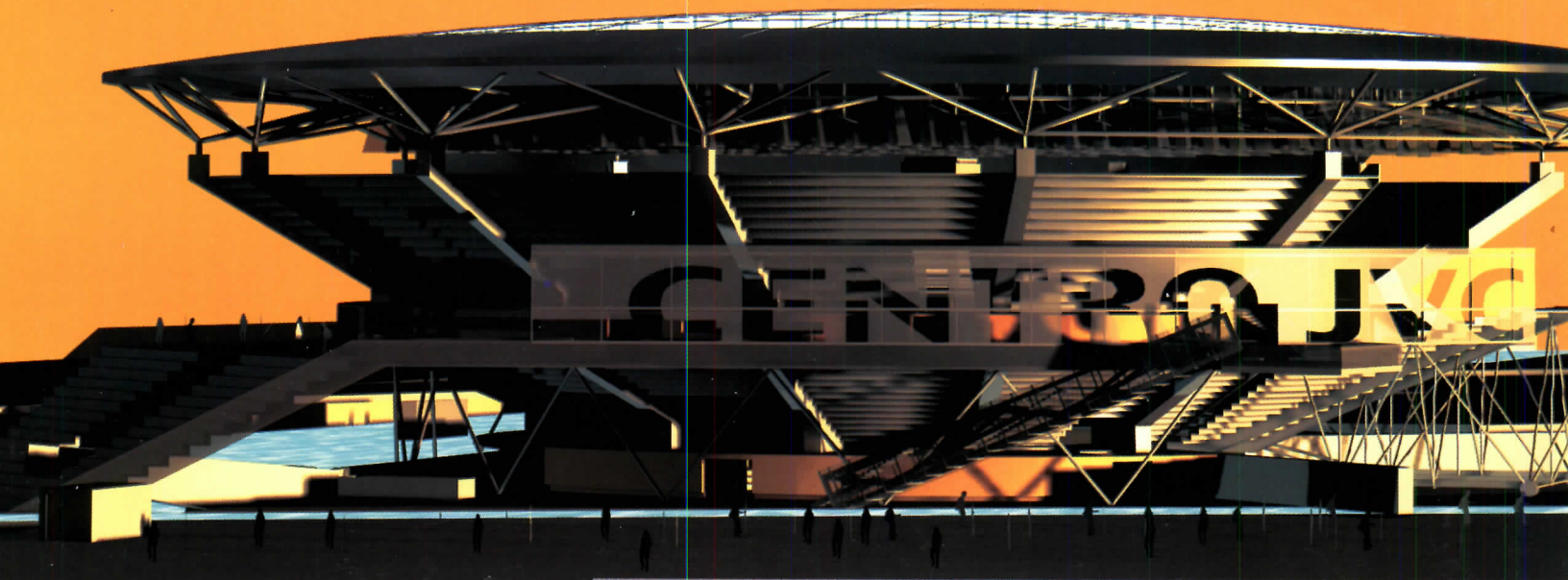
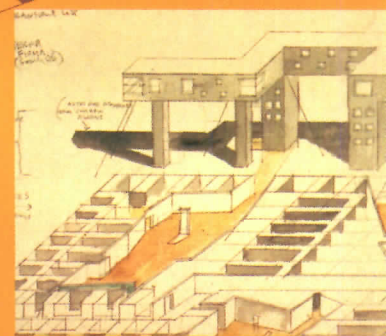


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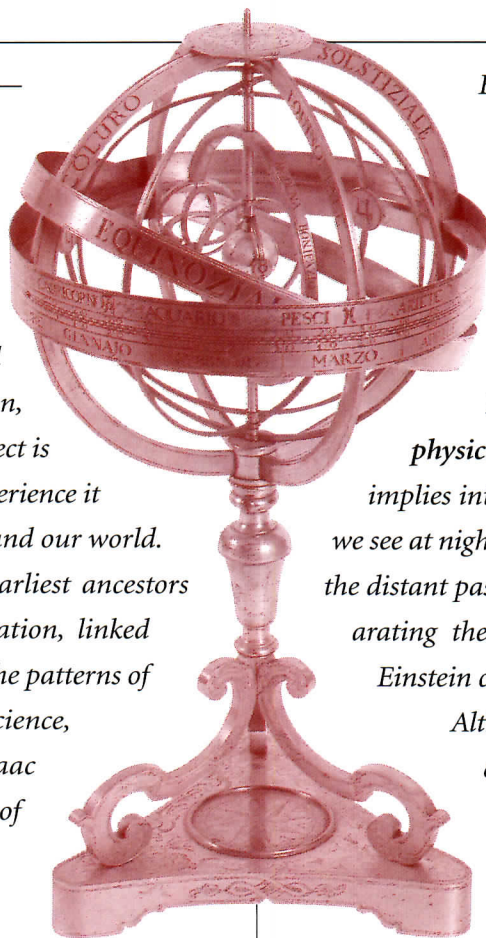
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EDITORIAL:

Time for a Change

BY ROBERT A. IVY, FAIA



It is the overlooked dimension—invisible, abstract, but real. Architects hardly discuss it, yet it resides at the heart of every concept and every built project, locked in a physical embrace with space. Important changes in our perception and understanding of the fourth dimension, however, demand our attention. The subject is time, and the way we understand and experience it is changing how we shape our buildings and our world.

Some history is in order. Our earliest ancestors marked time by experience and observation, linked with the cyclical rhythms of the sun and the patterns of human life. For the last 300 years, art, science, and architecture have relied on Isaac Newton's worldview, a discrete universe of past, present, and future set against the systematic order of the heavenly bodies. In this neat universe, architectural space could be regulated by dividing it up: The grid served as the framework for most architectural decisions, and still reigns.

In Newton's wake, science and its offspring, the machine, flourished. In 1759, the development of the chronometer, a highly precise clock, revealed the secret to accurately measuring longitude. Time and space were mated: Exact time-keeping allowed us to map the world's true shape and size. Lewis Mumford cited the invention of the clock as "the key machine of the modern industrial age." Today, the ultimate machine, the computer, helps us to map the farthest reaches of the dynamic cosmos.

Einstein arrived with the 20th century, and our understanding of the world changed radically. We are still sorting out the implications of his elegant, counterintuitive proposals, but as physicist P.C.W. Davies tells us, the effects of his theories were unparalleled. According to Davies, Einstein said that time is "connected to space physically." Think about that one phrase. Space implies interval, or time. The lights in the cosmos that we see at night, which we call stars, actually emanate from the distant past across space. The measurable interval separating their light from us is both time and space. Einstein called this entity "spacetime."

Although our own constructions are more mundane, architects routinely manipulate space at a smaller scale, and we often consider spatial intervals. We typically render time with columns, vaults, or grids, lending physical form to abstract rhythm, allowing the individual to read space as one might read a clock. We routinely speak of 20-foot bays as a way of understanding relative scale and size, though we give scant thought to the correlation of distance to time.

But wait a minute. Einstein went further to say that what might seem obvious, isn't. Einstein proposed that matter affects time, so much so that extremely dense objects, such as pulsars, which are collapsed stars, can literally warp time. In our contemporary universe, with its black holes and quarks, no longer are there any Newtonian absolutes; your location, vis a

vis another body, determines your experience of time. In one century, we have jumped through the looking glass, and post-Einstein, it's all relative. Architecture has been slow to reflect this brave new world.

The plot thickens. Contrary to Einstein's vision, contemporary discoveries suggest a constantly expanding universe, an unfolding cloud of matter that had an origin in time. Poised against this expanding infinitude, quantum mechanics, by contrast, examines the smallest bits, where the lines between matter and energy are blurred. As we see and learn more about the universe at both scales, it becomes an infinitely more complex place than we had understood—more multivalent and richer than the circumscribed, fixed universe we knew as children. The earth is no longer flat; time depends.

How have architects responded to the breakthroughs in science and philosophy? Using bytes and bits, a new generation is developing virtual forms that could have emerged from a cosmic cloud. This "blobitecture," with spaces that warp and floors that twist, represents a first, fleeting experimentation using computer-generated, 3D design. The new wave of students and experimental architects is, in effect, playing with our perception of time and space. The interiors of their amorphous new buildings, with elliptical walls imperceptibly slipping into ceilings and floors, are indeterminate, vaguely organic places that offer a physical representation of the post-Einstein cosmology. We have seen the future, and it is curved.

The new computer devotees follow in the wake of Frank Gehry, a plastic artist of a high order. With the aid of the CATIA program, Gehry has been pursuing his own sculptural vision freed from the strictures of the right angle. Although his architecture is less overtly theoretical than experimental, he has managed to catch a leaping moment in metal and stone. Gehry's fluid and blocky shapes dance, then freeze in place.

Theoreticians like Charles Jencks and Peter Eisenman are grappling mightily with the new ideas, analyzing the why's and how's of the brave new universe and seeking untapped forms of expression, including fractals, folds, and waves. With a very different sensibility, Rem Koolhaas and his coterie declare the constancy of change. His pared-down spaces with moving

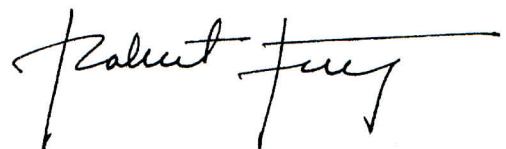
walls and platforms speak to the acceleration of human experience and the mutability of fixed programs.

Others are making more complex machines—cosmic watches, if you will. Santiago Calatrava, both an engineer and architect, is experimenting with buildings that move. These responsive, time-sensitive structures, such as his proposal for the Milwaukee Art Museum, feature roofs that can literally unfold, like petals of a flower, to track the movement of the sun. Norman Foster's Reichstag includes a sunscreen that rotates with the hour and the season to shield legislators from glare.

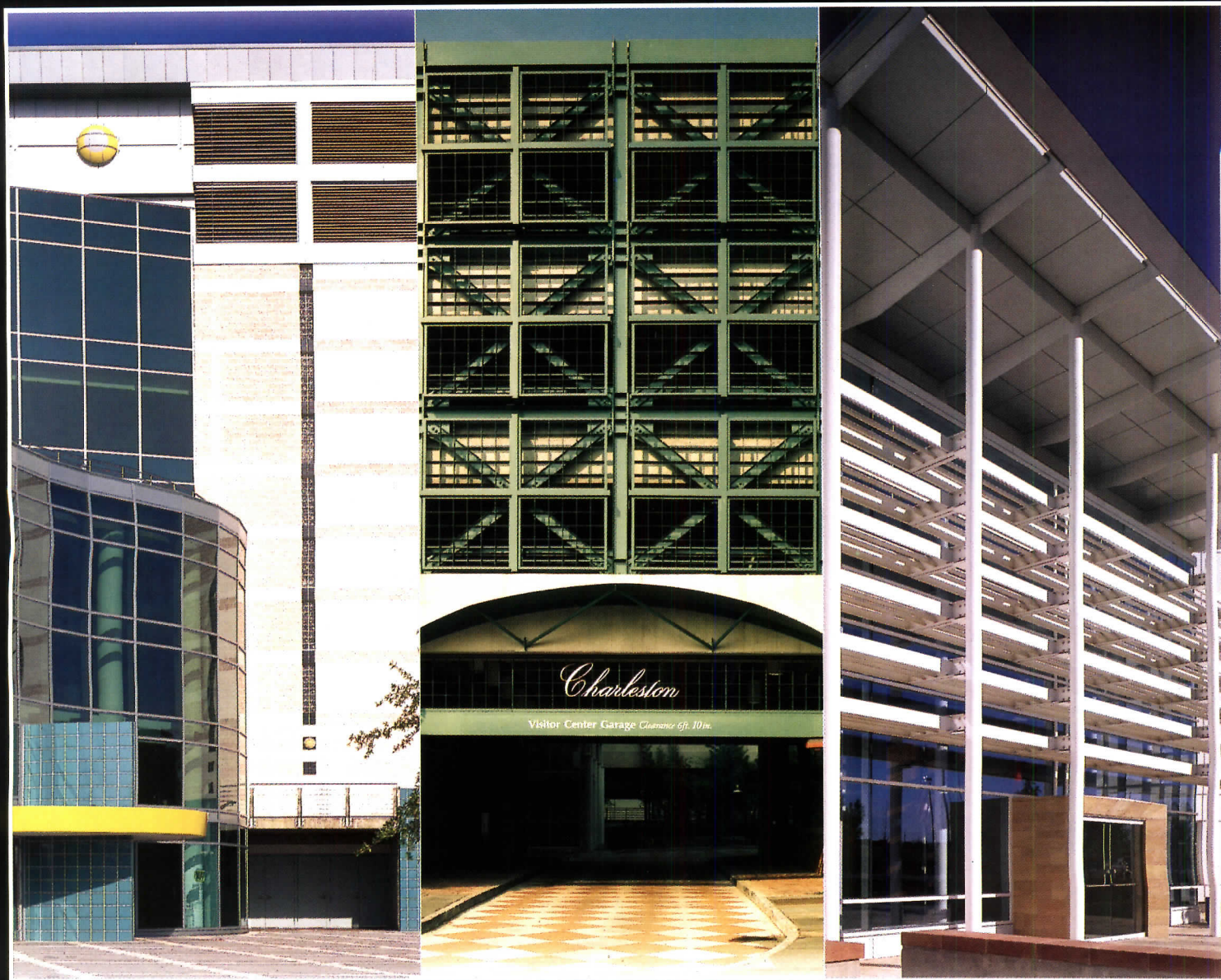
Increasingly, architectural language includes reference to another dimension beyond space and time that our ancestors frequently discussed, a spiritual one, which defies easy definition. The millennium may be the proving ground for this interior dimension as architects struggle to give shape to feelings as well as facts.

Most architects do not work on the cusp of change, as Calatrava and Gehry have. More often, we work more modestly and conservatively, solving problems for clients and producing buildings of integrity and, occasionally, of inspiration. Meanwhile, these notable artists are exploring form and thought, riding the wave of the moment with freedom as most of us never will. In other decades, they would have been characterized as "form-givers," a title that seems static today.

Architects that are experimenting with time are producing what seem to be strange new forms. They are, however, pointing in new directions—more complex, perhaps more demanding ones for architects. They have recognized that science and philosophy have been telling us that the physical universe remains unresolved, multilayered, and unfolding. While their attempts may seem awkward, sometimes even cartoonish, theirs are the first, halting steps into a new century and toward a new architecture. It's about time.



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CIRCLE 12 ON INQUIRY CARD

LETTERS

Architecture for the people

While Peter Davey [Critique, April, page 35] suggests American architects lack creativity and invention, Robert Campbell ["Is There an American Architecture?" April, page 76] points to imitation as the cause for the demise of American architecture. Unfortunately, neither seems to appreciate the richness of the cultural artifacts that surround them.

As American architects, we need to keep up with what is happening around the world, but we cannot wish that we could do what other, non-American architects are doing, because, very simply, architects in the U.S. have a history, landscape, laws, and legacy unlike any other culture in the world. Instead, we could obtain more pertinent information from a comparison of architecture as an *elite* artifact—created out of self-interest—to other American *popular* artifacts—derived

from collective interest. Compare Philip Johnson's Glass House to Sam Walton's Wal-Mart, for example. This would provide insight into American culture—its values, vices, ideals, and myths—that would help us understand and appreciate it.
—Aida Isabel Latorre, Assoc. AIA
Dallas

Earning opportunities

As Ray Dehn says in the May Speak Out column [page 30], interns "do bring many skills to the table." Interns are stepping up to fill project architects' roles, coordinating consultants, and getting buildings built. Architecture is a slow-moving machine in an instant society. Nevertheless, the impatience that society has instilled in intern architects needs to be positively focused toward the work of architecture and not toward the image of being an architect. The opportunity is out there; it is up to the intern to prove it is deserved.
—J.A. Remling
Atlanta

Arresting house

In April's RECORD Houses, Morphosis' Landa House (below) [page 129] epitomizes what is wrong with American architecture. Wrong as defined by Americans' inability to participate in the world discussion of current modern architecture. The architect, Thom Mayne, has defined the process as a "formal investigation [from which he would] then work backward to make it function programmatically for the owners." Is this form following function? Or function following fashion?

—David Krebs, AIA
Cleveland

**What is in a name**

I am glad to see you make the distinction between Auschwitz and Oswiecim in April's RECORD News. ["Auschwitz Synagogue to Be Restored," page 54]. The Nazis gave to the killing center the name of Auschwitz, derived from "ausschwitzen," which means "to sweat, to perspire." And Oswiecim? In Polish tongue, Oswiecim signifies a religious desire or instruction to make the town holy, free from sin, sanctified, a spiritual one. What a historical paradox.

—Adam Milczynski Kaas
University of Navarra
Pamplona, Spain

Serving Customers, not Clients

It seems ironic that in the same issue as Andres Duany's editorial regarding the architect's waning influence in the housing market, you feature a house designed by sculptor Michael Singer, who is not an architect. Singer's project illustrates exactly what Duany's redress of this

Imagine Your World

Design Your World



tired subject has failed to grasp. With the postwar suburban housing boom, home design and building has become one of America's greatest pastimes, where all are qualified to participate. The sooner architects admit that they are merely one of the myriad paths to a successful home in the customer's eyes, the sooner we, as a profession, will find our true role in the housing market.

—Brooks Howell

Jackson & Ryan Architects
Houston

Thank you Andres Duany for clearly articulating the need for architects to pursue a career in housing for customers. My greatest enjoyment as a professional has come in the rapid-paced world of working with housing developers. It was a difficult decision to make to choose this path and was never presented as an option during my education. Indeed, it was looked down on. But after evaluating prewar developer housing in many cities, I realized this

could be very rigorous and enjoyable. Now, with more than 300 homes built, I am proud to be part of a small group of architects who diligently pursue the design opportunities in this building type. Every day we work with our clients (the developers) to create better homes for our customers (the buyers). Remarkably, patrons do come to our door to work with us on unique, one-of-a-kind designs.

—Benjamin Schreier, AIA
Affiniti Architects
Boca Raton, Fla.

Duany's commentary [April, page 22] is right on the mark. My wife Shelley and I opened our firm in 1995 with the sole intent of providing good design service to customers who might not otherwise have hired an architect. Our projects typically are not highly innovative, but at least they're not overly kitschy, which is exactly what the customer would have got had we not been involved. We've been very profitable,

too. Our secrets: Honesty, good design, and low overhead.

—Michael J. Davenport, AIA
Davenport Architects
Downers Grove, Ill.

Speaking volumes

I have long been a fan of your editorials. "The Language of Peace" [May, page 23] has deepened my admiration. As doctors treat the body against disease and lawyers protect the body against injustice, architects shelter the body against insignificance, whether in a camp or a palace. The situation in Kosovo is an assault against architecture, not only in the material sense of destroyed buildings, but also in the sense of destroyed human significance as architectural purpose. The once language of power becomes the language of peace. Thank you for the reminder.

—Lisa Farooque via E-mail

Credits/corrections

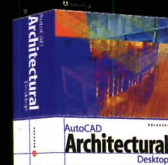
Sharron van der Meulen's name was

misspelled in a March Building Types Study on the Ronald Reagan Federal Building and Courthouse [page 118]. For the same story [page 121], sources should have been listed as follows: Steel structural system: *Herrick*; exterior cladding: *Classico and Noce travertine*; rubberized-apshalt roofing: *American Permaquick*; glazed concrete masonry units: *Spectra-Glaze*; glazing: *Viracon*; metal doors: *Stiles Custom Metal*; wood doors: *Durand Doors*; custom woodwork and wood doors: *Artek*; paint: *Frazee*; plastic laminate: *Wilsonart*; fireproofing: *W.R. Grace*; ceramic floor and wall tile: *American Olean*.

In the April Correspondent's File [page 47], Demarest and Associates of Dallas is the architect of the American Beauty Mill.

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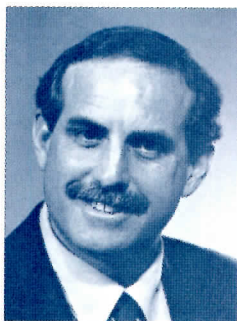
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SPEAK OUT Federal funding has increased. Cities want to curb sprawl. Now is the time to design better public transportation.

BY ELI NAOR, AIA

Eli Naor, AIA, is a vice president of VBN Architects in Oakland, California, where he oversees the firm's transportation and infrastructure studio. He was given an AIA Certificate of Merit award in 1997 for the design of Oakland's Jack London Square Amtrak Station. Naor was appointed transportation program advisor for the AIA's Regional and Urban Design Committee in 1998. He received his bachelor's and master's degrees in architecture from the University of California at Berkeley.



The future health of our cities will depend on the transportation systems designed in the next few decades. With the recent passage of the Transportation Equity Act for the 21st Century (TEA-21), architects have a prime opportunity to get a start on this process now.

Cities across the country are attempting to reorient their transportation infrastructure from the private car to public means of travel. Couple that with TEA-21, which is providing \$218 billion to revitalize highway and transit infrastructure over the next six years, and we can take great strides to limit sprawl and provide viable infrastructure. We can create a new image for public transportation, one that potential passengers find not only an acceptable alternative to a clogged commute, but also an inviting one.

TEA-21 encourages strong links between communities and transportation through diverse travel models, historic preservation, landscaping, public art, and bicycle access. As architects, we can aid communities in achieving these goals by employing the following methods:

Integrating transportation and land use. Too many public-transit stations sit alone, surrounded by parking lots, rather than being integrated with the urban environment. Rail stations can be invigorated by adding places to shop, reconnecting them with neighboring communities, and linking them with other destinations. Oregon's largest public-works project—the construction of Portland's 17-mile light-rail line connecting the downtown to outlying areas—has this type of vision.

Initially developed by shifting federal funds from several freeway projects, the light-rail system will ease traffic congestion on existing freeways. This marks a fundamental rethinking of public transit that can help it become the transportation of first (rather than last) resort.

Reusing abandoned urban-transit structures. Old transportation networks gave structure to the city and made identifiable corridors, many with eye-catching depots. Preserving and reusing these right-of-ways and historic stations not only saves historic fabric, but also maintains a sense of history and enhances adjacent neighborhoods. The focus of a \$1 billion economic development effort in Worcester, Massachusetts, centers on the renovation of historic Union Station into an intermodal transportation center. In California, buildings such as the historic 16th and Wood Train Depot in Oakland, the Santa Fe Station Building in San Bernardino, and the Southern Pacific train station in Sacramento could be similarly adapted to be economically viable contributors to neighborhood revitalization.

Linking routes. We need to improve travel corridors so the trip itself is enjoyable. In Minnesota, the opening of Stone Arch Bridge, a national landmark that spans the Mississippi River, gives pedestrians and bicyclists a way to connect from downtown Minneapolis to the university. In California, the Iron Horse Regional Trail in the San Francisco area connects three cities to a new rapid-transit station, bus stops, housing, and schools—

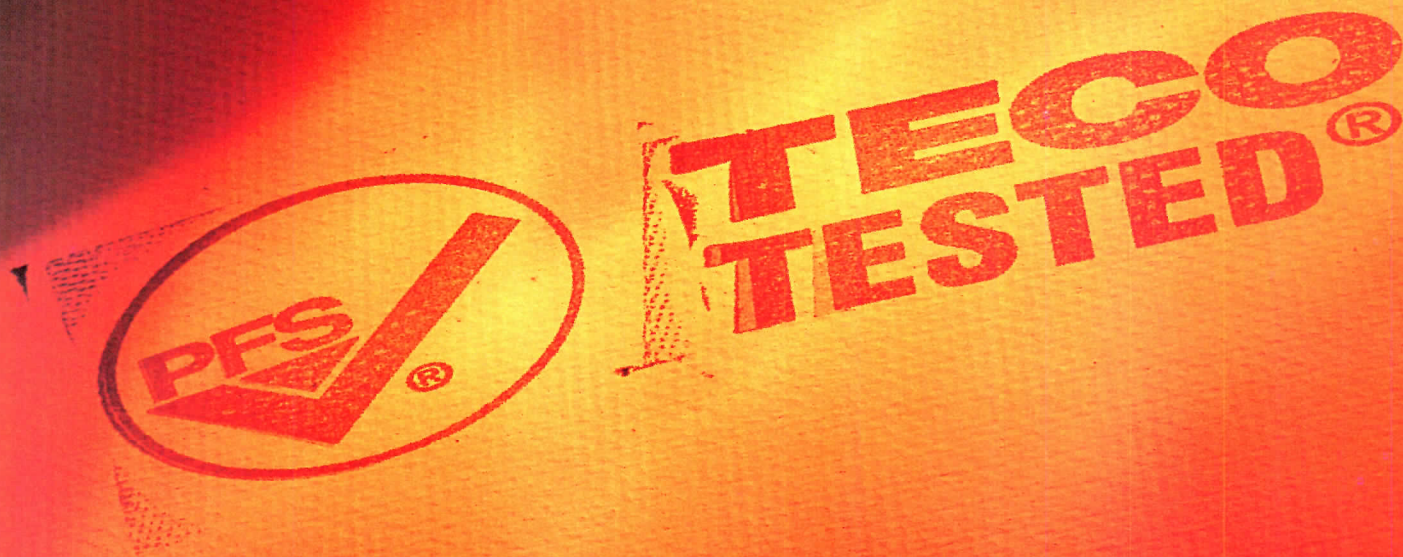
creating a major pedestrian commuting route.

Forging partnerships. To put a new face on public transportation requires collaboration between transportation commissions, local jurisdictions, architects, community organizations, developers, and transportation service providers. Rather than design statements, we need holistic designs. By bringing together key stakeholders, the integration of services, housing, and transportation is far more likely to occur. Architects can take the lead.

We already have the technology and resources to move large numbers of people efficiently over long distances. As architects, we can add a real sense of place to the journey's beginning, bring excitement to the arrival, and provide moments of delight along the way. We can make sure public transit is woven into the surrounding neighborhood and community, preserving existing historic transit structures and enhancing routes in between. We can help lead the public back to public transportation. ■

Contributions: *If you would like to express your opinion in this column, please send submissions by mail (with a disk) to Speak Out, Architectural Record, Two Penn Plaza, New York, N.Y. 10121; by fax to 212/904-4256; or by E-mail by visiting www.archrecord.com and clicking on News/Features/Dialogue. 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 text approval.*

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MENTORS Keeping an eye on contemporary art can give us a glimpse of the future of design and ease premillennial tension.

Carole Rifkind organized the "Art and Architecture: Resonance and Reverberation" roundtable last fall for the New Museum of Contemporary Art and the Architectural League of New York. She is the author of *A Field Guide to Contemporary American Architecture* (Penguin/Dutton, 1998) and *A Field Guide to American Architecture* (Penguin/Plume, 1980).

Though the approaching millennium has been discussed ad nauseum, it still produces fear—fear of change and of being left behind. Architects are concerned about staying in touch and know they must investigate new and innovative practices. According to author Carole Rifkind, one way to keep abreast is to follow contemporary artists, who will undoubtedly have a strong influence on the buildings of the next century.

Artists are exploring territory rich in meaning for the architecture of tomorrow, uncovering issues of identity, community, behavior, technology, ecology, materials, and place that are fundamental to our future. They are highly speculative, pushing beyond disciplinary boundaries and asking, What if? Why not? How come? Largely liberated from architecture's financial, programmatic, structural, and regulatory constraints, artists are challenging the status quo and directing their antennae toward the unknown.

Method as medium

Many of today's artists are drawn to architectural methods, themes, and images, which they frequently take on as the language and metaphor of their art. Some of the more interesting and significant art today is actually produced by leaders in architectural education who are also professional artists.

Artistic practice now stretches beyond traditional drawing, painting, and sculpture to encompass installation, video, film, computer, Internet, performance, and conceptual art practices. One such body of

work, *Room*, recently shown at the Menil collection in Houston, is characterized by such a conceptual approach. The installation combines portable furniture, video, and graphic images to show a lack of definition between interior and exterior, now and tomorrow, here and there. The work—by Sohela Farokhi and Lars Lerup, dean of the architecture school at Rice—is "triggered by possibility . . . its walls are horizons, zones, miasmas, thicknesses, and states of mind," say the designers.

Elizabeth Diller and Ricardo Scofidio, who teach at Princeton and Cooper Union, respectively, are architects whose work has centered on installations that reveal perverse and uncomfortable—yet illuminating—glimpses into our conventions and value systems. The deconstructed objects in *The withDrawing Room* challenge notions of domestic tranquility. Another work, *Slow House*, displays the sinister side of the country house.

Rachael Whiteread, an English artist, capitalized on architectural form and imagery in her 1993 *House*, a ghostlike concrete casting of a soon-to-be-demolished slum terrace dwelling that eloquently expressed both the spirit of the place and the dislocations experienced by new immigrants. Andrea Blum's *Domestic Arrangements* are roomlike environments that give a presence to the connection between architecture and social behavior, which she describes as usually "invisible within the architectural hierarchy."

Vito Acconci has ventured farther into the architectural camp, recently forming an architectural stu-

dio after more than three decades as a radical conceptual artist. His 1998 *Project for Marienhoff* is a plan for a massive space frame supporting an enormous multiuse complex that addresses the full range of the public realm—transit, shopping, education, and recreation.

Are we what we build?

Karl Jensen's 1999 *Primitive Hut*, a large-scale construction combining granite boulders with concrete beams and wooden joints, reflects a journey in which he has discovered social significance in making the realities of construction understandable. In a related quest, Coleman Coker's *Construction* studies the relationship between body and earth, being and becoming, horizontal and vertical. Coker, who teaches at the Memphis College of Art, explains that "through constructing, I come to know my place, I come to sense my relationship to the earth."

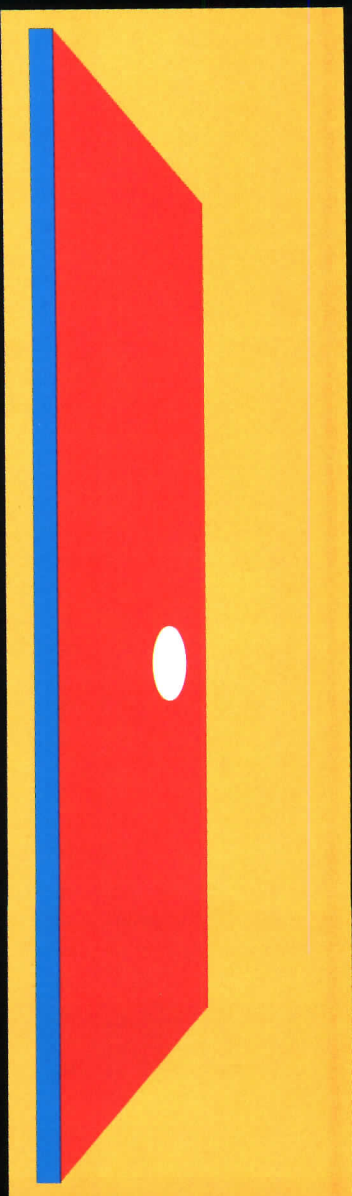
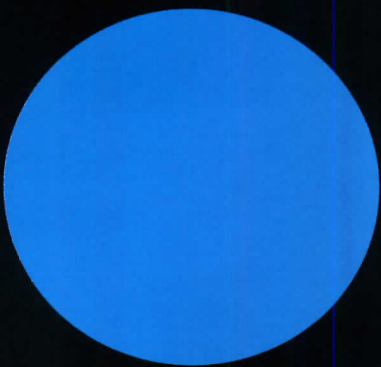
Architects should embark on their own investigations—not in books and journals or in laboratories and databases, but in studios, public spaces, galleries, and museums. You will find inspiration out there—and wisdom. ■

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





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PULSE RECORD readers were asked:

Can you spot an American house? What makes houses uniquely American?

Yes and No: The vast majority of American houses aren't designed by architects. They're put up by builders in vast tacky-tacky subdivisions all over the U.S. & Canada. I'm not well travelled, but I do believe those houses are uniquely American in their emphasis on volume & "hot features" and their disregard for quality and fit to either their inhabitants or the environment.

On the other hand, I've seen well-designed homes that would probably be equally fitting in any country with similar culture and climate to that in which they are located. Culture is not yet uniform across the globe, thank goodness, so there are some differences in dwellings that are due to it. And anyone who designs without considering climate or setting should be ashamed. That means there should NEVER be a one-size-fits-all

house. But it doesn't mean that Americans are so different from the rest of the world that our houses must necessarily be unique to America.

—*Kathie Snodgrass*
Facility Architect, Nez Perce National Forest
Grangeville, Idaho

Yes: You can spot American houses by their low quality materials and workmanship, cookie cutter properties, and by the fact that they're suffocated by style.

—*Suat Gurtan*
Pompano Beach, Fla.

Yes: You can. If you see a basketball hoop in the driveway, you know it's truly American. But this is a vast, vast issue. I was born in Luxembourg, and raised in Europe. From my perspective, the traditional

American house is often less-connected to the landscape and the environment than houses elsewhere in the world, say, in Europe or Japan. A typical suburban ranch house—The American House—often has a deck that floats above the landscape, as if the house was dropped into its setting like a matchbox.

—*Michel Franck*
Principal, Fox & Fowle
New York City

Yes: It's usually too big. All you can see in the front is the three-car garage. American houses have three-car garages, but the inhabitants keep their cars out in the driveway so they can show off their new Lexus. Also, Americans don't expect to live in their houses very long. They expect that they'll only be inhabiting a house around six or seven years. That's usually when it's

time for them to move into something even BIGGER.

—*Raul Pynchon*
New York City

Yes: The Bradys lived in an American House designed by Mike Brady himself. It had one bathroom for six children and a long wooden banister which must have been great to slide down.

American houses have refrigerators on the front porch, cars on their lawns, dogs tied up, and basketball poles neglected at odd angles.

John Cougar sang about American houses being pink and some are. Mostly, though, they are blue or white or red. Many have flags, as if the tenants were proud, or to reassure the rest of the world they had not gone too far.

—*T. P. Jones*
New York City

This Month's Question

Has the digital revolution fundamentally changed your perception of time?

"Technological progress has merely provided us with more efficient means for going backwards," said author Aldous Huxley. Well, maybe. Digital tools have raised our expectations of what we can accomplish in our professional and private lives, no doubt. But has technology caused you to perceive time in a new way? Have you taken on more tasks, or fewer? Do you find that you have more free time, or less?

Has the digital revolution changed your perception of time? Yes No

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Note: Pulse reflects individual responses to each month's question and is not meant to be construed as formal research.

What's your take on technology and time?

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CRITIQUE Finally, cities are back in the fore— but today's architecture is often too concerned with idealism instead of urban complexity.

BY JOHN KALISKI, AIA

There is a new passion for the city! It has recaptured the imagination of architects and the public. Sustainable development, compact planning—with sidewalks and walkable destinations—based on traditional towns, improved traffic engineering, and smart growth to limit uncontrolled sprawl are among the many new urban principles that have come to the fore.

Yet many architects feel a sense of discomfort, a sense that the new strategies for planning complex urban places are too simple, too easy. Why do some of us resist what many believe to be a better urban-design mousetrap?

Exceptional and irrelevant

Throughout the century, three key factors have formed the cultural underpinnings of architecture: A desire to express technology, a commitment to social progress, and a response to the urban condition. While all three factors continue to frame contemporary building form, it is the city itself that has best maintained intellectual currency with architects during the past 50 years.

Perhaps this is because architects presume a definition of the urban that always engages the technical (infrastructure) and the social (politics), even when the latter two of the key factors are out of

John Kaliski, AIA, is a principal in the Santa Monica, California-based AIJK Architecture and City Design. He teaches at the Southern California Institute of Architecture and served as chair of the AIA's Regional and Urban Design Committee in 1996.

favor. Designers believe that, when combined, these three forces establish enduring physical and symbolic relationships in an age when architecture is more and more reduced to the branding of the box and the styling of the predetermined envelope.

Viewed in this context, how successful are the urban forms that have attracted the most interest of late? Duany Plater-Zyberk and Company's Seaside, the Jerde Partnership's Universal Studios City Walk, Robert A.M. Stern, Jaquelin Robertson, Ray Gindroz et al.'s Celebration, the Disneyfication of 42nd Street, Hellmuth, Obata + Kassabaum's Camden Yards, and, to cite a European example, Rem Koolhaas's Euralille in France, are well-known and highly visible. But what do these projects express? They typically wrap an urge for escape, leisure, consumption, status, and exhibition in a veneer that simulates an organic urbanism. The importance of these places should not be minimized, but they fail to address many of the compelling problems that exist in cities. Their exceptional quality explains both their importance as special destinations and, frustratingly, their irrelevance to the broader urban context. They offer little instruction for existing neighborhoods or dying suburban tracts or for sustainable development of underutilized land. Surely city life is more complex and interesting than the narrow scope of these places.

Seaside is wonderful and compelling. Yet a resort cannot be a model for the multiple uses and



An iconic view of Manhattan's financial district at night, shot in the 1940s by Andreas Feininger.

issues of the next urbanism.

Celebration, no matter how nice, is a very small town on a green field and should be understood as such before it is over promoted as a solution for very big cities and regions. Universal City Citywalk is a brilliant evolution of the shopping mall. Still, a shopping mall is at best a diminished form of public space. Lille is a singular exhibition hall. Camden Yards is a baseball stadium in a city that still suffers from overwhelming urban ills. 42nd Street comes closest to recapturing the urban in its reuse and revitalization of an existing place—but is still more or less a single purpose destination that relies on public subsidy and corporate sponsorship for its success.

Everyday versus ideal

These places are fragments that do not induce a whole. Despite their impact, they remain exceptional circumstances—which suggests both their immediate importance as special destinations and irrelevance to the overall urban situation. Why

such a commitment to urban vitality in theory but such difficulty in developing high profile design practices that specialize in the improvement of the mundane? The history of Western architecture and urban design is full of ideal schemes. From the 15th Century utopian plan for Sforzinda to Ebenezer Howard's Garden City, from Le Corbusier's City of Three Million to Pedestrian Pockets, the traditional role of the architect is to illustrate, codify, and implement environmental order. The result has been a predisposition toward reductive visions that strip away the complexities of daily life.

Passion for pure ideals has driven many architects and urbanists to care more about an abstraction of the city than the actual thing. Even the best architects often marginalize themselves by professing a complex view of reality while inadvertently advanc-

ing and producing simplified design solutions. The public, meanwhile, tends to regard visionary ideals—and the architects who advance them—as dreamy and naive.

Today, more than ever, cities are places where difference is explored, foreignness is tolerated (if not always welcome), tradition is flouted, and new ideas are generated. The American city is an organic crazy-quilt of partially implemented ideas bumping up against each other. In Los Angeles, where I live, almost every variety of urban form and ideology can be experienced in an afternoon. Like most cities, Los Angeles defies the ordering systems of architects. A key issue for urbanism today is to bridge the gap between the culture of idealism that informs many architects' thinking and the compromises, pragmatism, and politics that instruct the making of cities, their districts, and their buildings.

There is, of course, a long history of attempts to bridge this gap,

including efforts by Jane Jacobs (*The Death and Life of Great American Cities*), William Whyte (*The Social Life of Small Urban Spaces*), Christopher Alexander (*A New Theory of Urban Design*), Kevin Lynch (*Good City Form*) and Denise Scott Brown (*Between Three Stools: A Personal View of Urban Design Pedagogy*). All have championed what Robert Venturi described as the making of a "difficult whole." All take prosaic conditions as their starting point. For them the city is primarily made from the inside out and from the bottom up. Working with an active public generates, shapes, and reshapes the ideas of the architect through a collaborative dance.

Function over form

Consider for a moment the value we confer on the participatory design processes that glorify the nuts, bolts, and grit of everyday urbanity. Quick, can you name a project based on such an approach that



New York's crowded corner of 34th and 5th, shot by Feininger in 1948.

has captured the imagination of architecture culture? This is not to suggest that Jacobs, Scott Brown, etc. have not been successful. Each

has been influential in creating a livable-communities movement that is increasingly embraced by, but also transcends, standard architectural and urban design practice. This movement concerns itself first with quality and second with the form of everyday life. Not that form is unimportant to livable communities, but performance criteria are favored

over formal design models.

As illustration, one need only go to the Web site of Rep. Earl Blumenauer (D., Oregon). He writes, "(A)nyone seeking a blueprint for a livable community should look no further than home. There is no sin-



gular plan, no cookie-cutter approach, no off-the-shelf example of what a livable community should be or look like.”

Blumenauer portrays the livable communities movement as encompassing a multiplicity of approaches to address the myriad issues posed by different cities, towns, and suburbs. This is a wonderful challenge, one that urban design and architectural thinking and practice should take to heart. New Urbanism is attempting to do so. But to fully participate in this movement, architects must once and for all abandon ideal models of urbanism in favor of critical and flexible designs that fit the many shapes and circumstances of the everyday city.

Toward critical urban design

Kenneth Frampton’s influential 1983 essay, “Towards a Critical Regionalism,” urged architects to counter the excesses of consumer culture by incorporating in their

designs deeper readings of place, culture, climate, local light, and the expression of local tectonics. He argued for a critical approach, defined by Webster’s as a direction “characterized by careful analysis and judgement.”

The architectural profession needs to adopt a similar sensibility when approaching urban design. A critical approach can be based on many sources—Classicism, Modernism, Postmodernism, or whatever—but it must surpass and reject all formulas or “isms” that promise sure-fire solutions to complex challenges or distance the architect from reality.

City design and designers in cities remain relevant only when they stay connected to the democratic impulse. Urban design and urban architecture must reach out to popular as well as democratic desires and find means to express them. Critical urban design, then, is rooted in real-life concerns. It must heed the multiple sources that cre-

ate a locale’s context. It must question and be able to say no as often as yes, and it must approach diverse problems with diverse tools. Above all, critical urban design must never confuse abstract models with reality. Architects who enshroud themselves in theory end up marginalizing themselves and their work. Critical urban design also accepts that there are many types of cities and communities. Highway cities, walking cities, village cities, city villages, and every combination that can be imagined are all valid and are shaped and improved by the open debates that swirl about their step-by-step improvement.

Accepting complexity

Critical urban design calls for keen powers of judgment, an open attitude, and direct discourse. It is unafraid of evolutions in technology and lifestyles that demand design invention. It accepts the contingent, the hybrid, the compromise, the ephemeral, and the impure as

opportunities to realize a valued quirkiness that is often absent from new building developments.

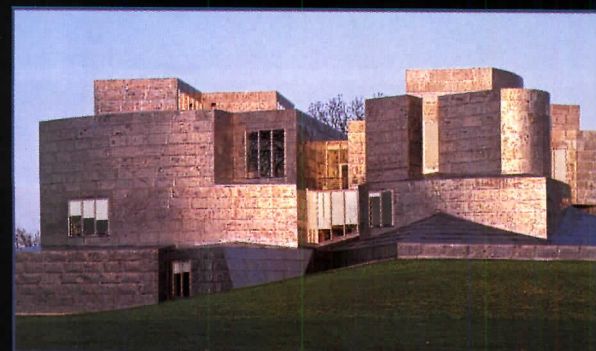
To some, no doubt, the desire for a more critical attitude in everyday practice is hairsplitting. After all, the movements of the past 20 years—New Urbanism in particular—have improved the outlook of urban design and architecture for the next 20 years. *I am concerned*, however, that a relentless drive toward ideal order remains ingrained in the profession as a whole as well as in New Urbanism.

The maintenance of this conceit is hazardous. Laypeople may have a passing interest in ideal cities, but they have a vital concern with the place where they actually live. Cities have a wide range of sizes, densities, transportation infrastructures, histories, geographies, cultures, and climates. We have a pressing need to approach urban design and architecture with an equally wide range of critical design responses. ■

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CIRCLE 20 ON INQUIRY CARD

DIGITAL ARCHITECT New 3D modeling merges the flexibility of clay with the precision of computers to create extraordinary forms.

BY B. J. NOVITSKI

A century ago, Spanish architect Antoni Gaudí was astonishing the world with extraordinary forms. While others worked with straight edges, Gaudí invented his own methods for modeling parabolic arches from the catenary curve created by suspending a length of chain between two points.

Today, architects are rediscovering the joy of sculpting unusual geometries. But unlike Gaudí, they are benefiting from readily available computer tools. They are demonstrating that computer-aided design (CAD) can do more than speed up production work. When skillfully applied, 3D modeling supports design creativity in ways that traditional methods cannot.

Olympic modeling

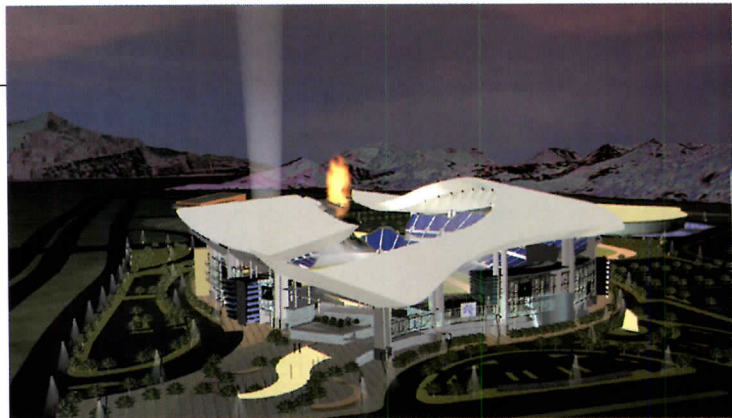
One example of such modeling is the Guangdong Olympic Stadium in Guangzhou, China. The stadium is being designed by NEB Design Group, a consortium that includes the Kansas City, Missouri, office of Ellerbe Becket, Oklahoma City-based Nixon and Nixon, and architects of record at the Architectural Design and Research Institute of the South China University of Technology.

The distinctive roof form conceived by senior project designer Michael Sabatini of Ellerbe Becket consists of two irregularly undulating bands, one on each side of the stadium, that symbolize the movement of a finish-line ribbon when broken by a winning runner. Each 75-meter-long band, supported along one edge by concrete pylons, cantilevers 52 meters over the stadium seats.

Communicating the shape of the ribbons within the design team and to the clients would have been virtually impossible without computer models. To create these, Sabatini started by using clay, chipboard, and even potato chips to convey his ideas.

Project designer Thomas Proebstle, AIA, and intern Andrew Sturm, both of Ellerbe Becket, used 3D Studio Max from Kinetix to draw two irregular curves shaped by three or more control points for the edges of each ribbon. By adjusting the control points, the architects could tweak the curves until their shape matched the original design concept. The designers then detailed the roof section, which consists of a steel space frame encased in metal cladding. Finally, they used the software to extrude this section along each ribbon's two constraining curves. The steel space frame maintains a constant thickness even as the top and bottom surfaces undulate.

These 3D architectural forms were passed electronically to Ellerbe Becket's in-house structural engineers. They converted the data into a software package, called Staad, in which they developed a structural analysis model to determine the integrity of the building, the thickness of the concrete pylons, and the sizes of all the structural steel roof members. The engineers then exported their model to 2D structural drawings in AutoCAD from Autodesk. Two-dimensional views of the 3D architectural model were also exported to AutoCAD for plan, section, and elevation construction



Guangdong Olympic Stadium is roofed with two ribbon-shaped forms—shaped by multiple control

drawings, now under further development by the architects of record.

"Given the constraints of the playing field's geometry, the structural engineering, and the integrity of the design concept, a lot of pushing and pulling of the ribbon occurred," Proebstle recalls. "It would have been extremely difficult

points—that would have been impossible to design, study, and document without computer-modeling tools.

to understand the shape and keep it graceful if we didn't have the 3D model that allowed us to study it with multiple 'cameras.'" The 3D images will also be useful to the contractor, who may use them with 2D shop drawings to communicate construction information in the field.

The Chinese government



Curved wall and ceiling surfaces and circular door and window openings suggest a nautical motif in a state-

room of the underwater habitat. Calculating their precise intersections required a computer modeler.

required that ground be broken after two months of schematic design, intensifying the need for speed and precision. Ellerbe Becket director Kyun Kim, AIA, says that this could not have been done if redrawing had been needed at each phase, as is commonplace with traditional tools. "To get input from mechanical, structural, and electrical engineers and to pull together a package in less than two months is unheard of," Kim says. "The early groundbreaking was scary, but it's working out."

Plumbing new depths

Another project promising to make a splash in architectural innovations is a proposed underwater hotel and habitat designed by George Berean, AIA, vice president at the Honolulu office of Wimberly Allison Tong & Goo (WAT&G). The firm is well known for its design of resort hotels, and this structure will offer a new twist on ecotourism by combining luxurious guest accommodations with scientific laboratories and observatories. The developer is currently seeking funding for the first such "U-SEA Habitat," which will probably be sited in Hawaii, Mexico, or Sicily.

The habitat will be moored at a depth of 40 feet, and guests will enter from a connected pier. "Umbilical cords" will be used for transporting power, water, and waste. The habitat will be transportable in case of hurricanes or other emergencies yet stationary enough to be classified as a hotel, not a ship. Half of the structure will extend above the water's surface for sundecks and observatories.

WAT&G architect Randy Totel, AIA, who modeled the structure with AutoCAD, claims the design would have been nearly impossible to draw and study without 3D solids modeling software. To counteract high atmospheric pressure, the underwater portion of the structure is round in plan, and the portholes are bubble-shaped lenses. Unnecessary structurally but consistent with the nautical motif, the staterooms' wall and ceiling surfaces are curved and their doorways are arched.

Using the modeling software, Totel drew the rounded shapes in 2D and graphically extruded them into the third dimension. Then, using Boolean operations to add and subtract 3D forms, he figured out how all the curved surfaces intersected.

The above-water structure, which is polygonal in plan and pyramidal in section, would have been equally difficult to shape without the software. Totel made the entire design more comprehensible to clients by creating animations that depicted the unusual forms from a series of vantage points. He created the animations with 3D Studio Max, where he applied material colors and textures and defined the locations, brightness, and other parameters of the simulated light sources.

Designing with light

The Chinese stadium and the underwater hotel demonstrate that computer modeling makes building complex forms feasible. But design needn't be exotic to benefit from such modeling. When Elizabeth (Zibby) Ericson, FAIA, design partner of the Boston firm Shepley, Bulfinch, Richardson & Abbott approached the design of a skylight at Boston College, she realized traditional media would not suffice because of the skylight's geometric complexity. It was to span a courtyard that was taking shape between a new rectangular building and an existing boomerang-shaped structure. The two buildings had different materials, structural systems, and floor-to-floor heights. The skylight over the narrow polygonal space between them was meant to unify the disparate elements.

"To span the dissimilar buildings," Ericson says, "the skylight had to bend in each dimension. The geometry was quite tricky and just wouldn't come together." With modeling assistance from Harold Hon, who used Bentley's MicroStation 95, Ericson was able to study dozens of ways to structure the skylight. The final design looks deceptively simple. It resembles a filigree-like trellis

more than a resolution to several intersecting structural systems made of steel.

On sunny days, this trellis will cast shadows on the walls and floor of the courtyard. Projecting exactly where those shadows fall would have been difficult and tedious to do by hand. Because the software includes a function that positions the solar light source and casts shadows through the modeled trellis, it is simple to generate a series of perspectives that show, for various times of the day and year, exactly where the filigree pattern will fall. "Without the modeling," Ericson says, "we would not have been able to accurately study the moving mural of light and shadow on the courtyard surfaces and understand the resulting spatial qualities. These studies helped us understand exactly how much surface decoration we would need and to what extent we could let the sun do the decorating." The study of light thus became as much a design criterion as the structure's geometry.

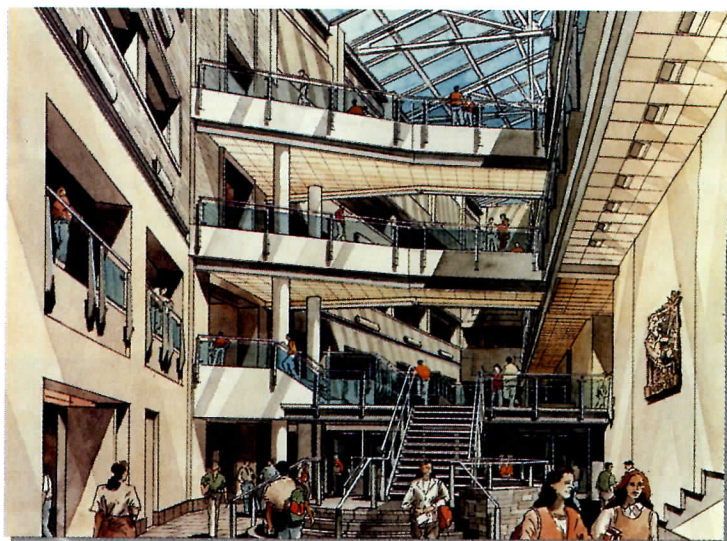
Beyond design

The implications of these expanding design capabilities are reaching beyond architectural studies and client presentations into construction processes. In a recent interview,

ARCHITECTURAL RECORD editor in chief Robert Ivy, FAIA, asked Frank Gehry, FAIA, if computers have changed the way he thinks (RECORD, May 1999, page 189). Although he appreciates that his younger-generation employees can work back and forth between physical and digital models, Gehry confesses that he hasn't done that himself.

Still, he insists that building the Guggenheim Museum in Bilbao would have been prohibitively expensive without computers. By entering a mathematical model of the building directly into the fabrication equipment, the architects demystified the shapes for the subcontractors, so the steel bids came in on budget. "This leads to a new way to practice where the architect gains more control," Gehry says. "So, the computer is a tool that can change architectural practice."

But is the tool changing modern architecture? Kim isn't sure if form is the chicken or the egg; whether "the design palette encouraged us to develop computer skills or if the computer's abilities brought curvilinear shapes to the palette," he says. "But clearly we're now able to demonstrate design notions that would have been impossible [to convey] in the past." ■



A computer modeler with solar angle calculations was essential to the design of this courtyard and

complex skylight, which unifies two dissimilar buildings on the campus of Boston College.



A NEW IDEA FOR MEXICO CITY'S ZÓCALO: ROWS OF TREES AND REROUTED TRAFFIC

The Zócalo—the huge plaza that anchors downtown Mexico City—is getting a new look. Bigger than Grande Place in Brussels, more orderly than Moscow's Red Square, and more compact than Beijing's Tienanmen, the Zócalo is one of the great urban squares of the world—but it also needs repairs, as most of the city does. To address the flaws, the government recently held a competition among Mexican designers to produce a renovation plan, with a proposal by Ernesto Betancourt, Cecilia Cortés, and Juan Carlos Tello emerging as the winner, as picked by an international jury.

The majority of the submitted proposals would have restricted or eliminated car traffic and suggested a fringe of plantings on the square's west side. As for the Templo Mayor, the great pyramid of the Aztec city of Tenochtitlán, some voted for maintaining the existing, enclosing facade, while others wanted to open up the archaeological remains to the square at the side of the cathedral on the Zócalo's north end.

Poles and plantings

The winning proposal's composition involves two parallel lines of jacaranda trees beside 65-foot-high columns, from which will hang flags, Christmas lights, and the like. A group of "sound poles"—which make sounds when the wind blows—at the northeast side will join a new sunken access to the

Templo Mayor. A new traffic chute next to the trees will separate cars from the square, physically and visually. The jury awarded second place to Alberto Kalach, whose drawbridge and water ponds at the Templo would have recalled the Acequia Real, an irrigation channel in the Spanish colonial era. The third choice was by Teodoro González de León, who proposed closing the front of the Templo with latticework.

Because Mexico City's mayor is an apparent presidential candidate, there is pressure to finish the renovation before the national election in 2000. Work is slated to begin in July. *Miquel Adrià*

REBORN CITY HALL IS LATEST UPDATE FOR SAN FRANCISCO'S CIVIC CENTER

San Francisco has unveiled the centerpiece in the decade-long rebuilding of its historic civic center with the reopening of the city hall. The Beaux Arts landmark (below), designed by Bakewell & Brown in 1912 to replace a previous structure destroyed in the 1906 earthquake, had been closed since 1995 due to damage caused by the 1989 Loma Prieta earthquake.

The renovation started in 1990 as a \$105 million seismic retrofit paid for largely by federal disaster-relief funds. Billed as the world's largest base isolation project, the engineering, by Forrel and Elsasser (with MBT as consulting architect), involved raising each of the building's 600 columns on rubber and steel cylinders. In 1995, the job was expanded to a more comprehensive restoration led by Carey & Co. and in 1996, newly elected Mayor Willie Brown initiated a sweeping reprogramming overseen by the city's Bureau of Architecture and by joint venture partners Heller Manus

Architects, Komorous-Towey, and Finger & Moy. The project soared to a \$300 million price tag and reached a high point with the painstaking restoration of the glittering gold-leaf dome.

The civic center's renaissance was kicked off by the new main library, completed in 1994. A municipal courthouse followed last year, along with the Hiram Johnson State Office Building. The conversion of the old library into the new Asian Art Museum, designed by Gae Aulenti with HOK, should be complete in 2001. The plaza at the center of the 16-block district, which survived the 1959 addition of a belowgrade garage and convention center, will also be revamped in the spirit of its 1912 design. *Eric C. Y. Fang*



HEALTH CARE, CHICAGO STYLE After more than a decade of planning, design, and construction, Northwestern Memorial Hospital of Chicago, the teaching institution of Northwestern University, began operations last month in its new \$580 million facility. The building, designed by a team comprising Ellerbe Becket, Hellmuth Obata & Kassabaum (HOK), and VOA Associates, consolidates inpatient and ambulatory care—services previously scattered in 22 buildings across a six-block area.

The new 2 million-square-foot facility is composed of two towers: A 17-story, 492-bed inpatient pavilion and a 22-story pavilion housing clinical and administrative space for up to 600 physicians. The two elements are connected by eight floors of diagnostic, therapeutic, and public spaces. The facility's exterior aligns it with the academic Gothic style that defines Northwestern University's downtown campus, while its massing and setbacks mirror other Chicago predecessors. To meet the standards of contemporary medical practice, as well as the increased expectations of today's patients, the new structure is wired for voice, data, and image transmission via fiber-optic cables connected to nearly 4,000 computer outlets, allowing staff to view test results in any part of the building.

The design signals the intended evolution of a hospital from a place of illness and confinement to one of well-being and openness, while still projecting a sense of security. "The building owes a lot to the typography of [Chicago's] Water Tower Place," says VOA's Rebel Roberts, "in that it's a commercial building as well as an institutional building. With three floors of public spaces, you're not immediately confronted with this high-tech, inpatient environment."

Describing the glass-clad ambulatory services tower as "fresher, crisper, leaner" than the more solid-looking inpatient component, HOK's Hank Winkelman notes that in the past, "hospitals have had ambulatory-care facilities associated with them, but they were somewhat subordinate to the whole, and often positioned to the side or behind. This ambulatory-care component is very sizable; it's like the son has become the man." *Thomas Connors*

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CIRCLE 23 ON INQUIRY CARD

MEET THEM IN ST. LOUIS: INTERNATIONAL CREW DIGS MIDWEST



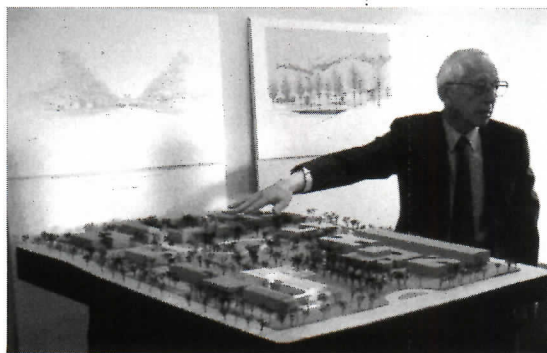
"Meet Me in St. Louis" may be the tune for the first years of the new century. A spate of new projects, ranging from innovative housing to research laboratories to arts institutions, promises to put the city squarely in the middle of the international architectural map over the next five years.

Already rising on its Grand Center location is the Pulitzer Foundation for the Arts, the brain-child of Emily and Joseph Pulitzer of the Pulitzer Foundation. Designed by Tadao Ando, the 24,000-square-foot structure—a composition of concrete, glass, steel, and plantings—is divided into two rectilinear bars and includes outdoor areas and interior exhibition spaces. It will house the Pulitzers' private collection, works gathered since the 1930s and described by Emily Pulitzer as "not dissimilar to the aesthetic of the architect." Completion is anticipated by the end of next year.

Construction began in May on the first phase of the Bohemian Hills housing project (top), designed by South African architect Jo Noero, associate professor at Washington University's School of Architecture, and Donald Royce, emeritus professor of the school. The project will eventually comprise 70 new houses and 50 rehabilitated apartments and is the result of an idealistic collaboration between the city's Landmarks Association president, Caroline

Toft, and the director of South St. Louis Youthbuild, Bob Branthorst.

Toft believes contemporary design can have an important role in revitalizing the reconstruction of American cities; in St. Louis, she has advocated contemporary housing design sensitive both to new uses and traditional contexts. Branthorst will use the new construction to provide training and employment opportunities in the construction industry for city youth. Bohemian Hills will provide city-center housing at the needed densities, in a variety



of sizes, and available at market rates—yet will avoid the double traps of historic pastich in subservience to context, or suburban organization in deference to perceived market pressures.

Maki's return

Also in May, architect Fumihiko Maki presented schematics for the new Visual Arts Design Center at Washington University. The VADC will

CELEBRATING THE LANDSCAPE To commemorate its centennial this year, the American Society of Landscape Architects (ASLA) has launched a campaign to build 100 parks in the U.S. through next April. "100 Parks, 100 Years", as the program is known, kicked off this April with a design workshop for the Boys & Girls Clubs of Washington, D.C.

In the coming months, landscape architects will work on a variety of projects, ranging from inner-city parks to playgrounds, community gathering places, waterfront sites, and a therapeutic garden. The project, according to ASLA executive vice president and chief executive officer Peter A. Kirsch, "will not only add beauty to America's cities, but will serve to unite communities, add health benefits and bring people closer to each other and their natural surroundings."

Founded in 1899, the American Society of Landscape Architects represents over 13,000 members nationwide. 46 states currently require registration licenses, which includes successful completion of a three-day examination.

"100 Parks is really the heart of our Centennial Celebration," notes ASLA President Barry W. Starke, adding that members will be working with General Colin L. Powell's America's Promise—The Alliance for Youth. "We're partnering with community groups and related organizations to build an awareness of parks in America's hometowns," says Starke. For more information on the program and a list of the proposed projects can be found on the ASLA website: www.asla.org. *Ellen Sands*

bring together the schools of Art and Architecture and the Department of Art History around a new home for the university's substantial art collection. Givens Hall, the longtime home of the School of Architecture, will be renovated completely, as will Bixby Hall, currently housing the School of Art. Maki's

design (at left, the architect with the model) includes the reprogramming and renovation of his first building in the U.S., Steinberg Hall, with expanded spaces for the School of

Architecture, and weaves the three existing structures together with new spaces for arts education and exhibition galleries. The 40,000-square-foot new structure will present an interplay of Missouri granite-clad walls with the architect's characteristic interest in transparencies and screens. Groundbreaking is expected in 2000, with full completion by 2004.

British architects are also at

work. Currently in design development at Nicholas Grimshaw and Partners, with HOK as the associated technical architects, is the Donald Danforth Plant Science Center, to be located just west of St. Louis in Creve Coeur. The Danforth Center is a not-for-profit collaborative enterprise between three St. Louis entities—Monsanto Corporation, Washington University, and the Missouri Botanical Gardens—and three universities: Purdue, the University of Missouri-Columbia, and the University of Illinois at Champaign-Urbana. When completed in 2001 it will be one of the world's largest and most advanced research facilities dedicated to the plant sciences.

Finally, this month will bring the selection of an architect for the new Forum for Contemporary Art building, a 20,000-square-foot set of exhibition galleries, performance spaces, classrooms, and studios to be located adjacent to the Pulitzer Foundation's arts pavilion. Betsy Millard, executive director of the organization, says the design will showcase the temporary exhibitions mounted within, but in addition, "the building will become our permanent collection." *Peter MacKeith*

MEETINGS OF THE MINDS Architectural get-togethers have been plentiful this spring. The AIA held its annual convention last month, with 12,000 attendees converging on Dallas. Among the hottest topics: Sustainable design, firm mergers, and design-build. Meanwhile, other groups have been talking up the future of cities, cutting-edge technology, and myriad pressing issues. Here is a roundup of recent rendezvous. *Soren Larson*

MUCH MALIGNED DETROIT SHOWS OFF ITS NEW Demeanor

For 30 years, Detroit has been synonymous with urban decay. The downtown core, though, is taking significant steps toward revitalization. A recent AIA-sponsored conference, "Detroit: Rebuilding Downtown," gave more than 100 architects from around the country a close look at Detroit's progress.

Progress is most apparent in terms of big new developments, as several bus tours and panel discussions showed. A new Major League baseball stadium called Comerica Park is under construction. Three new casinos are in the works. The sumptuously renovated Detroit Opera House opened a couple of years ago. And General Motors' purchase of the Renaissance Center for its headquarters has helped anchor all the new development. Attendees heard from critics as well. June

Manning Thomas, director of Urban and Regional Planning at Michigan State University, complained that the city pays too much attention to megaprojects and not enough to project that serve everyday life, like housing and retail. Also discussed was Detroit's urban planning tradition, which fell on hard times in the 1970s when Coleman Young, the city's first African-American mayor, took power. He distrusted the planning profession—which he blamed for programs that had devastated black neighborhoods—and gutted the planning process.

Architects did seem to agree that Detroit has more to celebrate than to regret. The city has seen more than \$5 billion in new investment in the past five years, and the outlook is the most hopeful it's been in decades. *John Gallagher*

THE LATEST IN DIGITAL DESIGN DISSECTED AT PENN SYMPOSIUM

How will new design tools shape future buildings? The question was contemplated last month at the University of Pennsylvania, where the Graduate School of Fine Arts hosted a symposium called "Digital Translations: Emergent, Operative Potentials for Architecture." Terence Riley, architecture curator of New York City's Museum of Modern Art, cautioned that in evaluating new curvilinear forms architects should refrain from welcoming change for change's sake, remain open-minded, and not neglect the generative potential of familiar recti-

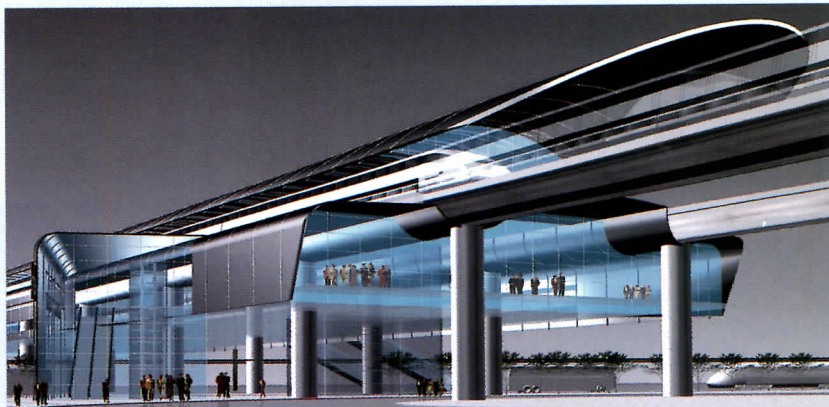
linear forms. But in the way of change, several speakers presented design techniques immediately applicable in practice. Penn professor Ali Rahim (who designed the Steel Museum in Karachi, Pakistan, below) uses animation software to create "dynamic diagrams" to understand building programs. For a library in Karachi, he showed how landscape, human traffic, and information resources vary through time and then identified "interaction zones," suggesting the location of public areas and bookstacks.

William Braham, also of Penn, explained how technology can help architects with the "messiest part of architectural practice"—developing color and material palettes. Color perception depends on a color's surroundings, and computer renderings enable designers to quickly evaluate combinations, he noted. *B. J. Novitski*



TECH TALK Accelerating technological advance "is changing the face of architecture," asserted London architect Chris Wilkinson at "Architecture with Technology: a New Synthesis," held in April at the Illinois Institute of Technology (IIT) in Chicago. A stellar cast of architects and engineers, mostly from Europe, made a convincing case. Peter Heppel, a structural engineer with Buro Happold of Bath, England, showed a broadcast tower he is working on with architect Richard Horden that would rotate with the breeze, minimizing material by presenting the least surface area to the wind. Cellular membrane structures, descended from the domes of Buckminster Fuller, are making a comeback in the sinuous, curving shell that will roof the Eden Project, a horticultural exhibit designed by Nicholas Grimshaw & Partners. Much of the innovation shown in double-wall curtainwalls, shading devices, and HVAC is driven by increasingly strict European mandates for energy conservation and sustainability. "There is no way you can justify building tower blocks the way you do in America, with each side the same," said Wilkinson.

Norman Foster and Richard Rogers, working with engineers such as Anthony Hunt, Peter Rice, and Frank Newby, were among the pioneers of technological collaboration, explained Peter Land, the IIT architecture professor who organized the event with architecture dean Donna Robertson. Now, a younger generation is emerging, such as engineer Neil Thomas, who showed an inflatable kite that self-levitates in the breeze by means of a built-in turbine. One question vexed the assembled: Why has America failed to partake of emerging technologies and analytical tools? Lower American fees and construction costs and a culture oriented to standardized components inhibit collaboration, opined Nigel Tonks of Ove Arup & Partners. An exception is Chicago-based Murphy/Jahn, which has won several competitions recently—including for high-speed rail platforms fabricated in airplanelike unibody construction (right)—through a focus on technical innovation and sustainable design. *James S. Russell*



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LONG-AWAITED STARCK PROJECT SHOWS AN INTRIGUING FACE TO PARIS

Though his office is located just west of Paris, until this year designer Philippe Starck had created few projects in the French capital. Even his most famous Parisian work, the café Costes, has been converted into a clothing store. An opportunity seemed to have arrived in 1992, when Starck and architect Luc Arsene-Henry won a competition to design the Erasme wing of the prestigious Decorative Arts College in the heart of the Latin Quarter—but under pressure from neighborhood groups, their concept changed radically before finally coming to fruition.

As it nears completion, the building has gone from the original idea of a translucent emerald green cube to a street facade that is windowless and practically flat. Starck himself calls it “aloof.” The white marble facade, with a slightly raised border, represents a frame surrounding a blank canvas. The project entails 76,000 square feet of library, theater, and studio space

between the Rue Erasme and the school's garden courtyard (where Starck's design of a crystal temple to house a cafeteria is now being constructed). The work also includes the restoration of an existing building on Rue Ulm and the creation of a transitional exhibition space to turn the corner between the two wings. Circulation paths are unified by the same raw sienna color on floors and walls.

Of course, Starck being Starck, the simplicity is deceptive. While the “frame” portion of the exterior wall is a classical, marble-clad wall, the inner portion, or “picture,” appears so thin that light passes through.

The picture is actually a double-glazed wall with an interior layer of glass and an exterior layer of what the architects call “marble-glass”—made by gluing glass to ½-inch thick marble, then polishing the whole down to a thickness of ⅜ inch. At night, interior lighting silhouettes the students against the milky facade. *Claire Downey*



BRUNER AWARD TO YERBA BUENA Most architectural prizes are given to individual designers or buildings, but the biannual Rudy Bruner Awards for Urban Excellence bestow honors on urban places. This year's \$50,000 Gold Medal goes to Yerba Buena Gardens, a mixed-use development that has transformed the South of Market district in San Francisco.



“We deal with the people issues, the user issues—the issues that don't necessarily show up in design magazines,” says Simeon Bruner, a Cambridge, Massachusetts, architect and founder of the program, named after his late father. Yerba Buena has had a dramatic turnaround; the site had been bulldozed amid ill-fated development decisions. “They learned from the mistakes,” says Bruner. “Now it's going to be an amazing thing for the city.” *Soren Larson*

A TOKYO STREET IS TRANSFORMED INTO A RESIDENTIAL EDEN

The concept of a journey through green passageways, sacred to Japanese culture, inspired the architecture firm Atelier Zo to design a streetscape in Tokyo called Yoga Promenade. The firm transformed a zigzag of residential streets into a bucolic procession of green settings and open play areas. With lush plantings along narrow canals and patterned surfaces that contrast light and shadow, the corridor recalls an entrance path to a shrine.

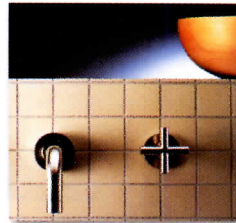
Architects in Japan are descended from great teachers, and Atelier Zo—Zo means elephant—is one of several firms with animal names operating under the umbrella Team Zoo, founded in 1971 by students of Takamasa Yoshizaka (1917-1981) at Waseda University. For Yoshizaka, architecture begins with discovery and flows with nature. His followers espouse the energy of the vernacular and a passion for the playful.

Yoga Promenade begins with a tunnel of green. Vine-covered bamboo lattices screen houses from the street, while fragrant olive and camphor trees arching overhead are lashed for support with *asanawa*—the ubiquitous Japanese



black twine—to wooden braces. The street is paved in silvery glazed roof tiles, some imprinted with parallel lines symbolizing rivulets and others with the cross sections of tree trunks, a reminder of time and longevity. Haiku carved into the tiles or weathered concrete surfaces are like poems unfurled on ancient scrolls. Farther along is a miniature river crossed by arched and scalloped bridges. Surrounding shrubs and camelia trees complement the collage of gray materials—tiles, concrete and riverstones. Overseeing the promenade entrance are two old demon heads—formerly ornamental roof tiles called *oni-gawara*—who perform their age-old function of warding off evil sprits. *Paula Deitz*

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SPRAWLING MINNESOTA CAMPUS FINDS FOCUS WITH GATEWAY CENTER

The University of Minnesota is the largest urban campus in the country and serves more than 40,000 students. While this distinction has advantages—such as the many metropolitan amenities—it also presents drawbacks. The U of M's sprawling precinct, without defined edges or sense of arrival, is too eas-

ily swallowed within the larger context. As its name implies, the university's new Gateway Center addresses this issue.

Designed by Antoine Predock, FAIA, in association with Minneapolis' KKE, the gateway will include two main elements. Memorial Hall, a distinctive "geode"

of granite planes and glass fissures, is the public component and includes an alumni/visitor center with conference rooms, a "heritage gallery" concerning the university's history, and reception space. Juxtaposed will be a copper-clad office block, housing the alumni association and other university-affiliated foundations, as well as departments with significant outreach missions.

A new campus anchor

Rising where Memorial Stadium once stood, the gateway program appropriately reflects the site's previous incarnation. The stadium had brought alumni, students, and community together for football games, which since 1982 have been played off-campus. The ceremonial Memorial Stadium Arch, preserved when the structure was razed in 1992, will be incorporated into Memorial Hall. With its main interior space soaring six stories, Memorial Hall should be robust enough to

anchor its important location.

Set to open this fall, the gateway is the latest response to dealing with the campus' edges. Frank Gehry, FAIA's Weisman Museum is the focal point as one crosses the Mississippi River to the east bank. On the western shore, a recently opened dance center, by HGA, and Ellerbe Becket's new Carlson School of Business acknowledge campus borders and neighborhoods. The university is shedding its staid image as well as developing a stronger campus fabric.

Meanwhile, the historic campus center is being addressed through two initiatives. The recently unveiled historic preservation plan was critical in garnering state funding to support the works. The other key is the new campus master plan, which revisits Cass Gilbert's 1908 idea of a strong connection to the Mississippi. The broad goal is to reinforce the campus' signature features to define an urban neighborhood. *Todd Willmert*

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ATLANTA TRIES REDEVELOPMENT TO LURE IN SUBURBANITES

Atlanta's growth has been characterized by suburban sprawl, and the city is clogged with commuter traffic. Now, efforts are being made to revitalize the urban core and build a community that encourages use of the rapid-transit system. One new project—the mixed-use Atlantic Steel redevelopment in midtown, being planned by Jacoby Development and architects Thompson, Ventulett, Stainback & Associates (TVSA)—will provide the option of urban living for a city where people work while living elsewhere.

Spanning 138 acres near the intersection of interstate highways 75 and 85, the development will be dramatically announced by two high-rise offices that will tower over the neighborhood. Additional buildings—most likely including hotels—will overlook the expressway and are tentatively planned to

range from 12 to 20 stories tall. Although master planning is not complete, a new bridge over the expressway at 17th Street will be the main entranceway to the development from the city. Tom Ventulett, FAIA, and Phil Junger, AIA, principals at TVSA, indicated that they think the 17th Street bridge design will become a recognizable signature of Atlanta. The bridge will also be the key to building a pedestrian-friendly environment for residents and visitors.

Multiple personalities

Atlantic Steel's skyline will gradually taper downward as it moves into a specialty retail shopping district and residential housing area. A three-tiered mall, with exposed walking areas and an entertainment complex, will be situated within the office park. The Mills Corporation of Arlington, Virginia, will oversee the

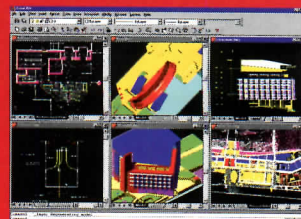
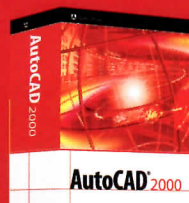


retail and entertainment complex, which is slated to include a variety of specialty shops, restaurants, and theaters. On the other end of the development adjacent to Northside Drive will be an office center that will serve as a research and development center for Georgia Tech.

The centerpiece will be the mid-rise residential district. Anchored by a lake and insulated with landscaping, it will include

apartments, townhouses, condominiums, and some single-family homes. There will be bicycle and walking trails throughout and possibly a light-rail system to work in conjunction with Atlanta's existing rapid-transit system. According to Ventulett, every aspect of the development, especially the residential portion, is set up so that people can walk from one destination to another. *Ray Holley*

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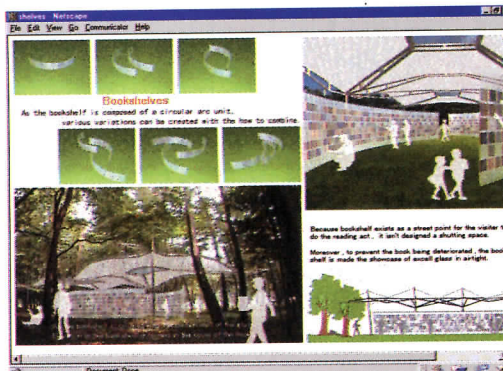
WHERE NO DESIGN HAS GONE BEFORE: THE FIRST CYBERSPACE COMPETITION

Nearly four decades after Massachusetts Institute of Technology graduate student Ivan Sutherland developed the world's first screen-based CAD program, a student team from MIT has won what was billed as the world's first Internet-based design competition. Organized by the Association for Computer-Aided Design in Architecture (ACADIA), the "Library for the Information Age" competition explored the potential of Web technology to support global, interactive design collaboration.

Every step, from the call for entries to the judging of winners and the announcing of winners, happened online at www.acadia.org, under the guidance of competition webmaster Brian Johnson and organizing committee chair Branko Kolarevic, who teach architecture at the universities of Washington and Hong Kong, respectively. The pro-

gram called for a small community library, to be realized as a physical environment, a virtual environment, or some combination of both. Peter Anders, a Michigan-based architect, member of the competition organizing committee, and author of *Envisioning Cyberspace* (McGraw-Hill, 1999), calls these hybrids of real and cyber spaces "cybrids."

Several broad themes emerged among the 650 student and professional entries (representing every continent save Antarctica). Web sites, as media of design communication, add layers of narrative and viewer-controlled interactivity to the traditional design vocabulary of procession and adjacency. For example, the two-person entry from the University of Kaiserslautern, Germany, winner of an award of merit, consisted of a single extended animation in Macromedia Shockwave software, impossible to



capture in print or on individual boards. The first-prize team from MIT agreed that the Web "provides a narrative, interactive, as well as experiential device for communication. It moves beyond the limitations of ordinary presentation panels."

High-tech teamwork

Creating the presentation sites also challenged the competing teams' abilities to collaborate internally. The eight-student team from the National Technical University of Athens, winners of the third prize,

observed that "although technology and the Web is suggested to be alienating and substituting [for] physical contact, in reality it worked out fine in a complementary way through our competition work site." Another theme

was the grounding of cybrid library spaces in the historic experience of physical libraries. The scheme produced by the seven-member professional team at Seattle-based Integrus Architecture, recognized with an award of merit by the jury, incorporates an insightful history of library building types—from medieval monasticism to modern metropolitan branches. This jostles with the funky aesthetic of the team's Book and Technology Mobile, or B.A.T.-Mobile.

Similarly, the main space, or

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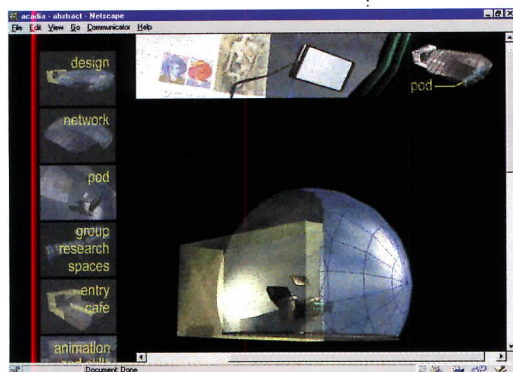
"network," of the first-prize MIT entry (near right), with its compound-curved, translucent skin, invokes the memory of great 19th-century reading rooms, like those of the Library of Congress or the library of the British Museum, albeit crossed with the megawatt extravaganza of a Las Vegas sports book, an auditorium where betting lines are displayed.

Creating community

The potential for technology to create shared experiences for library visitors was another common thread. An eight-person team from Kumamoto University of Japan won second prize with an entry (left) that included the "skybook," an overlay of streaming text on a digitally illuminated canopy reminiscent of Jon Jerde, FAIA's Fremont Street Experience (the barrel-vaulted, LED-studded mesh canopy spanning several blocks in downtown Las Vegas). This entry also included the E-Device, a freestanding holographic display repeated at intervals

throughout the scheme, allowing individuals to interact with each other through "virtual presence."

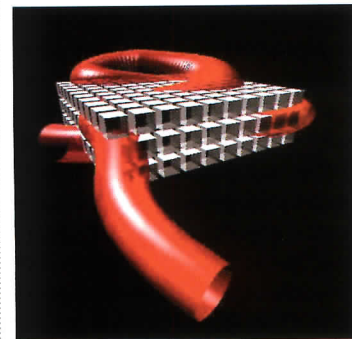
As proposed in all the premiated entries, libraries for the information age will balance new communal technologies with support for individual study. The E-Device would permit private interaction with library resources. The Athens entry (far right)



employs a digital "worm" to reconfigure a 3D grid from variable group spaces down to individual study

cells. The MIT scheme incorporates clusters of one-person, egglike, virtual-reality (VR) "hover screens," evocatively named "The Pod." These entries rely to varying degrees on VR display techniques pioneered at the University of Washington's Human Interface Technology Lab, as documented in Fred Moody's *The Visionary Position* (Times Books, 1999).

While most entries used technology to blur the boundaries between the physical and the virtual, the team from Kumamoto chose to actually dematerialize the building by distributing networked library functions throughout a forest. Juror Thom Mayne, AIA, of the California firm Morphosis, found this to be a "noble fusion of technology



and nature. Very Eden-like—not realistic, but refreshing." While unrealistic in the sense that it is not easily buildable, it contains elements that might soon find their way into libraries. For example, a global positioning system allows a book to be shelved on any of the pavilions distributed about the forest—replacing the card catalogue.

The 18th-century model of encyclopedic classification may ultimately give way to 21st-century digital modes for spatial distribution of information—truly a library for the information age. *Jerry Laiserin, AIA*

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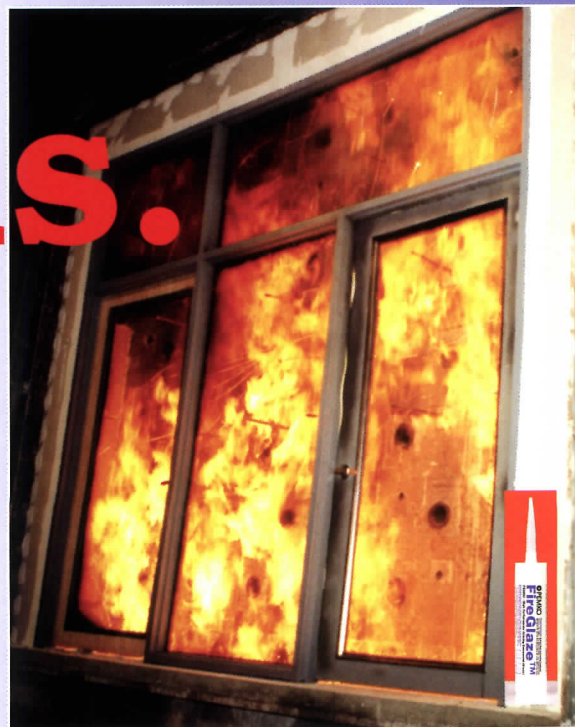


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NEWS BRIEFS

In the works Polshek Partnership has completed a Scandinavian-inspired design for the New York headquarters of the American-Scandinavian Foundation. The building is scheduled to open in fall 2000. In Antwerp, a jury convened by the Belgian Ministry of Justice has picked Richard Rogers Partnership to design a new complex of law courts. Rogers' scheme will include a sequence of sail-like roofs, visible from points all around the city and will feature eight wings arranged around a central public space. Meanwhile, Boston's Museum of Fine Arts has selected Norman Foster to design a master plan for its upcoming renovation and expansion.

Koonce to stay Norman L. Koonce, FAIA, who was named interim CEO of the AIA in January after the departure of Mark Hurwitz, has been named executive vice president and CEO on a permanent basis. As a result, the American Architectural Foundation, where Koonce had been president, has launched a nationwide search for his successor. Michael J. Stanton, FAIA, remains AIA president.

The battle of Brooklyn French architect Jean Nouvel, Hon. AIA, has been hired to design a shopping and entertainment complex for the Brooklyn waterfront, between the Brooklyn and Manhattan bridges. The developer, David Walentas, has long wanted to build a commercial center in the area, once a manufacturing district but now a burgeoning residential neighborhood. His ideas have been fiercely opposed by local citizens' groups—who fear more traffic and want the area made into a public park—but Walentas is pushing ahead despite their likely opposition. Some also say Nouvel's modernist aesthetic will clash with the look of historic Brooklyn.

Sweet charity Chicago's planned Millennium Park got a \$15 million

gift in April from the Pritzker family. The funds will help pay for the park's music pavilion, which will be designed by Frank Gehry, FAIA—who will also design the Great Lawn area and a pedestrian bridge over Columbus Drive. Overall, the park—slated for completion in spring 2001—is expected to cost \$200 million. Meanwhile, ground was broken in April on Gehry's school of management at Case Western Reserve University.

Native concerns The National Museum of the American Indian, slated to open in 2002 in Washington, D.C., suffered a setback in April when the Commission of Fine Arts rejected a revised design for the building. An initial design, approved in May 1996, was primarily the work of Canadian architect Douglas Cardinal—but Cardinal lost his position as lead architect in April 1998 when the Smithsonian dismissed the Philadelphia firm GBQC, the prime architectural contractor (technically, Cardinal was a subcontractor). The Smithsonian then turned over the task of completing the design to its own staff, working in collaboration with a team of architects headed by the Polshek Partnership and Tobey + Davis, with several American Indian designers as consultants. Another revised design is needed if groundbreaking is to take place as scheduled in September.

Bon anniversaire The pyramid at the Louvre celebrated its tenth birthday in April by offering free museum visits and hosting architectural conferences. I.M. Pei, FAIA's pyramid was conceived as a central entrance for the museum, but also as a symbol of the Louvre's modernity. It became the impetus for a program of renovations and construction that included the opening of an underground commercial center, the renovation of the Tuileries and the Jeu de Paume, and starting this fall, the renovation of the Orangerie—the final phase in what is now called the Grand Louvre.

DATESEVENTS

Calendar

Land Marks

Ottawa

Until June 13

An exhibition exploring the changes we see and those we don't between landscape and language when claiming and traversing land. National Gallery of Canada. 613/990-1985.

Archigram: Experimental Architecture, 1961-1974

San Francisco

Through June 15

The conceptual work of the celebrated British architectural collaborative, including photographs, drawings, models, and installations. San Francisco Museum of Modern Art. 415/357-4000.

Black Architects: Between Tradition and Memory

New York City

Through June 18

Work by black architects, seeking to place them as a group within a global and historical context. The Institute for Research on the African Diaspora in the Americas and the Caribbean. 212/650-8951.

Pierre Koenig: A Modernist's Vision

Santa Monica

Through June 20

Form Zero Architectural Gallery will exhibit drawings, models, and photographs from the 50-year career of architect Pierre Koenig. 310/450-0222.

The Architecture of Democracy

Glasgow

Through July

Parliamentary buildings at the McLellan Galleries, 270 Sauchiehall St. +44/41/331-1854.

Klas Anshelm: Six Works

Stockholm

Through August 1

An exhibition about the Swedish architect Klas Anshelm (1914-1980). Swedish Museum of Architecture. +46/8/587-270-00.

At Home in Chicago, Part I

Chicago

Through August 1

With sketches, drawings, plans, and a Quicktime video, this exhibit presents five single-family homes recently built by Chicago architects. The Art Institute of Chicago. 312/443-3600.

Where Do We Go From Here?

Washington D.C.

Through September 7

First in a four-part series that examines alternatives to current patterns of development and provides an overview of the causes of sprawl and how smart growth can accommodate development while preserving community character. National Building Museum. 202/272-2448.

An Urban Experiment in Central Berlin: Planning Potsdamer Platz

Washington, D.C.

Through September 19

An exhibition featuring the development concepts and building designs for Potsdamer Platz, the Times Square of prewar Berlin. The presentation reflects the historic, cultural, economic, and architectural forces that shape all urban spaces. National Building Museum. 202/272-2448.

Yasuhiro Ishimoto: A Tale of Two Cities

Chicago

Through September 12

This exhibition celebrates the work of Japanese photographer Ishimoto whose intuitive street pho-

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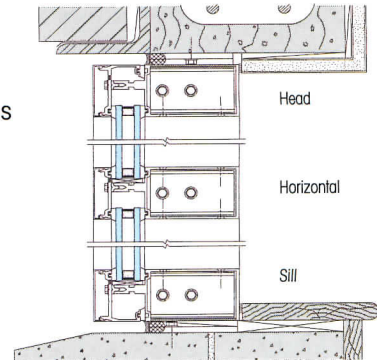
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tography of Tokyo and Chicago is unparalleled. The Art Institute of Chicago. 312/443-3600.

32 Italian Photographers: A Tribute to Phyllis Lambert
Montreal

Through September 26

To honor Phyllis Lambert, founding director and chair of the Canadian Centre for Architecture on her 70th birthday, 32 Italian photographers each donated a work that represents their personal vision of the built environment. Exhibited at the Canadian Centre for Architecture. 514/939-7000.

Roy McMakin—Documents Northwest: The PONCHO Series
Seattle

June 3-October 31

An installation of furniture and found objects by this designer, architect, and visual artist creates an unconventional apartment within the gallery. Seattle Art Museum. 206/654-3158.

A Face for Design
Chicago

June 7-September 15

Fifty international designers give their personification of design. The Chicago Athenaeum. 312/251-0176.

Erich Leischner and the Vienna Stadtbauamt
Vienna

June 16-August 2

With a focus on the interim war period, the exhibition aims to document the character of the Stadtbauamt's distinct architectural approach and its contribution to the character and identity of Vienna's cityscape. Architektur Zentrum Wien. 43/1/522-3115.

80 Models • 44 Architects "Une ville invisible"

Stockholm

June 4-August 15

House models from a collection at the Centre Georges Pompidou in Paris. The exhibition contains architectural landmarks from 1945 to 1998 by architects such as Le Corbusier, Frank Gehry, Herzog & de Meuron and many more. Swedish Museum of Architecture. +46/8/587-270-00.

Commercial Building Products Show
Los Angeles

June 25-27

CSI is hosting the Construction Specifications Institute's 43rd Annual Convention and Exhibit. Demonstrations of new commercial building prod-

ucts and the latest in construction practices and technology. The Los Angeles Convention Center. 703/548-1291.

Metropolitan Images: Recent Works by Jonathan Bressler
New York City

June 17-July 28

These collage-on-canvas works by Bressler incorporate heavily patterned and colorful background designs executed with hand-silk-screened paper and merged with historical, iconographic imagery, including subjects from the permanent collection of the Metropolitan Museum of Art, hence the title of the

exhibition. New York School of Interior Design. 212/472-1500.

El Nuevo Mundo: The Landscape of Latino Los Angeles
New York City

June 29-September 5

Photographs by documentarian Camilo José Vergara that reveal changes in the built environment of Los Angeles County will be exhibited at the Cooper-Hewitt, National Design Museum. The 100 photographs on display will explore the emerging Latino metropolis as it coexists with affluent Los Angeles. 212/849-8400.

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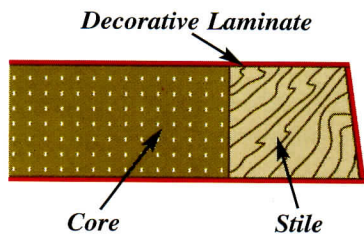
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Earthworks Revisited Seattle

June 17-May 2000

An installation celebrating the 20th anniversary of the King County Arts Commission's project Earthworks: Land Reclamation as Sculpture. Seattle Art Museum. 206/654-3158.

Visual Harmony in the Philadelphia Architecture of Wilson Eyre Philadelphia

June 30

Jeffrey Cohen, lecturer in the Growth and Structure of Cities Program at Bryn Mawr College, addresses Maxfield Parrish's architectural context and contacts in turn-of-the-century Philadelphia. At the Pennsylvania Academy of Fine Arts. 215/972-7600.

RIBA Hosting Free Radical Summer Programme London

July 5-August 28

Organized by RIBA presenting architecture in all its forms. This project incorporates two exhibitions and a series of talks set to explore late 1960s radicalism in architecture and design. RIBA Architecture Gallery. +44/71/580-5533.

NOW! Paris

January 14-18, 2000

For the first time in France, an international trade show is devoted exclusively to interior home design. Professionals in contemporary design, interior architects, editors, and a host of others will be attend. Paris-Nord Villepinte Exhibition Centre, Hall 7. +33/1/44-29-02-19.

Competitions

A 21st Century Urban Vision: Continuing Education Presentations Philadelphia

Deadline: June 18

Come explore, share, and learn about changes in the forthcoming millennium. Proposals considered for continuing-education workshops and seminars will be presented at the AIA national convention in 2000. Call the AIA, 202/626-7353.

The American Wood Preservers Institute “Century's Best” Awards

Submission deadline: August 2

This competition seeks designs for deck, dock,

garden, playground, or other treated-wood construction. The grand-prize winner will get a trip to the Sundance Resort in Utah. For more information call 800/356-2974 or visit www.awpi.org.

Boston Society of Architects Design Awards Programs

Submission deadline: August

(call for details)

The Boston Society of Architects (BSA) announces two awards programs. The Architectural Design Honor Awards Program is open to projects anywhere in the world by Massachusetts architects, and to built projects in the state designed by any architect worldwide. The eighth annual Unbuilt Architecture Design Awards are open to architects, architectural educators, and architecture students. For submission guidelines call the BSA at 617/951-1433 x221 or E-mail bsarch@architects.org.

1999 James Marston Fitch Charitable Foundation Mid-Career Grant Awards

Application deadline: September 1

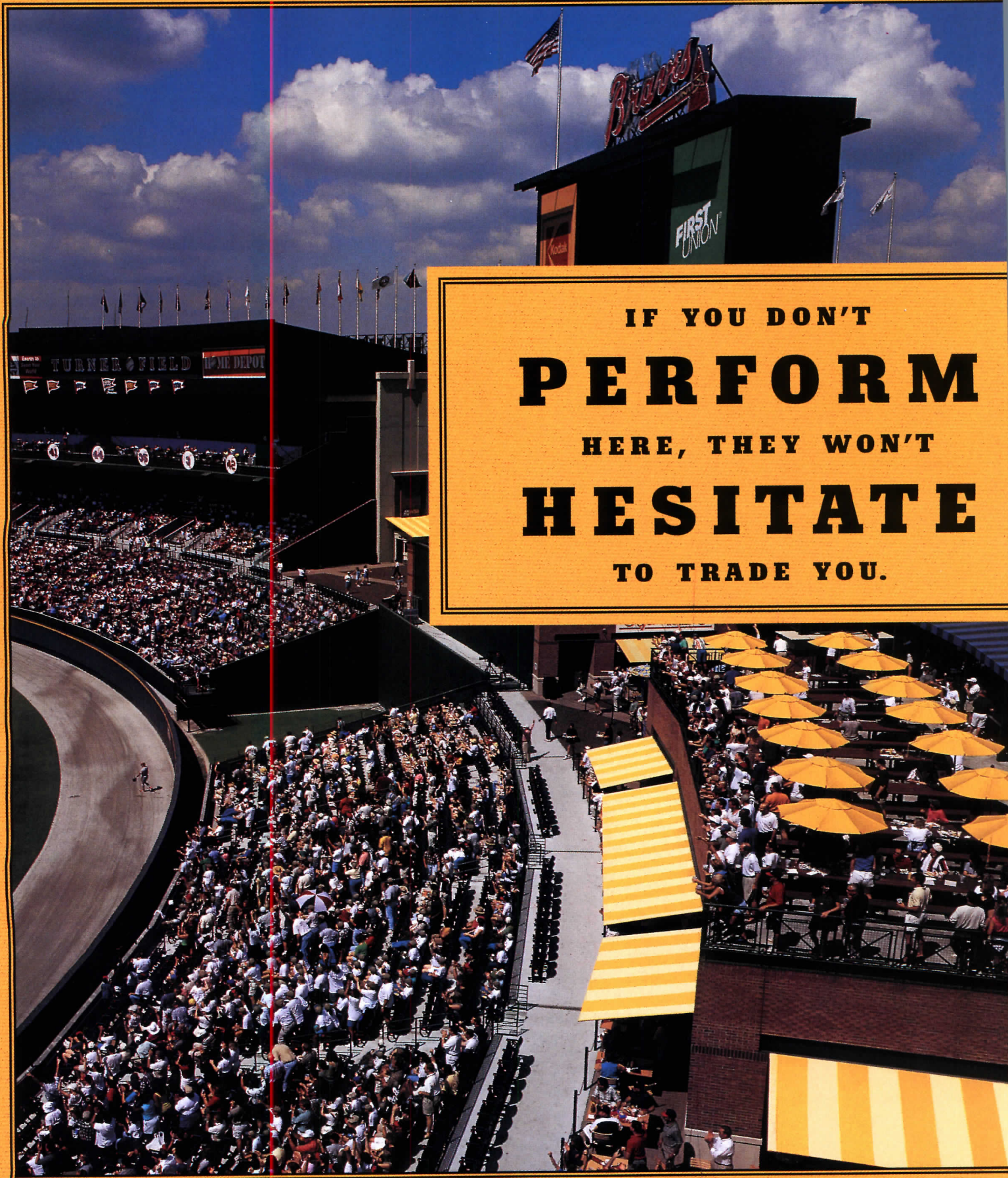
A \$20,000 research grant will be awarded to a professional with an advanced or professional degree and at least 10 years of experience, as well as an established identity in historic preservation, architecture, landscape architecture, urban design, environmental planning, law, engineering, archaeology, architectural history, or the decorative arts. The grants are intended to support original research and creative design that advances the practice of preservation in the U.S. For information call Margaret Evans at the offices of Beyer Blinder Belle, 212/777-7800.

ar+d Award

Entry deadline: September 6

The *Architectural Review*, with d-line international, a Danish architectural ironmongery firm, is launching a £10,000 annual international award. The ar+d award is for executed work and is open to all architects and designers 45 years of age or younger. Prizes will be given in several categories. Besides buildings, submissions consisting of interiors and manufactured products are encouraged. For information call +45/3/618-0400. ■

Please submit information for events and competitions at least six weeks prior to the magazine's publication date (June 15 for the August issue).



IF YOU DON'T
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HERE, THEY WON'T
HESITATE
TO TRADE YOU.

A FRESH LOOK AT THE LAST 1,000 YEARS,
FROM DONJONS TO UTOPIA

Millennium Part One: Futures Past

Oh, what a lovely millennium! The last thousand years seem to have virtually flown by. Wasn't it only yesterday that we were huddled in walled towns, giving fealty to lords and ladies, stuck in serfdom with limited travel potential? How tiresome. The muck . . . the smells . . . the dank, steamy halls—contemporary technology has erased them all in an air-conditioned cyberflash.

ARCHITECTURAL RECORD celebrates the evolution of the human race, and of architecture, in this, the first of two special sections that emphasize the Big Change in Time. First, Suzanne Stephens leads an architectural Grand Tour of Europe to reintroduce us to the Year 1000, an ultimate transitional moment, and to remind us how far we've come. Michael Sorkin, irrepressible iconoclast, surveys our utopian visions and chides that sometimes it is better that the grandest plans remain unrealized. Nevertheless, B.J. Novitski, with digital sleight of hand, shows what several would-be masterpieces might have looked like, had they been built. And our products editor revisits our 108-year-old archives to dredge up products you're not likely to see in the next epoch. Asbestos, begone!

After savoring the follies and the dreams of past centuries, strap yourself in for our December issue, when Millennium II blasts off with its decidedly futuristic tone. For now, kick back, relax, and allow yourself to feel superior. The past may have been visually stunning, but the grog was lousy. —Robert Ivy

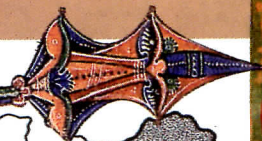
Still from Fritz Lang's *Metropolis* (1926).





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 AC SI MUNDUS IPSE
 EXCUTIENDO SEMET,
 REIECTA UETUSTATE,
 PASSIM CANDIDAM
 ECCLESJARUM UESTEM
 INDUERET.

—RODULFUS GLABER *



A RCHITECTURE IN THE YEAR ONE THOUSAND

A BRIEF LOOK BACK TO THE END OF
THE FIRST MILLENNIUM REVEALS A
RICH AND COMPLEX ERA.

BY SUZANNE STEPHENS

We often hear that the approach of the Year 1000 struck terror in the hearts and souls of the Christian populace, who were certain the world would come to an end. While recent scholarship indicates that this belief in the apocalypse was not so widespread as myth would have it, the end of the 10th century marks a boundary of sorts.

Let's assume we can take a quick tour of new construction at the end of the first millennium. Because of space limitations, this concocted visit must, of necessity, be sketchy. Nevertheless, it offers some surprises and insights. The stabilization of a number of cultures occupying the land between the British Isles and the Byzantine Empire brought about advances in certain aspects of civilization, and more specifically in architecture. In design terms, it was a time of imminent change, synthesis, and consolidation. What were the circumstances surrounding the development of architecture and, in some cases, urbanism in this period?

Forget about London, Paris, Berlin, or even Rome in the Year 1000. They were hardly hubs of cosmopolitan life. London was an active trading town, which, since the ninth century, had been fortified by the Anglo-Saxons against the Danes. While populous, it was small: Westminster Abbey was still a little Benedictine monastery two miles west of the city. For that matter, Winchester was the official capital of England from 829 until the Norman Conquest in 1066.

Paris was nestled on the Isle de la Cité. At least it was the capital: Hugh Capet made it the seat of a united France when he was crowned king in 987. Berlin, a mere fishing and trading town, was off the map. Although Otto the Great (936–973) had reconsolidated the Holy Roman Empire (Germany, the Netherlands, Austria, Switzerland, and two-thirds of Italy), there was no actual capital. Both Saxon emperors Otto I and II liked to roam around. Not until after Otto III was crowned emperor in 996 was a permanent court set up in Rome.

Rome may have been the center of the church, but it had been seriously ravaged over the centuries by tribes from the North. In the

** Just before the third year after the millennium, throughout the whole world, but most especially in Italy and Gaul, men began to reconstruct churches, although for the most part the existing ones were properly built and not in the least unworthy. But it seemed as though each Christian community were aiming to surpass all others in the splendour of construction. It was as if the whole world were shaking itself free, shrugging off the burden of the past, and cladding itself everywhere in a white mantle of churches. —Rudolfus Glaber*

Previous page: The exterior of the west tower of the All Saints church at Earls Barton, Northamptonshire, ca. 1000, is ornamented with plaster strips of stone thought to allude to timber framing. Cluny II (right), built in 955–81, in Burgundy, shows Lombardic influence. The church of Deerhurst, Gloucestershire (right, below), is from the early 10th century.



late 10th century it was a series of villages with several hundred massive towers and almost four dozen strong castles sprouting up among classical ruins. Venice, a lively port city actively trading with Constantinople, was still small stuff compared to later times.

The ultraglamorous city in this part of the world in 1000—the Paris of today—was Cordoba, Spain. It had been turned into the “Baghdad of the West” by an Islamic caliphate of the Umayyad dynasty, which had come from Damascus in the seventh century. Cordoba’s oil-burning street lamps and paved roads, raised walkways, and underground sewers, plus its thousands of markets, hundreds of baths, tons of shops, and abundant gardens set it apart. The Muslims also encouraged Jewish scholars to come to this cultural, artistic, and intellectual center, where math, medicine, and other sciences were developed to unusually advanced levels.

The other glittering capital was Constantinople, head of the East Roman (Byzantine) Empire. True, it had its heyday in the sixth century during Justinian’s reign and the construction of the Hagia Sophia. While Constantinople declined in the 7th and 8th centuries, it had revived by the 10th, when much of the empire had been taken back from the Slavs and the Muslims. In this city of contrasts one was best off being a member of the ruling Greek families. Author Richard Erdoes describes Constantinople as a city of “mud and stink” and of “gold and silk”—clearly the 10th-century counterpart of New York City.

From slavs to slaves

By the end of the 10th century, this part of the



world was entering a period of relative calm. Great Britain and Europe had been overrun for several centuries by Vikings from the north, Hungarians from the east, and Arabs from the Middle East. The Arabs claimed good chunks of Spain and Africa between 711 and the 10th century; the Vikings had taken over parts of England, Ireland, and France; and by 1000 Leif Ericsson had arrived at L’Anse-aux-Meadows, Newfoundland.

Now raids in Europe were falling off: Vikings and Hungarians



The narthex and nave of Saint-Philibert de Tournus (950–1030) in Burgundy (far left) represent the brick-based Lombardic architecture, while its ambulatory and east end (below) is northern frame-and-fill ashlar construction. The 10th-century residential donjon at Loches in the Loire Valley (near left) is white ashlar with thick mortar.

were even converting to Christianity. And the economic climate was improving. Agricultural inventions such as the share plow, the horseshoe, and the shoulder harness assured an increase in crops. Surplus goods spurred trade, although “slaves were the export commodity of western Europe,” notes historian Patrick Geary. Germans captured Slavs to sell (hence the name), but even the Welsh were sold as slaves by the Anglo-Saxons. Bristol was a major slave port, although Dublin became the largest slave market in western Europe right after the millennium. Verdun had a eunuch “factory,” where boys were castrated before being sold as attendants to Islamic and Byzantine courts. Small wonder that serfdom, part of the hierarchical feudal system, was a step up, since it gave minimal citizenship rights to the underclass.

***N*otable building types**

Churches, monasteries, mosques, and synagogues were social, cultural, and physical anchors in a changing world. Although architects (usually known as master masons) were involved in the design of castles, military fortresses, and cities, the dominant building type was the religious structure. Still, the real building boom was to occur not in the 10th century, but after the millennium. The monk and historian Rodulfus Glaber (ca. 985–1046) noted about this postmillennial period: “It was as if the whole world were shaking itself free, shrugging off the burden of the past, and cladding itself everywhere in a white mantle of churches.”

Was this a time when the cathedrals actually were white? Opinions differ. C. Edson Armi, an architectural historian, surmises that many of the churches in the northern part of France actually were plastered or stuccoed white, while others may have been light-colored ashlar. This northern European architecture of large, dressed stone construction, in which horizontal timber roofs covered the nave and groined vaults covered the side aisles, was quite different from the brick-based architecture that had taken form in Lombardy in northern Italy. The architecture of the Lombards featured barrel-vaulted ceilings that increased the vertical sense of space and continuous horizontal brick courses with no quoining and placed little emphasis on classical detailing and ornament. “It was almost totally abstract,” Armi points out. “It presented a new architecture.”

We can see that architecture of the period was not homogeneous. As Spiro Kostof put it, “There is no typical Romanesque church.” The Early Romanesque style varied from region to region and often contained traces



and elements of past architecture, including early Christian basilicas, classical columns, Roman arches and arcades, Carolingian westworks (the developed west end of a church evolving in Charlemagne’s reign), and Byzantine decorative motifs.

***A*rchitects on the go**

If we like to think architects only really started to travel in the 20th century, we should look at their confrères a thousand years ago. Masons from Lombardy made their brick-based architecture international, quickly spreading it to southern France and Catalonia. They were “responsible for

The prayer hall of the Great Mosque at Cordoba (right), which was expanded in the 10th century, has double tiers of horseshoe-shaped arches with polychrome voussoirs influenced by early Christian and late antique design. St. Panteleon in Cologne (966–980) (below) is an Ottonian form of Romanesque architecture with double-tower westwork.



the most important buildings being constructed at the time in Southern Europe,” states Armi.

Masons, according to Spiro Kostof, moved to the location and set up shop during the building process. Drawings à la Vitruvius seem not to have been used. In spite of the survival of the plan of the Carolingian monastery of St. Gall (ca. 820), it is believed that architects conceived the plans mentally and worked directly on the site.

While little is known about the masons’ education and background in the 10th century, they were thought to have belonged to guilds based on the Roman collegium of late antiquity. When completing their training, they were called “masters” or “magistri.” In all parts of Europe, positions were hereditary, passed down from generation to generation. Not until the 13th century did new blood enter the guilds through apprenticeship.

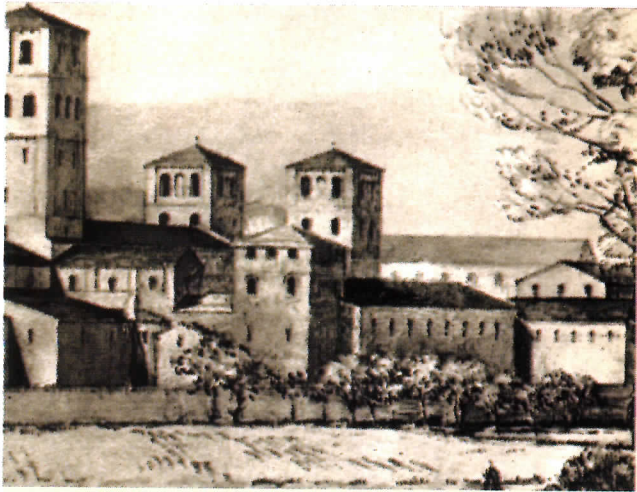
Before the 11th century, the architects’ contributions remained anonymous. After the millennium, building credits became more a matter of course: For example, Godwin Gretsyd was listed as the master mason and Leofsi Duddeson as the administrator for the new Westminster Abbey built by Edward the Confessor from 1050–66.

The social rank of the architect seemed to shift upward as well. Before the millennium, masons were thought to come from the lower ranks, Kostof points out. A couple of hundred years later, however, John Harvey notes that architectural design would be clearly the purview of master craftsmen, many of whom were viewed as “gentlemen” or “esquires of minor degree.” By this later period, around 1200, masters were known to be literate, able to design using proportional and geometrical methods, speak French (even when not), have an adequate knowledge of Latin, and be familiar with Vitruvius’ writings.



A brief glance at England

At the time of our tour, fortified towns with gridded plans, dating to Alfred the Great (871–899), dotted pastoral England. Most of the country consisted of farmland and small villages of thatched-roof houses gathered near monasteries and churches. Although many structures were built of wood, stone churches were the norm: Often they tended to imitate timber construction with decorative stone pilasters or feature triangular windowheads. For a while, the country, under the rule of Ethelred the



Saint Michael at Hildesheim (1007-1033) (left below) illustrates the maturation of Ottonian architecture in terms of scale and vaulting, while referencing the polychrome masonry of Charlemagne's Palatine Chapel at Aachen (796-894). The Bodrum Camii or Myrelalon in Constantinople (below) of the early 10th century uses the new cross-in-a-square plan.

water and the mound dispensed with altogether.

A tower, usually stone, called a *donjon* or *keep*, served as a place of refuge when the castle was under attack. Our tour brings us to Loches in the Loire Valley, one of the more architecturally interesting and livable donjons because of the massive scale of the white ashlar stone structure and its thick beds of mortar, not to mention fireplaces on each floor.

Next, we shall head further southeast to Cluny, the Lombard-style Benedictine monastery founded in 910. Rebuilt in 955-81 (known as Cluny II), it would be reconstructed and expanded in 1085-1130 (Cluny III) before ultimately being destroyed in 1798 after the French Revolution.

In 1000 Cluny had already attained a formidable reputation for its reforms (including insisting on celibacy) and for the quality of its architecture and furnishings. Not only was Cluny a religious sanctuary and school for future monks, but also it functioned as a retirement home for the titled, shelter for the homeless, hospital, and hotel for overnight visitors and pilgrims. Besides housing 64 monks, Cluny provided guest accommodations for well-born men and women in two separate dormitories, with attached banks of latrines (quite modern, we understand). Between the two dormitories was a dining hall where both sexes could

Unready, seemed fairly serene. But it would not be for long. The Danes began acting up again in the 990s; by 1013 Sweyn Forkbeard of Denmark would gain control of the England, followed by his son Canute.

***T*he *longue durée* in France**

No wonder fortified castles, as well as *burgs*, administrative protected settlements, did not go out of style. Depending on the region, they assumed varying forms, with interesting spatial approaches toward the problem of security. For example, a castle fortification of wood and earth might include a tower built on a mound (called a *motte*), girded by a palisade, and then surrounded by a ditch (or moat), with the entire assemblage set in an open area (called a *bailey*). Sometimes the moat was filled with



ARCHITECTURE IN THE YEAR 1000 *continued from page 000*

mingle over meat and wine. (Monks, who were vegans, ate apart.) True, on our tour, we wouldn't be able to mix much with the monks in their cloister, but then it might have been just as well. They were required to bathe only twice a year, on the major holidays.

This veritable Getty Center of religious practice contained tapestries, carpets, and metal objects that gave the place a luxurious quality some say was rare even for rich landowners. The church and dormitories had large glass windows, and under Odilo, made abbot in 994, a stone vault replaced the timber roof in the church.

While we are in the Burgundy area, we should stop to see the church of Saint-Philibert de Tournus (950–1030), since it represents a hybrid of the northern frame-and-fill ashlar construction and the southern brick-based one. The northern style is seen in the radiating apses on the east end, and was built, according to Armi, by a Loire Valley atelier. The narthex and nave on the other hand illustrate the powerful craftsmanship of the brick-based vocabulary.

A quick sojourn in the Holy Roman Empire

We still have the German part of the Holy Roman Empire to investigate, where culling of parts and pieces of architecture from late antiquity, early Christian, Carolingian, Byzantine, and Lombardic structures gave the "Ottonian" style a particular character. The Carolingian influence shows up in the westwork at Saint Pantaleon in Cologne (966–980), and if we were to linger here for a few years, or better, decades, we could see St. Michael's of Hildesheim going up from 1007 to 1033. It is considered one of the most impressive early-11th-century churches because of its scale and dramatic vaulting, not to mention the striking polychrome masonry evocative of Charlemagne's Palatine Chapel at Aachen (796–804).

Footloose in Spain

Normally a pilgrimage to the renowned Santiago de Compostelo in the northeast of Spain is de rigueur. But the year of our tour, 1000, may not be a good time to go. Santiago burned down in a raid by the infamous

Muslim Al-Mansour in 997. Sancho the Great was attempting to bring it back, but rebuilding wouldn't start until 1078. Meanwhile, we're too early for the Crusades, since the first, to Jerusalem, is still 95 years away.

Pilgrimages would have been an intense way to get the sense of the people. As architectural historian Robert Ousterhout explains, a whole raft of men and women would trek by foot and horse and/or boat to Santiago, Rome, or Jerusalem. They included everyone from the son of a local aristocrat who had committed some foul deed to an invalid in search of a miraculous cure. Accommodations were often crowded in the monasteries, hostleries, and boarding houses found en route.

Instead of Santiago, we'll head straight for Cordoba, the center of Islamic Spain. The Great Mosque, built in the late 8th century, had attained an awe-inspiring grandeur following its second expansion in the 10th century. Architectural historian Jerrilynn Dodds commends the prayer hall's "startling originality," where columns "explode into a labyrinthine elevation of superimposed horseshoe shaped arches."

As Dodds adds, the original mosque featured a good degree of *spolia*, recycled architectural elements found in churches and in Roman buildings. Even the horseshoe arch was influenced by late Roman Christian architecture in Spain. The alternating brick and stone was fashioned of local materials to suggest the richness of marble revetment, or veneer, found in late antique buildings as well as in the Dome of the Rock in Jerusalem and the Great Mosque of Damascus. Mosaics from Byzantium, a gift of the emperor, Nicephoras Phocas, were to infuse a brilliant gleam to the large *mihrab*, or Mecca-facing prayer niche, added to the Great Mosque in the late 10th century.

Architects of the mosque were members of court, and, at times, court eunuchs, says Dodds. Cordoba, in fact, could maintain an atelier, because the architects were always working on official buildings. The master craftspeople and artisans received a special education in court: "Architecture was a community service—as well as part of the myth-making process," she says.

In this final year of the 10th century, we should also stop by the recently completed and very spectacular palace of the Medinat-al-Zahra, built outside Cordoba. (We must see it now for it would be destroyed by fire in 1010). Organized as discrete units on layered terraces of a hill and placed around courtyards, the Islamic palace featured lavish marble and mosaic surfaces and pavings not unlike the Great Palace of Byzantine Emperors at Constantinople.

When Constantinople was not Istanbul

Moving on to the diverse and teeming city of Constantinople, where Basil II (976–1025) was ensconced in the Great Palace, we find a city within a city filled with sumptuous gold and marble. Searching out the new architecture of the period, we shall visit the U-shaped palace of the former emperor Romanos I Lekapenos, dating to 920. Built atop the fifth-century rotunda of the late antique Myrelaion palace, this structure (converted to a monastery by 1000) adjoined a Romanos-era burial church. Architectural historian Cecil

Striker has called it the "quintessence" of new church design, owing to the distinction between the support elements and the enclosing walls and the unprecedented semi-circular buttresses. Both Romanos'

The church of Saint-Martin-du-Canigou, (1001–09) north of the Pyrenees, is a prime example of the Lombardic style.

(continued on page 211)



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FAR EASTERN PLAZA
Taipei, Taiwan

*Architects: P & T Architects and
Engineers Ltd., Hong Kong and
C.Y. Lee Partners, Taiwan*

UNITIZED CURTAIN WALL SYSTEM



ENTERTAINMENT BUILDING
Hong Kong, China

*Architect: P & T Architects and Engineers Ltd.,
Hong Kong*

CUSTOM I600 WALL SYSTEM WITH ORNAMENTAL
CUSTOM COVERS AND CONCEALED VENTS
CIRCLE 43 ON INQUIRY CARD

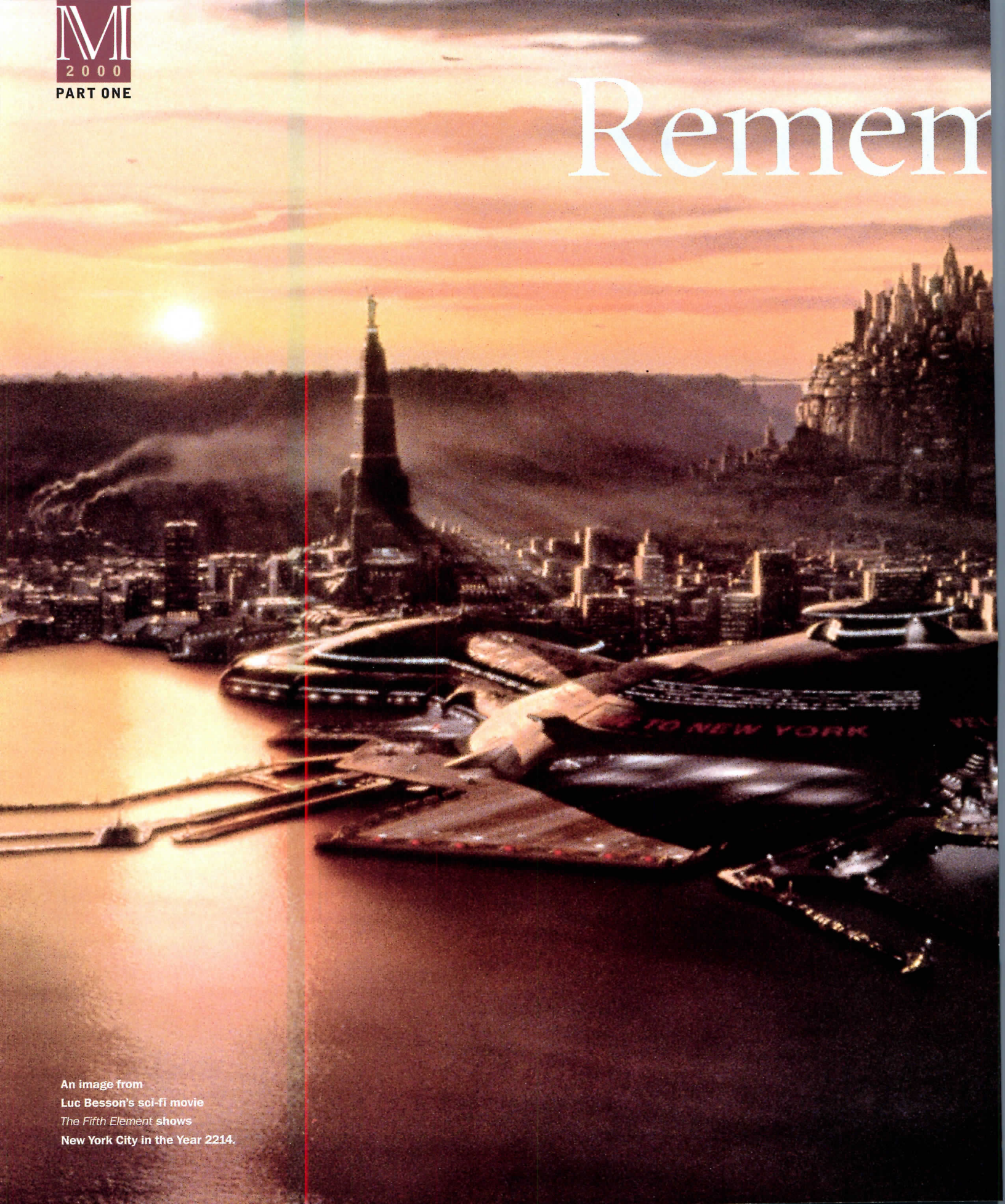


NTT SHINJUKU HEAD OFFICE BUILDING
Tokyo, Japan

*Design Architect: Cesar Pelli & Associates Inc. Architects,
New Haven, Connecticut, USA
Architect-of-Record: Yamashita Sekkei, Tokyo, Japan*

UNITIZED CURTAIN WALL SYSTEM WITH CURVED ELEMENTS

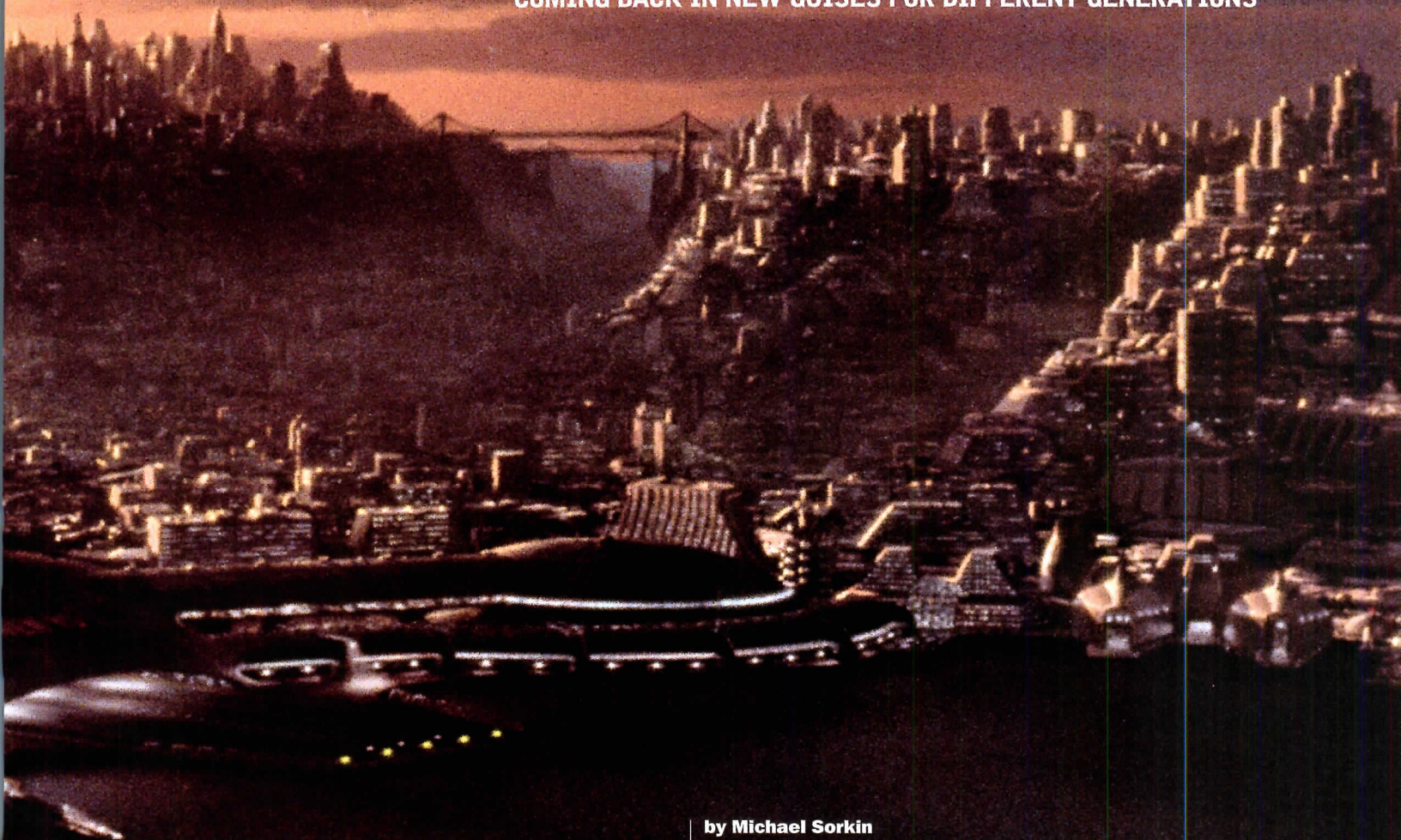
Remem



An image from
Luc Besson's sci-fi movie
The Fifth Element shows
New York City in the Year 2214.

Powering the Future

OLD VISIONS OF THE FUTURE HAVE A WAY OF BEING RECYCLED,
COMING BACK IN NEW GUISES FOR DIFFERENT GENERATIONS



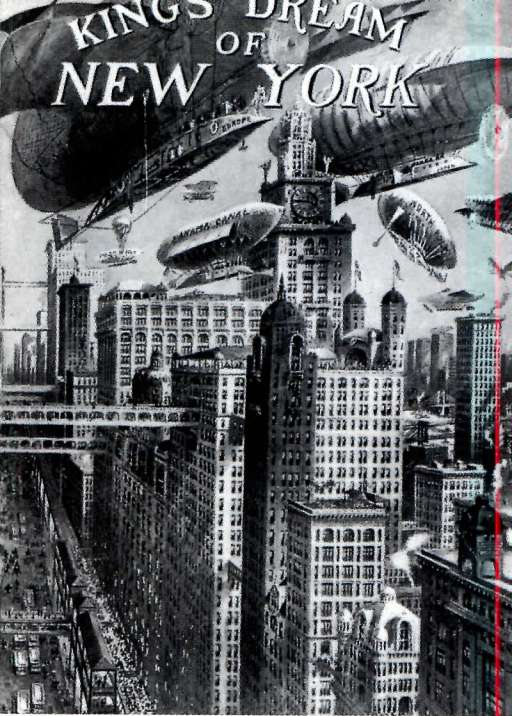
by Michael Sorkin

I was sitting in a darkened room earlier this year in London, taking in slides at a conference on the legacy of Modernist urbanism. I love those happy views of that old bright future: Soviet planner Nikolai Miliutin's linear cities; Radburn, New Jersey's greenways; Berthold Lubetkin's heroic failure at the proposed new town of Peterlee, England. All suggest how far we've come. Or do they? The slide that was projected most often at the conference was that familiar perspective sketch of Le Corbusier's City of Three Million, the one with those huge cruciform slabs receding on down the line.

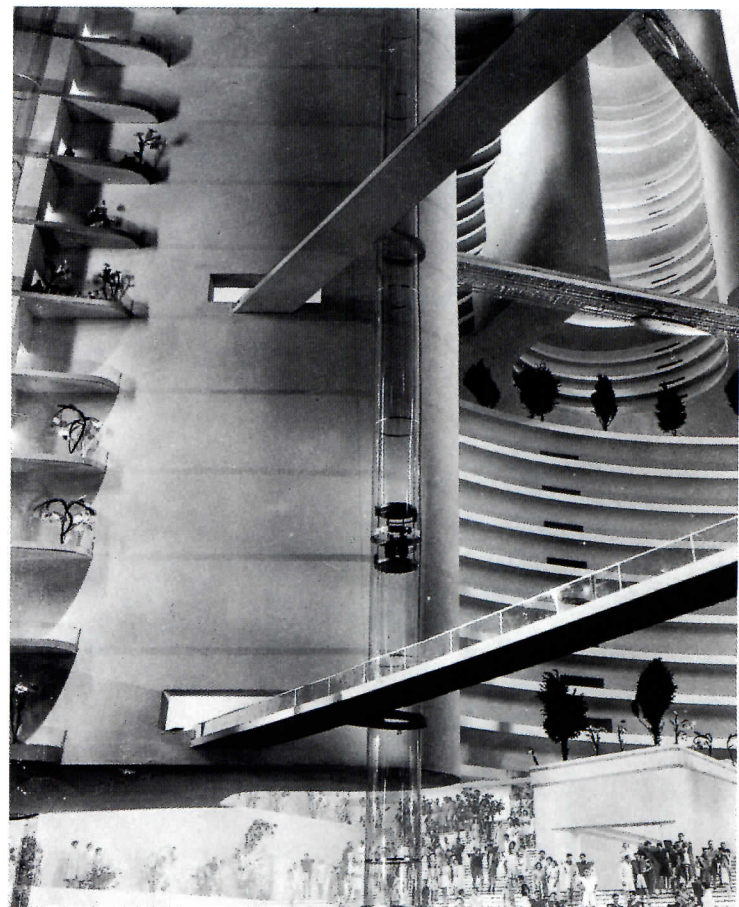
There often is a recurrent image at architectural conferences, the designated objective correlative. It figured that the Corbusian city, modern architecture's official dystopia—Pruitt Igoe succumbing to the dynamite—would be on the screen. But, as I stared at the sketch for the eighth time that afternoon, the drawing morphed: The slabs became Las

Vegas; the point vanished in a blaze of light at the end of the Strip. The big new hotels—Bellagio, the Venetian, the Paris, the Monte Carlo, the Mirage—are sized, proportioned, and positioned exactly like the towers in the City of Three Million.

Everybody's future, it seems, is somebody else's past. In the 1936 William Menzies film *Things to Come* there's an interior that's a dead ringer for John Portman's Marriott Hotel in Atlanta. This image of endless tiers (never mind the glass elevators) is a recurring trope in the utopia of grandiosity. Perhaps the most sublime version of the image is from *Close Encounters of the Third Kind*. In a marketing strategy of unusual canniness, the film was released for a second time—several years after its debut—with a slightly elaborated ending. The original finishes with wispy Spielbergian homunculi exiting their mothership to commune with earthlings. In the second version, we're invited indoors. And where do we



Both the movie *Metropolis* (this page) and the popular “King’s Views” of New York (opposite, top right) depict cities where layers of transportation take center stage, turning people and vehicles into merely rapidly moving particles.



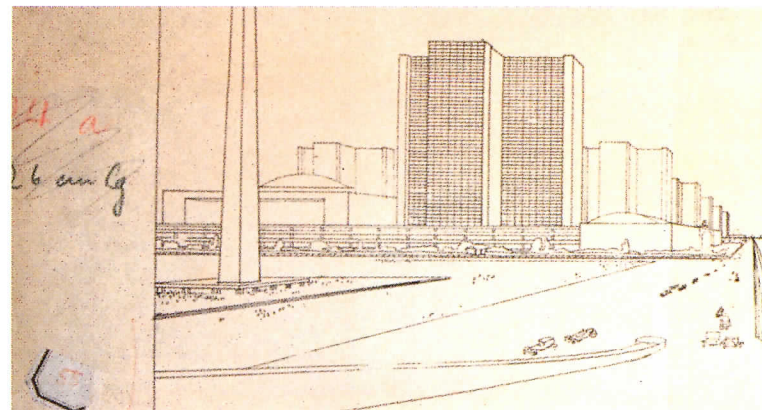
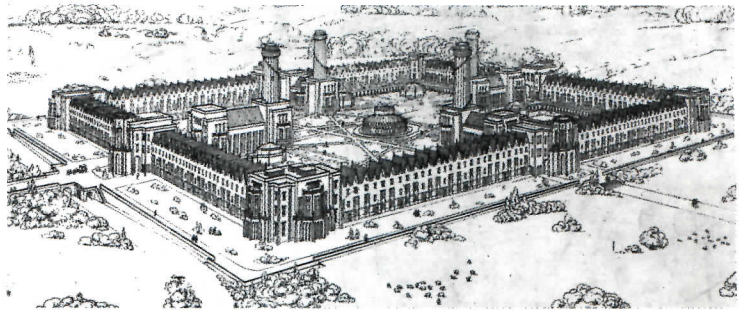
wind up? At the Marriott! Tiers of adorable aliens languidly wave from their ad infinitum balconies. The whole damn hotel flies!

A recent look backwards at a variety of futuristic images reveals remarkable consistency and an organization into four more or less clear categories. The first of these—the Marriott/*Close Encounters* case—is Breathless Interiority, the world indoors. Gigantophilia is an ancient hedge against the future—think of the Egyptians, more successful than anyone so far in predicting the landscape to come via building monuments so immense they’d be part of it forever. However, the mastery of huge interior spaces awaited later technological developments. If other eras provide precedent for Portman’s atrium tiers (think Roman Coliseum), the Gothic prefigures their enclosure. Only now have we more or less caught up in construction with a physics intuitively mastered a thousand years ago.

From the big room with glass to the sunless city

The modernization of the Breathless Interior begins with Etienne Louis Boullée, whose Cenotaph for Newton was a spherical container for the entire universe. Later, 19th-century engineers jumped the big room in scale and added glass. Boullée’s 18th-century Cenotaph (or Chartres Cathedral, for that matter) are projection devices, beaming the worshiper outward. As worship became secular, nature stood in for God. The great greenhouses (the tropics in London) flourished, beginning a line that runs through Bucky Fuller (ready to dome Manhattan), the Biosphere (the world under glass, the complete system), and all those images of space stations with self-contained, oxygen-pumping meadows and gurgling brooks in high orbit. This is the early work of virtual travel, the beginning of the end of a reliable idea of place.

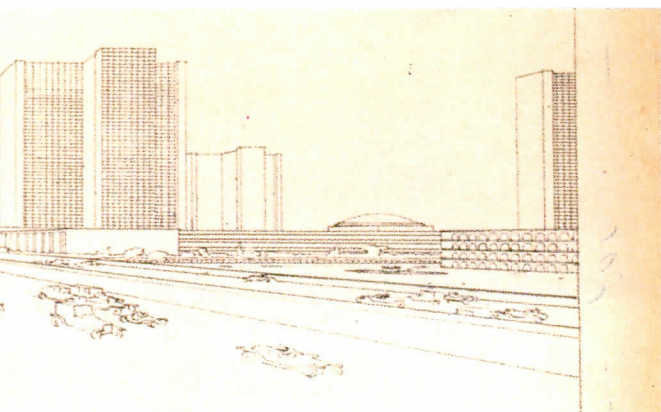
Of course, every trope turns tragic. Fritz Lang’s film *Metropolis* depicts an entirely indoor city, a nightmare culture, located in a sunless underground created for worker ants. In *Blade Runner* the city of the future is cast in perpetual gloom under toxic squalls. For Nazi Germany, Albert Speer imagined a monster dome where the entire nation might stand in one room at attention. *Star Wars*—with its corps of injection-molded Nazis—takes an expansive view of “space” itself, while keeping its interiors almost domestic. To be sure, Darth Vader has a generous office





A “breathless interior” from the film *Things To Come* (opposite, top left); Robert Owen’s utopian town of New

Harmony, Indiana, as designed by Stedman Whitwell (opposite, middle); Le Corbusier’s City of Three Million (below).



with a fabulous deep-space view, but in general, the fathership seems to be all corridors—an impression that cuts two ways, depending on whether your model is the liner (glorious! modern!) or the labyrinth (trapped, disorienting).

Disjunctive technology—stormtroopers, millennia hence, shooting at each other with old-fashioned ray-pistols—is a second category of fictive futures. My own first serious experience with such projective mechanics came from the film *20,000 Leagues Under the Sea*, memorable for Captain Nemo’s iron-plated submarine with its red plush Edwardian brothel interior. The Nautilus was a prescient depiction of postmodernity, the disjunction of style and function. And, like the best of science fiction, it seems retrospectively visionary: The technology predicted (not quite possible then) has now already arrived. *Star Trek* is the B version, with its Kelvinator spaceship, toggle switches, sliding doors, and pajamas as the eternal daywear of the future—the Enterprise as a 1950s appliance moving at warp speed.

By the last turn of the century, transport—accelerated and multiplied by cars, trains, and flight—had stolen the featured role in the city,

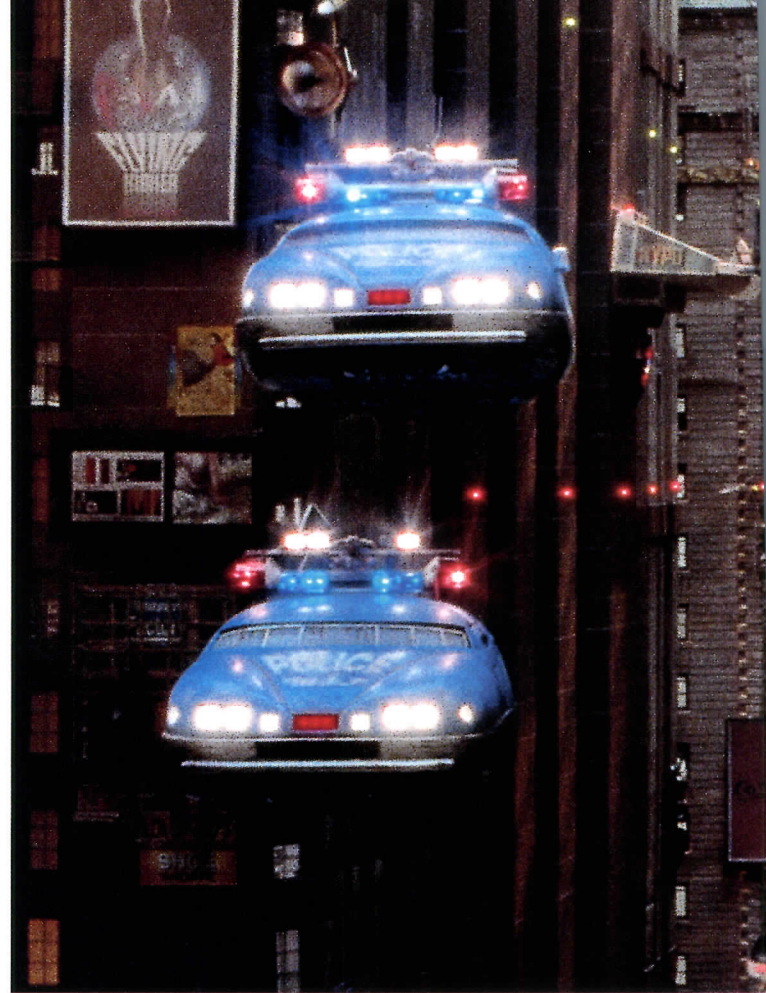
once played by the citizenry. Visions of the future could be measured in laminations, a fantasy that reached a high point in those wonderful “King’s Views” of the next Manhattan. At every level of the towering metropolis are flows of another medium: Cars, aircraft, trollies, pedestrians, bikes, name it.

Let it flow: Levitating taxis and particles in motion

Laminar flow is the third recurring dream of modernity. From the City of Three Million to Hugh Ferriss’ chiaroscuro Manhattan, from the tiny zooming cars at the Futurama to the three-axis taxis in the movie *The Fifth Element*, the little particles are in the foreground, representing both laminar flow—the multitude of means—and, by extension, their rigorous separation. Functional segregation is one of modernity’s obsessions, projected onto many a version of its dreamed-for future and reshaping the globe. Shanghai—to cite one example—is going through a spasm of lamination, building elevated roads and subways like crazy, caught in the same brief pause between pristine vision and the law of unintended but completely predictable consequence. Breaking the boundaries of gravity is the ultimate fantasy of lamination: Once an orbit is self-sustaining, you’re free of the ground. No wonder that visionaries from legendary Lebbeus Woods to Hollywood “visual futurist” Syd Meade aspire to a true hyperlamination in which gravity is brushed entirely aside, letting us float like angels.

Every era has its designated city of the future. Successively, New York, Los Angeles, Phoenix, Vegas, to the whole Pacific Rim have held the limelight. These images of the city are invariably about being big and being fast, but during the past half century, there’s been a shift from the vertical (towers in the park) to the lateral (strip centers everywhere). The high-Modernist future was strongly vertical, constructed in layers just like culture, producing classes of motion. The horizontalization of space is the democratic American contribution, no longer measuring size in depth but in extent. But nobody’s images can keep up with the pace of sprawl’s need for supply. The machine is far ahead of us. No wonder there are so many movies about weird suburbs these days.

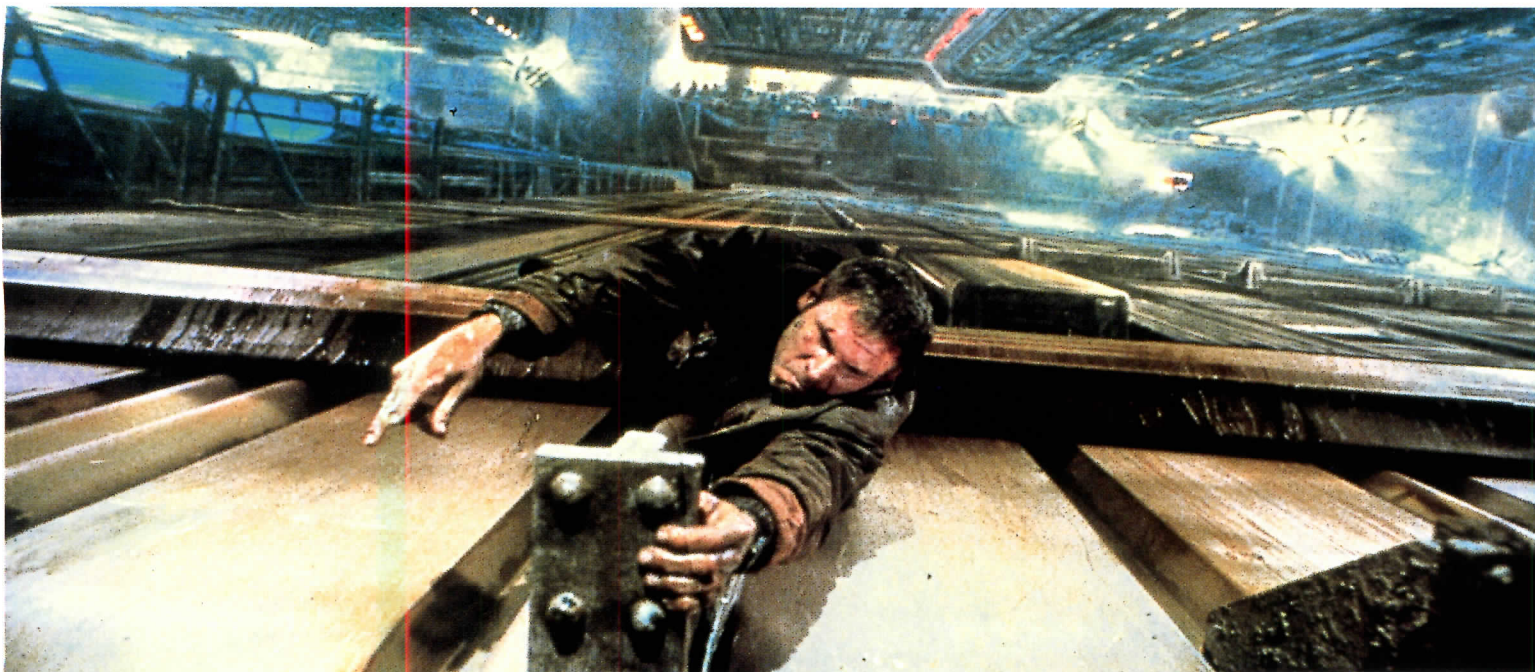
The fourth and final trope of futuristic thinking is the line, the most refined version of the infinite horizontal. The Great Wall of China is



Science-fiction films such as *The Fifth Element* (above), *Blade Runner* (below), and *The Matrix* (opposite, bottom) offer

bleak views of the future. They depict cities that are congested with all kinds of traffic or jerry-built

from pieces of decaying structures. The simulated environments hide the fact that the real world has been ruined.



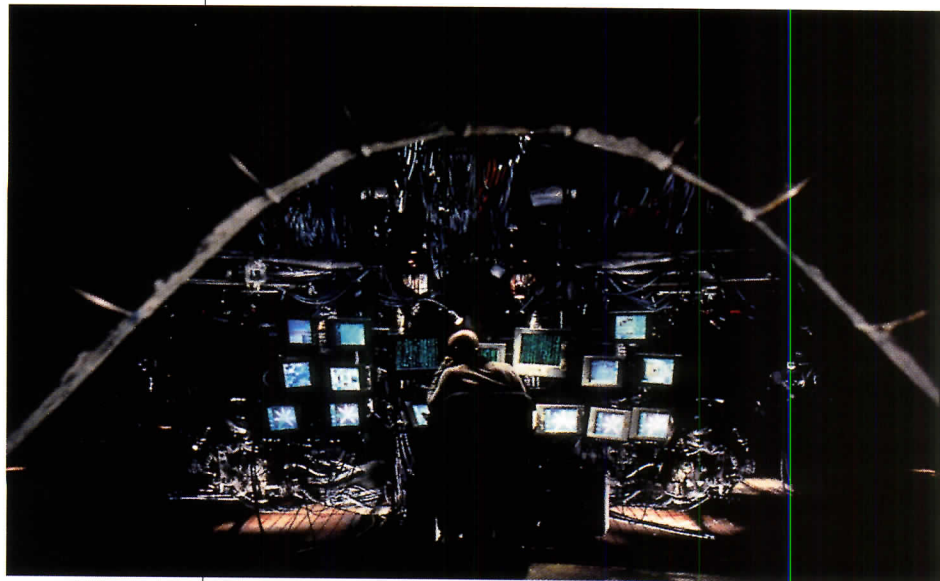


the model for such constructions, a feature that is the “only man-made structure observable from space” (a boast that is not strictly speaking accurate, but nevertheless is plain in its meaning). Such linearities have a long life in science fiction as well as in the works of such great 19th-century imagineers as *Roadtown* author Edgar Chambless and tramway promoter Arturo Soria y Mata and—the heir—Corb. The horizontal has always struck an egalitarian chord: Centerless equality based on continuous access by speed instead of the multiplying hierarchy of the vertical. The architecture of pure sinew reduces collective life to rapid motion. Such schemes drew conceptual inspiration from the laying of the great transoceanic cables that limned lines of communication as world structure. The Interstate is the ultimate American linear city, a living river where millions drift in their Winnebagos (self-ownership of the particles), stopping only at the service pods at every cloverleaf—the urbanism of perfect entropy.

We like science fiction because it makes what’s normal extreme. Excessive perfection is extremely scary; think of *The Truman Show*, the latest in a tradition that includes *The Prisoner*, the late-1960s British television show that had Portmerion in the Seaside role. I grew up in the suburbs, and they are still suffused with that nameless dread. In the wake of suburban high school shootings and child beauty-queen slayings, some people are wondering if

the suburbs themselves—and the anomie they breed—aren’t at least partly to blame. Stephen King has moved into Ozzie and Harriet’s house and, although things look much the same, there’s a strange gleam in little Ricky’s eye and a funny bulge under his long black trench coat.

The images recirculate like the return of the repressed. We are back in the Marriott again and again. We are condemned, it seems, endlessly to repeat the future. ■



Ancient history, or ready for a comeback

A look back at **OLD OR**

from ARCHITECTURAL RECORD's

M
2000

PART ONE

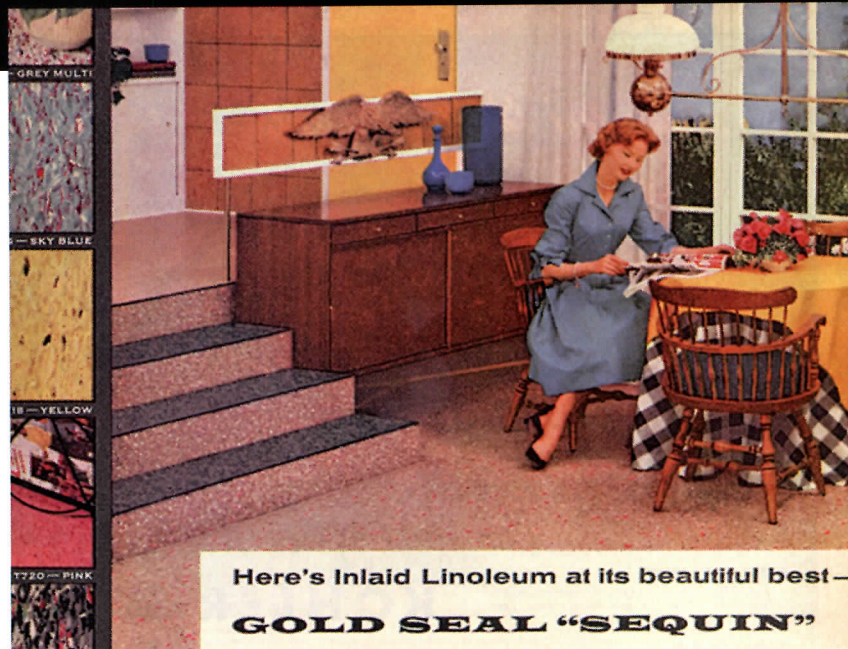
"Nature made asbestos; Keasbey & Mattison has made it to serve mankind . . . Pure White Lead for every surface . . . Lustraglass provides plenty of ultraviolet rays . . ."

Who in the world would specify products advertised like those described above? You did. Or rather, members of your profession once did. As we turn the page to a new century and millennium, it's worthwhile to take a moment to literally look back at the pages of ARCHITECTURAL RECORD, particularly the advertisements, and at the evolution of how architects have used and specified architectural products through the years.

Looking back at RECORD's advertisements shows that many once-popular products have lost their appeal. Products such as lead paint, asbestos, and freon are history because of health and environmental concerns, while zepelin doors, structural glass, and prismatic glass have disappeared from today's spec sheets because of changing tastes and needs.

Who can say what products we will look back on with amazement with the 20-20 hindsight of the next millennium?

—Rita F. Catinella, Products Editor



Here's Inlaid Linoleum at its beautiful best —
GOLD SEAL "SEQUIN"

Linoleum During the period between the two world wars, linoleum became an important economic player in the floor-coverings industry. However, after World War II, vinyl tiles usurped linoleum's share of the market.



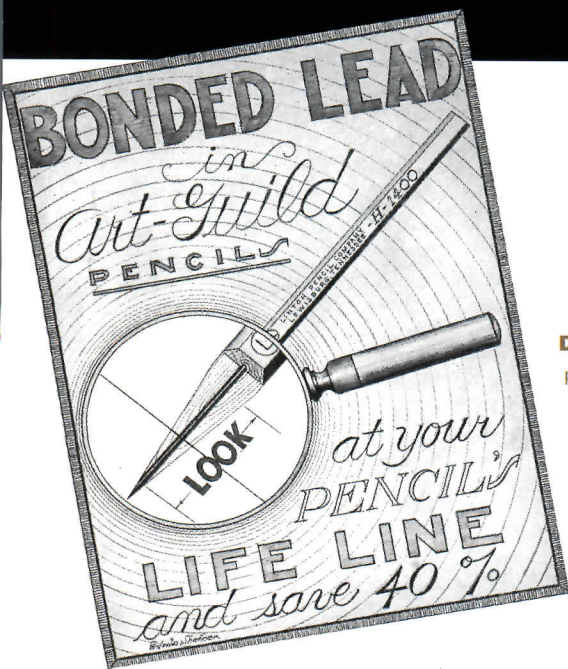
Drafting tables Standard 20th-century architectural tools, such as the drafting table and the T-square, have given way to an array of computer drawing programs.



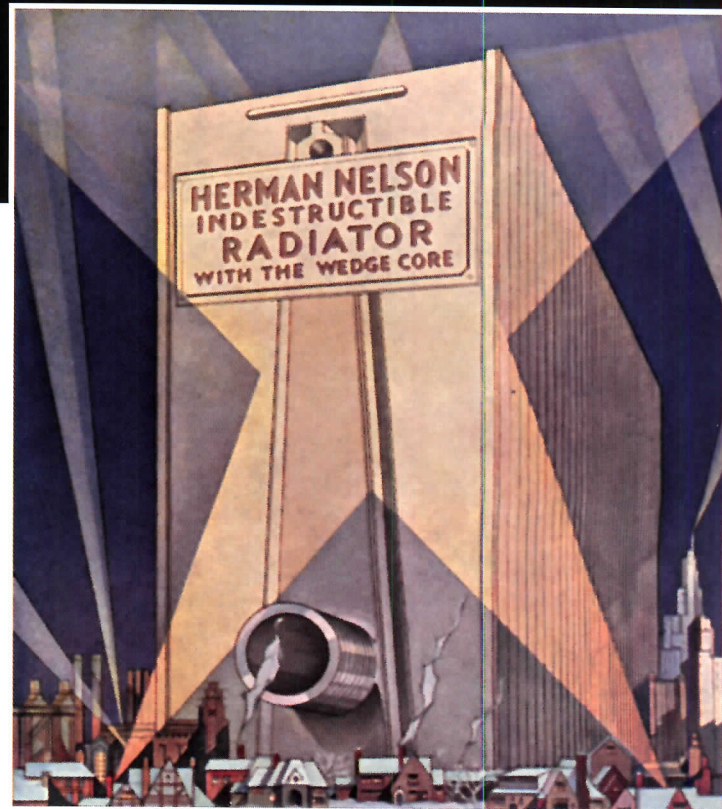
Terra cotta After World War II, ceramic veneer often replaced terra cotta in new construction.

EXTINCT BUILDING PRODUCTS

past century

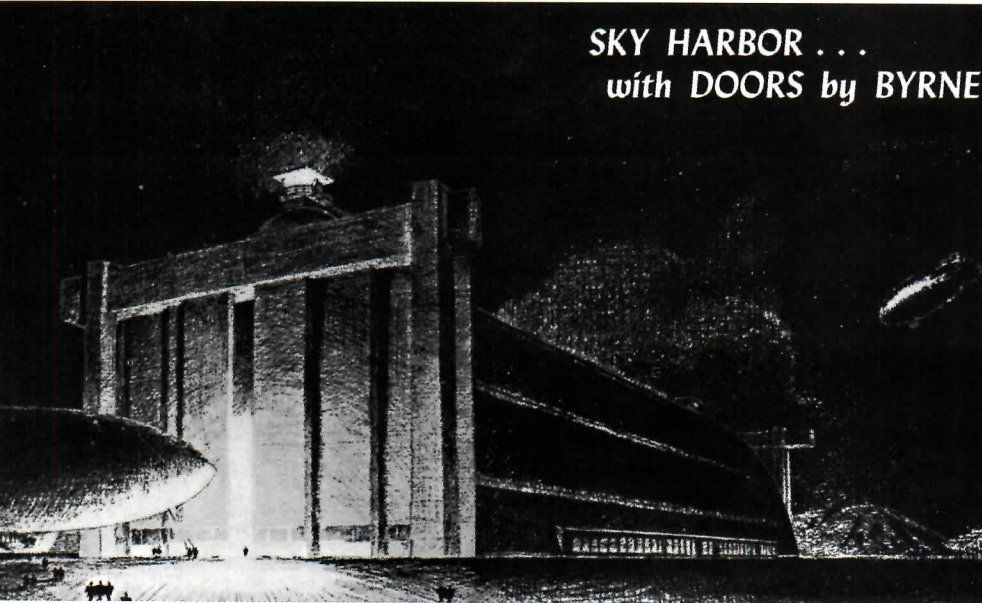


Drawing pencils While the phrase “back to the drawing board” is still used today, its meaning is often metaphorical in a digital age. A few years ago, drawing pencils, such as those from The Linton Pencil Co., were the tools used to prepare and rework plans.



Radiator grilles Art Deco ads, such as this radiator grille advertisement from the 1930s, emphasize the graphic style of the decade.

SKY HARBOR . . .
with DOORS by BYRNE



Zeppelin doors This two-page spread advertisement for 12-story-high hangar doors for zeppelins appeared in RECORD in 1930.

*This is the tale
any house can tell
when its health
is protected by
Cork*



For more information
write to
The Cork Tile Co.
1000 N. 1st St.
St. Louis, Mo.
63102



Cork tile Ground cork bark was used to manufacture cork floor and wall tiles, as well as a variety of cork insulation and composition products.

OLD BUILDING PRODUCTS.....

Once-popular products that are gone, not forgotten

BUILD WITH GLASS—TODAY

VITROLITE
Colorful Structural Glass



Freon refrigerants are on their way out, as alternatives that are kinder to the environment have been developed.



FREON

REG. U. S. PAT. OFF.

safe refrigerants



Structural glass was widely used during the 1930s for shop fronts, service stations, and movie theaters.

THE LUSTRON HOME—THE DREAM HOUSE OF THE FUTURE THAT WASN'T

In July 1943, as America awaited the end of World War II and the return of hundreds of thousands of GI's who would be looking for a place to settle down, RECORD's editor in chief, Kenneth Kingsley Stowell, predicted for his readers the attributes the house-of-the-future would require to meet the needs of our

nation for the next decade:

"The house-of-the-future will perform the same functions as the house-of-the-past and the house-of-the-present . . . to provide shelter, privacy, comfort, and convenience for each member of the family, and for the family as a whole . . . Consistent with the history of architectural and building progress, advantage will be taken of opportunities afforded by new materials and new structural methods to produce better houses for less money . . ."

One material that would help achieve that goal was porcelain enamel, a nonporous composite created when a thin coating of glass fuses to metal at extremely high temperatures. Also known as vitreous enamel, porcelain enamel appeared on several building types



at the time, most notably gas stations. Between 1947 and 1950 the Lustron Corporation housing venture developed and sold about 2,500 prefabricated houses made almost entirely of porcelain-enamel components. Touted as America's first truly volume-produced, low-cost home, the Lustron Home was intended to change how America would live.

Lustron's creator, Carl Strandlund, planned to have entire houses turned out and ready for shipment from the company's 1 mil-

lion-square-foot Ohio plant, at a rate of more than 40,000 a year.

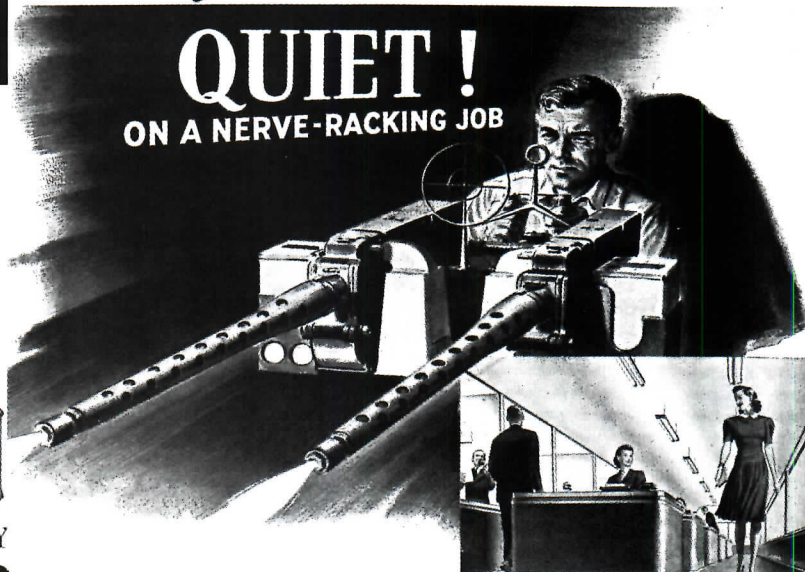
Claimed to be fireproof, decay proof, and vermin proof, the only nonsteel parts of the home were the window frames, floor tiles, and concrete foundations. Special trailers carried more than 3,000 unassembled parts per house, to be constructed into a home in 150 hours.

The Lustron Home's brochure comforted readers concerned with issues such as the effect of lightning

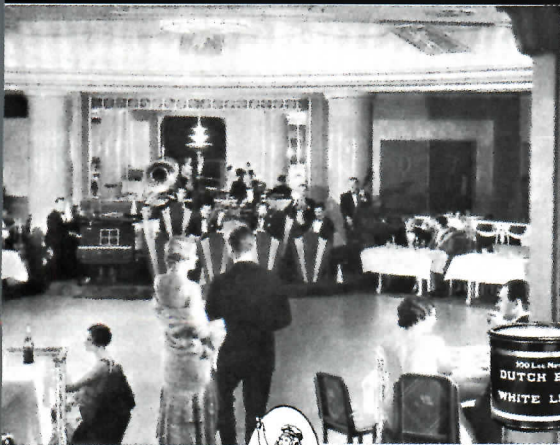


Looking ahead with Asbestos

QUIET!
ON A NERVE-RACKING JOB



Asbestos Asbestos was used in a variety of products for many years before its potential harm was noticed.



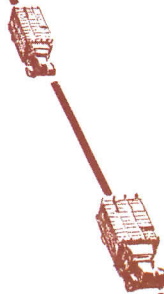
**DUTCH BOY
WHITE LEAD**

"Save the surface and you save all" — *Age of Steel*

Lead paint 1930s ads touted this product's durability, washability, and adaptability. Architects today help specify ways to clean up the toxic residue.

(the house was claimed to be a "self-contained lightning rod"); television and radio reception (the steel structure dissipated static electricity); or upkeep (soap, water, and a damp cloth). The floor plan featured 1,000 square feet of space and five standard rooms, but had no basement or attic. Other features included radiant heat, as well as a variety of colors, including yellow, gray, blue, and tan.

Despite initial interest, the Lustron Corp. faced severe financial problems, mainly due to the production line's inability to produce the 50 homes a day necessary to break even on a \$15.5 million government loan. Notwithstanding a last-ditch effort to increase productivity, the government ordered foreclosure action against Lustron in 1950—stopping production and one man's dream of revolutionizing the homes of tomorrow.



You need never be caught short of
PARTITION TILE
when you use
GYPSTEEL



Gypsum blocks and tiles

Shown in this 1930 advertisement for Structural Gypsum Corporation, gypsum blocks and tiles are no longer produced in the U.S.

GOING, GOING, GONE

Several of the products illustrated in these advertisements are already gone or are nearly out of production in the United States. Other outdated architectural building products that appeared in RECORD but are not illustrated here include:

- Old-growth timber
- Coal heating
- Ultraviolet ray window glass
- Cast-iron facades
- Typewriters
- Prismatic glass
- Wrought-iron facades
- Rotary phones

Digital Visions:

by B.J. Novitski

The unbuilt works of famous architects would reveal much about the designer and the times in which he or she lived. How would the built environment look if it included Le Corbusier's workman's villas or Frank Lloyd Wright's mile-high skyscraper? What might have been constructed from the sketches of Antonio Sant'Elia, Iakov Chernikov, or many others whose final visions can only be imagined?

In recent years, academics have explored these questions through computer modeling. Based on often sketchy documentation, the near-photographic renderings produced offer fresh material that may further our understanding of the creative minds of the masters. But how do we distinguish between what the master architect intended and what the reconstructor had to invent to compensate for a lack of detail in the original sketches? Is there a danger that an impres-

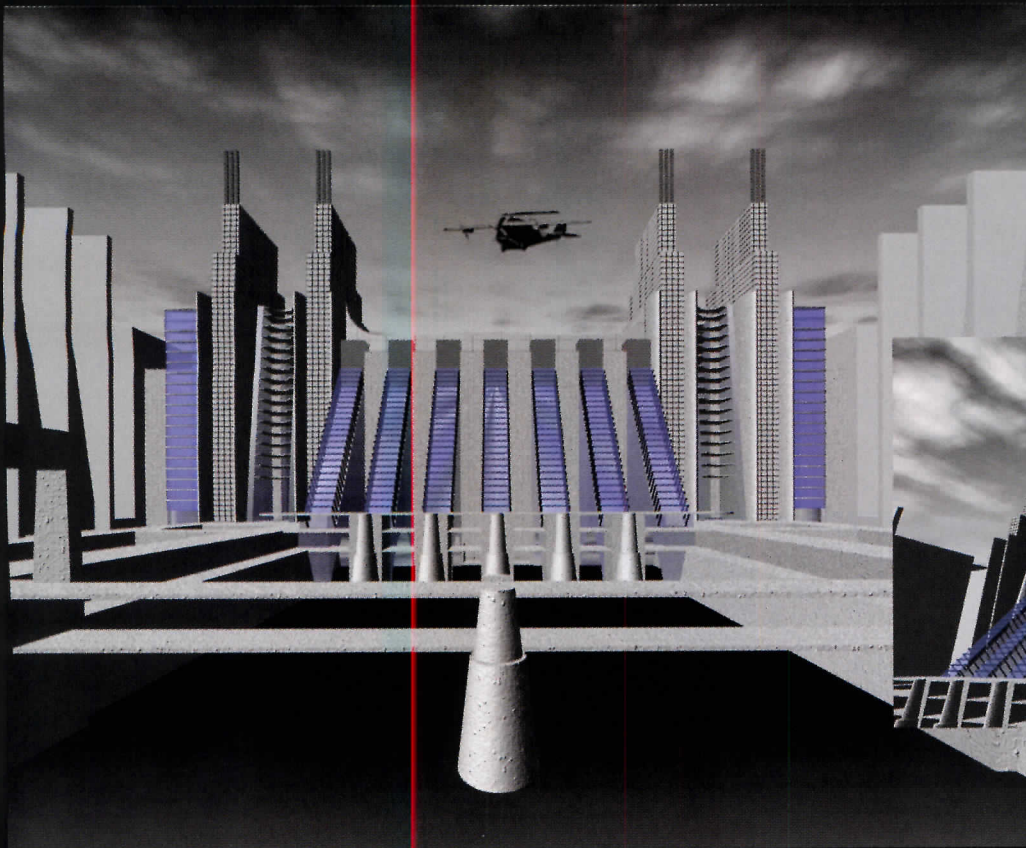
Based on Rendering Real & Imagined Images, 1998 Rockport Publishers, by B.J. Novitski, a contributing editor to ARCHITECTURAL RECORD.

sion of authenticity could give an erroneous twist to our interpretation of history?

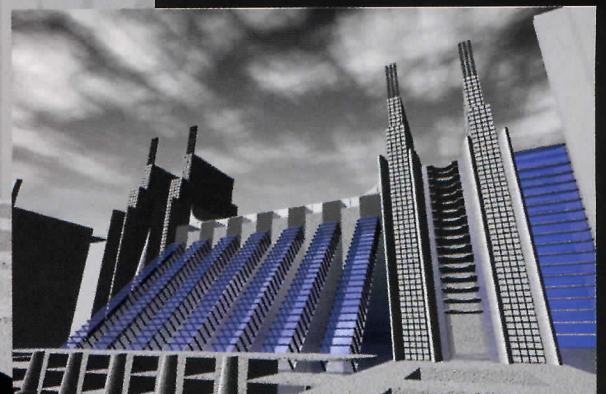
Modern reconstructors can never be certain that they are recreating the same building that the master had envisioned or that might have evolved during design development. So viewers must be aware that some of what they see is a modern fabrication, albeit an educated one.

The caution with which we approach these simulated images recalls the ambivalence that greets each modern attempt to construct real buildings from old drawings. For example, construction of several buildings from the drawings of California architect Bernard Maybeck, who designed the town of Brookings, Oregon, around 1915, is now being planned. Most of his town planning and buildings were never executed, although some were built and subsequently destroyed. Now, William Buchanan, president of Harbor Construction in Brookings, is dusting off Maybeck's drawings and preparing to break ground.

Maybeck probably did not expect to exercise much direct supervision during construction, so his drawings and specifications were highly



This imaginary station for airplanes and trains was the work of early-20th-century futurist Sant'Elia. The massive structure featured train lines belowgrade, a landing strip at the top, and roadways in between.



Buildings Never Built

THE UNBUILT WORKS OF FOUR FAMOUS ARCHITECTS ARE POSTHUMOUSLY RENDERED USING 3D MODELING SOFTWARE TO CREATE NEAR-PHOTOGRAPHIC IMAGES.

detailed, even by today's standards. This has helped Buchanan to "get inside Maybeck's head" and understand what he originally intended. For most of his source material, Buchanan credits the documents collection at the College of Environmental Design at the University of California at Berkeley. There he found complete job files for public buildings and house designs, as well as correspondence with contractors in which Maybeck explained what features of his buildings were important and where he could be flexible.

To better understand Maybeck's intentions, Buchanan has begun to reconstruct Maybeck's town plan using World Construction Set, a landscape visualization tool by Questar. Maybeck's site plans were very sensitive to contours; placing the plan on a different site could change its meaning. But Buchanan hopes the modeling will help create a plan that Maybeck "would have at least approved of."

This example illustrates how such modeling software can, in a sense, recreate the past. Similarly, the computer images of other unbuilt works hold a certain fascination. Purists will certainly object to their lack

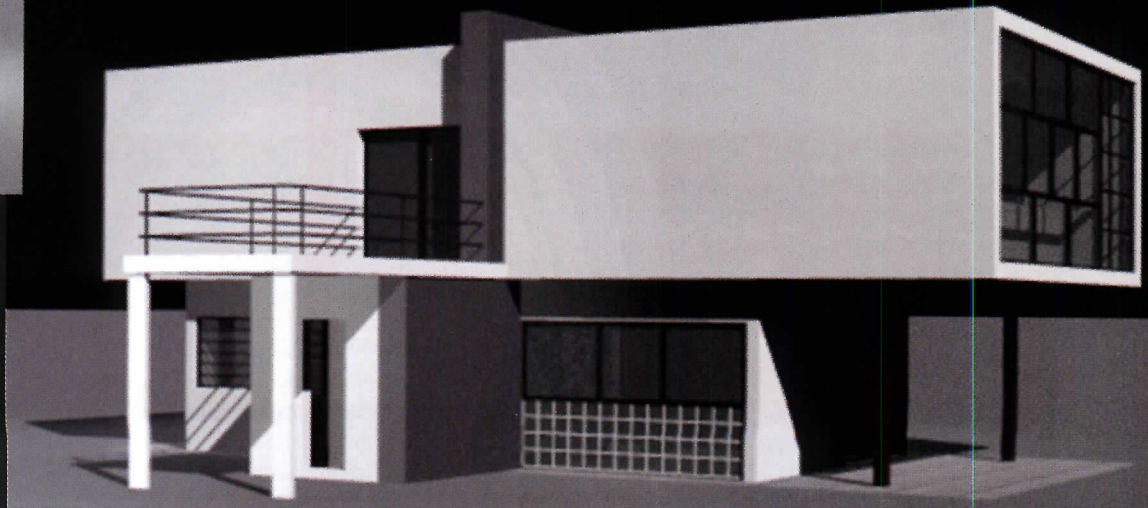
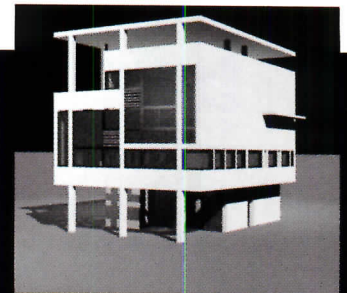
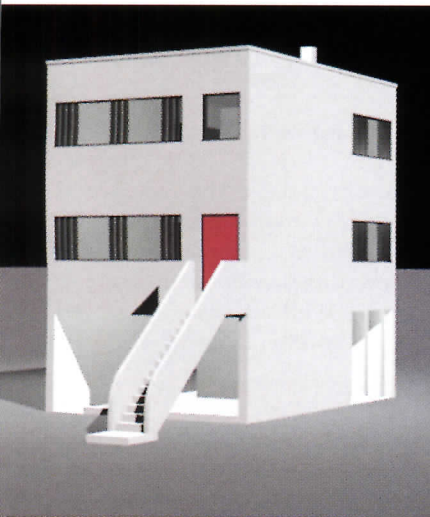
of authenticity, but the rest of us will enjoy the enlivened designs that transport us to a past that never happened.

The legacy of Sant'Elia

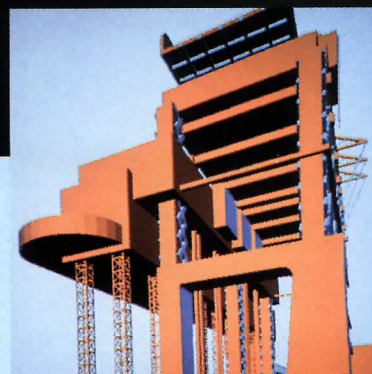
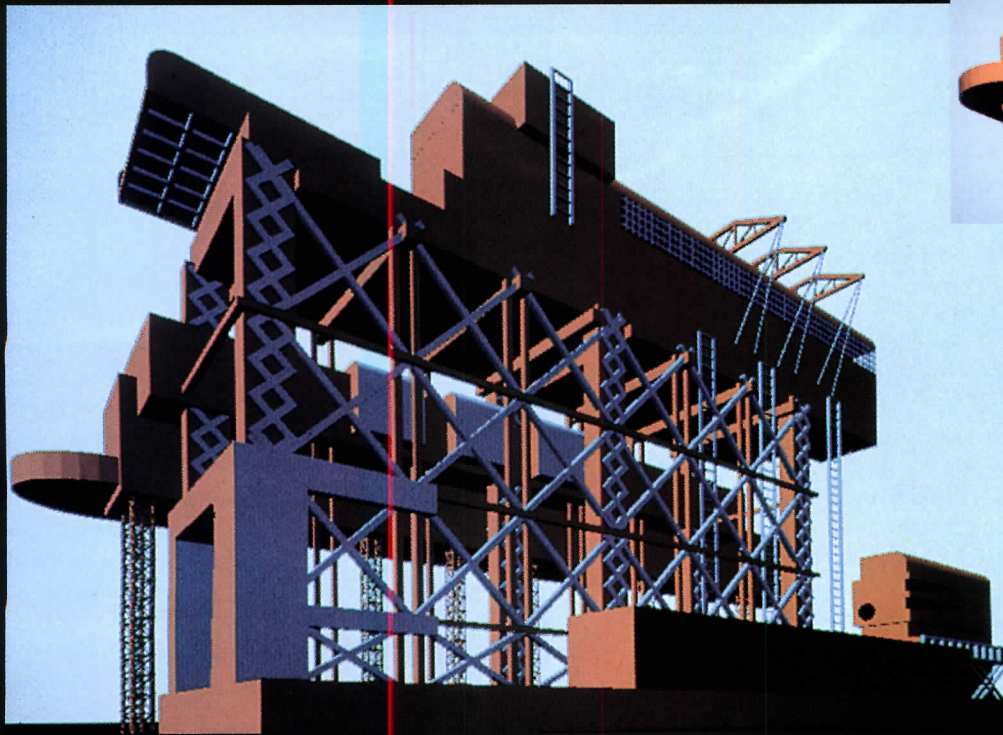
By 1914, the young Italian architect Antonio Sant'Elia was famous for his vision of the future. Although little of his work was ever built, his drawings and writings were influential. His *Manifesto of Futurist Architecture* featured drawings of how he thought cities of today would look. His station for airplanes and trains was particularly forward thinking considering that flight technology was very young and horsedrawn vehicles were more common than automobiles at that time.

Sant'Elia conceived the station as a convergence of several transportation systems: Trains belowgrade, cars at street level, and an airstrip on the roof. Pedestrian walks were on overpasses, and funiculars and elevators transported people between levels.

Midhat Delic, an architecture student at the University of Oregon, modeled Sant'Elia's massive structure with form•Z, a 3D model-



Unbuilt villas designed by Le Corbusier in the 1920s were modeled, including the simple Maison et Cantine (above), Maison Jacquin (center), and Maison Baizeau (far right). The white cubist houses were for the working class.



Chernikhov's visions of 20th-century Russian industrial architecture included Fantasy 39 (left, above) and Fantasy 4 (below).



ing software program by auto•des•sys. Delic based the model on Sant'Elia sketches of the structure's exterior. To determine the scale, he used clues, such as the size of the trains. He first created simple massing models and gradually added detail. He occasionally compared computer-generated perspectives to Sant'Elia's drawings to make sure his reconstruction matched the architect's original idea. Knowing that a precise reproduction from fragmentary source material is impossible to create, Delic sought mainly to convey the feeling of the place. "I kept the colors somber," he notes, "to indicate the gloom of this environment. Sant'Elia himself used little color." There are no original sketches of the structure's interior or back elevation, so Delic left that to the imagination.

The unrealized villas of Corbu

From 1922 to 1929, Le Corbusier developed a series of theoretical villas for the working classes. These deceptively simple white, cubist houses were often perched on thin columns to provide a work area below the main living space. During this Purist period, Corbu published *Towards a New Architecture*, which outlines his vision for the built environment and its underlying geometric logic. One key concept is that of *regulating lines*, geometric abstractions that, when traced over a building's plan or elevation, demonstrate the proportional relationships between various architectural elements. These abstractions, such as in squares, circles, and golden rectangles, can be manipulated by rotating, mirroring, and resizing to create an infinite number of related design variations. Their

proportions, Corbu argued, are what make architecture beautiful, and he used them to guide his Purist compositions.

Jerzy Wojtowicz, an architecture professor at the University of British Columbia, applied regulating lines in computer drawings and used Autodesk's AutoCAD modeling software to understand and reconstruct Corbu's seven unbuilt villas. Many of these villas were originally documented with only one or two sketches. While modeling, Wojtowicz used regulating lines to make educated guesses about the architect's inten-

PURISTS MAY OBJECT TO THE LACK OF AUTHENTICITY OF THESE IMAGES, BUT MOST OF US WILL SIMPLY ENJOY THEM.

tions; this is validated by the resemblance between his renderings and the original sketches. The resulting models both display the geometric logic and simulate the experience of walking around an unbuilt masterpiece. In spite of the villas' simplicity, Wojtowicz insists they are not formulaic. Le Corbusier did not apply design rules mechanically.

Chernikhov's constructivism

When Iakov Chernikhov drafted his visions of 20th-century Russian industrial architecture in the 1930s, was he drawing buildable structures or exercising artistic license to create a dramatic effect? It is uncertain if any of Chernikhov's published designs were ever built, but their geomet-

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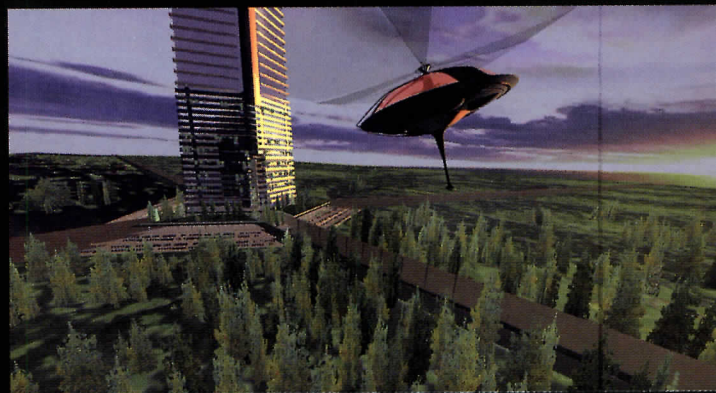
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Wright's 1956 vision of Usonia included a mile-high skyscraper soaring above the flat lands below. Transportation to the tower would have been by self-steering taxi-

copters (above and below) and by cars parked in multilevel garages. Despite all the technology, the skyscraper was meant to harmonize with the American landscape.



ric realism has been studied, using form•Z and AutoCAD 3D computer models, by architecture professor Thomas Seebohm and his students at the University of Waterloo in Ontario, Canada.

Chernikhov's vocabulary of forms and spatial relationships is illustrated in *101 Architectural Fantasies*, published in 1933. Intended to teach formal design principles to young architects, the fantasies are graphic art rather than constructible architecture. That's partly because Chernikhov drew each fantasy from only one perspective. As a result, it is impossible to interpret them with any certainty. Seebohm worked on the assumption that Chernikhov chose a viewpoint that would exaggerate the building's central vertical focus. This led the professor to discover design anomalies. For example, two towers appear to be twins, but Seebohm discovered that they are different sizes. If Chernikhov had drawn an accurate perspective, the towers would not seem nearly as dramatic.

"The models demonstrate Chernikhov's distortions for the sake of the drawing," Seebohm notes. "This study shows how misleading a few isolated views of a building can be." Now that computer modeling can probe the forms implied in sketches, it is possible to create the buildings they depict with greater realism. At the same time, history will be able to hold architects more accountable for the perspectives they construct or to illuminate why they distorted them.

Wright's mile-high fantasy

Did Frank Lloyd Wright seriously believe he could build a skyscraper a mile tall? His drawings and writings look and sound convincing. The

Illinois Building, unveiled in sketches in 1956, was 528 stories high and embodied many then-modern materials. It was tripod-shaped for stability, embedded deep into bedrock, built of steel, and sheathed in metal and glass. Each face was detailed differently to take best advantage of solar radiation from various angles, yet Wright relied on atomic energy to power the extensive elevator system.

The Illinois was part of Usonia, Wright's vision for an idealized and harmonious convergence of city and landscape. The skyscraper, which Wright predicted could hold 130,000 people, sat amidst freeways, multistory parking garages, and self-steering, flying-saucer-like taxi-copters that would run on radio beams.

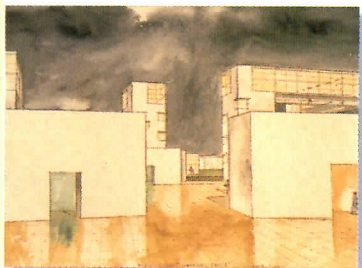
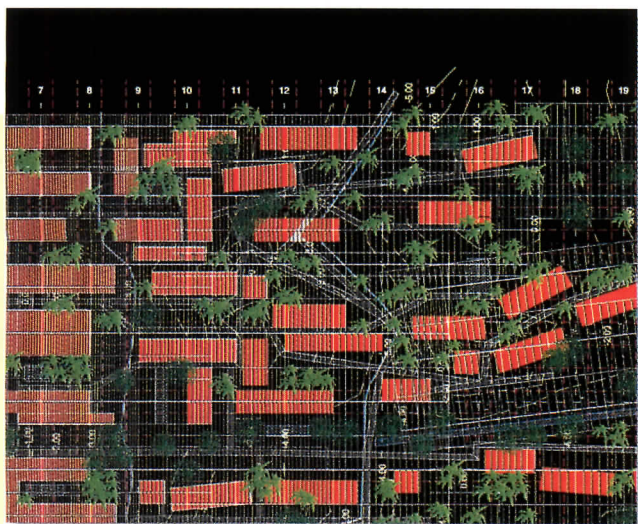
A group of former students at Columbia University's Graduate School of Architecture, Planning, and Preservation, used the school's Digital Design Lab to model, render, and animate the skyscraper and its surroundings. The building's tripod shape gave it the strength needed to support its height.

A tradition of simulation

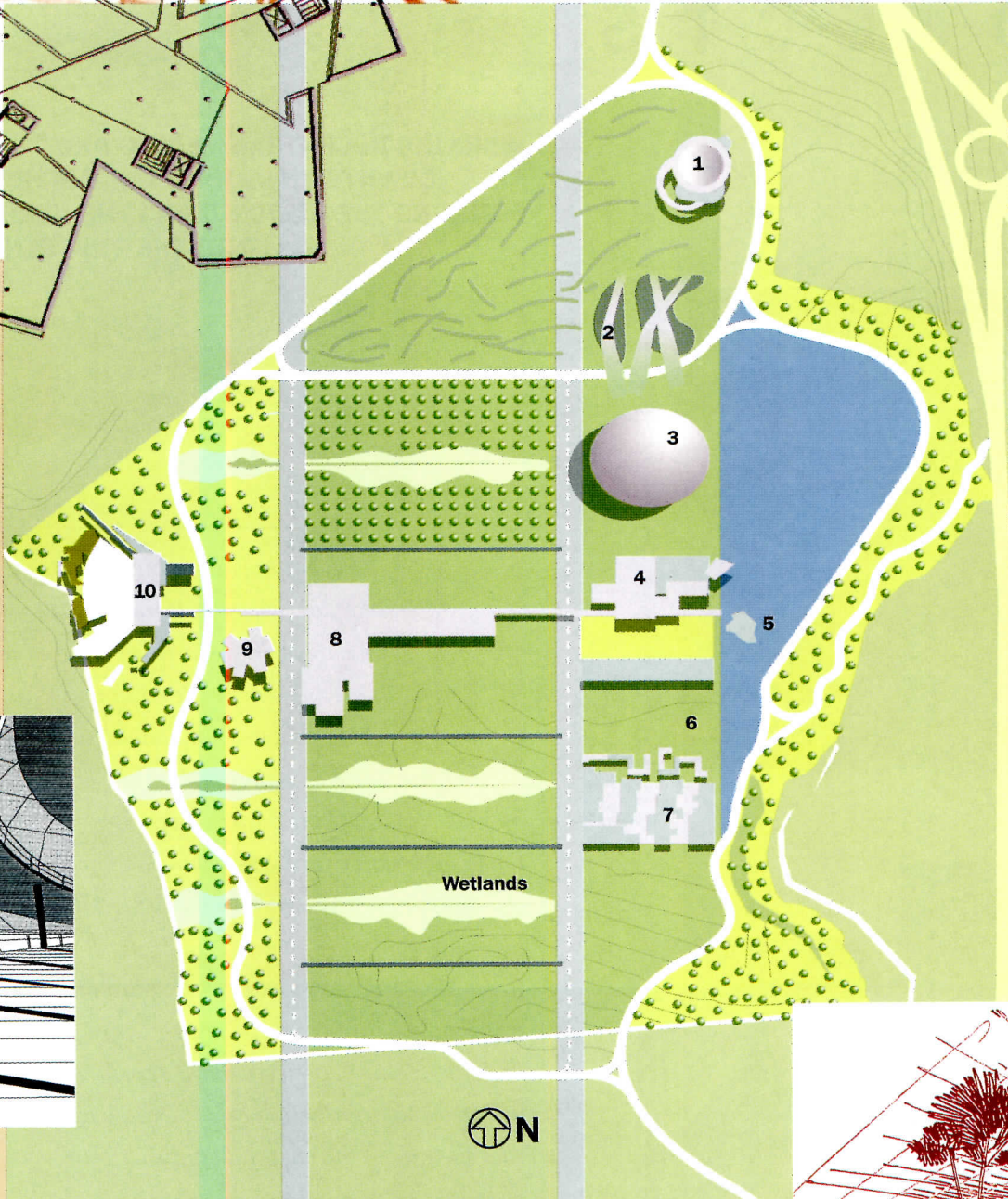
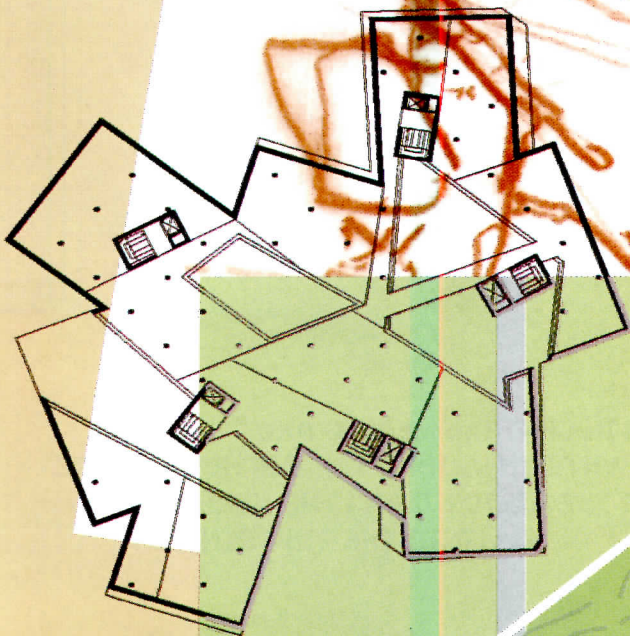
In the 19th century, a Frenchman named Paul Letarouilly published perspective sketches of Rome that, for the first time, formally captured the character of spaces, in contrast to the then-prevailing custom of illustrating buildings only in plan and elevation. Letarouilly's drawings were popular among Europeans who couldn't travel but were intrigued by Rome's architectural wonders. Similarly, today's digital reconstructors bring us masterful designs that no amount of travel could make accessible. ■

PROJECTS

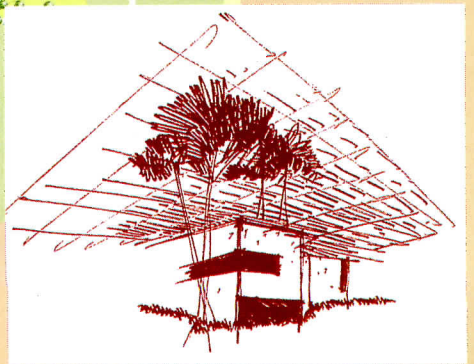
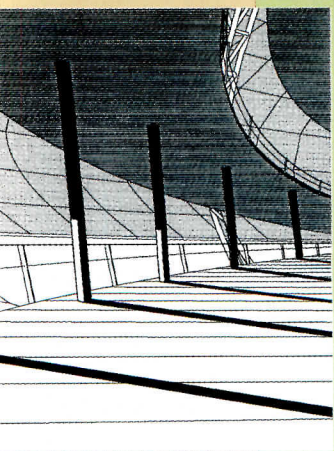
WORKING IN CENTRAL MEXICO AND DOWNTOWN MANHATTAN, ARCHITECTS ARE BRINGING THE HISTORIC AND THE VENERABLE INTO THE 21ST CENTURY.



A successful businessman envisions a \$200 million complex where culture and commerce, housing and entertainment work together to create a new kind of urban development on the edge of Guadalajara, Mexico. He commissions 10 star architects from around the world to design major buildings there. If built as planned, this multiuse center will complement the city's historic downtown with a forward-looking architectural showcase. Two thousand miles away, the New York Stock Exchange hires a pair of young computer-savvy architects to take the 207-year-old institution into cyberspace. Using laminated glass and electronic pixels, the architects connect the real and virtual worlds. In both of these projects, hard-nosed capitalists are asking architects to help them tackle the challenges of the future and lead the way to the next millennium.



1. Palenque
2. Fairgrounds
3. Convention center
4. Entertainment and shopping center
5. Children's museum
6. Art museum
7. Housing and hotel
8. Office and shopping
9. University
10. Amphitheater



A dream team of international architects designs the **JVC CENTER** with hopes of putting Guadalajara on the must-see map. Can they pull it off?

by Clifford A. Pearson

Bring 10 of the most innovative architects in the world to your hometown, tell them to stretch their imaginations, and set no initial budgetary constraints. That's what businessman Jorge Vergara Madrigal is doing in Guadalajara, Mexico, where he has started work on a new cultural and business center that he hopes to inaugurate late next year and to have buzzing by 2003. It sounds too good to be true. Indeed, there are many skeptics who doubt he can pull it off or can do it with the quality that initial sketches seem to promise.

The scope of the vision and its commitment to high design are almost unheard of in a time when many governments have washed their hands of grand urban schemes and the private sector has made quick profits its top priority. Although Vergara's development won't have a high enough density or enough housing to be a real city, the diversity of its facilities (convention center, fairgrounds, offices, entertainment and shopping complex, museums, hotel, housing, amphitheater, university, and even a *palenque*, or traditional cockfighting ring) take it well beyond the typical corporate office park or residential development. When asked what other places he used as models, Vergara says, "There aren't any."

Vergara, who has amassed a fortune in the past eight years sell-

ing architectural plans. "It's a mistake for us to eat the whole cake," explains Vergara, "but we want to maintain a certain standard, a level of quality."

"The main goal [of the JVC Center] is culture," says Vergara. "But culture doesn't make a profit, so we bring in business to support it." In particular, the convention business is underdeveloped in Mexico, states Vergara, even as 40 percent of all convention centers in the U.S. are booked up to six or seven years in advance. Less than two hours south of Dallas by plane, Guadalajara could attract many trade shows with the proper facilities, he reasons. Vergara hopes to develop a flow of 25,000 to 30,000 people each day and up to 400,000 people for conventions.

From maize to modernism

The JVC Center site is 750 acres of corn fields in a picturesque valley abutting a national forest. Northwest of the colonial core of Guadalajara, the development will officially be in Zapopan, just across the Periferico or ring road from the city. For several decades the Periferico separated the urban center from its rural periphery. Now development pressure is rising and the JVC Center will be the first major project to jump beyond the city's traditional growth boundary. Not everyone is happy about this. But

JORGE VERGARA'S GOAL IS TO MAKE MONEY. BUT HE ALSO WANTS TO JUMP-START A REVIVAL OF MEXICO'S SECOND LARGEST CITY.

ing nutritional drinks and health products in Latin America and the United States, envisions a new kind of development where culture attracts business and business supports culture. His goal is to make money. But he also hopes to jump-start a revival of Mexico's second largest city by putting it on the world's cultural map. In other countries this might be the government's job, but in Mexico it is much easier for a private developer to get things done. Pointing to the example of the Guggenheim Museum in Bilbao, Spain, he says, "They do this beautiful museum and they attract half-a-million people in one year. And they changed the city. With one building they did that. So I ask, 'What if we do ten?'"

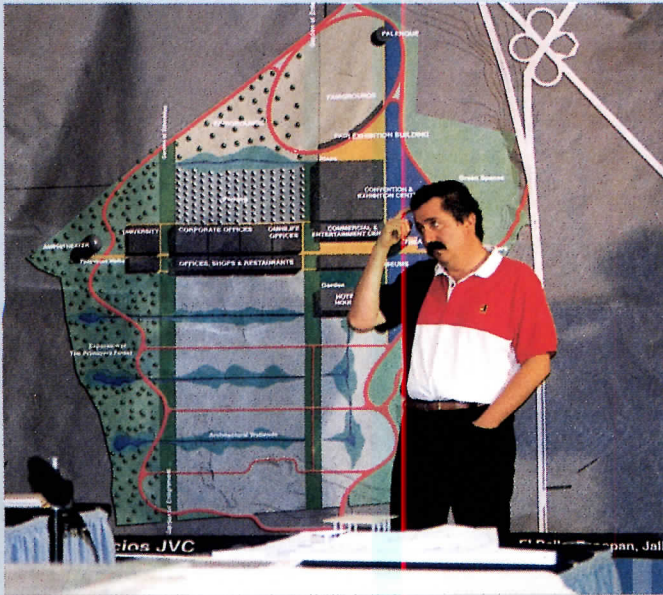
Starting with fairgrounds for Guadalajara's annual autumn *feria*—Mexico's version of the county fair—the first 10 buildings of the proposed JVC Center—as the project is called—are being developed by Vergara's company, Grupo Omnilife. In the future, land will be leased to other companies to build additional hotels, offices, and various facilities. Vergara's organization, though, will retain the right to review subsequent

Omnilife is funding studies of the 2,470 acres surrounding and including the JVC Center site to develop a sensible growth plan for the entire area.

When Vergara approached local and provincial authorities about a year ago with plans for his development, he met with a wall of suspicion. Since the valley is an important watershed for the area, the first questions they asked concerned the water supply and other environmental issues. Studies by Omnilife consultants showed that the development could be low-impact by preserving wetlands on the site, creating a new lake, minimizing paving, and extending the forest from the hills into the valley. By early this year, regulatory agencies were looking at the project more positively, says Vergara, and the governor of Jalisco province threw his support behind it. "At first people were afraid of what these crazy architects would do," recalls Vergara with a grin. "Now people are excited."

By hiring an impressive list of cutting-edge architects from around the world and thinking big, Vergara has caused a lot of people to take notice. What will Wolf Prix's entertainment and shopping center be

INTERVIEW



Jorge Vergara Madrigal is not your typical corporate mogul. With no college education and a career that includes time as an auto mechanic and a restaurant maitre d', Vergara (above), at 43 years of age, has built the most successful nutritional supplements business in Latin America, outselling his former employer Herbalife on his home turf, according to a recent article in the *Wall Street Journal*. This success stems from a culture of self-improvement that Vergara has established at the company, one that flows from his efforts to promote better education and his own story of turning around his life by adopting a healthier diet. Earlier this year, ARCHITECTURAL RECORD editor Robert Ivy, FAIA, interviewed the Omnilife president in New York.

On the origins of the JVC project: "My concept was to hire the best architects in the world and show the world we could design and build in a cost-effective and business-wise way. We wanted to show that we could make a new kind of city based on humane planning and at the same time honor architecture."

On his instructions to the architects:

"My approach wasn't to say, 'I want this convention center and I want it this way.' I said, 'I want you to tell me and imagine the best convention center. After you do that, I will budget it and tell you to trim this or take that out, if I cannot afford what you imagined.' That was a different approach for these architects."

On architects working as a team: "It's not easy to work with architects. They're really creative and emotional. But I wanted to put together a team that would make the project work—not only in terms of business but as a beautiful place, as a tribute to architecture, and as an example of what can be done as a team."

On getting things done: "I promised [the architects] one thing after I found out that every one of them was frustrated by so many projects in their offices that never get off the drawing board. I said, 'This one is going to be built.'"

On the design approach at JVC: "We have a rich culture here in Guadalajara, but it has been buried for 25 years. And I'm not old-fashioned. I believe in changes. That's why I like modern." ■

like? Or what about Thom Mayne's palenque, Enrique Norten's convention center, Carmen Pinós' fairgrounds, Daniel Libeskind's university, Jean Nouvel's office center, Toyo Ito's museum, Steven Holl's housing and hotel complex, Philip Johnson's children's museum, or Tod Williams and Billie Tsien's amphitheater?

And how will all these stars and their buildings work together? "We told the architects they must work as a team," says Vergara. "They must listen to one another and their buildings have to communicate with each other. I didn't want to create a museum of architecture; I wanted a city." To that end, the architects have gathered several times in Mexico and the United States, presented their projects to each other, and discussed all aspects of the development.

Out of these meetings has come a master plan that concentrates development along two parallel axes and a cross street connecting the two. A winding surface road takes cars around the perimeter of the site, while a pair of service roads are buried underground so delivery vehicles are hidden from view. Most of the parking is also underground, one level below the buildings. For conventions and big events, electric buses will shuttle people from a large parking lot off-site to the JVC Center.

Norten and Bernardo Gomez-Pimienta, the two partners of

SOME PEOPLE WERE AFRAID OF WHAT THESE CRAZY ARCHITECTS WOULD DO.

TEN Arquitectos, have served as coordinating architects for the entire development, helping Vergara to assemble the architectural team and overseeing the master plan. "It's not really a city," says Norten of the JVC Center, "it's a part of an existing city." Norten adds that the JVC Center will be "both a contrast and a complement to Guadalajara. The idea is to create a tension between the new and the old that will activate the Avenida Vallarta," the main road connecting downtown to the new development. The architects are also talking with the government about extending one of the city's two subway lines to reach the new cultural and business center. "Guadalajara's political, banking, and commercial center will remain downtown," states Norten. But the old buildings in the city's colonial core aren't well suited to the new workplaces and large cultural complexes envisioned for the JVC Center.

Guadalajara and other Mexican colonial towns revolve around outdoor plazas, but the JVC Center will be different. "The JVC has a much lower density and a different mix of uses than downtown, so it requires a different character," explains Juan Carlos Name, a Guadalajara architect who is working with Pinós on the fairgrounds and with Holl on the housing and hotel complex. "Modern public space is different from traditional public space," says Norten. While conscious of the failures of Corbusian plans that set towers in amorphous parks, the architects aim to create public spaces that are "fluid, dynamic, that are defined by the architecture, and not just left-over spaces," states Norten. Vergara explains the break from the colonial planning model by saying, "You can fit only four buildings around a town square. Here we have 10, and all are important."

Establishing the right adjacencies is one of the keys to making the JVC Center work as a place, explains Norten. Some of these relationships follow logically from the buildings' programs; for example, the fairgrounds, convention center, and palenque will all be used at the same time, so it makes sense to cluster them together. But other buildings have been grouped together to enhance the project's mission of merging culture and commerce. As a result, the entertainment/shopping center will face the art museum across a landscaped plaza, and the housing/hotel complex will share a sculpture garden with the museum.

Most of the commercial and convention facilities (including the palenque, fairgrounds, convention center, entertainment/shopping center, art museum, and housing/hotel complex) are aligned along one of the two north-south axes, the so-called Garden of Entertainment. Parallel to this axis and to the west is the Garden of Enlightenment, from which the university, amphitheater, and office complex emanate. Both of the north-south ways are pedestrian-oriented on grade but turn into vehicular service roads underground. Connecting these 1.25-mile long axes is a two-thirds-of-a-mile-long cross street that will start at the lake, end at the amphitheater, and be lined with shops and restaurants from around the world.

Fitting the buildings to the climate

In terms of the architecture, Vergara asked the designers to take advantage of the warm, dry climate, use as little air-conditioning as possible, specify mostly local materials, and maintain views around the site. He also gave the architects free rein to explore innovative design strategies and unusual programmatic combinations—without worrying about the budget. Only after the initial designs came in did the client have his staff review the plans to develop budgets for each building. “Every architect went further than I had imagined with their designs, but all of them are buildable,” reports Vergara. And most of the buildings are coming in very close to the rough budget that he had estimated would be needed at the beginning of the project.

Some changes, though, are being made. For example, Holl’s housing and hotel complex needs to accommodate more units, and the location of the amphitheater is still being debated. But the key ideas behind the projects have remained remarkably intact. “The magic of the project is that the architects were encouraged to dream at the beginning and not to design to fit a budget,” says Francisco Cornejo, a partner in Grupo Corey, the local architect for the entertainment center and the children’s museum and the project manager for the entire development.

Speaking of Vergara, Cornejo states, “Jorge doesn’t follow the usual rules. He is unique and will build something different. Sometimes his thinking doesn’t seem to make sense, but in the end it always works.”

“THE MAGIC OF THE PROJECT IS THAT THE ARCHITECTS WERE ENCOURAGED TO DREAM AT THE BEGINNING, AND NOT TO FIT A BUDGET.”

And responding to an observer’s skepticism about the size and complexity of the JVC Center, Cornejo says, “Many things will change. But one thing I’m sure of: If Jorge has it in his mind, it will happen.”

Vergara estimates that the first phase of the JVC Center with the initial 10 buildings will cost between \$180 million and \$200 million. Up to 90 percent of this will be funded from Omnilife’s internal sources. Only about 10 percent of the costs will be financed by loans and these will be for only the revenue-generating projects such as the convention center. “We reinvest all the money in our company and we save a lot.” Last year Omnilife reported sales of \$312 million worldwide. “For the first two months of this year, our sales are up 48 percent,” says Vergara. “We expect



Standing, left to right: Billie Tsien, Donald van Dansik, Enrique Ross, Daniel Libeskind, Nina Libeskind, Jean Nouvel, Juan Palomar, Tod Williams, Wolf Prix. Seated, back row: Francisco Perez Arellano, Fernando Romero, Alejandra Lerdo de Tejada, Enrique Norten. Middle row: Sergio Nuñez, Bernardo Gomez-Pimienta, Carme Pinos, Thom Mayne, Fabian Medina, Leonardo Lara. Front row: Monica Janet, Catalina Aristizabal.

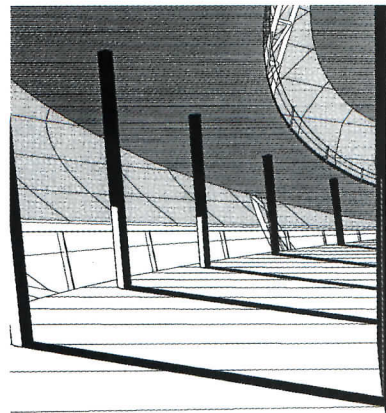
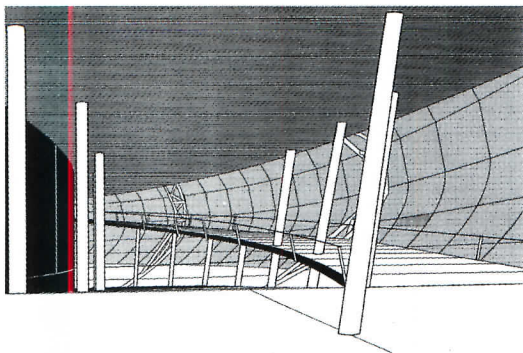
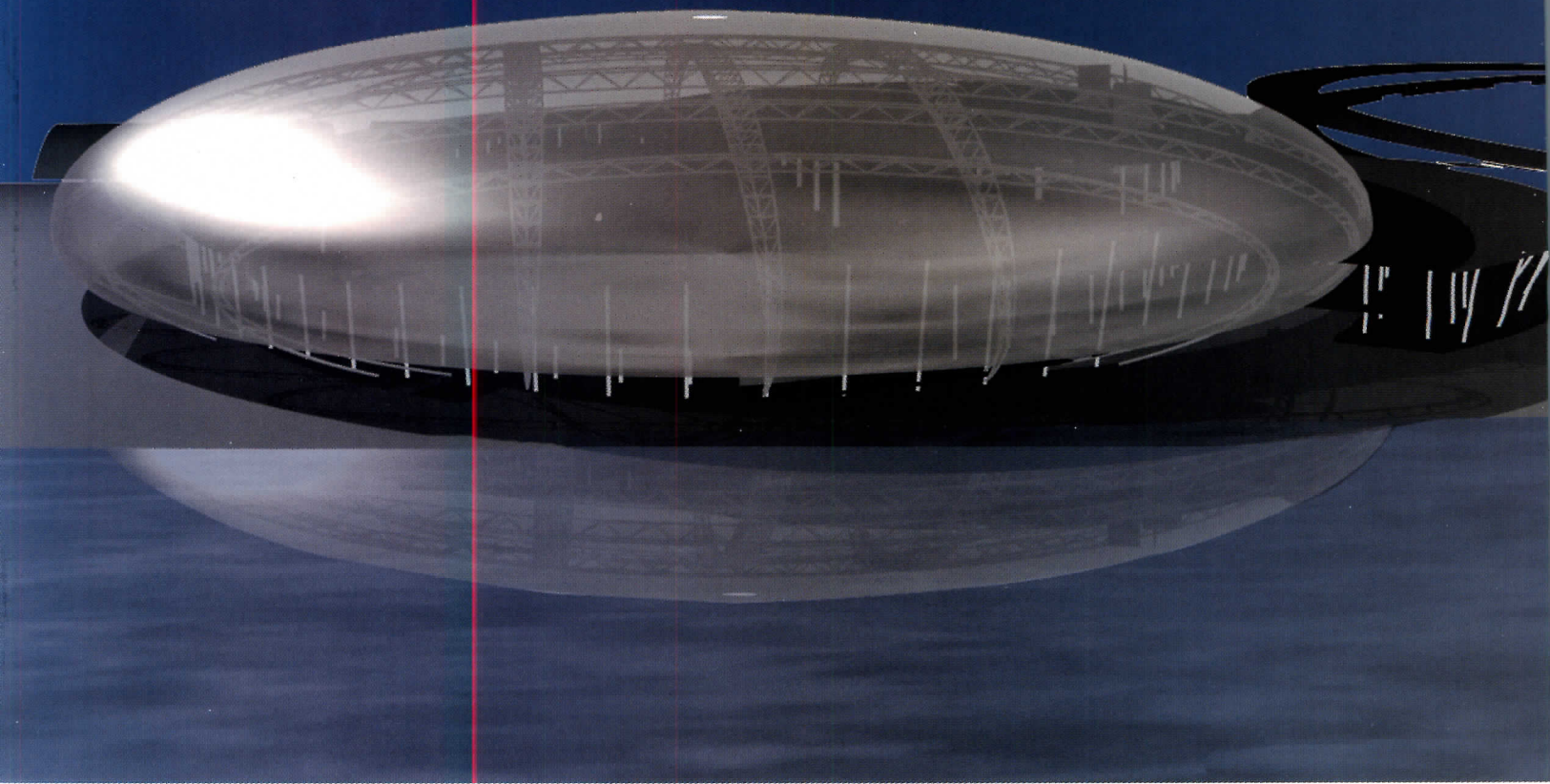
to reach \$500 million in sales in 1999.”

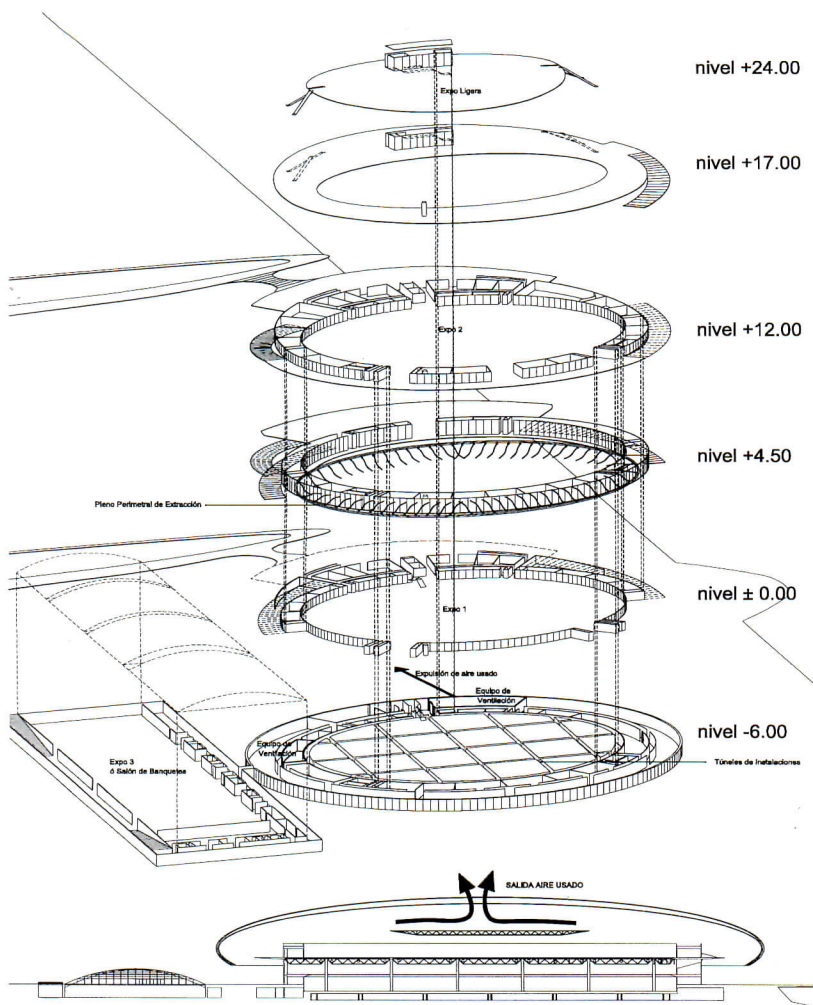
What kind of a place will the JVC Center be? More than an office park but not quite a city, the project has few precedents. Most of the time it will be populated with white-collar office workers, university students, affluent families visiting the entertainment center or museums, and foreign businesspeople attending conventions. Each October, the month-long feria will attract a broad cross section of Mexican society, bringing in hundreds of thousands of spectators for cockfights, boxing matches, and outdoor markets. The housing at the JVC Center will be beyond the reach of most Mexicans and will provide an alternative to traditional family housing. “A new kind of Mexican will live there—young, single professionals or divorced people,” explains María Emilia Orendáin, a partner in Toussaint y Orendáin Grupo Arquitectos, which is working with Ito on the art museum. “Right now, all housing in Guadalajara is designed for

families only.” Name adds, “I will move there, after my kids grow up. My wife and I will go to the movies every night.”

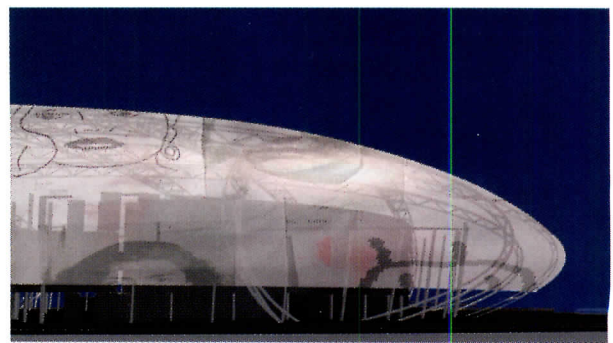
With infrastructure work just beginning, the JVC Center faces a host of challenges. Vergara wants the fairgrounds to open in time for the October 2000 feria and have the palenque and convention center ready a year later. By 2003 the first 10 buildings are scheduled to be complete. Constructing complex buildings on such a fast track in a country like Mexico may not be feasible, but Vergara’s vision is strong and infectious. “Jorge is using architecture to get things going in Guadalajara,” explains Orendáin’s partner Enrique Toussaint. That’s a powerful example for Mexico or any other country. ■

The great bulk of the convention center will be slimmed down (at least visually) by its curving form. Moving ramps (renderings bottom) will inject a dynamic quality to the building's interiors.





The convention center's functions are organized in concentric rings around the central exhibit area (axonometric above). Additional exhibit and banquet areas are in an underground annex west of the building.

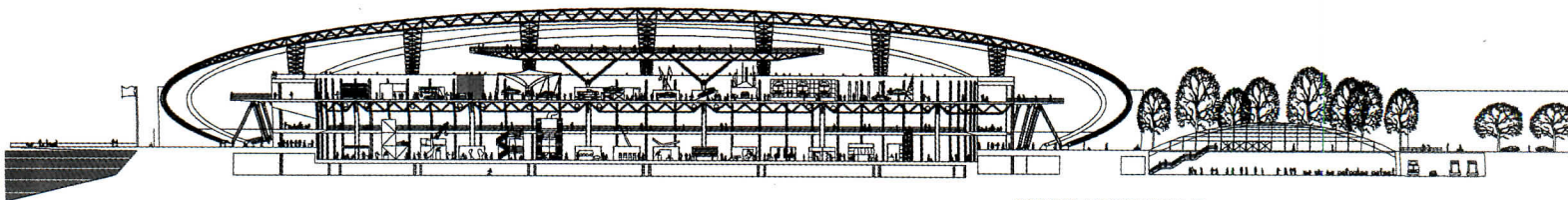


CONVENTION AND EXHIBITION CENTER GLOWS IN THE DARK

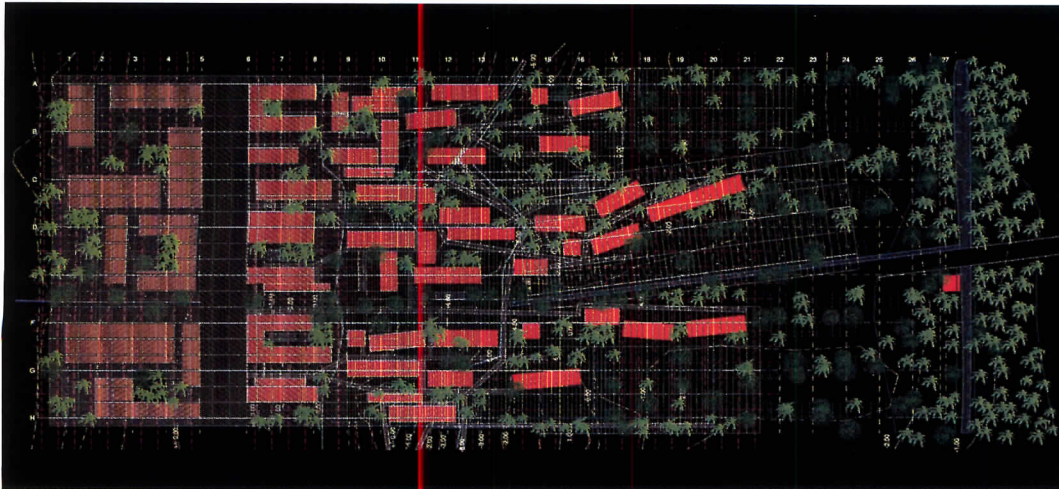
A giant elliptical building measuring 790 feet by 595 feet, the convention and exhibition center will offer a flexible setting for trade shows and large gatherings. Thanks to a grid of trusses spanning the entire space, the structure will have no interior columns. A translucent membrane will cover the building, allowing daylight to flood the interiors while reducing much of the heat from the sun's rays. At night the building will act like an enormous lantern, glowing from within and becoming a high-profile landmark in Guadalajara.

Convention-center functions will be organized in a series of concentric rings with exhibits in the center, support areas (such as auditoria, congress rooms, and restrooms) in the first ring, a revolving ramp linking all levels in the next ring, and lobbies in the outermost ring. Rooms for banquets and more exhibition spaces will be inserted under the landscaped plaza on which the convention center will be constructed.

Architect: *TEN Arquitectos—Enrique Norten and Bernardo Gomez-Pimienta, partners*



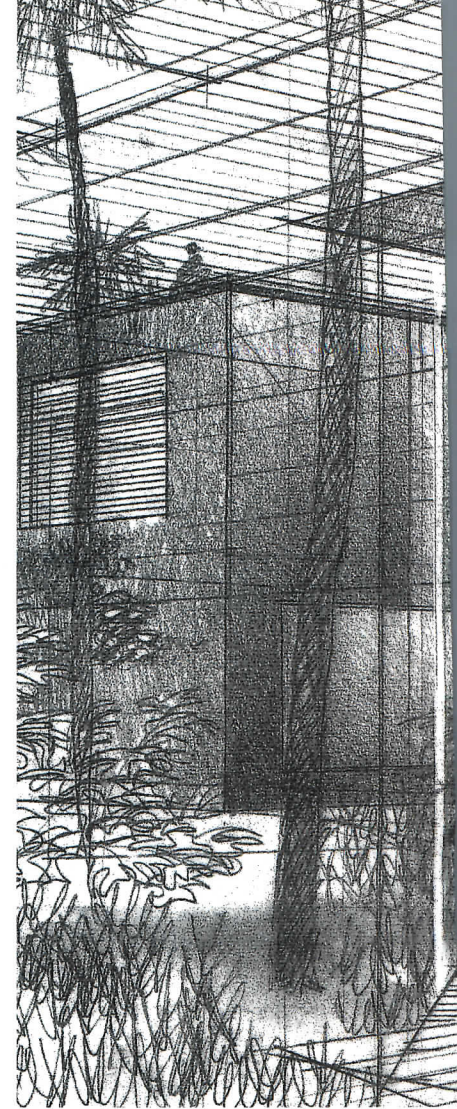
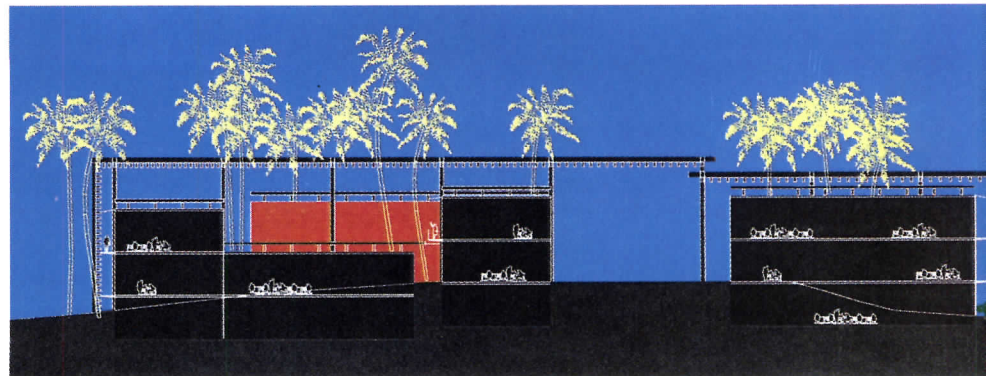
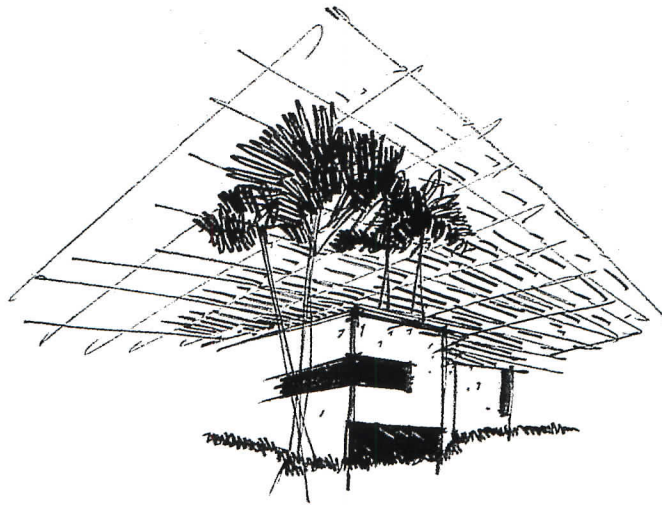
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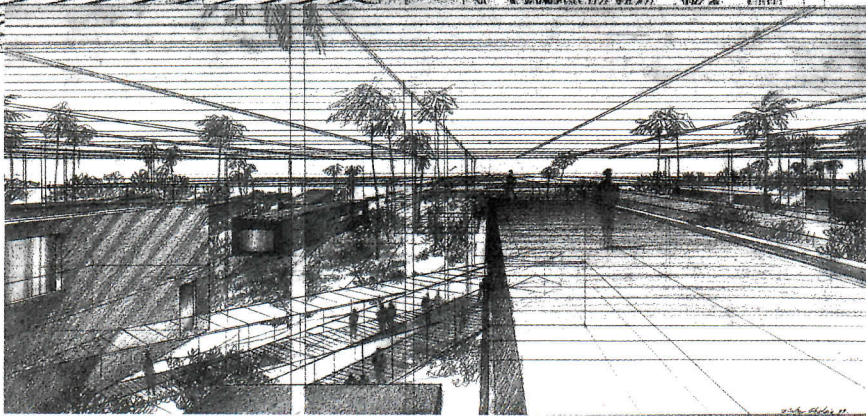
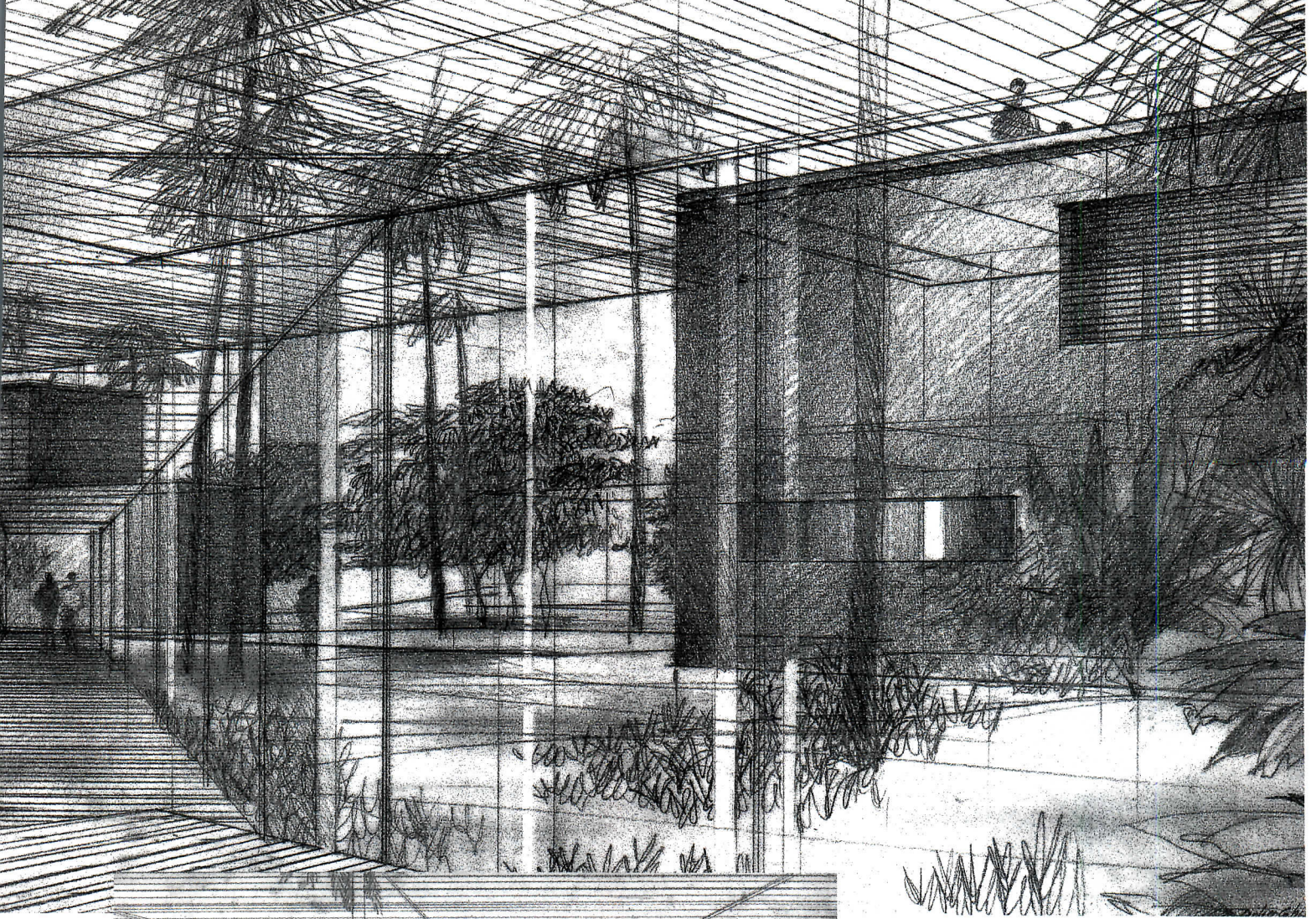


PROTECTIVE GRILLE SCREENS OFFICE AND RETAIL COMPLEX FROM THE SUN

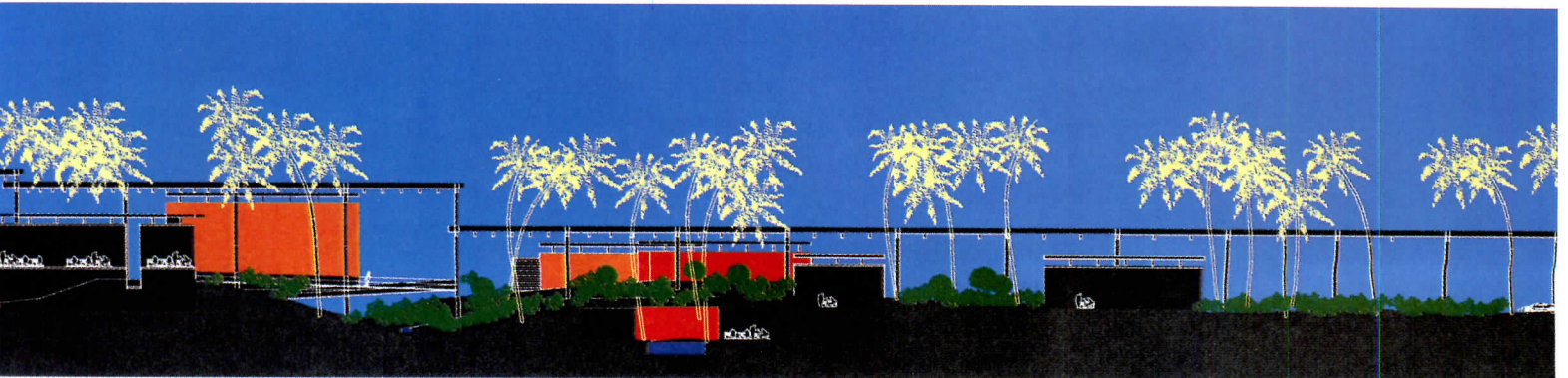
Taking advantage of Guadalajara's warm sunny climate, architect Jean Nouvel, Hon. FAIA, designed an office and retail complex that sits beneath a protective grille of fixed angled blades. Supported on tubular metal columns and beams, the grille will take much of the punch out of the strong sun, while allowing enough light and air to filter through to create an attractive setting for the buildings. Spaced closely together above the 78,000 square feet of shops and restaurants on the north end of the site, the rows of blades become progressively less dense over the 120,000-square-foot Grupo Omniflife office complex and parking lot. Tall palms and other plantings under the grille will also reduce solar loads on the individual buildings while blurring the separation of indoors and out. Walkways, courtyards, patios, and fountains between the buildings will offer open-air places for employees to relax, eat lunch, and congregate. The buildings themselves will be simple in plan and section and have no cantilevers or transfer beams, so they can withstand the effects of the region's recurrent earthquakes.

Architect: *Architectures Jean Nouvel and TEN Arquitectos*





To reduce the amount of air-conditioning needed in the Omnilife corporate offices, the architects covered the entire site with a layer of sun-protection blades and designed the buildings with operable windows.



ART MUSEUM ENGAGES A WORLD OF CONSTANT CHANGE

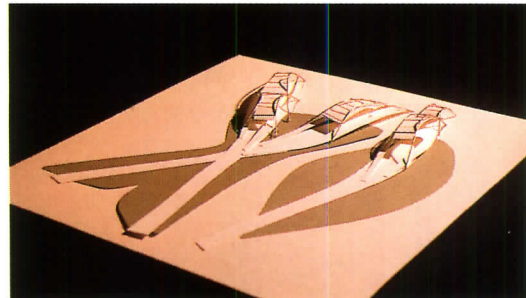
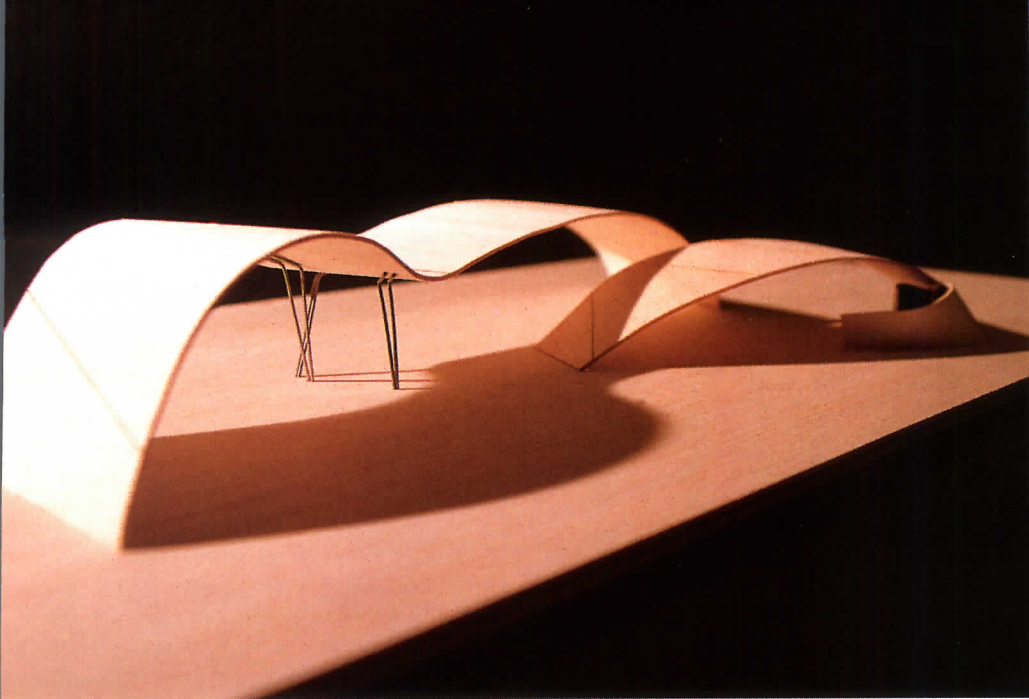
Reacting against the notion of the museum as monument, Toyo Ito, Hon. FAIA, has envisioned a contemporary art museum that celebrates change. Accordingly, he has drawn plans that depict a system more than a specific building or form. Slender columns will support a flat top-lit roof that can be extended in any direction. Large planes of glass will separate indoors from out with minimal interference. Exhibits will reside inside the built enclosure or might be set up outside, scattered around the fields that surround the building. Visitors will be able to move around and through the museum in many different ways. Free circulation, states the architect, creates "freedoms of programming and exhibition." Not only will art move outdoors, but a pond and plantings will also find their way inside. "The museum is integrated with nature. Nature becomes a part of the museum," explains Ito. With no permanent collection to begin with, the museum will house temporary exhibitions—a situation that should emphasize its open-ended nature.

Architects: *Toyo Ito Associates and Toussaint y Orendáin Arquitectos*

ART MUSEUM - CONCEPTUAL DIAGRAM

The museum will be a continually evolving place where people can relax, as well as look at art. The outdoors will provide as important a venue for art as indoor spaces will.

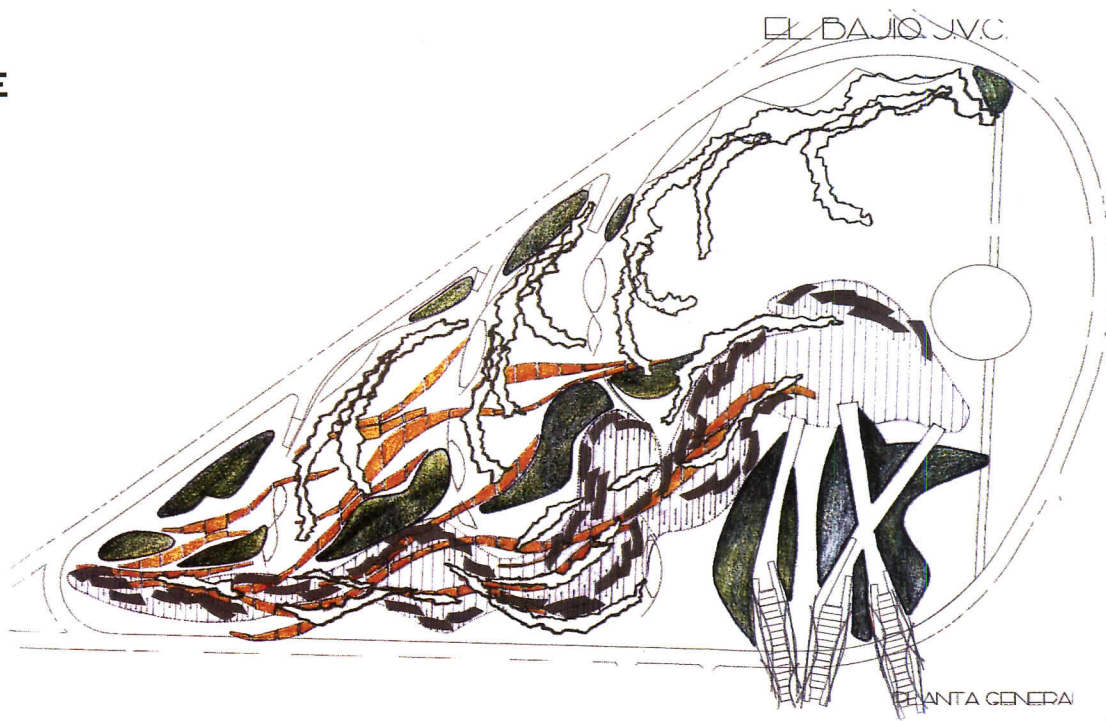




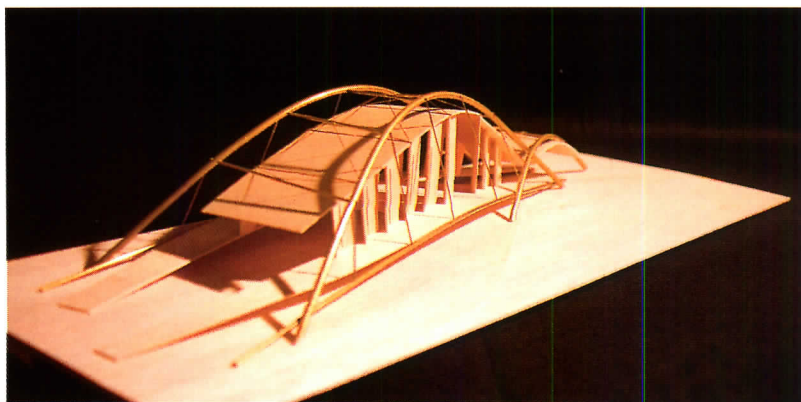
FAIR STRUCTURES BRIDGE AND DANCE OVER THE LANDSCAPE

To accommodate the markets, exhibits, games, and restaurants for Guadalajara's annual county fair, Barcelona architect Carmen Pinós designed a variety of constructions that practically merge with the landscape. The largest buildings (housing administrative functions, exposition spaces, and visitors services) are three suspension structures that act as entry bridges to the fairgrounds. Because the fair takes place for just one month a year and because most of the activities require protection from the sun and rain, the architect designed wavy canopy structures that will run like ribbons above the ground. According to Pinós' plans, the land itself will be carved to create a series of outdoor rooms that will appear almost as natural formations. The undulating, lightweight structures will be open on two sides, allowing air to circulate and preserving views through the site. As with many of the other projects at the JVC Center, this one will integrate indoors and out, taking full advantage of the local climate.

Architects: *Estudio Carmen Pinós and J.C. Name Arquitectos*



Administrative offices, visitors services, and some exhibition spaces will be in bridgelike buildings (right and top right). Markets and other exhibits will be under canopylike structures (top left).

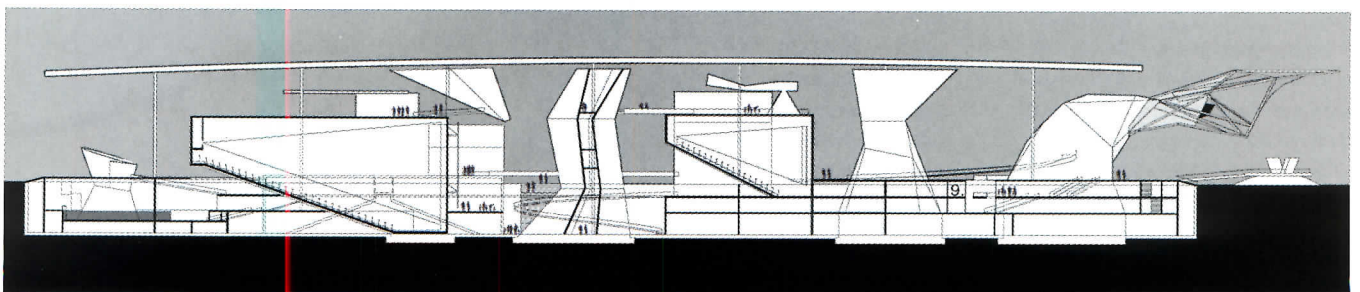
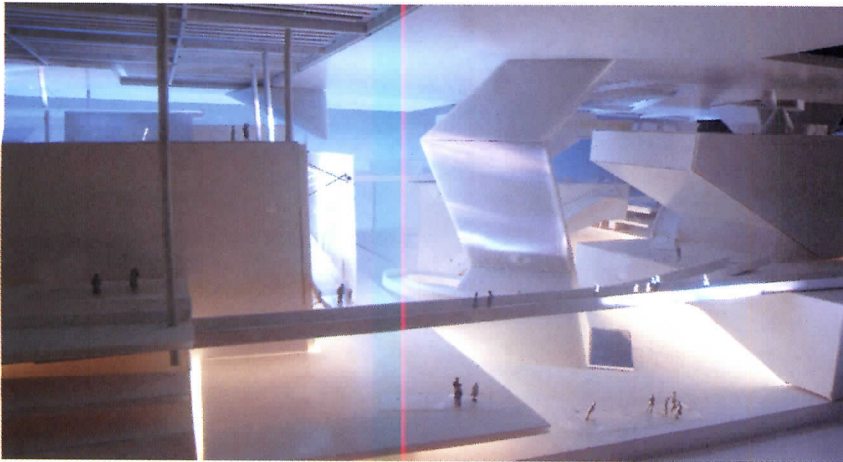


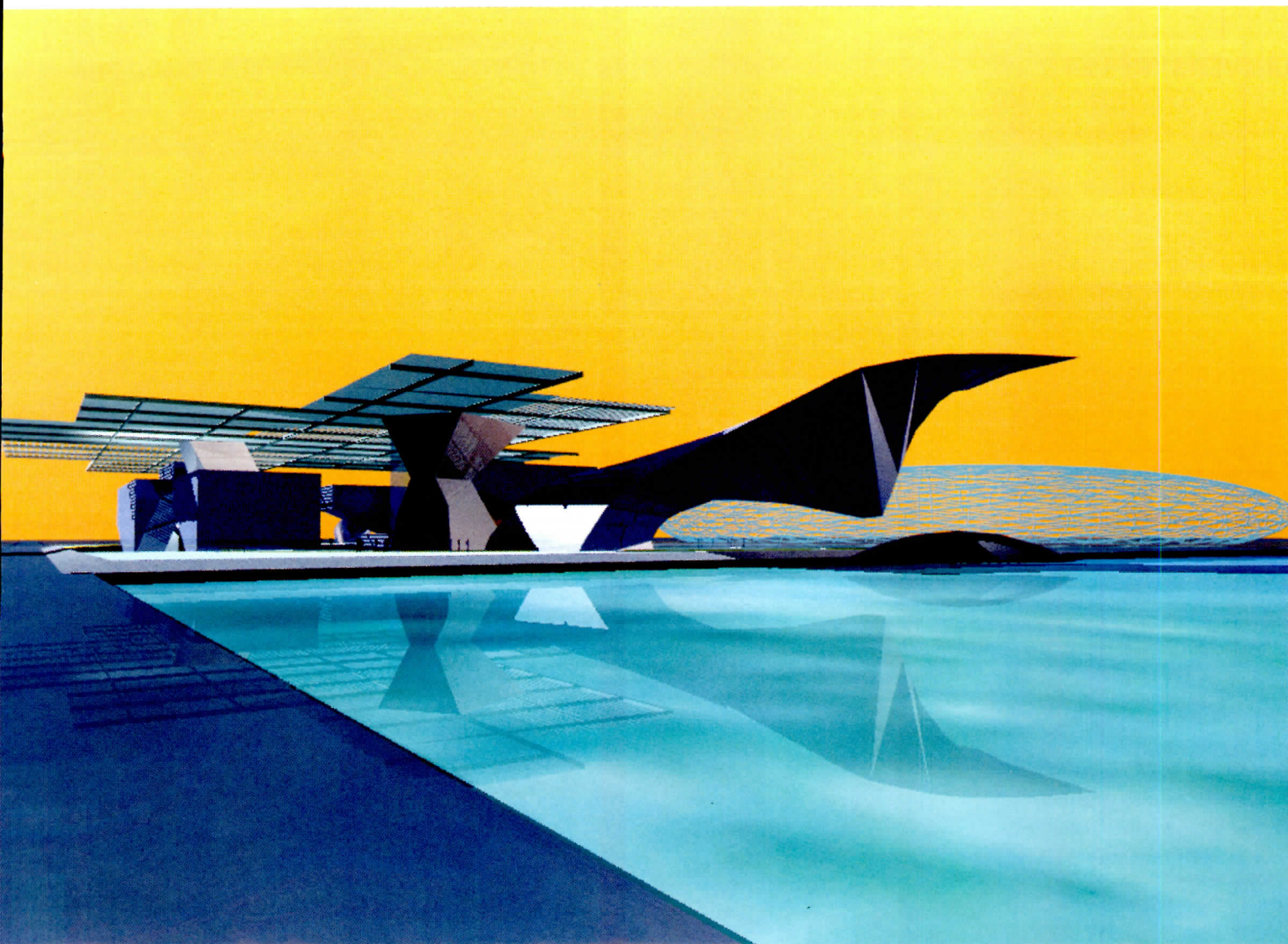
ENTERTAINMENT AND SHOPPING FOR THE 21ST CENTURY

Having impressed Jorge Vergara with their exuberant UFA Cinema Center in Dresden, Germany, Coop Himmelblau partners Wolf Prix and Helmut Swiczinsky were asked to apply their knowledge of movie-house design and take it several steps further. The resulting complex will combine 16 cinemas of varying sizes with restaurants, clubs, shops, a swimming and fitness area, and spaces to exhibit new interactive and information technologies. The goal is to redefine "entertainment from a place of mere consumption to a place of intellectual discourse," say the architects.

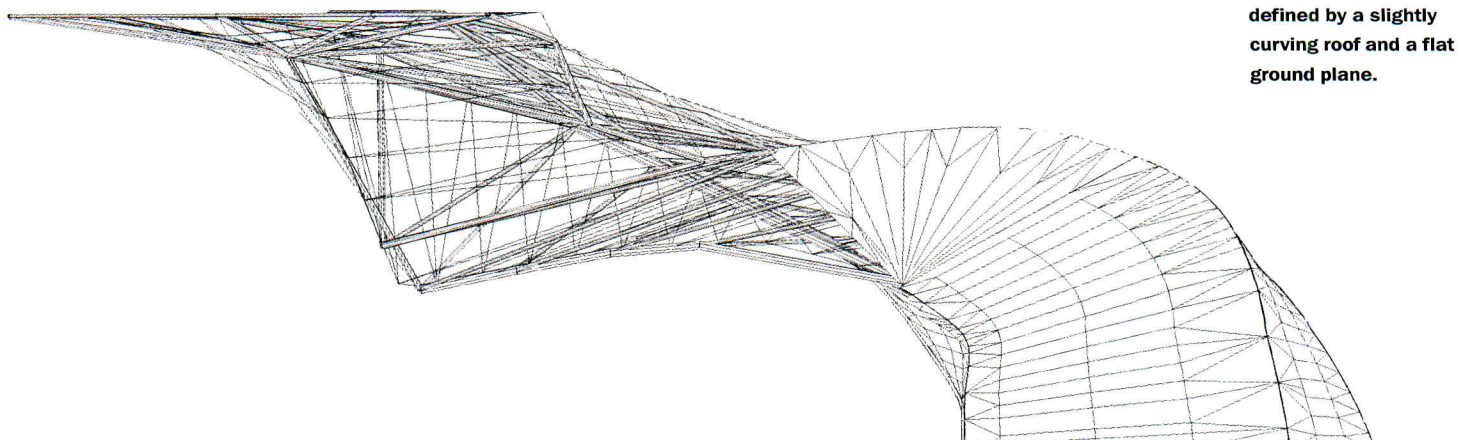
Rather than approach the project as one large building, Coop Himmelblau envisions it as a series of elements in an urban landscape defined by a gently curving roof and an expansive plaza. Cinema blocks, shopping decks, and soaring sculptural elements housing vertical circulation, restaurants, and clubs will stand almost as independent components within the roof and ground planes. Walking through this expressionistic landscape will be a kinetic experience, offering multiple perspectives and changing views. The building's partially louvered roof will filter sunlight into the spaces below.

Architects: *Coop Himmelblau and AVE Architectos*





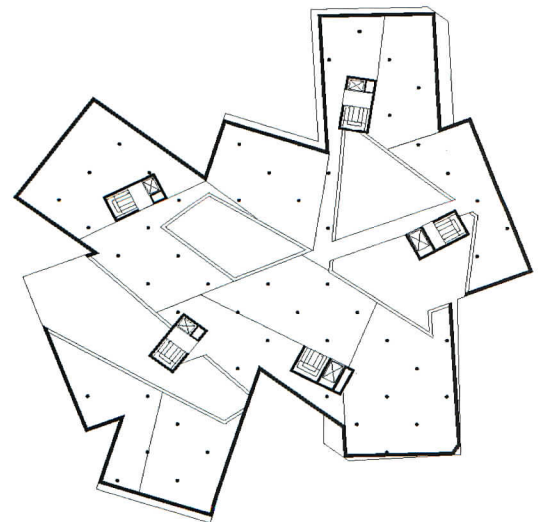
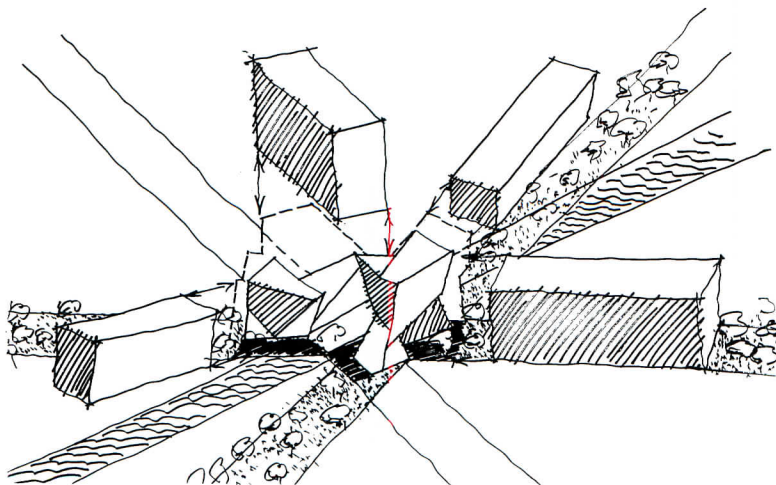
Twisting elements containing vertical circulation, restaurants, and clubs are inserted within and extend beyond the building envelope defined by a slightly curving roof and a flat ground plane.

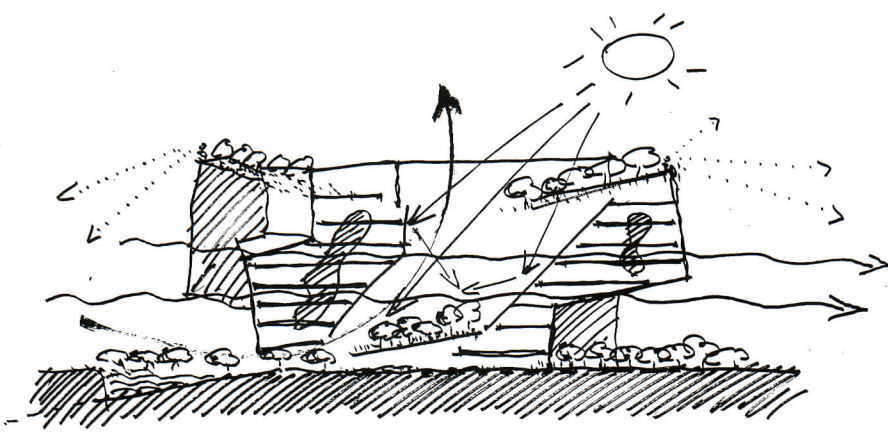


UNIVERSITY LETS STUDENTS AND FACULTY MIX IT UP

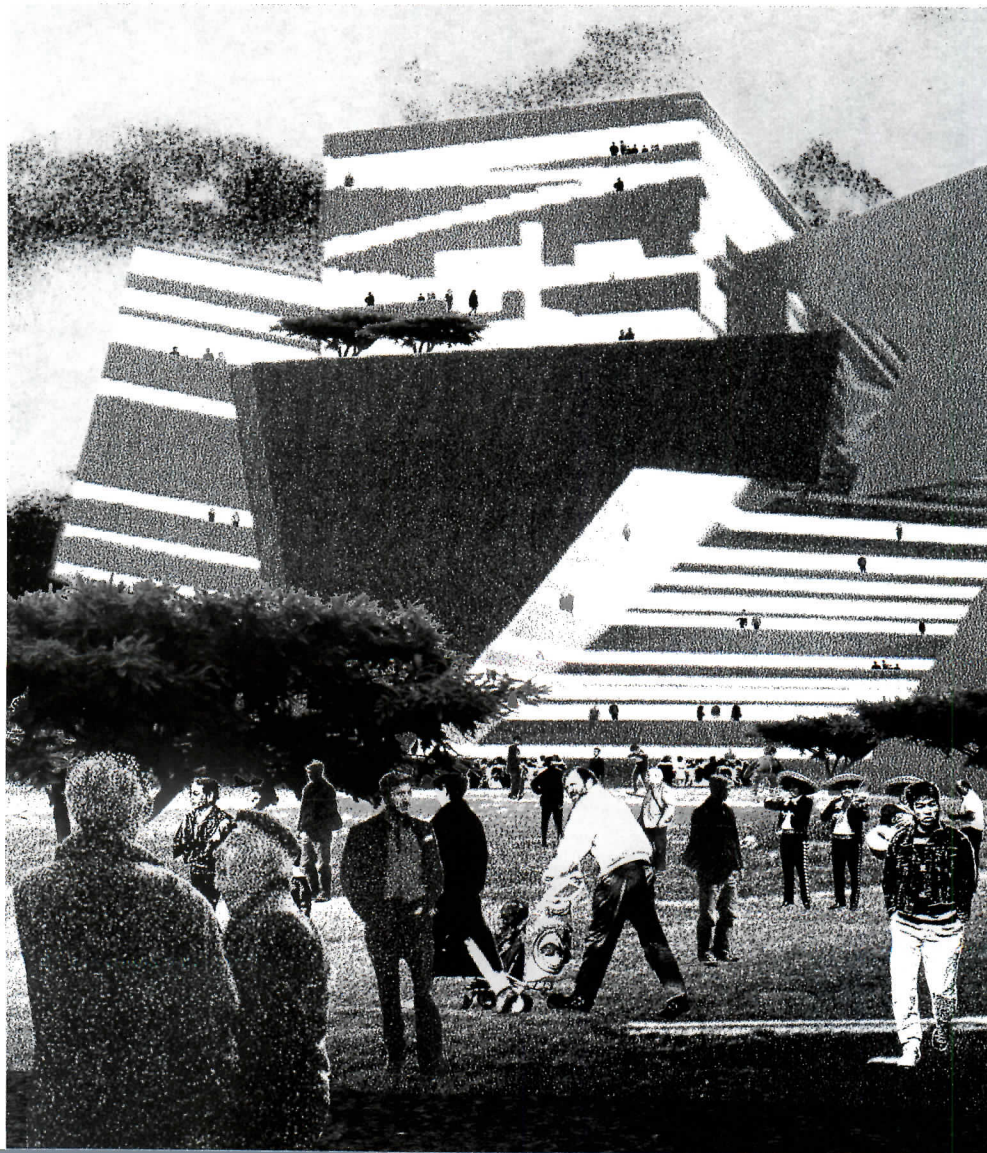
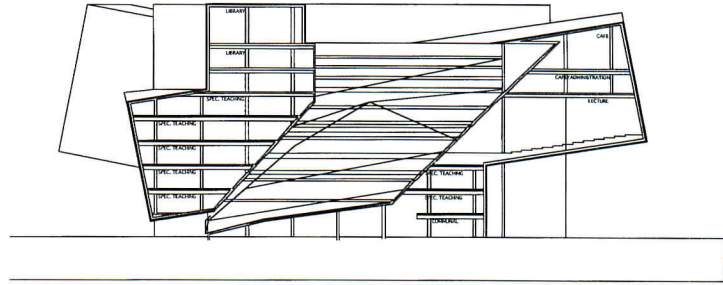
An important part of Jorge Vergara's vision for the JVC Center is a new university comprising schools of architecture, education, and public administration. Rather than organize the institution around an academic quadrangle, architect Daniel Libeskind stacked the schools in a manner that implies a collision of ideas. Indeed, one of the architect's key aims is to encourage interaction (both planned and accidental) between the students and teachers from the different schools. "The university should be a meeting place of many different aptitudes, skills, and horizons," says Libeskind. To accomplish this, he designed a building where lecture halls, cafeteria, and meeting rooms fit together to create "a mosaic of relationships." The ultimate goal is to elicit a "multilevel discourse" between the teachers and students of the various schools that will help "reshape the university as a social organism with common interests and goals." Located at one end of the JVC Center's main east-west street, the university is given its own space but is still closely connected with the rest of the development.

Architect: Daniel Libeskind





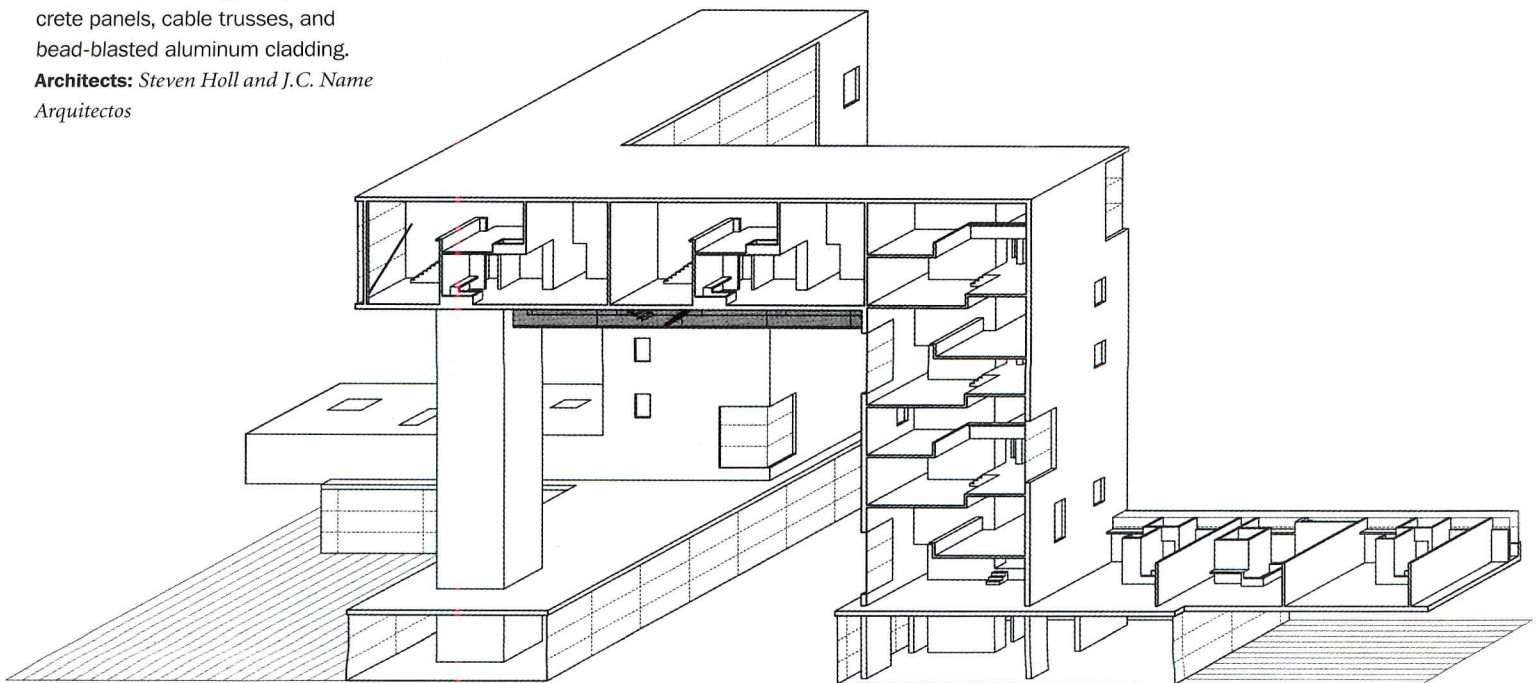
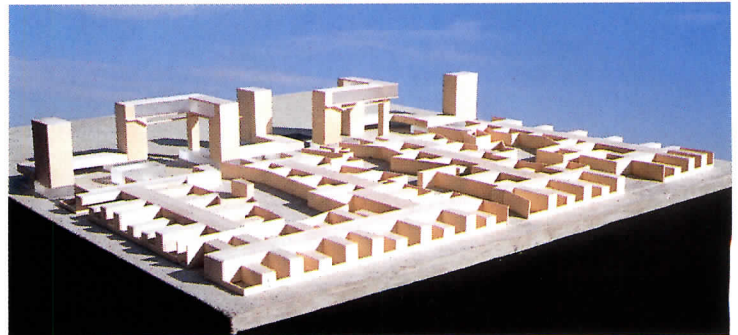
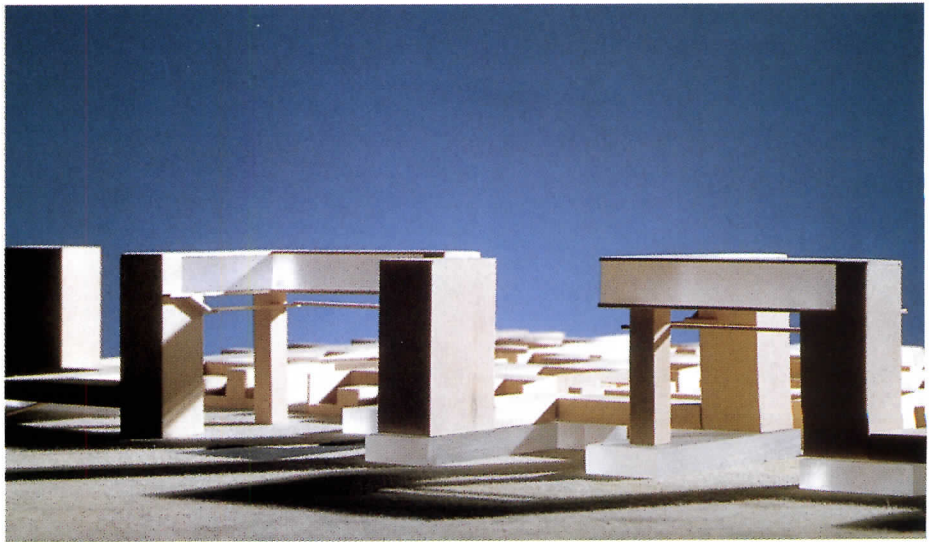
The architecture tries to transform the university from an ivory tower protected from the modern world into a dynamic and contemporary institution. Its colliding forms represent ideas coming together.

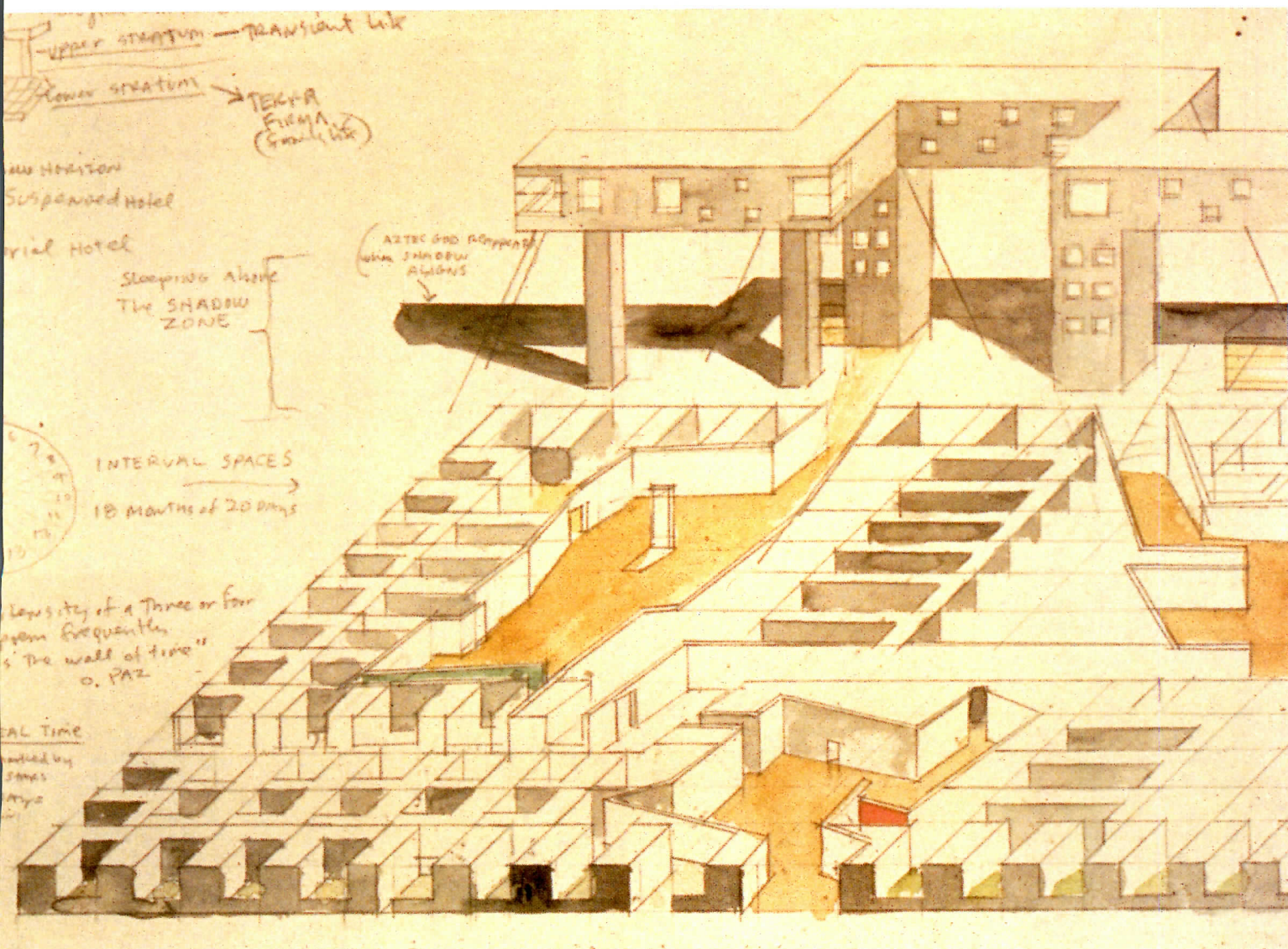


VISITORS BECOME RESIDENTS WHEN A HOTEL AND HOUSING MERGE

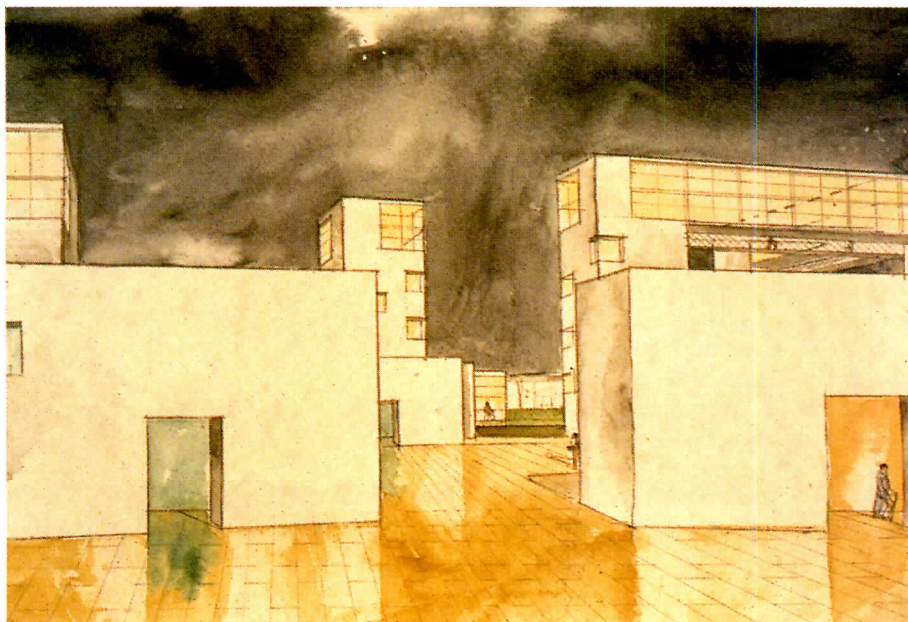
Well known for innovative housing developments in Fukuoka and Makuhari, Japan [RECORD, January 1997, page 64], Steven Holl, AIA, wanted to rethink the building type when he got involved in the JVC Center. He proposed combining a hotel with the housing and blending the two in a way that practically eliminates the distinctions between them. Although the project is divided into nine-story towers and one- and two-story low-rises, the apartments and hotel rooms are mixed together in all the buildings. The hotel's public facilities such as a restaurant, cafe, check-in lobby, and swimming pool, however, are clustered in a series of *translucent cubes* at the base of the towers. Courtyards provide access to many of the low-rise units, while others front on the street. Most of the 100 apartments and 100 hotel rooms are two stories high. The apartments should attract people looking for alternatives to traditional family housing, while the hotel will serve people visiting the JVC Center and Guadalajara. The buildings will be constructed using tilt-up concrete panels, cable trusses, and bead-blasted aluminum cladding.

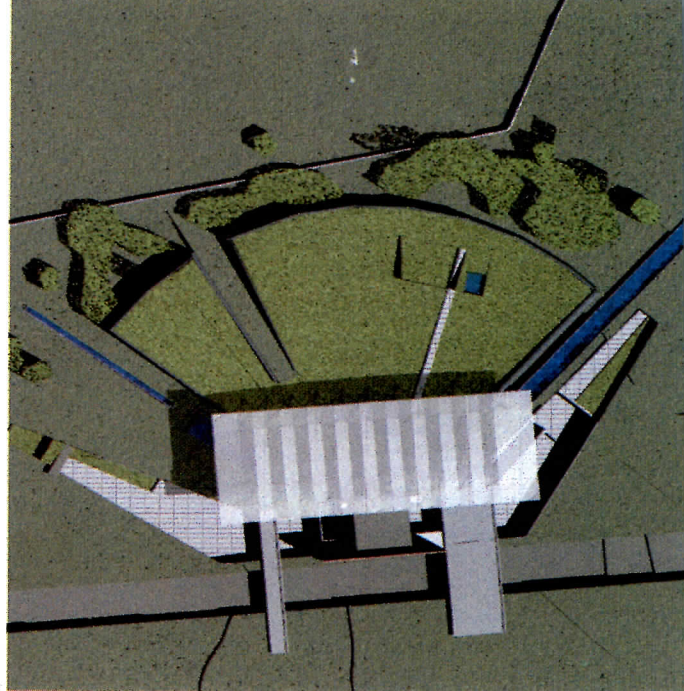
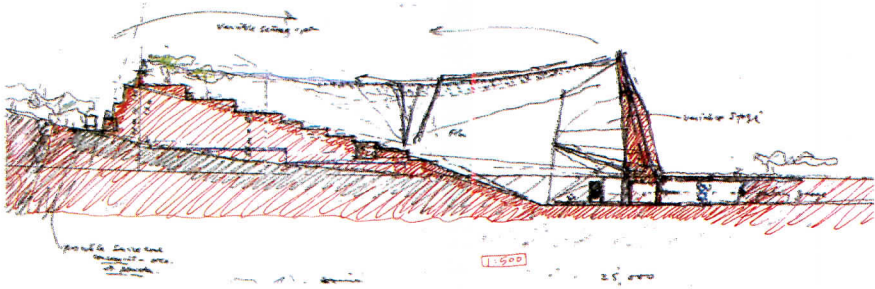
Architects: Steven Holl and J.C. Name Arquitectos





The towers will frame views of both the art museum's sculpture garden to the north and distant hills. Courtyards will provide access to many of the low-rise units, which can be hotel rooms or apartments.

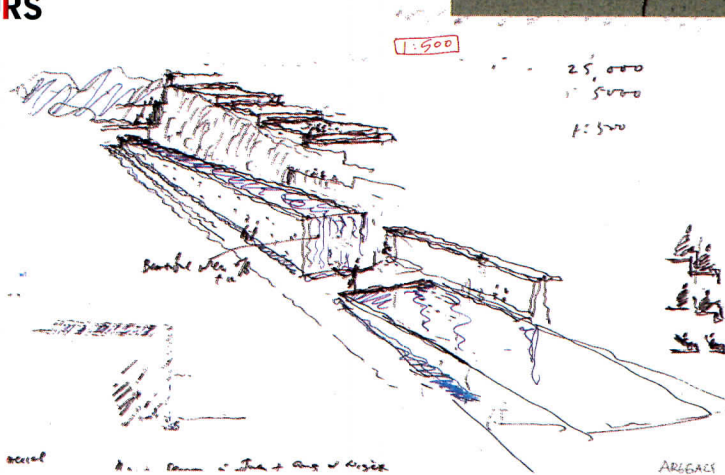




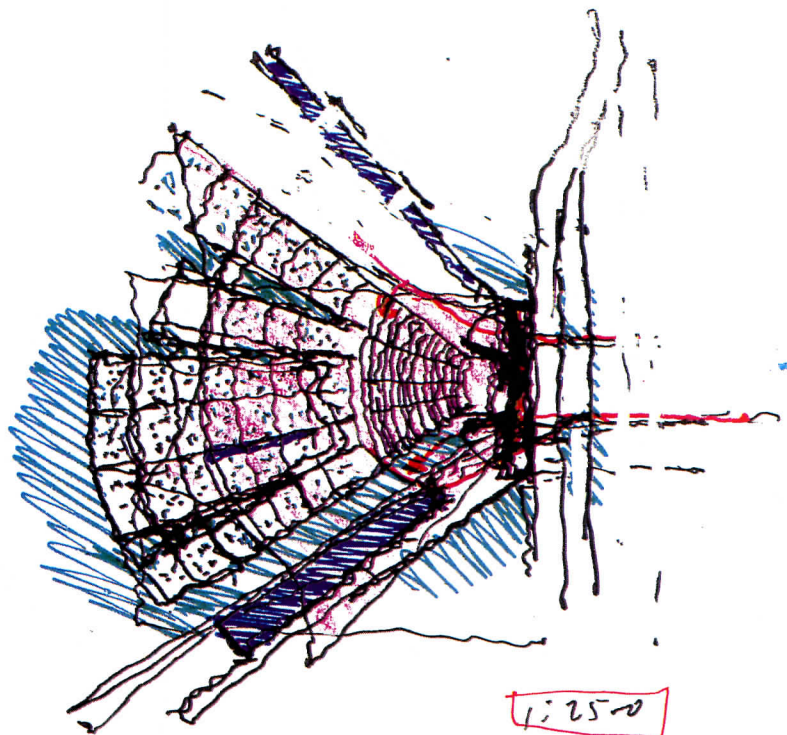
AN AMPHITHEATER USES TOPOGRAPHY TO DEFINE ITS CONTOURS

Nestled against the hills of the Primavera national forest on the western edge of the JVC Center site, the outdoor amphitheater designed by Tod Williams, FAIA, and Billie Tsien, AIA, uses the natural slope to help shape its own forms. Cutting and filling the hillside, the architects designed the seating in rows that rise with the terrain. At the same time, flat platforms and passageways slice into the slope, dividing the fan-shaped seating area into sections and providing access to the stage in the front and the forest in the back. On its sides will be fountains and pools where the sound of moving water will help mask background noises. Fixed seating for 5,000 people will be closest to the stage, while a sloped lawn further back will accommodate another 20,000 people. A translucent tensile canopy, whose lightweight structure will contrast with the concrete and stone walls supporting the sloped lawn, will float 65 feet above the stage and seating area. The canopy will be supported on four slender steel columns and have fabric on its underside to mask the structure above. An additional layer of fabric on top will shed water.

Architects: *Tod Williams Billie Tsien & Associates and Grupo LBC Arquitectos*



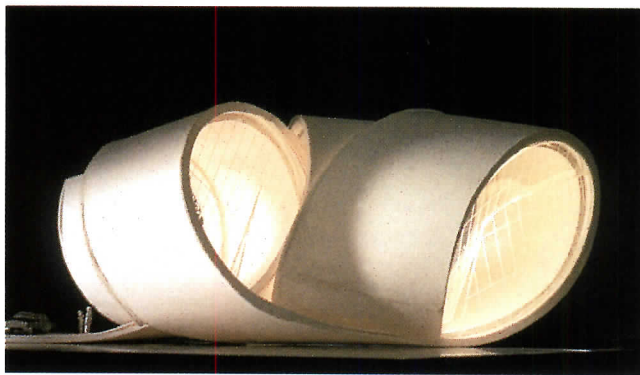
Water features along the sides of the amphitheater will mask noises from other parts of the development (drawing left). A cloud-like canopy will float above seating areas defined by heavier elements like stone walls.



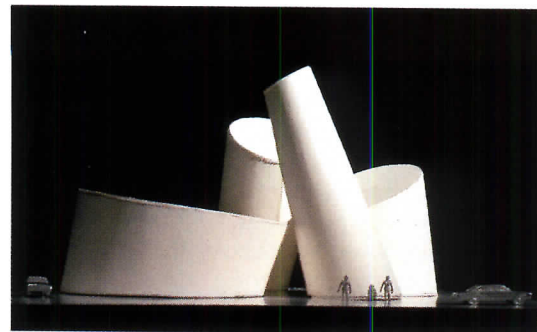
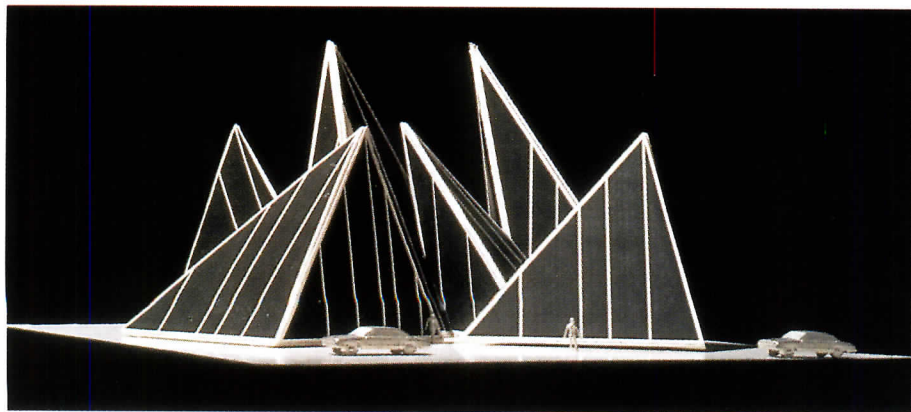
WARPING PLATO FOR FUN TO CREATE A KID'S PARADISE ISLAND

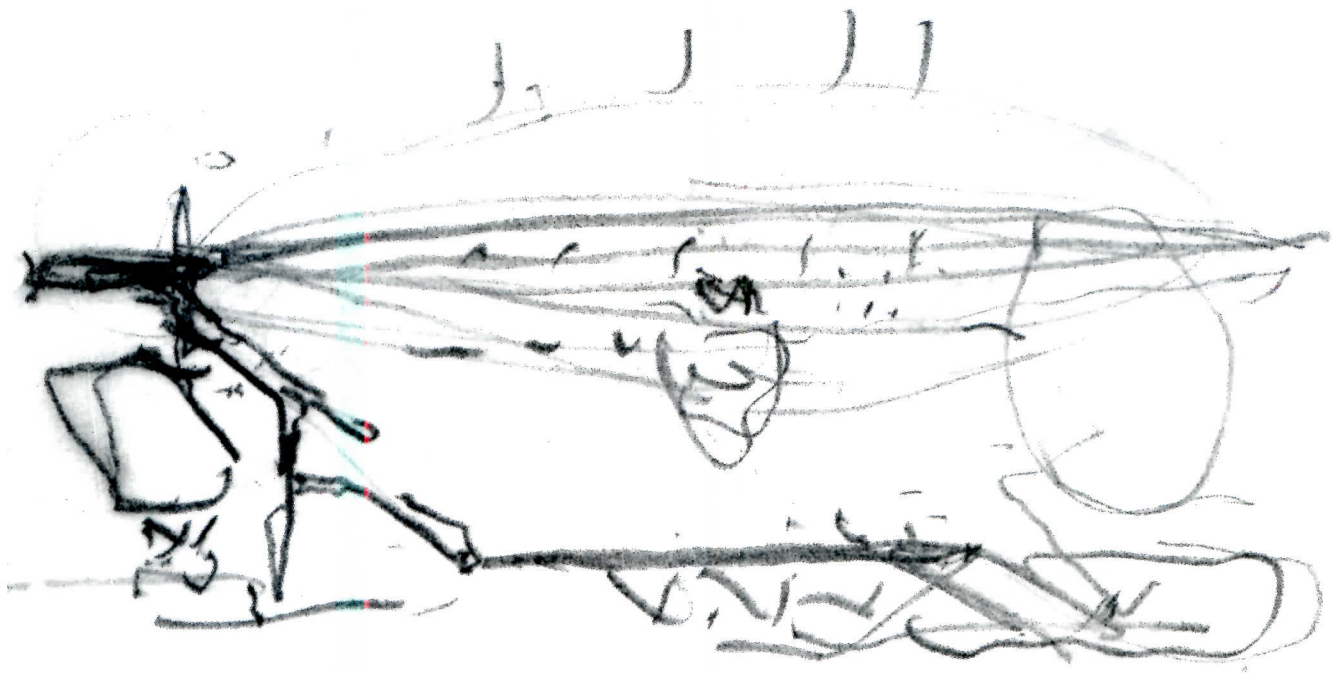
Who better to design a children's museum than 92-year-old Philip Johnson, FAIA? "I'm the best child!" argued Johnson during one of the early JVC Center meetings. No one disagreed. But instead of Play-Doh, the architect used Plato as his medium. Taking four different Platonic forms—cylinder, cube, cone, and pyramid—as his starting points, Johnson warped and multiplied each to create a set of four pavilions that explore what can be done with and to Classical building blocks. So a cylinder has been twisted into a coil, cones are tapered and reversed, cubes are crushed together, and a chorus of pyramids are tilted this way and that. Each pavilion has irregularly shaped openings, but no doors—because the warm, dry climate in Guadalajara makes them unnecessary. On the outside, the concrete structures will be painted an earth color, but inside, they will feature bright Mexican colors like purple, pink, and orange. Set on its own artificial island in an artificial lake, the museum—or "children's world," as the architect and client call it—will connect to the rest of the development by a rope bridge designed by Cecil Balmond of Ove Arup and Partners.

Architects: Philip Johnson/Alan Ritchie Architects and Grupo Corey



The four pavilions, each based on a different Platonic form, are set irregularly within a grid of palm trees placed 26 feet apart. The island location makes the disparate pavilions a group by isolating them from other structures.

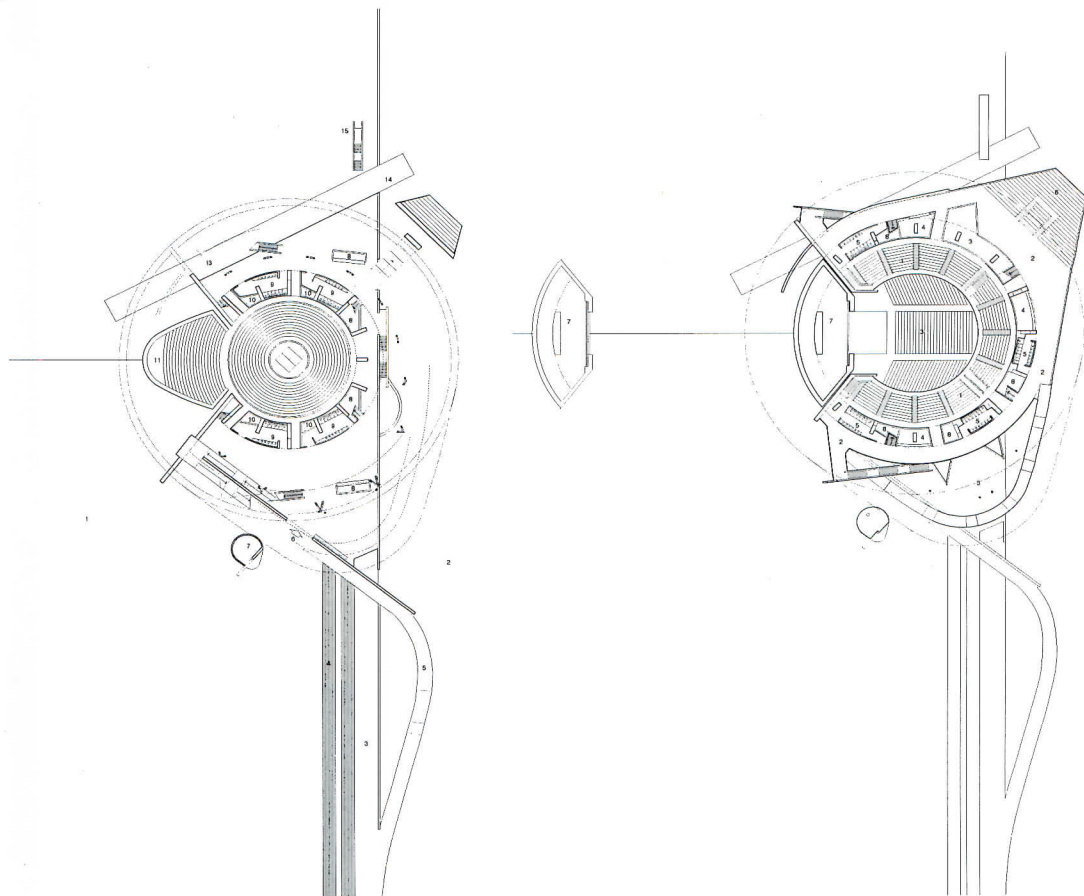




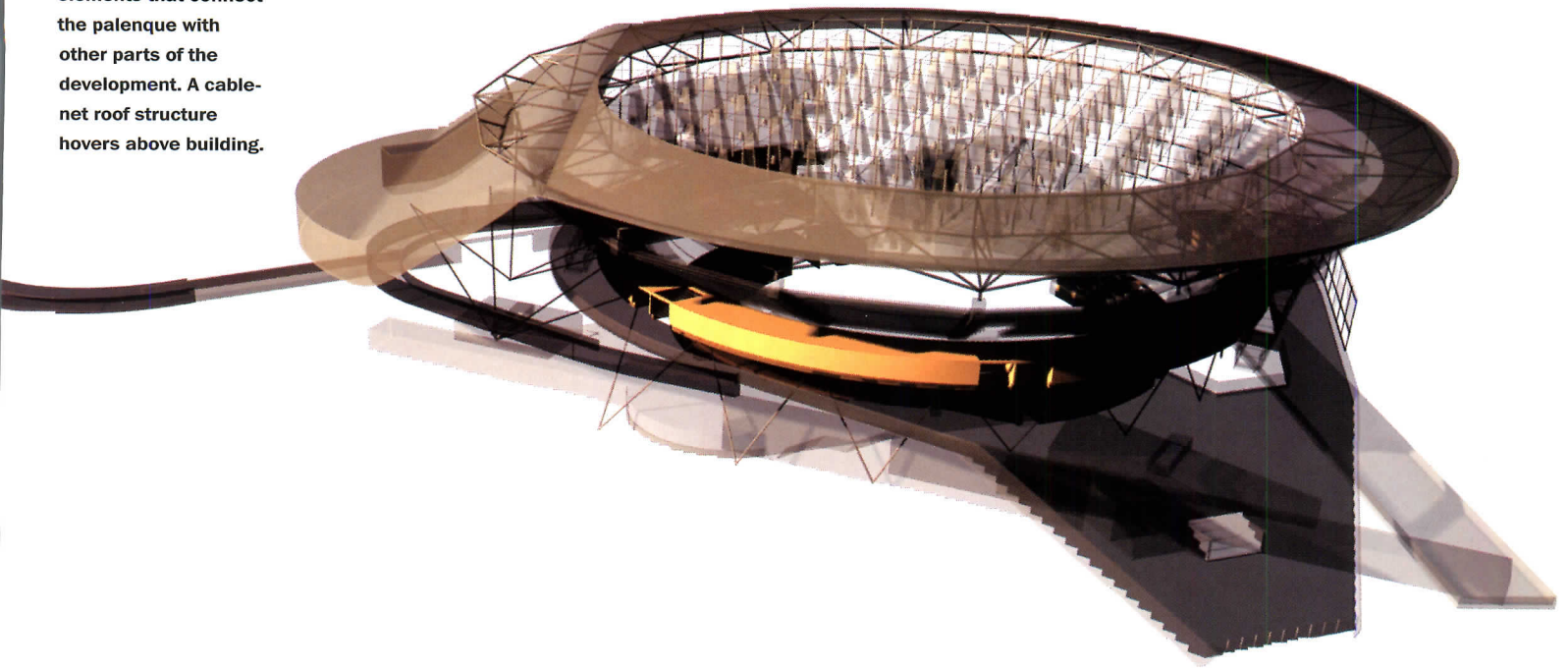
PALENQUE FUNCTIONS AS STAGE AND STADIUM FOR A RANGE OF EVENTS

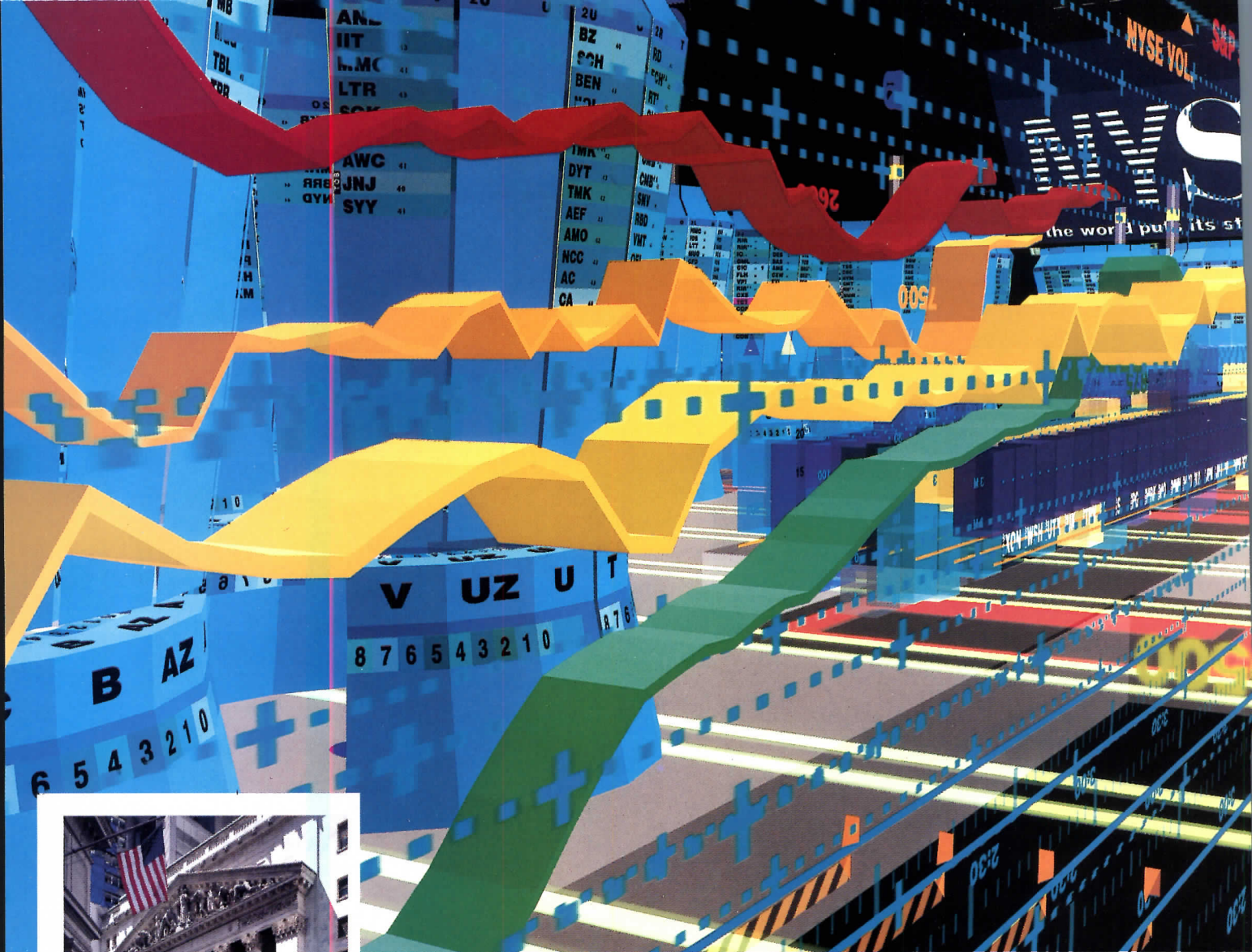
Located at the northeast corner of the JVC Center site, the 6,250-seat palenque (traditional cockfighting ring) will serve as a gateway for cars and as a landmark for pedestrians coming from the convention center and fairgrounds to the south. As designed by Thom Mayne, AIA, Patrick Tighe, and Ung Joo Scott Lee of Morphosis, with Francisco Cornejo and Esteban Cervantes of Grupo Corey, the arena will provide a venue for sporting events, concerts, dance performances, and cock fights. To enhance the building's adaptability, the architects placed the stage and grandstands on rails so they can be pulled away from the rest of the structure. For theatrical performances, the sunken ring at the palenque's center can be raised. Like some pre-Columbian buildings in Mexico, this structure will cut into the earth to make room for its lowest level of seating. Above this, the building will use lighter construction and be topped with a cable-net roof. A wedge-shaped grand stair will project over the lake on the east, providing an inviting place for informal gatherings.

Architects: *Morphosis, Grupo Corey*

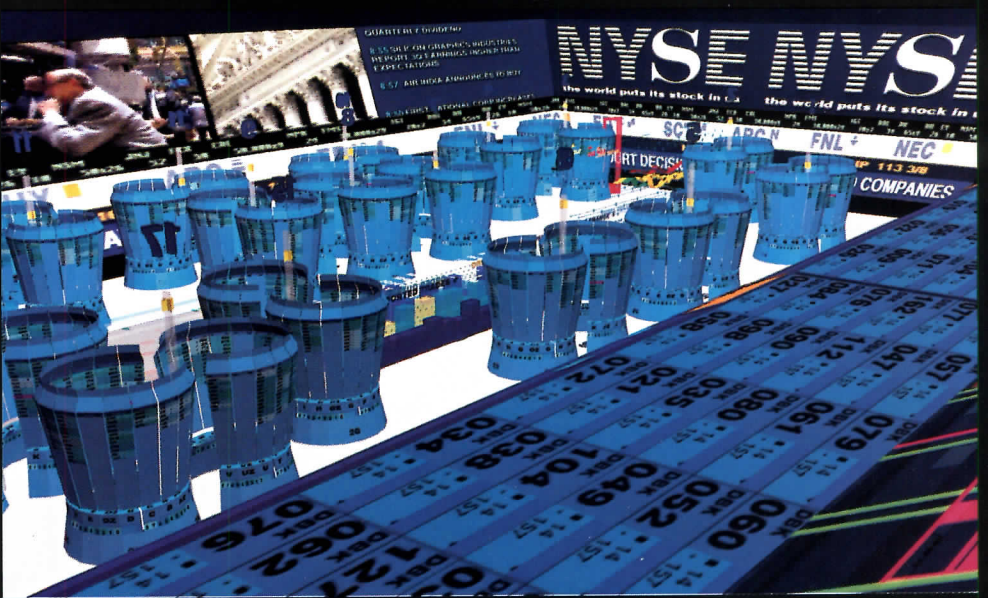


Walkways, ramps, and stairs orbit the arena, serving as dynamic elements that connect the palenque with other parts of the development. A cable-net roof structure hovers above building.





Within the venerable New York Stock Exchange (above, inset), the new, video-blue command center (opposite) contrasts with the trading room's visual chaos—as does the virtual trading floor (above and right).



Asymptote's dual projects for the **NEW YORK STOCK EXCHANGE** span both real and virtual realms.

by Sarah Amelar

With a touch of bravado, architect Hani Rashid of Asymptote Architecture likens his firm's recent designs for the New York Stock Exchange to a cathedral. "In both," he observes, "you have a large number of people passing through and a great deal of information to convey. In a cathedral, frescoes and stained glass carry narratives, making the virtual world real, whereas in the Stock Exchange, we've made the real world virtual." Indeed, in the Stock Exchange's new command center, as in much of Asymptote's work, the architecture spans the cyber and real worlds. Here, Rashid and partner Lise Anne Couture shaped not only the operations center's physical space but also the virtual Three-Dimensional Trading Floor (3DTF) that animates its computer screens—in effect, they designed the cathedral chapel, as well as the frescoes and stained glass within it.

Before hiring Asymptote, the overseers of the New York Stock Exchange struggled to channel the information coursing through their operations center. The minute-to-minute flow of data had grown so vast that those monitoring the trading floor—watching for improprieties and warning signals—needed new ways to visualize it. "In such high-pressure situations," says J. Steven Emspak, whose technology consulting firm, Shen Milson & Wilke, has collaborated elsewhere on command centers, "the response time has to be quick, if not instantaneous and intuitive. There's no time to read three columns across and seven lines down."

But technology and engineering alone were not solving the problem. "We realized that a user interface should be designed by people who understand space, graphics, and the theater of the computer," says Dror Segal, a senior director of SIAC, the Exchange's data-processing subsidiary. Segal ultimately sought out cutting-edge architects to transform graphed, tabulated, and indexed data into a spatial and readily traversed virtual environment. Rashid and Couture had established a reputation at Columbia University's Graduate School of Architecture, Planning, and Preservation with their innovative "Paperless Studio," where pixels replace graphite entirely. The two architects are currently creating a virtual museum for the Guggenheim.

Asymptote's initial commission for the virtual trading floor led to a commission for a real space in which to view this pixelated universe. From the outset, Rashid and Couture aspired to give 3DTF the tectonic qualities that make real-world architecture vibrant, legible, and visually stimulating: Scale, color, light, texture, graphics, and formal invention. Transcending the purely logical and technological, the architects wanted



to evoke on screen the tremendous energy of trading-floor activity.

They took the spatial configuration of the main trading room, with its point grid of posts, as a model for the virtual space. "It was our starting—and departure—point," says Rashid. "We could have fabricated an abstract space from scratch, but then we would've risked losing everyone, including our client." Instead, he explains, each familiar landmark

Projects: *Three-Dimensional Trading Floor (3DTF) and Advanced Trading Floor Operations Center*

Client: *New York Stock Exchange*

Architect: *Asymptote Architecture—Hani Rashid and Lise Anne Couture, principals; Sabine Miller (3DTF), Elaine Didyk and John Cleater (operations center), project architects*

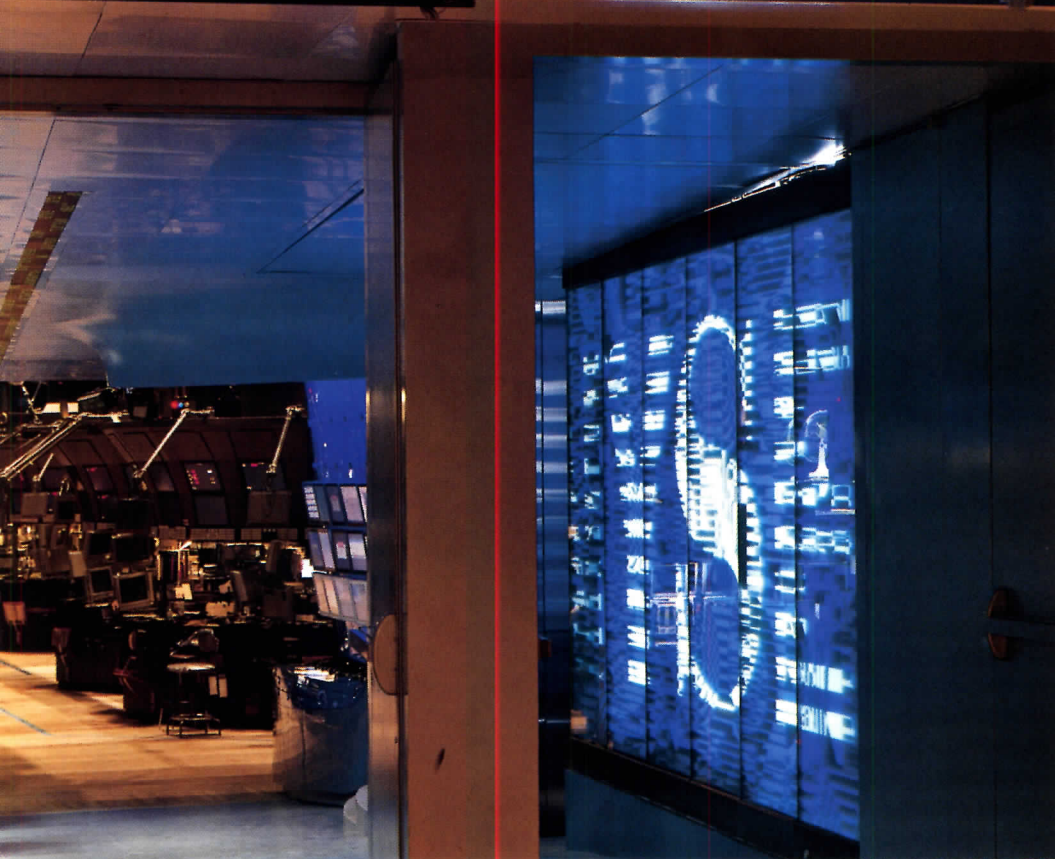
Consultants: *HLW International (structural); JB & B Consulting Engineers (mechanical/electrical); L'Observatoire International (lighting); SIAC and RT-Set (computer programming)*

Systems architect: *SIAC—Dror Segal, technical project manager (3DTF)*

General Contractor: *Morse Diesel International*

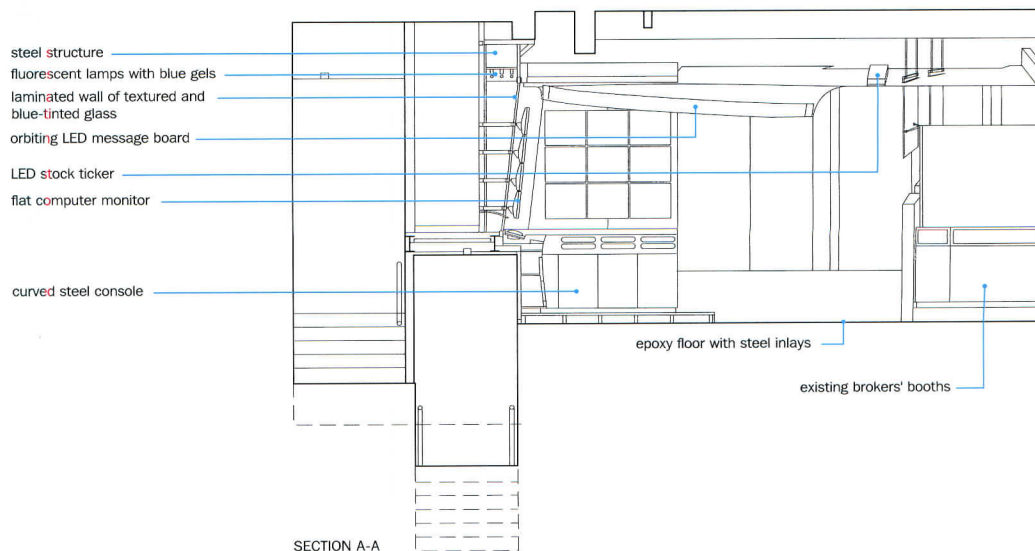
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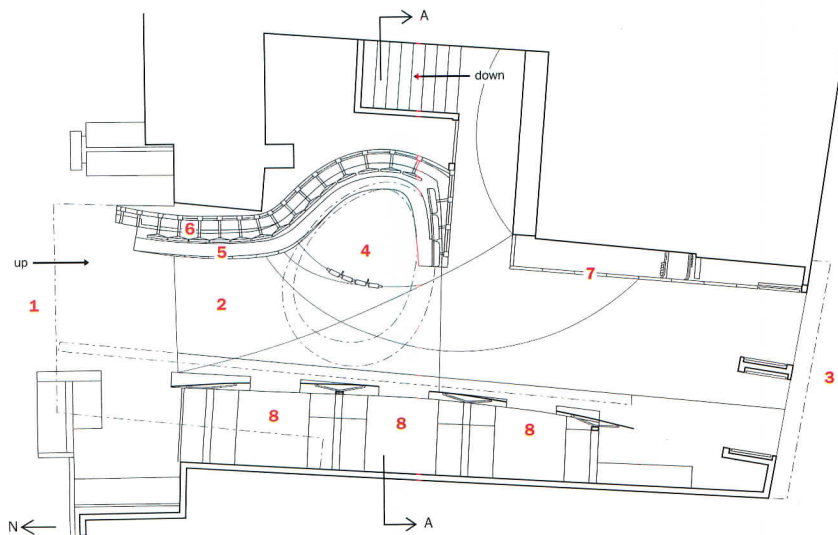
The streamlined command center (opposite and left) was designed to accommodate specific current technology, whereas the old trading rooms (left) were awkwardly retrofitted as equipment evolved. The command center's canted, curving, laminated-glass walls are backlit by fluorescent lamps with blue gels that accentuate the luminosity of the blue-tinted glazing (opposite).

The rear-illuminated mural by Asymptote (above and opposite) morphs the NYSE logo with insignias of hundreds of New York Stock Exchange-listed companies.





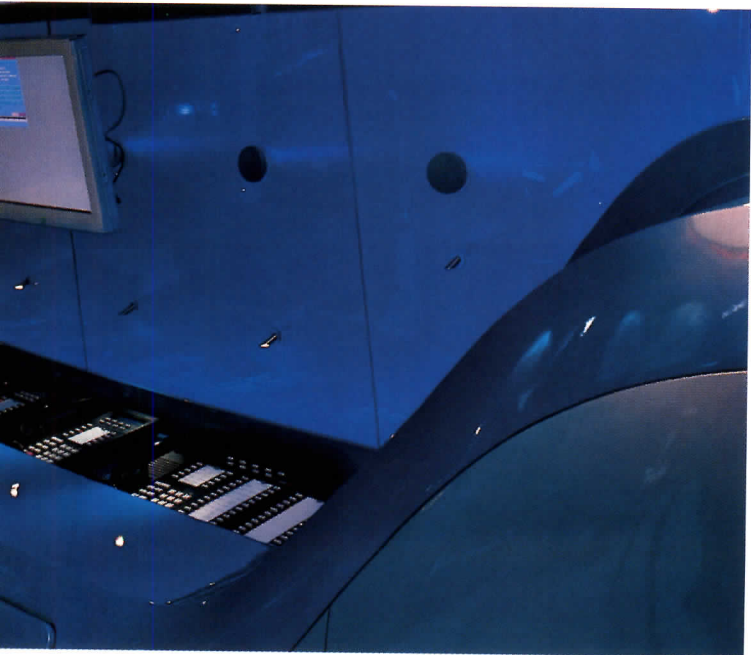
Monitoring the trading floor through the virtual realm, the operations staff leans on posts padded with cast-resin bolsters.



1. Main Trading Floor
2. Ramp
3. Blue Room (trading floor)
4. Command center
5. Console
6. Glazed wall with computer ports and monitors
7. Backlit glass mural
8. Existing brokers' booths

Pulsing with data, the Ramp's flat monitors are backed with translucent housings that reveal flashing lights and other inner workings (opposite, top). The perceived volume of information is heightened by reflections in the wall's glazing, the ceiling's metal panels, and the floor's poured epoxy (below and opposite).





provides an “entry portal,” from which the operations staff can journey into the previously uncharted 3D territory of data in flux. Once users learn the cybergeography, they can find and analyze complex data at a glance. On screen, they can pull up 3D correlation tools from the virtual floor to track simultaneous real-time behavior of related stocks or indexes. The undulating topography of the so-called “heat floor” swells and changes color, flashing red with activity surges. The iconography draws on nautical signals, including flags, to convey information quickly and trigger alerts. As on the actual trading floor, an LED ticker streams around the virtual room, while wall-mounted screens air live CNN broadcasts (placing one virtual world within another). The system, with Silicon Graphics high-powered Onyx 2 computers and Iris Performer flight-simulator software, borrows the technology of critical military operations.

Just outside the cyberzone, the actual command center occupies a sloped connector between the two real trading rooms. Dubbed “The Ramp,” it is the operations staff’s domain, as well as a heavily trafficked

BACKLIT AND VIDEO-BLUE, THE COMMAND CENTER EVOKES CYBERSPACE.

corridor, where traders passing through are free to observe the mission-control screens. This streamlined 1,200-square-foot, backlit, video-blue zone provides a metaphoric foray into cyberspace with its curving walls paneled in a laminate of “pixelated” (or textured) and blue-tinted glass. Across the glazed surface runs a grid of steel disks, ports for up to 60 flat-panel, high-resolution monitors.

Allusions to speed abound in the control area. Keyboards and telephones sit in a swerving console that gleams with blue and silver metallic car paint—a dynamic form that recalls a dashboard. At the center of the steel-paneled ceiling, an LED zipper with breaking news races in an elliptical orbit, while an LED ticker runs alongside it. Sleek, sexy, and high-tech, the Ramp contrasts with the visual cacophony of the gritty, paper-strewn trading rooms that flank it.

The reflectivity of the metal, glass, and the floor’s poured epoxy heightens the perception of vast and rapid data flow. Clearly, the command center must perform a vital public-relations role: To promote a state-of-the-art image of the Exchange. The new Ramp is now the backdrop for initial public offerings or newscasts from the New York Stock Exchange. A ceiling-mounted camera focuses on this arena, while the elliptical form in the ceiling holds a high-powered light cannon. Television stations have even used blue-board techniques to place an announcer on the virtual trading floor (where a live telecast of that broadcaster may actually appear on the video feed in the background, creating an image within an image . . . ad infinitum.) Thus the paired projects must be not only high functioning and experientially compelling, but also telegenic.

Construction on the dual projects proceeded in tandem, with two separate groups of engineers and contractors executing the architects’ designs. RT-Set America, a developer of 3D computerized broadcast systems, for example, wrote the animation code, while Milgo/Bufkin, metal fabricators who had custom built truck bodies before working with world-class sculptors and architects, constructed the metal components. Juggling an unusual combination of real and virtual entities, the architects would “often come back from the site with plaster dust on us,” recalls Rashid, “but other times, it was pure pixel dust.” ■

Sources

Custom metal work: *Milgo/Bufkin*

Paint: *DuPont*

Computers: *Silicon Graphics*

Software platform: *Silicon Graphics*

Monitors: *PixelVision*



Custom coping with factory-fabricated scalloped corners in designer Kynar 500®/Hylar 5000® color.



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LABORATORIES

Unclonable Architecture

ARCHITECTS AND CLIENTS COLLABORATE LIKE BIOLOGISTS IN A LAB.

WHEN THEIR EXPERIMENTS GO WELL, THE RESULTS CAN BE MARVELOUS.

by Charles Linn, AIA



1

Glassboro, New Jersey

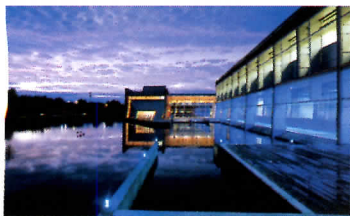
Henry Rowan Hall's labs serve a brand new engineering-education program with an extremely high degree of flexibility.



2

Emeryville, California

Ricardo Legorreta's building for Chiron Corporation is his first foray into laboratory design. It is the first phase of a much larger complex.



3

Lafayette, Louisiana

A wetland in front of the Estuarine Fisheries and Coastal Habitat Center educates the public about the importance of the research that goes on inside.



4

Decatur, Georgia

Training and the testing of biological specimens for diseases is the mission of the laboratories at Georgia Public Health Central.



5

Menlo Park, California

Scientists at the Vincent E. McKelvey Federal Building use highly specialized laboratories to study geology, hydrology, and ecosystems.

Everyone who ever took high-school biology remembers growing cultures in petri dishes half full of a clear, sterile gelatin called agar. Agar is so packed with nutrients that, under the proper conditions, a single organism dropped onto it can reproduce into colonies of many duplicate organisms. These will probably not mutate into new organisms unless something in their environment comes along and pressures them to change.

Architects experiment with the art and science of making places. Our version of agar is a blank roll of tracing paper. It is sterile and lifeless until we begin putting our own ideas onto it. And like agar, the empty page also provides an environment where an idea, under the pressures of designing for program, site, and budget, will evolve. We enlist our clients' help in giving us direction, and together, we build structures that are as much alive as anything in a petri dish.

All the labs presented here have some of the same clonable building blocks—benches with reagent shelves, fume hoods, eyewash stations—but beyond this, they couldn't be less alike. For example, teaching labs in Rowan Hall, by Ballinger, were designed to be modified for different purposes in a matter of hours. MBT Architecture's McKelvey Federal Building represents the opposite extreme. A single experiment in this building may be carried on in the same lab for years.

Lord, Aeck & Sargent's Georgia Public Health Central and Legorreta's Chiron Life Science Center exemplify labs that place strong emphasis on biology. Both respond to their users' need for daylight and to see the outdoors. Georgia Public Health's profile is low and horizontal. It was determined by the need for the careful but rapid handling of the huge quantity of specimens that have to be tested to keep the people of this state well. The organization of Chiron is vertically oriented, a hybrid inspired by two research lab types, academic biology and pharmaceutical.

Possibly what comes closest to being a large-scale, functioning petri dish are the man-made wetlands outside the Estuarine Habitats and Coastal Fisheries Center, designed by Eskew+. There was just a hole in the ground, which after collecting rainwater furnished a fertile place for wind-borne seeds to sprout. In time, these plants provided shelter, attracting waterfowl and amphibians. Fish, too, somehow found their way to these waters, along with plankton, insects, and a multitude of other life-forms that make up a whole, miniature ecosystem. As a tool for education, the beauty of this petri dish speaks for itself and for the plants and creatures the scientists working inside hope to preserve. ■

1

Henry M. Rowan Hall Rowan University Glassboro, New Jersey

ARCHITECTS AND A SURROGATE FACULTY DESIGN THE ULTIMATE IN FLEXIBLE LAB MODULES AT A NEW SCHOOL OF ENGINEERING.

by Charles Linn, AIA

Project: Henry M. Rowan Hall, College of Engineering, Rowan University, Glassboro, New Jersey

Design architect: Ballinger—Jeffery S. French, FAIA, management principal; Terry D. Steelman, AIA, design principal; Mark S. Chadwick, AIA, project manager; David Lang, AIA, Eric Keune, AIA, Margaret Grahame, AIA, Todd Ray, Andrew Thurlow, design team

Architect of record: Radey & Fuller, Doug Fuller, AIA, principal; John McQuilkin, AIA, project architect

Engineers: Ballinger—Jonathan Friedan, principal; Jose-Moringo Mestre, Edward J. Zinski, Orest Schwed, design team

Consultants: GRP Planners Collaborative (lab planning); Land Dimensions Engineering (civil); Verguson Company (landscape architects); Tighe Lighting (lighting)

Construction manager: Leher McGovern Bovis

General contractor: Terminal Construction

Cost: \$29 million; 94,500 gsf

Sources

Limestone: The Cleveland Marble Mosaic Company

Curtainwall, windows, skylight: Vistawall

Lab casework: Fisher-Hamilton

Trench duct: Walker

Cable tray: Mono-Systems

Lighting: Focal point, Elliptipar

Resilient flooring: Mannington

Acoustical ceiling: Armstrong

When industrialist and inventor Henry Rowan and his wife Betty pledged \$100 million to Glassboro State College in 1992, it was the one of the largest single gifts to a public institution in history. In return, they secured a promise from the New Jersey college's administration to start, from scratch, a new school of engineering. They would need a curriculum, faculty, students, and a building. What made the Rowans—not even alumni—give such an extravagant sum to an obscure college? They wanted to invest in developing a new kind of engineering education, one that would reflect the entrepreneurial spirit Henry Rowan had embraced as owner of the largest manufacturer of electric furnaces for metallurgy in the world.

A few years later, the college—renamed Rowan University— assembled an advisory panel to formulate a curriculum for the school of engineering. The four traditional engineering disciplines—civil, mechanical, electrical, and chemical—would remain, but would focus on fields incorporating new technologies: Manufacturing and process engineering, computer engineering, environmental engineering, and communications and information engineering. The curriculum would not call for the separation of teachers and students into formal departments. Instead, the approach would be

interdisciplinary. Dr. James Tracey, dean of the college of engineering, explains, “We set up our courses in a way that would encourage teamwork. For example, a student in electrical engineering can take classes in mechanical engineering and work with someone from another discipline, just as they will after they graduate.

“We also wanted to discourage the traditional process, where theory is taught in lecture classes, isolated from the laboratory experience. We wanted some of our teaching spaces to be next to labs, but we also wanted to be able to convert the classrooms to labs.”

Terry Steelman, AIA, partner-in-charge of design at Ballinger, a

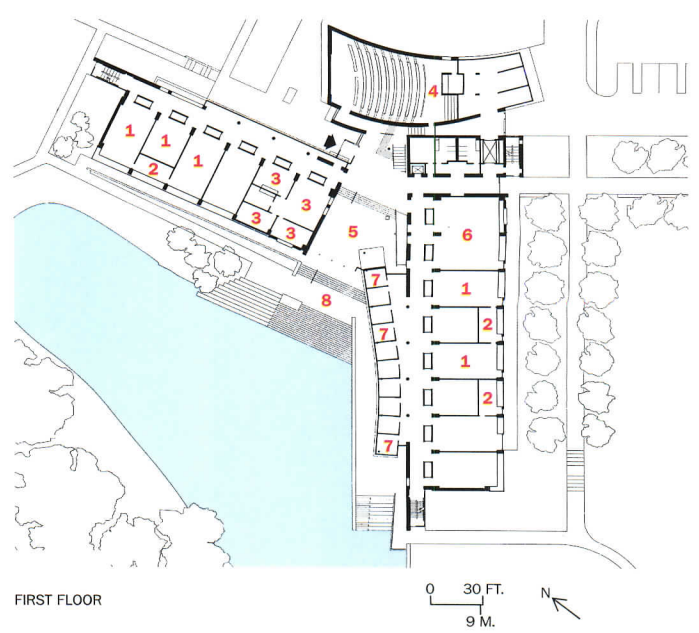
Philadelphia architecture and engineering firm, won the competition for the building. His scheme had a pair of three-story laboratory wings radiating extended from a core containing an atrium, lecture hall, and an outdoor gathering area. Although the competition established the part of the building, not knowing what specific courses would be taught and how many labs would be needed for teaching, intensified the design challenge. Furthermore, no faculty had been hired, nor were there students, and as a result, interest in course offerings could not be gauged, either.

To circumvent the problem, the architects coordinated a series of workshops over a six-week period



The commons in Rowan Hall (below, opposite) has become one of the most popular places for study and on-campus social gatherings. Labs and the commons overlook a small spring-fed pond (below).

1. Laboratory
2. Lab support
3. Office
4. Lecture
5. Computer lab
6. Commons
7. Faculty offices
8. Plaza





The walls separating each lab module are non-load bearing and can be removed to create larger rooms. Fully piped and wired floor trenches lie beneath these partitions. High-bay labs (left) can be created by removing the ceiling to access the space above.



The “smart bench” (left) can connect quickly to gas, vacuum, waste, and power lines and to the building’s computer network. The services run through a floor trench made accessible every four feet through pop-off panels (bottom), allowing for flexibility in arranging benches. Outside each lab, access doors to the vertical chase (below) make services easy to turn on or shut off.

with a “surrogate faculty,” to help gain insight into how to create labs that would meet the needs of the engineering school. The group included Dean Tracey, 10 engineering educators from across the nation, and members of the university administration.

The group devised teaching labs that could be configured in several ways. Lab spaces throughout the building follow a 22-foot-by-44-foot standard module, with non-load-bearing walls that are easily dismantled to join adjacent modules. The ceilings of the second- and third-story labs can be removed to create high-bay spaces. Even Dean Tracey’s office and conference room have plumbing and are wired for conversion into a lab.

Each lab receives gas, vacuum, and water services from a vertical chase in the corridor. Each chase serves a stack of three labs. The services to any lab can be turned on or off via a chase access door adjacent to the laboratory entrance. Each lab also has its own electrical panel.

Services are distributed horizontally through floor trenches, which also carry waste lines and cabling for the building’s computer network. Trenches lie at the center of each lab and under the partitions between the lab modules. Pop-off panels located every four feet along

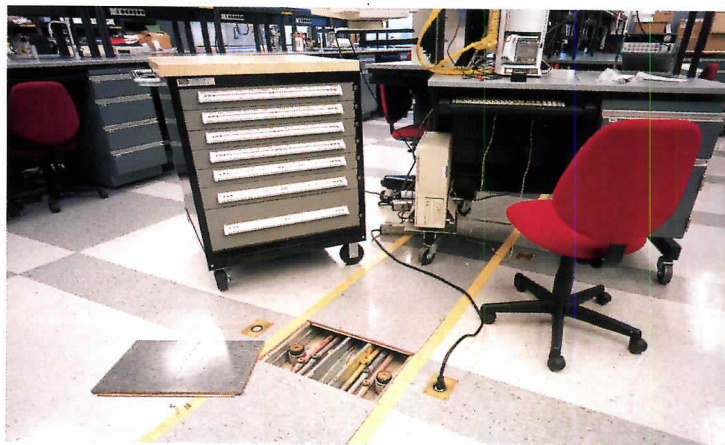
the trenches make accessing piping and computer cable easy. Electrical floor outlets are also nearby. Lighting, fume-hood exhausts, and HVAC are tucked into a ceiling-mounted service canopy that extends into each lab. A similar custom-made assembly runs the length of each corridor and carries lighting, HVAC, sprinklers, smoke detectors, electrical supply, and computer network cabling. All are easily accessed for alteration or repairs.

The design team developed a portable “smart bench” for the labs, that can be readily hooked into the services with quick-connect pipe clamps commonly used by plumbers. Different versions of the smart bench are made by combining various off-the-shelf lab equipment components. For example, benches in electrical-engineering labs usually require power and access to the computer networking but don’t require plumbing, so they are not equipped with sinks or gas and vacuum ports. Smart benches for chemistry, however, must accommodate the full complement of systems. Yet, because every lab module has all services built-in, an electrical-engineering lab can be converted to a chemistry lab in a matter of hours simply by changing the benches, some of which are on casters, making them mobile.

At present, some of the lab modules work in conjunction with classroom setups, where desks are located in one half of the lab, and benches in the other.

While faculty member John Schmalzel acknowledges that “Space equipped for doing experi-

ments is very expensive to use as classrooms,” he is quick to point out the prime advantage of the flexibility the architects designed: “It is ideal for the teacher and students to discuss an experiment, walk over to the lab and do it, then move back to their desks and talk about it.” ■



2

Chiron Corporation, Life Science Center Emeryville, California

LEGORRETA DESIGNS A SIGNATURE CAMPUS FOR A CUTTING-EDGE BIOTECH COMPANY.

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

Project: Chiron Corporation Life Science Center

Design architect: Legorreta Arquitectos

Architect of record: Flad & Associates—Robert Graves, AIA, partner-in-charge; John Mickow, AIA, team project director; Bill Bula, AIA, design coordinator; Charlie Garnett, project architect; Kitty Tyson, architect; Chad Siripalaka, technical specialist; Bob Hodgson, landscape architect; Randy Schmitgen, interiors

Consultants: Affiliated Engineers (mechanical/electrical); Earl Walls & Associates (lab planning); Brayton & Hughes (interior architect); Fisher, Marantz & Stone (lighting); KCA Engineers (civil); Richard Rietz, PhD (lab programmer); Peter Walker and Partners (site); Rudolph and Sletten (general contractor)

Cost: \$305 per square foot; 285,000 gsf

Sources

Curtainwall: Grandview/Royal Glass

EFIS: Dryvit

Metal roofing: Van Mulder

Sandwich panels: O'Keeffe's

Fire doors: Wan Door

Acoustical ceilings and suspension: Armstrong

Laboratory casework: ISEC/Hamilton

Paints and stains: Sherwin Williams

Carpet: Walker Bros.

The emergence of technology based on the science of recombinant DNA spawned one of the most promising areas of scientific discovery of the 1990s. As architects worked to articulate the ever-changing programmatic needs of the biotech industry, they borrowed heavily from prototypes from the pharmaceutical industry and academic biology laboratories to invent a new genre, the biotech lab. Legorreta Arquitectos has elevated this lab type—which, like most, can be potentially bland and institutional in appearance—to a higher level of expression for the Chiron Corporation.

After its founding in 1981 by three professors from the University of California's nearby Berkeley (UCB) and San Francisco (UCSF) campuses, Chiron quickly emerged as the largest employer in Emeryville. By the early 1990s, the company had converted several warehouses and petroleum-products labs in Emeryville industrial areas to accommodate its rapid growth. Chiron recognized the need to develop facilities that would help it compete for talented scientists and bring them together to formulate and share ideas. Also, Chiron wanted an architect whose building design would express its corporate

Eric Fang, AIA, is an architect and urban designer with Skidmore, Owings & Merrill in San Francisco.

culture, which some have said is infused with the same innovative and entrepreneurial spirit found in Silicon Valley start-ups.

Master planning a lab campus

Initially, Chiron worked with lab programmer Richard Rietz to determine spatial requirements for the facility. Then, in the fall of 1993, at the recommendation of architect Richard Brayton, FAIA, a friend of Chiron's chairman Dr. William Rutter, Chiron selected Ricardo Legorreta to develop a master plan and to design buildings for the company's first research and development campus. With no laboratory experience to its credit, Legorreta's firm did not seem the obvious choice for the project. Nevertheless, Chiron gravitated toward Legorreta's use of bright colors and strong, basic forms. About a year later, Flad & Associates, a leading national lab specialist based in San Francisco, joined the team.

Chiron had committed to stay in Emeryville and proceeded to devise a program calling for 2.5 million square feet of research and development labs and office space on a 25-acre urban industrial site. The size of the complex gave Legorreta the opportunity to master plan a research and development campus integrated into the surrounding cityscape.

Building 4, the first of seven six-story, cruciform-shaped buildings to be completed, will adjoin its sibling structures in two places: At street level, to create a network of small plazas, and on the third-floor level, where a pedestrian network will connect the buildings. Two office towers anchoring the campus at its north and south ends will house administrative functions. Parking will be confined to two large multistory garages on the west side of the site, isolating the labs from nearby railroad-traffic noise and preventing the site from becoming congested by automobiles.

Interaction a primary goal

Chiron's focus on fostering interaction between researchers is most clearly reflected in Building 4's spatial organization. To keep the lab design from influencing the overall form too much, and to maintain flexibility, Chiron decided not to adopt a formal program for the building until after the completion of the conceptual design.

The company's founders did recognize, however, that their scientists spend only about 20 percent of their time at the lab bench and, therefore, sought to recapture the creative environment of the notoriously cramped, but successful, labs at UCSF. During conceptual planning, Legorreta allotted Building 4 only about half the industry stan-

Building 4 (top and bottom) represents the first phase of Chiron's new campus. Massing of future buildings will be similar to this one. Eventually, a series of plazas at street level and walkways on level three will connect all seven buildings.





dard for lab space. At 8 feet by 10 feet, the offices are smaller than usual; however, they are organized around a communal zone, providing direct contact to the atrium on one side and the labs on the other.

After Flad & Associates came on board, the concept was refined. Following a vertical organization that has proved successful in other biotech labs, animal labs and air-intake functions are located on the first two levels of the building. Labs located on floors three through five represent a modified version of an often-used parti that places labs and offices around the perimeter of the building, outside a continuous race-track corridor. Support functions lie in the center.

The architects and lab planners modified this approach to create T-shaped units with labs along the top, horizontal side of the T and lab-support spaces on the vertical leg. Two of these T-shaped units are on each floor, on opposite sides of the building. A central zone separates the two blocks. This zone includes three meeting areas that connect the lab spaces and are separated by a lab-support block that is rotated 45 degrees to create triangular light wells, the building's social

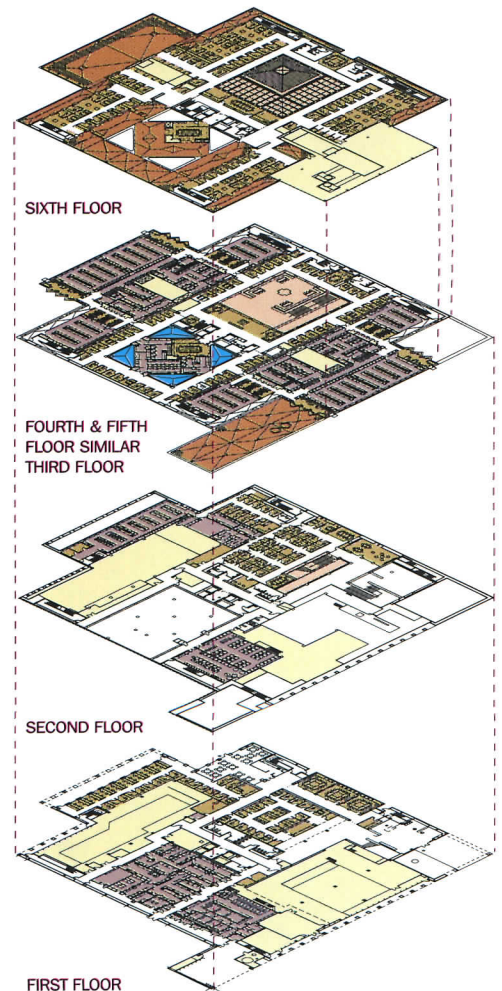
center, and a dramatic three-story skylit atrium. On the sixth level there are offices, indoor conference spaces, and a large roof terrace for private assemblies and gatherings. Legorreta also exercised tenacious ingenuity in sneaking in windows, such as those between the offices and the labs.

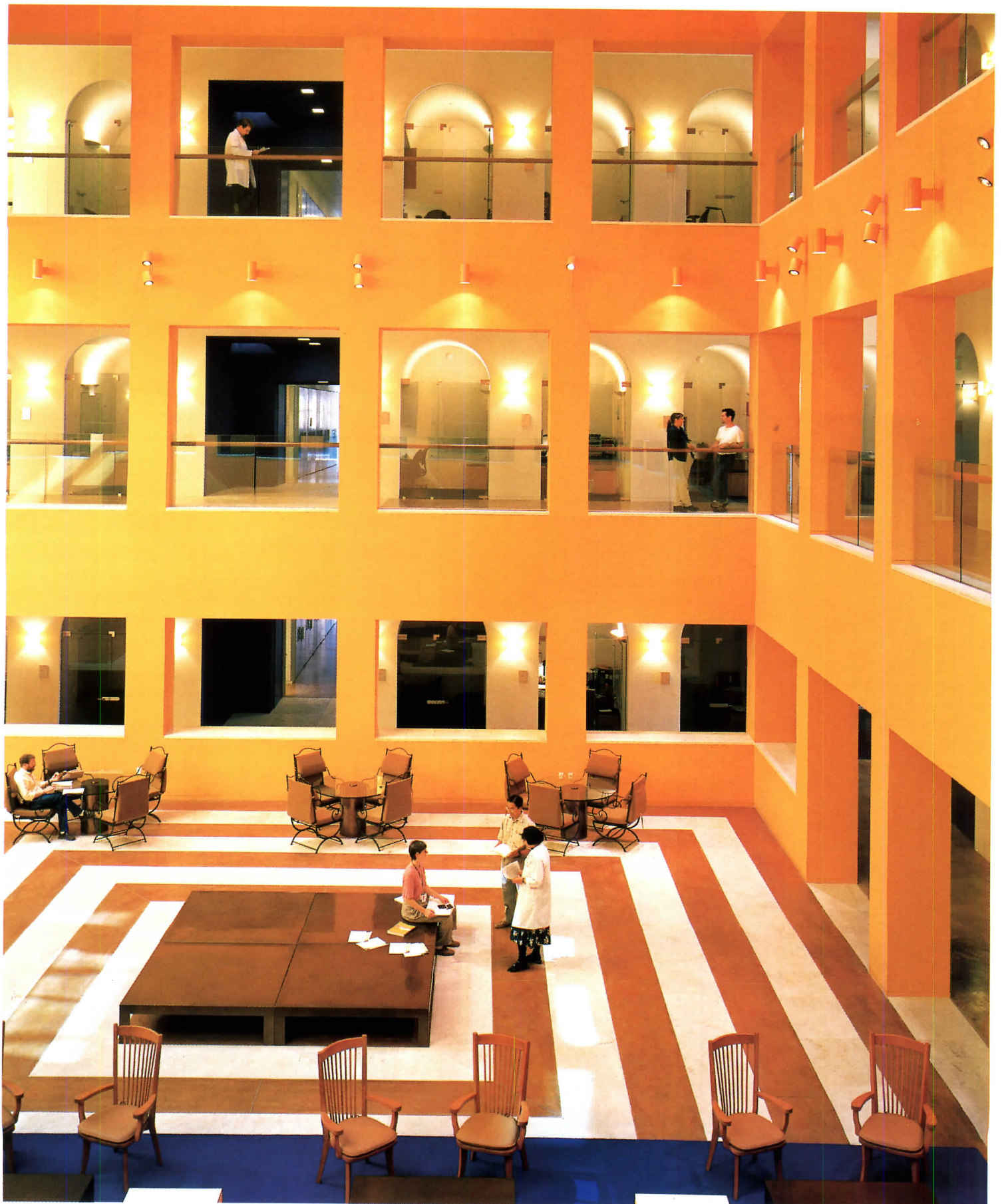
Flad took special care to ensure that Legorreta's vision would be carried out faithfully. For example, the firm developed a brick-faced concrete panel that recreated the look of the mortarless stacked-brick construction favored by Legorreta. This standard of care is evident throughout Building 4, which has a mass and solidity that helps it hold its own within the site's gritty industrial surroundings.

As a single entity, Building 4 has become something of a symbol of Emeryville's industrial rebirth, testifying to the center's initial success. As one unit of a larger, complementary plan that includes other buildings, plazas, and interconnecting walkways, however, a more telling evaluation of the campus' ability to engender creativity and interaction will elude its users and creators until it is complete. ■

- Lab and lab support
- Office and clerical
- Water feature
- Courtyard
- Roof
- Mechanical Corridor

Researchers can see outdoors by looking across a corridor and through an arched window (top). An atrium that starts on level three and extends through level five admits daylight to offices and conference rooms (opposite).





3

Estuarine Habitats and Coastal Fisheries Center Lafayette, Louisiana

MAN-MADE WETLANDS INSTANTLY ENGAGE THE CURIOUS PUBLIC AND DEMONSTRATE AN UNDENIABLE NEED FOR THE RESEARCH GOING ON INSIDE.

by **Christine Kreyling**

Project: *Estuarine Habitats and Coastal Fisheries Center*

Owner: *National Oceanic and Atmospheric Administration*

Design architect: *Eskew+*

Architect of record: *Guidry, Beazley, Ostteen/Eskew Filson Architects, a joint venture*

Project teams: *Eskew+—Allen Eskew, AIA, design partner; Chuck Hite, AIA, project manager; Steve Dumez, AIA, design director; B.J. Seigel, project architect; Guidry Beazley Ostteen—Charles Beazley, AIA, managing partner; Randy Rivera, project manager*

Consultants: *McKee & Deville Consulting Engineers (structural); Associated Design Group (mechanical/ electrical); Earl Walls & Assoc. (lab planning); Cline Bettridge Bernstein (lighting); Jon Emerson & Associates (landscape)*

Cost: *\$12.5 million; 67,000 gsf*

Sources

Face brick: *St. Joe Brick*

Curtainwall, metal windows, and entrances: *Vistawall*

Metal wall panels: *Centria*

Built-up roofing: *Siplast*

Insulating glass: *Viracon*

Skylights: *Wasco*

Wood doors: *PTK Door*

Door hardware: *Hager, Yale, Von Duprin*

Acoustical ceilings and suspension system: *USG Interiors*

Resilient flooring: *Allstate*

Carpet: *Bentley Mills*

Lobby sofa: *Knoll*

Many people consider dank, smelly swamps inhabited by slimy creatures to be of little value. And they tend to appreciate these humid habitats even less when legislation forbids draining them for new, developable land. Despite this seeming inconvenience, however, wetlands actually ensure the survival of countless species and aid natural water filtration and purification processes.

To settle the silt on further misperceptions, New Orleans-based Eskew+ designed the Estuarine Habitats and Coastal Fisheries Center (EHCFC) to educate the public by example with its interpretive center for visitors and two man-made wetland environments. Laboratories for the study of coastal marine life and habitats science and administrative offices support further programmatic requirements.

The building's adjacency to the existing National Wetlands Research Center (NWRC) implies a campus-like formation, which the architects aimed to achieve. Both facilities were designed in joint ventures between Guidry Beazley Ostteen and Eskew+ (previously known as Eskew Filson Architects).

The client asked that both

Christine Kreyling is a freelance writer who serves as architecture, urban planning, and design critic for the weekly newspaper, the Nashville Scene.

buildings share a common materials vocabulary that includes soft-textured red brick, light-colored concrete or stucco, and metal paneling. The facing buildings share parking, security, and other amenities, such as a library, greenhouse space, and an incinerator.

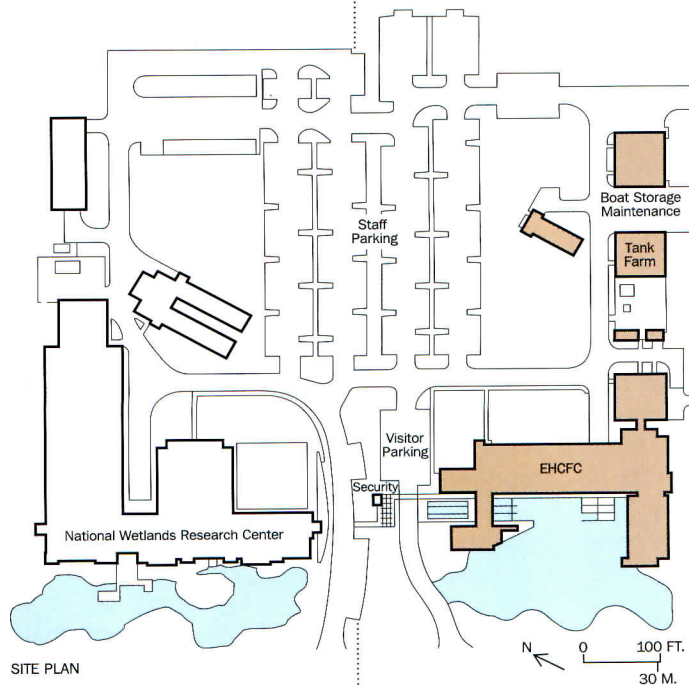
The most engaging aspect of the campus is the pair of freshwater wetland habitats in front of each building. "The water habitats are the signature of the project," says Eskew+ design architect Steve Dumez, AIA. "They

announce the nature of the research going on inside. We dropped the ground plane of the building right into the wetland, blurring the distinction between the water and the building."

A public to private procession

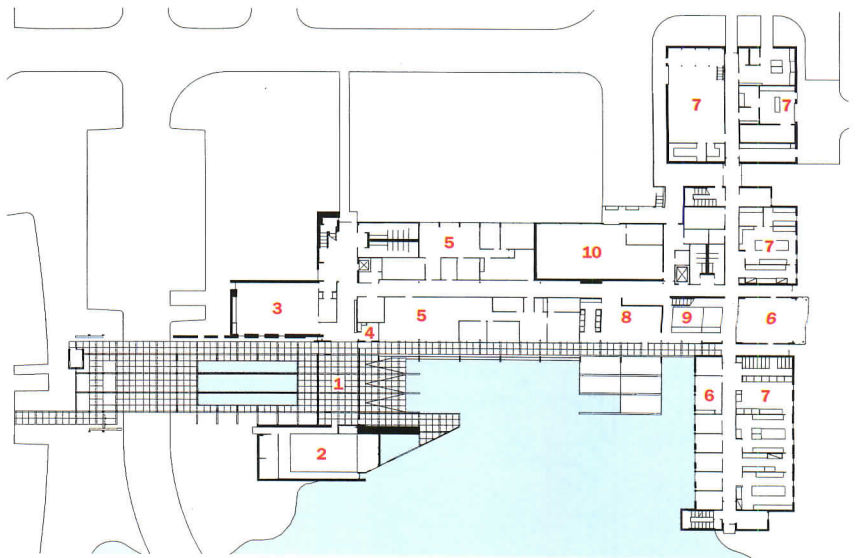
The building is organized in zones, beginning with the most public areas, proceeding to the semipublic tenant offices, and ending at the nonpublic research spaces.

Visitors approaching the EHCFC pass a rectangular pool en



- 1. Lobby
- 2. Interpretive center
- 3. Conference
- 4. Reception
- 5. Offices
- 6. Research offices
- 7. Laboratories
- 8. Cafe
- 9. Commons
- 10. Mechanical

Visible from across the campus' wetlands (below) are the interpretive center toward the left, the main lobby in the center, and the two-story office wing on the right.



FIRST FLOOR





An egret visits a pool outside the interpretive center (left). Humans coming by car cross a bridge to the parking lot (top) and pass a pool on their way to the entrance (above).

route to the lobby. Once inside, they may turn right to go to the interpretive center, where exhibits about wetlands are displayed, and, once there, they can walk outside to a plaza to experience the center's estuarine habitats firsthand. A second small pool is also visible outside the interpretive center. Access to semipublic spaces—the conference center and the administrative offices of several government tenants—and the non-public research areas is monitored from a reception area across the lobby from the interpretive center.

Planning workshops conducted with the clients and users prior to designing the building revealed that a two-story facility that separated administrative offices and laboratories into distinct wings would best suit the building program. Scientists, however, do have small offices in the lab wing where they may write reports. As laboratory planner Ulli Lindner, of Earl Walls & Associates, explains, “Offices have very simple

construction requirements compared to labs,” and are much less expensive to build.

The labs, for example, required the installation of a dual air-handling system, because air does not recirculate through them during experiments. This increases the cost and complexity of the HVAC system. Labs also require greater structural stability and more elaborate plumbing systems than offices. Lindner adds that “the per-square-foot cost of lab space can be twice the cost of office space, so you always separate them from the labs. And, you must also design offices so that they can't be turned into labs. One of the strongest tendencies of scientists is to spread out. If they see empty space, they'll move into it.”

Still, though cost dictated that offices and labs reside in separate wings, the clients wanted to encourage collaboration between users on different floors. To address this desire, Dumez connected the first

and second levels with a two-story commons room adjacent to the staff cafe. While these areas do create a buffer between the lab and office wings, the social nature of these settings tends to encourage interaction.

The tank farm

Research at the EHCFC focuses on animal habitats that occur in estuaries, where freshwater from lakes and streams mixes with saltwater from the sea; therefore, the center's facilities and support equipment are highly specialized.

One of the EHCFC's more unusual features is the tank farm, where three different types of water are stored for experiments: Manufactured seawater, which is produced at the tank farm; natural seawater, which is brought in by truck; and well water, which is pumped from underground. Along with a tank for each type, an additional tank provides storage when one of the others is being cleaned.

Each water type is pumped through its own recirculating loop and stored in a headbox, where it can be chilled, heated, or otherwise treated before it goes to the wet lab, where research on estuarine creatures is performed. The wet lab is similarly equipped with drainage trenches and drain lines for the three types of water. Finally, water recirculated back to the tank farm is filtered and irradiated with ultraviolet light.

Teaching the value of research

According to Dumez, the most successful aspect of the project has been for visitors to see in the man-made wetlands the essential mission of EHCFC and NWRC researchers and scientists: “Since construction, we have nesting egrets, turtles, and fish living there,” says Dumez, “People seem to appreciate this life-filled environment and immediately understand why it is important to study and preserve natural wetlands.” ■



Visitors enter through the light-filled main lobby (above), which is flanked by the man-made wetland habitats. Researchers dissect large animal specimens in the necropsy room (right), which is equipped with a hoist, freezer, and a table with its own ventilation system. Biology labs (below) also contain special ventilation systems as well as complex plumbing.



4

Georgia Public Health Central Laboratory Decatur, Georgia

FACILITIES FOR TRAINING AND FOR THE SOPHISTICATED HANDLING OF BIOLOGICAL SPECIMENS DRIVE THE DESIGN OF THIS PUBLIC HEALTH LAB.

by **Gareth Fenley**

Project: Georgia Public Health Central Laboratory

Owner: Georgia Department of Human Resources, Division of Public Health

Architect: Lord, Aeck & Sargent—Terry Sargent, AIA, design principal; Larry Lord, FAIA, principal-in-charge; John Starr, AIA, project architect

Engineers: Stanley D. Lindsey & Associates Ltd. (structural), Delon Hampton & Associates (civil), Thompson Engineers (mechanical/electrical), Carla S. Wertheimer (landscape)

General contractor: Beers Construction Co.

Cost: \$159 per square foot

Sources

Load-bearing metal stud system: Consolidated Systems, Inc.

Recycled copper shingles: Conklin Metal Industries

Curtain wall: Vista Curtain Wall & Storefront System

Metal doors: Southern GF Co.

Wood doors: VI Industries

Special doors: Atlas Door Corp.

Acoustical ceilings: Armstrong

Resilient flooring: Sespec

Carpet: Harbinger

Elevators: Dover Elevator Systems, Inc.

Plumbing: Flush-Metal Partition Co.

Security system: Regency Electric Co.

Environmental rooms: Environmental Specialties, Inc.

The striking exterior of the Georgia Public Health Central Laboratory may catch the eyes of passersby, but the laboratories inside are what really count. Above all, the building is a functional container for the secure processing of hazardous materials needed to sustain a critical mission: To safeguard the public's well-being by monitoring and controlling the spread of diseases, such as AIDS, tuberculosis, and hepatitis. The facility is the result of the client's persistent goal-oriented leadership, coupled with an insightful and creative architectural team fielded by Atlanta-based Lord, Aeck & Sargent.

Working on behalf of lab director Elizabeth Franko, project manager Karl Hoenes oversaw the development of new quarters for the state's primary clinical testing facility. It had been housed in a cramped and deteriorating building where fume hoods tied into the central air-handling system, and one working lab could only be reached by crossing a mechanical room.

"A fundamental vision of Dr. Franko," says Hoenes, "was, first, that the new laboratory space be open, driven by the need to be maximally flexible as public health

Gareth Fenley was the founding editor of Laboratory Planning and Design. She is currently a reporter for F.W. Dodge in Atlanta.

changes over the years. Second was the idea of 'central accessioning,' or centralizing the intake and processing of biological specimens. And the third [goal] was that the building function as a high-quality training facility, which the state of Georgia had never had."

Franko's insistence that provid-

ing ample and well-equipped space for training be the building's primary mission also led to the selection of a metropolitan Atlanta site, near the U.S. Centers for Disease Control and Prevention (CDC) and Emory University. These institutions are engaged in a variety of collaborative learning ventures at the new facility,



A sunscreen made of copper-toned fluoropolymer-coated aluminum tubing (below) shades the atrium on the south side of the building. The piers on the building's east and west sides are made from granite scrap. Shingles and trim are from recycled copper.

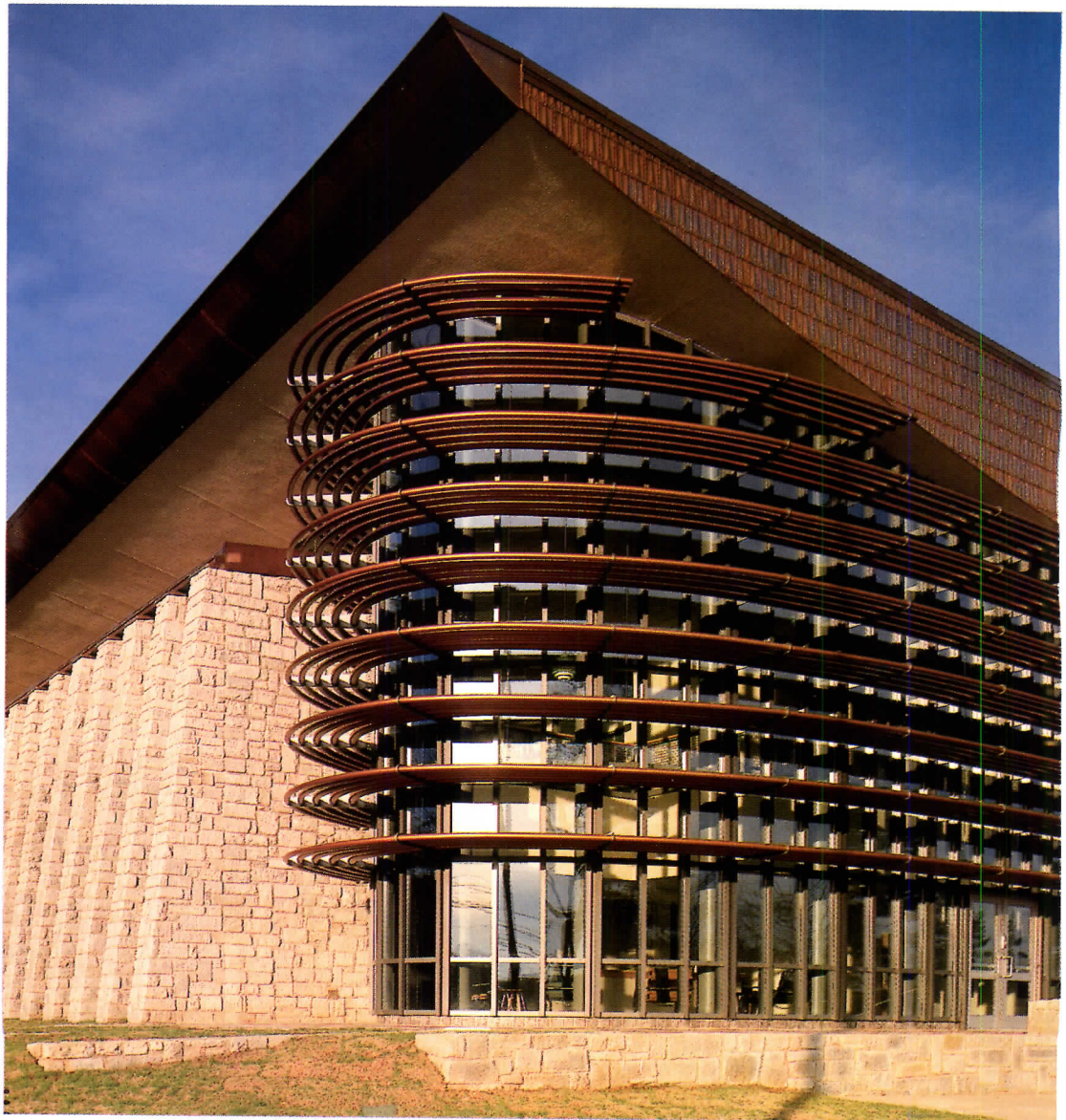


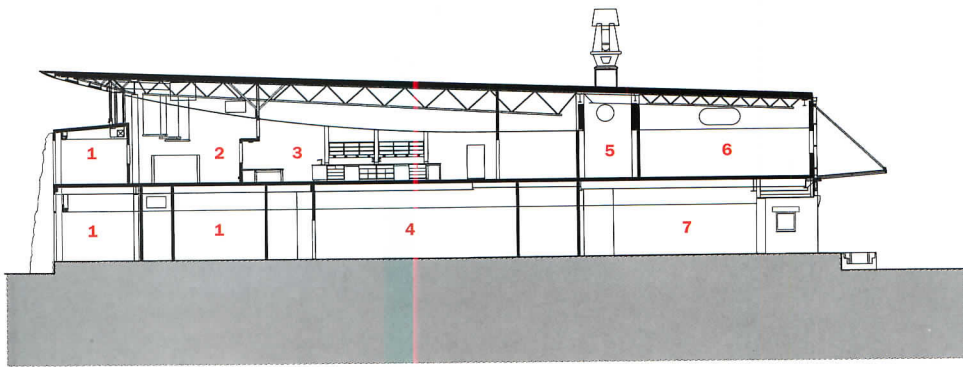
making the location mutually beneficial. Classroom and conference space accompany a fully outfitted minilaboratory with advanced biosafety level 3 (BL-3) suites, and built-in telecommunications capabilities afford distance-learning opportunities. The architects placed the training spaces, administration offices, and a handsome daylight lunchroom on the building's ground level, which is partially built into a hill. The attractive double-height south-facing lobby has curtainwall glazing and a distinctive sunscreen of aluminum tubing, coated with copper-toned fluoropolymer.

Logical workflow

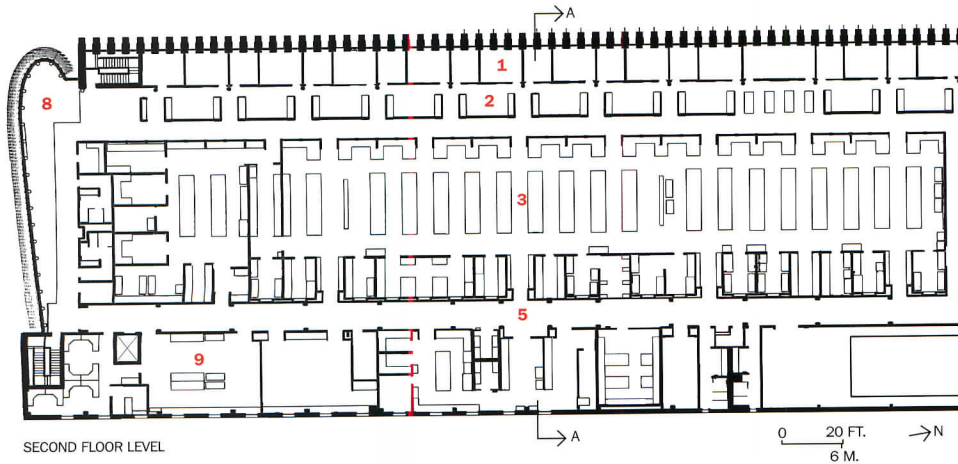
The main work in the 66,000-square-foot building begins at the loading dock on the eastern face. "The building is designed for a logical and natural flow of work," explains principal-in-charge Larry Lord, FAIA. Lab employees handle deliveries in the receiving room, where supplies are diverted to an adjacent warehouse and stockroom, while specimens for testing are transported by elevator to the upper level. All access to this level is by card-key. "There is a security separation between the lower, public floor and the upper floor," notes design principal Terry Sargent, AIA.

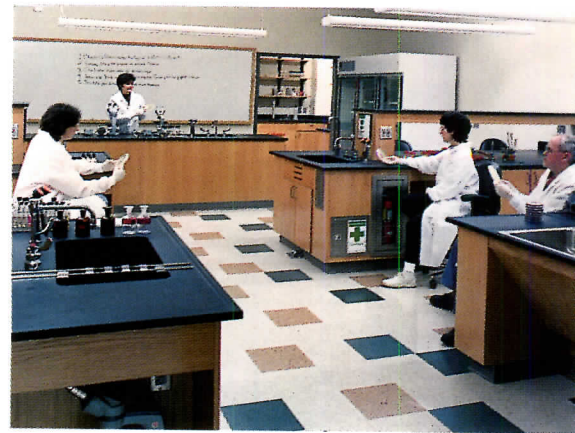
A single elevator brings lab personnel, specimens in hand, to the upper level, where they begin





1. Offices
2. Clerical
3. Laboratories
4. Classroom
5. Service corridor
6. Lab support
7. Receiving
8. Lobby/atrium
9. Accessioning





Indirect lighting eases eyestrain in the lab, and subtle changes in the floor-tile colors provide visual relief in the main workroom.

A training classroom (above) is fully outfitted with lab benches, so students can practice specimen testing procedures.

the accessioning process. From there, the specimens are taken to an adjacent accessioning room, where they are opened under biosafety hoods, numbered, and recorded for delivery to the lab bench.

Previously, staff members of individual units (such as virology and bacteriology) performed their own accessioning, which duplicated resources and interrupted workflow.

The lab units also share facilities and equipment, such as autoclaves for sterilization and an environmental room for cold storage. These support facilities line the east side of a corridor that runs the length of the upper level and has an open ceiling for easy access to mechanical and electrical systems. The corridor's west wall is dotted with gas cylinders piped from the open lab block, which backs up to this wall.

Laboratory organization

An enclosed block of laboratories, which the architects call a "building within a building," dominates the

center of the upper level. Seven lab units requiring BL-2 space are clustered in a single open area, while a mycobacteriology/mycology unit is a self-contained BL-3 space. This part of the laboratory, developed in collaboration with the CDC while biosafety standards were still at the draft stage, was the first in the U.S. to meet current standards for tuberculosis testing.

For complete flexibility, all lab benches have the same infrastructure, including gas, vacuum, emergency power, and deionized water. A slightly larger than normal bench-to-bench spacing of 10 feet, 8 inches enables staff members to carry out an array of scientific operations side by side.

Although offices line the west elevation, the architects designed this facade to expose the labs to daylight and views of Georgia pines. Beneath the bar-joint roof, the ceiling sweeps gently upward toward west-facing clerestories. Windows between the lab and offices visually open the space, encouraging com-

munication between these necessarily separate areas.

A modified constant-volume HVAC system that moves 70,000 cubic feet of air per minute provides one-pass air in the building. Optimizing airflow patterns, air enters near the doors and moves toward the areas of highest hazard, at the rear.

In the BL-3 area, high-volume airflow, not doors, confines hazards to the prep rooms. The design team concluded that swinging doors could be the greatest source of fumbles with delicate glassware containing specimens.

Materials palette

The architects made economical and often surprising decisions about surface materials. Inexpensive and durable, Georgia granite recovered from scrap provided a strong connection to the land. Along the western facade, the granite was laid up into vertical piers, which act as sun shades.

Shingles from recycled copper

bent over structural metal studs also protect the upper level from the elements—for about the same initial investment as building a brick wall would require—and offer long-term savings, according to the architects.

The single-slope, modified bituminous roof is designed for easy construction and low maintenance. For an interior finish on the corridor walls, Sargent specified sandblasted panels of cement board, hung in random patterns that recall the exterior granite.

Programming took about six months, during which Franko urged lab personnel to envision their ideal new workspaces. "We probably spent a substantially greater portion of time on the planning and design phase than most other state labs do. It paid off enormously for us," says Hoenes, who has observed an increase in productivity since the move to the building he affectionately calls his warehouse. "But," he adds with a nod to the architects, "it's a beautiful warehouse." ■

5

McKelvey Federal Building Menlo Park, California

FAR FROM GENERIC RESEARCH SPACES THAT CONVERT TO MEET CHANGING NEEDS, THESE LABS SUPPORT SPECIFIC USES AND TAKE THE LONG VIEW.

by **Guy Esberg**

Project: Vincent E. McKelvey Federal Building

Owner: General Services Administration

Architect: MBT Architecture—Michael Hearn, FAIA, project principal; Tom Ayers, AIA, project manager; Tully Shelly, AIA, laboratory designer; Stevens Williams, AIA, project designer; Kathy Kelly; interior designer; Brian Croeni, Jay DeShetler; Mike McCann, Bob Roberts, Phillip Wong, Robert Yee, project team

Consultants: Forell/Elsesser (structural); Gayner Engineers (mechanical/electrical); Kennedy Jenks (civil); Geomatrix (soils); Carter Tighe Leeming + Kajiwara (landscape); Douglas Hollis (artist); Research Facilities Design (lab planning)

General contractor: PCL construction Services

Cost: \$32 million; 157,500 gsf

Sources

Brick: Pacific Clay

Curtainwall, windows, doors: AGA

Suspended ceilings: Armstrong

Suspension grid: USG, Donn

Lab Casework: ISEC, Fisher-Hamilton, Kelly Moore

Wall coverings: Arc Com

MDF paneling: ISEC

Linoleum, cork flooring: Forbo

Tile: Dal-Tile

Carpeting: Bentley

Epoxy flooring: Tectonics

Lighting: Peerless

Tucked into a residential area among sprawling oak trees in suburban Menlo Park, California, just east of Stanford University, lies the campus of the Western Regional Headquarters of the United States Geological Survey's (USGS) Geological and Water Resources Divisions. Its new 96,000-square-foot Vincent E. McKelvey Federal Building, designed by San Francisco-based science- and research-facility specialists MBT Architecture, marks a significant departure from the design premise of most contemporary research centers. In addition to serving as home of the Water Resources Division's regional headquarters, the building houses labs for 200 scientists and the 300,000-volume USGS regional library, which is open to the public and ranks as one of the most extensive collections of geotechnical materials in the West.

Designed to fit in

Partially hidden from view by trees, the cleanly detailed, three-story brick-faced building appears to match the scale of its residential neighbors, an effect achieved by

Guy Esberg has been involved in the facilities design industry for over 20 years. He is principal of Guy Esberg & Company, a California consulting firm.

depressing the ground floor an average of 8 to 10 feet below grade. The laboratory design also had a positive effect on the building's integration into its surroundings: Lab "lofts" on all three floors connect to services at the center of the building, rather than at perimeter locations, the more common scenario. As a result, the 24-foot-high roof stacks are centrally located, as well, making them less visible to passersby.

The building exudes a sense of permanence and exhibits an attention to detail perhaps more reminiscent of a university structure with a 100-year projected life than of a conventional government research facility. By investing in a high-quality facility, "The USGS wanted to show it has a long-term commitment to the neighborhood," says MBT's Michael Hearn, FAIA. "This campus is important to the

local community," he continues, "and the client wanted the building to show that the community is equally important to it." Two separate entrances, one for staff and one for the public, preclude the need for special signage, card-keys, and other visible security elements that discourage the appearance of openness.

Paths run to and around the McKelvey building through lawns, oak trees, and artist Doug Hollis' stone, metal, and water sculptures, giving the site a community-college feel. Inside, the architects added an unusual human touch by decorating the entry foyers and halls with staff members' childhood science-fair projects.

Bucking a popular trend

The McKelvey building departs from a common trend in research-facility design: To maximize lab flexibility for





In keeping with USGS research into the science of water and geology, artist Doug Hollis created the pools and rock sculptures around the building.



One of the largest collections of its kind, the McKelvey Federal Building library (left) holds more than 300,000 volumes on

the geology of the western U.S. Labs like the one above are permanent installations that aim to meet specific and long-term needs.

different experiments, disciplines, and even industries. Popularly known as modular lab design, this approach is particularly appealing to organizations that need multiple spaces to serve a single experiment or research purpose for a few months or even years before altering them to meet changing needs or accommodate new occupants.

Dr. Jim Kuwabara, a project chief with the National Research

Program of the Water Resources Division and one of the scientists involved in the building's design, explains that the McKelvey building's labs bear little resemblance to the one-lab-fits-all scheme typical of modular design. "Flexibility, by definition, signifies the acceptance of a lab to change. Our experiments take years or even decades to complete and require highly specialized labs that support a long-term commit-

ment to fundamental, process-oriented research. The architect worked individually with each research team to microdesign every lab. Together, they sketched out the lab spaces down to the smallest detail," Kuwabara explains.

Specific methods of experimentation resulted in the construction of highly individualized laboratories. For example, in one room, scientists may smash rocks, while in another they culture photoplankton.

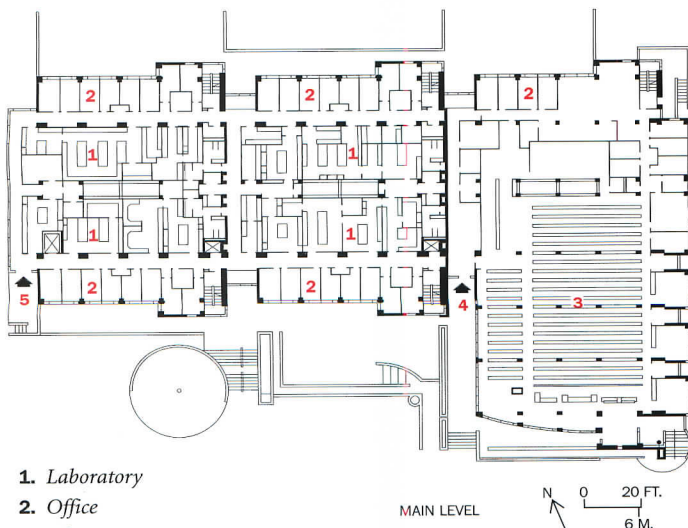
There's a class-1000 clean room that required solid-polypropylene walls and cabinets. Six constant-temperature labs needed metal walls, but in an area where exposed metal surfaces were forbidden. The solution here: Stainless-steel walls coated with acid-resistant epoxy. No ferrous metals could be used in the paleomagnetic research lab, so everything—from rebar to nails—had to be plastic. This particular lab occupies its own building.

MBT project architect Stevens Williams, AIA, explains that special care was taken to ensure that the McKelvey building's overall structure could accommodate the demands

of both geotechnical science and highly creative researchers: "Rocks are constantly being collected— heavy piles of them can end up anywhere, making load locations impossible to predict. In addition, these are very creative people who, in many cases, develop and build their own equipment, so there's little or no data on such things as heat, vibration, or weight. The practical answer was to design a very robust overall structure."

Investing in science

To Kuwabara, the extra effort that went into the design of both the overall building and the individual labs showed that the USGS had "a real commitment to providing a facility where the highest quality scientific information in a wide range of fundamental physical, chemical, and biological processes could be created. Of all the labs I've ever worked in, public or private, this is, by far, the most like a facility truly designed for scientists." And as the USGS enters the new millennium, one could hardly ask for a finer research facility, or for a better tool to recruit the scientists of the future. ■



1. Laboratory
2. Office
3. Library
4. Public entrance
5. Staff entrance

Battling Water Above and Below

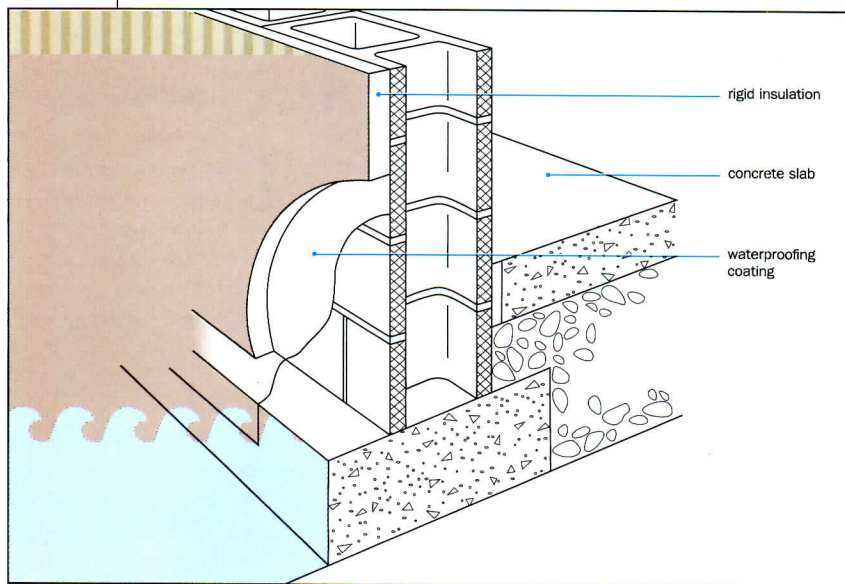
TO PREVENT MOISTURE FROM PENETRATING SUB- OR ABOVE-GRADE WALLS AND SLABS ARCHITECTS CAN SELECT FROM THE FIVE BASIC TYPES OF WATERPROOFING MATERIALS.

by Rich Binsacca

To the untrained eye, the simple masonry planter boxes wrapping the corners of the new Spectrum View Office Building in Boise, Idaho, appear innocent enough. But during design, Thomas Scofield of ZGA Architects in Boise imagined the contents of the planters—the soil, plant roots, and, most important, the water—all pushing against the masonry pilasters that highlight the corners of the building and form the inside walls of the planters. He recognized that the contents of those seemingly innocuous planters could pose a very real threat to the building's longevity and structural performance.

Scofield's solution was simple: Wrap the pilasters with three-foot-wide swaths of self-adhering rubberized asphalt with a polyethylene backing. To complete the system, Scofield also specified a rigid-foam insulation panel to protect the waterproofing membrane during construction and, later, from the soil added to the planter boxes. The insulating panel also diverts water from the masonry pilasters, while solid grouting of the concrete masonry units helps block moisture infiltration.

All this effort for a few planter boxes? "Masonry wants to absorb water so we have to take precautions," Scofield says. All over Boise's ever-growing downtown core similar systems can be found on the walls of building foundations with usable subsurface space—most often parking garages—and underneath flooring and elevator pits, among other applications. Though Boise is located in a high desert and is 500 miles from the nearest ocean, development along the city's riverfront often necessitates waterproofing below grade. Or, like the Spectrum View planters, for special applications aboveground.



Waterproofing basics

An architect's selection of a waterproofing system should consider the foundation wall material, expected performance qualities of the waterproofing material, and the use of the belowgrade space—many codes require waterproofing if the underground space is habitable. Other factors include the waterproofing membrane's functionality in temperature extremes, its vapor permeability, the quality of the substrate, problems with protecting the material during construction, and, of course, cost considerations. "Architects also need to be cognizant of regional differences and levels of acceptance before specifying a system," says engineer Dean Rutilla of Simpson Gumpertz & Heger in Arlington, Massachusetts. A soils engineer should be consulted to determine the types of soil that are present and how they will impact the system's performance, while a waterproofing consultant offers guidance on problem soils.

There are five general categories of waterproofing materials: Rubberized asphalt sheet membranes, bentonite clay, asphalt, mastic, and PVC or high-density polyethylene sheet membranes. Surface-bonding cements, which consist of glass fibers and Portland cement, are often classified as waterproofing systems. But these are used more often to keep water in—for example on the inside surfaces of swimming pools, cisterns, and water-holding tanks.

Sheet membranes are most widely used in vertical applications

Rich Binsacca is a freelance writer based in Boise, Idaho, who specializes in construction- and technology-related subjects.

CONTINUING EDUCATION

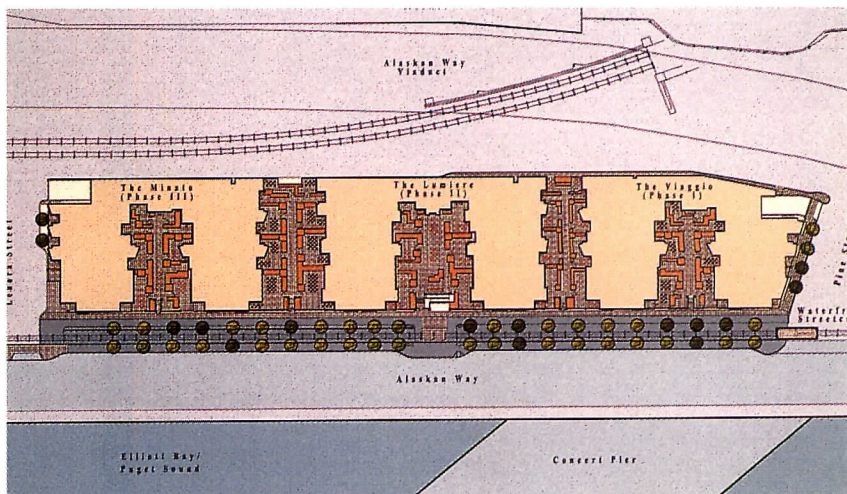


Use the following learning objectives to focus your study while reading this month's ARCHITECTURAL RECORD/ALA Continuing Education article. To receive credit, turn to page 208 and follow the instructions.

LEARNING OBJECTIVES

After reading this article, you should be able to:

1. Identify the factors involved in making a decision to waterproof versus dampproof a building.
2. Compare the characteristics of positive-side waterproofing to blind-side waterproofing.
3. Describe a typical waterproofing system.
4. Describe recent changes in waterproofing materials.



The waters of the Puget Sound lap at retaining walls just a few feet from the front of Waterfront Landings (left), a mixed-use residential development in

Seattle. To prevent water from infiltrating the subgrade parking areas, G.G.L.O. Architects combined waterproofing panels and a drainage system.

because they have seams through which standing water can penetrate. Liquid solutions, which are seamless, are more suited to horizontal applications, such as plazas or decks. Most of the materials come with accessories, including fasteners used to apply sheet membranes, surface-preparation solutions, and slender tapes used to waterproof tight areas, corners, or seams.

The self-adhering rubberized asphalt membrane that Scofield specified is the most commonly used waterproofing material, accounting for nearly 60 percent of the market, according to the Sealant, Waterproofing & Restoration Institute. W.R. Grace's Bituthene, which has been around for 45 years, is a name that's practically synonymous with rubberized asphalt. Bituthene and its iterations are formulated for application on dry, cured concrete walls and when the temperature is above 40 degrees F. That means the membrane may not be applied for up to as many as 30 days after the concrete is poured, depending on the speed at which the concrete cures (dictated by outside temperatures and the nature of the concrete mix). Once the forms are stripped away, the surface accepting the membrane must be made smooth and monolithic to prevent spalls, tie wires, honeycombs, or other irregularities from interrupting the membrane's continuous seal. This additional step further slows the construction schedule and adds costs. Once laid, the membrane must be protected from direct sunlight, rain, and other environmental conditions which degrade it until the backfill, wearing slab, or other covering is added.

Special primers and formulations are increasingly available for colder conditions, as well as for use with unusual soil conditions. But for the most part, the membrane is best reserved for moderate climatic conditions and on smooth surfaces.

Bentonite, technically referred to as sodium bentonite, is a naturally expanding clay that may be troweled or sprayed on, or, more commonly, encased in layers of cardboard or geotextile and mechanically

fastened to the substrate. Bentonite's chief advantage is that it can be put over a concrete surface almost immediately after the forms are pulled, which helps speed the construction schedule. It also does not have the climatic limitations of rubberized asphalt, though the material or cardboard panels should not be exposed to rain or snow. Bentonite is somewhat permeable, allowing moisture vapor to migrate through walls and condense on interior surfaces. The vapor can cause damage and odor over time.

Bentonite enclosed between layers of geotextiles is the most practical (and expensive) version of the product since the carpet-like sheets are difficult to puncture and are flexible enough to go up over lagging and other uneven surfaces. Also, the cardboard that encases some panelized versions will degrade over time, causing the bentonite to erode and leaving the walls completely exposed.

Liquid asphalt, which accounts for about 20 percent of the total market, has two major advantages over its competitors: It is highly elastic, allowing it to bridge cracks and accommodate movement, and it embodies "self-healing" properties, meaning the material will ooze around and seal a puncture from a nail or sharp object. Applying two layers, with a sheet of fibrous matting in between, creates a stronger barrier. Asphalt is most suited to a horizontal application since the hot liquid, mopped onto a vertical surface, can drip, posing a safety hazard.

Mastics are urethanes modified with various polymers to make them flexible. These are cold-applied, usually by rolling or troweling them onto the surface. They dry to create a hard surface, often eliminating the need for protective board. Mastics are easy to apply, but there is evidence that they become brittle and lose their effectiveness more quickly than asphalt. Both types of fluid membranes are suitable for rough surfaces and tough-detail areas, such as tight interior corners, penetrations, and other conditions that are difficult for sheet membranes to accommodate. But while the thickness of a sheet membrane is factory-controlled, spray-and-trowel-applied systems rely on the installer to achieve the desired thickness.

This lack of control makes architects understandably nervous, says J. C. Trybus of Koch Waterproofing Solutions. That's one reason why his company focuses on residential basements and allows the bigger players to focus on commercial construction. Koch is banking on a renewed consumer interest in livable basements. Currently only about 10 percent of all new homes include a waterproofing membrane (most have nothing at all). But builders are increasingly offering below-grade space outfitted as an extra bedroom, family room, or home office.

Least common are the single-ply sheets, including PVC and high-density polyethylene. That's because the materials and their application is expensive, especially if there are a lot of details or horizontal-to-vertical transitions to coax the sheets through. In most cases seams must be heat welded, though installation varies.

A basic system may consist of one of these waterproofing materials combined with site drainage, insulation, a rigid material to protect the membrane from construction fill and, in some cases, a wearing layer or top slab. Adding insulation not only helps protect the membrane, but also mitigates the effects of freeze/thaw cycles and, of course, keeps the

interior of the building more comfortable. The addition of a drain panel or subgrade drain tile directs water away from the building. These are useless if the water level consistently rises above the footings because the drainage channels would be filled with water.

From the inside out

In most cases, waterproofing membranes are applied to the outside, or "positive" side, of the structure. This requires additional excavation around the foundation, a factor that may limit its use with infill and urban projects. "Negative-side" waterproofing, applied to the interior of the wall, is used primarily for water-holding purposes, though it is increasingly called upon when positive-side waterproofing is not possible. By design and necessity such systems allow the water to infiltrate the structure before it is blocked from the interior space.

Often necessary in tunnels, under slabs, when a new building foundation abuts an adjacent structure, or if an existing soil retention system prohibits excavation, negative-side systems involve the application of a waterproofing membrane on the inside of the foundation wall, over

PRODUCTS

Waterproofing choices

Sarnafil Roofing and Waterproofing Systems: Sarnafil offers a variety of waterproofing products, including thermoplastic membranes, drainage panels, and membrane fasteners. 800/451-2504. www.sarnafilus.com/swp.htm

Barrett Company, Inc.: Ram-Tough 250 is asphalt combined with SBS rubber polymers. The two-coat system, spread to a thickness of 90 mil, is reinforced with polyester fabric. 800/647-0100.

XYPEX Chemical Corporation: XYPEX is a cementitious coating that penetrates the pores and capillary tracts of the concrete, setting up a nonsoluble crystalline formula-

tion that prevents water penetration. 604/273-5265. info@xypex.com

Thoro Waterproofing & Dampproofing: Thoroseal is a cementitious waterproof coating, Redi-Mix paint is for negative-side application. 904/996-6000. www.hsc-ss.com

Carlisle Coatings & Waterproofing, Inc.: CCW-525 is a spray- or trowel-applied modified polyurethane mastic. It is also available as a sheet membrane. Sure-Seal Butyl membrane is a vulcanized elastomer sheet. 800/338-8701. www.carlisle-ccw.com

Grace Construction Products: Bituthene is a self-adhering rubberized asphalt sheet. Preprufe is a rubberized asphalt sheet formulated for negative-side applications. Paraseal is a cold-applied, pouring-grade sealant for Bituthene. 800/444-6459. www.gcp-grace.com

Mar-Flex Systems Inc.: Mar-Koet 5000 is

spray-applied asphalt. Mar-Flex 500 is spray-applied, heavy-bodied cut-back asphalt protective coating, and Sunflex is a rubber polymer, spray-applied membrane. 513/422-7285.

Pacific Polymers International Inc.: Elasto-Deck B.T. is a modified bitu-

Duramem 500 is a one-part, cold-applied liquid polyurethane for structural concrete. It cures at ambient temperatures to form a rubbery membrane that allows some expansion and contraction. 800/523-6688. www.pecora.com

TC MiraDRI: MiraDRI moisture protection products offer MiraDRI self-adhering rubberized asphalt sheet, MiraSEAL rubberized asphalt, and MiraCLAY sodium bentonite clay panels. 770/729-1004. www.miradri.com

Gaco Western Inc.: LM-60H, is a two-component, 100 percent solids, liquid rubber. 206/575-0450. www.gaco.com

Dex-O-Tex Division, Crossfield Products Corp.: Specialty coatings for commercial and residential projects include Barrier Guard, a fluid-applied, polymer emulsion, waterproof membrane. 310/886-9100. www.dexotex.com

Koch Waterproofing Solutions: WATCHDOG features a polymer-enhanced asphalt membrane that is spray applied. 800/876-5624.



men, liquid waterproofing membrane system applied by roller, brush or airless spray equipment for planters, belowgrade, under mortar bed and between-slab applications. 800/888-8340.

Pecora Corporation: The Duramem series of elastomeric sheet membranes is suitable for masonry, concrete, and wood surfaces.

compacted soil, or between a mud slab and the structural slab. A few companies have recently launched products that address the problems inherent in this sort of blind-side application. One solution is a new adhesive that mechanically bonds with the just-poured concrete to create a positive-side membrane—a formula that's expected to proliferate within the industry in a few years. Here's how it works: rubberized asphalt is laid into the formwork before the pour. The adhesive layer, which faces in the direction of the pour, is protected by a thin film that shields it from the elements and allows workers to step on it. As the concrete is poured, the film and the adhesive bond to it, reversing the normal process of applying the membrane.

Another negative-side solution that, so far, has been used mostly in retrofit situations eschews traditional waterproof membranes and drainage systems altogether. Electro-osmosis technology, by Moisture Solutions International, employs a series of anodes—wires set into the interior surfaces of concrete walls and floors—and a cathode wire embedded in the earth outside the structure, both connected to a central unit mounted on the wall. Low-voltage pulses sent throughout the wires cause water to gravitate toward the cathode and away from the anodes.

This sounds risky and expensive; so far, electro-osmosis technology has been tested and used on government buildings where protection of below-grade storage of records and files is an important consideration. But the system eliminates the need for excavation, can be set into the slab and wall form work in new construction, and offers easy access to the wall-mounted control unit.

How dry is dry enough?

The first question an architect needs to ask when evaluating a waterproofing system is this: "How waterproof does the building need to be?"

Rutilla says. Dampproofing, which differs from waterproofing in that it merely prevents water infiltration by capillary action, is often sufficient, especially in porous soils, where water percolates quickly. But faced with the threat of water infiltration or a hydrostatic head, whether from the

MOST BUILDING CODES REQUIRE A WATERPROOFING SYSTEM WHEN BELOW-GRADE SPACE IS OCCUPIED.

water table, tidal flow, floods, or aboveground sources, such as fountains, architects must create a waterproofing system. "This is a choice that's often driven as much by the budget and construction schedule as by the presence of water," Rutilla adds. "You have to find out what the owner's expectations are."

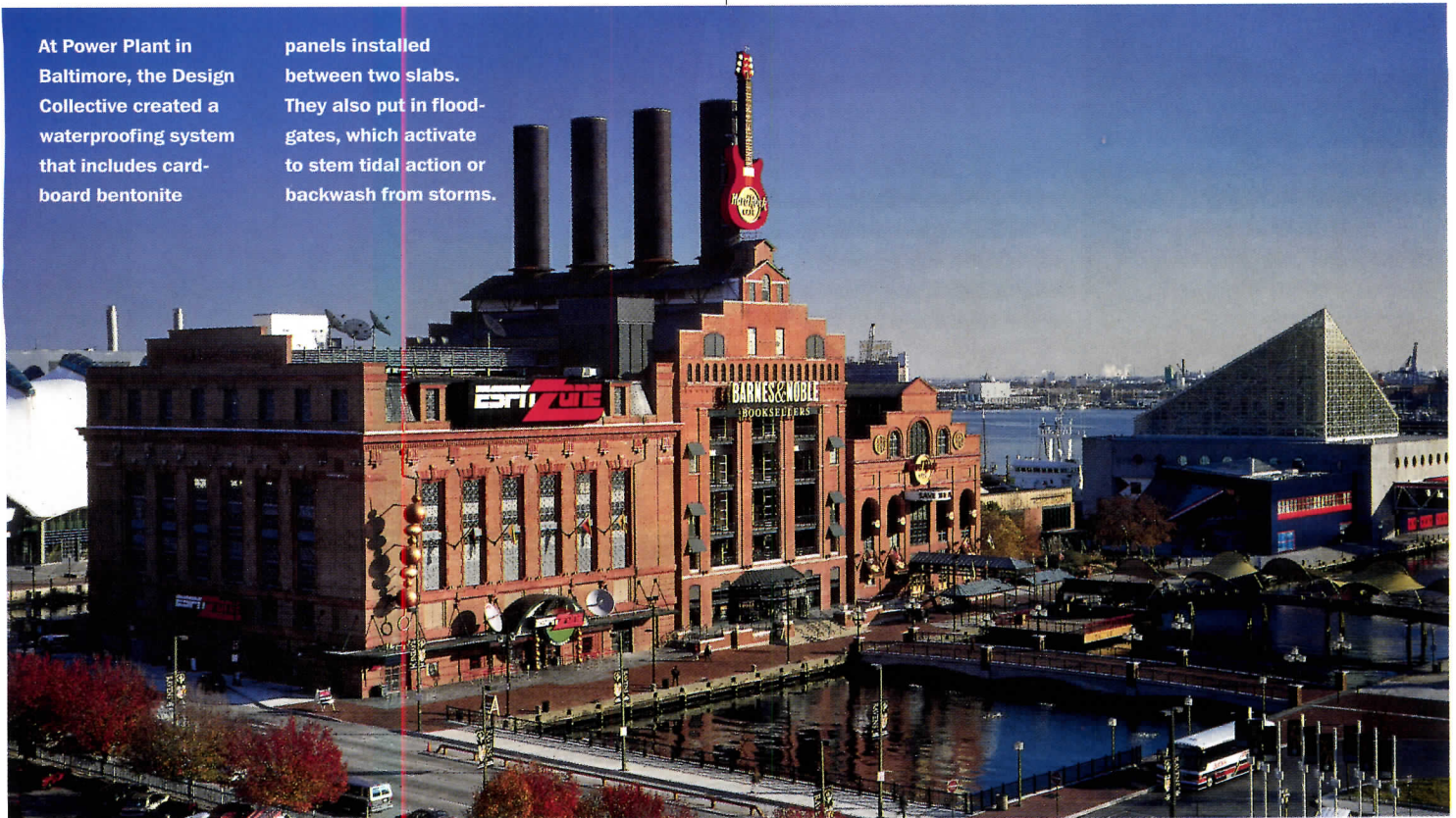
Timothy Harwood, a technical advisor for Grace, fields calls from architects specifying these systems. "I ask early on if the owner is willing to pay \$2 per square foot for a basic waterproofing system," Harwood says. "If not, dampproofing for around 80 cents a foot must suffice. Architects want to extend the life of the building and serve their clients as best they can but \$2 a foot is sometimes a hard sell."

By comparison, dampproofing most often involves simply mopping a layer of coal tar onto the foundation wall. Unlike the various waterproofing membranes, coal tar lacks the ability to bridge small cracks and fissures, gateways for water infiltration. It simply retards water migration instead of sealing off the structure. It also contains compounds that are not environmentally friendly. Other dampproofing options include acrylic latex, polyethylene, and cementitious coatings.

The actual specifications for waterproofing, once the system is decided upon, also play a role in the application and cost. Under normal

At Power Plant in Baltimore, the Design Collective created a waterproofing system that includes cardboard bentonite

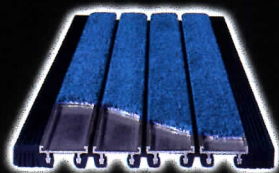
panels installed between two slabs. They also put in flood-gates, which activate to stem tidal action or backwash from storms.



You can do this on PediTred® II.
We know. We did.



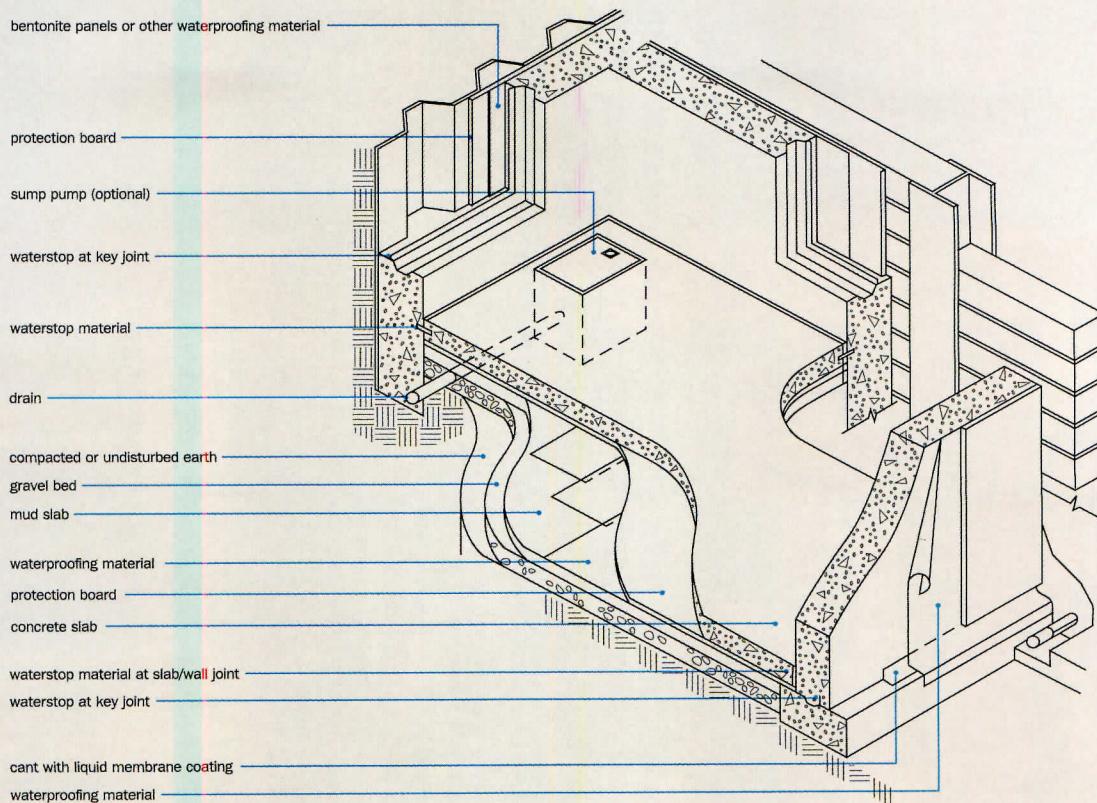
PediTred II is the industry's only entrance grid able to support 1000 pounds per wheel. And although you're probably not overly concerned about supporting forklifts in the entrances of posh stores and offices,



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CIRCLE 63 ON INQUIRY CARD



conditions, architects appreciate the standardization of off-the-shelf waterproofing specs, which free them from detailing the system on paper. “Bituthene or equal” is a typical spec for architects simply looking for language to plug into the spec sheet.

“The language calls out the materials, method, and installation per the manufacturer’s recommendation,” says Scofield. “To a certain degree, you have to rely on the standard specs to get competitive bids.” But such standardization is not a license for complacency among architects. Extreme soil or drainage conditions often require careful attention. Also all waterproofing systems have their limitations and the implications must be carefully considered.

Keep the water out

At Waterfront Landings, a 320,000-square-foot mixed-use condominium/retail project on Seattle’s Puget Sound, Mark Wishkoski, AIA, of G. G. L. O. Architects in Seattle, worked with soil and civil engineers to devise a waterproofing system for the project’s belowgrade parking garage. Because this project’s garage slab is at sea level, Wishkoski designed a series of perforated pipes that direct water that seeps in during high tides to a sump basin, where it is pumped away from the foundation to a nearby sewer drain. The drainage system complements the bentonite cardboard panels which the architect specified for under the slab and along the belowgrade walls. These are meant to encapsulate the structure and prevent water migration.

The building’s elevator pits, which serve five floors of residential and retail space, also needed special attention to keep water from leaking in

and mixing with the lifts’ hydraulic fluid. To ensure a tight seal for each elevator, Wishkoski called for a layer of bentonite between a mud slab (installed to provide a solid working surface over unstable soils) and the elevator pit, with the clay-saturated sheets pulled up the walls. “It’s really not much of a mystery,” he says of the design. “You just have to be aware of the conditions.”

Across the country in Baltimore’s Inner Harbor, architects from the Design Collective applied a similar solution for Power Plant, an adaptive reuse of three 40,000-square-foot masonry structures built around 1900. Two of the buildings had belowgrade space, one of which collected about eight inches of water at high tide, thanks to window

WATERPROOFING SYSTEMS MUST BE EVALUATED IN LIGHT OF SOIL CONDITIONS.

walls, foundation vents, and an inadequate sump-pump system. But because these two buildings weren’t going to be occupied by the project’s new retail and commercial users, Don Harris, AIA, and Bob Worthing, AIA, simply added two automatic pumps to serve the existing sump; waterproofing was deemed unnecessary.

But the other building with belowgrade space—a shallow cut of about four feet with the rest of the wall exposed above grade—required raising the floor above the flood plain and installing bentonite panels between a mud slab and a new slab. They also installed floodgates or barriers at the exposed opening of the below-grade space, which activate to stem tidal action or backwash during storms or high tides. The now-dry space serves as a utility area for ESPN Zone, a sports bar.

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Trouble below

Boston's Central Artery/Third Harbor Tunnel Project (informally dubbed "The Big Dig") will submerge Interstate 93 beneath the city's downtown core. A series of vent towers are required along the path of the interstate. One of these, Vent Building No. 4, includes office space, parking, and ground-floor retail, all nestled around twin 125-foot-tall vent towers. The project scope also includes a reconstructed subway entrance with new elevators and stairs down to the platform level.

With schematic design by Arrowstreet Architects, based in Somerville, Massachusetts, and final design split between them and

The most complex interface between new and existing construction involved threading new caisson foundations through the subway station. This necessitated the use of multiple waterproofing materials in unique ways. This was not only because of the difficulties inherent in creating a circular, waterproof expansion joint while preserving the continuity of the existing waterproofing, but also because to the confined work area. The waterproofing system Arrowstreet designed included three levels of water barriers. At the base of the caisson foundations was bentonite-impregnated rubberized asphalt sheeting which meets the exposed edge of the existing waterproofing. Above this is a layer of bentonite, then

WATERPROOFING SYSTEMS ARE NOT A BIG MYSTERY, BUT ARCHITECTS MUST UNDERSTAND THE SITE CONDITIONS.

Boston-based CBT Inc., the 375,000 square-foot facility, about half of which is underground, includes a complex foundation structure and a wide range of waterproofing conditions. For shallower subgrade levels, self-adhering rubberized asphalt sheets were used on conventional concrete foundation walls and slabs. Connections between the new construction and the existing subway system necessitated a lap between the waterproofing system that was used when the subway was built 100 years ago—hot-applied asphalt and embedded felts, which was still liquid, pliable, and effective—and the new rubberized asphalt membrane. Successfully exposing the existing waterproofing to achieve a lap joint was not always achievable given the delicate nature of removing the existing structure to expose the old waterproofing. Hot-applied modified asphalt and bentonite tape were often employed when the size of the lap was not sufficient.

PVC sheets applied with an adhesive to the wall of the core. As a final precaution, a relief drain was included to prevent water from reaching the platform walking surface in case water evaded these protective layers.

What's coming

Recent regulatory policies have banned or severely limited the use of solvent-based waterproofing products, including mastics and primers used to prepare the foundation for waterproofing. Land-use covenants and infill or urban sites often restrict excavation or the ability to install standard, positive-side systems. Tight budgets and construction schedules may discourage their use as well. All these factors have caused a shift in the industry toward new products for special conditions, a variety of primers, sealants, and other compounds to ease application, and non- or low-VOC mixtures to meet environmental standards, and reduce odor and flammability. ■



AIA/ARCHITECTURAL RECORD CONTINUING EDUCATION

INSTRUCTIONS

- ◆ Read the article "Battling Water Above and Below" using the learning objectives provided.
- ◆ Complete the questions below, then check your answers (page 208).
- ◆ Fill out and submit the AIA/CES education reporting form (page 208) or file the form on ARCHITECTURAL RECORD's Web site at www.archrecord.com to receive two AIA Learning Units.

QUESTIONS

1. What makes up a typical waterproofing system?

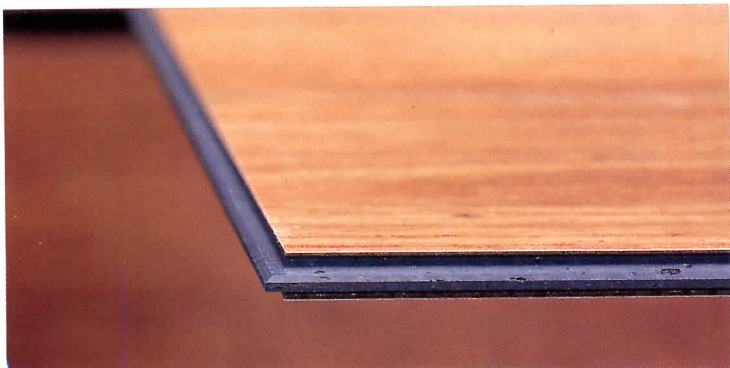
2. What is the difference between waterproofing and dampproofing?

3. When is blind-side waterproofing used?

4. Under what conditions should standardized waterproofing specification not be used?

5. What has brought about recent changes in waterproofing materials?

NEW PRODUCTS



WILSONART LAMINATE FEATURES WATERPROOF CORE TECHNOLOGY

At home or at work, pipes will burst, drains will overflow, and basements will flood. The resulting damage can cause a major disruption while the flooring is replaced. While nothing can stop a natural disaster, Wilsonart International's Performance Flooring—a high-pressure laminate floor with a double-wear layer for durability—has a waterproof synthetic core, as well as a 25-year residential wear, stain, fade, and water-damage warranty. Wilsonart offers the flooring in its “best” category as a new option for wet areas and high-traffic zones.

Originally designed to meet the demands of commercial applications, the flooring is for residential settings as well. From the outside, Wilsonart's flooring looks similar to the company's other flooring lines. The planks and tiles are the same size and thickness; it features the patented tongue and groove system; and it meets the same codes and testing for fire rating, slip resistance, impact resistance, and sound absorption.

What differentiates the flooring is an engineered-grade recycled plastic core produced by ProFX Core Technology (detail above). This enables the use of 100 percent post-consumer recyclable industrial plastics.

Natural woodgrain and stone looks make up part of the 12 new designs that reflect crossover looks for both residential and commercial customers. Plank format woodgrain designs focus on traditional looks, while tile-format designs range from colored, concrete-inspired abstracts to rock designs in earth tones.

800/710-8846.

Wilsonart International,
Temple, Tex. **CIRCLE 200**

Two important concerns for the flooring industry continue to be durability and safety, and two segments that address those issues in particular are resilient and laminate flooring. But these floors are not merely utilitarian in nature. As the following roundup shows, performance does not have to suffer to achieve the interior look desired for an installation—whether residential or commercial. Highlighted below is a resilient safety floor that helps maintain a safe, comfortable, and hygienic working environment for cooking students and a new laminate that features a 100 percent recycled waterproof core. —Rita F. Catinella, Products Editor



COOKING SCHOOL STAYS GROUNDED WITH SAFE, RESILIENT FLOORING

With a recent renovation and expansion, Peter Kump's New York Cooking School, in New York City, has created a culinary education center that will host 16 to 20 classes daily, seven days a week. With such heavy traffic, as well as the added considerations of hygiene, safety, and comfort, flooring became an important consideration.

“To not invest money in the floor does not make sense to me,” said Peter Kump's director of education, Richard Simpson. “This is the surface our students are in contact with all day. It has an impact on their experience.”

Designer Lawrence Gordon Associates, of Larchmont, New York, chose several colors of Altro Impressionist 25 safety flooring with



Easyclean Technology for six of the facility's classrooms. Heat-welded seams enhance hygiene, a 2.5-millimeter-thick surface provides ergonomic comfort, and the flooring stays slip resistant when wet.

“We knew that even a slip-resistant shoe won't help if you're on a wet quarry-tile floor. And quarry tile accumulates dirt in its grout,” added Simpson. 800/382-0333. Altro Floors, San Francisco.

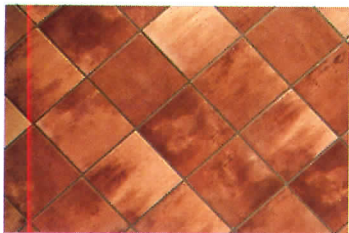
CIRCLE 201

OPTIONS IN LAMINATE AND RESILIENT FLOORING

Flooring has a dramatic influence on an installation. The look, feel, safety, and maintenance of what is underfoot affects every person who works or lives in the space on a daily basis. As the following roundup demonstrates, laminates continue to take on innovative new looks while resilients cater to key issues such as wear, slip, and moisture resistance.

▼ Thinking outside of the box

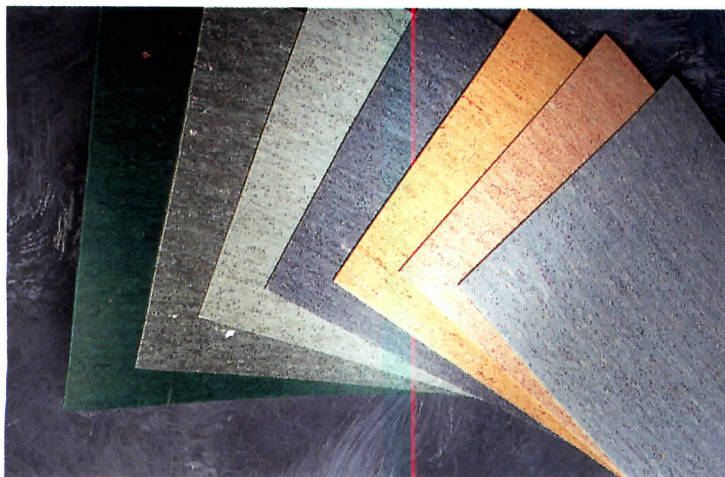
The Design Out of the Box concept from Amtico offers homeowners 35 different patterns of vinyl flooring in tile form in several looks, including wood grains, stones, slates, quarries and marbles. 800/270-9313. The Amtico Studio, Atlanta. **CIRCLE 202**



▼ Color line doubled

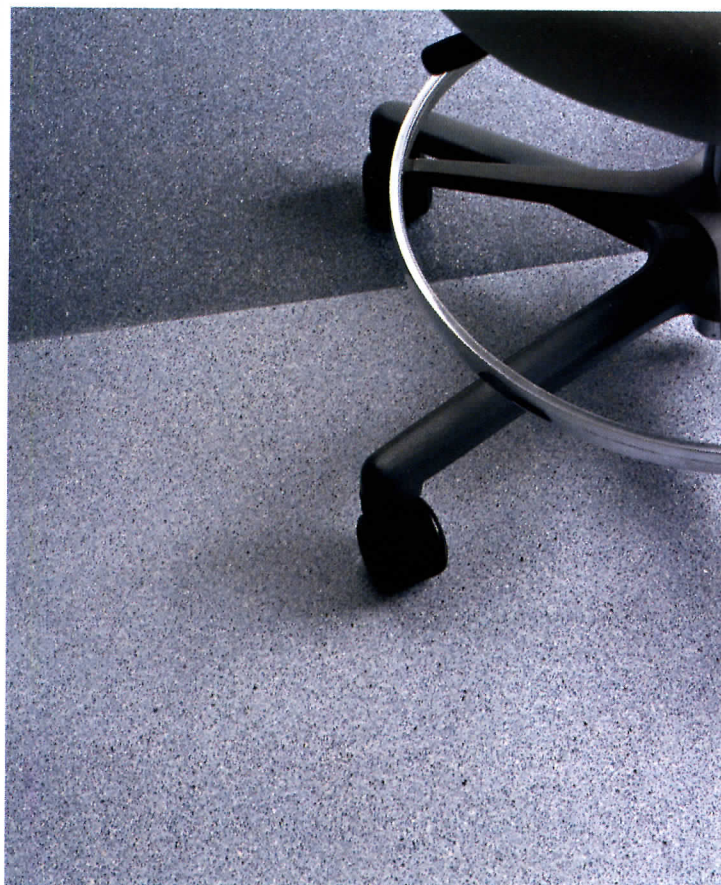
Tarkett has doubled the number of colors in its Optima line of commercial sheet flooring—a palette that now coordinates with the company's Expressions tile line. Optima now includes 37 colors and features a homogeneous construction for

durability and resistance to stains, chemicals, and indentations. Heat-welded seams provide a monolithic floor surface. Optima is recommended for hospital, school, retail, office, and light industrial applications. 800/225-6500. Tarkett Inc., Whitehall, Pa. **CIRCLE 203**



► Elementary decision

In Chicago's Finkl Elementary School, a prototype elementary school designed by DeStefano and Partners, Ltd., Azrock Vinyl Composition Tile offered the durability needed for high-traffic areas such as hallways (shown) and lunchrooms. Available in 123 designer colors Azrock's 12-inch-by-12-inch vinyl composition tiles of 1/8-inch commercial gauge features a granite chip pattern distributed throughout the entire tile thickness—making it more resistant to wear and tear. 800/921-1717. Domco Inc. USA, Florence, Ala. **CIRCLE 204**



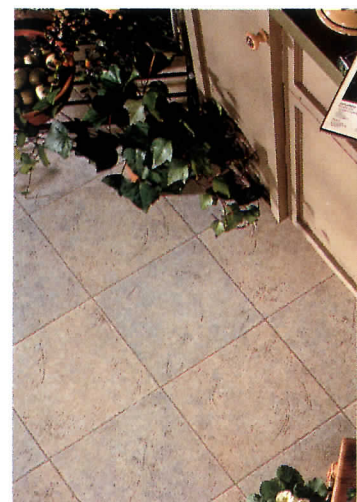
▲ Eye-friendly flooring

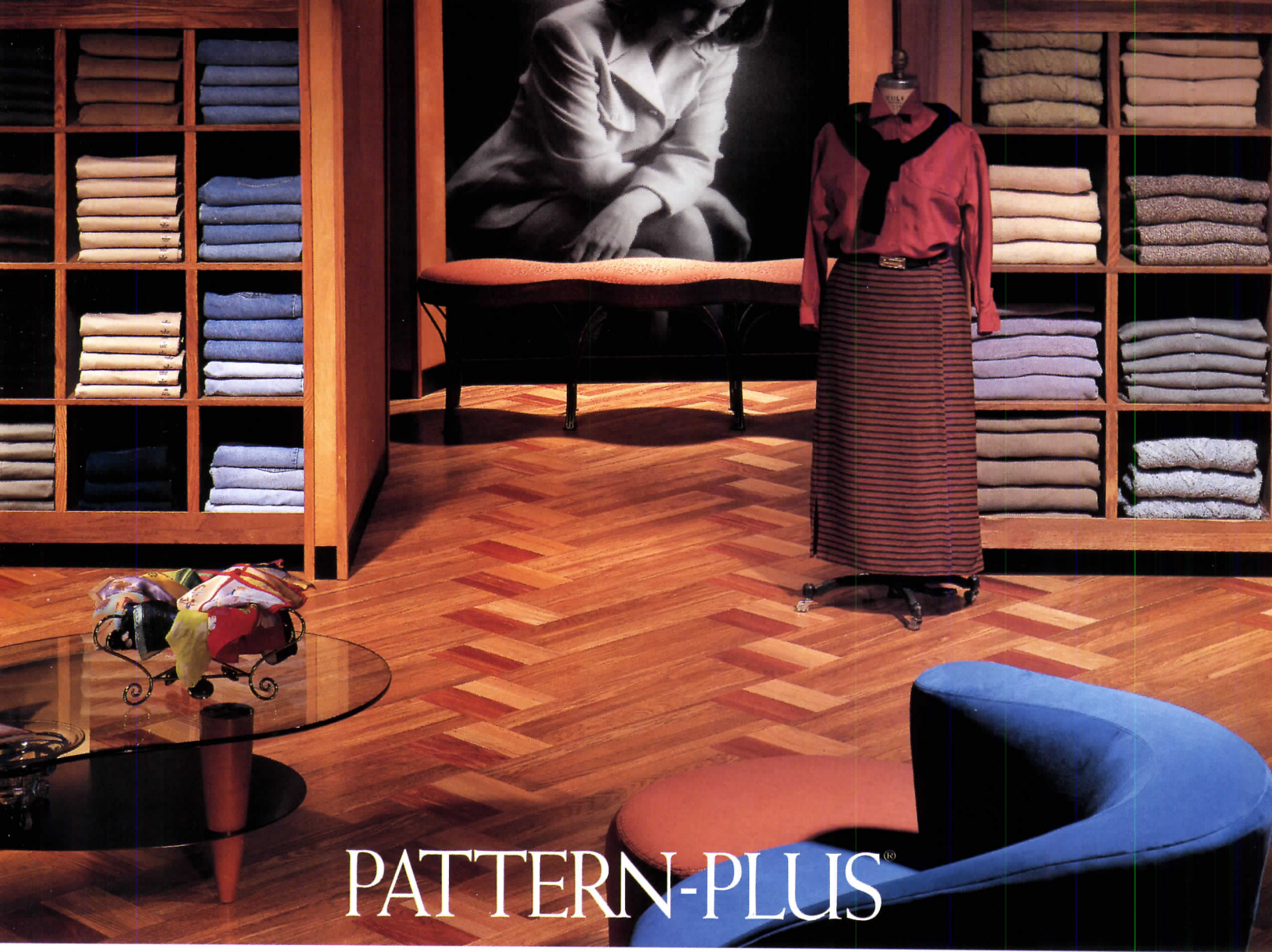
Mannington Commercial is updating its Fine Fields inlaid sheet flooring with 12 new colors, while BioSpec homogeneous sheet flooring line now comes in 9 new colors—including 6 low-contrast colors that make it easier to see dropped items (especially important for healthcare applications). Both Fine Fields and

BioSpec work together to address specific functional needs of different spaces and to allow for design flexibility and cost-effective installations. Both products may be heat- or chemically-welded to seal out germs and moisture. Solid color and camouflaged weld rods are available. 800/241-2262. Mannington Commercial, Salem, N.J. **CIRCLE 206**

► Fundamental foundation

Natural Inspirations, Armstrong's new flooring designs, are available in over 60 new colors and natural patterns at every price point. Four new Natural Inspirations looks are additions to the Memories collection of Armstrong's Fundamentals line of vinyl sheet flooring, including Livingston, pictured here in light slate with rich taupe. Livingston is a 12-inch traditional distressed paver, richly textured with an uneven surface for a natural look. Each floor carries a five-year limited warranty and features a urethane no-wax wear layer. 800/233-3823. Armstrong World Industries, Inc., Lancaster, Pa. **CIRCLE 205**





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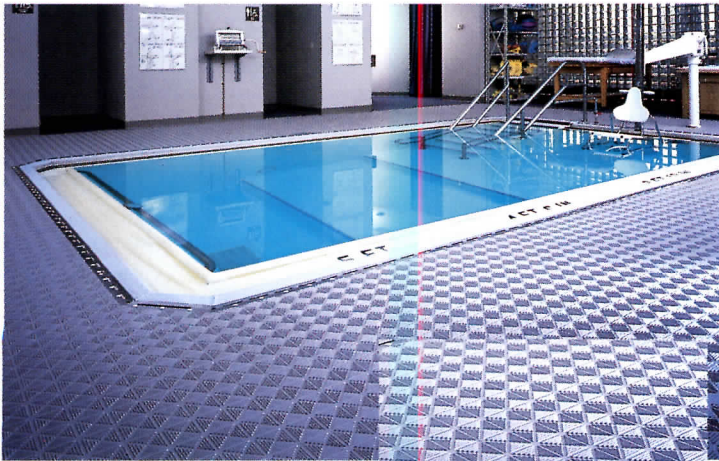
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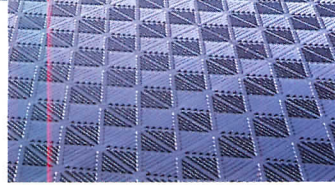
CIRCLE 72 ON INQUIRY CARD

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▲ Not slippery when wet

Johnsonite's Safety Stride vinyl flooring was installed around the hydrotherapy pool located on the ground floor in Miami Valley Hospital in Dayton, Ohio. The safety flooring provided slip resistance and proper drainage of excess water for a heavy-traffic area used daily by patients on foot or with walkers, crutches, or wheelchairs. Safety Stride features a patented "pyramid and duct" raised-profile design that allows water,



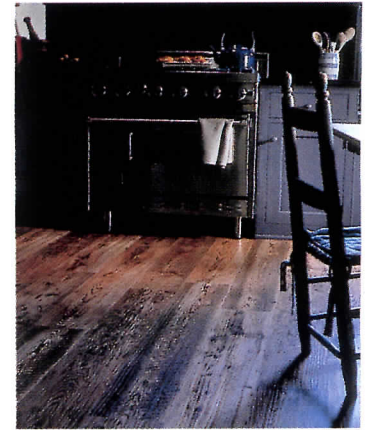
snow, grease, cooking oils, and other slippery liquids to remain below foot level and be directed away from spills for increased slip resistance. 800/899-8916. Johnsonite, Chagrin Falls, Ohio.

CIRCLE 207

► Natural inspiration

The Heirloom Collection, from Formica Corporation, portrays the detail and rustic character of refurbished wood planks. Looks are available in ancient oak, aged heart pine (shown here), and American chestnut. Formica flooring coordinates with offerings in the other Formica brand lines, including Formica brand laminate, Formica Ligna wood surfacing, and Surell solid surfacing material. 800/FORMICA. Formica Corporation, Cincinnati.

CIRCLE 211



◀ No filling around

Roppe Corporation's North Coast Collection features wood, marble, granite, and stone looks with the wearability and stain resistance of high quality solid vinyl. Featuring a thick wear layer, North Coast does not contain fillers. Pictured here is Lakewood Quarters in Baton Rouge, Louisiana. 877/SAMPLE-4. Roppe Corporation, Fostoria, Ohio.

CIRCLE 212

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vinyl wood, marble, and stone, and our brand new Marley Dimension safety flooring. You are sure to win with all 78 of Marley Flexco's vibrant new colors, *plus you also can register to win a Caribbean cruise. Winners will travel into the new millennium on a 7-day New Year's cruise for two set to sail the week of January 1, 2000.*

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CIRCLE 75 ON INQUIRY CARD



▲ Ceramic-like laminates

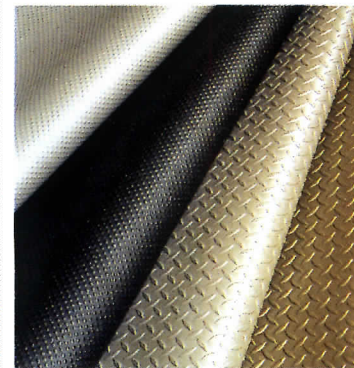
Traffic Zone high-performance floors from Bruce Laminate Floors now offer an expanded product line of tile and block styles. Introduced last year, Toledo Tile now adds two more shades: Verde and Crema. This ceramic-inspired pattern measures 15 $\frac{5}{16}$ inches by 15 $\frac{5}{16}$ inches. Toledo Tile's features include grout-line edges that blend tiles together and a subtle blending of seven color variations within each square. 800/722-4647. Bruce Laminate Floors, Mount Olive, N.J. **CIRCLE 208**

▼ Dressing up the selling floor

Pergo Publiq laminate flooring, from Perstorp, is designed specifically for retail and restaurant spaces in the contract market. Pergo Publiq comes in 26 designs, from traditional to trendy, and features a triple wear layer surface of high-pressure laminate. Pergo Publiq consists of individual planks measuring 47



inches long, 8 inches wide, and $\frac{1}{8}$ of an inch thick that fit together with an advanced tongue-and-groove system to form a "floating floor" (a decorative floor not attached to the subfloor). To minimize business downtime, it can be laid directly on top of old, level, hard-surface flooring. 800/33-PERGO. Perstorp Flooring, Raleigh, N.C. **CIRCLE 210**



▲ Diamonds and pearls

LonPearl and LonPlate Patina are two of Lonseal's newest introductions in sheet-vinyl flooring. Both patterns offer the same durability of Lonseal floors with a high embossed design. LonPearl suits a variety of retail installations, showrooms, health clubs, and restaurants. The diamond pattern featured in LonPlate Patina makes it suitable for heavy industry and as high-fashion retail, theme cafes, museums, and restaurants. All Lonseal styles come in a variety of colors. 800/832-7111. Lonseal, Inc., Carson, Calif. **CIRCLE 209**



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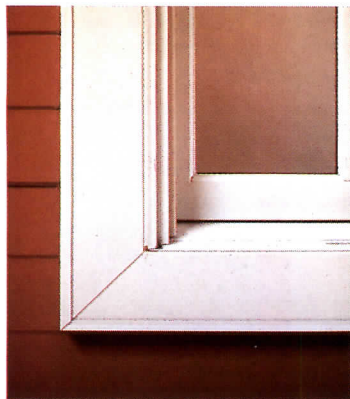


*Photo: Chicago State University, Rotunda Hall
Architect: Harry Weese Associates, Johnson & Lee
Photo By: Ken Kavana
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PRODUCT BRIEFS

► **Window frame expander**

Pella's frame expander system gives homeowners an affordable option by allowing a standard-size window to fit a custom-size opening. The system covers the space between the exterior of the house and the window. The product hides brick mould and any blocking used to make the rough window opening fit the new Pella Window, providing a low-maintenance trim. 800/84PELLA. Pella Corporation, Pella, Iowa. **CIRCLE 213**

▼ **Storefront framing**

Kawneer's new TriFab VersaGlaze (VG) Framing System allows designers and installers to vary the glass pane from front, center, back or even multipane applications. 770/449-5555. Kawneer Company, Inc., Norcross, Ga. **CIRCLE 214**

▲ **Stacking silhouette**

Stacking 12 high, the Silhouette chair, from KI, features a lightweight frame and a flexing back. The polypropylene shell is available in four colors and can be specified in a wide selection of fabrics. 800/424-2432. KI, Green Bay, Wis. **CIRCLE 215**

▲ **Green ceiling panels**

Eurostone All-Environment Ceiling Panels are manufactured from expanded volcanic Perlite, ceramic clay, and an inorganic binder, creating an environmentally safe and recyclable product. Impervious to heat, moisture, and

microorganisms, the panels are ideal for use in schools, medical facilities and hospitals. The lightweight panels can be individually cast in a variety of dimensional patterns, and custom logos are available. 800/323-7164. Chicago Metallic Corporation, Chicago. **CIRCLE 216**

▼ **Bamboo paneling**

Bamtex flooring is made from bamboo, which can be safely harvested in a short period of time without harming the environment. Bamtex can also be adapted for other uses, such as for the custom

wall panels, in the hotel lobby shown below. This particular installation features 15-inch-wide tongue-and-groove sheets. The paneling is also available in square-edge sheets. 800/222-1068. Hoboken Floors, Wayne, N.J. **CIRCLE 220**

► **Facing a vertical challenge**

Altos, from Teknion, provides full-height, flexible space division. Altos features a variety of interchangeable outer surfaces that permit the user to change the aesthetics and function of either or both sides of a wall without the replacement of an entire wall section. Altos allows for placement of cabling capabilities at work surface, baseboard, and intermediate height. 877/TEKNION. Teknion, Inc., Marlton, N.J. **CIRCLE 219**

▼ **Smoother sailing**

Developed in Italy for cruise ships such as the QE2, the Printwood line of fine wood veneers from Abet Laminati has been expanded to include seven new reconstituted, dyed veneers with a homogeneous look in wood grain and color. Also included in the line are five new-dyed natural veneers. 800/228-2238. Abet Laminati, Englewood, N.J. **CIRCLE 218**

▲ **Built-in steamer**

Gaggenau's gourmet combination built-in appliance collection features a large electric barbeque with lava stones, a steamer (shown), an electric deep fryer, and a downdraft ventilator. 800/828-9165. Gaggenau, Huntington Beach, Calif. **CIRCLE 217**

PRODUCT BRIEFS

► Retractable office furniture

Haworth introduces Vancouver, a contemporary series of modular wood furniture that features crescent-, arc-,



and kidney-shaped desks to support efficient work flow and in-office conferencing. The desks expand and contract by way of a retractable, pivoting link top that also integrates power and data

access under the front edge of the desks to accommodate computers during in-office conferences.

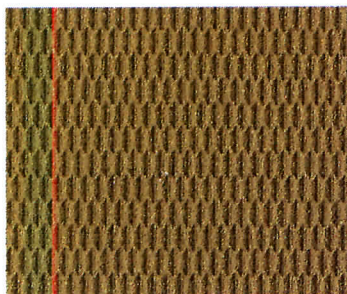
Accessories include a lockable laptop table, a mobile return that stows away, and retractable link tops.

800/344-2600. Haworth, Inc., Holland, Mich.

CIRCLE 221

► Decorative acrylic

Nevamar's Vitricor decorative acrylic is now available in a new formulation, Flex V, which simulates hand-lacquered finishes. Flex V is ideal for cabinetry, vanities or wall accents, resurfacing existing laminate installations, or wrapping columns or other tight-radius applications. International Paper, Odenton, Md. CIRCLE 222



▼ Minimalist seating

AGI's Kurv, designed by the U.K.'s Boss Design, offers a minimalist solution to seating in corporate reception areas, libraries, hospitality prefunction spaces, museums, galleries, and homes. The system provides continuous seating of any

length, which can be interspersed with several tempered-glass table options. The seat cushion insert is of polyurethane and dacron, and the optional back is made of 12-ply, cross laminated maple. 336/434-5011. AGI Industries, Inc., High Point, N.C. CIRCLE 224



► Grass-reinforcing rings

Grasspave's roll format makes the turf reinforcement quick and easy to install. Applying large rolls of Grasspave's porous pavement over a sandy gravel road base creates driveable lawns. The rings are 100 percent recycled plastic. Invisible Structures, Inc., Aurora, Colo. CIRCLE 223



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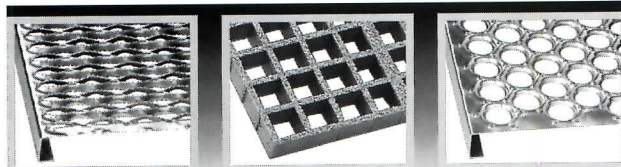
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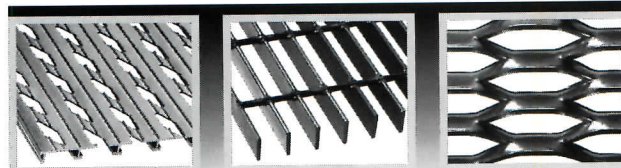
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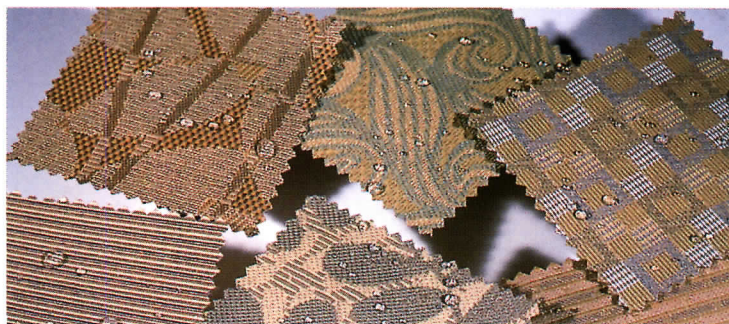
CIRCLE 80 ON INQUIRY CARD

PRODUCT BRIEFS

▼ Protective force field

Force Field, a new Crypton upholstery collection from Maharam, combines the performance characteristics of a vinyl upholstery with the hand of a woven textile. The collection offers permanent

stain, moisture, and bacteria resistance, and a Crypton finish provides protection against wet and dry stains. Six patterns in coordinating scales and designs are available in the grouping's range of 48 colorways. 800/645-3943. Maharam, New York City. **CIRCLE 225**



◀ Cooking sink

Kohler's PRO CookCenter features a cooking vessel in conjunction with a kitchen sink. The CookSink, an eight-quart cylindrical cooking vessel, serves as a convenient water source and drainage area. 800/4-KOHLER. Kohler Co., Kohler, Wis. **CIRCLE 226**

▼ Waterproofing foundations

Koch Waterproofing Solutions' expanded line of Watchdog Waterproofing options provide water protection for parged block or poured wall foundations. Watchdog Waterproofing features a flexible membrane—a polymer-enhanced membrane that is spray-applied to bridge foundation cracks. 800/876-5624. Koch Waterproofing Solutions, Heath, Ohio.

CIRCLE 227



▲ Wine storage equipment

Sub-Zero offers four wine storage models designed to keep wine in its optimum condition and showcase wine collections. Units are available with glass or solid doors, with either a stainless-steel or custom wood trim. Full upright and undercounter models are available. 800/532-7820. Sub-Zero Freezer Company, Inc., Madison, Wis. **CIRCLE 228**

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PRODUCT LITERATURE

Operable wall systems

Modernfold Inc.'s 1999 Sweet's brochure illustrates how the company's operable wall systems and accordion partitions help commercial building professionals manage interior space, sound, and sight issues. 800/869-9685. Modernfold, Inc., New Castle, Ind. **CIRCLE 229**

Window treatments

The 1999 Hunter Douglas Fashions Commercial Window Treatments catalog showcases the latest product information. 800/727-8953. Hunter Douglas Window Fashions, Upper Saddle River, N.J. **CIRCLE 230**

Retaining-wall systems

VERSA-LOK Retaining Wall Systems' new four-color brochure illustrates the design flexibility of VERSA-LOK standard units. Project photos include residential, commercial, and shoreline applications. 800/770-4525. VERSA-LOK, Oakdale, Minn. **CIRCLE 231**

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www.qualitylight.com
- Bayer, Coatings and Colorants Division:
www.BayerUS.com/CoatingsandColorants
- La-Z-Boy Contract Furniture Group:
www.lzcontract.com

Health-care flooring

Two updated Flotex floorcovering brochures are now available from Bonar Floors. "Flooring for Healthcare Environments" explains the benefits of using Flotex in long-term care facilities and hospitals, while "Product Portfolio" shows the entire collection of patterns and colors in both rolled goods and tile. 800/852-8292. Bonar Floors, Newnan, Ga. **CIRCLE 232**

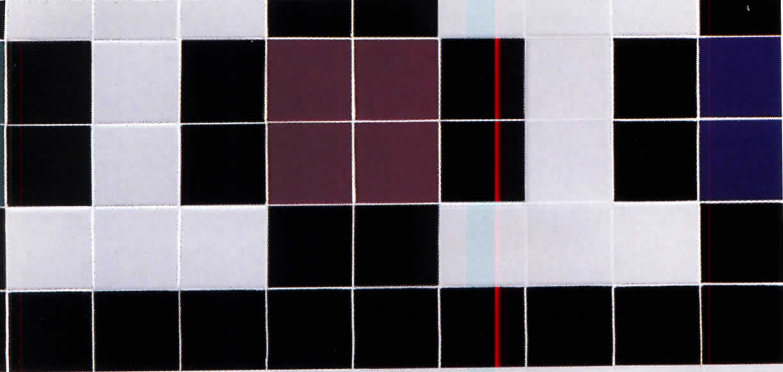
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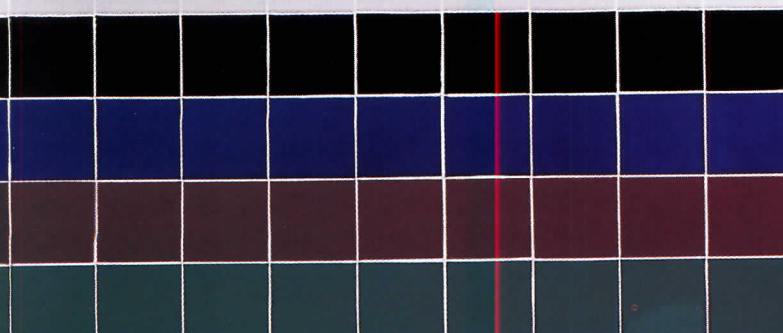
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PRODUCT LITERATURE

Aluminum products

Southern Aluminum Finishing's 1999 Extrusions and Sheet catalog and price list details SAF's anodized and coated aluminum products and services. 404/355-1560. Southern Aluminum Finishing Co., Atlanta.

CIRCLE 233

Insulation brochure

The Dow Chemical Company introduces a new, four-color brochure providing information on Styrofoam brand insulation products to solve or eliminate moisture problems in new and existing building construction. 800/441-4369. The Dow Chemical Company, Midland, Mich. **CIRCLE 234**

Door design ideas

"Decorating with Doors" is a new idea book offered by CraftMaster Door Designs by Masonite. The full-color, 21-page brochure demonstrates the potential for door design. 800/504-1020. Masonite Corporation, Chicago. **CIRCLE 235**

Porcelain source box

The new Montano Porcelain Stoneware source box presents the commercial-tile flooring collection in a five-folder, mini-reference library format created specifically for architects and designers. 877/MONTANO. Montano Porcelain Stoneware, Cerritos, Calif. **CIRCLE 236**

Rubber applications

A detailed, new eight-page color brochure from Advanced Elastomer Systems highlights the use of Santoprene rubber in construction applications including expansion joints, commercial glazing seals and weatherstripping. 800/305-8070. Advanced Elastomer Systems, L.P., Akron. **CIRCLE 237**

Wrought-iron components

Outwater Industries' Wrought Iron Components catalog supplement features wrought-iron railing and gate and grille components. 800/631-8375. Outwater Plastic Industries, Woodridge, N.J. **CIRCLE 238**



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Questions appear on page 186. To receive CES credits, fill in the education reporting form below or on our Web site (www.archrecord.com).

1. A basic waterproofing system typically consists of a site drainage system (when the water level is not consistently above the footings); a thin, nonporous membrane; a rigid material that protects the waterproofing membrane from environmental conditions and construction fill; insulation, which mitigates the effects of freeze/thaw cycles; and, in some cases, a wearing layer or top slab.
2. Dampproofing is usually done with coal tar or other coatings, including acrylic latex, polyethylene, and cementitious coatings applied to the foundation wall. This differs from waterproofing membranes because dampproofing coatings lack the ability to bridge the small cracks and fissures that let water in; dampproofing simply retards water migration instead of sealing off the structure. It costs considerably less, however, at around 80 cents a foot compared to waterproofing, which costs roughly \$2 a foot.
3. Blind-side waterproofing is used when a membrane cannot be applied to the exterior of the wall or slab. It may also be utilized in

zero-lot-line, historic, or urban projects when positive-side waterproofing requires additional excavation around the foundation that isn't possible. Waterproofing the inside of the walls means that water is typically allowed to infiltrate the structure before it is blocked from the interior finishes.

4. Standardized specifications for waterproofing cannot be used in cases where there are extenuating soil or drainage conditions, when there are extreme temperatures or exposure to the weather before construction of the foundation, or when the cure time required before a standard can be installed is longer due to the concrete mix or temperature.
5. Recent regulatory policies have banned or limited the use of solvent-based products, including mastics and primers used to prepare the foundation for waterproofing. Also, restrictions on excavation or standard positive-side systems, limitations of off-the-shelf waterproofing, and tighter budgets and construction schedules have discouraged the use of traditional products. The industry has shifted toward components and accessories designed to enhance the membrane's performance and ability to block water, as well as new products for special conditions. Manufacturers offer a variety of primers, sealants, and other compounds to create a dry, smooth surface, including non- or low-VOC mixtures to meet environmental standards and reduce odor and flammability. Fluid membranes are suitable for rougher surfaces. The disadvantage is that the thickness is not uniform since it is not factory controlled.



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ARCHITECTURE IN THE YEAR 1000 *continued from page 90*

church (known as Bodrum Camii) and the church of the monastery of Constantine Libs were characteristically small in size and featured unique cross-in-a-square plans that created nine bays of different heights and shapes.

Goodbye to all that

As we virtually sail off into the sunset and return to 1999, we regret not being able to go to India, Japan, and China—at least for now. Still, in this part of the world, we see the Year 1000 marks a crucial boundary in time and is not just a number. Certainly the turnover of kings, emperors, and popes would still occur after the millennium. However, trade and the Crusades in the next century would transform the economy of these areas and intensively affect the sociocultural system. Also knowledge and learning would gradually move from the monastery or the cathedral school to universities.

Architecturally, the Year 1000 was also the cusp of an era in which the builders and masons would soon reflect changes in their “cognitive process,” write Charles Radding and William Clark. Such a transformation would allow them to innovate instead of just imitate as they moved toward more 3D thinking, creating spatially integrated wholes out of a series of discrete modules. Since our tour ends early, we must forgo seeing famous monuments of the 11th century, such as the Cathedral of Strasbourg (1018–1028), Mont Saint-Michel (1022–1135), Durham Cathedral (1093), Pisa Cathedral (beg. 1063), or even Cluny III, which features Vitruvian proportions and the new pointed arch with thinner groin vaults. Nevertheless, 1000 proves to have been a fertile time. From the diversity of design elements thoughtfully gleaned from the past and from the craftsmanship executed by roving anonymous architects would emerge a whole new history. ■

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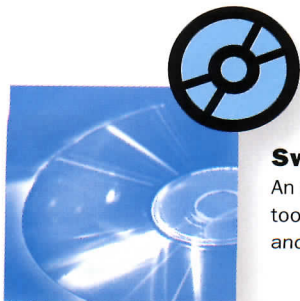
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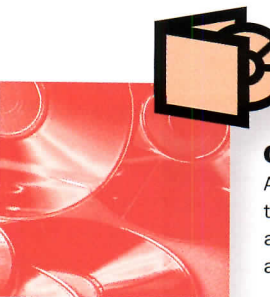
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THE FUTURE

The electronic permitting process may soon eliminate paper for architects, if they are ready.

BY KIRA L. GOULD

Growth-friendly, super-wired Silicon Valley sometimes seems like another world to communities elsewhere in the country, but some of the area's innovations may change the way business is done everywhere. One example is the region's Smart Permit project, a range of programs and software aimed at upgrading the regulatory environment.

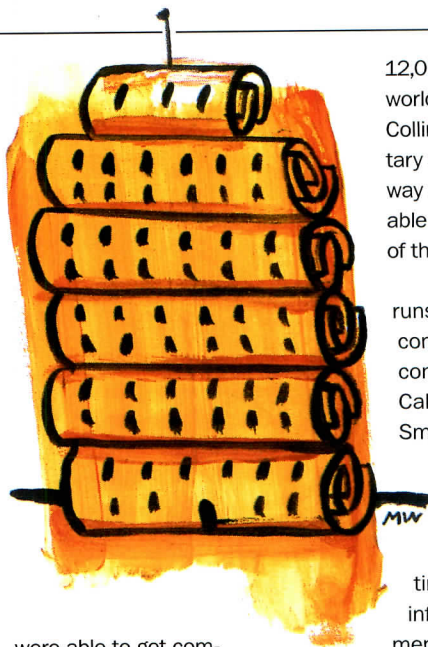
In time-to-market-sensitive Silicon Valley, everything has been fast track for years—except the permitting process. A committee of local officials, executives, architects, and engineers led by Joint Venture: Silicon Valley, a nonprofit regional collaborative, developed Smart Permit to solve the problem. According to Randy Tsuda, committee director, more than 80 percent of city decisions require land-based information—data about the geography of a place and the infrastructure and buildings that exist there—and until recently, most of that has existed only in paper form. Cooperation within the Silicon Valley region represents one of the most amazing aspects of this project; officials from several cities came together to standardize permitting processes and unify building codes and their interpretations.

"This is a new model for cities to deliver all types of services, including building permits," he says. "The virtual city hall will allow more community development services and information to be available more of the time. File cabinets of applications and drawings are being replaced by computer servers. What takes a week today will take sec-

onds or minutes in the future." He points out that more than \$10,000 of paperwork typically goes into a major new commercial building and says, "with Smart Permit, it will essentially be zero."

Sunnyvale, California, was the first of six cities to bring its pilot system online two years ago. According to Leland Vandiver, the city's data systems and network manager, the systems include Web-enabled tracking software, GIS software for land-based data, and desktop tools that allow people to reference drawings, redline information, and conference efficiently. While there are still glitches to be resolved (such as protection technologies to ensure that people and signatures can be authenticated), Vandiver predicts that this kind of system will be fairly commonplace in many areas within five years.

Already the systems are being tested, though the steep learning curve means that it's easiest to apply to small projects first. David Bendet, of MBT Architecture in San Francisco, has tried Smart Permit; a 2,000-square-foot renovation project was permitted through the electronic system. "Despite technical difficulties, this was a dramatic time saver for our office," he says. "The biggest advantage to me was consolidation of files from consultants. In the past, we'd receive multiple sets of signed blueprints, collate them, and deliver them to the city. After we received corrections from the city, the process was essentially repeated. But by using E-mail and FTP sites, which allow us to post files for access by others, we



were able to get comments almost immediately from the city and transmit them to our consultants, who would revise and resubmit files electronically."

Outside Silicon Valley, as attempts are made to automate the permitting and communications between project players, architects see promise for some aspects of the Smart Permit approach. Even cities with labyrinthine permitting systems are increasingly using electronic resources. Mark Woerman and Arlan Collins, of CNA Architects in Bellevue, Washington, report that permitting in the Seattle area is typically a struggle. At the outset of a large, complex project for Renton, near Seattle, "Everyone involved agreed to handle concerns and responses electronically, and this made a big difference," Woerman explains. They point out that now some 30 agencies in their area demand to see projects larger than

12,000 square feet. "In the paper world, they all reply in isolation," Collins says. "This system, rudimentary as it is, allowed an interactive way of responding, which was valuable in terms of time and progress of the project."

Architect Zane Paxton, AIA, runs G-4 Consulting, a technology consulting firm for the design and construction trade in San Carlos, California, and is a member of the Smart Permit committee. He

acknowledges that there's still work to be done, but is optimistic about the approach. "This will change timetables, increase available information, and it has environmental benefits as well. We will save a great deal of paper and lots of unnecessary driving."

But there is a price of admission. "Architects need Internet access and E-mail at every desktop," Paxton says. He's currently working with local AIA chapters to survey firm readiness. Vandiver, who's worked with many firms in recent years, is surprised at how "architects, who are in many ways very forward-thinking, seem to be unprepared."

As Paxton points out, it's not as if a firm needs hardware, software, or network power to be able to participate in Smart Permit or similar efforts. Even those practitioners who distrust the impact of digital tools on the design process itself agree that whatever else the future holds, electronic interaction is likely to increase. ■

Kira L. Gould is a freelance writer living in New York City.

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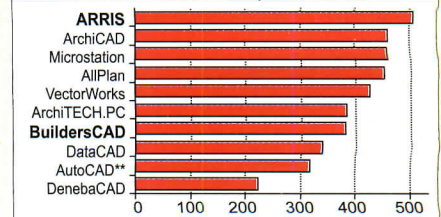
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