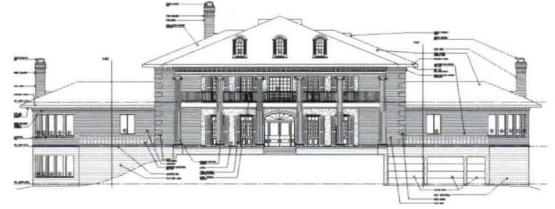
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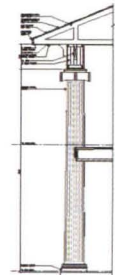
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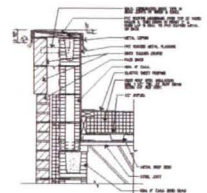
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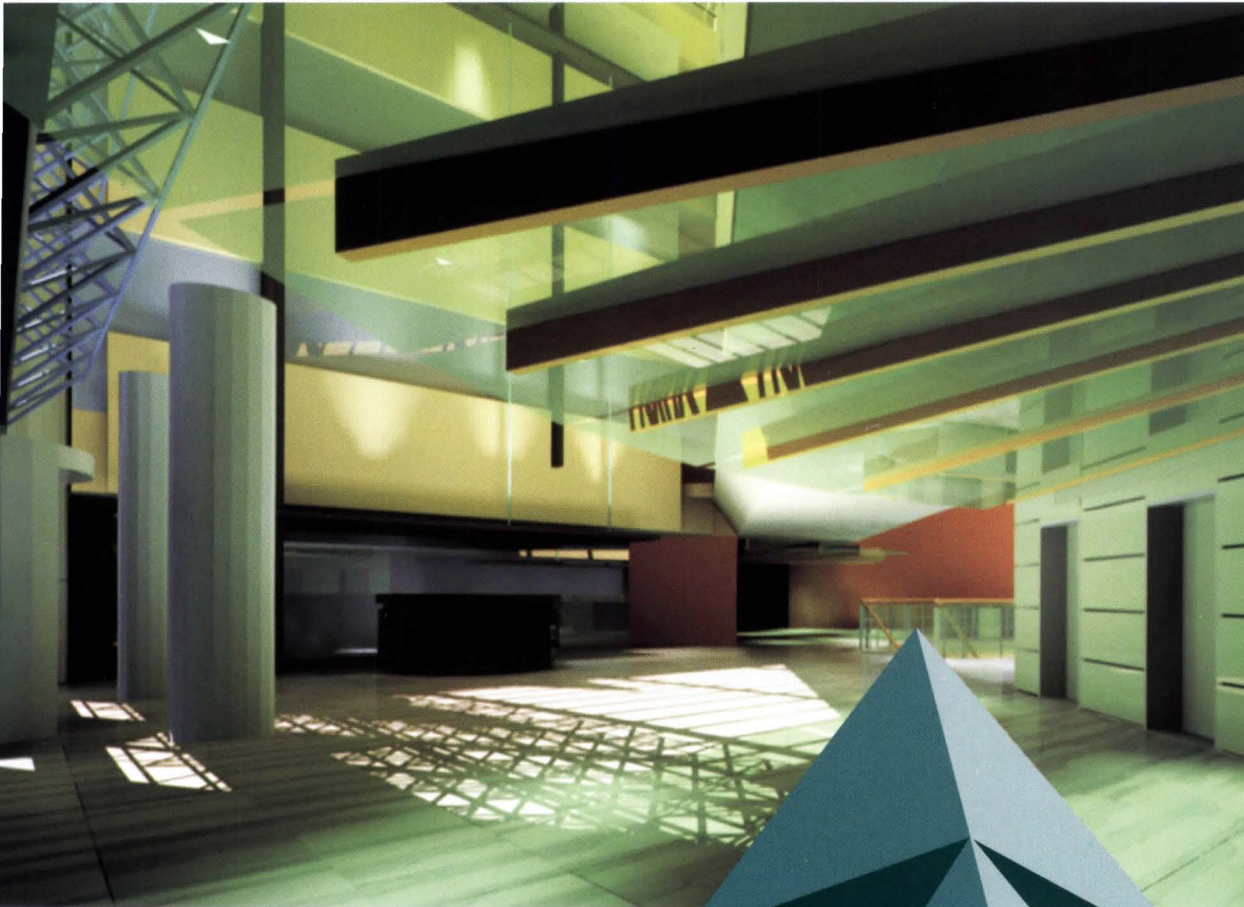
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