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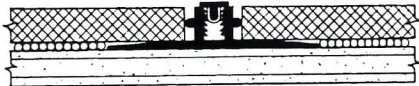
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Letters/Calendar

Seaside scapes

Great editorial on background architecture [ARCHITECTURAL RECORD, February 1996, page 9], a cause I have tried to champion—with limited success—for years. Even in Seaside, where the code legislates background architecture, the cultural and educational forces which make each architect feel compelled to outdo Howard Roark, make it an uphill battle. Architects like Scott Merrill who take pride in well-detailed, elegantly proportioned simple boxes are all too rare.

The fault lies not just with the schools and the general culture but also with the architecture press, which tends to publish monuments and “interesting” buildings for obvious reasons. It is harder to make background buildings photogenic; they are by nature not glamorous. But streetscapes or cityscapes made up of competent, simple buildings which fit well together are glorious.
Robert S. Davis
Seaside, Florida

Riverside re-do

I enjoyed the November 1995 issue on the acoustical renovation of Riverside Church [RECORD, pages 36-37]. However, I would like to provide some clarification and a correction.

The writer is incorrect in stating Wallace Clement Sabine was consulted on the Riverside Church project in 1930 (Sabine died in 1919). One of his students, Clifford Melville Swann, continued his work into the late 1920s and early 30s. Swann also served as an acoustical consultant during this period.

The article alludes to two types of Guastavino tile; one was Rumford tile (1911-1915). The second was called Akoustolith, which replaced the Rumford tile since it was easier to manufacture and had approximately two times the sound absorbency in the speech frequency range as the Rumford tile. (Readers who are interested in more information can contact the Avery Library at Columbia University, New York City, which maintains the Guastavino archives.)

Neil Thompson Shade
Acoustical Design Collaborative
Falls Church, Virginia

Through May 27

An exhibition of “Scènes d’atelier” of Christian de Portzamparc is at the Centre de Georges Pompidou Museum, Paris, showing 41 of the 1994 Pritzker Prize winner’s designs.

June 6-September 3

A special exhibition at the Museum of Modern Art in New York City will celebrate the occasion of the 90th birthday of Philip Johnson, and his role as a curator and donor to the museum. Contact the Museum of Modern Art, 212/708-9400.

Through June 9

The travel sketches of Louis Kahn will be on view at Williams College, Williamstown, Mass., and include 73 drawings of sites and structures by Kahn. The exhibit moves to New York City’s Jewish Museum afterward.

June 17-20

Construction Technology ’96 conference and exhibition for new technologies in the building industry will be held at the Anaheim (Calif.) Convention Center. Sponsored by The Construction Information Group of The McGraw-Hill Companies (which includes RECORD, ENR, Sweet’s Group, and F.W. Dodge), the event will be held in conjunction with A/E/C Systems ’96. Call 800/451-1196 or fax 601/458-7171 for further information.

June 24-25

“Green Building Materials ’96,” Radisson Hotel, Gainesville, Fla., will explore important issues concerning the specification and manufacture of so-called “green” building materials. For information, call Dr. Charles Kibert, 904/392-7502; fax 904/392-9606.

Competitions

◆ Registration deadline to redesign Lt. Joseph Petrosino Park in lower Manhattan is May 15; submissions due Sept. 3. For details call Storefront for Art & Architecture, 212/431-5795; fax 212/431-5755.

◆ The Urban Studies and Architecture Institute International Design Competition is inviting entries to its “New York: The Lost Archipelago Governor’s Island” competition. A \$150 fee must accompany registration, which is due by May 31; entries by Aug. 11. Winners will split a \$25,000 prize. Phone 212/727-2157; fax 212/727-2159 for details.

◆ “The End” fourth annual architectural design competition, “The Chair,” is seeking entries via the Web (<http://www.thechair.com>) by May 31. Phone 213/296-6226 for details. ■



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Ready for Inspection

There's a side to streamlining government that architects and engineers should care a lot about, simply because it affects their pocketbooks and their exposure to risk. I refer to the increasingly topical subject of inspection.

The idea is that handing off building inspection, including plan review, to the private sector will avoid costly delays forced by clogged inspectors' calendars, and allow downsized building departments to fulfill their substantial other duties to the public.

In New York City, monumental delays in processing plan reviews led the Buildings Department in 1994 to authorize architects and engineers to self-certify that their own project plans and specifications conform to applicable codes and regulations. Projects are still subject to spot inspections by departmental staff—at a rate of about one in four. (Not so long ago, most design firms had on retainer so-called "code consultants"—savvy fellows with good connections in the building department whose job it was to expedite the issuing of a building permit.)

Another stage for shifting oversight from public agency to the architect or engineer is when issuing a certificate of occupancy. In some countries, such as Australia, outsourcing by the building department is standard procedure, says Pasadena architect Robert Fowler. Architects are given the option of obtaining approvals at the various stages of a job from the city's own buildings department or, if they prefer, from a third-party private agency. Architects claim better service from the private agencies—they're available weekends, and keep more flexible hours. And the competition puts government on notice to mind its public responsibility.

Services under the Australian model could be offered by specialized A/E firms or, with proper safeguards, by a discrete division of large, multi-divisional firms. Third-party inspection by a private agency involving a certificate of occupancy in New York City would require an act of the City Council, which is said to have reservations.

As for the inspectors, they're not so sure. At least in New York one purpose of assigning inspection to the private sector is to allow inspectors to attend to the great volume of queries from the public. But it doesn't take great insight to see that in the background hovers the future of a downsized public workforce and reduced budgets.

This all means, first, that the explosion of new codes and regulations, from ADA to energy to wetlands to compliance with endangered species regulations, is placing a burden on building departments that many would as soon shed. Second, inspection offers architects an opportunity to specialize in what could be a solid source of fees. Third, outsourcing introduces risk on a big scale—to the professional and possibly to the public. Many an architect might welcome a second pair of eyes, a Phoenix architect told RECORD. Every time they certify a project, A/E's would put their licenses in jeopardy, and risk being sued for certifying non-complying elements in the plans. And what about the risk to the public of unqualified private-sector inspectors?

The answers aren't clearcut, but the issue serves to highlight a cause RECORD has long championed—that the architect's skills can be applied to services well outside traditional private design practice. And it's another opportunity to put a new face on a profession that for too long has been perceived as caring only about esthetics and downsizing its own risk. *Stephen A. Kliment*



Design

Briefs

Architects and the Feds

◆ The U.S. Department of Justice has closed its most recent investigation into the architectural profession's alleged violation of anti-trust laws. The investigation had been requested by the National Society of Professional Engineers (NSPE). The American Institute of Architects (AIA) has said that whether or not engineers can serve as prime professionals on a building project depends on state licensing laws.

◆ A partnering charter recognizing "the importance of efficient and high-quality design and construction of public buildings" was signed by the American Institute of Architects, the Associated General Contractors of America, and the U.S. General Services Administration on March 4.

Landmarks in need

◆ Stanford University has launched a fundraising campaign for the restoration and seismic upgrading of Frank Lloyd Wright's Hanna House, which was severely damaged in the Loma Prieta earthquake of 1989. The university, owner of the property since 1974, hopes to raise nearly \$2 million for the restoration of the house.

◆ Human nature, not mother nature, has imperiled Zeckendorf Plaza (1954-1960), I.M. Pei's award-winning, mixed-use complex in downtown Denver. The owner, HBE Corp., of St. Louis, intends to expand the site's existing hotel, transforming a vacant department store and demolishing a hyperbolic paraboloid entrance pavilion. Preservationists, architects, and others led an unsuccessful bid to gain landmark status for the complex, arguing that it is a significant part of the city's cultural heritage. The Denver Urban Renewal Authority, which is to supply a \$25-million subsidy for the \$135-million redevelopment project, and other city officials believe otherwise. Demolition of the paraboloid is slated for July.

◆ To help support the restoration and preservation of cultural heritage sites around the world, the World Monuments Fund of New

Continued on page 20

Los Angeles

New Center for Art And Architecture

April marked the official opening of the MAK Center for Art and Architecture, Los Angeles. Established as a satellite of the Museum of Applied Arts of Vienna, it will offer programs and exhibitions at Rudolf Schindler's Kings Road Studio House (1922), which is currently undergoing restoration. Funded by the museum, the Austrian government, and local contributors, the center is to act as a think tank and research institute, producing publications and electronic media, housing photo archives, and supervising the new Artist and Architect in Residence Program at the Schindler-designed Pearl M. Mackay Apartment House (1939). "Again Architecture: The Havana Project," the MAK Center's inaugural exhibition on view through July 27, includes proposals for the Cuban capital by Eric Moss and Carme Pinos, among others. *Abby Bussel*

New York City

Portzamparc Comes To New York



©Nicolas Borel

French architect Christian de Portzamparc has designed his first American project. Now under construction on Manhattan's 57th Street is his 23-story glass tower for the French luxury goods group, LVMH, which will include a Louis Vuitton boutique at its base. Designed with The Hillier Eggers Group of New York, the tower is to be completed in 1998. *Claire Downey*

Awards

Rafael Moneo Wins 1996 Pritzker Architecture Prize



© Francisco Ontañón

José Rafael Moneo has been named the 1996 Pritzker Prize Laureate. A 58-year-old Modernist based in Madrid, Moneo is the first Spaniard to receive the \$100,000 prize, which will be awarded on June 12 in Los Angeles. "Each of his designs," reads the formal citation, "has a confident and timeless quality indicative of a master architect whose talent is obvious from the first concept to the last detail of the completed building." He's being honored for his work, including the Davis Museum and Cultural Center at Wellesley College [RECORD, October 1993, pages 84-91], and his role as an educator, both in Spain and the U.S., where he chaired the Harvard Graduate School of Design from 1986 to 1990. Moneo, also the recipient of the 1996 UIA Gold Medal, says the Pritzker is both an honor and a responsibility that will serve as a constant force "to do things better." ■

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Prince Charles Builds His Dream Town

Phase One of the Prince Charles-sponsored town of Poundbury includes 250 homes in a master-plan by Leon Krier and others.

After many pronouncements on the subject, Britain's Prince Charles is now realizing his vision of an alternative to Modern architecture and urbanism on land owned by his Duchy of Cornwall on the outskirts of Dorchester, the county town of Dorset and Thomas Hardy's Casterbridge.

A fantasy town called Poundbury

Four years after sailing through its planning applications, the first quarter of Phase One—250 owned and rented homes in an assortment of vernacular styles—is complete and occupied. Ultimately, the development, called Poundbury, could increase the area of Dorchester by 50 percent, providing up to 3,000 homes on 400 acres over the next 20 years. Several local architects, who request anonymity, have been involved in modifying the original masterplan by Leon Krier. Others are scathing about the results. "A cooked-up, potted history of architecture," said one. "Why do we have to do this? Why can't we find an acceptable style for the third millennium?" "When it's finished, it's going to be just another estate," predicted another.

Poundbury fails in many ways. For a start, the bleak site is wrong. Dorset towns have grown historically along valleys, and not (since Neolithic times, at least) on hilltops, as does Poundbury. It is located just far enough from Dorchester to make people car-dependent. And residents will likely drive not into town, but around the bypass to shop at vast new superstores, which are also built on Duchy land. Thus little has been done to ensure the economic survival of the center. All this is curious because the Prince writes in a recent issue of his magazine, *Perspectives on Architecture*, that "we should look harder at ways to reuse our existing housing before we rush into building on greenfield sites."

Poundbury is also flawed in its urbanism. The sidewalks are too consistently wide, perhaps reflecting the need to conform to contemporary planning laws. Pocket handkerchief yards hint at the demands of today's realtor, not the evolution of a historic town. There are not (yet, anyway) those special spaces such as a broad "high street" that give English towns their character.



The houses are too tidy, too symmetrical, and too small to bear the weight of their stylistic presumptions. The overall effect is as if the Prince and Krier had been playing with a young chemist's "crystal garden." In an instant, they have grown little crystals of a variety of salts that would never be found together in nature, neither in such perfection nor in such proximity to one another.

A potpourri of historic styles

Poundbury's potpourri of styles is picturesque, but inauthentic. "There are no 'boring Victorian terraces, no 1890s workers' cottages," notes one local. "Because it is laid out for pedestrians and cars, there are no oddities of manorial waste, no bits left over." While Poundbury has an instant "history," there is no individual history in any of the houses. In real houses of the period pretended here, modern kitchens and bathrooms, for example, would have been added on at a later date, often at awkward junctures. Instead, of course, these rooms are incorporated where the modern homebuyer expects to find them.

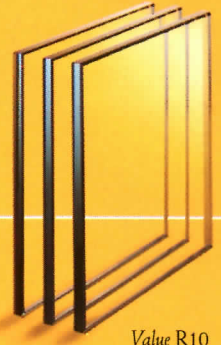
As a consequence, floor plans are not always as corresponding elevations imply. Too many

materials have been employed in an attempt to provide visual interest and to showcase "traditional" crafts. Other details also try too hard. Dates of construction (1995) are pretentiously inscribed in too lowly frontages. Street name signs are crafty, not civic; house numbers are regimented, not individual.

Lack of vision, lack of reason

But above all, Poundbury is flawed because it has no real reason to exist. Shops may come, but jobs probably will not follow. A genuine focus is not likely to arrive either. Local sources explain that the area's churches, already struggling to fill and maintain existing buildings, turned down their chance to build in Poundbury. Instead, Krier has designed a bizarre 80-foot-high "vertical feature" to fill the physical and symbolic role of a church. "Utopias bore me. Let us have a plurality of styles," Krier has said. But Poundbury is a utopia of pluralism. Utopias are all very well. The mistake is to build them. *Hugh Aldersey-Williams*

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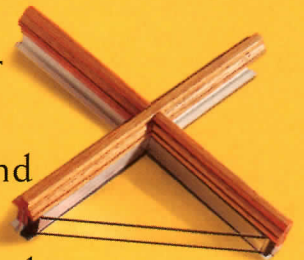
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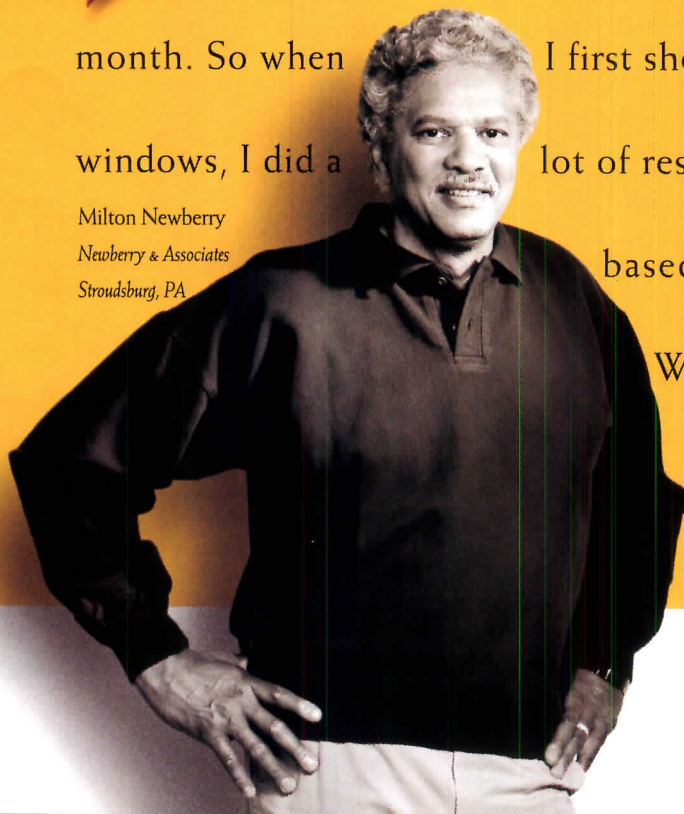
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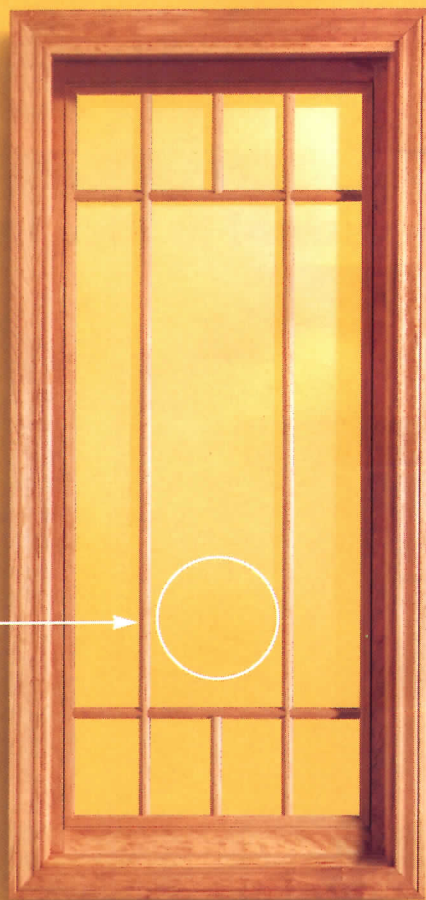
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Design

Briefs

Continued from page 13

York City has released its first annual list of "100 Most Endangered Sites." Imperiled by war, natural disaster, insensitive developments, or neglect, the sites include the White City in Tel Aviv, Israel, and the wooden churches of Chiloé Archipelago in Chile. American Express has committed \$5 million to the project.

Campbell Wins Pulitzer

RECORD Contributing Editor Robert Campbell, architecture critic at *The Boston Globe* since 1973, has won a 1996 Pulitzer Prize. A shrewd, often acerbic observer, Campbell is known as a voice of common sense on an often turbulent architectural scene. He has a large public as well as professional following.

Award to Mexico City

The fourth Veronica Rudge Green Prize in Urban Design, formerly known as the Prince of Wales Prize, was awarded to Mexico City on March 13 for the restoration of both its historic center and the District of Xochimilco, a pre-Columbian Aztec agricultural landscape. The prize is given periodically by Harvard's Graduate School of Design for projects that make "a positive and substantial contribution to the public realm."

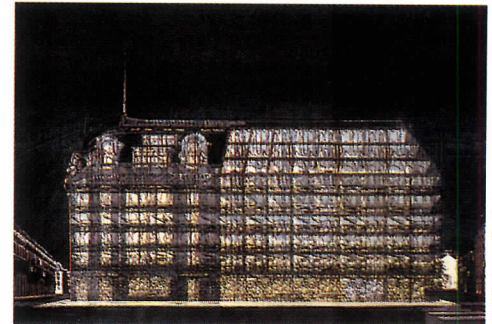
Cedric Price archives to CCA

The archives of English architect and Archigram member Cedric Price, who is best-known for his investigation of flexible structural technologies, have been acquired by the Canadian Centre for Architecture (CCA) in Montreal. The archive covers 1953 to 1981. ■

Paris

Culture Etched in Glass and Stone

Francis Soler's competition-winning design for the French Ministry of Culture in Paris unites new and existing glass and stone structures with decorative tracery etched into the building facades. The 180,000-sq-ft project, to be located on a full-block site just north of the Louvre, will house offices currently scattered throughout the city. An existing central courtyard will be opened to the street, creating a public park. Work is to begin next January. *C.D.*



© N. Boret photo

Key West, Florida

AIDS Memorial to Rise in Key West



The Wheeler Group of Minneapolis has won an international competition for the design of a permanent AIDS memorial in Key West, Fla. To be built on a city-owned site at the entrance to a public pier, the winning scheme is designed as a concrete plaza with three horizontal granite sections etched with the names of people who died from complications of AIDS. Words of reflection and a map of the Florida Keys will also be incorporated into the plaza. Financed by the Miller Brewing Company and private donors, construction of the \$150,000 project is expected to begin this month with completion slated for December 1, World AIDS Day. ■

Watts, Los Angeles

Inner-City Kids Use Design to Take Back a Piece Of Their Neighborhood

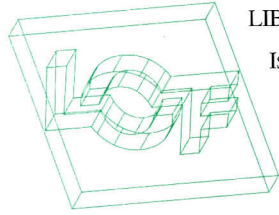


As government agencies reduce funding for urban improvements, many youth programs are taking matters into their own hands. One project, "Caution: Children at Work," involved the redesign of a neglected playground by school children in the Watts area of Los Angeles. Completed in February, the project was organized under the auspices of the local 4-H by two teachers, John Gust of the Compton Avenue Elementary School and Meghan McChesney, a colleague at a nearby school who recently entered the Teach for America/AmeriCorps USA program with an

architecture degree from Washington University in St. Louis. McChesney guided the mostly 9-year-olds through the design process, using an apple to explain plan, section, and elevation. The students' plan—in the form of a four-leaf clover—even addresses ADA requirements. The \$80,000 project, funded by the Housing Authority of the City of Los Angeles, yielded more than a playground. Not only did the students receive a letter of commendation from President Clinton, but they learned that they could help to improve their own community. *A.B.*

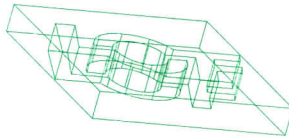
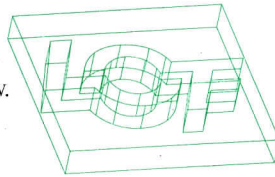


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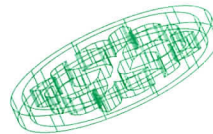
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Carnegie Study Sets Goals for Educating Architects; Calls for Renewal

By Robert Ivy

Seeking "common ground and purpose" for a profession "riven by self-doubt," the Carnegie Foundation for the Advancement of Teaching in Princeton, N. J., released its long-awaited report on architectural education and practice on May 6. The document, which was co-authored by the foundation's former president, the late Dr. Ernest L. Boyer, and Carnegie senior fellow Lee D. Mitgang, proposes a "broad blueprint for educational renewal."

Thirty months of research and writing by investigators resulted in both an assessment of the state of contemporary education at the nation's 103 accredited schools of architecture, as well as suggestions for revitalization. Rather than propose specific criteria for evaluation and improvement (a "cookbook" for fixing evident problems) or a core curriculum for schools, the report establishes a framework for future debate; it is not prescriptive.

"Educating architects not only for competence but also for civic engagement is surely one of the highest priorities for architecture schools in the coming years," the document declares. Entitled *Building Community: A New Future for Architecture Education and Practice*, the study represents a departure from previous efforts, says Mitgang—"an independent view by outsiders" of the relation of education to the profession.

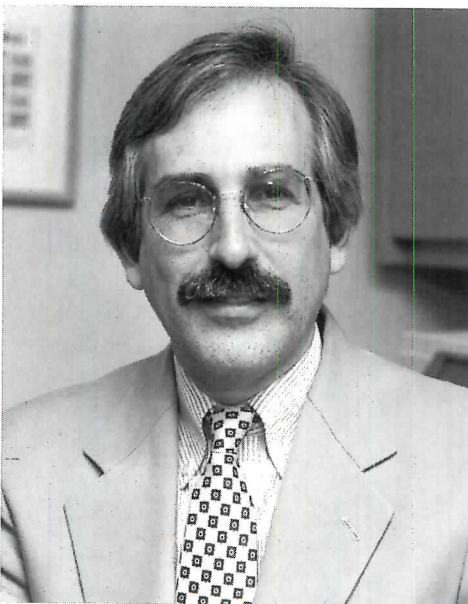
Teaching problem-solving

Several larger themes, both opportunities and challenges, emerged from the research. First, the authors found that architectural education—with its emphasis on collaborative learning, designing within constraints, and synthesizing knowledge—offers specific, positive ways of teaching problem-solving skills to students in a variety of educational settings. Included throughout the report are examples of innovative, successful programs already underway at the nation's schools of architecture.

Architect and author Robert Ivy is liaison with ARCHITECTURAL RECORD under the recently signed alliance between The McGraw-Hill Companies and AIA.



The late Dr. Ernest L. Boyer was president of the Carnegie Foundation for the Advancement of Teaching.



Lee D. Mitgang, a Carnegie senior fellow, was co-author of the report.

More troubling, however, was an evident "disconnection" of architecture students from the larger academic setting, a social and intellectual alienation that sets the stage for the years of practice that follow. The report acknowledges a litany of grievances, includ-

ing excessive student stress, inadequate opportunities for faculty scholarship, overly-demanding curricula, an often-autocratic jury system that stifles legitimate communication between student and teacher, inadequate minority representation among students and faculty, and minimal economic resources.

No dramatic call

Building Community issues no dramatic call for increased technical competence or acumen. "The report establishes seven goals of larger consequence. The schools and the profession themselves must decide, 'Are these the right goals?'" Mitgang says.

Goal 1: "An Enriched Mission"

Chief among these goals is "an enriched mission" concerned with the "larger purposes of architecture itself" for schools of architecture. The profession's efforts should be channeled toward public-spirited ends, it argues, those higher civic concerns that architects are uniquely suited to address.

As an example, Mitgang cites the value of beauty in building. Beauty must be balanced by designs that address human need, from innovative housing solutions for low-income families to hospices for AIDS patients; creative urban solutions, including preservation of valuable urban resources; and "preserving the planet," a renewed emphasis on sustainability for the coming century.

Goal 2: "Diversity with Dignity"

A chapter entitled, "Diversity with Dignity," describes architecture's unique status within the academic setting. Aimed primarily at university administrators, the chapter argues that architectural schools contain "a mosaic of talents" that do not conform to the norms of the typical research-driven university. Applied knowledge should count. When considering faculty for tenure, for example, administrators should weigh time spent in the active practice of architecture.

Goal 3: "Standards without Standardization"

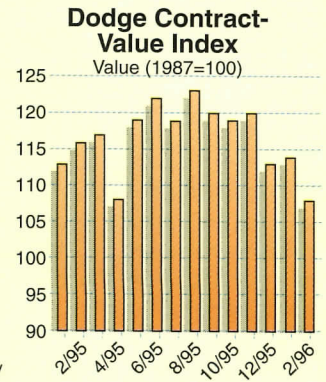
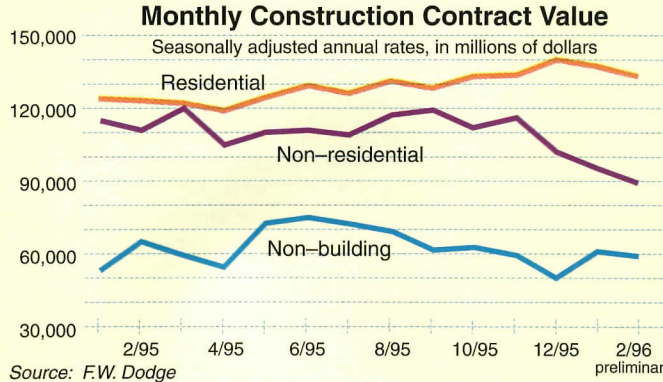
Just as universities should change the way they value architectural faculty, so the Carnegie report proposes new categories for the architectural accreditation standards. "It

Continued on page 128

Indicators

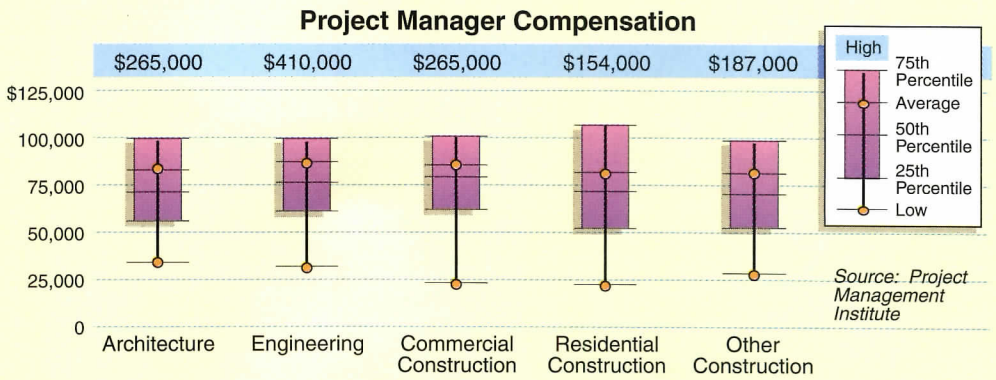
Non-residential leads lower volume

Most non-residential building categories declined in February, including stores, offices, and warehouses, making the slump in this category now three months long. There was little support from other building types, leading to a 5 percent decrease in total construction for the month. School construction plunged 20 percent, which likely will be only a temporary setback. Housing slipped 3 percent, but its current level is still strong. (Multi-family—a recent source of strength—dropped 19 percent.) ■



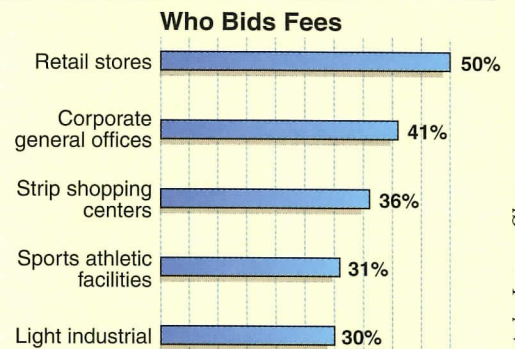
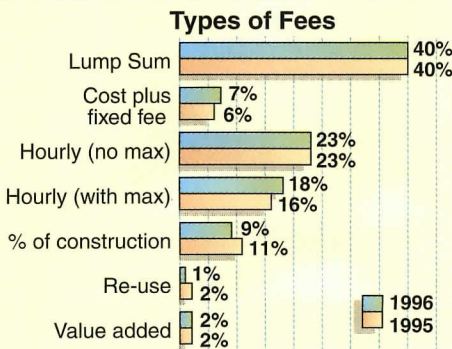
Competitive PM compensation

Salaries of architect project managers are competitive with those offered project managers in similar construction-related capacities, according to a recent survey by the Project Management Institute. The survey looked at a wide variety of project-management professionals, and found those in the energy, food, and economics/finance categories were compensated best, with median salaries near \$90,000. The full survey (\$129 non-members) is available from PMI at 601/734-3330, 610/734-3266 (fax). ■



Fees improved; fee-bidding down

This year's Design Services Fee Survey showed improved fees in those building types where activity is increasing. Respondents said competing for projects primarily on price waned slightly, suggesting to PSMJ that clients may be unhappy with results. The types of clients who most often bid fees are shown far right. "Value added" on near right chart refers to fee incentives; "re-use" to payment for designs used more than once. The survey (\$195) is available from PSMJ Resources, Newton, Mass. 617/965-0055. ■



Source: Practice Management Associates

Charts by Leannor Glynn

The Profession This Month

- Storm- and Crime-Resistant Glazing 34**
- Wood Details of Patkau Architects 40**
- Software Reviews 51**
- New Engineered-Wood Products 54**

Short Takes

- ◆ **Three regions to share highest housing growth:** National Association of Homebuilders economist David Seiders expects a slippage in housing starts in 1996 of about 2 percent, but the Pacific states, the West North Central, and the Northeast regions should experience increases in starts of up to 12 percent.
- ◆ **Downtown office markets improve:** According to a survey by real-estate services firm Cushman & Wakefield, strong leasing

activity occurred in many downtowns in spite of highly publicized corporate downsizings. Midtown Manhattan, Boston, Chicago, and San Francisco were strong; weakness was reported in Denver, downtown Manhattan, and Los Angeles.

- ◆ **Differing perspectives on space needs:** "Hoteling," appealing to companies because it allows more than one person to use an office, will expand to 22 percent of office space in five years, said designers in a recent survey. Facilities managers, however, saw hoteling using only 10 percent of space. ■

Resisting Natural And Human Forces

By Tom Harpole

Unless we plan to live in subterranean environments, architects must become more aware of various glazing options that provide life safety and property protection. The threats are myriad, including hurricanes and terrorism. There is no truly unbreakable glazing, and building codes generally don't call for assemblies to deter bombs, bullets, and burglars. Still, there are a number of glazing products that can protect buildings from threats ranging from small-time "smash-and-grab" thieves to bomb blasts.

The increase in random violence, crimes against property, and terrorism, as well as the enormous damages from recent hurricanes, have prompted research in protective glazing—glass that fractures but continues to safeguard the people and property behind it. Researchers have developed affordable configurations that continue to provide a barrier even after the glass has structurally failed.

The benchmark to which other products should be compared is laminated glass. Standard laminated glass consists of two or more plies of glass, bonded by PVB (polyvinyl butyral), the plastic interlayer used in car windshields. Laminated security-glass products can be made with any type of glass: annealed (plain plate glass); heat-strengthened (a hardened glass with more tensile strength); or fully tempered glass (which breaks into small rounded pieces rather than shards). Laminated glass, like monolithic (single layer) glass, may be specified for virtually any application, and can meet criteria for heat transfer, visibility, esthetics, or acoustics.

Tom Harpole, based in Avon, Montana, is a widely published writer on architectural glazing, and a member of the Society of Explosives Engineers.

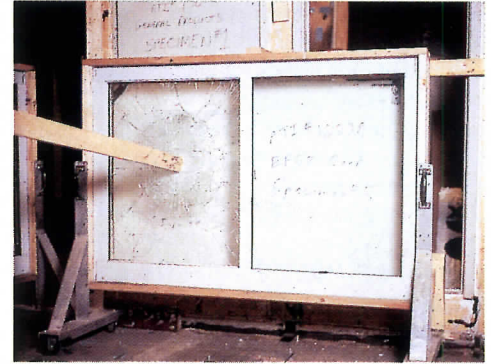
There are also many polymer-based lights that use polycarbonate layered with glass, polycarbonate only, and polycarbonate and acrylic, some using a PVB interlayer and/or polyethylene, polyurethane, and polyvinyl films. Various combinations of these materials have impact resistance to physical assault and a range of weapons. But all these security glazing options share one thing: their post-breakage performance. They may be fractured by various assaults or storm damage, but all can maintain building-envelope integrity after breaking.

Theft-deterrent glazing

Burglars use a variety of ways to breach glazing, from quiet cutting to noisy breakage with heavy tools. "Aggressors seem to have boundless energy and creativity," Ron Massa, of the Lorrion Corporation, security consultants based in Burlington, Mass., explains. "But they know that as they work, other security systems are sensing and responding to their attempts." A reasonable risk, according to Massa, would be a one-shot attack with a brick or rock, then reaching through the breached glass and escaping.

Short of massive constructions of monolithic glass, resisting such attacks requires laminated glazings. There are laminated polycarbonates with various plastic coatings and glass layers that will certainly resist forced-entry attempts, but when cost and long-term life are considered, and guns aren't a factor, polycarbonates are often more expensive than a nominal 1/4-in. laminated glazing with PVB interlayer. Assemblies that have passed the ASTM F1233 forced-entry test are worth considering. The test procedure includes multiple blows with blunt tools including sledge hammer, shop hammer, ram, and ball-peen hammer. The sharp tools used in F1233 include a wood-splitting maul, fireman's axe, chisel, and ripping bar.

ASTM F1233 is currently used as the industry standard, according to Valerie Block, a technical consultant to the Glass Association of North America, but many manufacturers refer to HPW-TP-0100, a test widely used in the 1980s developed by H.P. White Laboratory, Street, Md. These forced-entry tests enabled architects and specifiers to compare all-glass laminates with polycarbonate lami-



An aluminum-framed window assembly glazed with laminated glass undergoing the Metro Dade missile-impact test procedure.

nates and glass-clad polycarbonates. ASTM tests conducted at the H.P. White laboratories on how glazings resist main-force assaults prove that laminated glazing constructions are remarkably resilient. Perhaps the most interesting findings were in the area of forced-entry or main-force attack.

Massa explains, "We all think of glass as fragile, but laminated security glass is one of the toughest building materials available." Indeed, it is somewhat incongruous to watch an 8-in.-thick concrete block wall breached in less than 10 blows with a sledge hammer, while on a nearby test frame, a 1/2-in. laminated-glass light resists dozens of identical blows. H.P. White technicians conduct the forced-entry tests according to the ASTM F1233-89 Standard Test Sequence. Specimens are subjected to both blunt- and sharp-impact weapons as well as thermal stress and chemical deterioration weapons. In general, tests show that heat-strengthened laminated glass is superior to annealed or fully tempered laminated glass; several plies of thinner glass are superior to fewer plies of thicker glass; and thicker interlayers are more resistant to main-force attacks than thinner interlayers.

ASTM attack sequences may not reflect the reality of most break-in attempts. It takes at least one minute of hard loud effort to achieve a smash and grab through a 1/4-in. laminated-glass light. Since targets of opportunity are the stock-in-trade of burglars, Massa feels that most architectural applications would not require more robust assemblies.



Continuing Education

This article qualifies for AIA continuing education credit. For instructions, turn to page 135. AIA members should fill

out the self-report form in this issue and send it in to earn two AIA Learning Units.

Tested glazing options are increasingly available when clients seek protection from break-ins, wind-driven debris—even terrorist bombs.

High-wind resistance

When wind-borne missiles break traditional window glass, water pours in and damages building interiors and contents. Worse still, the sudden over-pressurization of the building interior may contribute to failure of roofing components, which can destroy the entire structure. Hurricane Andrew, at its peak, racked up damages at the rate of \$3.3 million *per second*; insured property damages in Florida totaled \$16 billion. Insurers are acutely aware that these events may occur anywhere from Brownsville, Texas to the Maine coast.

The Insurance Institute for Property Loss Reduction (IIPLR) reported that the average insurance payment to individual homeowners was 40 percent greater when the building envelope was breached. Newly enacted Florida statutes allow insurance companies to increase the deductible to 15 percent of the appraised property value if windows and doors are not protected to levels prescribed in Dade County/Miami area building codes. "It could get to the point that whether missile-impact resistant glazing is mandated by local codes or not, it will have to be used to qualify for insurance," says Paul Beers who, as a glazing consultant in south Florida, has tracked the building-code changes.

Historically, shutters have been used to protect openings from high winds. Shutters require building occupants to deploy them, which often doesn't happen. According to an IIPLR, survey, less than half of the Miami-area commercial and residential buildings had shutters when Andrew made landfall; of those that had shutters, less than half were actually used.

In Andrew's aftermath, the construction industry, insurers, and the public recognized the need to upgrade building design. Architects designing hurricane-resistant windows should look at research done by independent laboratories investigating window types and construction. Such studies show that the enormous damages inflicted by hurricane-force winds can be lessened. Three south Florida counties—Dade, Broward, and Palm Beach—have adopted building-code changes that address windborne debris. To be approved, windows or shutters must pass a

test regime designed to replicate the wind-borne debris impacts and lateral loads experienced in hurricanes. The tests separate the materials into applications above or below 30 ft. For the window or shutter applications below 30 ft, large missiles are shot at specimens at 34 miles per hour, once in the center and again within six inches of a corner. If the specimen survives without a penetration, it is subjected to 9,000 pressure/suction cycles, which replicate wind turbulence during a five-hour storm. For applications that are more than 30 ft above ground, 10 two-gram missiles (meant to replicate the average weight of roof gravels) are shot at the specimen at 50 miles per hour and then the same pressure/suction cycles are applied. Windows are tested as a complete assembly of glazing and frame.

"We've reached a sort of critical mass with respect to gaining acceptance for engineering building envelopes in high winds," says Dr. Joe Minor, Professor of Civil Engineering at the University of Missouri at Rolla, one of the world's foremost glass researchers. He has studied glass under blast and ballistic attack, during seismic events and hurricanes, and he was instrumental in writing the missile-impact standard for south Florida [SSTD 12-94]. "Adopting new building codes has been a struggle, but now that more than 300 products have passed the Dade County missile-impact test, there's a general level of acceptance and availability of products that help move this change along."

Among products tested and approved by the Dade County Office of Code Compliance are more than 140 shutter panels made with plywood, aluminum, steel, and extruded polycarbonate. Hinged, folding, rolling, and accordion shutter assemblies have passed. Window types and constructions that have passed include single- and double-hung units, casements, and sliding and swinging designs, all of which also comply with egress codes. Vinu Abraham, director of the Hurricane Test Lab in Riviera Beach, Fla., one of more than a dozen labs that are currently testing products for missile impact, says that the common denominator for glazing that has passed both the large and small missile tests is a light laminated with a 0.09-in.-thick PVB interlayer.

Although the Southern Building Code Congress chose not to adopt the South Florida building code standard described above, they have directed their wind-load committee to research a tiered response, using realistic wind-speed zones and missile-impact loads and angles that reflect the actual risk incurred by most of its member jurisdictions.

As the SBCCI code-change process plays out in the fall of 1996, SSTD 12-94 will have been in place for two years. Standard practices are evolving, and professionals can be at risk if they don't keep up. Following Hurricane Andrew, Minor testified several times as an expert witness in litigation on this point. "The issue was the degree to which the architect should have known how to design against wind-borne debris. There was very little credible, published information at that time. Now there is adequate information on missile impact-resistant glazing," Minor maintains. "More than a dozen independent laboratories are testing materials that architects can easily learn about. Just be sure that the claims made by manufacturers are based on recognized standards such as SSTD 12-94."

Ballistic-resistant glazing

Armed robberies have become so common that employees of fast-food outlets and 24-hour convenience stores and gas stations are 10 times more likely to be killed at work than any other workers except for cab drivers, security guards, and police. To protect employees, who must see and be seen, many of these businesses rely on bullet-resistant systems that have been tested to the Underwriter's Laboratories (UL) rating systems for glazing. The UL ratings have two levels that test resistance to weapons less powerful than a .44 magnum. Given the proliferation of .44 magnum and more powerful weapons, however, security specialists suggest that designs for ballistic threats start at the UL 752 level 3 rating. The nominal savings for resisting only lower-caliber ballistics aren't worth the risk, they say.

Ballistic protection with polycarbonate glazing has become an accepted, well-researched standard practice. For the architect facing a glazing design that must deter ballistic threat, a consultation with a member of the American Society for Industrial Secu-

rity (ASIS) may help define a suitable approach. In addition to ASTM F1233-92 and UL 752 test standards and protocols for bullet-resistant glazing, U.S. testing guidelines include U.S. Department of State standard SD-STD-01.01 and National Institute of Justice NIJ-STD-0108.01. Some of the independent laboratories that can perform tests to these standards include the U. L., of Elk Grove, Ill., H.P. White Laboratories of Street, Md., and two in California: Warnock-Hersey, of Antioch, and the Naval Civil Engineering Laboratory, Port Hueneme.

Ballistic-resistant glazing can be broken down into three categories based on the composition and attributes of the materials used:

- ◆ *Laminated polycarbonates*, with polyurethane interlayers, offer mar-resistance and no-spall ballistic protection. (Spall are particles that fly from the protected side of a security-glazing unit under attack.)

- ◆ *Glass-clad polycarbonates* combine the heat-, chemical-, and abrasion-resistance of glass with the impact-resistance of polycarbonate; various configurations can provide escalating levels of UL 752 protection.

- ◆ *All-glass security glazing* uses multiple layers of glass with polyvinyl butyral (PVB) interlayers. All-glass products provide affordable security for larger applications, such as storefronts and commercial buildings, and residences that may experience varying levels of ballistic attack, as well as main-force assaults such as smash-and-grab burglaries and vandalism.

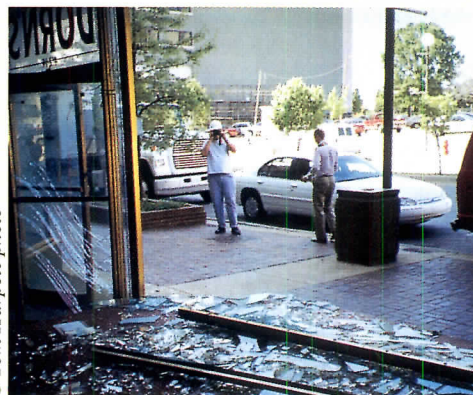
As with laminated glass, polycarbonate laminates can be configured for thermal performance as well as most esthetic considerations such as tinting or reflectivity. There are incompatibilities between plastic security glazing and organic solvents, ammonia, acids, and some glazing sealants. Prolonged exposure to water can cause delamination and other damage to polycarbonates, and routine washing must be done carefully and without squeegees. There are so many permutations of these products, and so many site-specific applications, that architects are urged to consult with security or glazing experts to design defensive-glazing lights that meet the anticipated threat level as well as other code requirements of particular jobs.

Bomb resistance

A threat that poses widespread glass breakage is, of course, a deliberate bombing, which involves not only the target but nearby structures. The 1995 bombing of Oklahoma City's Murrah Federal Building, in addition to killing 169 persons, injured hundreds of



Blast test at the Glass Research and Testing Laboratory, Texas Tech University.



© Tom Harpole photo

The Oklahoma City bomb blast showed the different behavior of annealed storefront glass and laminated glass (held in frame).

people in untargeted buildings up to two miles away. Some 500 victims from 300 buildings were treated for lacerations and other soft-tissue injuries from flying glass. That horrific fact has raised awareness of the need for research to develop glazing that doesn't become part of a terrorist's weaponry.

Professor H. Scott Norville, Director of the Glass Research and Testing Laboratory at Texas Tech University, Lubbock, has tested more than 300 window configurations in the Texas Tech "blast-research arena" since 1990. Norville surveyed the blast site in Oklahoma City for four days immediately after the bombing. He noted that within a 700-ft radius

of the Murrah building, every conventional window configuration failed except for laminated glazing—behavior that is consistent with his test-blast observations. The author accompanied Norville in his survey, and subsequently extrapolated the effects of the Murrah bomb, a device relatively easy to conceal and deliver, to more densely developed and populated urban areas. The author measured specific downtown locales to arrive at a statistical abstract that would illustrate potential damages. The analysis assumes that all of the standard window glass within 700 ft of a hypothetical ground zero would be broken by such blast overpressures and that approximately 60 percent of the glass shards would be thrown into buildings, while the rest would fall on the streets, facts of glass breakage consistent with laboratory research and field observations. Population densities are based on average occupancy in downtown high rises of one person per 250 sq ft.

The statistical abstract it reveals is as plausible as it is appalling, according to Norville. For example, a Murrah building-sized bomb detonated in front of Manhattan's Radio City Music Hall would break and project approximately 1,278,900 sq ft of glass into and around six buildings occupied by more than 70,000 people. Roughly 511,000 sq ft of glass, weighing more than 2.8 million pounds, would rain down onto streets and sidewalks.

Lorron's Massa notes that bomb damage is compounded by the fact that broken glass falls for hours. "Every time the wind changes more shards fall, which seriously increases the risk to rescue personnel," Massa says. "Targets of symbolic significance, and the buildings near them, should be designed to mitigate the effects of blast overpressures."

Following the Murrah bombing, the Department of Justice published its "Vulnerability Assessment of Federal Buildings." The document contained as its sole specific recommendation for defensive or protective glazing: "install Mylar film on all exterior windows." That conclusion was the subject of much dispute, with objections coming from some glass researchers, manufacturers who had tested their products against blast overpressures, and security consultants such as Massa. Norman J. Glover, chairman and

program manager for the City University of New York, (CUNY) John Jay Criminal Justice Center, invited these critics as well as other glass researchers, engineers, architects, and industry representatives to a conference on protective glazing. "There is a large body of controversy as to the effectiveness of Mylar-type [polyethylene terephthalate] film for this purpose," Glover stated in his invitation.

At the conference, Lynn Beason, an assistant professor at Texas A&M, College Station, and a spokesperson for the International Window Film Association (IWFA), a coalition of window-film manufacturers, stated, "The manufacturers and the people that supply this product are well aware of problems that they have had with image in the past, and they're aware that the amount of technical information they have to offer is very limited." Beason mentioned that the IWFA would like to "move away from anecdotal information whenever we're talking about window film." He noted that the laminated glass industry has generated a "massive amount of research literature since the early 1980s," while the five-year-old IWFA has yet to publish the results of similar testing. He felt that applied window film does not reduce the strength of glass below acceptable design levels, although he had not yet conducted tests.

In his concluding remarks to the CUNY conference, Norville stated: "In a rational philosophy of blast-resistant design, the designer concedes that the glass will fracture if an explosion occurs. He or she then relies on adequate frame design and the post-breakage behavior of the glazing material to protect the building, its occupants, and its contents." He feels that this requires the use of glazing-infill materials such as PVB in laminated glass.

Ed Conrath, a professional engineer with the Army Corps of Engineers' Protective Design Center in Omaha, also surveyed the scene at Oklahoma and arrived at somewhat different conclusions than Norville. "If you are working with budget constraints, but want a measure of lower-level protection for the short term, applying window film may be better than doing nothing." Conrath adds, "If

I'm planning a new building I'm going to specify laminated glass every time. Once you've installed it, it's there until it breaks. With the films, the useful life is short. Life-cycle costs should be looked at, but we all have budgets to live with. Applied films can offer a limited level of protection when curtains are used and furniture is placed away from windows."

Window films may have their place, but both Norville and Massa are troubled by the fact that window films seem to be widely confused with laminated glass. Norville maintains that not all window films are manufactured from identical polymer bases, nor do the manufacturing processes impart equal levels of strength to the varying products. Manufacturers may not be able to show independent tests verifying the strength of adhesives used with films, and the effects of aging. "If films are tested to ASTM standards and procedures in the future, it would be advisable for the specifier to ensure that the specific window coating was in fact tested," Norville explains.

Match windows to structural strength

A critical consideration in retrofitting buildings to withstand explosions is planning window upgrades where protection is matched to the structure's ability to deflect dynamic loads. Steve Scoggins explains, "There is no point in armoring windows beyond the building's capacity to withstand momentary overpressures or explosions. Most conventional buildings begin to suffer structural failure in the three-to-six psi range." Scoggins is a high-rise construction engineer with Norment Industries, one of the world's largest manufacturers of bullet, blast, and attack-resistant products. "In new construction you can pour concrete that will take 10 to 60 psi and you can design window systems that will handle those loads, but there is no reason to spend money on doors and windows that can exceed the loads an existing structure can take." Scoggins recommends that a structural engineer be consulted to verify the building's inherent strength under dynamic loads whenever a retrofit is planned.

Conventional glazing frames are designed only to withstand wind and snow loads. Most

of the test protocols call for edges of test specimens to have one in. of glass-edge bite (the glass dimension held by the frame), or be wet glazed with structural silicone. Security glazing absorbs some of the energy in an attack, but also transfers energy to the frame, which then passes it through the fasteners to the building. No component in this system can be overlooked. Theoretical analysis of the dynamic response of glass and frame systems are difficult, and custom frames are expensive, so to achieve the most affordable effective system, architects should consult glass makers and window manufacturers, as well as glazing consultants.

Evaluating true costs

Any analysis of post-breakage performance in glazing presumes the cost of replacement. Justifying glazing capable of remaining in place after breakage should include consideration of actual losses as well as losses associated with a building that is made uninhabitable because its envelope has been breached. "The factor that made the World Trade Center bombing disastrously expensive was the lost use of hundreds of office spaces for months afterward," Lorrón's Massa recalls.

The specific requirements of a given application will narrow the field from which effective options can be compared. As a rule of thumb for uninstalled glass, laminated glass costs roughly 30 percent more than tempered glass of the same dimensions.

It is also worth noting that window-glass prices rise exponentially with the size of the light. The larger the light, the more difficult it is to manufacture flawless glazing. In general, laminated glass is less expensive than polycarbonate glazing. In larger, exposed applications such as curtain walls and storefronts, laminated glass gives a longer useful life since it doesn't exhibit the ultraviolet degradation and susceptibility to scratching that polycarbonates do. Glass-clad polycarbonate constructions avoid ultraviolet problems and scratching, but their price per sq ft tends to preclude their use in large applications intended to mitigate blast overpressures. Polycarbonate glazing, however, provides many well-researched options against ballistic attacks. ■

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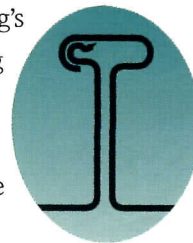
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Structure Both Concealed And Revealed

By Sheri Olson

The work of Patkau Architects doesn't draw its expressive power just from inventive form-making. The Vancouver, B.C.-based firm uses building materials—but especially wood—in an esthetic that's structurally expressive, but also intentionally (sometimes almost untidily) accommodating of each project's diverse needs, whether that be circulation or the need to draw light in.

The materials may be ordinary, but the geometries and details of the firm's work are not. It means challenging conventional construction practices, which is sometimes difficult in small private projects, often highly frustrating in public work. Three recent projects—a branch library, a public school, and a school for a native community—show how the architect coaxes its challenging designs to completion.

When construction is exposed that is usually concealed, the architect must help the builder realize the higher level of quality desired. "It's not typical for rough framers to be doing finish work," acknowledges John Patkau. Sometimes, as with the Newton Library, built by Farmer Construction, Victoria, the quality of construction is very high as a result of a good contractor. "But it can't be counted on with publicly bid projects," explains Patkau. Instead, high-effort details are limited, and the folded and creased geometries—conventionally clad—carry the day. "If we don't get a high level of construction, it won't compromise the project," Patkau says.

In at least one project, the architect and contractor had to negotiate an unconventional construction sequence to accommodate the details. Exposing underlying systems also requires close coordination with consultants. "It is more work for us because we must organize the framing very carefully," explains C.Y. Loh, the structural engineer on all three projects. His Vancouver firm has frequently collaborated with Patkau Architects over the last 15 years. To communicate the often-complex geometry of the structure, the engineers and architects study projects together in model form. Viewing the framing

Sheri Olson is an architect, teacher, and writer based in New York City.

in three dimensions also proves useful in visualizing the structural forces applied.

The architects haven't had the advantage of developing a similar long-term relationship with a contractor, due to the projects' varied locations and the requirement to bid public projects. "This type of work can be difficult to begin with, but working on public projects makes it even more difficult," says Patkau. On the other hand, he continues, "We count on the bidding process to find a contractor who really wants to take on the project."

Still, though Patkau doesn't speak of it, getting the firm's projects completed with relatively little compromise appears to require unusual tenacity and flexibility. One example: an estimate by the construction manager for the Seabird Island school (page 44), based on 75-percent-complete construction drawings, came in much higher than expected. The architects made \$500,000 in deletions from the project. The native tribe which built the school itself, was able to bring each phase of construction in under what had been estimated, and the deletions were reinstated. "The estimate ended up reflecting conservatism rather than the realities of the project," explains Patkau.

Hierarchy of materials

Part of the expressiveness of traditional Pacific Northwest architecture is the use of wood for primary structural components, non-bearing partitions, and finishes. "Wood has the distinction and virtue of being a very flexible material," says Patkau. "Complex geometric configurations that may be difficult or costly when made of other materials are not as daunting in wood."

The Patkaus take cues from Pacific Northwest vernacular, but they make hierarchical distinctions in the way materials are used: the "primary" heavy-timber structure at Seabird, versus the "secondary" wrapping of cedar-shingle roofing, for example. There is even a "tertiary" role that gypsum-board cladding plays in more than one project. It's amorphous and doesn't have an obvious structural role, so it's treated pragmatically (to diffuse light, to conceal structural equipment) and as a visual counterpoint to the repetitive bays and grids of timber framing and stud walls. ■

© James Dow



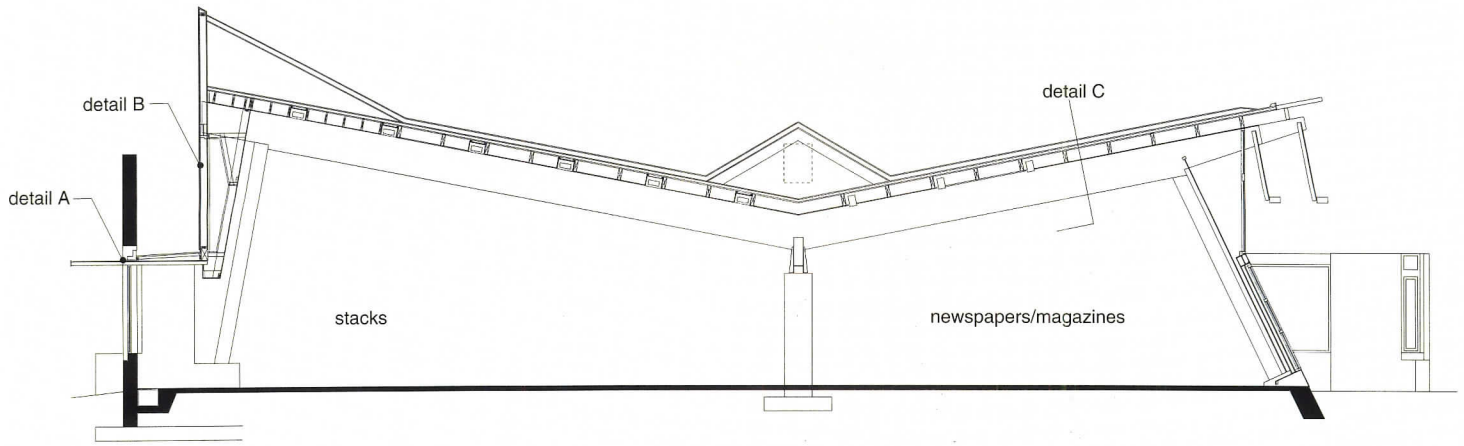
Newton Library Surrey, B.C.

In this 16,000-sq-ft branch library, the exposed, glulam heavy-timber structure appears to emerge from the stucco-clad volumetric forms of the walls. The contrast recognizes both the limitations of materials and the budget of this project, in a Vancouver suburb [RECORD, June 1995, pages 94-95].

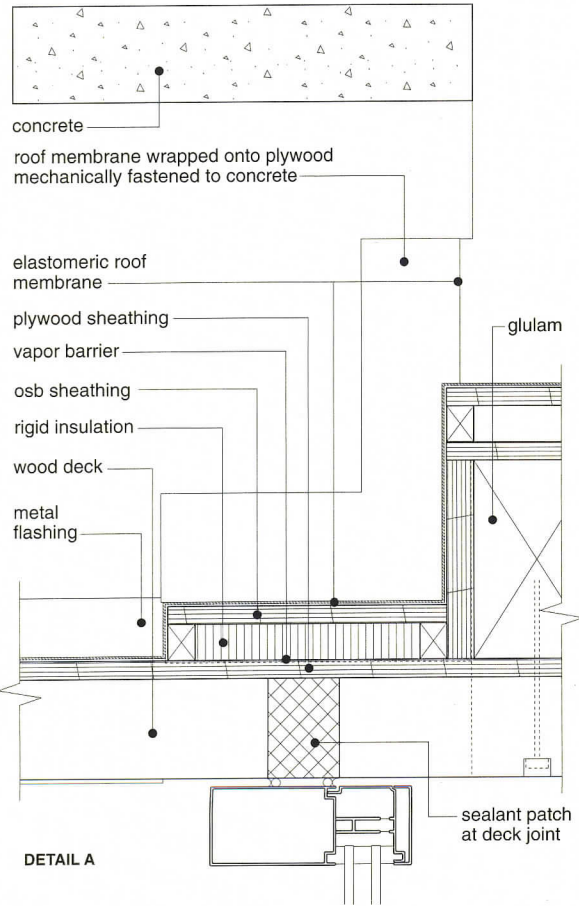
The timber framing's regular bay spacing creates an ordered sheltering armature—heaviest at the center supports, tapering to a delicate thinness at overhangs—that visually organizes the building. The non-bearing stud walls, clad in acrylic-based stucco, frame the recesses and extensions in plan.

Inside, areas of light framing clad by drywall inexpensively conceal mechanical and electrical systems and reflect outside light deeper into the space (detail, opposite far right). Esthetically, the architects see these elements as amorphous "horns" and "droopy bits" counterpointing the visual order of the wood framing. Wherever the ceiling assembly changes from clad to exposed structure, the drywall "skin" is feathered out to its own thickness, giving way to exposed wood decking (detail C). Load-bearing walls and columns are exposed, poured-in-place concrete. Where the roof assembly appears to float through an opening in one concrete wall (detail A), the wood deck is hung from a glulam concealed behind the concrete wall. Membrane roofing rolls up the vertical wall surface to become flashing. S.O.

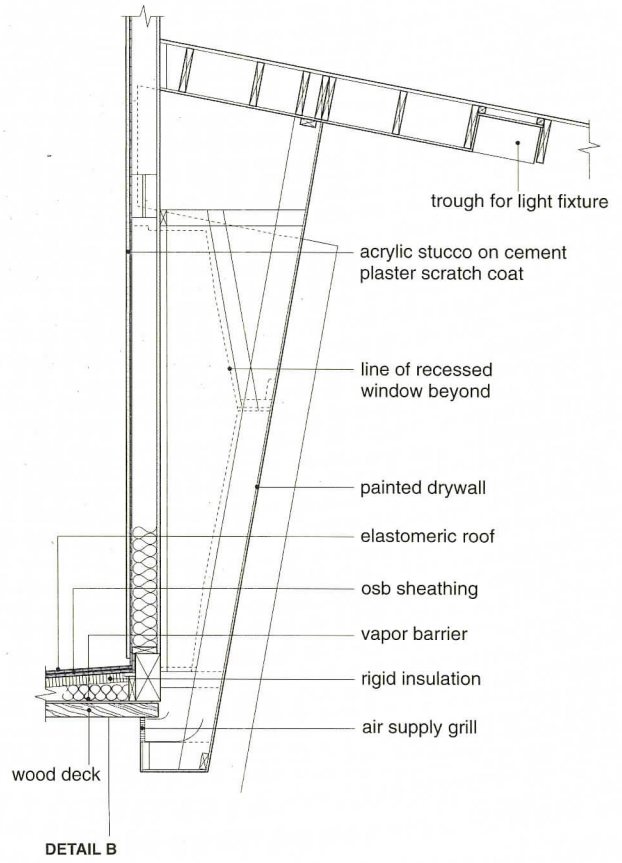
Wood's versatility helps one architect realize projects with both a rich vocabulary of materials and unusual geometric complexity.



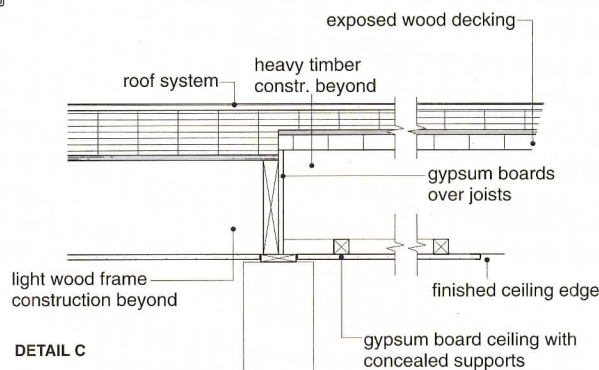
SECTION LOOKING WEST



DETAIL A



DETAIL B



DETAIL C

Strawberry Vale School Victoria, B.C.

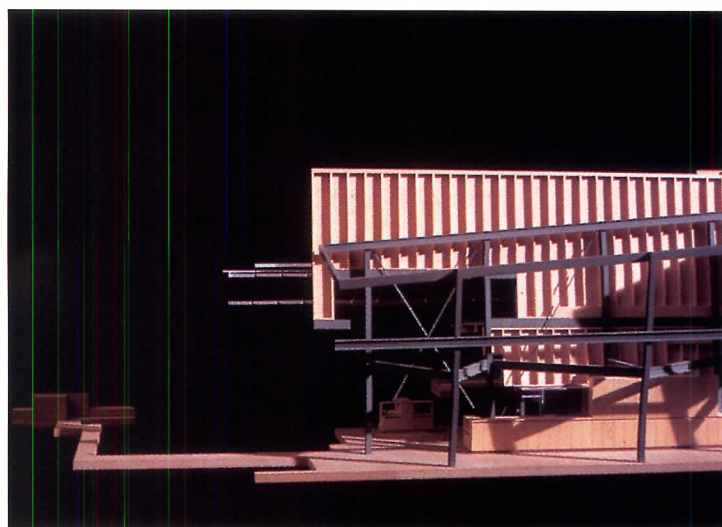
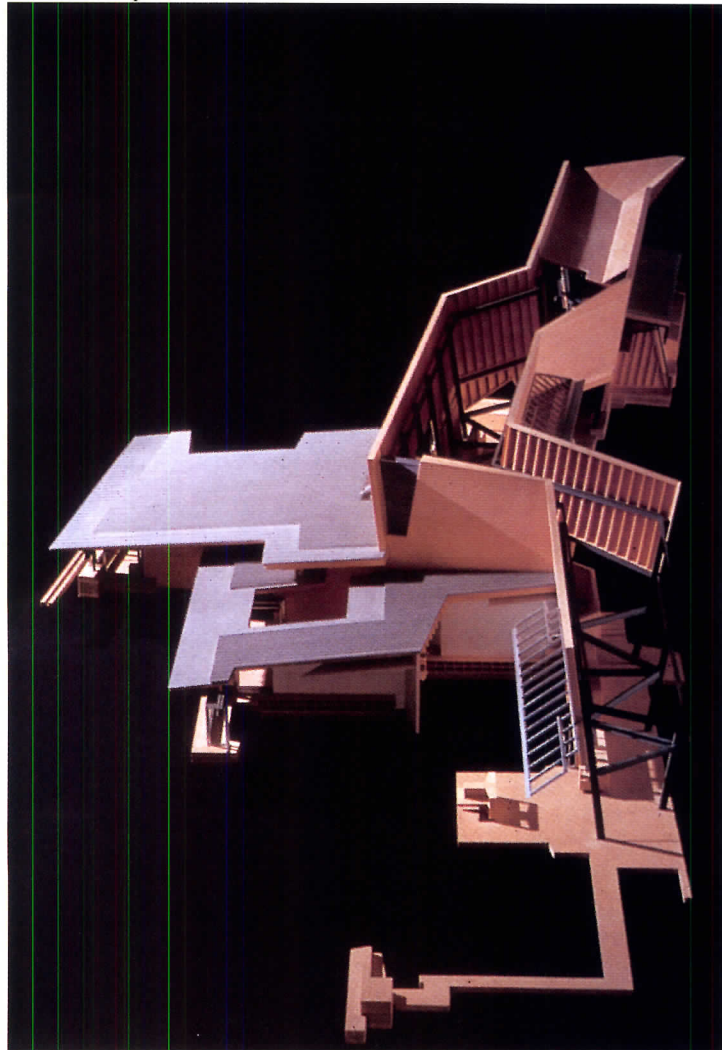
Patkau Architects saw in this school, which will open later this year, a chance to impart to its 400 students some understanding of how buildings are made. The design of the 34,500-sq-ft project expresses its conventional construction methods. What's unique is the selective way the building technology is displayed.

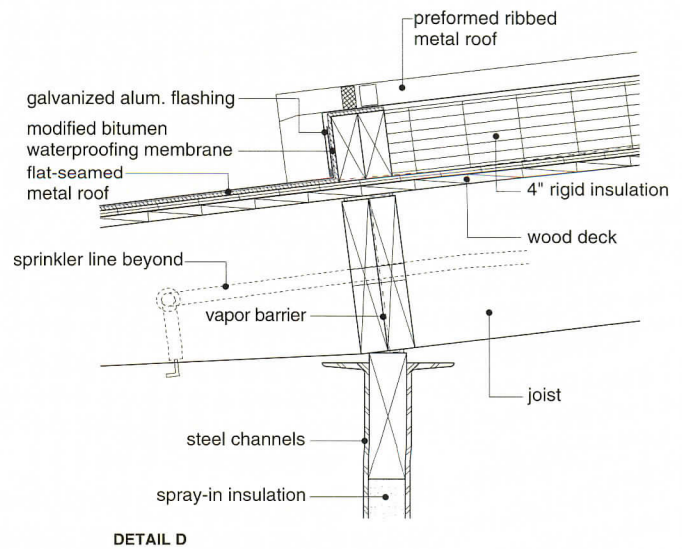
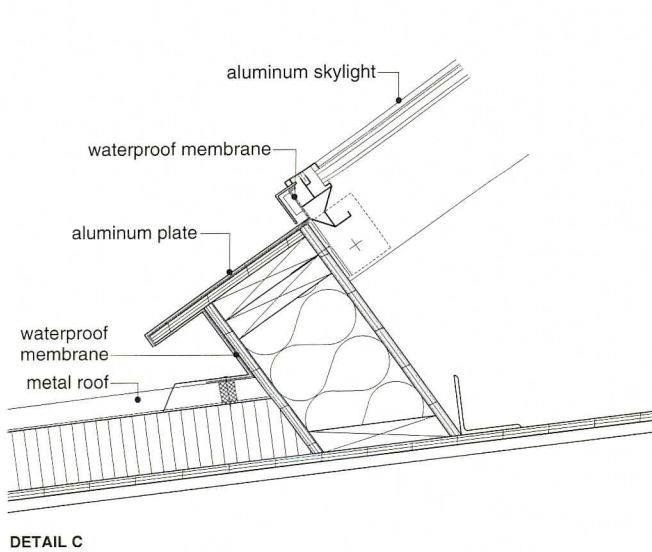
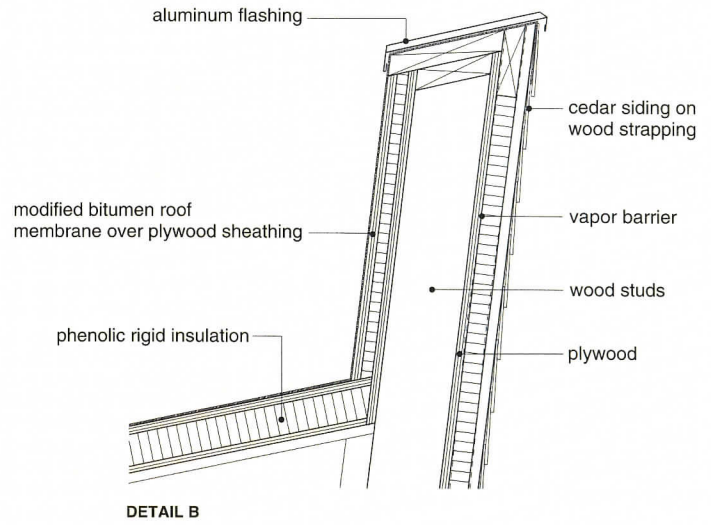
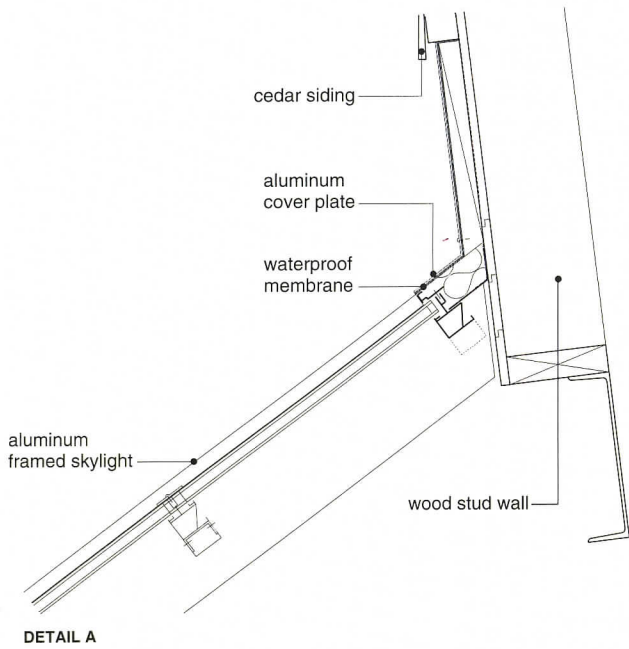
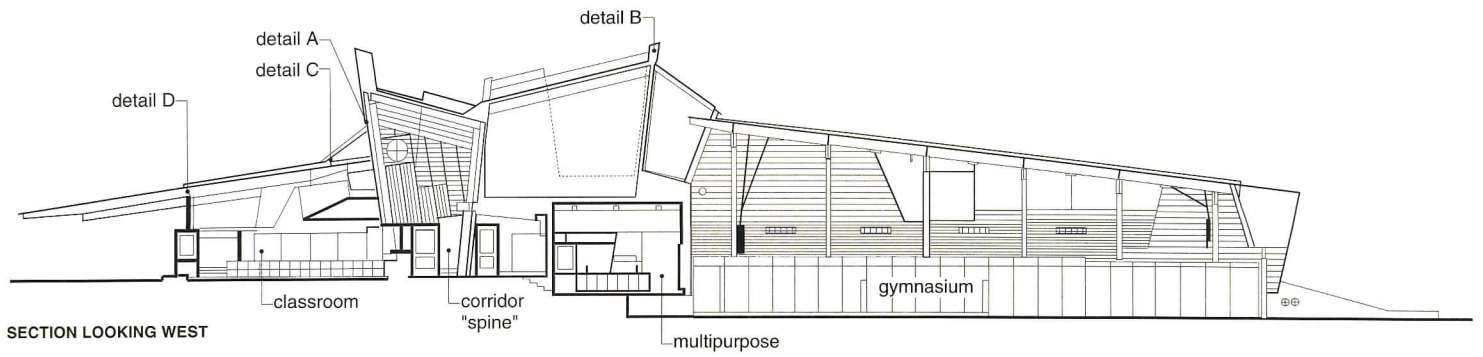
"Materials are carefully chosen to achieve a clearly articulated objective," according to Patkau. There is an internal steel frame, which is exposed. It's like a giant central truss along what the architect calls "the meandering spine," an irregularly shaped central corridor (top right). The local contractor, JCR Construction, attached wood-framed stud walls to the framework, much of it unclad (bottom right). Like the Newton Library, gypsum board is used to conceal mechanical systems and to diffuse natural light where needed. It's also intended to draw a visual distinction between exposed supporting construction, and clad "non-supporting" construction.

To get the thin, tapered roof edge desired, the Patkaus detailed a heavy, ribbed, metal-roof profile that acknowledges the thickness required for the insulation over occupied space (detail D). At the uninsulated exterior overhangs, the thickness for the insulation is dropped and the roof cladding changes to flat-seamed sheet metal. (Dry-pipe sprinklers in the exterior soffits meet code requirements for combustible construction.)

Natural lighting was important to the project, so the placement of skylights, interior finishes, and even blackboards was computer-modeled by Criterion Inc., Portland, to criteria developed by mechanical and electrical consultants D.W. Thomson, Vancouver. At the upper level of the spine, for example, where a clerestory window might have been used, a skylight was designed to drive light deeper into the space (details A and C). *S.O.*

© James Dow photos





Seabird Island School Agassiz, B.C.

As part of a program developed by the Canadian government's Indian and Northern Affairs department to support native communities, the Salish tribe built the Seabird Island School, completed in 1991.

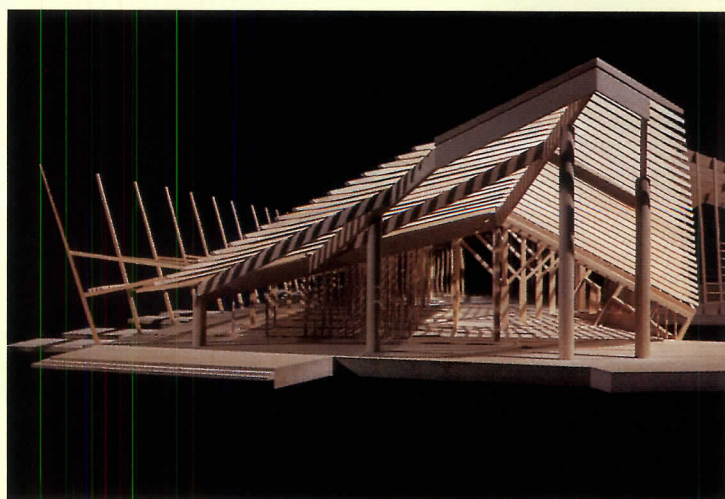
The irregular shape of the school in part evokes native culture (it's been compared to a fish or bird) and in part responds to conditions of the site. On the north side, the folded roof wraps the framing and finishes low to the ground, blocking extreme winter winds. On the south, the roof visually peels back (top right) exposing the struts, beams, and trellises that animate the side bounding the existing community. The spar pole detail (opposite middle right) is in the tradition of totems and porches of natives of the Pacific Northwest.

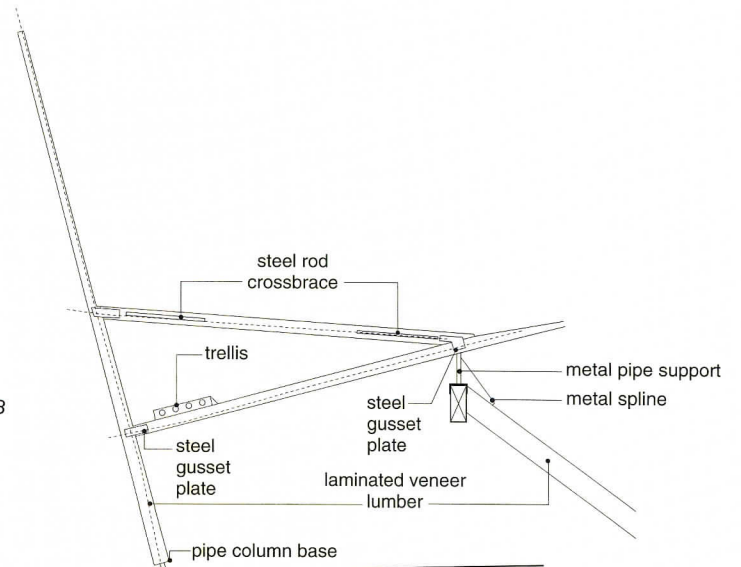
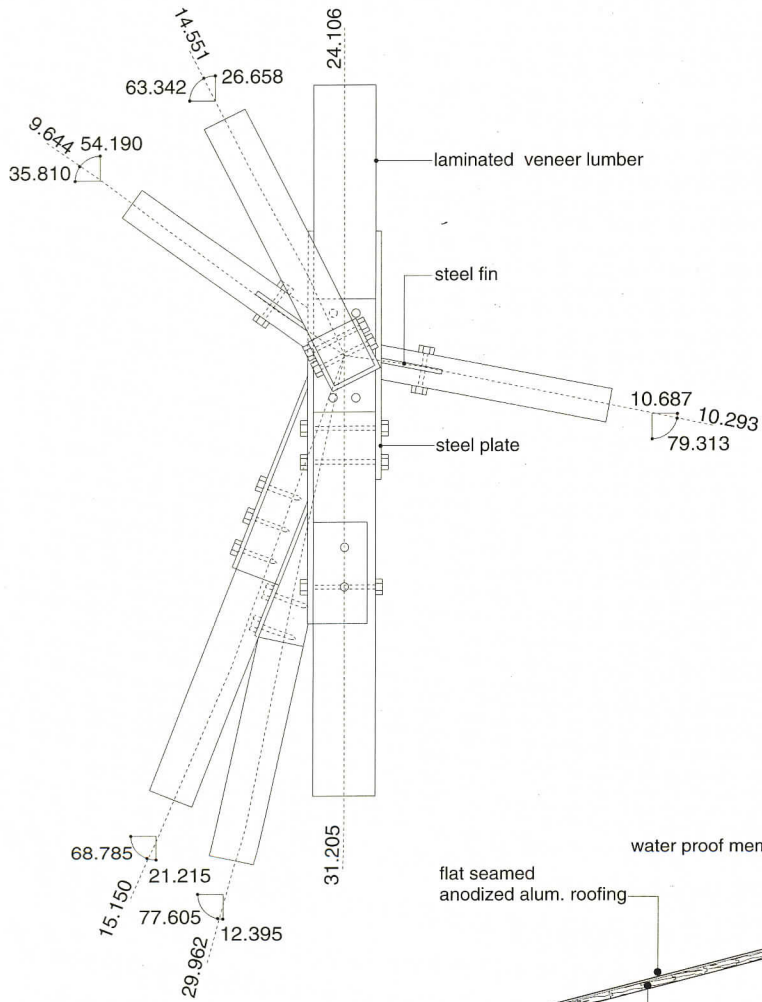
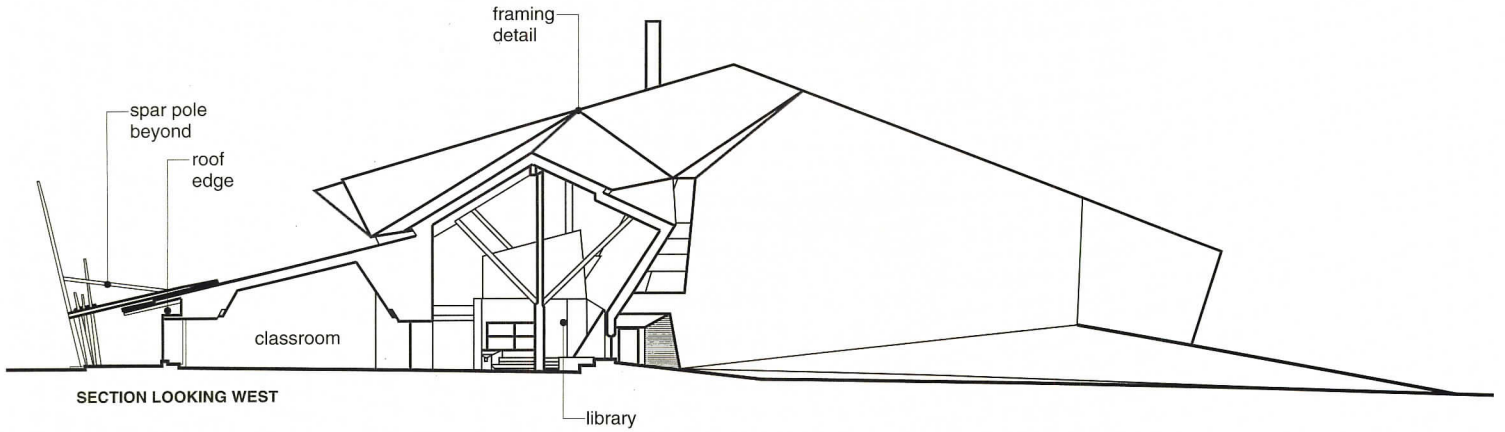
With the supervision of construction manager Newhaven Projects, the tribe did the concrete work, structural framing, interior partitions, and installed the vapor barriers and insulation. "The band probably didn't realize how difficult the project was," says Patkau, "but fortunately they were up to the challenge." The structural system for the 23,500-sq-ft school uses engineered heavy timbers of laminated-veneer lumber (LVL), which have higher structural capacity than similar glued-laminated members.

To help visualize some of the more complex three-dimensional conditions of the building, the architects made a detailed framing model to supplement the construction documents (bottom right). After construction was completed, the architects found out that there were occasions when information was scaled directly from the model. The tribe experienced few difficulties with the project, according to Patkau, and he is pleased with the workmanship.

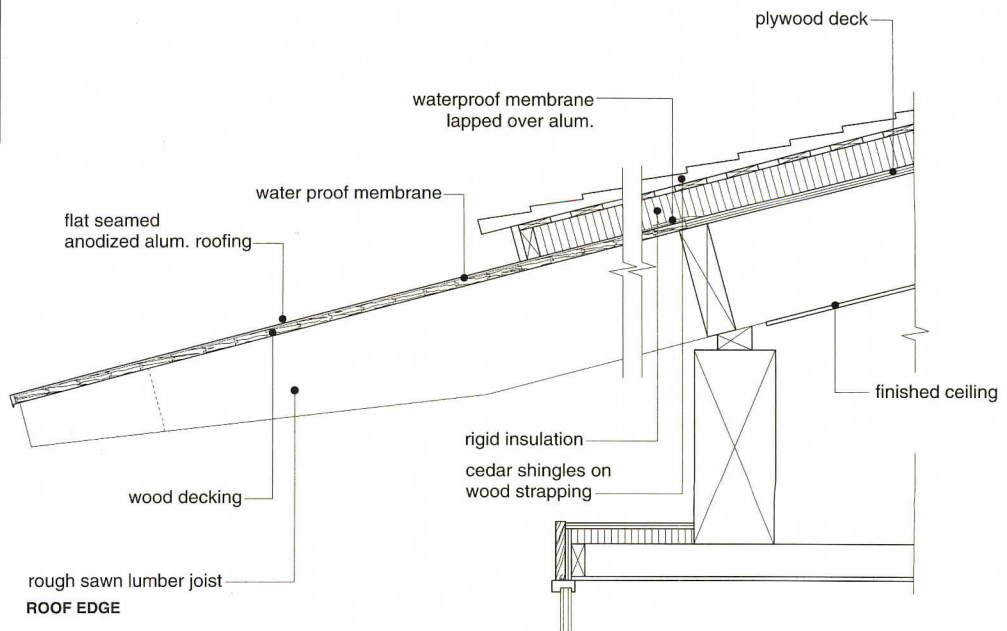
The roof assembly locates a combined air/vapor barrier at the dewpoint of the assembly, with insulation placed on top of the framing members. Where insulated meets uninsulated roof construction, the architect added a step in the roof, emphasizing the taper of the eave (bottom detail). *S.O.*

© James Dow photos





SPAR POLE DETAIL



ROOF EDGE

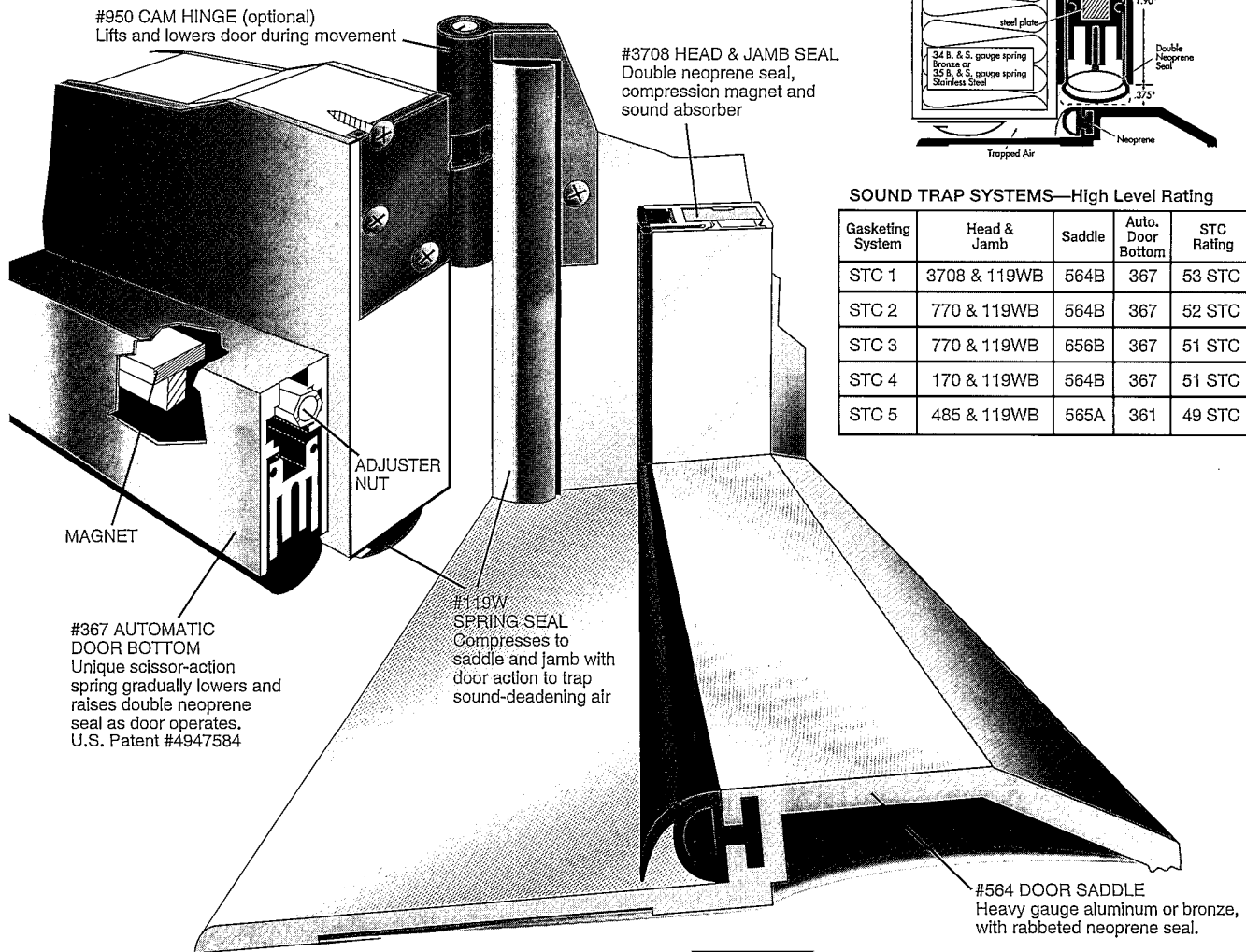
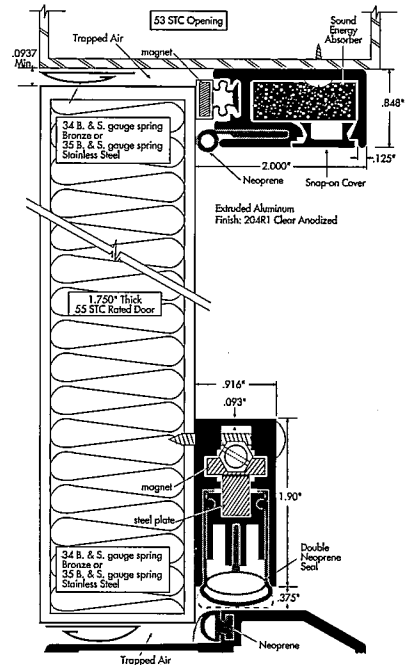
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STC 3	770 & 119WB	656B	367	51 STC
STC 4	170 & 119WB	564B	367	51 STC
STC 5	485 & 119WB	565A	361	49 STC

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WHEN NOTHING ELSE
IS GOOD ENOUGH
FOR LONG ENOUGH

Three for the Business

Here are three packages that help your office run more smoothly—one helps with proposals, one keeps the books, and one helps write specs.

By Steven S. Ross

Designers in all but the smallest offices are used to handing "those miserable tasks" over to subordinates. But the software for handling such tasks is getting powerful enough, and easy enough, to use that many should be thinking about reorganizing work flow.

Take *Inwork*, for instance. It generates SF254 and 255. Until a few months ago, it was available only in DOS—tough to use, when the final output was wedged tightly into those boxes in the forms. The new version does not require the skills of a word processing expert—what you see is what you get. There's also a stronger database with the project, for tracking office items that don't go into SF254 and 255.

An *Inwork* competitor, by the way (*RFP*), has also gone Windows—"what you see is what you get." *RFP* has historically had a much stronger marketing database component. We expect to review its new version in the next month or two.

QuickBooks "interviews" you about your business, on-screen, to set up your accounts. A big brother to *Quicken*, *QuickBooks*, has matured into a fairly capable full-blown accounting program for small offices.

Need spec writing? A new product, *SpecLink*, guides you better than any cut and paste system we've seen. And finding what you need takes not much more than point and click (if your projects fall neatly into the *CSI* spec system).

Inwork 4.06

Vendor: Parallel Resource, Inc., 703 East Glenn Ave., P.O. Box 2488, Auburn, Ala. 36831, 334/821-9000; fax and BBS 334/821-9700; inwork@parallelresource.com; http://www.parallelresource.com.

Equipment required:

Windows 3.1 or higher, any Windows-compatible printer, 8MB of random-access memory; DOS version requires MS-DOS or PC-DOS 6.0 or higher, PostScript printer. Large Super-VGA monitor strongly recommended for Windows version.

Cost: Professional Edition (marketing database as well as SF254/255), \$1,195; Lite Edition for Windows or Standard Edition for DOS (both SF254/255 only), \$795. Includes 90 days telephone technical support; annual contract is \$195.

Inwork (the original name, changed several years ago, was *SFX*) is a whiz at assembling Standard Forms 254 and 255 from a database of capabilities. The new "Lite" version adds Windows flexibility and on-screen formatting. The "Professional" version also has database links that partially automate various marketing chores such as assembling brochures. The system is not meant to contain a full marketing database, however. That is, you can't, for instance, easily use it to generate prospecting letters tied to specific project types.

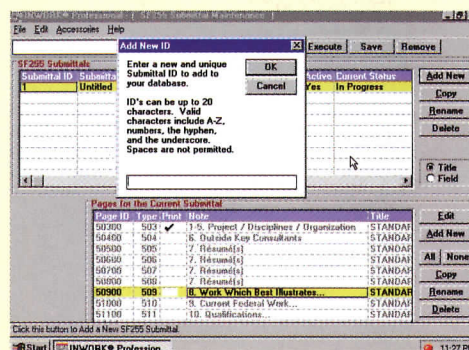
Once you've set up the system, you can insert resumes, project types, and so forth into the SF254/255 format just by clicking on a scroll box title, or by specifying what you want with a database query—all projects of a certain value or type, for instance.

The professional edition can track more data than would be required by an SF254/255. You query with SQL-like commands.

Manual: A looseleaf, tab-indexed "how-to."
Ease-of-use: Good. The biggest problem is adjusting printers, especially older ones that have a printing area barely large enough to handle the SF254/255 page size.

Error-trapping: Good. It's tough to overwrite important files, except at installation.

151 on Reader Service Card



An SF255 maintenance screen from *Inwork*, with a new submittal added to the database.

QuickBooks Pro 4.0

Vendor: Intuit, Box 3014, Menlo Park, Calif. 94026. 800/781-6999; http://www.intuit.com.

Equipment required: Computer capable of running Windows 3.1 or higher, 4MB of RAM (8MB strongly recommended), or Macintosh with 68020 or newer CPU, or Power Macintosh, System 7.0 or higher; 8MB minimum. CD-ROM with animated help files available on Windows version only. Modem for optional World Wide Web connection.

Cost: Estimated street price \$189; \$50 rebate for existing *Quicken* and *QuickBooks* users.

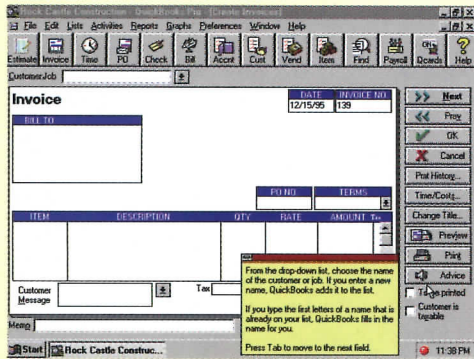
Smaller firms (roughly four principals or fewer) should take a close look at *QuickBooks Pro*, from the same folks who provide *Quicken* and *TurboTax*. The program comes with architect-specific templates to help organize your books. There are manuals and (in the CD-ROM version) on-screen tutorials. In fact, you can start by having the software itself quiz you about details of your business.

The package's biggest strength from an accounting point of view is that when it comes to revenue and expenses, its underlying database is actually double-entry. In double-entry bookkeeping, you can't cancel a posted transaction by erasing it. You must post (enter) another transaction that "reverses" the first. This allows your financial records to be fully audited.

Double-entry bookkeeping is cumbersome for the financially challenged, however. So *QuickBooks Pro* simply hides the fact that it is doing it. You use an on-screen interface that looks like you are filling in an invoice, paying a bill, and so forth.

There have been many improvements in the software since the DOS-based *QuickBooks* was reviewed by us a few years ago. But there have also been improvements in the standard *Quicken*, the Intuit package meant for individual family use. There's also an intermediate product, *QuickBooks*, that lacks some of the features of the "Pro" version.

Each product adds on to the next. The standard *Quicken*, for example, allows you to



Invoice entry screen for QuickBooks Pro.

track checking accounts and credit cards, print and write checks, output 10 business report and graph types, and do limited accounts receivable and payable (no audit trail) and expense budgeting. If you want to add payroll check writing and payroll tax accounting to Quicken, you buy a separate package, QuickPay.

QuickBooks has QuickPay built-in, along with the more robust double-entry accounts receivable and payable. QuickBooks also includes an invoicing module and the ability to send regular statements to your receivables list. There's also inventory tracking and cutting of purchasing orders, some basic job costing and budgeting and, (new with version 4.0) 80 reports, contract management and, in the CD-ROM version, the business and legal libraries.

The Pro version, which costs about \$50 more, has more job costing and budgeting features, a screen for estimates and bids, and time tracking. The Pro version can output about 90 reports.

Pro 4.0 adds quite a bit of functionality to earlier versions. The payroll module, for instance, now not only handles earnings and deductions and prints checks. Now it does forms 940 and 941, W2, W3, and 1099. You can subscribe to tax-table updates (U.S. only). Reports can be customized.

Files from the less advanced packages can be read into the more advanced ones. For Windows versions, you can even exchange data with the TurboTax, Intuit's tax package. For instance, Quicken and QuickPay files can

be read into QuickBooks and QuickBooks Pro. The conversions may not be totally automatic, due to the security features of the Pro version, however. Thus, you could be running two sets of paychecks for the same person in QuickPay—but not in QuickBooks Pro.

The initial cost is so low in part because of Intuit's volume and in part because the company hopes to sell you business forms, updates, and Internet-based banking services.

QuickBooks Pro is network-aware; more than one copy can run on a network at the same time. But only one copy can use the same data file at the same time. That is, a file being used is locked, rather than only a single record in a file. It comes with an Intuit-only version of Netscape Navigator to connect with the company's services.

Manuals: Paperback User's Guide, getting started guide, and guide to CD-ROM files. The CD-ROM-based guides, including one specific to architects, can be printed out. **Ease-of-use:** User-obsequious. The Web browser (Netscape Navigator) can't be installed alongside existing copies of Navigator. **Error-trapping:** Excellent. The biggest problems involve conversion, especially if you switch over from your current system (or no system) in mid-year.

152 on Reader Service Card

SpecLink Version 1.0

Vendor: Building Systems Design, Inc., 1175 Peachtree St., 100 Colony Square, Suite 1600, Atlanta, Ga 30361. 404/876-4700; fax 404/876-0006; 800/266-SPEC.

Equipment required: Computer capable of running Windows 3.1 or higher; 8MB of random-access memory (16MB strongly recommended), CD-ROM player. Files take 43MB on your hard drive, plus CD-ROM.

Cost: Comprehensive, \$1,595 (\$1,395 annual renewal); Architectural alone, \$1,195 (\$995 renewal). Annual subscription includes four quarterly updates, newsletter, telephone support, on-line BBS.

SpecLink (formerly Comspec) gives you

CSI's MasterFormat on a CD-ROM disk. The text is not accessed through a word processor, however. Instead, it has been entered into a database (under the hood, a Microsoft Access database). Thus, you can do far more than cut and paste paragraphs. Sections of the database are linked so that once you find one piece you need, you are connected to the others. You can also create your own links.

You select the text you want to include in your spec, rather than cut away the text you don't. The underlying database remains inviolate, so that quarterly updates sent by BSD don't disturb the links and selections you've created for specific projects or for an office spec. You can buy a license for more than one user on a network.

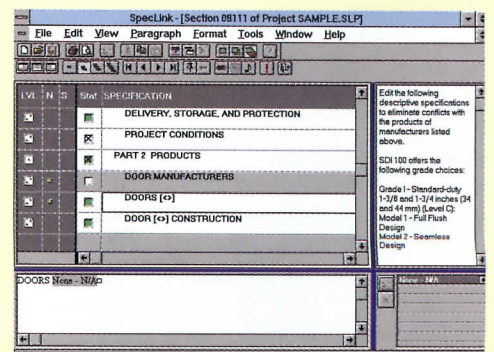
The database system is bulky (43MB on your hard drive!), but stable—it is based on Microsoft Access (a database program) with a "front end" (the screens a user sees) created in Visual Basic.

The overall effect is startling—a system that designers might actually use in a small office, rather than handing over to a secretary familiar with word processing or a part-time spec writer.

Manual: An 82-page paperback.

Ease-of-use: Pick up the meaning of a few unfamiliar icons and it's all you need.

Error-trapping: It's easy to fix mistakes. **153 on Reader Service Card**



SpecLink's array of specifications shows how they can be searched as you would an indexed, printed document. Then you can follow links to relevant sections.

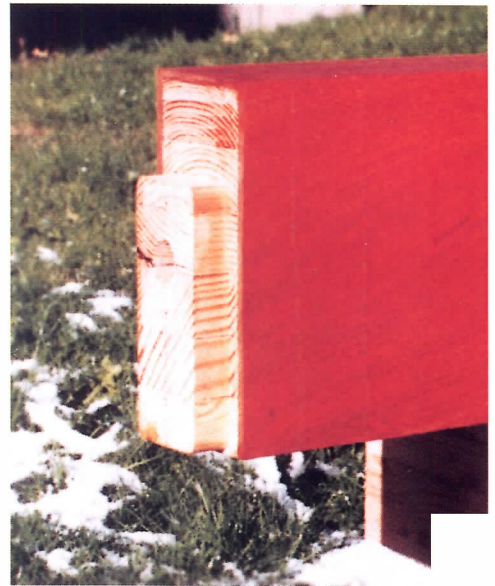
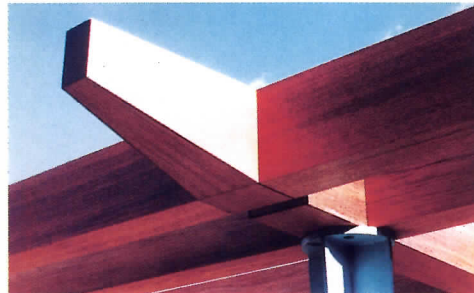
Engineered-Wood Products And Design/Spec Tools

154. Veneered glulam timbers

A natural-wood veneer option is offered as a "premium appearance" upgrade for laminated-beam structural frame members in applications requiring a higher level of finish.

The mill's unusual joinery technique uses concealed fasteners in place of steel hangers or joinery plates. Beams are connected by mortise and tenon joints (far right), and mechanically fastened by a "timber lock" device: a 5/8-in. hex-head concealed bolt that draws members together. The mahogany veneer is available in 1/4-in.-thick flitches 18 ft long, and has a close-grain pattern that effectively hides joints where sections of veneer meet. Other species can be used. After the beam is fabricated to size, the veneer finish is epoxied under pressure. Radiused members can also be veneered;

product is approved for exterior locations. Harper Owens Architects of Kent and Greenwich, Conn., designed an 18- by 56-ft lap-pool enclosure using veneered timbers in an exposed structure (below, in construction view). Here, the tapered beams project beyond the wall; the ends have been covered in pieces of end-grain veneer. 802/674-6145. Green Mountain Precision Frames, Windsor, Vt.



155. Engineered wood CD-ROM

A technical library on a disk, a new reference from APA—The Engineered Wood Association contains complete versions—including text, drawings, photographs, and tables—of 24 publications most requested from the association. The data includes such wood-construction systems as glulams, performance-rated OSB, composite and plywood panels, shear walls and diaphragms, all-wood foundations, engineered-wood deckings, and non-residential roof systems.

Available in both Windows and Macintosh versions, the electronic format permits several types of information searches: by topic, by subheading from the main subject list, or by locating a word or phrase within text. Price is \$59; platform requirements and ordering information: 206/565-6600, x189. APA—The Engineered Wood Association, Tacoma, Wash.



156. Plastic-reinforced glulam

A 1996 winner of the Civil Engineering Research Foundation's Pankow Award for Innovation, structural glued-laminated wood beams (glulams) reinforced with fiber-reinforced plastics are now made and distributed under the trade name FiRP Reinforced glulam. An International Conference of Building Officials (ICBO) Evaluation Report has approved a method of developing allowable design values for the timbers, which have significantly increased—by 30 percent—span and load capacities at smaller cross-sections than conventional glulams. The performance criteria for the end product determines the thickness, width, and placement of the carbon/aramid/glass-fiber composite reinforcing layer; the finished beams are not priced higher than standard glulams of similar load capacity, says the company.

By combining the environmental and installation advantages of a wood product with increased load capacity, tensile strength, and improved seismic behavior, FiRP beams are said to be able to compete with steel and concrete materials in many structural applications. 503/836-2000. American Laminators, Drain, Ore.



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For more information, call your National Gypsum sales representative. For technical information, call 1-800-NATIONAL, or fax 1-800-FAX-NGC1. And see what's possible when you can bend a little.

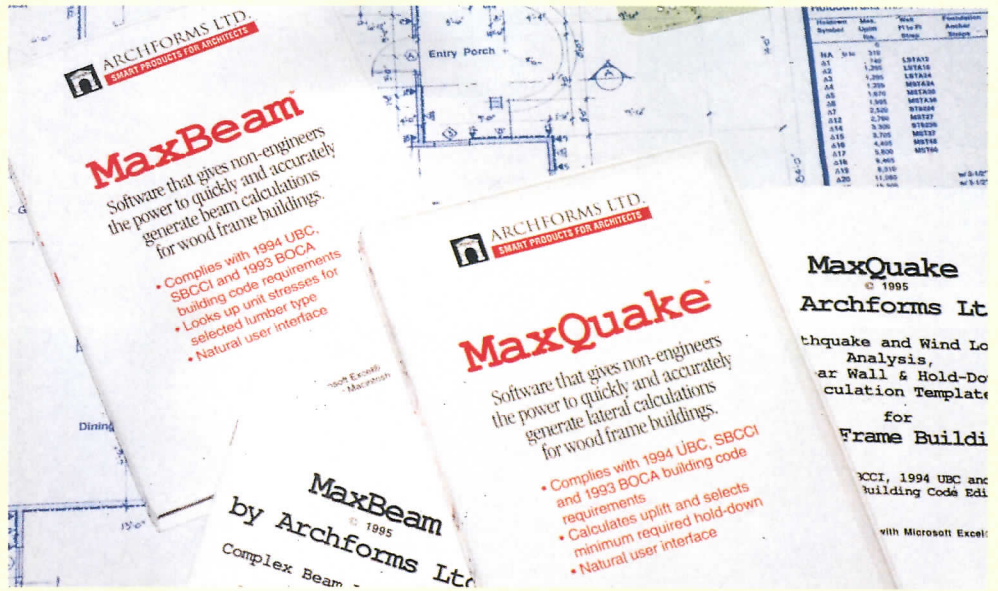
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157. Wood-frame design software

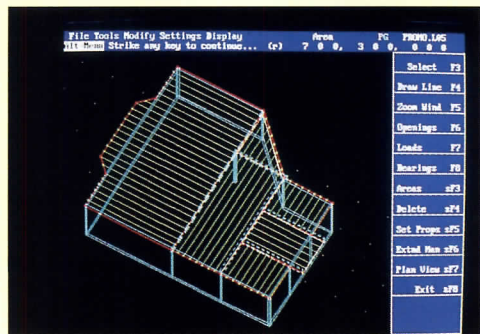
Said to give an architect or builder "total control" over small wood-frame projects, MaxBeam and MaxQuake programs easily generate complex beam, earthquake, and wind calculations, and produce fully documented reports as required for building-permit consideration. Developed by architect Larick Hill, the software is a tool that identifies structural problems early in the design process, and immediately suggests possible structural-design alternatives. Designed to be "intuitive," the software performs all calculations based on minimal input from users. Both programs comply with the most recent UBC and SBCCI codes. \$149 each; \$250 bundled. Requires Microsoft Excel; MS-DOS, Windows, and Macintosh versions available. 800/958-ARCH. Archforms, Ltd., Portola Valley, Calif.



158. Long-length wall system

This maker's FrameWorks line of structural building components has added a new engineered-wood product. TimberStrand LSL Premium Studs are made in lengths as long as 16 ft. Like other structural elements made with laminated-strand technology, the studs use material from fast-growing tree species like aspen and poplar, offer predictable loading behavior, and are free of the knots or other natural defects of sawn lumber. Studs are said not to warp, twist, or shrink either on the job site or after installation. Available as nominal two-by-fours and two-by-sixes, the 1.3E studs can be used in the construction of interior and exterior walls of single- and two-family homes as allowed by local codes.

Also new: a Windows-format version of TJ-Xpert software, said to offer specifiers and lumber dealers full access to loading, performance, dimension, and other data about any FrameWorks structural component. Working from supplied floor plans and dimensions, the program creates the most economical framing design based on all current ICBO codes. The software lets the user capture plan and layout information directly from a CAD drawing. 800/338-0515. Trus Joist MacMillan, Boise, Idaho. ■





159. Free-standing ceiling

A conceptual-design project headed by Merritt Seymour, Interior Trees mimic structures found in nature—roots, trunk, branches, leaves—while they define space, route ventilation air and power cabling, diffuse upwardly directed lighting, and temper noise levels. “Trees” can be placed in a space to create a supportive environment. Comments? 312/822-3400. USG Interiors, Chicago.



160. Oversize roof tile

A new-looking roof option, XL Series tiles are a larger-format, easier-to-install version of this maker's interlocking flat designs such as Classic and Williamsburg. The clay body has minimal water absorption and resists impact damage; at 10 7/8-by 16-in., it is slightly longer than standard tiles. 800/945-8453. Ludowici Roof Tile, Inc., New Lexington, Ohio.



161. Disk-format EIFS manual

An interactive Windows-based program helps match the site and program needs of a specific project with the most appropriate Sto system and architectural coating. Data is displayed in text, tables, and images, all of which can be exported to other documents; a Showcase section presents each product in depth. Platform and ordering: 800/221-2397. Sto Corp., Atlanta.



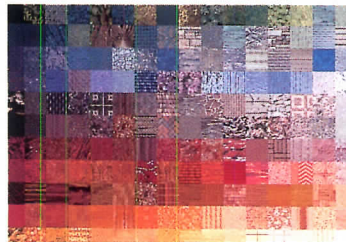
162. Egress roof window

When located within reach, as required, Model GPL windows can help some attic and loft area living spaces meet egress codes. Wood-framed units have large, unobstructed glass areas, and open a full 45 degrees. Even when closed, an integral ventilation flap lets stale interior air out and fresh air in, reducing humidity levels. 800/283-2831. Velux-America, Inc., Greenwood, S.C.



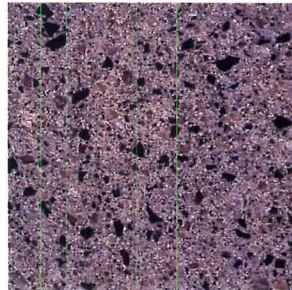
163. Flexible stacking chair

Intended to offer comfort and squirm-room through long bouts of sitting, the Zooney Chu stacker (named for its designer) has a flexing, molded-shell back and wire-rod frame. One of several Neocon 1996 introductions planned by Haworth, the chair offers multiple color options. 616/393-1604. Haworth, Inc., Holland, Mich.



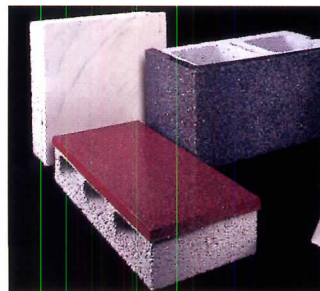
164. CAD materials library

For use with rendering and paint software, Just Textures CD has over 900 seamlessly tileable patterns—brick, fabric, floors, granite, wood—that will repeat in all directions when mapped onto 3D objects. There are also 300 element textures—cars, rugs, plants, etc. All can be used directly from the CD. Price: \$199 (royalty-free). 800/458-0609. KETIV Technologies, Inc., Portland, Ore.



165. Stone-pattern solid surface

A realistic pattern that replicates the specks of mica found in natural stone, gray-green Willow is one of three new Crystelle colors in Avonite's translucent-appearing Decor series. Stone-look and solid color Avonite is available in Class I and Class III materials. An architectural sample board contains pieces of all eight Crystelle patterns. 800/428-6648. Avonite, Belen, N.M.



166. “Granite” wall in one step

Lightweight Aristocrat masonry units are glazed in several layers, which gives the face a deep and light-diffusing appearance. Block is said to combine the look of marble, granite, or solid-color stone with the economics and structural performance of a load-bearing wall. Available in several sizes, including 16-by 16-in. units. 800/233-1924. Trenwyth Industries, Inc., Emigsville, Pa. 17318. ■

Short takes

Bigger and bigger. Describing itself as the largest building materials company in the world, Paris-based Compagnie de Saint-Gobain announced three new business ventures. CertainTeed Corporation, of Valley Forge, Pa., Saint-Gobain's U.S. subsidiary, will work with Ecophon AB of Sweden to market architectural acoustical ceiling products made in Europe. Also, CertainTeed has acquired The Bird Corp., a producer of asphalt roofing in Norwood, Mass.

The parent company itself acquired Advanced Glass Systems, Trumbauersville, Pa., which makes security and special-use glazing incorporating a resilient polymer core.

Sound bite. USG Interiors, Inc., Chicago, will spend \$45 million to increase the capacity of its Auratone acoustical-ceiling tile plant (Greenville, Miss.) to meet strong commercial and retail demand from the U.S. and Pacific Rim countries.

Wood-frame construction. The 1995 SBC High Wind Edition of the Wood-Frame Construction Manual from the American Wood Council gives engineered and prescriptive design requirements for one- and two-family dwellings in high-wind areas (90-120 mph). Covers structural elements and connections, and explains new perforated shearwall and wall-stud system factors. 800/890-7732. American Forest & Paper Association, Washington, D.C. ■

In this issue RECORD uses the featured buildings to highlight special challenges facing American architects as they practice in today's shifting business and social environment. Each of the four buildings represents one or more such challenges.

Silicon Graphics Shorelines Entry Site in Mountain View, California, by Studios Architecture (pages 72-79) echoes the demands of a new type of architecturally enlightened client who wants a unique facility but insists on tight schedules and budgets. The Amtrak station at Solana Beach, California, by Rob Wellington Quigley (pages 96-103), is an extraordinary example of an architect who took an active, participatory role with the community in extending what might have been an ordinary train station into a popular community landmark. Suntec City, by New York City-based architects Tsao & McKown (pages 86-95), is not just a successful example of a large overseas project by an American architect; it shows that urban values can be maintained even in this \$1.4-billion mixed-use development in downtown Singapore. William Rawn's Music Building at Phillips Exeter Academy, Exeter, New Hampshire (pages 80-85) is a happy effort by the architect to design a building that accommodates state-of-the-art audio/visual and acoustics systems on a 215-year-old traditional campus.

Also echoing the issue's theme, Building Types Study 737 (pages 104-113) chose retail facilities to pinpoint a growing role for architects in representing a retailer's image across different cities and locations. *S.A.K.*

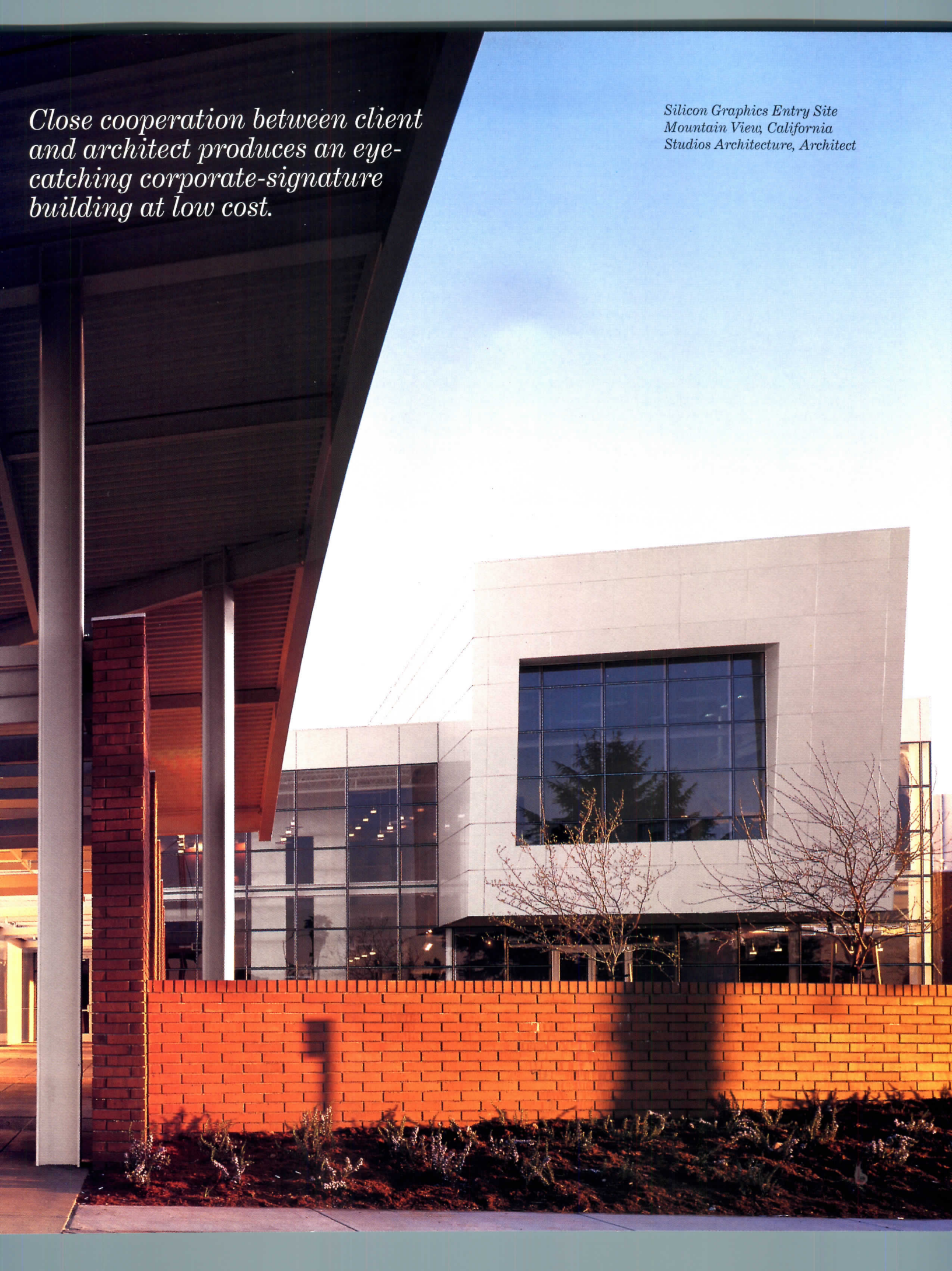
*Manufacturers' Sources
listed on page 130*

Agile Architecture



*Close cooperation between client
and architect produces an eye-
catching corporate-signature
building at low cost.*

*Silicon Graphics Entry Site
Mountain View, California
Studios Architecture, Architect*



Ray Johnson, director of corporate facilities for Silicon Graphics, has a simple reason why the company's Gateway Building eschews the usual Silicon Valley anonymity, and instead adopts eye-catching angles, colors, and exposed structure: "We're a visualization company so we have to make a visual impact," he says. "We are anything but conventional, and our buildings should be too." No wonder that the architects at Studios Architecture, who designed this 110,000-square-foot structure, use words like "visionary, playful, and a godsend" to describe their corporate client. Yet there is a method in this exuberant madness. Each arc and angle in this two-story structure responds to a difficult site, helps create an environment of office "neighborhoods," sized for maximum flexibility and efficiency, and lets Silicon Graphics—within a very small budget—create the kind of environment that will stimulate and retain staff in the highly competitive computer-employee market.

Studios and Silicon Graphics have been working together for almost a decade. Over the years, lead designer and Studios' partner Charles Dilworth has designed a series of renovations to tilt-up or brick-clad warehouses for the company in the industrial area of Mountain View, California, that have created an ad-hoc corporate "campus." The company never had the money for fancy appointments, so Dilworth created a visual order out of existing structure, using the metal studs and drywall allowed in tenant-improvements budgets. "By now the company sees limited means as its house style," he says, "and it wants them even in its own new building."

The Gateway Building, shown here, is the first stand-alone structure the company has commissioned—the start of a one-million-square-

foot campus, all designed by Studios and currently under construction. It brought the company from the anonymity typical of Silicon Valley to a site right next to the area's major freeway. "It's a port-of-call," explains Dilworth. Studios' principal Erik Sueberkrop adds, "People see this place, come here to ask directions, and get referred on to the rest of the campus." "Yet neither we nor the city of Mountain View wanted it to be a boat floating in a sea of parking," Instead, the curved building forms a wall close to the road that eventually breaks open, as one rounds it, to allow entry. Inside is a 14,000-square-foot training facility that also is open to the public. "This is the anchor for office neighborhoods planned like a city," says Sueberkrop. Those areas fit along a diagonal spine, "where people can see and shout at each other," according to Dilworth. Coffee bars, complete with cappuccino machines, form the nodes, "like home kitchens," as Sueberkrop puts it.

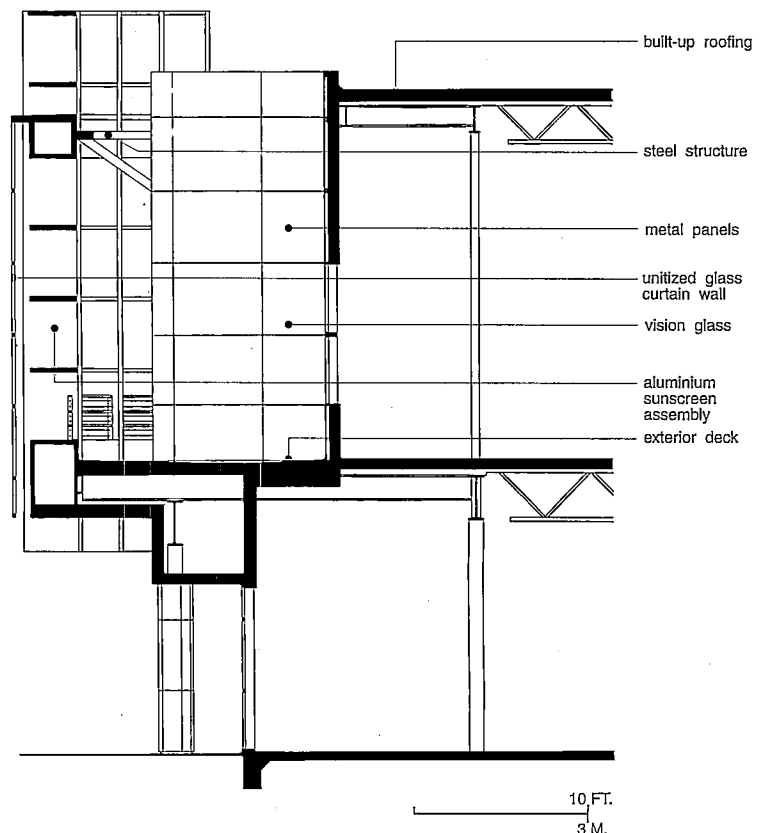
Work happens in a combination of office systems coupled with special connectors that allow quick demounting. Studios Architecture designed a special "power pole" that brings data and power to the work stations. All of this adaptation allows Silicon Graphics to change configurations easily. The arching roof pulls it all together. All the structural supports are clearly visible and the light comes washing down in a computer-friendly, indirect manner. Says Dilworth: "We learned to love the cheap, earthquake-resistant brace frame. Look," he says, pointing to a steel column where three different-sized members come together. "There is beauty in fortuitous discovery." At the meeting point of the electrosphere and suburban sprawl, Silicon Graphics has marked its spot with an emphatic and graceful structure. *Aaron Betsky*

Up Close

Challenges: Work with a large client design team and still maintain a unique creative direction. Produce a lively building in a highly visible location to evoke Silicon Graphics' product innovation and, at the same time, adhere to stringent cost limitations and earthquake-resistance codes.

Program: The client required training and computer-graphics production spaces for some 300 persons working in 50-workstation groups. It also wanted a clear circulation system that would encourage employee interaction. The building was to welcome visitors and be the orientation point for a large Silicon Graphics campus now being built.

Solution: The architects and client team produced a two-story, 110,000-square-foot building arranged along a linear circulation spine. To keep costs down, the UBC Type II, steel-frame construction has been left exposed, complete with angled earthquake braces under the roof. The unusual layout of the building conforms to the curve of a nearby freeway on one side and spreads out in two wings on the other side to admit daylight deep inside the building.



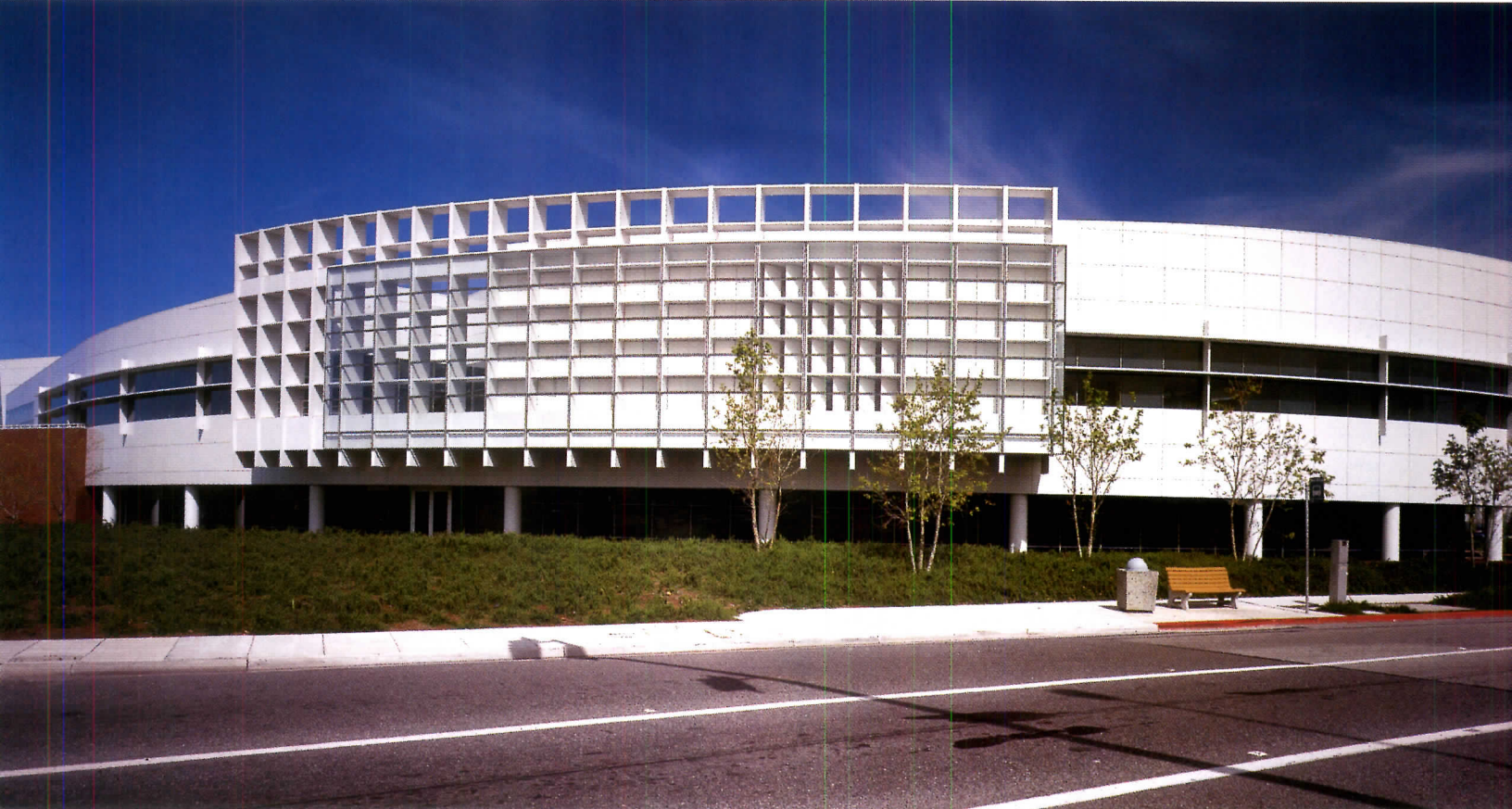




1. Entry site
2. Shoreline campus
3. North Charleston Studio Campus

“The building mediates between the pedestrian and the car,” says architect Charles Dilworth. Seen from the freeway, the Gateway Building is a curving arc (below and opposite, top). Close-by, it

presents an overscaled grid, which protects conference rooms against the sun and the noise of the freeway. An overscaled window of the training room and an arched canopy announce the



© Richard Barnes photo above



entrance (below). A low brick wall encloses a garden and recalls the original Silicon Graphics campus several blocks away. On the rear of the building (bottom) the rotated geometries

twist off of the city grid to create a small courtyard next to the cafeteria (opposite bottom). The grid of the facade system is an inexpensive unit wall system.



© Richard Barnes photos





Office “neighborhoods” contain some 50 work stations, which Silicon Graphics has found is the optimal size for inter-departmental communications. The firm’s custom-designed power pole allows easy work-station changes. The spine (near left) creates a sense of overall connection. The public face of the building continues to the lobby area, where a glass wall (opposite) marks the security zone.

Credits:

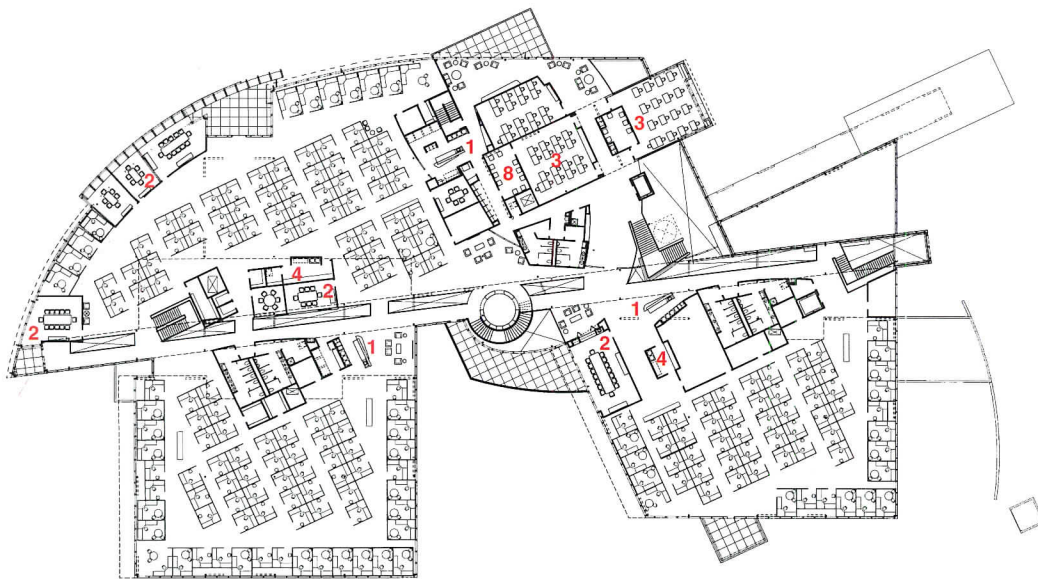
Silicon Graphics Entry Site Mountain View, California

Owner: Silicon Graphics Real Estate—Ray Johnson, Don Young, Robert Reuter; David Kalb, Janice Coelho, Heidi Thomas, client design team

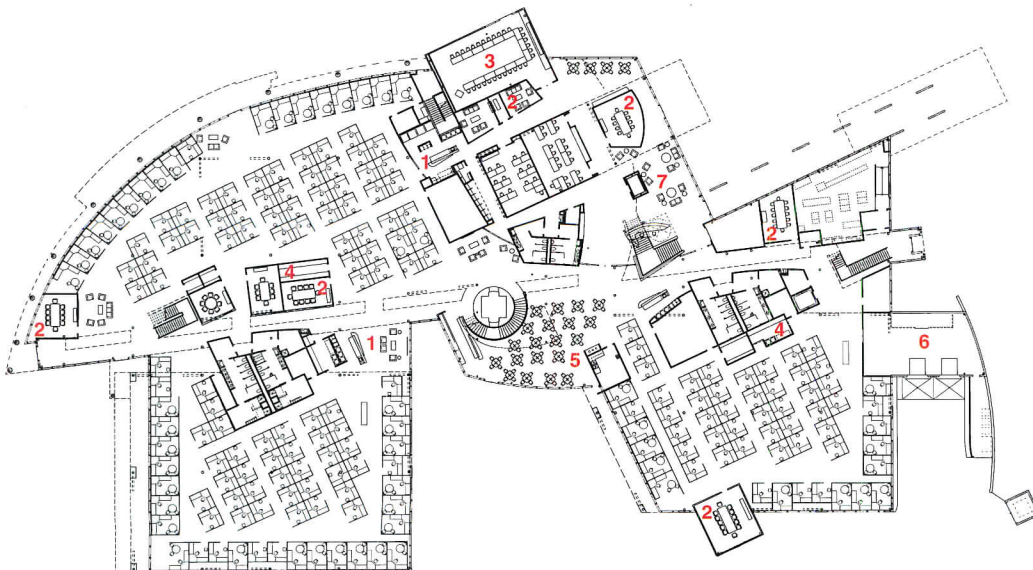
Architect: Studios Architecture—David Sabalvaro, Erik Sueberkrop, principals; Charles Dilworth, senior designer; Kelly Haegglund, Clifford Wong, Jeffery Benningfield, Michael O’Callahan, Bill Cooperman, Philip Luo, Elliot Freed, Jeffrey Curry, Anders Hench, Colin Walker; Chase Fenton, Benjamin Aranda, project team

Engineers: GFDS Engineers (structural); The Mark Thomas Company (civil); Encon (mechanical, plumbing design/build); Ackerman Engineers (electrical design/build)

Consultants: The SWA Group (landscape); Lumenworks (lighting)



SECOND FLOOR



FIRST FLOOR



1. Coffee area
2. Conference
3. Training
4. Copy area
5. Cafe
6. Loading
7. Lobby
8. Machine room



Fitting Harmony



*A new music building on a
venerable campus is appro-
priately seen but not heard.*

*Forrestal-Bowld Music Center
Phillips Exeter Academy
Exeter, New Hampshire
William Rawn Associates, Architects*



Founded in 1781—the last year of the American Revolution—Phillips Exeter Academy has long been one of New England’s most prestigious preparatory schools. Its mainly Georgian buildings are arranged around quadrangles meant to encourage a sense of community (site plan, below). Architect William Rawn Associates has chosen to reinforce this pattern with the campus’s newest building, the Forrestal-Bowld Music Center. It closes a gap at the northwest corner of the academic quadrangle with a two-story structure that matches its neighbors in scale and finish materials, but clearly expresses its own era. It also expresses the school’s ethos of sensible living and rigorous engagement in learning by using plain, durable finishes and nearly square rooms that encourage focused attention, participatory interaction, and optimal acoustics.

An addition to the 1959 Perry Music Building by Shepley Bulfinch, the Center is a deliberately modest, sensible structure designed for hard work and long use. More than 500 students, about half the school, study music—instruments range from piano to bagpipes, styles from classical to rock. For years, the department had been stretching the capacity of the Perry Building, using photocopy rooms for practice, and, in the case of the 90-piece orchestra, rehearsing in a space so acoustically inadequate that the conductor felt her hearing was being harmed. The new Center, intended for practice and rehearsal (but not performance), rectifies these deficiencies. Incorporating the old building—which was gutted and rehabbed—it increases the number of practice rooms and teaching studios and provides a chamber-group rehearsal room and, most notably, a large orchestra rehearsal hall. A major part of the design budget was devoted to acoustical studies by Lawrence Kirkegaard, who collaborated with Rawn on the Seiji Ozawa Hall at Tanglewood. “Sound needs [spatial] volume to develop fullness and richness—it has a dimension in time,” says Kirkegaard, who chose specific materials for their acoustical qualities, including fiberglass panels, spray-on treatment for the ceilings, curtains, linoleum for the floor, and well-gasketed doors.

That the new structure should fit so closely the spirit of the Academy is due largely to Rawn’s “intensive design process.” Although Exeter is only 45 miles north of their Boston office, Rawn and project architect Alan Joslin lived for several days at the Academy, talking with faculty and students, urging students to play with massing models of the building, and generally working to understand, in Rawn’s words, “the folkways and ethos” of Exeter. Music chairman Stephen Kushner has high praise for this process. “The depth and success of the result,” he says, “is manifest in the building.” *Nancy Levinson*

Up Close

Challenges: Design an addition to a 33-year old music building that fits a venerable campus and reinforces its quadrangle master plan. (Neighbors include Georgian-Revival buildings, clapboard houses, and a library designed by Louis Kahn.) Provide acoustically sophisticated spaces for music instruction, practice, and rehearsal. Reinforce an institutional culture that emphasizes a rigorous, participatory educational process.

Program: Provide music spaces to include a large orchestra-rehearsal hall, a choral-rehearsal hall, a small rehearsal/teaching space, 10 teaching studios, and 17 practice rooms. Provide offices for the department director and assistant, and faculty. Include communal spaces.

Solutions: Adopt a fitting scale and materials, like brick cladding, cast-stone trim, and a lead-coated-copper barrel roof, but with current design expression—a rectangular facade bounding the formal academic court and a curving facade leading to an anticipated less-formal arts quadrangle. Arrange new interior spaces around large central community spaces (or “courts”), which look out onto the campus green. Renovate the existing building to create practice rooms, a choral-rehearsal hall, and another interior “court,” this one less public and more intimate.

Statistics: 22,250-square-foot facility—new steel-frame construction: 12,500 square feet; gut rehabilitation: 9,750 square feet; major rehearsal hall: 1,970 square feet; typical teaching studio: 190 square feet; typical practice room: 60 square feet. Cost: \$2.8 million.



1. Original building
2. New addition
3. Arts quadrangle
4. Academic quadrangle





The interior “courts” (far left and opposite) encourage a sense of community.

Credits

*Forrestal-Bowld Music Center
Phillips Exeter Academy
Exeter, New Hampshire*

Owner: *Phillips Exeter Academy—Kendra O’Donnell, principal; Lynda Beck, vice-principal; Joseph Edward Fellows, treasurer; Stephen Kushner, chairman of music department; Mimi Braver, former chairman of music department; James G. Rogers III, chairman of Trustee building committee*

Architect: *William Rawn Associates, Architects Inc.—William L. Rawn, principal-in-charge; Alan Joslin, senior associate/*

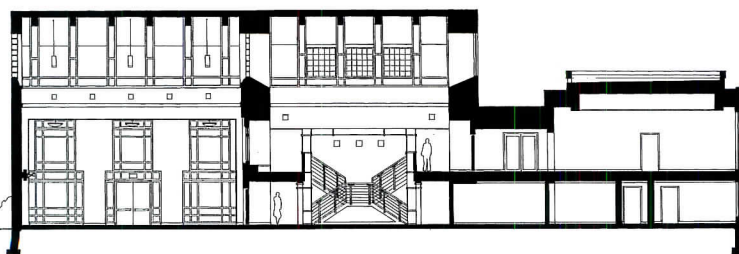
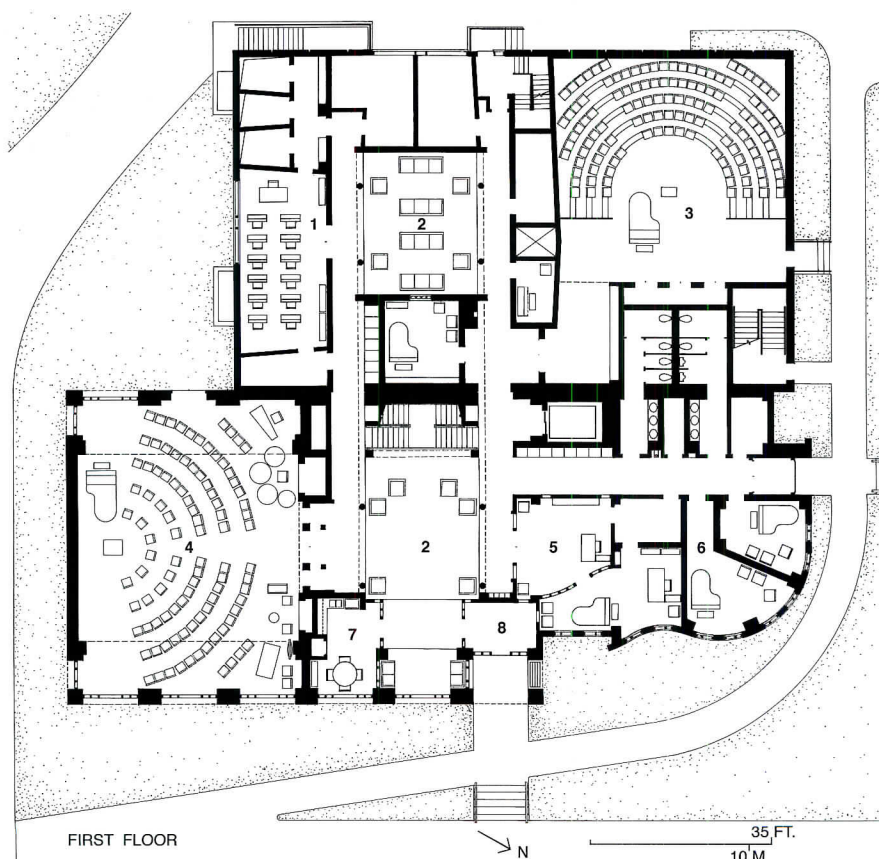
project architect for design; Randy Wilmot, construction coordinator; Steven Hart, Richard Yeager, Sean Wang, Lindsay Crawford, David Yosick, Katie Hutchison, Brian LaBau, Robert Linn, Nicole Bouvier; Cliff Gayley, project team

Engineers: *LeMessurier Consultants (structural); TMP Consulting Engineers (mechanical, plumbing); Lottero + Mason (electrical)*

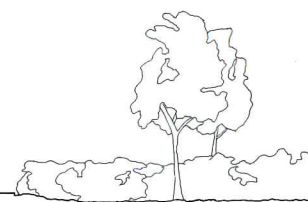
Consultants: *R. Lawrence Kirkegaard & Associates (acoustics); Michael VanValkenburg Associates, Inc. (landscape); Ripman Lighting (lighting); Helena Korpela (furniture consultant)*

General Contractor: *Hutter Construction Company—David Lage, project manager*

1. Lab
2. Court
3. Chorus
4. Orchestra
5. Administration
6. Studios
7. Office
8. Vestibule

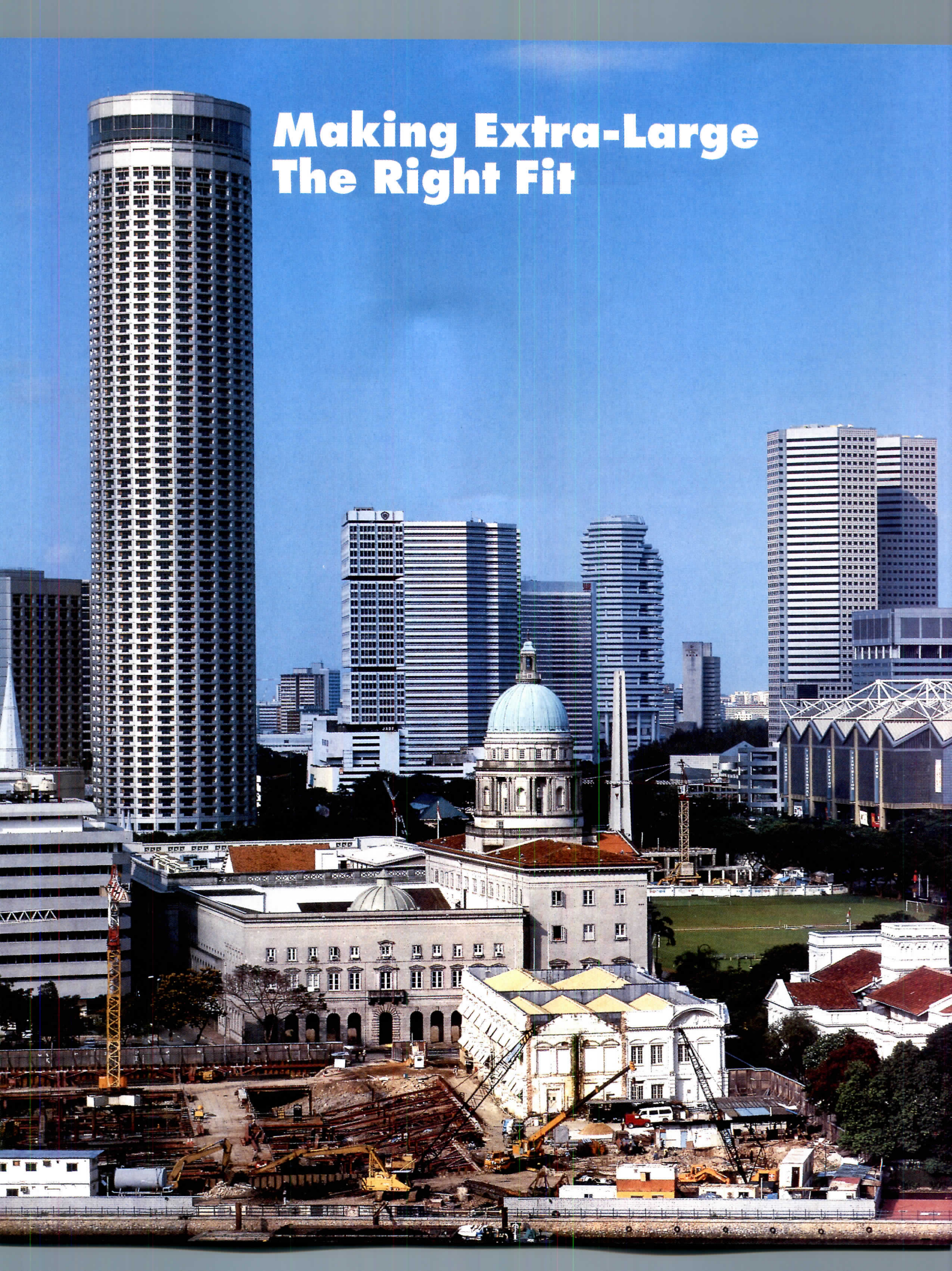


NORTH - SOUTH SECTION





Making Extra-Large The Right Fit



Tsao & McKown designs a multi-use mega-development that contributes to rather than rips at a city's urban fabric.

*Suntec City
Singapore
Tsao & McKown, Architect
DP Architects, Architect of Record*



As cities throughout Asia leap from the 19th century straight into the 21st, the multi-use mega-development is fast becoming the architectural icon of the day. National leaders, multi-national developers, city officials, and even people on the street see these projects as symbols of new-found prosperity and power. Images of skyscrapers and convention centers find their way into commemorative stamps and TV commercials promoting the new Asia. The challenge facing architects designing these giant complexes is making them work as more than just three-dimensional logos: making them integrated pieces of cities undergoing radical transformation and creating designs that speak to both traditional cultures and an emerging sensibility based on equal parts consumerism, national pride, and faith in technology.

Suntec City—comprising a 1.08-million-square-foot convention center, four 45-story office towers, an 18-story tower, 800,000-square-feet of retail and entertainment space, and parking for 3,200 cars—tackles these challenges head-on and, to a remarkable degree, wins. Although the faceted tall towers and the blocky shorter tower are too reserved in form to truly enliven the Singapore skyline and have been criticized for the amount of sunlight they block, Suntec City works better and better the closer you get to it. As designed by Tsao & McKown (with offices in New York City and Singapore), and the Singapore firm DP Architects, the Suntec buildings wrap around a circular plaza that promises to be a real urban amenity when all of the restaurants and shops around it are filled. And by creating spaces between buildings that work as outdoor rooms and opening several levels of retail space to sunlight, the architects have made important strides in breaking from the internally focused mega-projects so common in Asia. “Rockefeller Center was an obvious inspiration,” says Zack McKown, who spent most of the last eight years living in Singapore. “We wanted to accommodate a level of urban life not typically found in Singapore,” adds Calvin Tsao, who commuted back and forth from New York City.

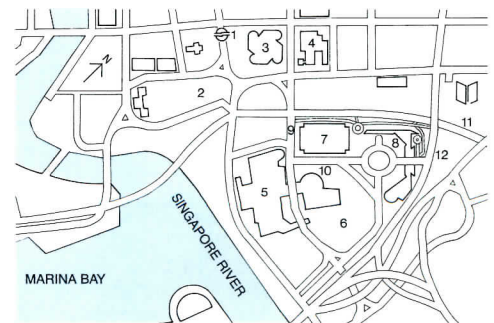
Privately developed by a consortium of mostly Hong Kong shareholders on a 23-acre site offered for bid in 1988 by Singapore’s Urban Redevelopment Agency (URA), Suntec City connects to the rest of downtown Singapore in a variety of ways. By bringing the convention center to the edge of the site—rather than setting it back as is typically done in Asia—the architects created street walls on two important avenues, Raffles Boulevard and Nicoll Highway. As a result, the project seems very much a part of downtown, not a separate enclave. Although Tsao and McKown’s initial impulse was to orient the towers to the marina, they eventually realized it was more important for the buildings and the central plaza to face the city.

Up Close

Planning: Buildings are organized around a central plaza that serves as a focal point for outdoor activities and a visual landmark. The plaza was inspired by Indian mandalas, which are often used for planning villages and civic structures. The master plan resembles a hand with the convention center being the wrist, the five office towers the fingers, and the fountain a “golden” ring in the palm—a scheme visitors easily remember. Opening the plaza to the city and using buildings to create street walls on key boulevards, the architects gave the project a strong urban presence.

Global Practice: With offices in New York City and Singapore and projects in the U.S., the Far East, and India, Tsao & McKown is a global firm. Both Tsao, who once had worked for I.M. Pei, and McKown, who had worked for Rafael Viñoly, had international experience before starting their firm in 1985. When it began work on Suntec City in 1988, Tsao & McKown had 10 architects in New York. Within 18 months, the firm opened a Singapore office and had 18 architects there and 3 in New York working on Suntec City. Singapore had been in a recession when the project started, but by late 1989 it was booming. So much building was underway at the time that hiring and retaining experienced architects in Singapore was difficult. As a result, most of the designers in the Singapore office came from New York; a few, such as Neil Troiano, have stayed with the project for most of its life. Though Tsao was born in Hong Kong, the firm put McKown in Singapore because he wasn’t expected to follow the often-elaborate rules of Asian etiquette and could speak more frankly. By sending partners and associates between New York and Asia and collaborating via phone, fax, and Internet, the firm tries to work as one office—a goal that was tested by the size of the Suntec City job.

A digitally enhanced image (preceding pages) shows the Singapore skyline as it will look in mid-1997 when the last two buildings of Suntec City are finished. Photo (left) shows the same scene today. A central plaza (opposite) provides shaded seating at grade and restaurants facing a fountain one level below.



- | | |
|-----------------------|-----------------------|
| 1. MRT Station | 7. Convention Center |
| 2. The Padang | 8. Suntec City |
| 3. Raffles City | 9. Raffles Boulevard |
| 4. Raffles City | 10. Temasek Boulevard |
| 5. Marina Square | 11. Nicoll Highway |
| 6. Millenia Singapore | 12. Rochor Road |



© Richard Bryant/Arcaid photos, except as noted

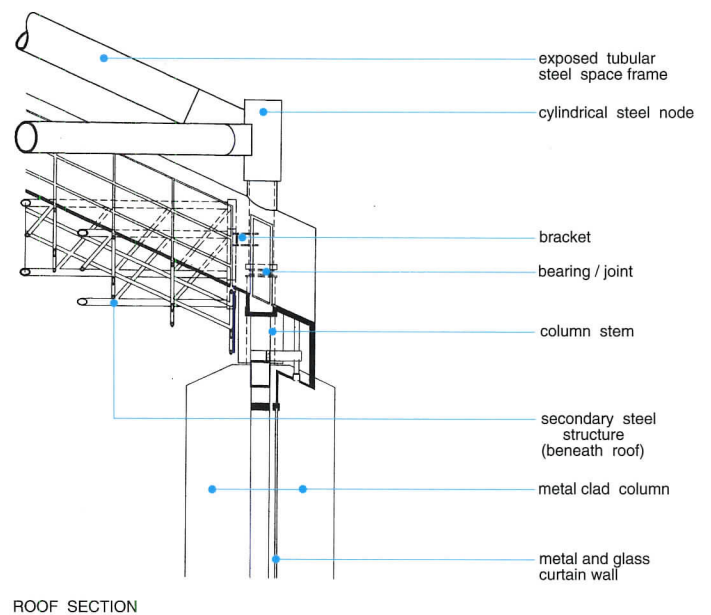
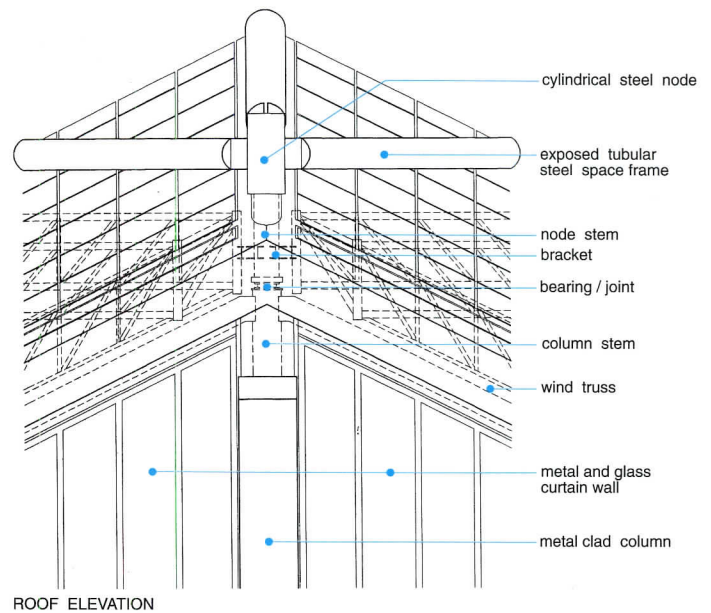


Just as important, the architects—with help from the URA—convinced the client to go to the expense of raising the convention center one level above grade and leaving the ground floor free for retail, restaurants, and public spaces. Reviving a practice set by Singapore's 19th-century founder, Sir Stamford Raffles, the architects recessed these public spaces behind a covered arcade that provides protection from rain and direct sun, and creates a continuous promenade around three sides of the convention center. In a similar gesture to the public realm and the local climate, Tsao & McKown carved out four-story-high spaces from the base of each of the towers, curving them around the fountain plaza that is the heart of the city within a city.

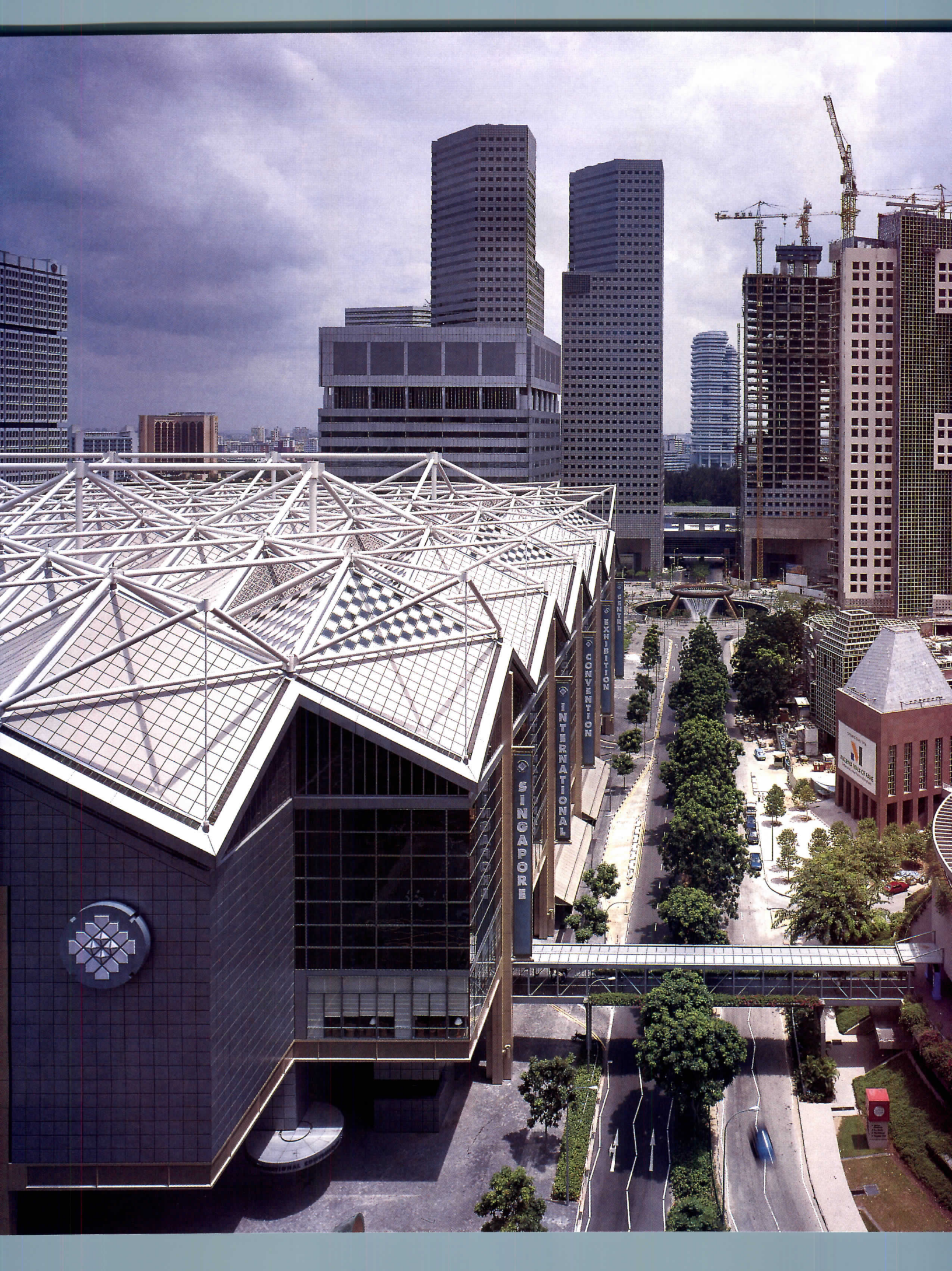
Because the convention center had to accommodate long spans and provide a 130,000-square-foot column-free convention hall on its top level, steel construction was used. Its multi-pyramid roof, which has become its identifying feature, is suspended from an external space frame and includes glass panels that bring sunlight into the hall. As is the norm in Asia, the office towers are concrete-frame structures—although massive cast-in-place transfer girders allow the corners of these buildings to be cut away to create covered patios.

While construction in southeast Asia is rarely up to world-class standards, the Suntec buildings exhibit a level of craftsmanship and detailing that is a testament to the close working relationship between the foreign and local architects and to Tsao & McKown's involvement until the end of construction. To tie the buildings together visually, all of them are clad in sea-foam-green aluminum and granite panels. Where facets are cut in the towers, stone seems to give way to an underlying metal-and-glass skin. On parts of the buildings closest to pedestrians, portions of curtain wall erupt in colors—such as saffron, curry, and jade—that refer to the local mix of Chinese, Indian, and other Asian cultures.

Although the last two towers and an adjacent entertainment/retail component won't be finished until next year, Suntec City is starting to come alive with office workers, shoppers, and people relaxing at restaurants. It has its own sense of place, while offering enough ties to the rest of Singapore so it never seems a world apart. All too often, Western architects working in Asia have been unable to deliver projects that rise above the get-it-done-quickly norm. But Suntec City shows that urban values and quality design don't have to be sacrificed when architects cross the Pacific; in so doing, it has raised the standard for other mega-developments here. *Clifford A. Pearson*



At 570 feet by 475 feet, the convention center's external space-frame roof (opposite and drawings above) is one of the largest in the world. The 18-story office tower (left) has large (28,000-sq.-ft.) floor plates to attract international tenants.

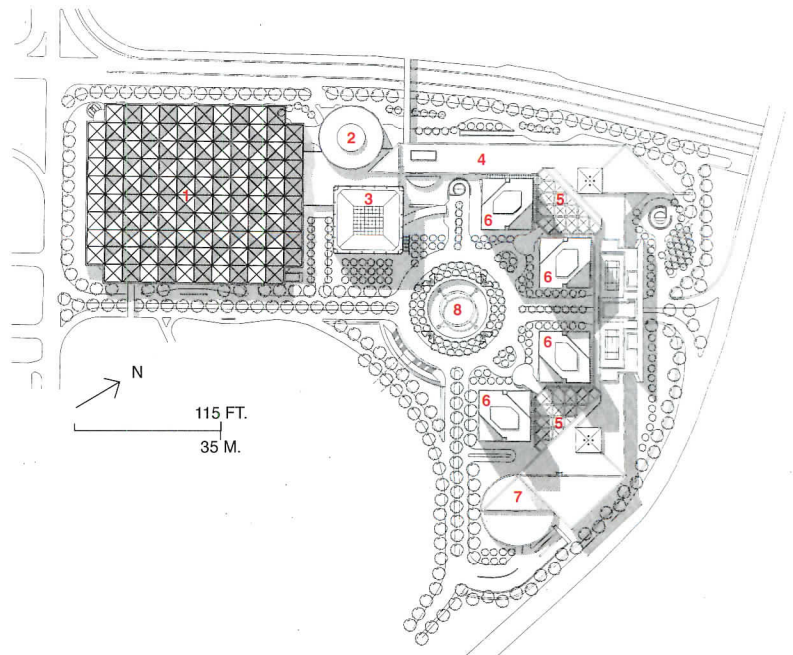




From a distance, Suntec City's aluminum and granite cladding give it a unified, monochromatic presence on the skyline (opening pages). But up close and at grade level, the architecture splinters into a variety of forms and a rich range of materials and colors that engage pedestrians. The boldest colors were used on elevations facing the city and major streets (left top), while subtler hues were employed on those elevations facing the central plaza. By carving away space under the bulk of each building, the architects created protected outdoor patios and promenades that feed into the central fountain plaza.

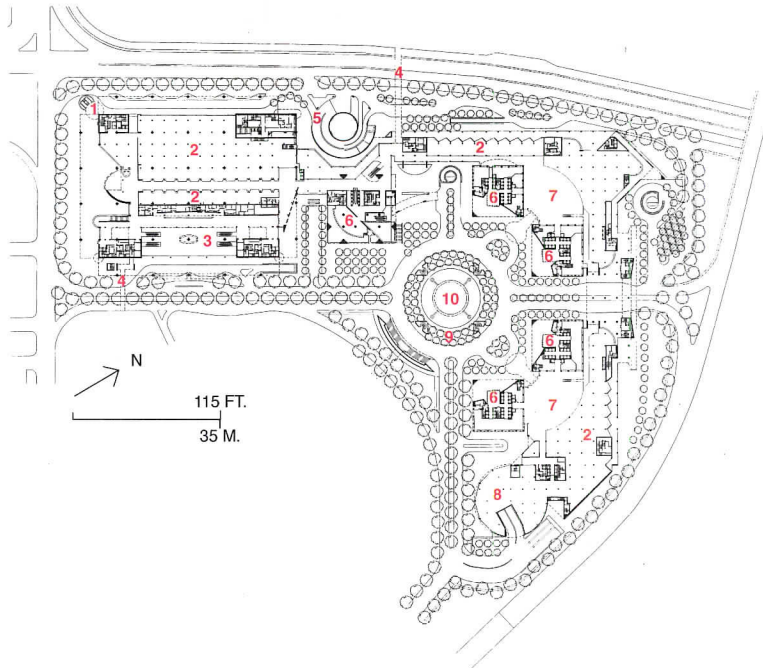
To entice visitors from the street level to restaurants and shops below grade, Tsao & McKown used a variety of architectural devices, such as cutting through to lower levels (top right) and using skylights to offer views below (lower right). A canted glass wall and a reflecting pool call attention to a restaurant in the lower level of the 18-story office tower (opposite). The theme of transparency and penetration is continued in the lobby of this same tower (lower left).

1. Convention center
2. Vehicular ramp
3. Office tower (18 stories)
4. Retail
5. Retail atrium
6. Office tower (45 stories)
7. Retail/entertainment
8. Central plaza





1. Pedestrian underpass
2. Retail
3. Convention center lobby
4. Pedestrian bridge
5. Vehicular ramp
6. Office tower lobby
7. Retail atrium
8. Retail/entertainment atrium
9. Fountain terrace
10. Fountain



A multi-story atrium on the long southeast side of the convention center and a mostly transparent wall on this elevation (opposite) help orient visitors. The urban setting demanded a stacked arrangement for the convention center with, from top down—a 130,000-square-foot column-free convention hall; a 130,000-square-foot exhibition hall that can be divided into three spaces; two floors of meeting rooms, a ballroom, and an auditorium; and a ground floor with registration and retail.

The lobby and registration hall features a floor mosaic of Buckminster Fuller's *Dymaxion Map* (bottom left). A grand stair; one of the few architectural requests of the client, is a composition in glass and light (far left).

Credits

Suntec City
Singapore

Architects: Tsao & McKown—Zack McKown, Calvin Tsao, partners-in-charge; Andres Atela, Maureen Boyer; Lynne Bright, I-Ni Chen, Frank Czyzewski, Antonio Eraso, Barbara Farina, Melanie Francis, Werner Franz, John Garrahan, Carolyn Hunter; Kaz Iwamoto, Charles Kessler; Ted Krueger, Trish McKinney, Ruth Miller, Gary Morgenroth, Stephen Norman, Stephen Rouse, Raymond Shick, Gerald Szeto, Thomas Tow, Neil Troiano, Elvis Wells, Ross Wimer; Tom Woo, project team; Wendy Lim, Lily Low, Dieter Metzger; Robert Morris, Colette Mullan, administration

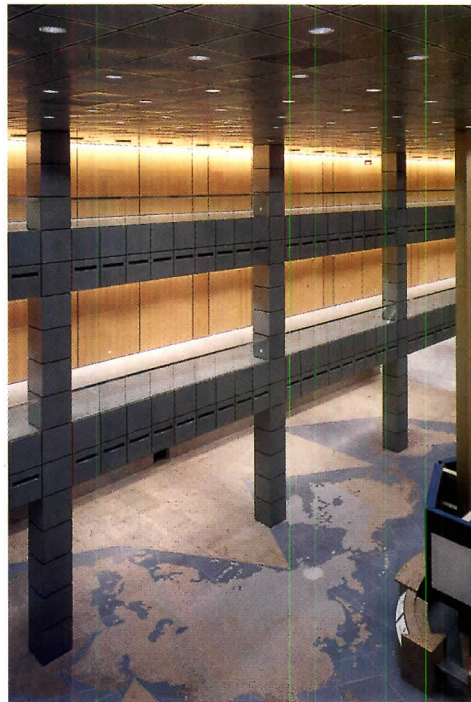
Architect of Record: DP Architects

Engineers: Weiskopf and Pickworth (structural concept, convention center); Maunsell Consultants (civil/structural); Parsons Brinckerhoff (mechanical/electrical)

Consultants: Ng Chun Man & Associates (project); R. A. Heintges Architects (cladding); Arnold Associates (landscape concept); Clouston (landscape); Tracy Turner Design (signage)



© Tim Griffith/Esto



© Tim Griffith/Esto



Making Tracks

With advice from the local community, Rob Quigley designs a train station that asserts itself.



*Solana Beach Transit Station
Solana Beach, California
Rob Wellington Quigley
Architecture/Planning, Architect*



Howard Roark would be horrified by Rob Wellington Quigley—not by what he produces, but how he works. While the fictional architect in Ayn Rand's 1943 novel *The Fountainhead* quickly became the symbol of architect-as-dictator, Quigley has developed a different reputation in his adopted home of San Diego: architectural conciliator. Though the shift from old-style dictatorial designer to team player mirrors a more general transition in the U.S., from a top down to participatory culture, Quigley maintains that, for him, the change has not been at the expense of architectural quality. From his vantage point, participatory design leads to stronger buildings.

Clients like Betty Laurs, Manager/Rail Services for the North County Transit District, agree. Laurs has overseen the creation of the eight train stations of a new commuter line running from San Diego to Oceanside, California, and Quigley's station, in Solana Beach, is her favorite, partly because of its daring design. "No one is lukewarm about the building," admits Laurs, "It's love or hate." Quigley was selected from a group of contenders for both the strength of his previous work and his comprehensive consensus-based approach, which extended the county's on-going program of conferring with existing community groups to include public walk-in workshops where people made lists and drawings of what they thought the project should be. (The selection was certainly not based on Quigley's fee. Laurs says the architect was "more expensive" than other candidates.)

Quigley says the process did not place him in a subservient role. Instead, it provided an outline for what his project must accomplish and rallied popular support for his eventual proposal. "Create a civic presence," says Quigley, was his main charge and to do that he looked both to the existing fabric of the town, and at what was missing. While the semi-circular steel-framed form of the station was largely inspired by Quonset huts popularized in San Diego by the increased military presence during World War II, the tower on top rose out of a need to create a civic marker in a community that lacked one.

Building the nearly 70-foot tower required special approval since the town had a height limit of 35 feet. While the North San Diego County Transit Development Board, a political body, designated the site a special district and could, as Laurs points out, "build anything" on the land, the group did want the support of the city council. With Quigley arguing that "It's not my tower. It's the town's," at council sessions, the exception to the height restriction was granted. Laurs says the city council also favored copper cladding for the barrel vault over the pre-weathered zinc the architect had chosen, and the transit board overrode the council on that. "We paid one of the most renowned architects in Southern California, perhaps even the U.S., for the design," says Laurs. "It would have been presumptuous to second-guess him," a sentiment even Howard Roark would find worthy.

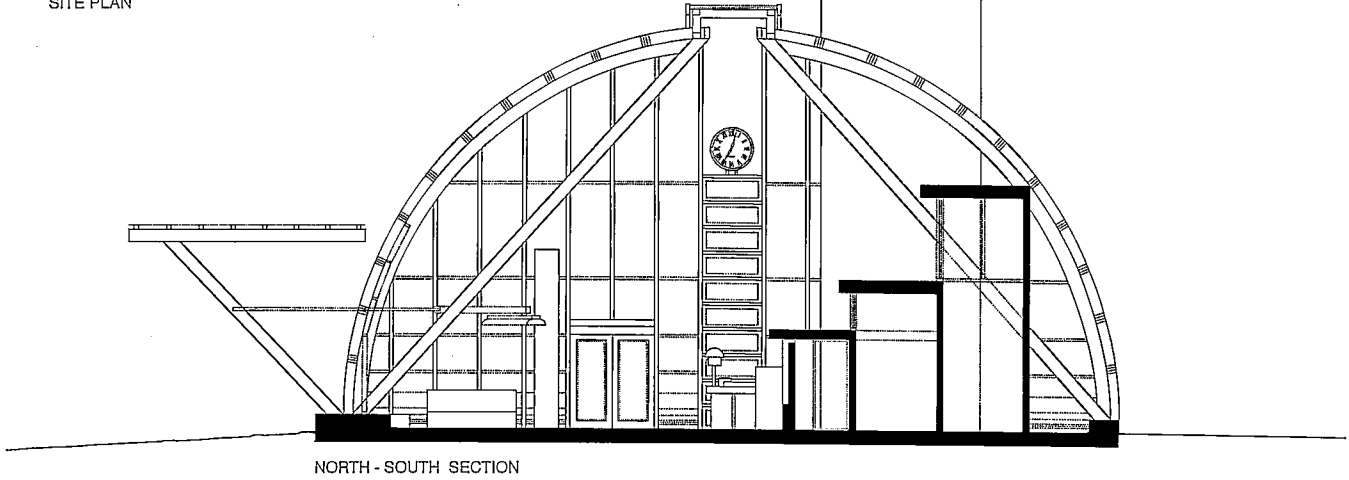
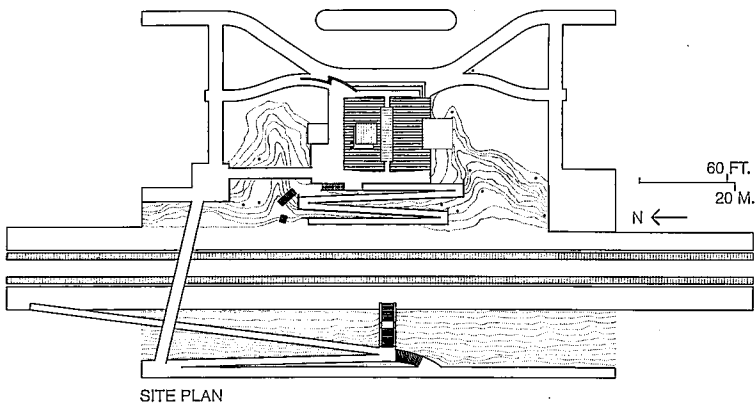
Karen D. Stein

Up Close

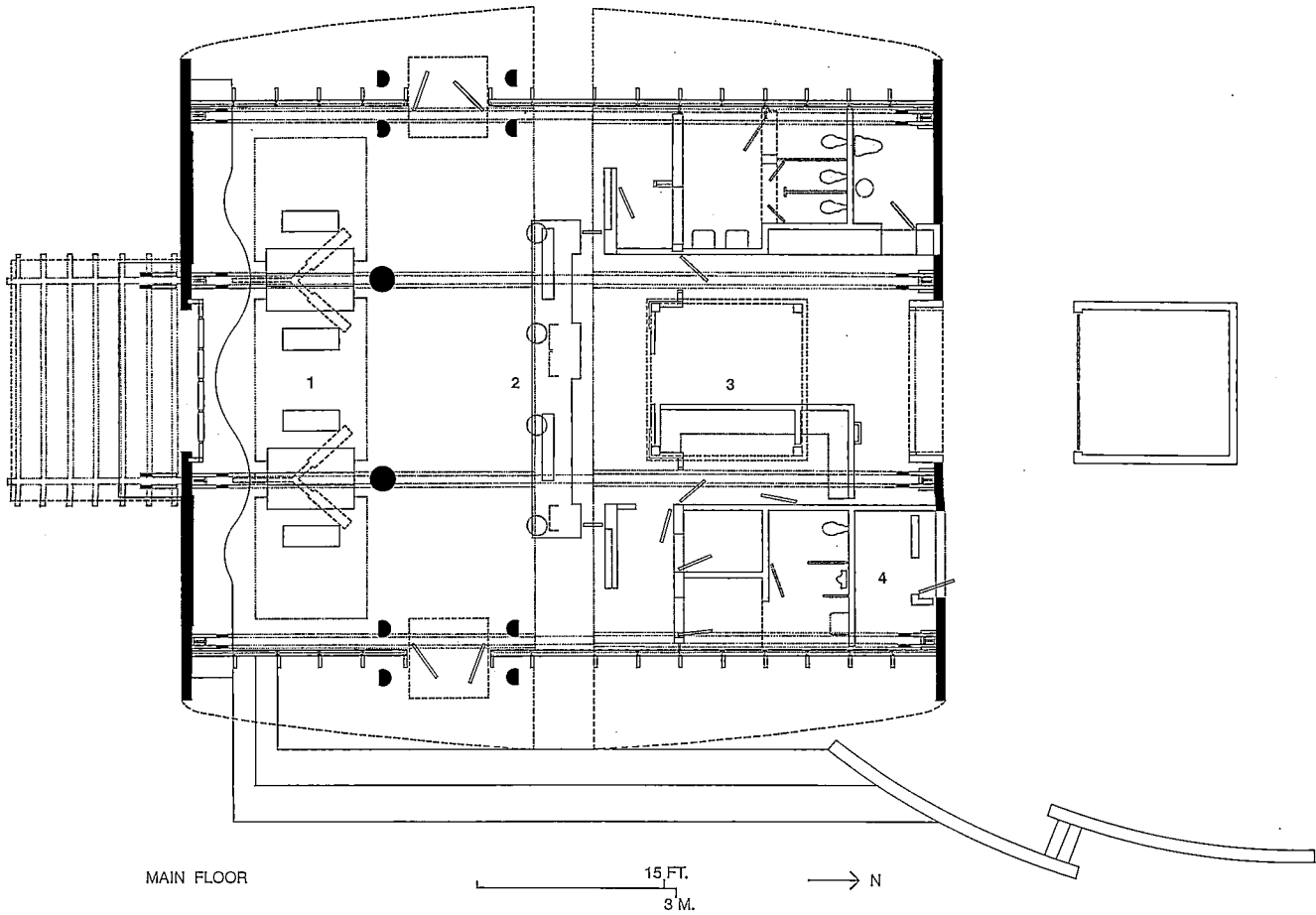
Challenges: Integrate community residents in a design process that creates a new town center and rail station for a Southern California beach community. Links with nearby Highway 101, connector to downtown San Diego, and the eventual 25-foot depression of railroad tracks to eliminate road overpasses, were also critical to the project.

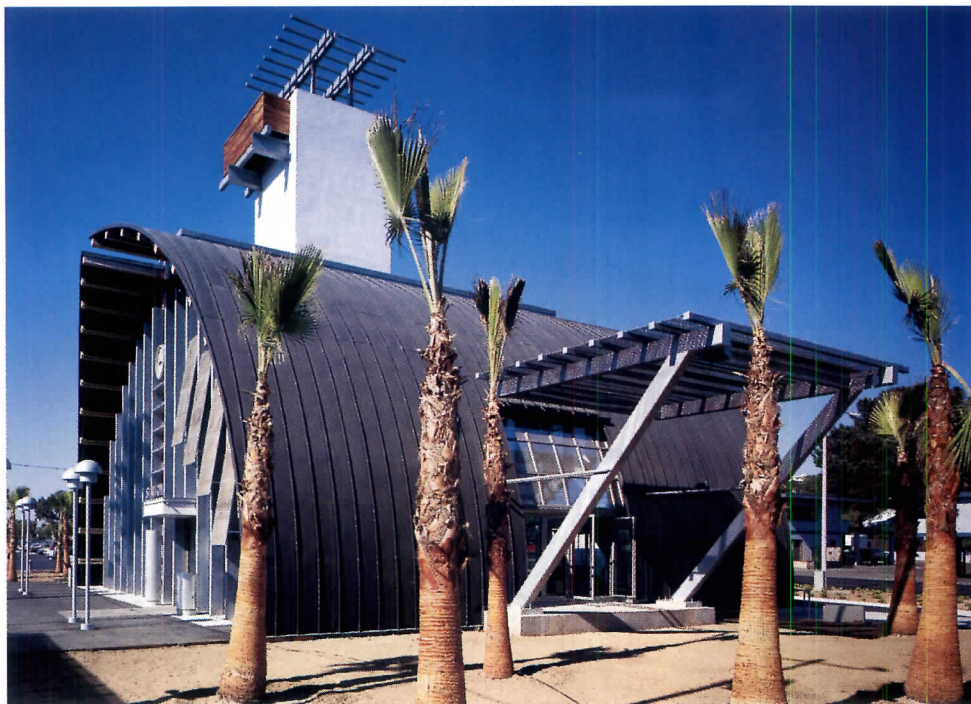
Program: A roughly \$20 million, 454,000-square-foot mixed-used development on a 255-foot by 1,780-foot site, conceived as the new center of Solana Beach, to be constructed in phases over several years. The first phase, now complete on a 155-foot by 960-foot parcel, includes a rail station and a parking lot. Future construction will comprise retail and restaurant space, movie theaters, low-cost housing, artists lofts, townhouse-style apartments, and a parking garage, to be located to the north of the station.

Solution: Architect Rob Quigley devised a series of public workshops for community members and developers to resolve a variety of programmatic issues, including building scale, noise-control methods, traffic patterns, and appropriate architectural imagery. The community residents lobbied for the station to have a tower to symbolically convey the project's civic importance, demanding, and eventually receiving from the city council, an exception to the town's height restriction. Towers are now included in the town's code.



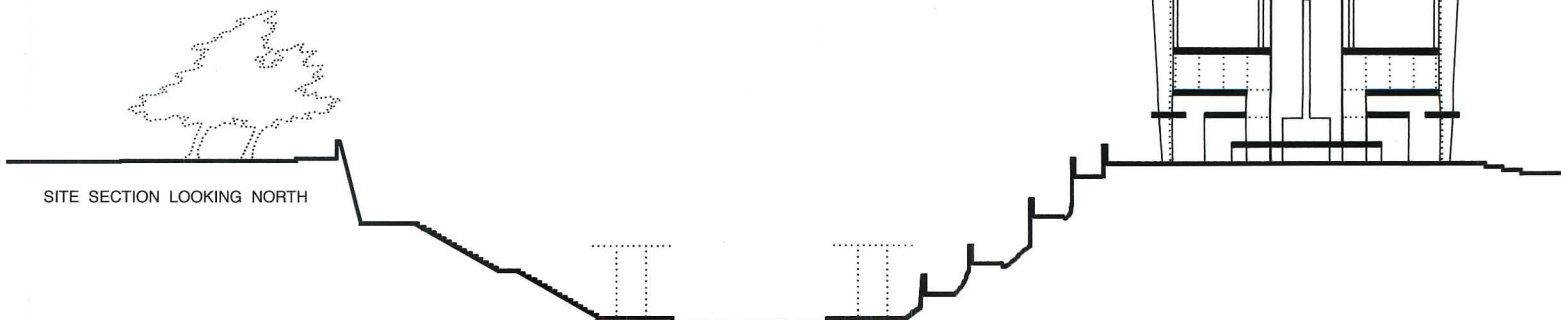
- 1. *Waiting area*
- 2. *Ticketing*
- 3. *Baggage*
- 4. *Staff*





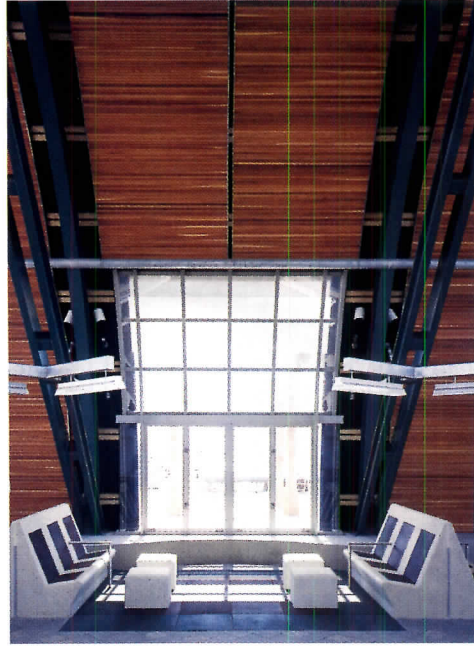
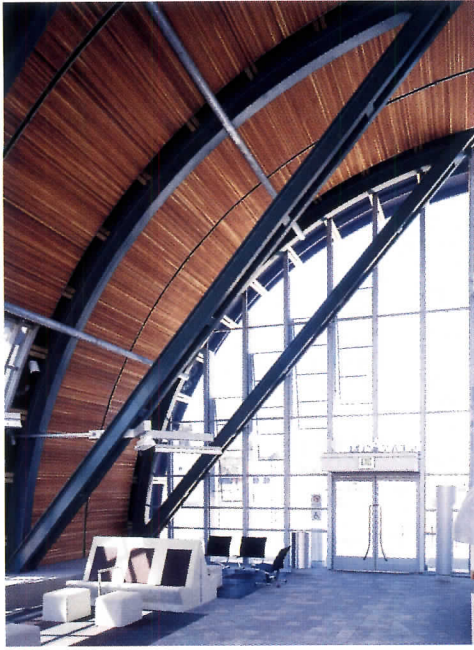
The site section (drawing below) shows the eventual 25-foot depression of the railroad tracks, which would allow car traffic around the station to continue uninterrupted. Following the completion of track work in the next two years, passengers will exit trains and ascend a terraced platform into the station. Palm trees and a wood and metal canopy provide shade along the south side of the station (photos top and bottom left) and a park-like link to the existing town center.

The tower, intentionally unavailable to the public because of its lack of handicap accessibility, serves largely as a civic marker—rising some 68 feet (almost double the height restriction of 35 feet), it makes the station the tallest building in town (opposite).



SITE SECTION LOOKING NORTH





To control interior heat gain, Quigley used principles of passive solar design—shaded south facade, generous cross-ventilation, laminated low-E glass—but air-conditioning was added to ensure comfort. Quigley resolved the need for civic stature with his observation that “I’m designing for people in T-shirts,” and created a grand public space modeled on the form of Quonset huts, popularized in the region during World War II. Panels of redwood strips are infill to the steel structure.

In the waiting area, benches are precast-concrete with rubber inserts (top left and right). A skylight over the ticketing counter (bottom and opposite) connects the two halves of the semi-circular roof. Ducts are arranged decoratively along the tower’s center column. Flooring is asphalt tile.

Credits

*Solana Beach Transit Station
Solana Beach, California*

Owner: North County Transit District

Architect: Rob Wellington
Quigley

Architecture/Planning—Rob Wellington Quigley, Guillermo Tomaszewski, Bob Dickens, Catherine Herbst, Todd Rinehart, project team

Engineers: Integrated Structural Design (structural); James Mann and Associates (mechanical); Flores Consulting Group (civil), Kimley-Horn (traffic); McKay Conant Brook (acoustic)

Consultants: McCulley Design Group (signage/interiors); Patrick Quigley & Associates (lighting); Adams Design Associates (landscape)

General Contractor: Douglas E. Barnhart, Inc.



CO TRAINS

EXIT

WOMEN

Amtrak

When Design Meets Image

By Donald H. Shillingburg

During the last five years, the winners in the retail marketplace have been big-box discounters like Wal-Mart, whose combination of low-overhead and volume sales allows them to reduce prices without reducing profits. Coupled with the explosion in high-fashion “outlet centers,” which offer designer wares at reduced prices, the market is hitting traditional retailers with a devastating one-two punch. Even shopping centers, once stalwart profit engines, have been affected. Looking to generate traffic, they have turned to entertainment and other non-retail offerings. But the problem remains: the retail industry is over-crowded and consumers’ dollars are limited.

The increasing dominance of the big-box, bare-bones retailer is giving manufacturers like Levi’s and Rockport shoes an impetus to enter the retail market on their own. Thus the “flagship store,” once reserved by high-fashion companies for big-city locations, is now being used by manufacturers hungry to communicate directly with their consumers. At the same time, traditional retailers are fighting big discounters by rolling out a new generation of prototype stores that carve out specific niches in a crowded marketplace. What these “brand flagship stores” and new prototypes have in common is the goal of communicating to the consumer a strong identity—connecting a company’s product with a particular life-style, much the same way that advertising has for decades. These stores are as much about exhibiting products as selling them; as such, they are part museum, part store.

Using design to build relationships

Because they are three-dimensional environments, stores can introduce the customer to “what the brand is all about” in a far more comprehensive fashion than a 30-second television commercial can. As Ed Murphy, president of Levi’s Only Stores explains, “It’s about setting up a relationship with the customer and building a bond which extends beyond the single visit.”

Donald H. Shillingburg is a New York City-based writer.

Faster than postal service.

This 400-square-foot prototype shop for Dockers Authentics can be assembled within two days from a kit of display fixtures, standardized elements, and simple graphics. Designed by architect Henry Myerberg and Tucker Viemeister and David Hales of Smart Design, all elements are fabricated off-site, then delivered to the department store or shopping center where the shop will be placed.

The way store design is executed has an important parallel to advertising. In addition to the overtly “architectural” services design firms offer, they are branching out to provide graphic design, furniture and fixture design, and interactive video—all with the goal of building brand identity for clients. In so doing, design firms are blurring the distinction between architecture and advertising, graphic design and merchandising.

Desrippes Gobé & Associates, which designed the new Rockport Shoes prototype (page 112-113), calls itself an “image management and strategic design” consultant, and many of its partners come from industrial design and marketing backgrounds, not architecture. The firm’s methods blend market analysis with strategic planning and the integration of product, graphic, and architectural design.

Not just architecture

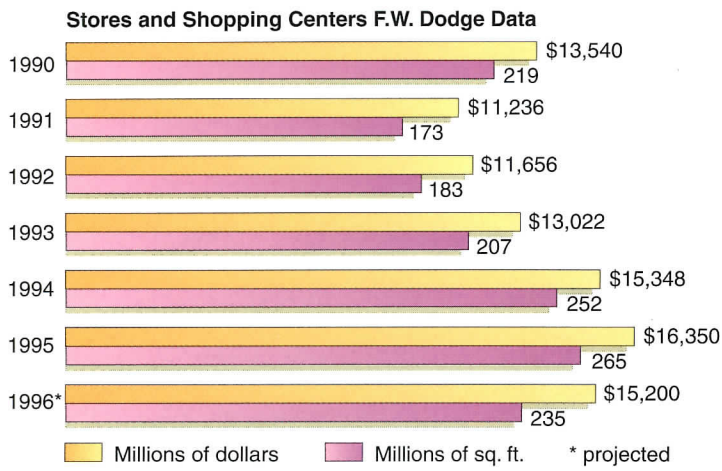
Even traditional architectural firms are broadening the kinds of services they provide retail clients. For example, Bergmeyer Associates in Boston offers image-based services such as graphic design and interactive media, in addition to architectural design, design implementation, and construction supervision. The firm understands that store design is a means of communicating with consumers. The store has to bring the customers in and let them know, implicitly, what the brand is about, says Joseph Nevin, a Bergmeyer principal. Merchandising, packaging, signage, and store design must work together to get the message across. As a result, the retail architect has ceased to be just a form-maker and has become a mediator, bridging the gap between product and consumer.

Nevin, who was the principal-in-charge of the Original Levi’s prototype store (pages 106-107), explains his firm’s process, “It is a form of team building. The architect brings a team of creative people to the table with the clients and their advertising agency. Together we discuss how we might create and communicate an image for the client.



© Peter Mauss/Esto

Firms designing prototype stores are going beyond traditional architectural services, bridging the gap between design and advertising.



In some cases, the clients communicate what they want very clearly, while in others it is much more of a collaborative effort.”

Creating architectural packages for multiple locations

Beyond establishing a brand identity, the key challenge of designing a prototype store is creating an architectural package that can be replicated in a wide range of spaces and settings. Using a kit of materials, graphics, and fixtures, the prototype must make the most of “dumb spaces” found in context-free shopping malls. The design has to allow for a variety of circulation patterns, each allowing the customer to experience the product in a carefully orchestrated way. In the process, the product itself becomes an important design element, as in the Original Levi’s store where gigantic walls of jeans and shirts are color-coordinated to give the wall texture. The store also has to be versatile. Although its architecture can’t change easily, it can incorpo-

rate fixtures, lighting, and graphics that can be altered periodically. Display fixtures are also being called on to provide on-floor storage to reduce the need for sales people to make trips to the stockroom.

Adaptability has been pushed to the maximum at a mini-IKEA shop in New York City, where the entire product line—and hence the look and design of the space—changes every season (below). Designed by the Walker-Group/CNI, the store changes merchandise, displays, and graphics every few months to transform itself from IKEA Cooks (featuring kitchen wares) to IKEA Sleeps (displaying bedroom furniture and accessories) to IKEA Plays (showcasing toys).

Because prototype stores are “rolled out” to various locations, ease and speed of construction are key factors in their design. Architect Henry Myerberg and industrial designer Tucker Viemeister responded to these factors in their design for a 400-square-foot display for Dockers Authentics (opposite), which can be installed in department stores. The store-within-a-store is made of inexpensive materials assembled off-site and can be shipped in and set up in two days. Today many stores are going high-tech, installing electronic information kiosks where shoppers can use interactive terminals to learn more about the company—and the brand. Of course, the interactive nature of these kiosks also allows the company to learn things about the customer—such as age, income, shopping habits, and so forth. A variety of video and electronic displays throughout the store allows the retailer to mix advertising with sales, bringing commercials directly to the sales floor. The task for architects is incorporating all these electronic gadgets and displays seamlessly into the overall design of the store.

The greater challenge for retail architecture and design, however, is to carve out a niche in the minds of consumers and fill it with the client’s brand identity. ■



If this is cookware, it must be autumn. Having established a reputation for its big-box stores in suburban locations, IKEA is now moving into cities with small outlets that focus on one product line at a time (left and far left). The prototype design by the Walker Group/CNI uses elements such as a long ramp and simple display shelves to create an environment that can accommodate various merchandising strategies while projecting a unified brand identity.

The Original Levi's Store

New York City

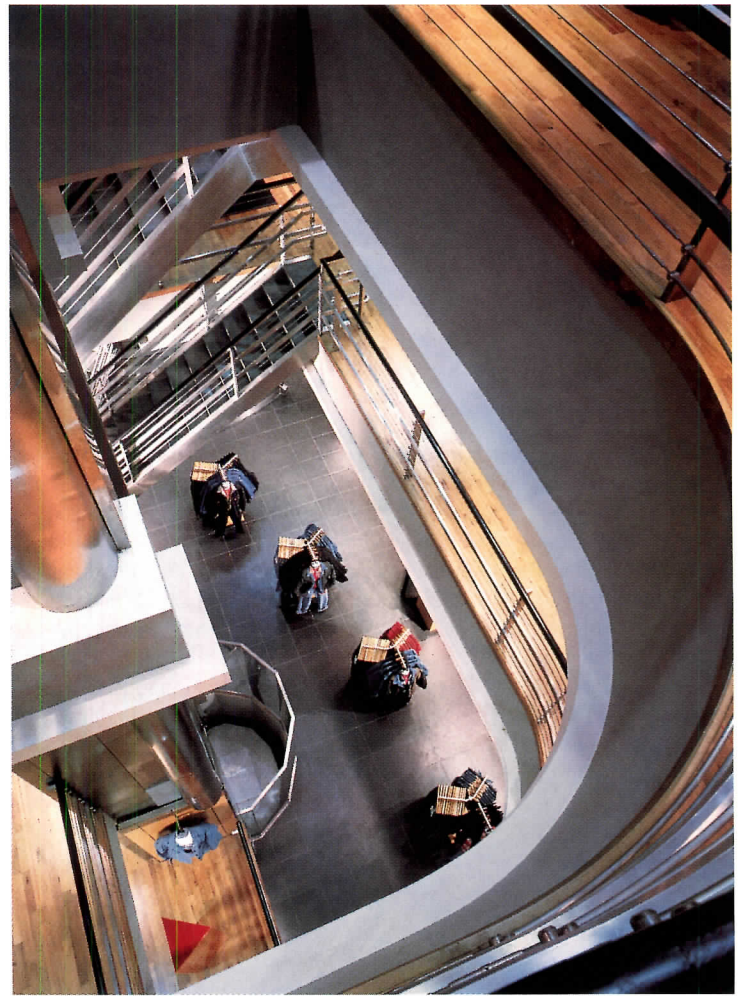
Bergmeyer Associates, Architect

© Chun Y. Lai photos



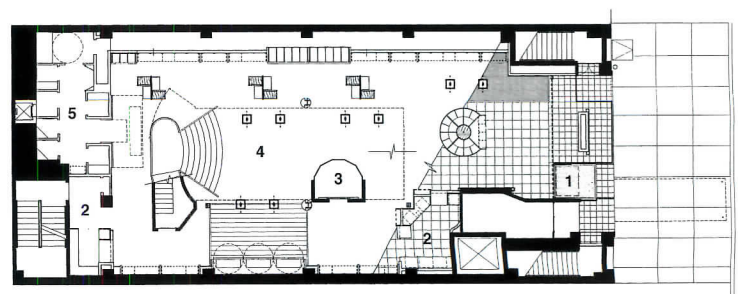
This brand-flagship store allows Levi's to present its entire line of clothes, from shoes to hats, and still have room to experiment with new styles. Ed Murphy, the president of Levi's Only Stores, explains, "It allows the customer to step into the Levi's brand, experience it, and be impressed by its breadth." Although the store must remain profitable, it functions largely as a marketing laboratory where the company

can test new items, see what sells well, and experiment with various ways of relating its products to an entire life-style. The Levi's prototype design, developed by Bergmeyer Associates' Joseph Nevin and Dan Broggi, consists of two inter-related layers of design: a few eye-catching elements that grab shoppers' attention and a set of circulation strategies that guide people through the store. From the



Music videos projected onto a giant screen (opposite right), interactive computer kiosks (opposite left), and a hard-edged palette of materials work together to create an environment in which Levi's is identified with a hip-and-cool, fast-paced lifestyle. Bergmeyer Associates used a grand staircase to help orient shoppers and open views to several floors at the same time.

1. Entry
2. Cash desk
3. Elevator
4. Sales
5. Fitting rooms



FIRST FLOOR

20 FT.
6 M.

large red backdrops in the store's front windows to a large video projection system at the back of the ground floor, the architects made the most of a few memorable design elements. Because the New York City store occupies an unusual space with a two-story-high ground floor and two additional floors above that, customer circulation is difficult. In retail establishments, high ceilings aren't always welcome

since they can push products on display out of reach of customers. Although an open-glass elevator was already in place, the designers had to draw customers in and up to the higher floors where most of the jeans are sold. To accomplish this, they created a large open stairway that fans out on the ground floor, just below the video wall. Each of the upper floors wraps around the circulation space, surrounding the

customers with product displays. One of the most appealing aspects of the design is the way it uses the product itself as a design element. For example, wall fixtures appear as gigantic stacks of jeans, arranged vertically by color, so the two-story space is turned into an advantage—the gigantic multi-colored walls of clothes impress rather than intimidate the customer. *D.H.S.*

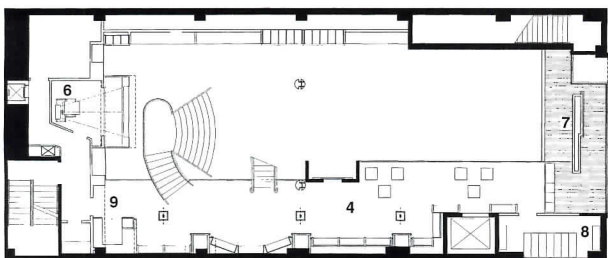
Credits

Architect: Bergmeyer Associates—Joseph P. Nevin, Jr., principal-in-charge; Daniel Groggi, project manager

Engineer: Lovett and Rozman Associates (structural)

Consultants: Ripman Lighting (lighting design); GAVI Industries (audio/visual); Crimson Tech (interactive kiosk)

Construction Manager: Richter + Ratner Contracting



- 6. Video
- 7. Display
- 8. Storage
- 9. Cash/wrap

MEZZANINE

Bottega Veneta

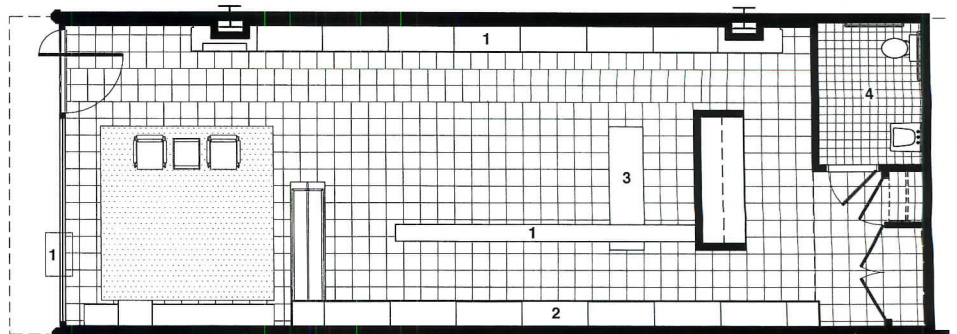
Copley Place Mall, Boston, Massachusetts
Francois de Menil, Design Architect
Bergmeyer Associates, Architect of Record



© Paul Warchol photos



1. Display
2. Storage
3. Cash register
4. Restroom



MAIN FLOOR

N ← 6 FT.
3 M.

This high-end Italian leather-goods retailer turned to Francois de Menil to give its stores a distinctive, Modern image that would appeal to younger customers. De Menil's strategy was to blur the distinction between the display and the product being displayed. "We thought that the whole store should be the display," explains the architect. Like a good showman, de Menil offers sneak peeks without

revealing everything all at once. Some items are discreetly tucked inside deep openings in the main display along one wall, while others are hidden completely behind sliding doors. By displaying items as if they were in a museum, each the focus of its own space, de Menil and his associates give the merchandise an aura of treasure. While isolating key items in this way, de Menil accommodated the full range of

product colors and line items by designing fixtures that double as storage cabinets. "We wanted there to be a small ceremony to purchasing a product. As the customer selects what he or she wants, the salesperson opens an adjacent drawer and the whole range of colors is made visible," explains de Menil. The more interested the customer gets, the more choices are revealed. *D.H.S.*

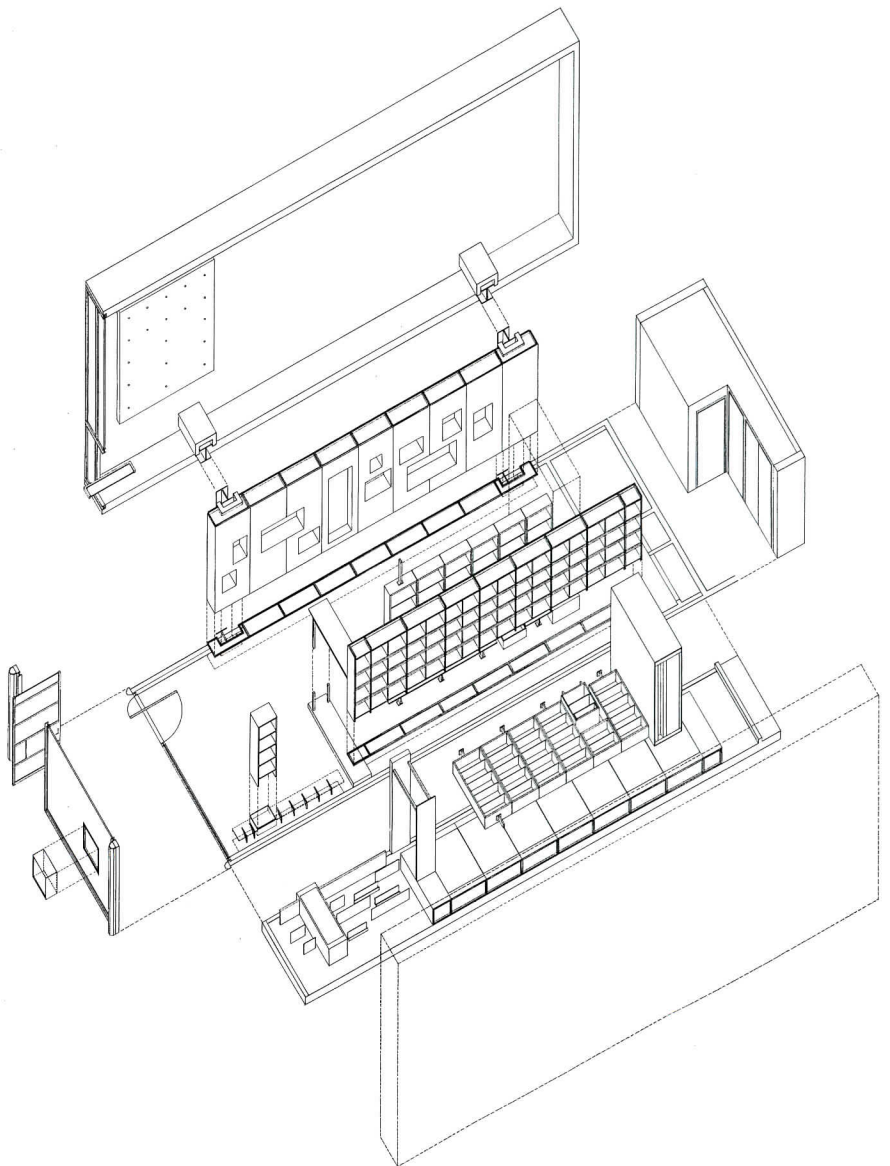
Credits

Design Architect: *Francois de Menil, Architect—Francois de Menil, principal-in-charge; James Moustafellos, project architect; Viken Arslanian, John Blackmon, Jan Greben, Stephen Leventis, Lavinia Pana, Marek Walcrak, project team*

Architect of Record: *Bergmeyer Associates—Nina J. Monastero, senior associate; Jeanne Carey, project manager*



The clean lines and minimalist style of the store express the company's elegant European identity. Drawing (above) shows how the architects designed a system of drawers and cabinets that keep merchandise on the sales floor but out of sight.



Sprint Spectrum

Tyson's Corner, Virginia
CORE, Architect

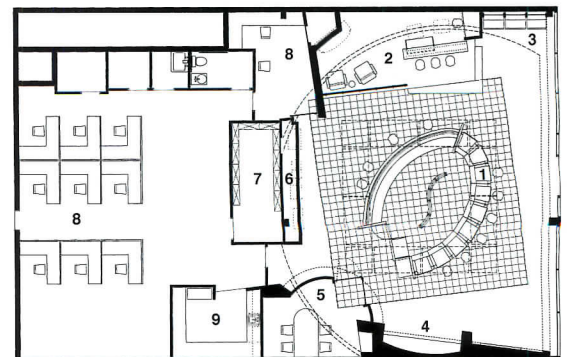
In designing a chain of mobile-telephone stores, the Washington, D.C.-based architecture firm CORE was asked by American Personal Communications to express the excitement of a new technology, while making it accessible to everyone. Somehow the design had to be both cutting-edge and warm-and-fuzzy. The stores, located in Washington, D.C., and its suburbs, sell both equipment and

service contracts for the new PCS telecommunications technology. This mobile phone system makes use of digital communications over a new frequency. In bringing this product to market, the owner knew it would have to educate people about the technology before they would be willing to buy it. The stores themselves would have to carry much of the burden of teaching consumers about the system, how it works,

© Michael Moran photos



1. Kiosk
2. Lounge
3. Applications
4. Accessories
5. Conference
6. Video
7. Storage
8. Office
9. Pantry



MAIN FLOOR

N ←

16 FT.
5 M.

and what kinds of sales and service options are available. "They wanted us to give a place and a face to this new form of consumer technology," explains Peter Hapstak, a CORE partner. "So we tried to mix communicative high technology like interactive video with warm materials and colors." The design leads customers around the store and past a series of displays that explain the technology and how it

works. On entering the store, customers move around an elliptical counter in the center of the space. Initial stops along the way include an interactive kiosk and a display of the phones themselves, followed by several panels that give a description of the types of service available. Finally the customer arrives at the central desk where a salesperson can answer any questions and take orders. The key element in the design is

the central ellipse from which the sales staff operates. It was decided that a wandering sales staff would be too intimidating, so information would be provided at the customer's request. Both the route and the displays along it were designed to give customers the chance to learn about the technology on their own, while always being close enough to the central counter to ask questions. *D.H.S.*

Credits

Architect: CORE—Peter F. Hapstak III, Dale A. Stewart, partners; Ghassan Abukurah, project architect; Luis Boza, F. Quito Banogon, project team
Engineers: Face Associates (mechanical/electrical/plumbing) Rathgeber/Goss (structural)
Lighting Consultant: Coventry Lighting
General Contractor: The J.R. Austin Company



To express the high-tech aspect of the telephones sold here, the Sprint Spectrum stores include a variety of video displays—from interactive computer screens to television monitors. At the same time, warm colors and a ceiling painted like the sky (opposite) help project a sense of friendliness. Cubicles along one wall (rear of photo above left) provide some acoustical privacy for shoppers trying out phones.

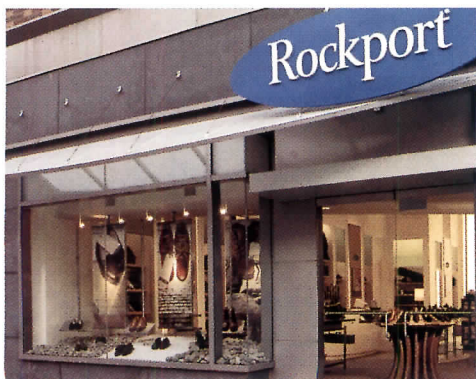
The Rockport Store

*New York City
Desgrippes Gobé & Associates, Designer
Barry Koretz Associates,
Architect of Record*

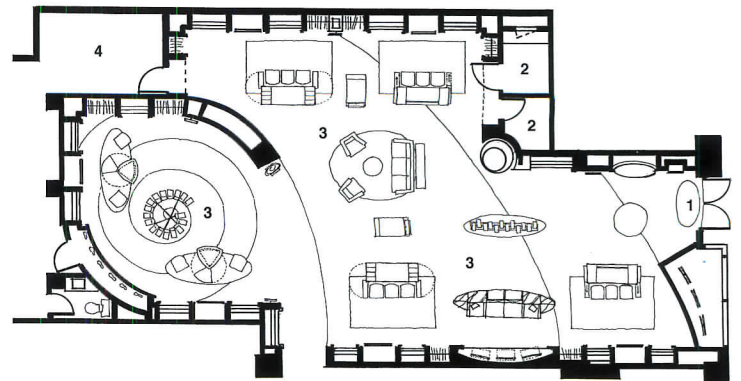
© Andrew Bordwin photos

Known for its comfortable but stodgy shoes, the Rockport Company hired Desgrippes Gobé & Associates to help it develop a more exciting and fashionable image to boost sales. Starting with a new strategy—targeting younger Baby Boomers aged 35 to 45—and then weaving together packaging, advertising, graphics, and architecture, Desgrippes Gobé has given the once-sleepy brand a sharper,

more dynamic image. Playing off the company's original home in Rockport, Maine, the new image, explains Desgrippes Gobé partner Ken Hirst, evokes "a place where the land meets the sea"—a place that is environmentally correct and casually fashionable. The colors, layout, and materials used in the new stores all subtly recall ocean and shore-line imagery. The 2,800-square-foot flagship store, the



1. Entry
2. Fitting
3. Sales
4. Stock



MAIN FLOOR

12 FT.
4 M.

first of which is on the Upper West Side of Manhattan, is organized into three zones, each corresponding to a different kind of shoe: rugged, relaxed, and refined. These areas stretch as bands across the store, forming the curves of a nautilus shell that culminate in a large backlit wall “meant to evoke the Rockport lighthouse,” says Hirst. Reflecting the different nature of the shoes and the lifestyles associat-

ed with them, the designers varied the colors and materials in each of the three zones, keeping the fixtures mostly the same. For example, in the “rugged” area the floor covering is a rough tile, whereas the tile in the “relaxed” area is smoother. At the same time, the colors used in the store get brighter, lighter, and purer the closer one gets to the “refined” zone enclosed by the great curving white wall. *D.H.S.*

Credits

Designer: *Desgrippes Gobé & Associates—Ken Hirst, partner-in-charge*

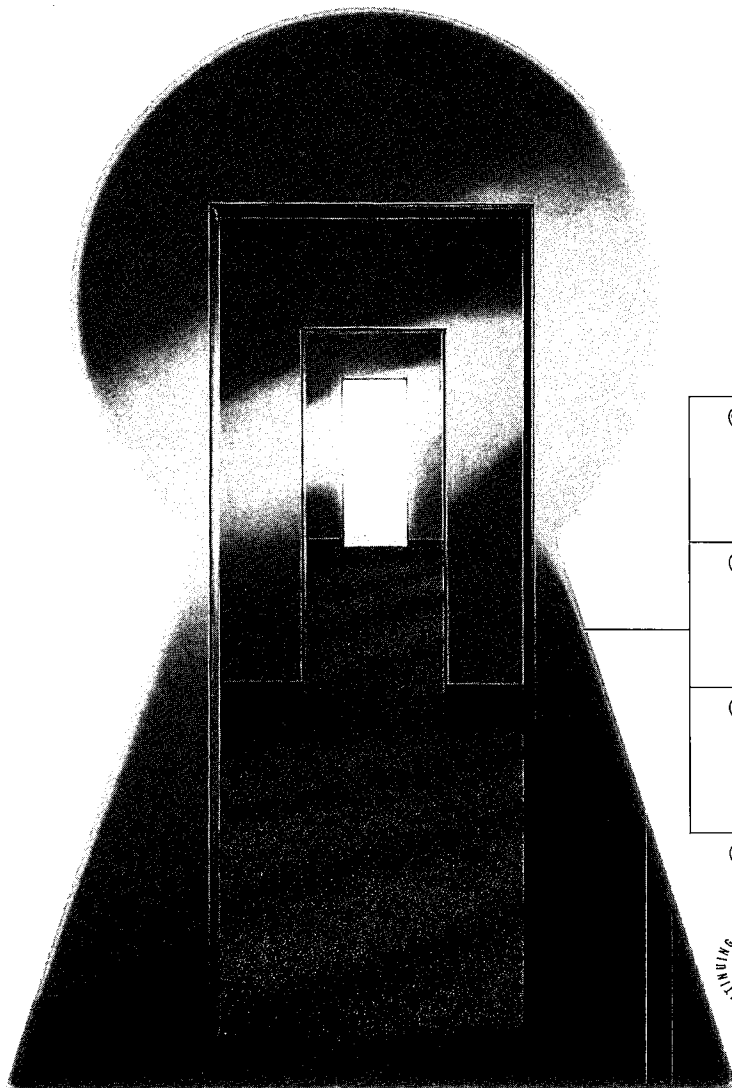
Associated Architects: *Barry Koretz Associates (architect of record); Ahearn Schopfer & Associates (construction documents)*


Lighting Consultant: *Lighting Management, Inc.*


General Contractor: *GC Contractors*





One of 12 flagship stores that will be built, the New York City outlet addresses the street with lots of glass and a metal canopy (opposite bottom). Adjustable fixtures display shoes as if they are in motion (opposite top), adding a dynamic touch. An information kiosk (right in photo opposite) includes print, video, and electronic media. Ceilings range from 9 feet high at the entry to 17 feet in the “refined” zone (above).



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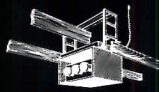
SWIVEL BASE



PANEL LIFT



POP-UP TABLE

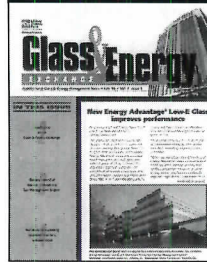


POP-DOWN PROJECTOR

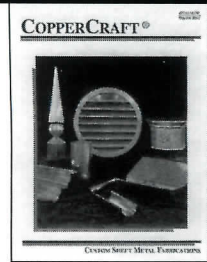
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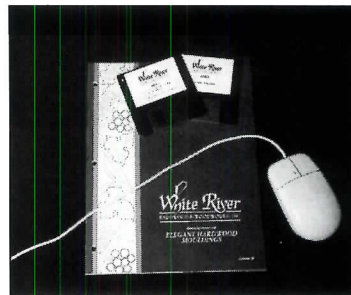
Product Literature



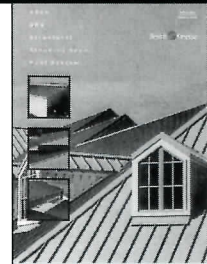
200. Glass-technology update
A new quarterly newsletter offered without charge to architects, *Glass & Energy Exchange* aims to keep readers current with glass technology and glazing techniques, inform on strategies for selecting glass, and discuss changes in energy and other codes as they affect fenestration design. Fax requests: 419/247-4517. Libbey-Owens-Ford, Toledo, Ohio. *



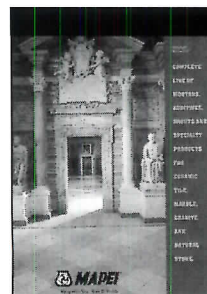
201. Sheet-metal accessories
Working with copper, terne-coated stainless, zinc, and other metals, CopperCraft prefabricates architectural elements such as cornice, dormers, cupolas, domes, finials, and decorative conductor heads and gutter systems. A color catalog illustrates standard products, and describes custom-design and restoration services. 800/486-2723. CopperCraft, Dallas.



202. CAD design for mouldings
A PC/Windows program helps an architect develop room designs with decorative embossed-wood mouldings. Users can view profile drawings of crown and cornice mouldings, place them in a "real" space, and print out details of custom-composite trim. Price: \$19.95. 501/442-6986. White River Hardwoods-Woodworks, Inc., Fayetteville, Ark.



203. Standing-seam roof guide
Wind-uplift and maximum-positive load data for this maker's standing-seam roof panels are given in a four-page architectural guide. Custom roof-design capabilities include continuous long-length panels—up to 220 ft—for projects where end laps must be eliminated. 800/759-7474. Smith Steelite, Moon Township, Pa.



204. Tile-setting materials
A 16-page Sweet's catalog covers a full line of grouts, mortars, additives, underlays, and other products for ceramic-tile installations, including exterior cladding, pools, and flooring. Describes newer hydraulic products as exhibiting very high strength, rapid cure, and uniform coloration. 800/992-6273. Mapei, Garland, Texas. *



205. Engraved glazed masonry
Spectra-Glaze block can be ordered with both standard-pattern and custom-design signage, logos, and decoration engraved in the facing. As stain-resistant as the smooth-surfaced face itself, engraving lets the block work as both wall and signage; detailed murals can be incorporated as well. 800/638-3188. Burns & Russell Co., Baltimore. *Continued on page 131*

* Product Data on CAD disk
For more information, circle item numbers on Reader Service Card.



Or the second woman appointed to the Supreme Court?

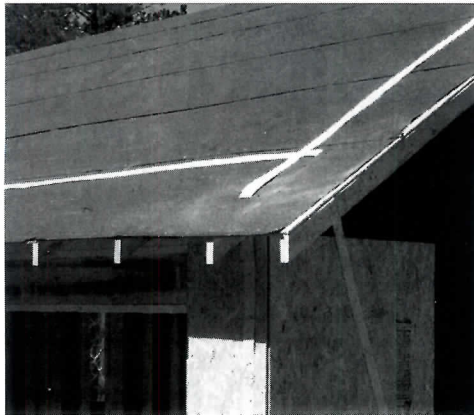
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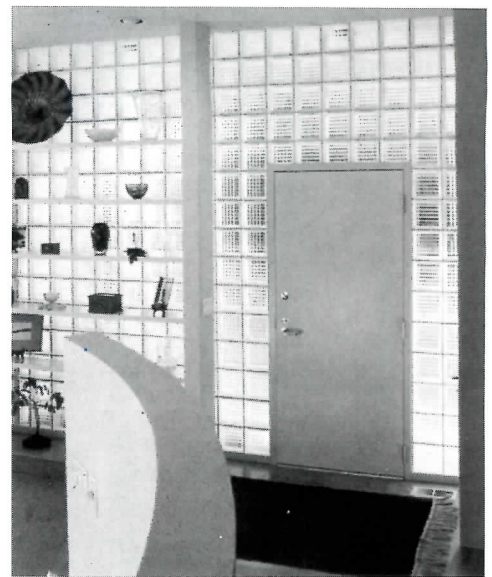
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New Products



167. Uplift-resisting reinforcement

Millibar strapping, furnished in 3-in.-wide, 230-ft-long rolls, is a structural composite of Kevlar fibers with a tensile strength of 525,000 psi. A supplemental restraining system to be used in conjunction with conventional load-path devices, the material goes from the foundation up the side wall, over the roof and back down, reinforcing wood- and light-steel structures against high-wind loads. Installation in X- or V-patterns on side walls improves a building's seismic performance. A catalog gives test data. 770/844-9438. New Necessities, Gainesville, Ga.

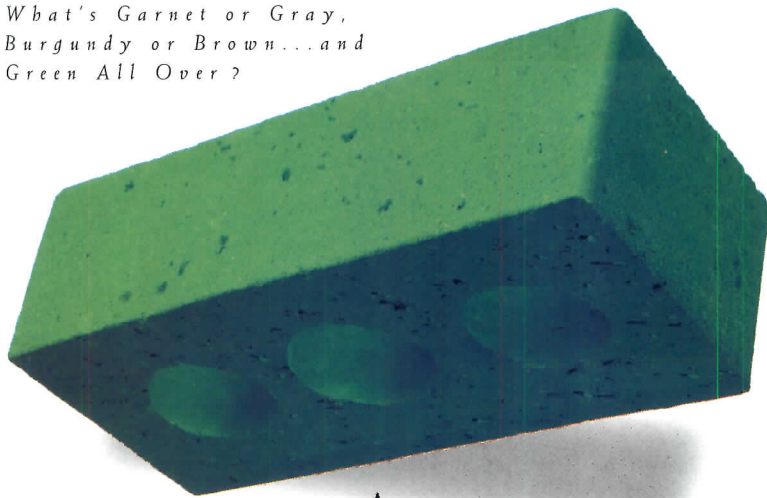


168. Impact-standard glass block

Glass-block windows fabricated with this maker's KWIK'N EZ flexible, all-silicone installation system have passed the new South Florida impact and wind-pressure tests. The approved assembly (not pictured) used 7 3/4-by 7 3/4-by 4-in.-thick Thickset block. The exterior wall (above), built with Argus-pattern units, transmits 75 percent of available light; this block can have a 45-minute fire rating in 6- and 8-in. unit sizes. 412/327-6100. Pittsburgh Corning, Pittsburgh.

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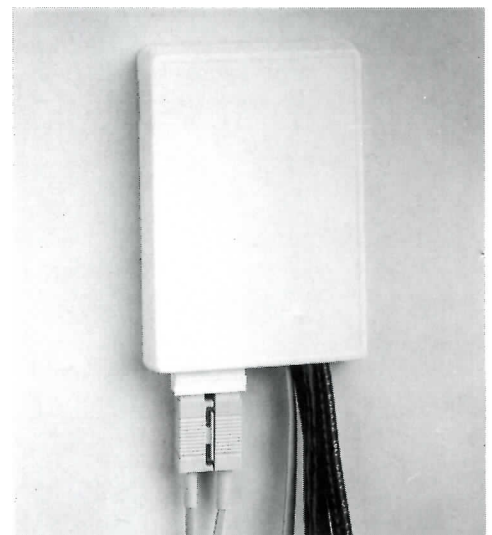
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169. Work-area multimedia outlet

A flush-faced outlet box conceals and protects connections for mixed-media cables, including ST- and SC-style fiber-optic and twisted-pair cable. Faceplate can be ordered in four colors and stainless steel; its shallow depth permits furniture to be placed directly against the faceplate without dislodging the connection. 717/986-5160. AMP, Inc., Harrisburg, Pa. ■

Circle 46 on inquiry card

Product Literature



206. Commercial tile

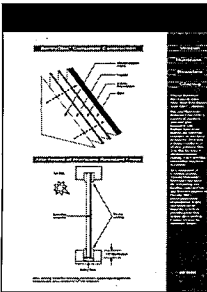
A 24-page catalog covers tile made specifically for commercial-use codes and traffic requirements. Illustrated by product and application photography, with color-option, test, and dimensions given for each tile type. Describes The Sample Connection, a rapid-response specification program. 800/FLA-TILE. Florida Tile Industries, Lakeland, Fla.

Firestone Building Products



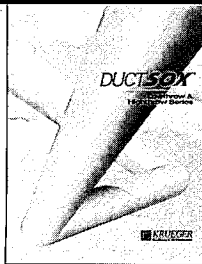
207. Single-source roofing

A 22-page Sweet's catalog gives material, performance, and installation details on RubberGard EPDM, modified-bitumen, and UltraPly roofing product lines, and specifications on ISO 95+ polyisocyanurate insulation. Available via the Internet at firestonebpc.com, or by calling 800/428-4442, x 7084. Firestone Building Products Co., Carmel, Ind.



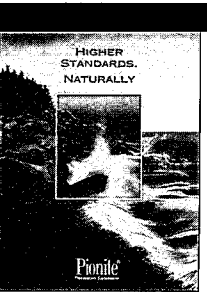
208. Hurricane-resistant glass

A new glazing option that passes Miami/Dade impact tests in a single-pane configuration, Hurricane-Resistant Glass uses DuPont's SentryGlas composite (a factory-laminated layer of PVB, polyester film, and an abrasion-resistant coating) on the interior surface. Requires 1/2-in. bite in retrofit applications. 800/533-2080. Viracon, Owatonna, Minn.



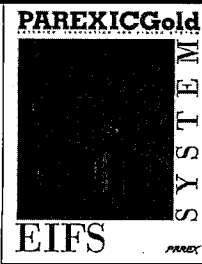
209. Air ducts made of fabric

DuctSox need no separate grilles: the ducts themselves diffuse cool air through the surface of the material without intrusive drafts. Said to distribute even-temperature conditioned air throughout large spaces. Fabric acts as its own filter, and can be ordered in colors to work with interior designs. Data in CD-ROM format. 520/295-8500. Krueger, Tucson, Ariz.



210. Custom-pattern laminate

A colorful catalog illustrates Pionite laminates for interior use, including ChemGuard solvent-resistant material for healthcare and laboratory surfaces, fire-rated and static-dissipative products, and a low-minimum-order custom-design program. Quick-ship samples offered to specifiers. 800/746-6483. Pioneer Plastics Corp., Auburn, Me.



211. Impact-resistant EIFS

A brochure describes the I-C Gold mechanically attached exterior system as particularly suitable for retrofit applications, as it can maintain existing design elements while providing a new, thermally improved weatherproofing cladding. ASTM fire and other test results cited. 800/537-2739. Parex Inc., Redan, Ga. *Continued on page 131*

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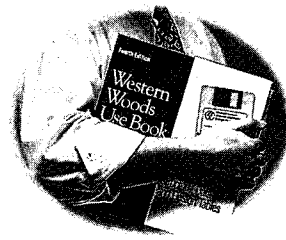


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Special Report continued from page 22 implies a radical shift in standards from blocks of knowledge to modes of thought," says Mitgang. "Communication" would become "sharing of knowledge" in this new understanding; "design," "integration of knowledge." Diverse programs should be encouraged that integrate technical and practical knowledge and offer flexibility.

Although current programs are effective in teaching design skills, students need help in computer-aided design and writing skills, in non-Western studies, and in construction materials. One deficiency stood out—graduates overwhelmingly mentioned "professional practice" as the greatest shortcoming in their education.

Goal 4: "A Connected Curriculum"

After completing their coursework all graduates should leave schools of architecture not as fully trained technocrats, but as "reasonably competent beginners." A more liberal curriculum would also provide greater exposure to the great ideas and personalities of history, philosophy, and literature, preparing architects to confront ethical and moral dilemmas plaguing the contemporary world. A more liberal education would prepare architects to communicate with the public, a critical professional shortcoming.

Goal 5: "A Climate for Learning"

Ideally, students will reach beyond the rarified world of the design studio to encounter the entire university community, according to the report. "The whole rationale for moving the focus of professional education from apprenticeships in the 19th century to the campus was that certain types of education are best done on campus," contends Mitgang. However, researchers often found today's students to be socially isolated, physically removed from campus centers, and overworked. The architectural school, Mitgang asserts, should be "a caring place, a just place, open and communicative, interesting, even celebrative," reflecting a diverse student body and faculty.

Goal 6: "A Unified Profession"

Schools that are open, communicative places can help achieve a unified profession. They can help students find work and provide better counseling; professionals can take a more active role in educating future architects through mentorships, pre-graduate and post-graduate internships, and continuing education. Economic challenges abound, however, hampering some schools' abilities to respond. "One school is struggling [to improve] but they don't have secretaries."

Others lack libraries, materials labs, and scholarships to increase diversity.

Goal 7: "Service to the Nation"

Whatever their material resources, architectural schools are most effective when they foster "a climate of engagement" for faculty and students. The study concludes with a call to action entitled, "Service to the Nation."

The report was born out of the shared concern of architects, students, and educators for the future of architectural education. A consortium of five organizations commissioned the study in 1993: the American Institute of Architects, the American Institute of Architecture Students, the Association of Collegiate Schools of Architecture, the National Council of Architectural Registration Boards, Inc., and the National Architectural Accrediting Board, Inc.

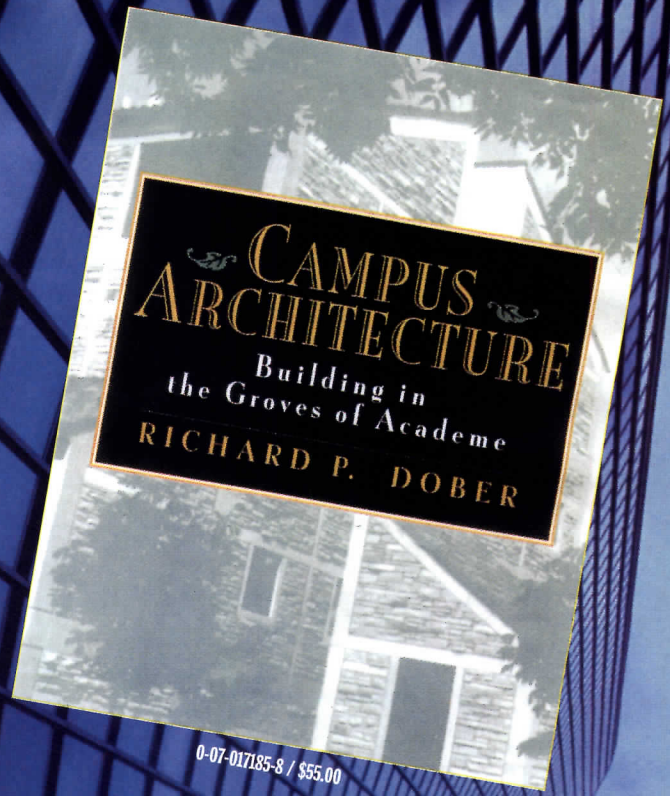
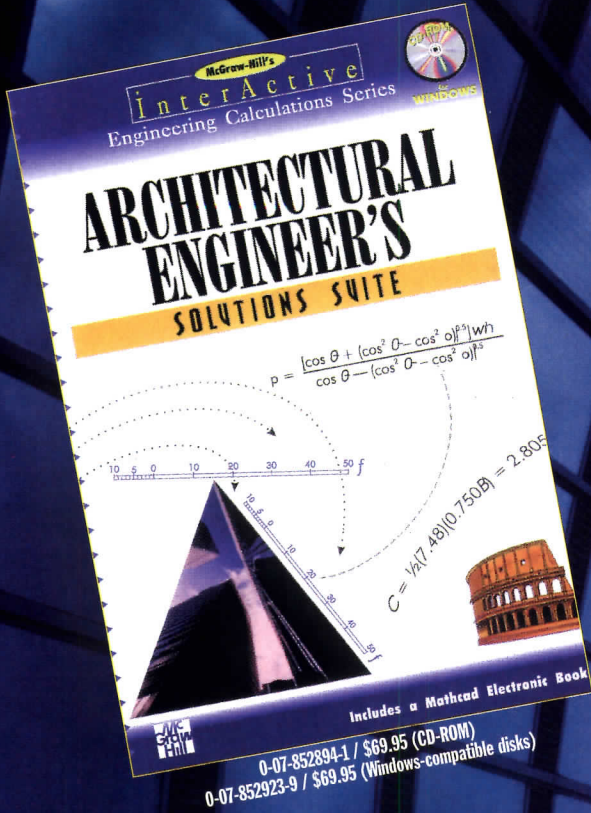
Solid Reputation

Building Community is expected to provoke widespread interest throughout the architectural community and the larger world of education, in part because it has been issued as a Carnegie Foundation report. In the past, the foundation's investigations have triggered significant changes in other disciplines, including medicine, which was the subject of a landmark study in 1910.

Another critical factor is the reputation of the co-author, the late Ernest Boyer. Former president of the Carnegie Foundation and a former U.S. Commissioner of Education, Boyer was regarded as a pre-eminent educator and author. He died in December 1995, five months shy of the publication of his final work.

An example of successful practices drawn from *Building Community*:

"Texas A&M University's College of Architecture operates one of the nation's most ambitious architectural research programs. It includes a Hazard Reduction and Recovery Center, which studies ways to reduce damage from natural and technological disasters; the CRSS Center, which studies issues related to management in the design and construction industries; a Visualization Laboratory, which studies computer animation and electronic design simulation; the Center for Housing and Urban Development, which has students and faculty working on the needs of impoverished 'colonias' communities along the Texas-Mexico border; and a Psychophysiology Laboratory, which conducts basic research on how built structures affect human psychology and physiology." ■

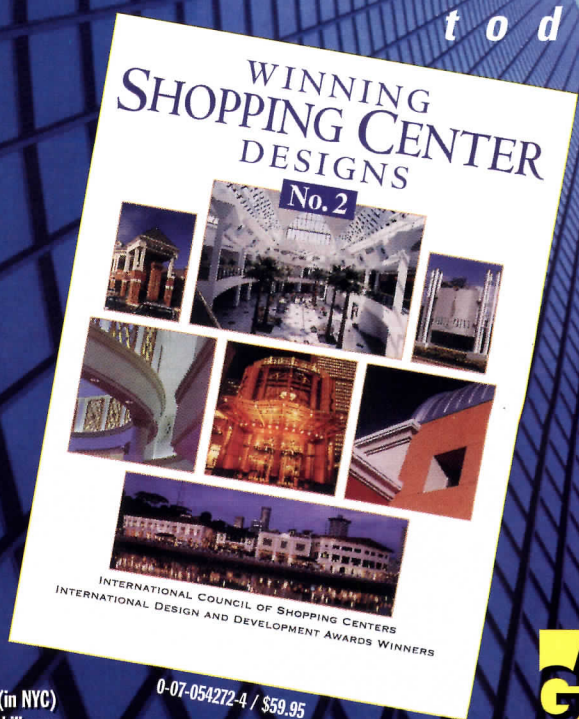
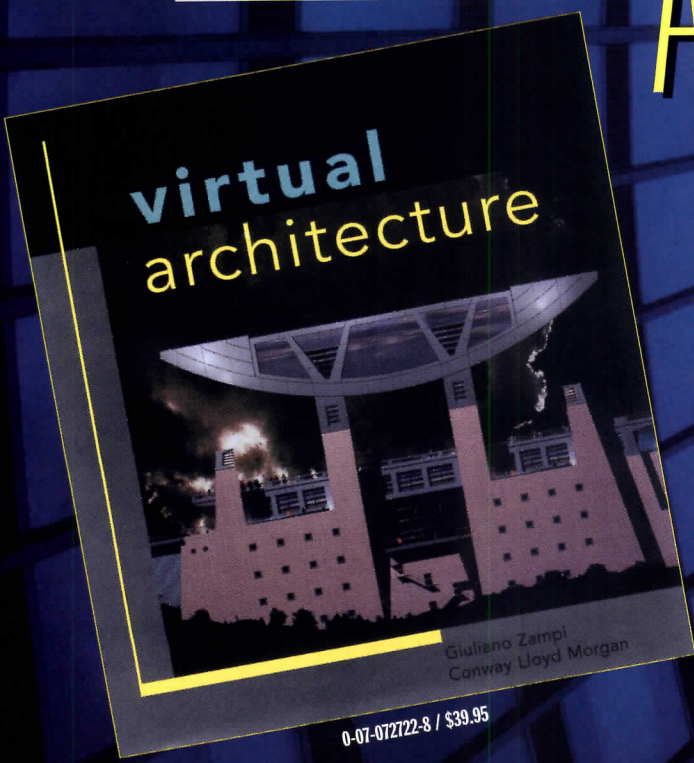


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Manufacturers' Sources

Pages 72-79

Silicon Graphics Entry Site
Studios Architecture, Architect
Curtain wall, entrances: Walters & Wolf Glass.
Cladding panels: Mitsubishi (Alpolic). Tinted glass: PPG Industries. Laminated glass: Viracon. Exterior standards: Poulsen Lighting. Lobby pendants: Nova Industries. Reception desk: custom by architects, fabricated by Woodtech Industries.
Countertop: Syndesis, Inc. (Syndecrete). Railings: Lee's Imperial Welding. Corridor carpeting: Interface Flooring Systems. Office system: Herman Miller. Indirect fixtures: Peerless Lighting. Ceiling: Armstrong World Industries. Ductwork: designed and fabricated by ACCO. Paints: Kelly Moore.

Pages 80-85

Forrestal-Bowld Music Center, Phillips Exeter
William Rawn Associates, Architects, Inc.
Lead-coated copper roof: Revere Copper. Brick: Stiles & Hart. Buff-color mortar: SGS. Cast stone: Duraston. Windows: Kawneer Co. Torchieres: Custom by architects, fabricated by Visa Lighting.
Tile floor: Chromtech Porcelain. Railing: Kempo. Sconces at stair—Murano Glass; on wall—Shaper. Paints: Sherwin Williams. Rattan furnishings: Smith & Hawken. Rug: Prince Street Technologies. Woodwork: American Woodcraft. Windsor chairs, tables: Charles Webb. Cherry-veneer doors: Weyerhaeuser. Orchestra rehearsal—VCT floor: Azrock. Pendants: Shaper. Wallwashers: Peerless Lighting. Wall panels: Conwed; Guilford of Maine fabric. Acoustic treatment: International Cellulose (K-13). Orchestra chairs: Wenger.

Pages 86-95

Suntec City, Singapore
Tsao & McKown, Architect
Aluminum cladding: Huat Aluminum, Ltd. Heat-strengthened insulating glass: Asahi Glass Co.
Curtain wall: Permasteelisa Pacific, Ltd. Granite cladding and pavers: fabricated by Campolonghi Italia; Stone Specialist. Elevators: Ryoden, Ltd. Escalators: General Electric; Otis.

Pages 96-103

Solana Beach Transit Station
Rob Wellington Quigley Architecture/Planning
Curtain wall: Torrance Aluminum, fabricated by Tri City Glass. Laminated solar-control glazing: Southwall Technologies. Reflective glass: I.C.D. (Opaci-Coat). Zinc roofing: Cominco. Sunscreens: Cambridge Wire Cloth. Paneled ceiling: Redwood. Glulam beams: Alaskan Yellow Cedar. Entry doors: Rotoswing. Pulls: Elmes. Interior doors (wood): T. M. Cobb; hollow-metal doors: SteelCraft. Closers: Dorma. Locksets: Best. Hinges: Hager. Linear fluorescents: Zumtobel. Cylindrical spots: Lumière. Seating: Via. Benches: Quick Crete Products. Wood stain: Ameritone. Metal paint: Tnemec. Asphaltic floor: Hastings Pavement Co. Rubber tile: Carlisle Tire & Rubber (Soft Pave). Ticket-counter lighting: Poulsen Lighting. Air-diffusing vents: Seiho. Clock: Electric Time.

Pages 106-107

The Original Levi's Store, New York City
Bergmeyer Associates, Architect
Birch doors, maple cabinetry and paneling: Conrad Corp. Locksets: Schlage; Arrow Locks. Granite

tile: Louis W. Mian. Wood floor: Junckers. CFL recessed downlights: Indy. Accents and floods: Lightolier. Incandescent track: Juno. CFL wallwashers: Columbia. Quartz wallwashers: Elliptipar. Cash-desk light: Lucifer. Leather chairs: de Sede.

Pages 108-109

Bottega Veneta, Boston
Francois de Menil, Design Architect; Bergmeyer Associates, Architect of Record
Patch-fit display: Keer Design/Michael Scheiner. Sandblasted glass: PPG (Starfire); Bendheim Architectural Glass. Paints: Benjamin Moore. Cabinetry: Bonetto Art Legno; Leveille Woodworking. Limestone: Precision Stone. Fluorescent fixtures: Legion Lighting; Lightolier. Halogens: Prescolite. Display: Celestial Lighting. Seating: Knoll. Sisal carpet: Karistan/Bigelow.

Pages 110-111

Sprint Spectrum, Tyson's Corner, Virginia
CORE, Architect
Laminated glass: Sumiglass. Special paint: Surface Protection Industries (Polomyx). Perforated-metal panels: McNichols. Lighting: Edison Price; Leucos: Progress; Lightolier; CJ Lighting.

Pages 112-113

The Rockport Store, New York City
Desgrappes Gobé & Associates, Designer
Barry Koretz Associates, Architect of Record
Tinted- and laminated-glass panels: Bendheim. Flooring: Adoquin Stone Tile. Seating: Herman Miller. Fixtures: Lightolier. ■

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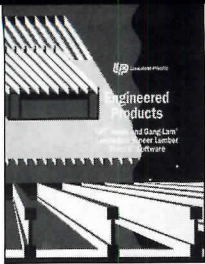
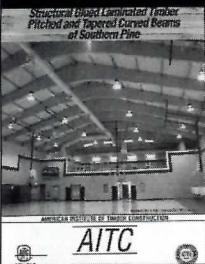
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Product Literature



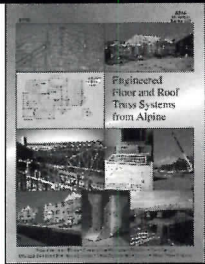
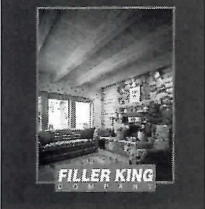
212. Curved glulam beams

A design guide illustrated by church and institutional projects discusses the structural capacity and esthetic appeal of pitched and tapered curved pine beams. Includes span tables and technical data; beams are available in both symmetrical and unsymmetrical configurations. 303/792-9559. American Institute of Timber Construction, Englewood, Colo.

213. Engineered wood

A four-page Sweet's catalog highlights LPI joists, Gang-Lam laminated-veneer lumber, and OSB rim board, components of the maker's "Solid Start" program said to insure the long-term strength and non-squeak performance of residential floor systems. Explains Wood-E engineering software. 800/299-0028, x704. Louisiana-Pacific, Portland, Ore. *

LAMINATED WOOD ROOF DECKING



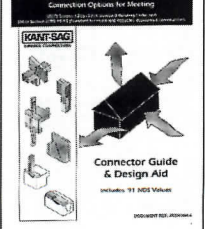
214. Laminated-wood decking

Heavy-timber roof decking laminated from Douglas fir, larch, Ponderosa pine, and inland red cedar combines the warm appearance of natural wood with loading capacity that withstands racking and lateral loads. A brochure gives dimensions, loading tables, and lay-up suggestions; decking can be specified pre-finished. 208/337-3134. Filler King Co., Homedale, Ida.

215. Floor and roof trusses

Wood trusses are designed to meet specific span, configuration, and load conditions of residential, commercial, and industrial structures. An eight-page catalog gives span and loading data and framing details. Fire-rated systems are available; demonstration videos and CAD support offered. 305/781-3333. Alpine Engineered Products, Pompano Beach, Fla. *

Hurricane Framing Connectors



216. Hurricane connectors

A 20-page connector guide and design aid can help architects satisfy SST-D-10-93 of the Southern Building Code, which deals with uplift and horizontal forces produced by high wind. Allowable resisting loads are cited with all wood-to-wood and wood-to-masonry connectors; explains the importance of a continuous load path. 800/526-8724. Kant-Sag, Montgomery, Minn. * Product Data on CAD disk

217. Laminated-veneer lumber

A 1996 catalog has 24 pages on engineered-wood beams and headers, illustrating bearing details and supplying spacing and allowable uniform loading data for specific applications. Beam depths are matched with the correct Kant-Sag or Simpson connector; describes FastBeam design-analysis software. 800/423-2408. Georgia-Pacific Corp., Atlanta. * ■

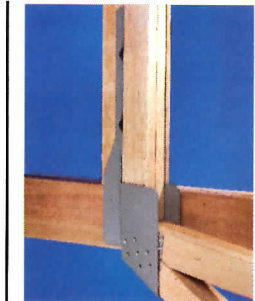
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INNOVATION ON DISPLAY

Construction Technology 96

The Conference and Exhibit for New
Technologies in the Building Industry

Sponsored by
Construction
Information Group



Sweet's Group

F.W. Dodge

*Architectural
Record*

*Engineering
News-Record*



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SHOW PREVIEW

Conference: June 17-20, 1996
Exhibit: June 18-20, 1996
Anaheim Convention Center
Anaheim, California USA

Held in conjunction with
A/E/C SYSTEMS® '96

he Exhibit

CT 96

Exhibit Overview

Construction Technology 96 will feature the latest building products for architects, building engineers, facility managers, specifiers and contractors. The technology for all building products changes each day, and architects and designers have a difficult time keeping up with the best products for their jobs. At this event, held in conjunction with A/E/C SYSTEMS '96, you'll see exhibitors who are on the cutting edge of applying technology to their product development.

Construction Technology 96 is the LIVE version of the Sweet's Catalog. It includes a 150-vendor exhibit and a four-day conference—plus free registration to the A/E/C SYSTEMS '96 exhibit.

Highlights

- See the latest building products
- Receive continuing education units
- Attend quality seminars
- Hear industry leaders
- Learn new specification techniques
- Attend user group meetings



Who's Exhibiting (as of March 19, 1996)

A-E & C Infonet • AIA MASTER SYSTEMS • American Cemwood Corporation • American Institute of Architects • Ameristar Fencing Products • Ametco Manufacturing Corporation • Anchor Fence • Andersen Windows • Architectural Record • Architectural Specifier • Aperture Technologies • ARCHIBUS, Inc. • Association of Construction Inspectors • at (Architecture Today) • Autodesk Design Blocks • Barton Industries • Brock Manufacturing • Building Industry Exchange • Building Systems Design • CADSPEC • Canadian Wood Council • Composite Technologies Corp. • Construction Information Group • Construction Specifier • Construction Specifications Institute (CSI) • Coronis Building Systems • Creative Systems • C-Tech Inc. • Custom Curb • Delphi Research • Dimensional Stone • Door Hardware Consultants • Dur-A-Flex Inc. • Dynamic Isolation Systems • Easi File Corporation • EFCO Corporation • Engineering News-Record • Environmental Assessment Association • EPA/Green Light Energy Star • ESP • Facility Information Systems • FM: SYSTEMS • FM Link • F.W. Dodge • Freudenberg Building Systems • The Garland Company • Geberit Manufacturing Inc. • Genuine Dutch Inc. • Harris Chemical • Hayn Industries Inc. • Header Reinforcements • Heritage Glass • Hettinga Technologies • High Quality Tacticle System • Housing Inspection Foundation • Husky Technologies • Ideal Limited • IKG Industries • Infrared Dynamics • International Facility Management Association • Innovative Tech Systems Inc. • Intellibuild • International Society of Facility Managers • InterPro Resources, Inc. • IPC • Kalin Associates • KC Metal Products • Kullman Industries • Lightscape Technologies, Inc. • Loadtest, Inc. • Lyncole XIT Grounding Systems • Marble Technics • McGraw Hill • Medite Corp. • Mortar Net • National Association of Real Estate • National Institute of Building Sciences • National Recycling Coalition • NELCO Engineering • Nora Rubber Flooring • Openings • Preservation Polymers West, Inc. • Pemko Manufacturing • Plumberex Specialty Products • Pugliese Interior Systems • Ready Access • Rockwell • R.S. Means Consulting Services • Senergy Division • Silikal Resin Systems • Sportlite Inc. • Stained Glass Overlay • Sto Finish Systems Division • Style-Mark Inc. • Sweet's Group • Technical Glass Products • Today's Facility Manager • United States Aluminum • US Glass • Weathershield

Innovation on Display

To register free for the exhibit or for more information on the four-day Construction Technology '96 conference, call 1-800-451-1196 or fax to 1-610-458-7171.

Construction Technology 96

Exhibitor Product Showcase

Here's just a sampling of the exciting products that will be displayed by Construction Technology 96 exhibitors at the Anaheim Convention Center - June 18 - 20, 1996

American Cemwood Corp Booth 2832

Cascade Shake, Pacific Slate and Royal Shake are color-throughout, lightweight, class "A" fire rated and impact resistant wood-fiber and cement roofing products.

Autodesk Design and Construction Library Booth 741

CD-ROMs containing dimensionally-accurate, vector graphics and associated technical and performance data of manufacturers' building components that can be inserted into AutoCAD with the click of a button.

Hettinga Technologies, Inc. Booth 2736

Controlled Density™(CD) Molding produces large, flat, lightweight plastic panels offering significant alternatives to plywood, pressboard, and other wood-based products. Panels are strong, moisture resistant, will not warp, rot. They possess inherent insulating properties, are ideal for construction in all climates. Unlimited Applications: Housing, Concrete Forms, Agricultural, Office, Marine...

Kalin Associates Booth 1136

GreenSpec: Specifications for Environmental Sustainability A database of green products and practices for architects and construction professionals. Organized according to CSI Masterformat, it explains the pros and cons of the existing product or methodology and the green alternative, and provides language to include the green alternative in architectural and engineering specifications. Text and diskette.

Silikal Resin Systems Booth 2637

Silikal Resin Systems manufactures acrylic resins systems for concrete protection. A full line of standard and antimicrobial coating and restoration systems are available. One hour cure, impact, abrasion and chemical resistant. Antimicrobial systems control the growth of a broad range of microorganisms on the Silikal surface. Materials manufactured in the USA.

Style-Mark Inc. Booth 2726

Architectural Accents large rail and baluster system. Lighter and easier to handle than concrete; more durable and lower maintenance than wood. Structurally reinforced urethane components offer unusual strength and durability. Easy installation, noncorrosive parts and totally hidden fasteners. Resists weather, insects, and decay. For information call 800/446-3040.

(Advertisement)

New Products



170. Secure access control

A range of high-security portals and entry systems made in Europe by Tonali, S.A.F.E. (Secure Against False Entry) access-control products are now available in the U.S., Canada, and Mexico. Designs include cost-effective swing doors and multiple-door

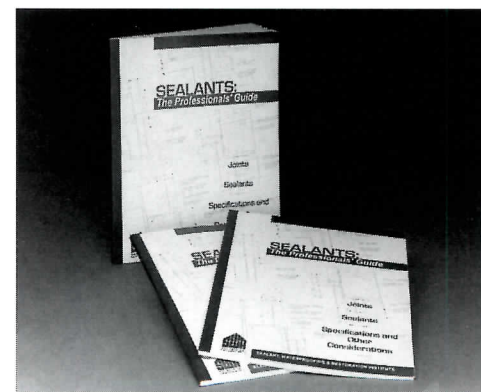
installations for high-traffic areas. Units can be ordered with metal detectors, weight sensors, and biometric identification (fingerprint or eye-pattern) sensors. Shown here: the Portal 6000, a revolving entrance with integrated "covert" metal detection. Concealed clam-shell-type doors automatically operate to deny access to secured space when triggered by sensors, without requiring screening personnel. Finish options include enameled and stainless steel. 513/867-4000. Mosler, Inc., Hamilton, Ohio.



171. Firestop for use with CPVC piping

Flexible, water-based FS 1900 sealant meets UL 1- and 2-hr fire tests in wall assemblies penetrated by CPVC (post-chlorinated polyvinyl chloride) pipe, a material now widely used in sprinklers and tub, shower, and sink installations. The blue-gray colored

intumescent sealant will adhere tightly to the surface of CPVC without reaction. FS 1900 can also be used with other types of plastic piping, cables, or insulated pipe, as well as with through-penetrations of standard metal. 908/334-8796. International Protective Coatings Corp., Oakhurst, N.J.



172. Joint-design and sealant guide

Prepared for the design professional, the new SWRI handbook explains the importance of proper joint design, and discusses caulk selection, surface preparation, installation, and problem-solving. Price: \$40. 816/561-8230. Sealant, Waterproofing & Restoration Institute, Kansas City, Mo. ■

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

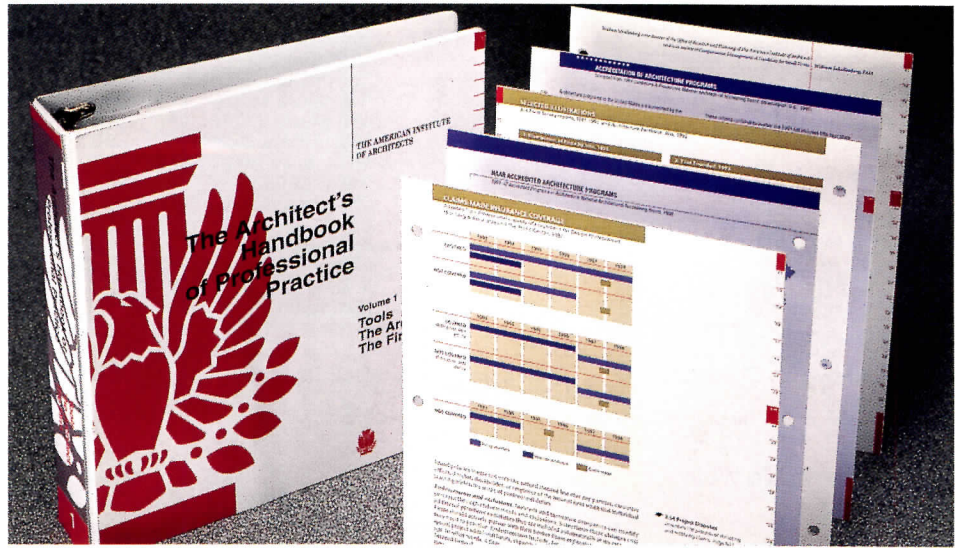


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Cutting corners in architectural planning and design can be a very serious and costly mistake. So can following outdated practices. That's why you need a book you can reference time after time to make sure you're following the most up-to-date standards and guidelines—and to make sure you're laying the foundation for a safe, sound and profitable business practice.

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Manufacturers' Spotlight

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Chadsworth Columns

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Crafts an extensive array of Architectural elements carved in solid woods. Color Product Catalog with over 400 elements, shows a selection of capitals, corbels, moldings, onlays, panels etc. Design Portfolio illustrates product use. Items stocked in Maple and Red Oak and available for immediate delivery. Complete catalog set - \$20. Visa & MC welcome. Complimentary brochures available.

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Security Grilles



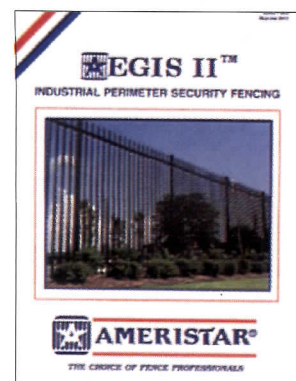
Security grilles, manufactured by Atlas Door Corporation, are ideal for use in shopping centers, schools, garages, and banks, and offer optional features that enhance security, safety, and aesthetic appeal. Atlas, the leader in commercial and industrial doors, offers rolling security grilles in a comprehensive array of materials, sizes, and patterns.

Call (800)959-9559

Atlas Door Corporation

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EGIS II™



Aegis ornamental fence systems feature strong Forerunner™ rails, internal retaining rods, & specially designed panel brackets. Aegis II industrial ornamental fence offers the strongest security ornamental fence available in today's market. Aegis holds the distinction of having its fence systems specified by more architects & builders than any other in the market. Both industrial & residential brochures are available upon request & include data on structure, design, & options available. Panel design is a component system for easy shipping. For additional information & a free 8-page brochure, call (800) 321-8724. P.O. Box 581000, Tulsa, OK 74158-1000. Fax# (918) 835-0899



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Movable Walls

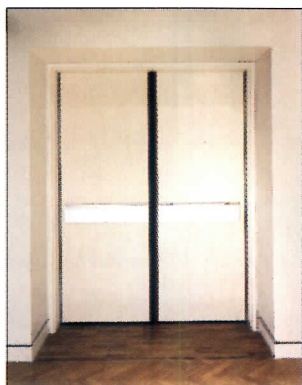


Flexible and very affordable Dowcraft Movable Walls are presented in a colorful 8-page brochure. The architect is offered new comparative cost-data and environmental factors -- versus the dust, debris and disposal problems of drywall. Dowcraft floor-to-ceiling steel walls are shipped prefinished, preassembled and ready to install over carpeting and under ceiling tile. Architects can specify any of 250 baked-on enamels -- or choose from over 3,000 Maharam vinyls, fabrics and wood veneers.

Dowcraft Corporation

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The TOTAL DOOR® SYSTEM



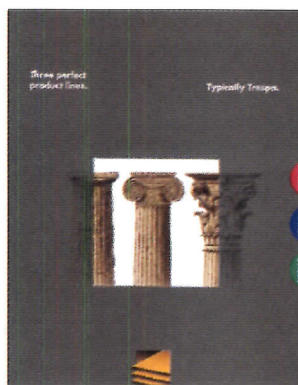
is an architect-designed integrated door assembly. It includes prefinished door panels and all hardware. Fire rated pairs do not require coordinators, vertical rods, astragals, flush bolts or floor strikes. Will retrofit to any frame. Meets all codes and ADA. Wood and metal faces available to 3 hours. Lifetime limited warranty on locks and panics.

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Pontiac, MI 48342,
1-800-852-6660

Openings

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Trespa® Solid Composite Panels Three Product Lines

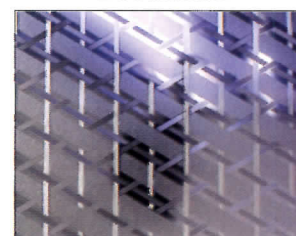


Toplab® chemically resistant laboratory grade panels for benchtops, work surfaces, shelves. Athlon® sanitary grades for toilet partitions, lockers, vanities. Meteon® UV colorfast grade for exterior cladding, soffits, fascias, balcony panels. All grades are durable, available in colors, and proven performers in these applications. 1-800-4-TRESPA.

Hoechst Celanese Corp.

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INTRODUCING THE NEW ALPHA COLLECTION FOR 1996 With 24 patterns to choose from, ranging from the most basic vandal resistant **TEXTURES**, to innovative **STANDARDS** and our new **ULTRA Series** (photo). Patterns come in standard sheet sizes with border-to-border decorations, using distinctive finishes on a variety of metal surfaces for elevator doors and interiors, wall panels, column covers and trim. Starting at less than \$10 per sq. ft. for Textures, the average price for stainless steel Standards is \$12 to \$15 per sq. ft.. Call 800-537-1127.

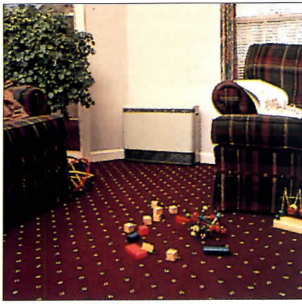
Surface Design + Technology

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Manufacturers' Spotlight

To Advertise: Call 1-800-544-7929
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Revolutionary Vent-Free Convection heater



The Rinnai Silent Servant heater is designed to heat larger than normal living areas yet blend into any decor. The Silent Servant is feature rich with 7 levels of fan and capacity, 99.9% energy efficiency, LED to show room temperature, child safety lock feature, no open flame, and a 3-year full warranty. This clean burning Natural or LP gas heater modulates the capacity from 5,000 to 20,000 BTU's with continuous operation to keep the temperature constant all day long Rinnai America
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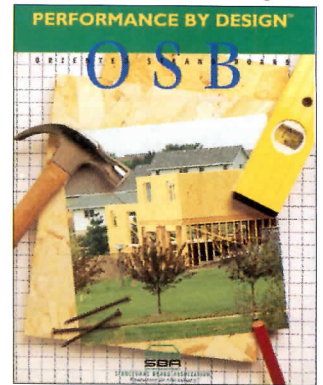
Now Certified for beams and columns for ratings up to 2 hours! A/D Firefilm permits the designer to use the appearance of exposed steel with the steel fully protected from fire. It is applied as a thin-film coating 0.4 to 3 mm (0.02 to 0.12 in.) thick. During a fire A/D Firefilm expands to form a meringue-like layer up to 100 mm thick, which insulates the steel from the fire. The topcoat is available in a wide choice of colours.

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A/D Fire Protection Systems, Inc.

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OSB Performance By Design



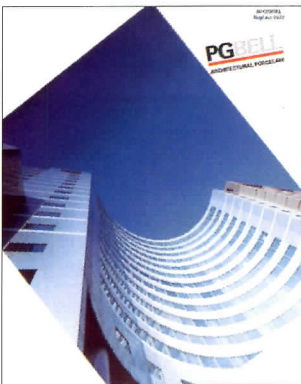
Virtually every new home built today incorporates Oriented Strand Board (OSB), the fastest growing structural panel. OSB affords a greater range of uses and flexibility because it's *engineered* to perform. Learn about OSB through SpecRite, the Structural Board Association's new software program for specifiers. It's free!

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Structural Board

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PG BELL



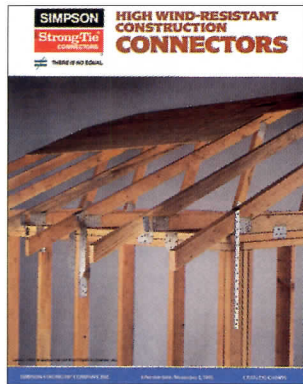
Porcelain Enamel panels offer designers a solution that has an almost unlimited choice of color; a permanence that will not fade when attacked by the weather, by chemicals, or be marred by vandals.

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Accessible Lavatory Insulation



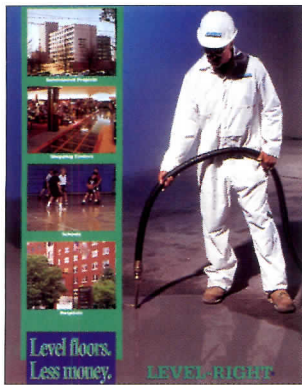
A full color catalog will explain the different Handy-Shield safety covers offered for the new or retrofit projects that need to comply with the American Disabilities Act. The specific use, sample specifications, drawings and color choice are all summarized in this easy to understand catalog.

Plumberex

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Manufacturers' Spotlight

Level-Right® Self-Leveling Floor Underlayment



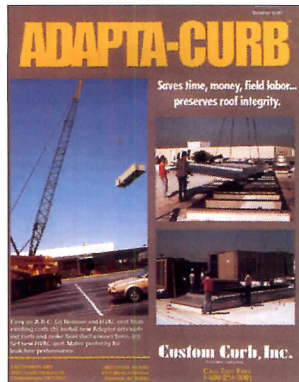
Ideal for large projects or small repair jobs, Level-Right® goes down quickly, cleanly and cost-effectively. It's poured over irregular or weather-damaged concrete; worn ceramic tile, terrazo or adhesives; transforming the original surface into one that's smooth, level, and perfect for floor coverings. In 2-4 hours, Level-Right provides a temporary wear surface.

Call Maxxon Corp.
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or fax 612-478-2431

Maxxon Corp.

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Unique System for Retrofit Solutions



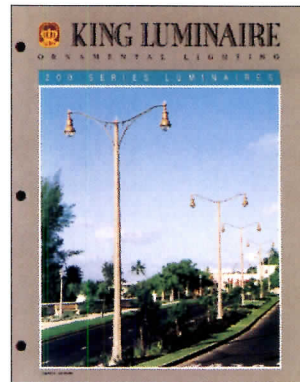
Informative color brochure illustrates the many configurations and options available with Custom Curb Adapta-Curb System that allows equipment changes without disturbing the roof. The unique system is designed for retrofit as well as new construction to add or replace HVAC units, vents, plumbing stacks, skylights and other rooftop equipment. Exclusive sloped design for positive water run-off and proper load distribution.

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Custom Curb, Inc.

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King Luminaire combines the great photometrics you need with the quality and appearance your project must have. Engineered to provide maximum lighting performance with minimal long term maintenance, King Luminaire fixtures and poles offer versatility, quality and a long, long service life. We specialize in buyer satisfaction. Call us at 1-800-268-7809.

King Luminaire Co., Inc.

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From the Clear All Heart Redwood Classic™ column to the DuraClassic™ Poly/Marble column to the FRP Classic™ Fiberglass column cover to a full line of stain-grade columns, Melton Classics offers a product for every architectural millwork need. Constructed in keeping with the Classic Orders of Architecture, the Melton Classics column line is second to none in quality, authenticity, availability and tradition - and yet is affordably priced. Call us toll-free at (800) 963-3060 for a free catalog or quotation.

Melton Classics

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Register & Grille Mfg., Co.

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Duraflake FR fire-rated particleboard



Duraflake FR provides Class A fire protection in wall systems, store fixtures, furniture and case goods. It has a UL flame spread rating of 20 and a smoke developed rating of 25. Its smoothness, machinability and uniformity make it an ideal substrate. It even resists warping and won't leach chemicals. Call (541) 928-3341.

Duraflake

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Fire Retardants and Preservatives



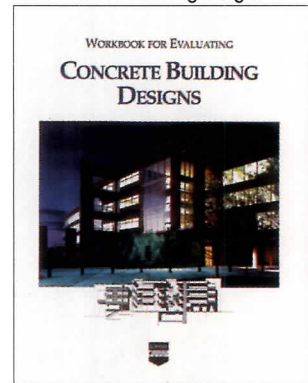
Hoover Treated Wood Products' new 12-page Sweet's catalog features Pyro-Guard third generation interior fire retardant lumber and plywood for roof sheathing and other structural uses; Exterior Fire X FRT lumber and plywood for decks, balconies, siding and other outside uses; and CCA preservative treated lumber and plywood that's kiln dried after treatment

Call 1-800-832-9663.

Hoover Treated Wood

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CRSI Workbook for Evaluating Concrete Building Designs



An easy-to-use resource for confirming the framing system of a reinforced concrete structure. Material dimensions, quantities and cost analysis along with impact on other building systems are featured. 80 pages.

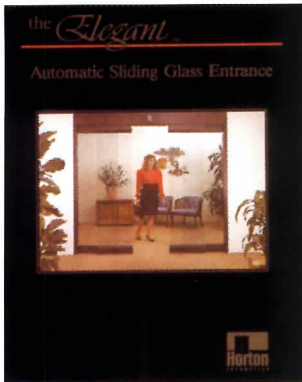
Contact CRSI
for ordering information.
Phone: 847-517-1200
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CRSI

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Manufacturer's Spotlight

Door Operations



Horton Automatic EasyAccess™ Series 7000 and series 4000 LE Automatic Swing Door Operators make complying with Americans With Disabilities Act "Easy" and "Accomplishable". These automatic swing door operators can be installed to most existing doors and require no structural modifications. Installation of either operator helps create an affordably priced, barrier free entrance. **Automatic operation with a push of a button.**

Horton Automatics

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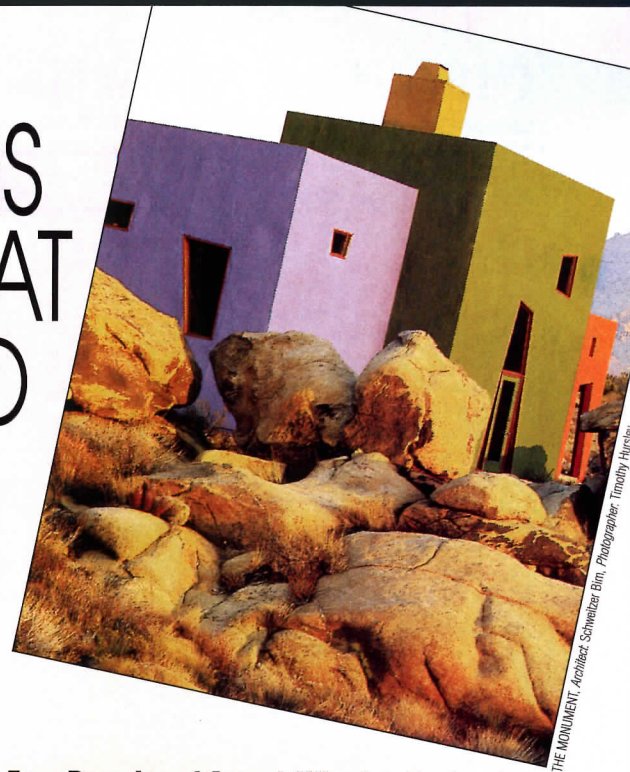
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