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Carnegie Report: Quiet Thunder on The Education Front

Some expected the long-awaited report on architectural education prepared by the Carnegie Foundation for the Advancement of Teaching, sometimes known as the Boyer report, after the late Ernest L. Boyer, the Foundation's president who died five months before it was made public, to be a highly prescriptive document. It would set the nation's 103 accredited schools of architecture swinging on a high course of greater relevance, increased respect within the academic community, and a closer reflection of the nation's diversity.

Others expected a toothless scholarly research report identifying the various problems besetting the schools, but coming up with few solid directives as to what to do about them.

What emerged last month (see also a summary of the report in RECORD, May 1996, pages 22 and 128), is neither a dramatic call to action nor a bland statement of vague intentions. Rather, it recognizes the variety of configurations and curricula that mark the schools, and settles instead for a formula offering a series of guideposts for students, faculty, practitioners, and administrators. It seeks to move the present system out of its doldrums and toward a system of schools more relevant to the profession, to other departments on campus, and to the nation's agenda.

The chief phenomenon that captivated the researchers, who visited 15 campuses, 24 architectural firms, scrutinized 50 NAAB reports, and surveyed 500 students, faculty, administrators, and architects, was the design studio. "We were especially inspired by the design studio, the distinctive holy-of-holies of architecture education where generations of bleary-eyed students have hunched over drafting tables till all hours working on balsa or cardboard creations amid old sofas and soda cans. We are convinced that these studios, scruffy though they may look, are nonetheless models for creative learning that others on campus might well think about."

While this romantic vision of the studio is getting to be more the exception than the rule in an increasingly automated school learning environment, it does retain the essential kernel of an architect's education, namely design, which is, in the final count, the process of taking the chaos of often conflicting constraints of program, budget, site, and schedule, and melding them into a buildable, functioning, affordable whole.

The Carnegie report places an unerring finger upon the two critical disconnects plaguing today's architecture schools—the gaps between the schools and professional practice, and between the architecture schools and the rest of the campus community. Architecture students and faculty, says the report, "seem isolated, socially and intellectually, from the mainstream of campus life. And if the most pessimistic observers are correct, the gulf dividing architecture schools and the practice world has grown perilously wide." By urging upon its constituencies its 7-goal bundle (concern for social and environmental values; greater campus respect for the special teaching process of the architecture school; a shift from blocks of knowledge to modes of thought; support of alternate career options; a more liberal curriculum with focus on communicating; dramatically increased liaisons between office and school; and greater engagement between schools, architects, and the community), it expects each group to devise and run with its own viable program.

In the end, the Carnegie report's greatest contribution may well be its goal number 6: "A unified profession." It pinpoints a range of means to close the gap between the schools and practitioners, showing ways to band together around enriched learning in school, sensible internships, and sustained learning from career beginning to career end.

To make this happen, every architect, student, educator, and administrator needs to read this civil, optimistic, blessedly jargon-free report, then pick up the ball and convert its generalized tenets into specific plans of action.

The Carnegie report offers a rare opportunity to re-form the present system. The process should begin without delay. *Stephen A. Kliment*



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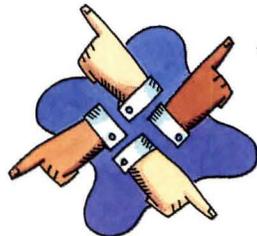
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New York City

Entertainment Investors Rediscover Harlem's Drawing Power



With the March announcement of plans for a \$56-million, 260,000-sq-ft retail and entertainment complex in Manhattan's Harlem, interest in inner-city commercial projects is reaching trend-setting proportions. Designed by Simmons Design Group of Brooklyn with Skidmore, Owings & Merrill, New York, Harlem USA is designed to address the street with a transparent curtain wall and ground-level access to most of the stores. The 125th Street complex will also contain inter-

active exhibitions (linking corporate sponsors to local educational, recreational, and cultural organizations), a sports center, and a cinema. Developed by Grid Properties and the Gotham Organization in conjunction with the Commonwealth Local Development Corp., it will be funded with equity from the developers and conventional debt financing and is expected to create 500 permanent jobs. Groundbreaking is set for year's end. *Abby Bussel*

Houston

Moneo Unwraps Museum Design

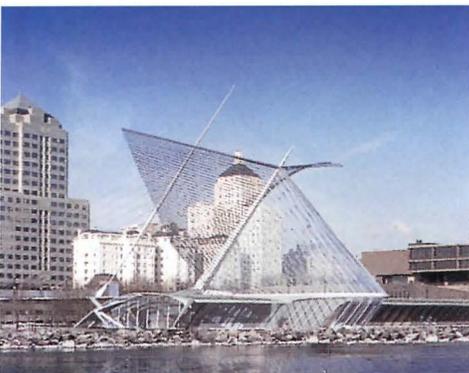
The final design for the Audrey Jones Beck Building of the Museum of Fine Arts in Houston, by Spaniard Rafael Moneo with local firm Kendall/Heaton Associates, has been unveiled. The 185,000-sq-ft addition, slated for a full-block site across from the existing complex, will improve the museum's national ranking in exhibit space from 30th to 6th. Underground galleries will link the new building to the existing museum, which was designed by William Ward Watkin (1924) and added to by Mies van der Rohe (1958, 1974). The limestone-clad structure, with its crenelation of rectangular skylights, is to be completed in 1999. *Gerald Moorhead*



© Akker/Zvonkovic

Milwaukee

Calatrava's Expansion of Saarinen-Designed Museum to Take Flight in 1999



Santiago Calatrava's design of a \$27-million addition to the Eero Saarinen-designed Milwaukee Museum of Art has been adopted. Calatrava's second commission in the U.S. (after his commission to complete New York City's Cathedral of St. John the Divine, a project now on hold) and most likely his first built work here, is a 58,000-sq-ft addition that will house changing exhibition galleries, a 300-seat lecture hall, a restaurant, and a gift shop. Inspired by the site of the museum on Lake Michigan, Calatrava's design—a kinetic sculpture conjuring bird- and ship-like

forms—will be entered through a 60-ft-tall, translucent pavilion with an adjustable louvered sunscreen. A single-story gallery of glass, steel, and concrete will connect with the existing museum, designed by Saarinen in 1957 and added to in 1975 by local architect David Kahler, who is also the architect of record for the new wing. A suspended pedestrian bridge, with a 100-ft angled mast, will play a key role in connecting the museum to Milwaukee's downtown. A fund-raising campaign is currently under way and a December 31, 1999, opening is planned. *A.B.*

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A Right-Sized Future for Living in Lower Manhattan

Manhattan's skyline is changing. While Wall Street has adapted to the technological advancements and competitive pressures affecting American corporations, the real-estate market has not been so agile. A team comprising specialists from New York City's Department of City Planning (DCP) and representatives of local real-estate and corporate interests has made a bold move to stave off disaster. Their efforts should serve as a useful, if imperfect, model for redevelopment strategies in urban centers across the country.

The Plan for Lower Manhattan, unveiled in 1993, and an alternate scheme developed by a group of students at Columbia University's Historic Preservation Program, were the subject of "Reviving Lower Manhattan: Preserving the Past to Ensure the Future," a symposium sponsored by the Graduate School of Architecture, Planning, and Preservation at Columbia in March. The symposium provided a forum for discussing the insightful solutions proposed in both plans, which include mixed-use residential and commercial zoning, tax incentives for owners and tenants, and an integrated transportation network.

Mixing it up

In an earlier era, "getting out of the way was the most constructive thing planners could do to ensure progress." This sentiment, invoked at the symposium by Joseph Rose, chairman of the New York City Department of City Planning, as a reminder of more contentious planning efforts in the past three decades, is happily absent from the plan.

The cooperative atmosphere between the City's DCP and the local real-estate and corporate communities is a precedent that, if adopted more broadly, might, for example, have forestalled the present threat to Chicago's architectural heritage [RECORD, April 1996, page 15] that has arisen from its hotly debated landmarks legislation. And such cooperation might ensure the success of the just-published plan for Washington, D.C., that was formulated without the input of the local real-estate community. Despite this laudable cooperative effort, the authors of the plan have forged compromises that may adversely affect Lower Manhattan's distinct "sense of place."



© Ben Russell

To encourage a 24-hour community, the plan relaxes the controls that regulate the placement and density of residential space. The "density penalty," a clause in the city's 1961 Zoning Resolution that prohibited residential spaces smaller than 1,800 square feet, has been revised to allow developers to now offer units as small as 900 square feet. As Carl Weisbrod, president of the Alliance for Downtown New York noted, "this is still large, but is a much more reasonable size than was permitted under the previous regulation." Maybe, but a 900-square-foot, market-rate apartment is unaffordable for corporate support staffers who earn a wage below the \$131,000 cited in the plan as the area's average. While people may be priced out of the area, the greater question will be how these new residents alter the three-centuries-old tradition of commerce in Lower Manhattan.

Doomed to repeat itself?

But perhaps most troubling is the plan's myopic vision for new development. Zoning changes contemplated by the city, and rightly criticized by the Columbia students in their plan, recognize that the "tower in the plaza" is not a viable paradigm for the irregular blocks of Lower Manhattan. But the changes, which would encourage more as-of-right development and more closely regulate the building envelope and street wall, don't go far enough.

As Wall Street tries to reinvent itself as a 24-hour community, a downtown plan—and its critique by Columbia University students—offers an intriguing, if imperfect, model.

While the plan does include a recommendation to study the historic resources in the area and suggests a certain affinity for landmarking significant structures, it does not fully embrace the city's landmarks legislation. In ignoring local landmarks laws, which compels developers to comply with design standards, and turning an equally blind eye to the demonstrated economic benefits of designated historic districts, the planners have left blocks of low-rise buildings at the periphery of the historic core vulnerable to unrestrained development and have only implicitly acknowledged the value of the area's historic resources.

Changing the guard

The shortcomings of the plans proposed by the city and the Columbia students may have less to do with the complexity of the issues at hand than with the zoning and planning tools they incorporate and the preconceptions of their authors. New ideas need to be brought to the table; a challenge best left to the students, who were not allowed to present their findings at the symposium, but who will become the next generation of influential residents and planners in America's cities.

Derek H. Trelstad

Trelstad was formerly Senior Editor of Building Renovation magazine, and is now a designer with Friedman & Oppenheimer Structural Engineers, New York City.

Lessons in Making Cities Work

The American City: What Works, What Doesn't, by Alexander Garvin. New York: McGraw-Hill, 1996, 475 pages, \$60

Reviewed by Todd W. Bressi

The title of this book is both celebratory and defensive—a recognition that while some aspects of cities can inspire us, there are a lot of things that need to be fixed. Alexander Garvin—an architect, developer, and New York City planning commissioner—sifts through a century of planning experience to find plenty of lessons on how to stimulate healthy urban development.

The American City offers a survey of public attempts to shape city development and is organized into chapters about basic themes like parks, retail areas, housing, land-use regulation, preservation, and comprehensive planning. The well-researched text combines urban history with case studies of specific projects and programs, rather than dwelling on abstract theories about policy or process. At the same time, Garvin is not bashful about stating his own position—that successful planning initiatives must consider factors such as the market, location, design, financing, and time, and that they must be concerned about manipulating ongoing change, not prescribing visionary end states.

Garvin implies that the most critical issues cities face are capturing capital investment, expanding economic activity, and retaining middle-class residents. He wisely argues that city planning's ultimate goal should be to craft public actions that “produce a sustained and widespread private-market reaction.” He poses tough questions for quick-fix projects like convention centers and stadiums, and makes it clear that improving the housing stock and increasing homeownership in poor sections of town also deserve civic attention.

Because of its breadth and evenhandedness, *The American City* is bound to be adopted as a text in courses on city planning; it is better grounded in how cities really work than the encyclopedic “green book” (*The Practice of*

Todd W. Bressi is executive editor of the journal Places and teaches urban design at Pratt Institute.

Local Government Planning) that I read in graduate school. For students, it clearly reveals the dynamic between public policy and the physical form of cities.

But *The American City* leaves its readers wanting in many ways—the lack of a comprehensive bibliography is particularly aggravating. Garvin's insistence on evaluating mature programs or projects enables him to cull his observations from decades of real experience. But it also makes the book seem outdated, since current concerns and initiatives receive little attention.

For example, Garvin lauds Portland's and Denver's transit malls for focusing private investment downtown, but takes up neither the matter of using transit investment to coalesce suburban growth, nor of helping scattered “edge cities” mature into coherent urban centers.

He writes off urban manufacturing, despite recent research that argues some manufacturers thrive in cities because they offer diverse human and capital resources.

Garvin's focus on physical planning also becomes a hindrance when he declares that planners work through public investment, regulation, or development incentives—ignoring the impact everyday municipal services like sanitation, security, and maintenance of the public realm have on investment decisions. In some places, these responsibilities are so poorly managed that business and citizen groups are assuming them.

Increasingly, our footloose society regards places as things to consume and then abandon when we lose interest. City officials must cultivate not only capital investment, but also attachment to place: neighborhoods, shopping districts, the public realm. Coupled with Roberta Gratz's *The Living City* and two books inspired by the Rudy Bruner Award, *Urban Excellence* by Philip Langdon and *Breakthroughs* by Neil Peirce and Robert Guskind, *The American City* can play an important role in educating architects, planners, developers, and city officials. ■

Briefly Noted

The New American Ghetto, by Camilo José Vergara. New Brunswick, N.J.: Rutgers University Press, 1995, 245 pages, \$50.

For nearly 20 years, photographer and sociologist Camilo Vergara has documented the insidious process of urban decay. Returning to the same blocks in the same neighborhoods of New York, Newark, Los Angeles, Chicago, Detroit, and Gary, Indiana, year after year, he has built an archive of photographs that shows in a nearly clinical manner what happens to once-thriving places when abandonment, poverty, and fear take over. As presented in this book, these photographs, coupled with Vergara's verbal observations, serve as a record of urban devastation and a powerful indictment of neglect.

Encyclopedia of American Architecture, Second Edition, by Robert Packard and Balthazar Korab. New York: McGraw-Hill, 1995, 724 pages, \$90.

Handsomely produced with all photographs in color, this book covers a lot of ground—from adaptive use to zoological buildings, with stops along the way for Furness, Frank, and Venturi, Robert. The roster of architects, though, is less than encyclopedic and some entries—such as “patron, architectural” and “history of architecture”—are too broad to be properly covered in just a few pages.

Hariri & Hariri, compiled by Oscar Riera Ojeda. New York: Monacelli Press, 1995, 192 pages, \$35 (paper).

The first in a series of books on members of “the next generation of architects and designers,” this attractive monograph shows 30 projects by the New York-based sisters Gisue and Mojgan Hariri. Rather than being assembled chronologically, the projects (both built and unbuilt) are organized by themes—such as politics and power, global culture, and spirituality and otherness. Short essays by Kenneth Frampton and Steven Holl serve as bookends to the main body of the publication.

Winning By Design: Architectural Competitions, by Judith Strong. Oxford: Butterworth, 1996, 200 pages, \$38 (paper).

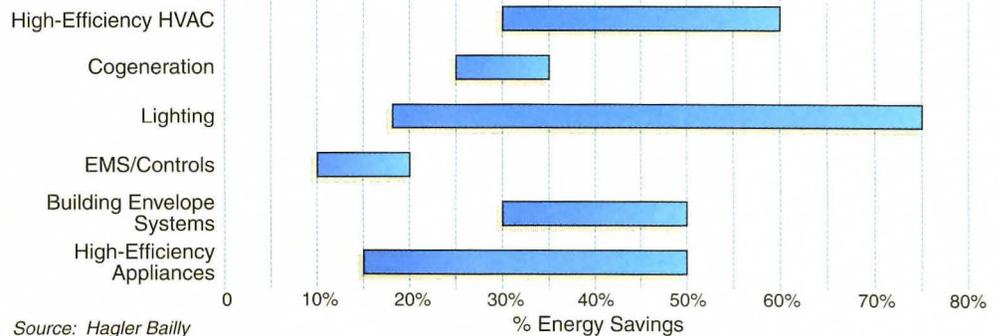
While focusing mostly on the U.K., this book can be useful to architects in other countries too. The author does a good job of framing the debate over competitions and offers solid advice on how to participate in them.

Indicators

Lots of energy efficiency to be found

Though building systems have become steadily more energy-efficient, a global look at potential savings suggests there's much progress still to be made. The study estimates average growth of the energy-efficiency market at 6 percent annually through 2015. Market share will increasingly move from developed countries to less-developed countries, so techniques developed here may prove highly exportable. Efficiency will figure prominently in this month's UN Habitat conference in Istanbul. ■

Potential Energy Savings in Construction Technologies



Source: Hagler Bailly

Charts by Leonor Glynn

Building costs solid

After remaining essentially flat for the last few years, building costs are edging up nationwide. This year's rise will exceed the rate of inflation if it keeps up. Increases were steepest in the country's center half: Denver, St. Louis, Kansas City, Cleveland, Minneapolis, Pittsburgh. With Olympics construction nearing completion, Atlanta is flat, as is Boston, Los Angeles, San Francisco, Dallas, and Baltimore. Prices in midwestern cities have shown steady strength, while those in the Northeast, like Philadelphia and New York, have begun moving upward after a long moribund period.

Commodity price swings, such as those for lumber, have moderated, suggesting that labor rate increases may finally be kicking in. Still, construction inflation is hardly a certainty. As this month's market forecasts show (following pages), slackening housing and retail demand will free up labor for growing building types like offices and lodging. Even busy prison builders are under cost pressure from penny-pinching government agencies. ■

Building Cost Indexes

	12/90	12/91	12/92	12/93	12/94	12/95	5/96	% change from 4/96	% change from 12/95
Atlanta	2238.80	2278.83	2404.75	2477.13	2480.55	2412.12	2470.10	+0.7	-1.6
Baltimore	2579.90	2508.06	2607.76	2673.24	2830.66	2818.21	2856.29	+0.6	+0.5
Birmingham	2149.96	2189.75	2279.26	2352.15	2439.28	2509.21	2533.69	-0.2	+2.1
Boston	3110.03	3102.31	3355.57	3539.63	3601.94	3549.18	3569.19	+0.1	+0.2
Chicago	2893.6	3034.72	3162.99	3325.70	3415.62	3446.51	3470.99	0.0	+2.0
Cincinnati	2638.73	2674.15	2817.16	2920.20	3001.15	2942.02	2953.42	+0.1	+1.8
Cleveland	2886.93	2903.81	2903.1	3088.76	3218.65	3273.15	3305.79	+0.2	+3.3
Dallas	2061.61	2215.88	2278.21	2307.62	2448.62	2433.04	2474.70	+0.7	+0.8
Denver	2321.28	2375.26	2438.39	2501.00	2608.72	2661.49	2711.27	+0.2	+6.1
Detroit	2974.47	3046.92	3136.74	3278.20	3424.95	3459.88	3485.99	0.0	+2.6
Kansas City	2645.28	2637.20	2677.21	2873.20	2916.25	2889.17	3013.84	+2.8	+3.7
Los Angeles	3020.51	3097.83	3198.66	3359.03	3420.42	3427.26	3412.81	0.0	+0.3
Minneapolis	2648.43	2711.5	2811.14	2989.48	3131.05	3129.52	3145.84	+0.5	+3.0
New Orleans	2220.20	2260.52	2360.24	2330.86	2469.21	2499.08	2560.01	0.0	+1.8
New York	3847.21	3997.91	4151.28	4343.76	4458.36	4557.44	4603.96	+0.1	+2.3
Philadelphia	3040.85	3169.81	3130.58	3532.34	3480.78	3563.18	3563.18	0.0	+2.4
Pittsburgh	2717.08	2807.73	2954.64	3038.97	3218.37	3287.92	3326.02	+0.7	+3.4
St. Louis	2602.16	2686.93	2743.01	2840.58	3091.81	3089.59	3134.74	-0.1	+4.3
San Francisco	3245.04	3270.90	3298.09	3463.34	3519.17	3561.60	3534.30	0.0	+0.6
Seattle	2552.58	2715.04	2787.74	2948.18	3024.48	3046.50	3088.93	+2.2	+2.2
20-City avg.	2702	2751	2834	3009	3110	3127.80	3160.75	+0.4	+2.1

Source: Engineering News-Record, Construction Economics Department. The Building Cost Index combines 68.38 hours of skilled labor weighted by the 20-city average of bricklayers', carpenters', and structural ironworkers' rates, plus 25 cut of standard structural steel shapes at the mill price, plus 22.56 cut (1.128 tons) of portland cement spot-priced locally, plus 1,088 board-ft of 2 by 4 lumber spot-priced locally. The base year is 1913 = 100. To compare a given city's costs

by percent, divide one index into the other. Example: the index for a city for one period (200) divided by the index for an earlier period (150.0) yields 1.33, which means the costs in the later period are 33 percent higher than the earlier period. Likewise, the earlier period's costs are 75 percent of those in the later period (150.0 divided by 200.0 = .75 or 75 percent).

The Profession This Month

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Short Takes

- ◆ **Defective-siding settlement:** Claims of premature failure of residential siding made from oriented strandboard have been settled, according to Louisiana-Pacific, the target of homeowner suits [RECORD, October 1995, pages 21, 111]. The company will extend its warranty and honor claims validated by third-party adjusters. It has set aside \$275 million to cover siding replacement.
- ◆ **Volatile construction volume:** Contracted construction volume jumped 7 percent in

March, according to F.W. Dodge, after a drop in February and a rise in January. Nonresidential construction surged 17 percent, but the three-month 1996 total is still 13 percent below the 1995 period. Residential construction was up for the month and 12 percent ahead of the same period last year.

- ◆ **What happens when the firm founder passes away?** 49 percent of firms don't know, says a survey. Revised, *Ownership Transfer: Options and Strategies*, from the American Consulting Engineers Council (\$69 AIA; \$99), offers guidance: 203/347-7474. ■

Two Crystal Balls

AIA's Kermit Baker describes shifts over the next 15 years that will affect the kinds of construction put in place; Robert Murray updates the 1996 Dodge Construction Volume forecast.

By Robert Murray and Kermit Baker

Over the next 15 years, building activity will increase an average of 1 percent per year, largely in line with population growth, reports Kermit Baker (with assistance of F.W. Dodge's Robert Murray), in AIA's "Changes in Construction Markets: The Next 15 Years" (AIA bookstore: 800/365-2724; \$7 members/\$10 non-members). Nearly all the growth in non-residential spending will come from the commercial and residential categories. Office construction is expected to bounce back sharply on a percentage basis, although today's levels are very depressed. Institutional categories are expected to be stable.

The shift in recent years to renovation as a higher percent of construction spending will continue. By 2010, the market for work on existing buildings will be even larger than for new construction.

Mirroring population growth, most new construction over the next 15 years will be centered in the South and West—regions expected to capture more than 80 percent of population growth. Migration from other parts of the country will swell these regions, and a disproportionate share of immigrants is likely to settle in the Sunbelt region, though many also will remain in major gateways, such as San Francisco, Miami, Chicago, and New York.

The changing building-type mix

◆ **Residential:** Much of the population growth will be among households in their 40s and 50s, who traditionally buy bigger, more expensive homes. Households in younger age groups will shrink, undermining the rental and first-time home markets. Married couples without children are the second-fastest-growing household type. By 2010, most of this group will be "empty nesters." The high percentage of single and two-person households bodes well for smaller houses with many amenities on easy-to-maintain lots or condominiums. Home owners in this group will be in their peak-earning years; these are also peak remodeling years. Owners will add

Kermit Baker is AIA's chief economist; Robert Murray is vice president of economic affairs in McGraw-Hill's Construction Information Group

home offices, security features, and apartments for aging relatives.

Growth in schools and colleges

The recent rebound in school construction will continue over the next decade [spotlight, following pages]. Remodeling will be sustained by lower dropout rates and the needs of aging stock. New construction growth will

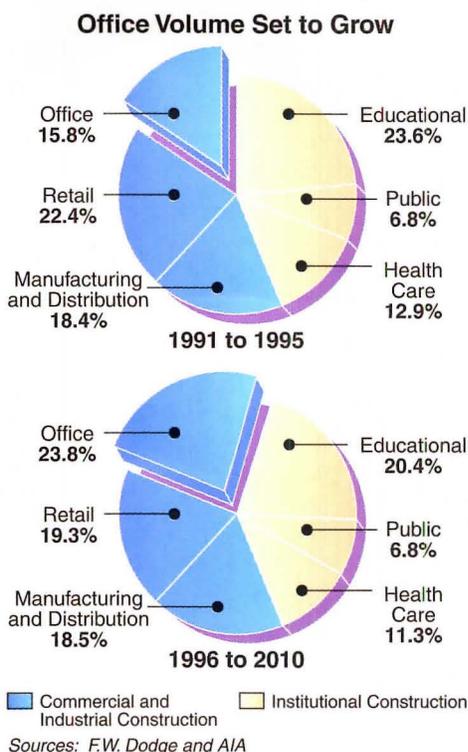
patient), and residential facilities. Cost-containment pressures will force ever more efficient use of the existing building stock. After relatively flat construction levels over the next decade and a half, health care will be poised for a surge when baby boomers move into their 60s. That older people seek care for chronic conditions doesn't necessarily translate into more hospital beds, though, since more of these procedures are now handled in ambulatory settings. In the next 15 years, living arrangements for the elderly will have an important influence on health-care construction. Since three quarters of the over-85 population live outside nursing homes, assisted-living options will become more important.

◆ **Public buildings:** Justice construction activity will remain strong as the population most likely to turn to crime (18- to 24-year-olds) increases. At present, justice projects account for approximately two-thirds of public construction spending. Even so, jail and prison construction has failed to keep pace with growth in the inmate population. Other types of public construction will continue to see little expansion as budget pressures limit government job growth.

Offices up from today's low base

◆ **Retail:** Retail-construction spending will retreat from current strong levels as excess space and weaker sales growth force retailers to rethink expansion plans. The aging population will further dampen demand, as older households spend a smaller share of their income in stores. Recent growth in retail has come more from new and revamped retail formats stealing market share from existing formats than from consumer demand. The relationship between retail activity and space built is imperfect. A better retail mousetrap may well make existing formats obsolete, spurring construction activity.

◆ **Office:** After an eight-year recession, rising rents, falling vacancies, and continued growth in office employment now ensure that construction activity will return to levels close to those in previous decades. Today, nearly 80 percent of office jobs are in services and the finance, insurance, and real-estate sectors. While these areas will still generate virtually all future office employment, job growth is headed for a slowdown in about a decade as



While businesses will continue to control costs through careful use of space, the growth of service employment bodes well for offices.

follow the "echo boom" bulge to high schools and colleges, while K-8 will slacken. Colleges will benefit because not only are more students finishing high school, they are attending college in record numbers. Higher college enrollments also reflect the growing numbers of older adults returning to complete degrees or obtain advanced training.

Stable volume for institutional work

◆ **Health care:** With the aging of the population, new health-care construction over the next 15 years will be primarily clinics, chronic-care facilities (both inpatient and out-

The Shape of 1996

Following 1995's gain of 2 percent, total construction activity is projected to advance 4 percent this year. Single-family housing will have to provide much of the upward impetus, given the deceleration now being experienced by other sectors.

Early data for 1996 shows that this is indeed taking place, although it remains to be seen what impact higher mortgage rates will have on the housing market. Funding limitations for public-works construction may ease as growing unmet needs become more glaring. The still-improving components of the income-property group should soften that sector's overall loss of momentum. R.M.

1996 National Estimates

Dodge Construction Potentials

June 1996

		1995 Actual	1996 Forecast	Percent Change 1996/95
Nonresidential Buildings				
Floor Area (in millions of sq. ft.)	Office Buildings	113	125	+11
	Stores and Shopping Centers	266	235	-12
	Other Commercial	320	317	-1
	Manufacturing Buildings	160	150	-6
	Total Commercial & Manufacturing	859	827	-4
	Educational,	176	184	+5
	Hospital & Health	69	67	-3
	Other Nonresidential Buildings	171	170	0
	Total Institutional & Other	416	421	+1
	TOTAL NONRESIDENTIAL BUILDINGS	1,275	1,248	-2
Contract Value (millions of \$)	Office Buildings	\$14,577	\$16,300	+12
	Stores and Shopping Centers	16,436	15,350	-7
	Other Commercial	15,419	16,325	+6
	Manufacturing Buildings	12,374	12,125	-2
	Total Commercial & Manufacturing	\$58,806	\$60,100	+2
	Educational	\$21,445	\$22,775	+6
	Hospital and Health	10,707	10,450	-2
	Other Nonresidential Buildings	21,326	21,075	-1
	Total Institutional & Other	\$53,478	54,300	+2
	TOTAL NONRESIDENTIAL BUILDINGS	\$112,284	\$114,400	+2
Residential Buildings				
Dwelling Units* (thous. of units)	Single Family Houses	989	1,015	+3
	Multifamily Housing	275	290	+5
	Total Residential Buildings	1,264	1,305	+3
Floor Area (millions of sq. ft.)	Single Family Houses	1,869	1,918	+3
	Multifamily Housing	301	315	+4
	Total Residential Buildings	2,170	2,233	+3
Contract Value (millions of \$)	Single Family Houses	\$110,211	117,300	+6
	Multifamily Housing	17,562	19,100	+9
	Total Residential Buildings	\$127,773	136,400	+7
Nonbuilding Construction				
Contract Value (millions of \$)	Transportation Construction	\$41,630	\$41,550	0
	Environmental Construction	18,260	18,150	-1
	Total Public Works	\$59,890	\$59,700	0
	Utilities	\$3,557	\$3,650	+3
	TOTAL NONBUILDING CONSTRUCTION	\$63,447	\$63,350	0
All Construction				
Contract Value (millions of \$)	Total Construction	\$303,504	\$314,150	+4
	Dodge Index (1987=100)	117	121	

*FW. Dodge basis

Architectural Market Outlook

In the short term, neither strengthening office nor hotel construction will offset weakening housing and retail. Over the next few years, commercial types will grow; institutional spending will stabilize.

investments in office technology pay off in the form of lower staff needs. Also, as "alternative-office" strategies take hold (from work-space sharing to telecommuting), companies will need less space.

◆ *Manufacturing and distribution:* Productivity gains in the industrial sector, coupled with generally slower growth in the economy, will limit the need for additional manufacturing and distribution capacity. While growth in merchandise exports will partially offset this dampening effect, the amount of industrial construction activity in the next 15 years will still be lower than in the previous 15.

A further damper for manufacturing is that, as the population ages, it spends less on goods and more on services. Traditional manufacturing has suffered inroads from cheaper

landing has been followed by a soft takeoff.

◆ *Single-Family Housing:* This sector's period of weakness ended during 1995's second quarter. The 1995 annual total of 989,000 units represented a 7 percent drop, but the pattern of activity over the course of 1995 set the stage for a generally higher volume of activity during 1996. The rise in mortgage rates bodes little support for the current brisk pace of single-family housing.

Income-property outlook mixed

The 1996 economy, with growth in the range of 2 percent to 3 percent, will have a varied impact on income-property sectors. Don't expect the 29 percent surge that occurred in 1994 or the 15 percent increase in 1995 (to a still-impressive one billion square feet). This growth was driven by hotels (up 57 percent in

healthy condition of the lodging and gaming industry. Hotel occupancy rates are in excess of 70 percent nationwide, while occupancies in Las Vegas hotel/casinos have risen to nearly 90 percent. Plans to develop new gaming properties are moving ahead in Atlantic City, as well as in such locations as Louisiana, Indiana, and Connecticut. Hotel chains also have begun aggressive construction programs in the mid-price and economy lodging segments; the luxury sector remains on hold.

◆ *Store construction* has boomed, so it now confronts its cyclical downside. The growth of "big box" merchandisers and "category killers" played an important role in recent retail expansion, but the market is now suffering casualties. Even Wal-Mart reported lower fourth-quarter 1995 earnings, its first quarterly earnings decline in more than 25 years.

Institutional buildings inch upward

◆ *Healthcare:* Construction continues to adjust to cost-containment pressures, with shorter patient stays and hospital mergers meaning lower volume [see spotlight following].

◆ *Schools:* Renovation work is still an important part of the institutional-building market, particularly as it applies to schools. Further increases are likely, given growing student enrollments through the end of the decade and replacement or renovation needs.

◆ *Prisons:* Construction in 1995 slipped from its recent elevated volume, but it can be expected to bounce back. Unlike many other project types, it is supported by virtually certain funding, given political priorities, and the fact that state prisons are operating at close to 130 percent capacity.

Weakness in transportation

The transportation appropriations bill for fiscal 1996 provided a slight 0.5 percent increase for highway construction, a surprising development given the deficit-reduction climate. More in keeping with the times was flat funding for airports, and declines for mass transit and Amtrak. ■

"Trends dictate slow but steady growth in construction spending over the next 15 years. . . . More than half of all dollars will go into additions and alterations."—Kermit Baker

foreign producers, forcing American manufacturers to focus on more technologically sophisticated products. Thus R&D facilities are the fastest growing manufacturing construction category. Improved inventory management will continue to limit warehouse demand for the next 15 years, as producers seek higher profits by squeezing the distribution system.

The short term: struggling for growth

Construction volume grew a modest 2 percent in 1995, reports Robert Murray, of McGraw-Hill's Construction Information Group. Volume will continue to grow, but compared to the 8 and 9 percent growth rates between 1992 and 1994, the operative word is "mature." Some sectors are expanding, but others continue to weaken, the net effect being that overall volume should stay in the plus column for the fifth year in a row. There are still enough signs of a sluggish economy, such as sagging capacity-utilization rates and industrial output, to suggest that the soft

1995); and warehouses (up 37 percent). While most of these categories are still well below their mid-1980s peak, the 1995 amount for stores was just 2 percent shy of its record 1985 amount.

Financing continues to be available, particularly as insurance companies and pension funds look again to real-estate investment. A recent Federal Reserve survey offers a cautionary note: it showed that banks had tightened lending standards toward the end of 1995 for the first time in three years.

◆ *Office:* Vacancy rates have moved steadily downward. The oversupply of office space has been reduced by 50 percent over the past four years. Rents in many markets are still too low to produce the cash flow necessary to justify new construction, but exceptions began to appear last year in suburban Atlanta, Washington, D.C., and Los Angeles.

◆ *Hotel construction* will remain on its upward trend in 1996, given the current

Regional variations:

Growth in 1995 was unevenly spread geographically, a pattern that should continue. The South Central led the nation with a 6 percent rise, followed by gains of 3 percent in the South Atlantic and 2 percent in the North Central. The West edged up 1 percent, as ongoing strength in the Pacific Northwest and mountain states offset continued weakness in California.

The Northeast lagged behind most of the nation, barely able to hold steady. Initial data for 1996 suggests that California is finally emerging from its doldrums, but the prospects for the Northeast remain questionable given that region's corporate layoffs and bank consolidations.

Renewed expansion by both regional latecomers, the West and the Northeast, would be consistent with the rolling regional recovery patterns evident since the 1980s. R.M.

1996 Regional Estimates Dodge Construction Potentials June 1996

Contract Value (millions of dollars)	1995 Actual	1996 Forecast	Percent Change 1996/95		1995 Actual	1996 Forecast	Percent Change 1996/95
Northeast CT, ME, MA, NH, NJ, NY, PA, RI, VT							
Nonresidential Buildings				Residential Buildings			
Commercial and Manufacturing	\$9,052	\$8,800	-3	Single Family Houses	\$10,782	\$11,525	+7
Institutional and Other	9,519	10,125	+6	Multifamily Housing	2,535	2,650	+5
Total	\$18,571	\$18,925	+2	Total	\$13,317	\$14,175	+6
Nonbuilding Construction	\$10,643	\$11,325	+6	TOTAL CONSTRUCTION	\$42,531	\$44,425	+4
North Central IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD, WI							
Nonresidential Buildings				Residential Buildings			
Commercial and Manufacturing	\$13,743	\$13,750	0	Single Family Houses	\$24,255	\$24,500	+1
Institutional and Other	13,063	12,600	-4	Multifamily Housing	3,692	3,825	+4
Total	\$26,806	\$26,350	-2	Total	\$27,947	\$28,325	+1
Nonbuilding Construction	\$14,073	\$13,950	-1	TOTAL CONSTRUCTION	\$68,826	\$68,625	0
South Atlantic DE, DC, FL, GA, MD, NC, SC, VA, WV							
Nonresidential Buildings				Residential Buildings			
Commercial and Manufacturing	\$11,976	\$11,875	-1	Single Family Houses	\$27,431	\$30,675	+12
Institutional and Other	11,200	11,425	+2	Multifamily Housing	4,428	4,725	+7
Total	\$23,176	\$23,300	+1	Total	\$31,859	\$35,400	+11
Nonbuilding Construction	\$11,524	\$11,275	-2	TOTAL CONSTRUCTION	\$66,559	\$69,975	+5
South Central AL, AR, KY, LA, MS, OK, TN, TX							
Nonresidential Buildings				Residential Buildings			
Commercial and Manufacturing	\$9,806	10,350	+6	Single Family Houses	\$18,834	\$19,700	+5
Institutional and Other	8,606	8,750	+2	Multifamily Housing	2,471	2,650	+7
Total	\$18,412	\$19,100	+4	Total	\$21,305	\$22,350	+5
Nonbuilding Construction	\$11,508	\$10,675	-7	TOTAL CONSTRUCTION	\$51,225	\$52,125	+2
West AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY							
Nonresidential Buildings				Residential Buildings			
Commercial and Manufacturing	\$14,229	\$15,325	+8	Single Family Houses	\$28,909	\$30,900	+7
Institutional and Other	11,090	11,400	+3	Multifamily Housing	4,436	5,250	+18
Total	\$25,319	\$26,725	+6	Total	\$33,345	\$36,150	+8
Nonbuilding Construction	\$15,699	\$16,125	+3	TOTAL CONSTRUCTION	\$74,363	\$79,000	+6

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

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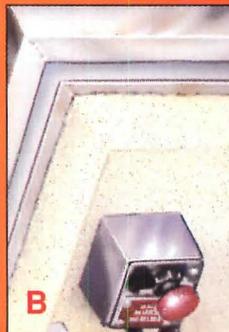
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Schools Face Funding Bind

A \$112-billion backlog in school remodeling and new construction is colliding with the public's reluctance to pay the bill.

By Douglas Gantenbein

The Baby Boom's baby boom is knocking on schoolhouse doors. Hard. The number of elementary and secondary students hitting the books this fall will surpass the previous record of 51 million, set in 1971. That number will likely leap to 56 million by 2004. And it's not just children of the celebrated post-World War II generation crowding schools. Waves of immigrants in Florida, Texas, and California also are creating enormous new pressures. Moreover, few districts have kept up existing buildings. Century-old school buildings crumble in New York City. Termites munch on New Orleans schools, and a ceiling in a Montgomery County, Ala., school collapsed just 40 minutes after youngsters left for the day. All told, the problem is so severe that the General Accounting Office says there is a construction and maintenance backlog of \$112 billion. Primary school spending, meanwhile, amounted to just \$3.5 billion in 1994.

The result of these two trends is an unprecedented demand for new school construction and remodeling. "The need is everywhere; it's not overstated," says Michael Casserly, director of the Council for Great City Schools a Washington, D.C., education policy institute oriented primarily to large school districts. Already educational building has been the bright spot in non-residential construction, increasing every year since 1983. AIA studies show that in 15 years construction levels will go even higher—40 to 50 percent higher than levels seen in the 1980s, even allowing for inflation. Thus last year's figures, when all educational-construction awards totaled \$23 billion, might not represent a peak.

Where to find \$112 billion

This sunny forecast is clouded by uncertainty over who will pay the bill. Financing schools is an enormously complicated and expensive process. But the process to arrange that financing is Balkanized among local districts, states, and to a limited degree the federal government.

In most cases, ultimate responsibility for schools gets pushed down to the local level. There it runs smack into growing voter

Douglas Gantenbein is a freelance writer based in Bellevue, Wa.



Boney Architects' master plan for Charlotte-Mecklenburg's Educational Village includes a middle school (upper left), a high school (bottom), and an elementary school (top right).

resentment over high property taxes. Another difficulty: Parents and voters demand better student performance before "rewarding" districts with new "toys" like schools filled with high-tech educational gadgets.

And teachers, too, are seeking a bigger part of the spending pie in higher compensation, claiming that quality instruction means more than fancy buildings. It doesn't help that most local property-tax measures, the usual instrument for local school funding, require a two-thirds majority. "That means every 'no' vote counts twice," says one unhappy school official.

Pressure now is on state governments to help finance new construction, but they are reluctant to share the burden. "You have all these governors running around talking about the quality of education," says Casserly. "They've been very paltry with their resources while being very generous with their rhetoric." Michigan revised its school financing mix in 1993 to reduce local property taxes and increase state aid. But, says Mary Fulton, a

policy analyst with the Education Commission of the States, a Denver-based think tank, few others have followed suit.

There are a few bright spots. California voters—pioneers in tax resistance—in March approved a bond measure that will result in \$2 billion in spending for K-12 school construction. School officials were ecstatic at the easy victory, particularly after narrowly losing a similar measure two years ago. Still, that bond will barely make a dent in a construction backlog of \$7 billion.

Demanding design criteria; tight budgets

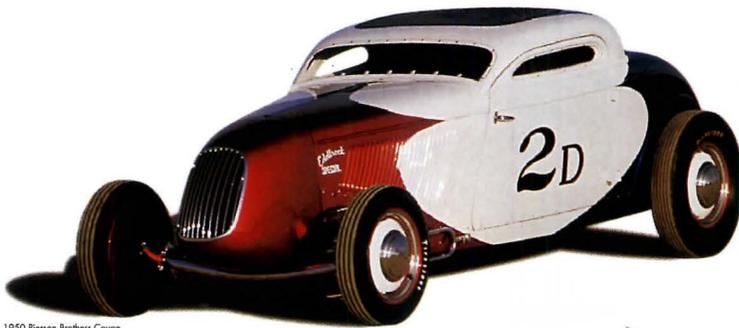
Architects are being forced to respond not only to tight budgets, but to dramatically changing roles for schools as well. Heinz Rudolf, a partner with BOORA Architects in Portland, Ore., says two high schools his firm is designing in that fast-growing state are responding to a wide range of educational and community needs. Among them: greater emphasis on language labs, a desire to foster team teaching, the need to make schools day and evening facilities for both students and

Continued on page 114

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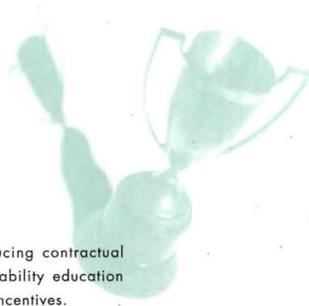
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Health-Care Prognosis: Change

By Barbara A. Nadel

From California to the Carolinas, managed-care market forces have reshaped the health-care arena. For-profit hospitals, insurance companies, and networks of managed-care providers are determining the size, location, and scope of health-care facilities, based on financing availability and market share, as well as service demands. The only sure bet in the current climate is the need for flexible design to accommodate even more change.

According to the American Hospital Association, the number of hospital beds has been steadily decreasing, from 923,000 in 1992 to 700,000 in 1995, to an estimated 500,000 in 2000. At this rate, based on a conservative estimate of 100 sq ft per bed, hospitals might conceivably be left with over 42 million sq ft of vacant space by the turn of the century.

Proposed reductions in federal Medicaid/Medicare programs will likely require further cutbacks, especially at urban institutions now serving large uninsured populations. They will consolidate, downsize, or close. Major medical centers and teaching hospitals will receive less public money for federal research grants, medical education, infrastructure improvements, and in subsidies for elderly and indigent patients. The extent of the proposed reductions, and the implications of converting this funding to state block grants, isn't yet known since these changes are still being debated in Congress.

Recycling obsolete facilities

"Hospital strategic plans now consist of 'we want to stay in business. How can our current facility meet that objective?'" observes Collin Beers, design director with Granary Associates, in Philadelphia. Recycling unneeded space allows hospitals to remain competitive by making the best use of existing infrastructure. In-patient areas are being renovated for subacute care, cancer treatment, and rehab therapy. Hospitals with underutilized in-patient operating rooms now want to attract ambulatory surgery patients for better utilization and efficiency.

Barbara A. Nadel is principal of Barbara Nadel Architect, in New York City, a health- and correctional-facilities specialist.

Architects have a role in helping hospitals find new uses for the 200,000 in-patient beds and 42 million sq ft of surplus hospital space estimated for 2000.

"Design professionals are shaping facilities to compete in managed-care settings by reducing operating costs through staffing efficiencies and shared multi-functional spaces," adds Joseph Sprague, senior vice president at health-care design giant HKS in Dallas. This may mean using an operating room for surgery or delivery, or scheduling exam rooms for different weekly clinics. A design that eliminates two full time employees, for example, might finance a second imaging machine.

"Installation and upgrades of new technology, such as cardiac cath labs and MRI equipment are continuing in many institutions after being deferred for several years," reports David Thistlewaite, principal of Thistlewaite Architectural Group in San Francisco. The challenge is retrofitting such small but costly

high-tech projects into buildings that may have too-low ceilings or inadequate mechanical or electrical systems.

Hospitals without beds

Many hospitals have developed their own integrated managed-care networks. "Satellite diagnostic and treatment centers, or 'hospitals without beds', are on the rise across the country," says architect Ralph Hawkins of HKS. These offer urgent care and have birthing centers and 72-hour, short-stay beds. Hospitals own and operate them with house medical staff, creating a seamless in-patient/outpatient organization consistent with managed-care reimbursement policies.

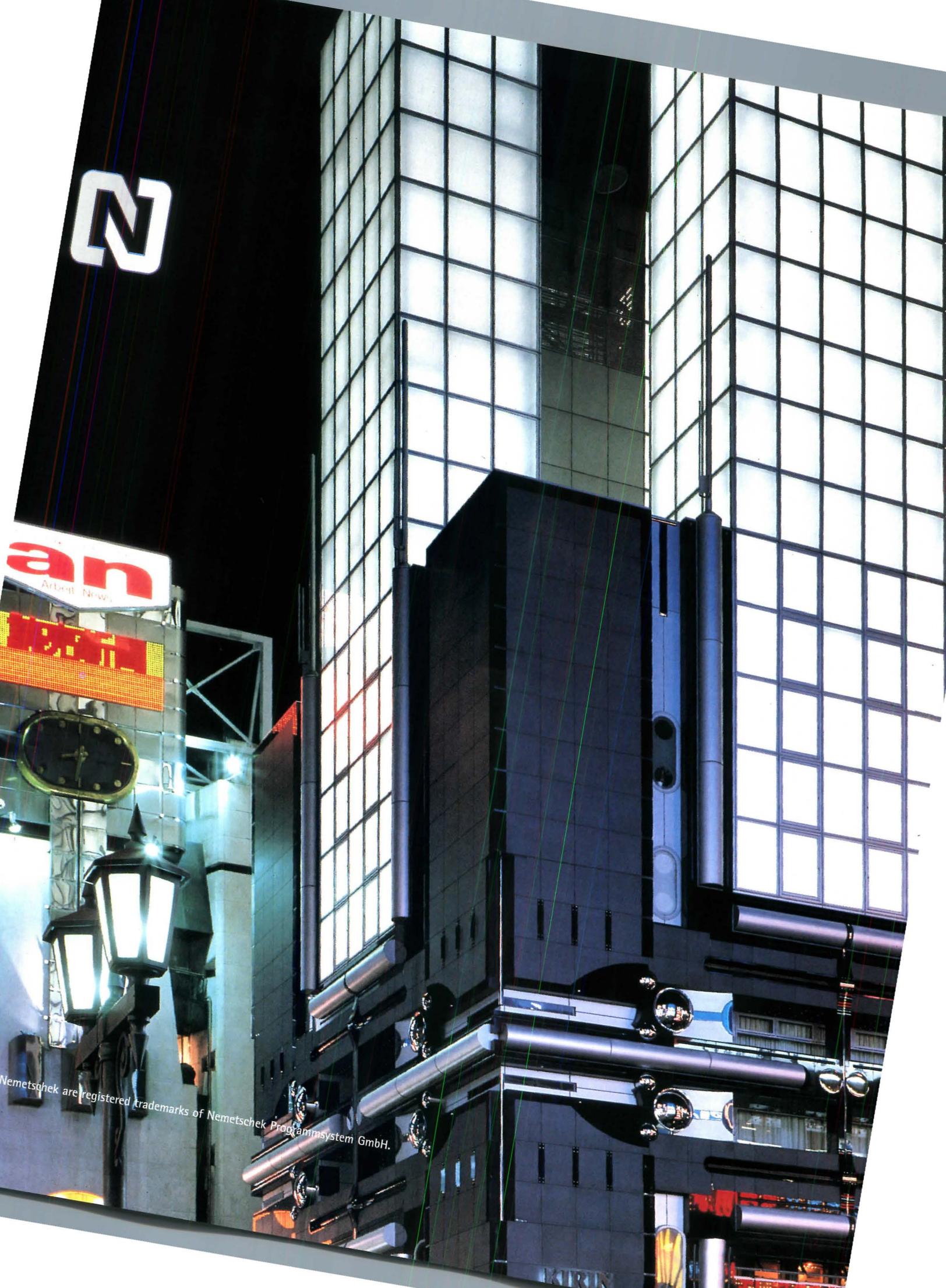
Hospitals are also entering the long-term-care market by converting skilled-nursing
Continued on page 114



Going retail: Designed by Architecture for Health Science and Commerce, The Sister Thea Bowman Family Health Center (bottom), a converted supermarket (top),

brings a variety of ambulatory services to the street, extending the reach of its parent, Catholic Medical Center of Brooklyn and Queens (N.Y.), and saving money.

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COMPUTER DELINEATION AWARDS

Space, Time, and Cyber-Architecture

In this, RECORD's third awards program recognizing the use of computer modeling, rendering, and animation tools in the presentation of architectural concepts, entries fell into two

First Prize: "Logic Error"

Delineator: Paul Q. Davis, Minneapolis

On the evidence of this entry, its assertion that "the world is in flux" is an understatement. The animation is not a project per se, but a series of expertly art-directed vignettes that take their cues from rock-music videos in content, editing, and imagery. Collaborating with Davis were Dav Arak Koenen, Daag R. McCallum, and Christopher Brain Mullen, all of Ellerbe Becket, Minneapolis, which provided the computer hardware and software supporting the team's explorations. They will receive the first prize, *Frank Lloyd Wright: Presentation Drawings*, a CD-ROM collection of nearly 5,000 drawings, offered by Luna Imaging, Venice, Calif.

"Ellerbe Becket has always supported a 'think tank' approach to the computer," explains Davis. "What we learn in the kind of exploring we do on our own time leaves us less inhibited when we pursue real projects with real clients." Offering little conventional narrative, the video intersperses occasional flying chunks of architecture with religious imagery, kitsch bits, and a possible crucifixion. Among bravura moments is a cityscape that stretches itself out like a ribbon, then wraps a cylinder that proves to be supported by a hub framed in the shape of a star. In another sequence, a spaceship-like object appears to spin downward into a cityscape, which flies into pieces as if hit by a cyclone. "Try not to focus on anything in particular," urges Davis. "The key is to unleash your own subconscious flow." In this case, that's good advice.

"Our current work is experimental," continues Davis. "We like to think of it as a moving collage of spontaneous visual emotions." The jury rewarded this exploratory approach. It rejected for an award another entry by the same team that could be regarded as a science-fiction video brochure for Ellerbe Becket. "Here, someone is exploring a language," commented juror Gaetano Pesce.

Computer: IBM RS6000, IBM Pentium

Software: IBM AES, Autodesk 3D Studio

Output: VM-Studio (video)

Web site: http://www.logic_error.com



Computer Delineation Awards

"The computer permits much more complex shapes, which are reflected in architecture. 'Logic Error' is an image. This is a building."—Juror Tom Hanrahan

Second Prize: "Firehouse 451"

Delineator: Drew Miller, Atlanta, Ga.

The entrant calls this suite of images "a metaphorical structure and space," derived from Ray Bradbury's science-fiction classic, *Fahrenheit 451*. Miller's prize is a copy of *Houses of Frank Lloyd Wright*, a CD-ROM offered by Luna Imaging, Inc.

Modeled from the historic Oglethorpe fire station in Savannah, Ga., Miller's vision is suited to Bradbury's nightmare firemen, whose duty it is to burn down (rather than save) the houses of those suspected of harboring literature, so that social "diversity and individuality" can be silenced. To the ruined walls, Miller has attached signs and electronic billboards (1), a furnace for literature burning (3), and a re-education center (including an inverted fire escape—2) for "the 451 youth corps."

Miller first developed the project while a student at the Savannah College of Art and Design under professors James Goodlett, Jr., and Deirdre Hardy. He completed it after graduating. Jurors were impressed by Miller's rendering skills. The shadows, for example, made the presentation unusually readable. Light was not just calculated, but manipulated for emphasis, augmented by selective use of realistic surface treatments.

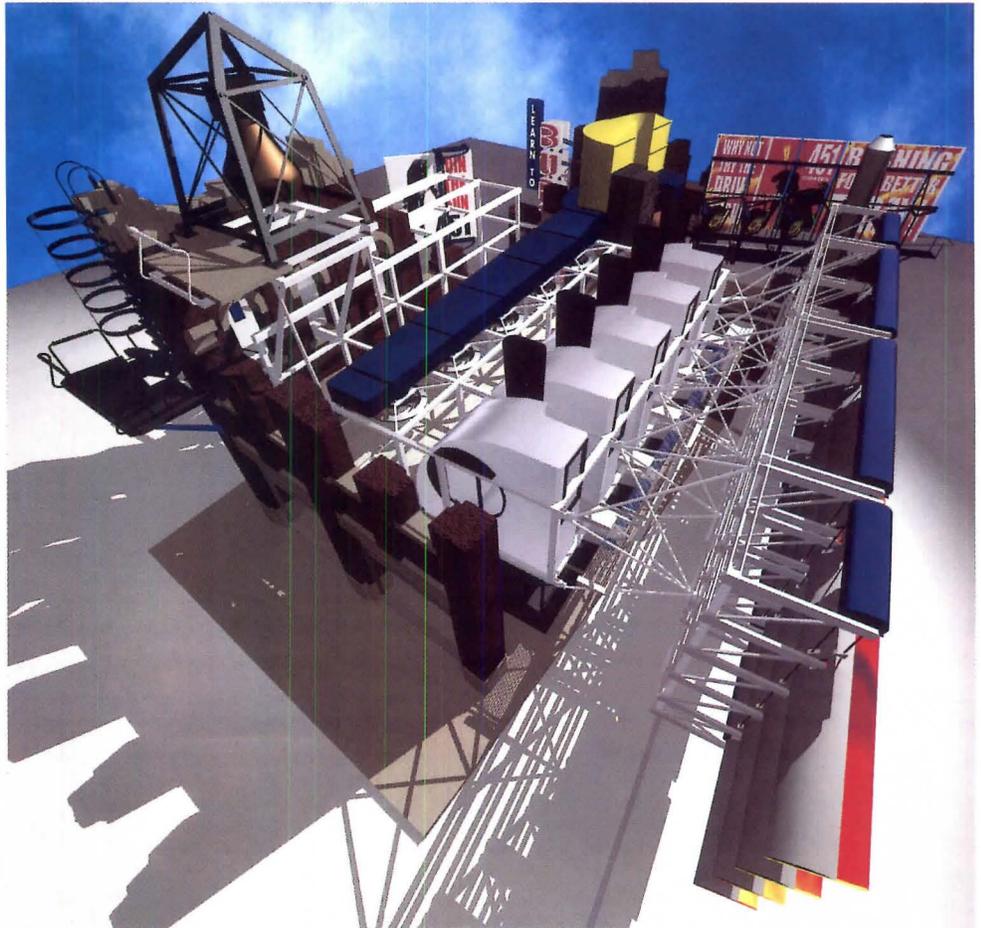
This entry spurred a jury discussion as to how electronic imaging tools might be influencing what is produced. "The design of real buildings," explained Hanrahan, "reflects what the architect designs with—buildings that look like the foam-core models they were designed from, for example. Now the computer permits much more complex shapes, which are reflected in architecture. 'Logic Error' is an image. This is a building." J.S.R.

Computer: Pentium-type PC

Software: Cadkey DataCAD 6.0, Autodesk 3D Studio 4.0, Adobe Photoshop 3.0, Quark Express 3.31

Output: Kodak CLS 86600, Tektronix Phaser 480 (dye sublimation printers)

Web site: <http://www.mindspring.com/~dfmiller/fire451.htm>



Second Prize: "The Power of Change in Gothic: Notre Dame Cathedral of Amiens"

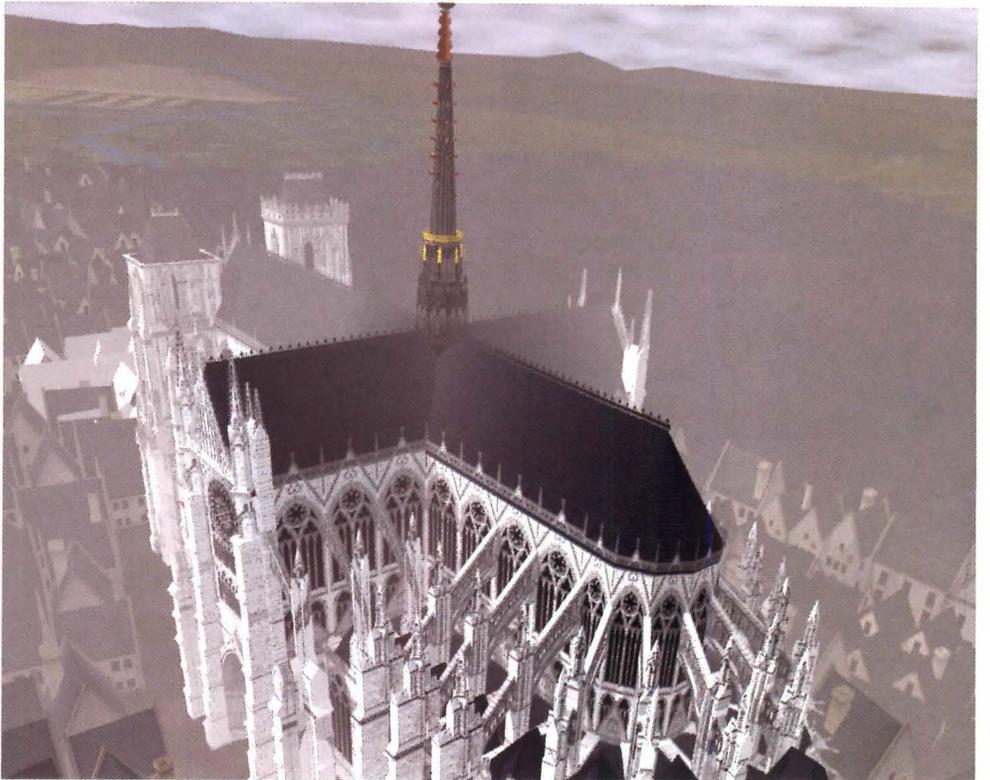
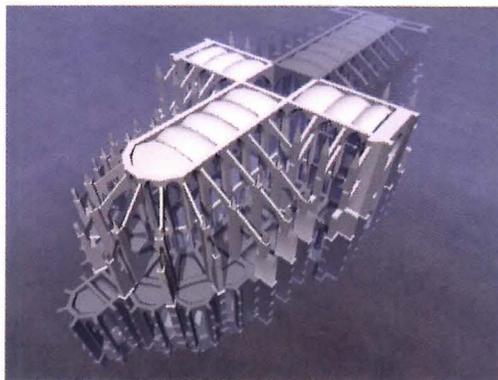
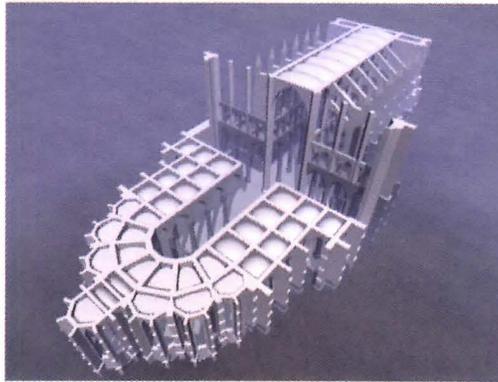
Development Team: Stephen Murray, executive director; Eden Muir, digital technologies director; Rory O'Neill, creative director and animator; Maurice Luker, managing director.

The project uses computer models and animation to engage both college and K-12 students "in the active interpretation of a work of art and its historical period," according to the Media Center for Art History at Columbia University, which produced the entry (and will receive the prize, *Houses of Frank Lloyd Wright*, offered by Luna Imaging, Inc). Animation places the cathedral in its village context (4), and describes the metaphysical geometric ideas behind its design. Construction and engineering principles are demonstrated by showing an animated sequence of construction (1, 2, 3). A "collapse" demonstrates the shortcomings of the design, and the remedial work undertaken.

The jury was impressed by the entry's sure use of the technology. Elements were realistically rendered, and tools were used to ease interpretation. A mist surrounds the Cathedral, for example, creating a subtle but effective sense of depth. "I have some concern that this was the work of many people, who had many resources at their disposal," noted juror Hanrahan. "Is it really showing how it works or how it's built?" asked Viemeister.

The material came out of a study by Stephen Murray, professor at Columbia University's department of Art History & Archeology. Students at Columbia's Graduate School of Architecture modeled the cathedral at the school's Digital Design Laboratory. Additional funders included the National Endowment for the Humanities and the Samuel H. Kress Foundation. J.S.R.

Computer: Silicon Graphics
Software: Microsoft Softimage
Output: VHS tape
Web Page: <http://www.arch.columbia.edu/DDL/projects/amiens/>.



Computer Delineation Awards

One entry was successful simply because it conveyed by the most realistic means possible the precise arrangement and feel of the rooms to users, who probably find reading plans difficult.

Honorable Mentions

Project:

Taichung Civic Center, Taiwan
(Figure 1, below)

Delineators: Michels Bollinger, Inc., Washington, D.C., New York City: Doug Michels, Peter Bollinger, James Allegro, Mina Chow, George DeFalco, collaborators.

The project was delineated for entry in an international competition. Gaetano Pesce: "This one evokes a military power."

Computer: Silicon Graphics Workstation

Software: Alias wavefront

Output: Iris (prints)

Project: "Automorphic Architecture" (2)

Delineator: Bryant P. Yeh, Los Angeles

An exploratory project. Tom Hanrahan: "A poem, not a building."

Computer: four Pentium-type personal computers

Software: Autodesk AutoCAD 12, Adobe Photoshop

Output: Epson ink jet (printer)

Project: Palisade Center (3)

Delineator: Scott Folts, Syracuse, N.Y.
A gantry for media.

Computer: Tri-Star TriCAD P90

Software: Autodesk AutoCAD 13, Autodesk 3D Studio 4, Adobe Photoshop 3.0

Output: Epson Stylus (printer)

Project: Landa House (4)

Delineator: Mark R. Briggs, Morphosis, Santa Monica, Calif.

A rendering combining solid modeling with wire-frame. Gaetano Pesce: "A sketch, a section about process . . ." Tucker Viemeister: "I don't know what it means."

Computer: Pentium-type PC, Apple Power Macintosh 8100

Software: Forum 2, Autodesk 3D Studio

Output: Epson Color Stylus (printer)

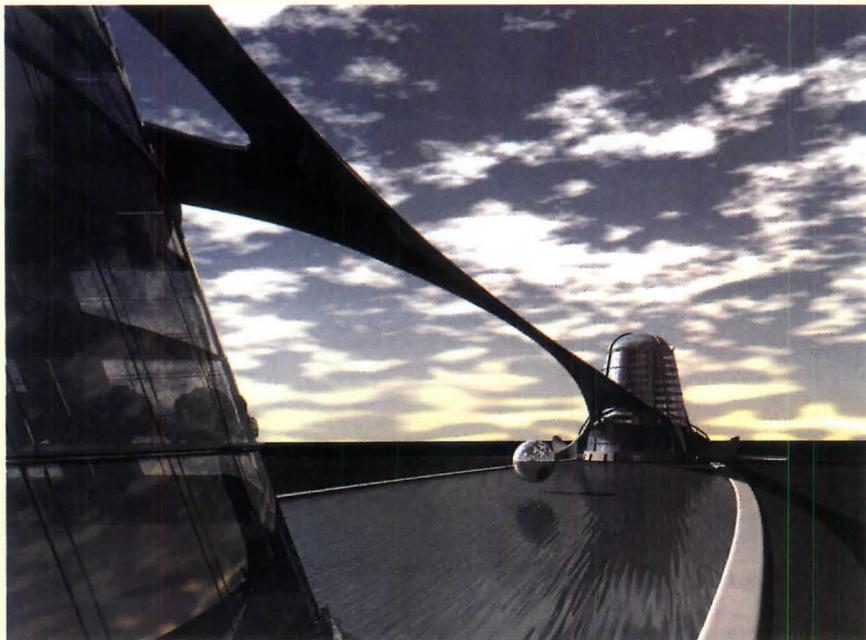
Project: "The Monastery of St. Casimir" (5)

Delineator: Darius Kuzmickas, University of Utah, Park City.

A rendered computer model with an animated walk-through.

Computer: Pentium-type PC

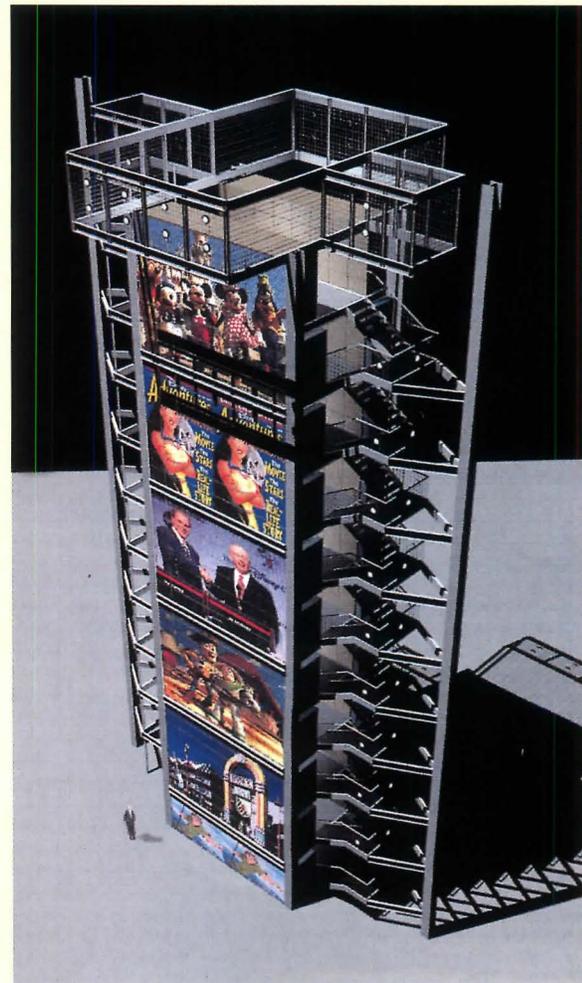
Software: Bentley Systems' Microstation 5.0, Adobe Premier 4.0, Adobe Photoshop 2.5



1



2



3

The Irreplaceable Artistic Hand

Awards commentary by Joseph Vance

Output: videotape and ink-jet prints

Project: New Worship Center, Old River Baptist Church (not shown)

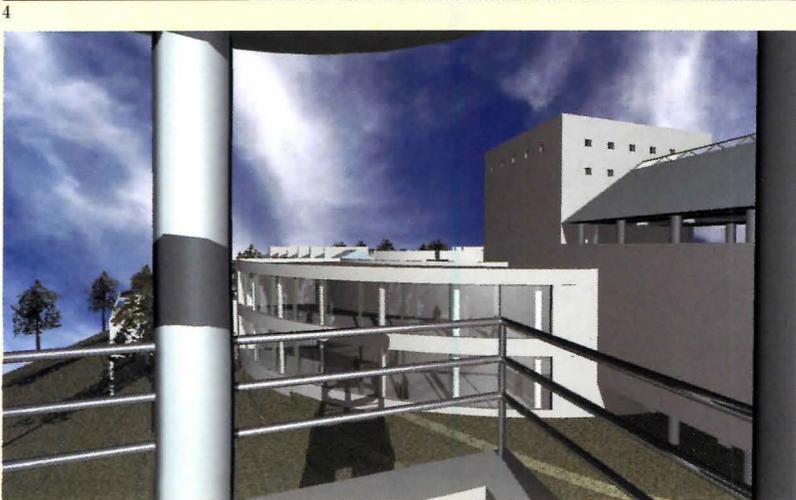
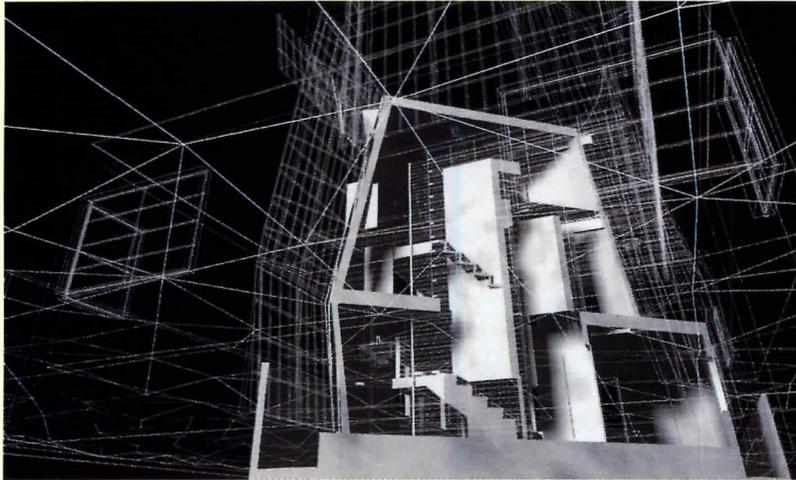
Delineators: David Ren Henderson, Zero Gravity, Inc., The Woodlands, Tex. Robert Yager, Paul Lyle, Geoffe Greene, collaborators.

An animated and rendered model that showed a church group not only what their project would look like, but how it would be built. Tucker Viemeister: "I don't like the design too much, but it communicates how it's done."

Computer: Silicon Graphics Indigo 2 Extreme

Software: Alias Wavefront

Output: Sony BetaCam SP (video)



The number of entries in the third Computer Delineation Award program was up significantly in 1996—356, compared to about 90 last year. The size of the response suggests that nine years after the personal computer landed on architects' desks, designers are becoming more comfortable with computer-based modeling and rendering, and these tools are becoming as conventional as cardboard models or ink-line renderings once were.

The jury this year consisted of Gaetano Pesce, a New York City-based architect and designer; Tom Hanrahan, partner in Hanrahan & Meyers, a New York City architect; and Tucker Viemeister, vice president product design at industrial-design firm Smartdesign, Inc., also of New York City.

Matching project and rendering technique

The winners shown on these pages depict a wide range of successfully implemented computer-based rendering techniques. That said, there were also many examples where technical mastery fell short. It looked like some entrants indiscriminately used every feature offered by the modeling or rendering application. As a result, surfaces appeared wrapped in faux wood grain or marble and lit from unnatural angles with surfaces reflecting light in ways not seen in nature.

As Tucker Viemeister noted, some entries seemed driven by what the computer can do, as opposed to what method of presentation was most appropriate for the project. As a general rule, the more successful images were those that either mastered enough software features to create convincingly realistic images, like the Taichung Civic Center (opposite), or used the features sparingly for a simpler graphic effect, like the Landa House entry by Morphosis (left). An exception to this was the second-place winner by Drew Miller (previous pages). His interpretation of the firehouse from Ray Bradbury's *Fahrenheit 451* is not only unmistakably computer-generated, it embraces the technology to convey its ideas. The rendering is detailed, but the surfaces aren't textured photo-realistically. The colors are intentionally vibrant and the model is lit for dramatic rather than realistic effect.

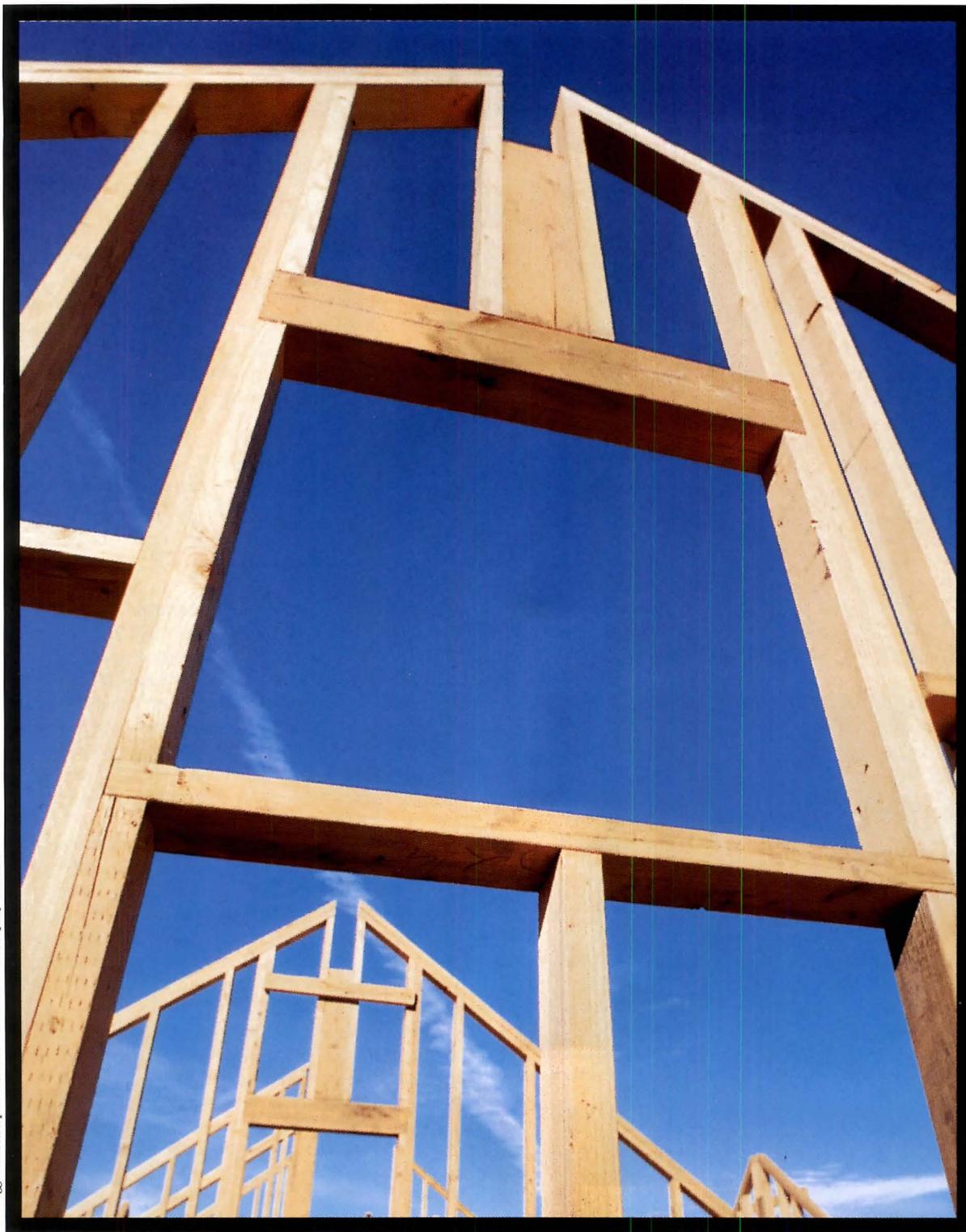
Jurors' "intense" reaction to animations

Just as with traditional media, a successful computer rendering is delineated—requiring the hand of an artist and the eye of a photographer. The shortcomings of entrants lacking these skills was most pronounced in the animation entries. Video presentations, just like television and movies, draw more visceral reactions. Jurors certainly reacted more intensely, excited by some entries and repelled by others. An entry for a

Continued on page 112

Joseph Vance heads his own New York City architecture firm and is chairman of New York/AIA's Macintosh Users Group.

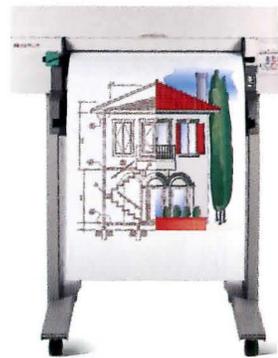
*U.S. suggested retail price. ©1996 Hewlett-Packard Company PE12597



Unlike the Spanish tile, the Palladian windows
and the hand-carved doors, the new HP DesignJets have
come in under budget.

Circle 68 on information card

For once, the one you really
want costs less than you
\$2,195* thought it
would. The monochrome
HP DesignJet 330 starts at
just \$2,195*. If your work
calls for color, there's the
DesignJet 350C starting at
\$2,695*. They deliver sharp
plots—fast. For convenience,
both models have optional
roll feed and legs. And they're
backed by a free one-year
on-site warranty. Visit us at
<http://www.hp.com/info/1603>
Or call 1-800-851-1170, Ext.
1603 for your nearest HP dealer
and a sample of the
impressive results you'll get
with an HP DesignJet plotter.



HP DesignJet 330 and 350



Coming: Drawings With Data Overload

By Steven S. Ross

It's time to rewrite local codes again. There's a growing consensus that drawings of the future are going to contain lots of data—far beyond what even the biggest, nastiest projects require now. There's also a growing consensus that product manufacturers—the folks who supply windows, doors, sewer fittings, and street lamps—are going to do most of the codifying of such data.

The vendors must remain competitive in the national construction-products market. But many large cities and other jurisdictions do not follow national codes. Some follow most of the rules, but word them in different ways. Some have their own rules. Some arrange the rules differently, even when the paragraph-by-paragraph wording closely parallels national codes such as BOCA.

Thus, a Class 3A widget in one jurisdiction may have an exact or close counterpart on BOCA STD-43C. Or, those Class 3A widgets may have no exact counterpart at all, elsewhere; other jurisdictions may have layered in the Class 3A rules as parts of five or six other code sections.

The thinking among major jurisdictions with many codes of their own—New York City and San Francisco come immediately to mind—has been to start developing translation systems. Without changing the underlying data of their codes databases (or changing the data only in minor ways), the idea has been to create more user-friendly “front ends,” interfaces that allow architects and builders to find information.

That approach seems cost-effective for existing technology. But by the time these user interfaces are finished in many jurisdictions, the technical needs will be different. I worry about the added costs of designing, constructing, and maintaining buildings in New York City a decade or two from now, because so many vendor-supplied “intelligent details” will be only marginally useful, unless New York codes are brought more into line with national codes.

What's more, the babble represents an opportunity lost, for practices to supply more deliverables to clients in the form of data

that will help maintain a building and handle modifications 20 or more years after the keys are handed over to clients.

Building owners have either been complacent, or have looked upon the situation as an opportunity to weaken codes while realigning them. For the conversion to proceed in a timely fashion, however, it must be taken on as a separate issue, apart from code changes—no matter how logical those code changes may appear.

This is not a time for finger-pointing, either. Many of these “non-standard standards” got written into codes in the first place because the cities that did so were pioneers. New York, for instance, was perhaps the first large jurisdiction to approve acrylic sheets for lighting.—SSR

Form-Z RenderZone 2.8

Equipment required: Macintosh or Windows-capable computer. Power Mac or Windows 95 with at least 16MB of RAM strongly recommended; 32MB is even better (the extra 16MB will set you back about \$400 at current prices). Versions are available for Macintosh 68040 CPUs, Power Mac, Windows 3.1, 95, or NT.

Vendor: autodesys Inc., 2011 Riverside Dr., Columbus, OH 43221; 614/488-8838, fax 614/488-0848; formz.mktg@applelink.apple.com; <http://www.formz.com>.

Cost: form-Z, \$1,495; RenderZone, \$1,995. Windows promotional pricing until June 30—\$999 for form-Z; \$1,399 for RenderZone.

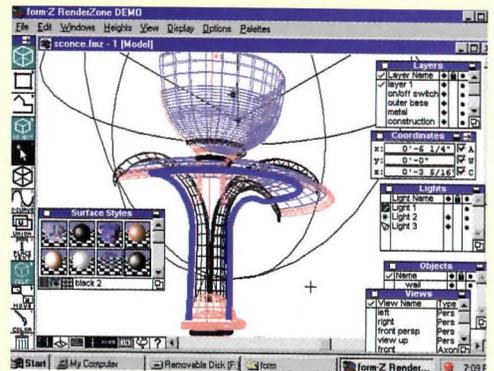
This popular package for creating detailed 3D models just got a lot better. The folks at autodesys have been steadily adding features to form-Z every few months for many years. Last month brought bigger news. First, the basic modeling package, form-Z itself, has been enhanced with photorealistic rendering: the combo is being sold under a new name, RenderZone. But form-Z without this feature is still being sold as, well, form-Z. The second big piece of news: form-Z and RenderZone are now available for Windows computers as well as for the Mac. All these permutations carry the “version 2.8” tag.

This month's reviews of modeling and GIS software underline the emerging need for more data standards.

We've done some rough speed tests with RenderZone, comparing Windows and Mac versions. Right now, we find Power Macs faster than Pentiums of equivalent price and memory. Older 68040-CPU Macs are slowest of all (as much because of memory management as CPU speed). We also prefer the Macs for rendering because the display usually offers truer colors.

It is clear that Windows is catching up, however. And because most high-end CAD packages are sold mainly for Windows, the ease of keeping everything on one platform may outweigh the Mac's benefits.

Form-Z has long been class of the field among Macintosh modeling packages. It offers solid and surface modeling, along with some drafting and some rendering functionality. But 3D modeling is where it really shines. It handles



Sconce rendered in RenderZone in wireframe. Note the variety of surface textures available.



Sconce shows excellent depiction of transmitted internal light source, as well as external reflected light.

boolean operations (adding and subtracting solid or planar shapes) easily and intuitively. It also allows you to easily define meshes, curved splines, helical objects, and special effects such as NURBS, 3D text, object rounding, and deformations.

One of the neatest new features is a resizing dialog that makes matching underlying bitmaps and other objects a breeze. The query tool now handles 2D objects as well, again helping to integrate new objects into a model.

Form-Z also has had a good record of keeping its file-format translators rock-solid and up-to-date. Version 2.8 for Windows adds 3DS, Windows BMP, and Windows Metafile. But users have had to render form-Z models in other packages such as 3D Studio or Ray Dreams to get really spectacular effects. The RenderZone version makes that unnecessary.

You can download demos of both RenderZone versions (Mac and Windows) along with mini-manuals from the firm's web site, <http://www.formz.com>. The files are large (several megabytes each) but the wait will be worth it.

Manuals: Excellent; downloaded demo versions have mini-manuals that print out in Acrobat format (you can download an Acrobat reader/printer free from the autodesk site).

Ease of use: The interface is first-rate, but not for everything or every working style. If you like to scoop out shallow sections from solids by "sculpting" (without creating a shape and then doing a boolean subtract), and you do a lot of it, the interface will be a bit cumbersome. On the other hand, speed counts in high-end modeling and this package is fast—even faster than the last version we tested thoroughly, 2.3. We hate the copy-protection dongles.

Error-trapping: Good. At times you run out of "buffer" space to hold rendered images; zooming or panning then forces a re-render, which is time-consuming. On the other hand, you can now save partially rendered images—an enormous time-saver.

150 on Reader Service Card

ArcView 2.1 for Windows

Equipment required: Computer capable of running Windows 3.1 or 3.11 (8MB minimum), or Windows NT (12MB minimum). Windows NT computer must use Intel CPU. Vendor warns that it has not been tested on Windows 95. Fast Pentium strongly recommended. Macintosh and Unix versions available.

Vendor: ESRI (Environmental Systems Research Institute, Inc.), 380 New York St., Redlands, CA 92373-8100, 800/447-9778 (GIS-XPRT), 909/793-2853, fax 909/793-5953, <http://www.esri.com>.

Cost: \$995 each with 90 days telephone support; \$295 a year annual maintenance, free upgrade to 3.0 late this summer.

With more and more offices getting into the planning business, or at least spending more time with planners, you may have to master the world of geographical information systems (GIS). If you are going to use them a great deal, you'll probably want to consider a true workstation version, perhaps running on a Sun SPARC computer. But for light-duty use, a Windows-based package may be acceptable.

Why the need for power? GIS projects are extremely data-heavy, even more so than most architectural projects, even large ones. CAD vendors themselves have been working on solutions. Autodesk pushed ArcCAD from ESRI, an add-on for AutoCAD. Autodesk is about to release its own add-on now. So is Bentley Systems. We'll be reporting on those in some detail in future issues.

For really huge GIS tasks, Autodesk is about to release its ADE (AutoCAD Data Extension) version 2.0. We've been playing with the beta version, and we are impressed. For very basic tasks (population profiles, for example) MapInfo, BusinessMap, and similar products are available. MapInfo is looking more and more like medium-level GIS, too.

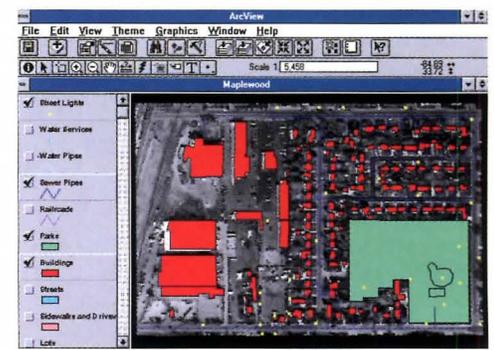
For medium-duty tasks such as subdevelopment planning, or for heavy-duty, city-wide tasks where you don't need to include every scrap of data (and thus create a monstrous data pile), ArcView offers an excellent solu-

tion. It runs independently of CAD software but can exchange data. The firm also sells lots of geographical data at reasonable prices.

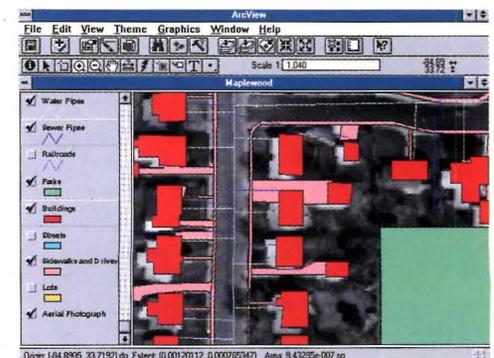
There's also a developer's environment, called Avenue for customizing ArcView to your needs.

Manuals: Concise, to the point, full-color paperbacks. ESRI also has a large selection of texts available; you can even order them from the firm's web site, <http://www.esri.com>. **Ease of use:** Great for a GIS product. The project viewer looks very much like the viewer in common database products such as Access or Paradox. It is easy to superimpose data on aerial photos—even satellite photos. **Error-trapping:** Excellent. It seems near-impossible to destroy data.

151 on Reader Service Card



Buildings, some street-light utilities, and parkland superimposed onto aerial photo.



Area of first view, but with sewer pipes and sidewalks added.

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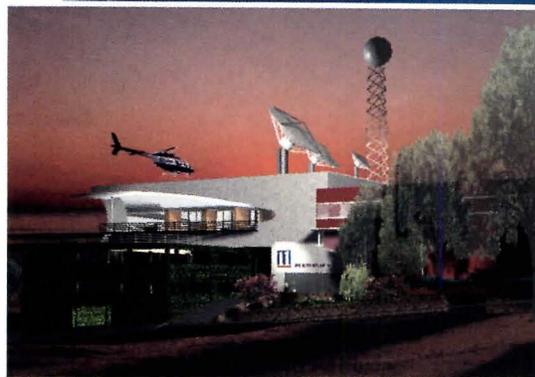
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Larry Lord, EALA
Principal
Lord, Aeck & Sargent
Atlanta, GA



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154. Decorative and fire-rated

A/D Firefilm is a paint-like intumescent coating that retards thermal transmission to keep structural steel below its failure temperature for a rated time. Available in ratings of up to two hours according to tests by Underwriters Laboratories of Canada (CAN/ULC-S101; ASTM E-119). The white, water-based finish is sprayed on as a single coating up to 0.12-in. thick over a compatible red-oxide primer, and top-coated with a low-VOC decorative paint. Chamberlain Architects used Firefilm on structural metal at The Canadian Warplane Museum (right) so that the hangar framing would not have to be concealed by a rated finished ceiling. The installed film is impact- and abrasion-resistant. 800/263-4087 (U.S.); 416/292-2361; fax 416/298-5887. A/D Fire Protection Systems, Inc., Scarborough, Ont.



© Lenscape photo

155. Thin, esthetic fire resistance

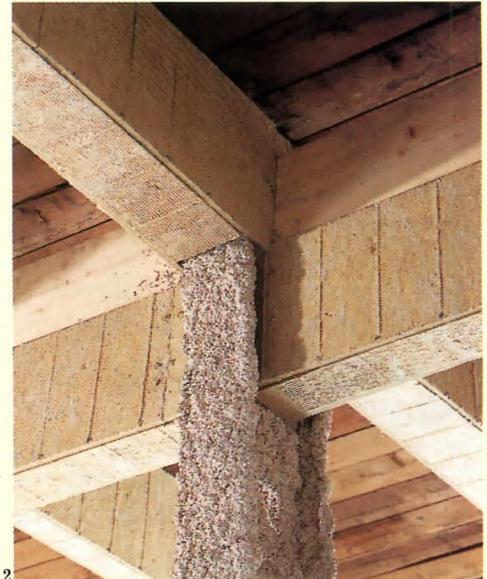
Albi makes several types of intumescent coatings. These swell (intumesce) at elevated temperature to form an inches-thick insulating-foam barrier that maintains the beam or other structural element at below-failure temperatures for a minimum time. The product line includes solvent-based mastics, suitable for exterior use and capable of multiple-hour ratings. For interior use, the firm's water-based thin-film coating, AlbiClad TF (1), is said to be able to capture sharp details—such as cast-iron bolt heads (4)—without blurring the outlines of architectural elements as thicker coatings might. Decorative topcoating will not compromise fire-retarding performance.

A new, non-intumescent fireproofing, DriClad board (2) requires no water or mixing. A mineral product comprising volcanic rock and resins, it can be precut for on-the-job installation. Boards are mechanically fastened with the AlbiScrew system after blade-cutting.

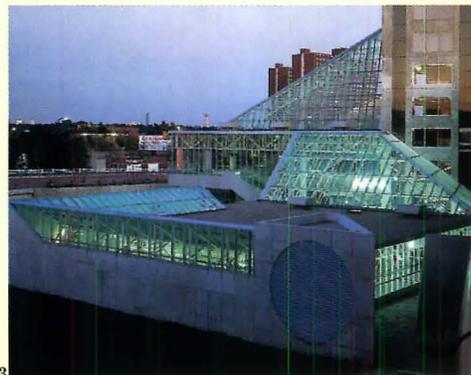
Among the applications for AlbiClad TF intumescent is a supporting atrium structure (3) used in the Alewife TransitStation in Boston, and a retrofitted series of steel columns (4) at the Reading Terminal Market, in Philadelphia. Both were spray-applied directly to the structural steel. 860/828-0571; fax 860/828-3297. Albi Manufacturing, Div. of StanChem, Inc., East Berlin, Conn.



1



2



3



4

© Alex Beatty photo

© Jeffrey Stevenson photo

© C. Geoffrey Berchin photo

Less obtrusive paint-like intumescent coatings, relatively new high-density cementitious coatings, and fire-proofing boards permit new design freedom while protecting structural steel.

156. High-density cement fireproofing

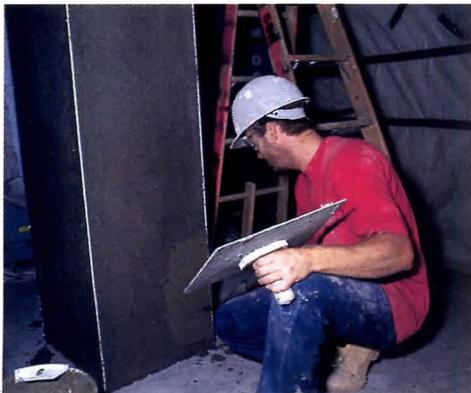
A high-bond-strength Portland cement fireproofing introduced in the early 1990s to offer the architect finish options not previously available in a cementitious product, Grace's Monokote Type Z-146 has recently been reformulated. The improved chemistry allows a thinner application to achieve the same hourly ratings as the original, thicker depth. The material comes premeasured, needing only to be mixed with water in a paddle-type plaster mixer at the job-site. Z-146 is sprayed onto clean interior or exterior

structural steel in thicknesses appropriate for ratings of up to four hours. It can be finished with a trowel to create a smooth, decorative finish (1).

Type Z-146 can be integrally colored in the mix, eliminating painting, or standard paints can be applied to smooth surfaces. The beams (2) are clad in Monokote fireproofing coated with epoxy, in order to meet the dust-free requirements of a computer-chip assembly facility. The compound is said to have sufficient build and impact-resistance to allow

space-saving definition of beams and other structural elements in heavy-use applications such as in parking garages (3).

Grace has also improved the installation characteristics of its medium-density Type Z-106 product, for use in areas such as elevator shafts with no direct exposure to the environment. 617/876-1400. Grace Construction Products, Cambridge, Mass.



157. Thin, intumescent mastic

Fire Research Laboratories makes a line of fire protective coatings, including intumescent and cementitious types, for a wide range of Class A and UL requirements. Its No. 44 fiber-reinforced mastic, formulated for application with a heavy-duty sprayer or trowel, can conform to the contours of beams, allowing such details to contribute to the architecture of a space (right).

tance, and to be able to withstand hard use and occasional dings. No. 44 mastic meets VOC regulations both in application and after cure. The standard color is white, as shown; decorative top coating is permitted. It is approved for use on both structural steel and structural wood shapes, as well as on aluminum and plastic substrates in some applications. 800/877-3473. Fire Research Laboratories, Albuquerque, N.M.



The coating dries to a hard, flexible finish that is said to have excellent abrasion resis-

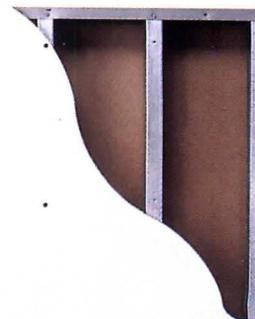
158. Fire- and assault-resistant

A new 5/8-in. Fire-Shield wallboard combines labeled, one- and two-hour fire resistance with several levels of impact and penetration resistance. The Hi-Impact board (right) is a composite of type X gypsum core encased in heavy, natural-finish paper on the exposed side, and a liner paper on the back. Lexán film is bonded to the back in one of three thicknesses as appropriate to the requirements of mental-health hospitals, correctional facilities, housing, and schools. When installed as part of an approved assem-

bly, boards can withstand impact penetration from gurneys, ballpoints, or hammers at levels of up to 1,450 foot-pounds.

Compared with other impact-abuse wall systems, Hi-Impact wallboard is said to be easily cut-to-fit. A tapered edge allows for joint reinforcement. 800/628-4662. National Gypsum Co., Charlotte, N.C.

See Product Literature, page 116, for additional sources of fireproofing materials.





159. Aggregate look

Introduced last year, Magna-pattern Corian has a larger, granite-like particulate blended in a realistic multi-color matrix. New this year: Mediterranean (blue tones with white particles) and Rain Forest (dark green with earth-tone specks). All Corian is Class A per ASTM E-84. Colors are integral; in-use scratches may be removed by light sanding. 800/426-7426. DuPont Co., Wilmington, Del.



164. Bright-color VCT

A popular and economical floor for school, retail, and healthcare applications, Standard Excelon Imperial Texture now comes in 50 colors, including the eight new "spice" tones pictured. Complete sample program for architects and designers. 800/292-6308. Armstrong Commercial Floors, Lancaster, Pa.



160. Lines and prints

Two new vinyl wallcoverings by Patty Madden are intended to coordinate in commercial interiors. Both 54-in. wide, Netting has lines and shadows in a woven look; Netting Damask adds a soft overprint. A sample book is offered without charge to architects and designers and covers all these Vinyl Resource patterns. 516/582-4300. J.M. Lynne Co., Inc., Smithtown, N.Y.



165. Nylon upholsteries

Made of solution-dyed Zeftron, the Berkshire fabric line consists of tapestries and stripes available in 23 color options, constructed to meet the most severe abrasion- and color-fastness tests. Priced for contract applications at about \$35/yd. Sample swatches: 212/995-0115. Maharam, New York City.



161. Geometric broadloom

From the new Women @ Work line of sculpted-pattern carpet (so named to commemorate female textile workers, from bobbin tenders to fabric designers), Spool Rack is a 40-ounce contract construction of Ultron nylon with an emphatic diamond-shape design. Sample program: 800/221-3684. Prince Street Technologies Ltd., Cartersville, Ga.



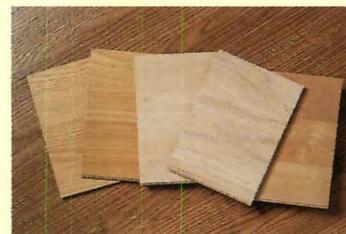
166. Extra durable

A new plastic-laminate option, Armored Protection Plus is said to provide greater visual clarity and pattern fidelity, as well as insuring longer as-new service life, even in applications such as children's furnishings. Woodgrains, in particular, have a brighter, more authentic appearance. Sample chips offered. 410/551-5000. International Paper—Nevamar Div., Odenton, Md.



162. Raised-line pattern

"Inspired by urban intersections, avenues, and streets," Metropolitan broadloom has a two-color grid design that allows for a wide range of accent shades. Part of the Cityscapes contract line made of Antron Lumena fiber, the carpet incorporates integral stain- and microbe-resistance. 706/882-1891. Interface Flooring Systems, Inc., LaGrange, Ga.



167. Laminate flooring

Made in tongue-and-groove planks for "floating" installation, new flooring is said to combine the easy-to-clean and decorative characteristics of the high-pressure laminate used for countertops with a traffic surface 10 times more durable. Designed for kitchens and other home areas; floor comes in 15 wood grains and can be laid over existing flooring. 800/435-9109. Wilsonart, Temple, Tex.



163. Tough cottons

Made by mills in the U.S. and Belgium, Cultural Ingredients fabrics incorporate various weaving techniques to achieve heavy-use abrasion resistance in all-cotton and cotton-blend materials for contract applications. Styled by Jane Eschbach in neutral colors, upholsteries come in three patterns, each in five colors. Swatches: 800/444-8812. Geiger Brickel, Atlanta.



168. Wallcovering source

Satinesque Class A wallcoverings, offered in a 54-in. width, are now organized into a two-volume Core Binder. This includes five groupings—faux finishes, wovens, Brush Strokes, fabric looks, and classical motifs—30 patterns in 963 colorways. Binder is a convenient size with large swatches. 800/895-9908. Columbus Coated Fabrics, Div. Borden, Inc., Columbus, Ohio. ■

Building Types Study 738/Community Buildings

These days many Americans find themselves making do with less. Social programs have disappeared; crime lives an extravagant life in many neighborhoods where it had been an anomaly before. And now the race to get onto the information superhighway threatens to create a new kind of class distinction in our society: The information-rich versus the information-poor.

Fortunately, architects can help balance the scales when they seize opportunities to design community buildings that make an appropriate response. Community facilities can become places where social services are offered to the young and old alike, such as the three featured this month: Sepulveda Recreation Center in Los Angeles, by Koning Eizenberg (pages 78-81); Irvington, Community Center, Fremont, California by ELS/Elbasani & Logan Architects (pages 82-87); and George Robert White Youth Development Center in Boston, by Leers Weinzapfel Associates with Chisholm Washington Associates (pages 88-91).

When police precincts are decentralized, and facilities encourage the community to become involved with law enforcement, crime rates drop: witness the Tempe, Arizona Police Station, by Architekton (pages 96-101).

And many community libraries now offer more than books. They offer access to computers and the Internet for anyone who desires them, like the featured libraries this month: San Antonio's Great Northwestern Library (pages 68-73), by Lake/Flato Architects; the Clayton Community Library in California (pages 74-77), by Simon Martin-Vegue Winkelstein Moris; and the Ross University Hills Branch Library (pages 92-95) in Denver, by Michael Brendle Architects. *Charles Linn*

Continuing Education

This issue contains the third installment of the AIA/ARCHITECTURAL RECORD Continuing Education Series. After reading the four articles in the series (pages 66-67; 68-73; 88-91; and 96-101) identified by the distinctive round logo, reply to the questions (page 169) and check your answers (page 171). AIA members may fill out the self-report form in this issue (pages 173-174) and send it in for two AIA Learning Units. Use the learning objectives below to focus your study.—*Mark Scher*

Mark Scher is AIA Director of Continuing Education Programs and Products.

Learning Objectives

After reading the article series and completing the exercises, you will be able to:

- ◆ Describe two current design approaches for law enforcement facilities that encourage community involvement.
- ◆ Identify two tactics for adapting to reduced public funding for community facilities.
- ◆ Identify at least two changes in current library designs that go beyond traditional considerations.

Manufacturers' Sources listed on page 122

Community Buildings: Coping With Cultural Change

Community facilities—libraries, police stations, community centers, and the like—are the knots that tie together the fabric of our towns and cities. They enrich the quality of life for individuals to an extent that can only be attained through collective organization—how many could afford to own thousands of books and a building to house them, a private security force, or have their own indoor basketball court? And, who would want to? The best part of the richness of community facilities is that they are shared.

The transformation that community architecture is undergoing in many ways reflects changes in our culture: the age of the Internet and the electronic storage of text will unalterably change the architectural form of our libraries. Many community centers now provide an array of social services, not just facilities for sports and the arts. And crime in American cities has created a strong push for community policing, which has changed the way law-enforcement facilities are located and built.

Community centers serve everyone, not just the athletic

According to James Colley, the director of Parks, Recreation, and Libraries in Phoenix, part of the changing role of community centers

“Government can’t go back to the old days, owning a recreation center purely for recreational purposes. It has to serve a wide diversity of populations...”

has come about because changes in the philosophy of local governments—and resulting losses in public funding—have altered what governments can and can’t provide for the public. “We now have to collaborate between city departments and private, non-profit social-serving agencies to serve the population. I see it as a partnership: we have to work together, because of diminishing resources, to maximize use of the facilities and the dollars we have left.

“Government can’t go back to the old days,” points out Colley, “owning a recreation center for purely recreation purposes. It has to serve a wide diversity of populations and their needs, dollar-wise, staff-wise, maintenance-wise, everything. A community center can house social services for seniors, like Medicare and social security. For teens we offer a place to apply for a job, pregnancy counseling, a drug problem, school drop-out counseling—any service. We don’t limit ourselves to recreation. We make the most of the facilities—we don’t have to go out and duplicate those facilities for a very specialized program because we’ve already got space for them.”

All this means that when architects are programming community centers, they should check with their clients to see that spaces for

meetings of different sizes, classrooms, office space that is appropriate for counseling sessions, and in some cases kitchens, are included in addition to the athletic facilities that were traditionally required.

In Phoenix, resources were conserved by constructing multi-generational facilities that serve the youth and elderly instead of just a single group. “About four or five years ago we built three of these facilities, about 35,000 square feet each,” says Colley. “One side is primarily a senior facility where we work with our human services department to provide food services. On the other side we have a component for a typical youth program; between them we have meeting spaces for either group to be used for whatever purpose they need.”

Law-enforcement facilities reach out to the public

Fifty years ago, the typical image for a police precinct station was that of a fortress. “Constructed in that era, it was an appropriate image for a police station to be seen as impenetrable,” says Mike Erp, executive director of the Washington State Institute for Community-Oriented Policing. “It was a place where the cops could do their work without the fear of being invaded by the public. But in an evolutionary process, police are beginning to realize that image and substance are very closely related. We as police practitioners can no longer present the image that we are isolated, distant and cold, non-caring.”

Architects should take note of two trends Erp sees in the construction of law-enforcement facilities, trends which ultimately may lead to new design opportunities. The first, that these facilities should be more open-looking, has been somewhat hampered by the need for security in law-enforcement buildings. But Erp has noted a change. “Little by little, as police have the chance to construct new facilities, they’re allowing their needs for security to be tempered, and are creating a more customer-friendly type of facility.

“There is still a concern about the individual on the rampage who might wander in, but little by little you’re starting to see that, at least architecturally, there is the creation of more openness. You’re seeing larger entryways, vaulted ceilings, a lot more glass, meeting rooms for the community, where before you might have just seen brick and mortar and bars. But even in localities where there has been a movement toward this more-open environment, you’ll still find metal detectors, just like at an airport.”

The second trend Erp sees is decentralization of these structures—from a few large facilities in a few areas of a town to many smaller structures that are established on almost a neighborhood scale. These may come in a number of ingenious forms, according to Erp, both to control cost and to allow for portability.

“One is a storefront-style police station, in a rented or donated space in a downtown or strip mall. Another is the mini-station, which might be a portable recreational vehicle or a small facility that is a complete police station. It might even have a jail, or just a place where officers can take down a report, so it’s basically just a scaled-down version of headquarters.” Portable “cop shops” are often set up in troubled

Community architecture changes with the culture. To find design opportunities, architects must see how our culture evolves.



Continuing Education
For learning objectives and instructions, turn to page 65.

neighborhoods on a temporary basis, and are moved once crime is under control. "The neighbors really have a hard time giving them up," says Erp.

Libraries: maintaining community in the information age

It is a popular notion that there will soon come a time when a person can summon virtually any information they might desire through a computer that could be located almost anywhere, and that libraries for all practical purposes will be obsolete. Architect Carol Ross Barney, of Ross Barney Jankowski Architects in Chicago, who has several libraries to her credit, disagrees. "I think probably the opposite's going to be true. Data is just data. Only when someone is able to use it in a certain way does it become information. That is going to be the librarians' role, so it actually makes libraries more important than they were in the past."

For the present, Ross Barney sees several changes in library design that architects should note. "All the libraries we've done in the last five years have really moved into a new type of information management. They're heavily electronic. We're probably even at a point where the technology handicaps the building the most [in terms of wiring and special indirect lighting for computer terminals]. A lot of people are going to a fiber-optic type of technology, which really increases the amount of data you can send. I think that the technology aspect of it will get easier if anything. It will be more sophisticated, but it will be less demanding on buildings."

Another change is in the area of spaces for specific library programs, says Ross Barney, which are intended to enhance the place of the library in the life of the community. Some of these include spaces for childrens' story hours, galleries, community meeting rooms, and special spaces where computers can be used. "The library isn't just the place where you keep the books. There is a lot of community and educational programming that goes on far beyond reference work and books. It plays a big part right now in planning and building a library. We still create a lot of spaces than you would expect in a library traditionally, but there is also lot of sophisticated machinery that's available to the patrons, like computers they can use, that go beyond the typical buying a book and keeping it on the shelf.

"We've also had a lot people talk of the quality about their work and study environment. There is a real interest in getting daylight in the offices for example, and certainly all the study areas. When we design library furniture, ergonomics is really important—all this bears out the notion that patrons have a hidden awareness of the quality of the environment."

One thing that hasn't changed is that people are concerned about the image of the library in their community. "In terms of American architecture," Ross Barney says, "I think that libraries have a really strong image, thanks to Andrew Carnegie's program to build one for anybody who ever wanted one. Almost every one of the communities where they have a Carnegie Library wants to retain that same, strong, dignified image." *Charles Linn*



In community-oriented policing, police facilities are decentralized, and located where they may be needed most. Often they are placed in storefronts or kiosks like this facility in New York City's Times Square. The presence of police personnel who constantly staff such facilities deters crime, makes people safer, and offers a place to file police reports or just ask for directions.



As culture changes, community facilities like this public bath house on New York's west side also evolve. This one was built when many residents had minimal indoor plumbing. Later it was used as a public swimming pool, and still later, for lifeguard training.



A computer area in Gwathmey Siegel and Associates' new Science, Industry, and Business Library in New York shows what libraries in the future might be like, but books—and libraries themselves—seem destined to survive for a long time to come.

© Charles Linn photos

A Warehouse For Books

*A suburban library fashions a
community gateway with regional
vernacular and industrial imagery.*



*Great Northwest Branch Library
San Antonio, Texas
Lake/Flato Architects*



Ricardo Legoretta's Main Library in downtown San Antonio, Texas was not the only library construction in the Alamo City last year. The Great Northwest Branch Library by Lake/Flato Architects, scions of O'Neil Ford, was one of several in a bond-financed program.

In response to lobbying efforts by The Great Northwest (the subdivision's actual name) civic association for a library in their area, the city purchased an empty field on a busy, low-density commercial street. Located at the intersection of the main entrance to the neighborhood sequestered in the wooded hills beyond, the library becomes a gateway and provides a distinctive identity for the community. The neighborhood association was involved throughout the design of the library, giving the community a sense of ownership and participation.

In a commercial-strip context, the library brings the semi-rural self-image of the established middle-class neighborhood out to the commercial thoroughfare with subdued style and appropriate scale. At 12,000 square feet, the one-story library is similar in proportion to its less-attractive neighbors, though set closer to the street. The "front" is actually in the back, facing the neighborhood approach, along with the parking. The building is placed on the site to allow for expansion to double its size with two bays to the east and five bays to the north, eventually forming an L-shaped plan.

Described by architect Ted Flato as a "warehouse for books," the library program is very simple. Aside from a community meeting room, toilets, and a small private work area, the interior is one open space. A librarian at the circulation desk can see everywhere. With a budget of barely \$90 per square foot, the building had to be very efficient, planned for flexibility, growth, and visual control. Like a grocery store (for books), Flato notes.

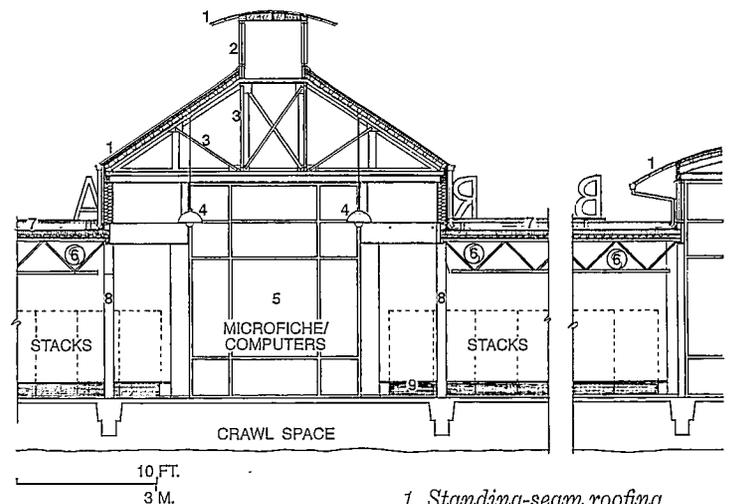
The apparent simplicity of the modularized plan is contradicted by the complexity of the building's section. Organized into seven bays, the volume alternates four low, flat-roofed areas for books with three high, clerestory-lit areas for reading. Stone walls protectively enclose the book bays, which are dense with building systems: metal and wood trusses, pine decking, exposed round ducts, industrial fluorescent strip lighting, and book stacks. Daylight permeates the interior but in a controlled fashion: the intense light of the south-Texas brush country seldom reaches the floor.

The lean design and limited palette of materials reflects the architects' ability to get the most out of limiting circumstances, including vandalism problems. The materials and methods of construction, left exposed to view, are the library's ornament. There is nothing on the exterior to be painted, just natural stone and galvanized metal. Images and references are contrasted and juxtaposed. For example, the industrial-steel frame with corrugated siding and metal windows is set in counterpoint to the rural vernacular stone work. The stone pattern has become something of a Lake/Flato trademark, using "old yella," a locally-quarried ochre limestone in flat sheets, coursed with a thin line of gray limestone similar to natural geological layering. The masonry is laid up with the "German-smear" grouting technique found in the immigrant homesteads of the Texas Hill Country.

There was likewise little budget for maintenance and virtually none for landscaping. Trees that were originally planned to soften the site and blend it into the wooded hills beyond were cut from the budget at the last minute. The architects are now working with the civic association to establish native grasses and wildflowers for a no-maintenance site. *Gerald Moorhead*

From the busy commercial street, the library is almost formidable (opposite upper right). Heavy stone masses project forward of the light-metal structures, protecting windows in a defensive posture against vandalism, presenting a solid wall to the street. The lowered screens around the air-conditioning-package units further shield the window embrasures. The lightweight-metal structures of the reading bays appear to rise from within the protective enclosure of heavy, rustic stone walls.

The library's front is turned toward the neighborhood (opposite lower right). The functions within the library are expressed in the rhythm of low stone book bays alternating with high illuminated reading bays, inspired, according to partner David Lake, by Louis Kahn's concept of servant-and-served spaces.



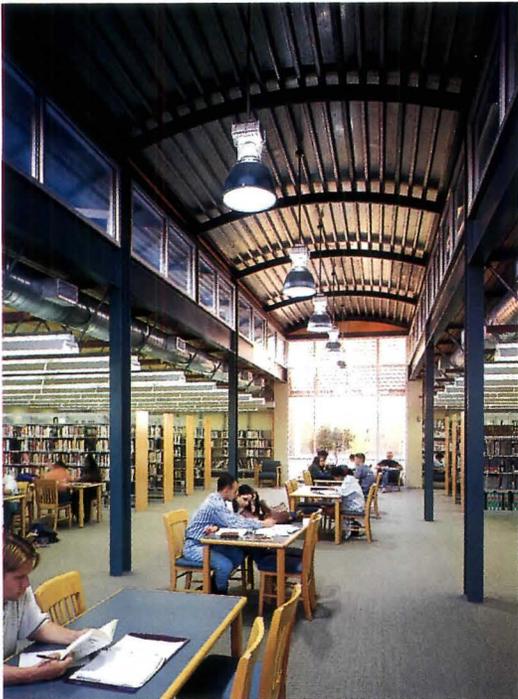
1. Standing-seam roofing
2. Insulating-glass clerestory
3. Steel-angle trusses
4. Light fixtures
5. Aluminum window frame
6. Air ducts
7. Single-ply roofing
8. Steel columns
9. Return-air base



Continuing Education

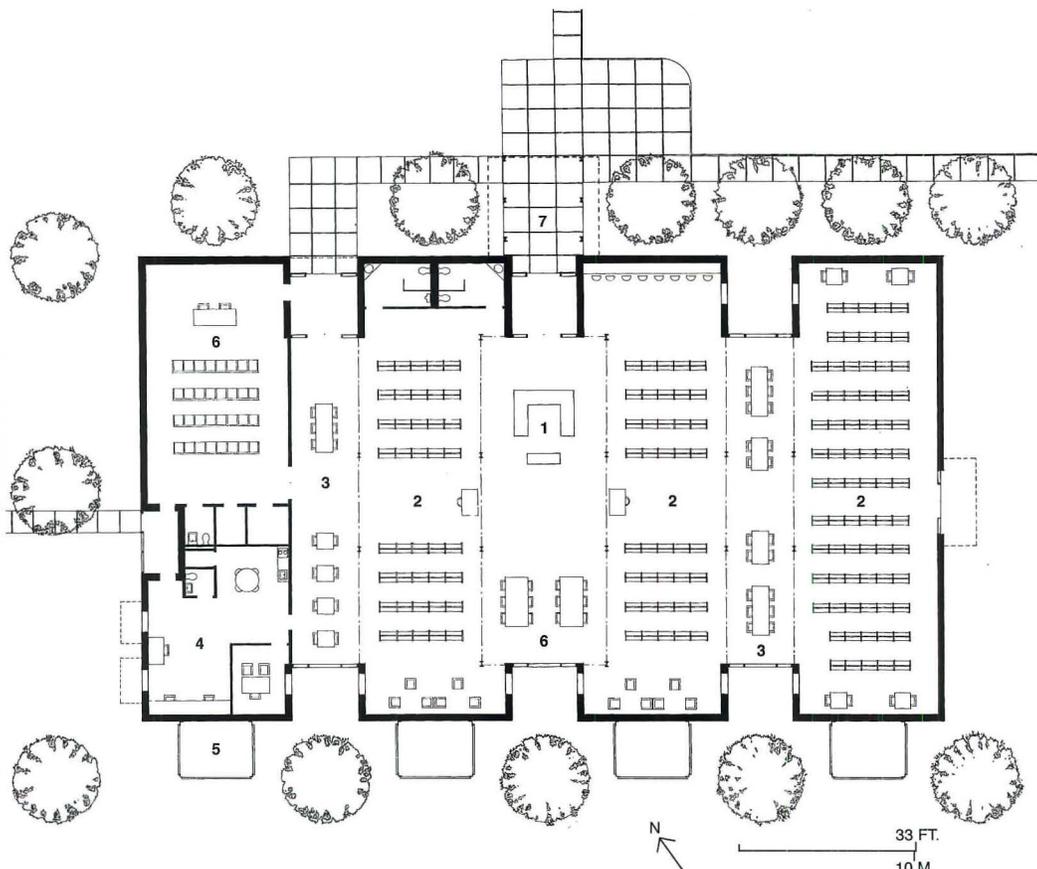
For learning objectives and instructions, turn to page 65.





Although the library is just one big room, there are comfortable, quiet places to sit and read. The glazed end walls of the high bays are recessed back from the stone enclosing walls of the low bays, forming mini-courts around which seating is placed. The high bays are also pleasant to sit under since the book stacks and perforated roof decking system soften the acoustics.

Louvers over south-facing windows and plywood panels in the high monitor shield the interior from direct light while the clerestory windows diffuse natural light throughout the interior. Although the librarians required a lighting level of 80 footcandles in the stacks, daylight is comfortable throughout the library even without the fluorescents.



- 1. Circulation desk
- 2. Stacks
- 3. Reading area
- 4. Workroom
- 5. Mechanical
- 6. Computers and microfiche
- 7. Entry

Credits

Great Northwest Branch Library
San Antonio, Texas

Architect: Lake/Flato
Architects—Ted Flato, David Lake, Kim Monroe, Joaquin Escamilla, Robert Trinidad, architecture team

Engineers: Structural Engineering Associates (structural); HMG & Associates (mechanical/electrical/plumbing); M.W. Cude & Associates, (civil)

General Contractor: Kunz Construction Company



Making Books A Civic Symbol

*Clayton Community Library
Clayton, California
Simon Martin-Vegue Winkelstein Moris,
Architect*



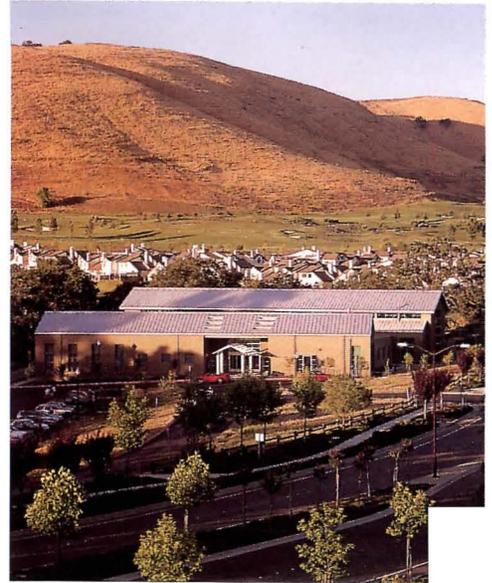
Originally a stagecoach stop, Clayton, California, is one of those lovely rural towns just beyond a big city that is beginning to attract young professionals and dual-income, multiple-computer families. Forty-five minutes east of San Francisco, the town has 8,000 residents and a historic landscape that includes 19th-century farm buildings and an old stone winery. But its city hall is assembled from mobile structures and—before its new library was completed last year—it had no civic architecture to speak of. Today, the 15,000-square-foot library is a symbol of the new Clayton—a town that grew by nearly 70 percent in the 1980s and is getting wired for the 21st century.

With the closest branch nearly six miles away and the school-age population growing rapidly, Clayton residents said in surveys in 1988 and 1991 that getting their own library was a top priority. Spurred on by a dedicated group of local women, residents established the Clayton Community Library Foundation and received state funding from a bond issue known as Proposition 85 that passed in 1988. Ultimately, all levels of government were involved in the project—the state providing two-thirds of the financing, the county serving as the operator of the library, and the city as primary client.

One of the key challenges facing architects Simon Martin-Vegue Winkelstein Moris was designing a building that would fit within a rural landscape while at the same time standing as an important civic symbol. After many meetings with town residents, the architects developed a design that strongly recalls agricultural buildings with their gable roofs and shed-like forms, but assumes a more honorific posture inside with suspended barrel-vault ceilings and proportions determined by fitting an imaginary circle within the main reading room or “great hall of books.” “We wanted to get enough height in there to ennoble the building,” explains Cathy Simon, the partner-in-charge. Organized as two bar-shaped buildings splayed on either side of a low browsing room and courtyard, the library is 33½ feet at the ridge of the main structure and 25 feet high at the ridge of the meeting room.

Connecting the building to the landscape was another important concern. The architects opened the building to views of Mount Diablo to the south and a creek and farm buildings to the north. They also designed a large courtyard that serves as an outdoor extension of the meeting room. Daylight from clerestory windows bounces off light shelves and corrugated-aluminum vaulting in the reading room, creating ambient lighting, while task lights on reading tables are supplemented by windows along the room’s perimeter. “We wanted to put the light where you need it,” says Simon. To keep staffing costs down, the library has just two checkpoints—an information desk in the reading room and a circulation desk outside the room. According to Anne Marie Gold, the Contra Costa County librarian, the Clayton library is now one of the busiest in the county and has become the primary architectural symbol in town. *Clifford A. Pearson*

© Nick Merrick/Hedrich-Blessing photos



The \$2.8-million library is a simple steel-frame structure clad in colored stucco that picks up the hues of the surrounding landscape. Although the architects had explored several roof options, the community expressed a strong desire for a gable design that recalls agricultural buildings.



EAST-WEST SECTION



The main reading room or “great hall of books” (left) is a basilica in plan, with stacks in the nave and reading tables in the aisles. Seismic bracing runs along the east and west walls below clerestory windows. The circulation desk (bottom left) offers self-check-out service. The meeting room (opposite) plays host to city council meetings.

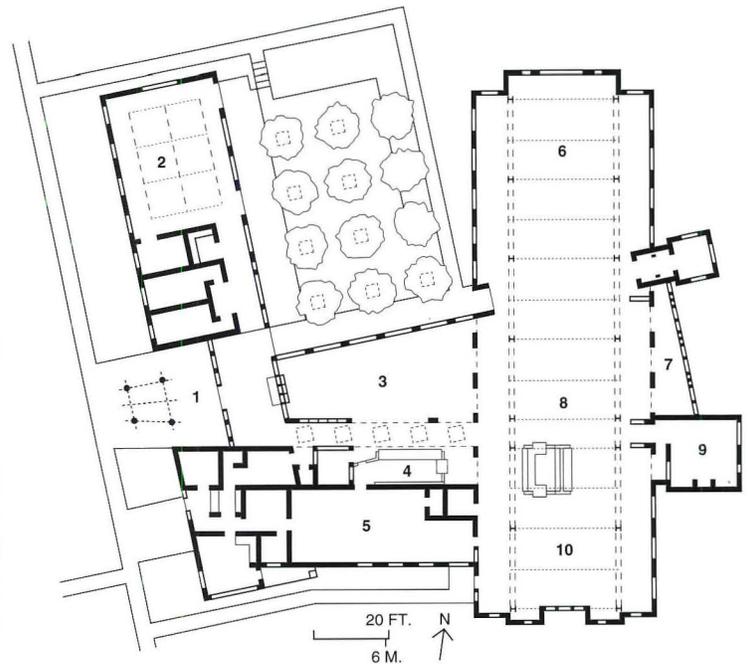
Credits

*Clayton Community Library
Clayton, California*

Architect: *Simon Martin-Vegue Winkelstein Moris—Cathy J. Simon, partner-in-charge; J. Peter Winkelstein, project manager; Linda Sobuta, project architect; Diane Lam, interiors*

Engineers: *OLMM Structural Design (structural); J.L. Engineers (civil)*

General Contractor: *Midstate Construction*



1. Entrance
2. Meeting
3. Browsing
4. Circulation
5. Staff
6. Adults
7. Young adults
8. Reference
9. Story
10. Children



Hanging Tough

A new gym in a Los Angeles public park turns what was once the site of gang turf wars into a viable community center.



*Sepulveda Recreation Center Gymnasium
Los Angeles
Kohnig Eisenberg Architecture, Architect*



When you design to a set of security and maintenance criteria, [the project] becomes impersonal," says Julie Eizenberg of Los Angeles-based Koning Eizenberg Architecture. The primary challenge of designing the Sepulveda Recreation Center in a troubled neighborhood in the city's San Fernando Valley, however, was to balance security and maintenance criteria with a seemingly opposing agenda—the need for a welcoming, community-oriented facility—and do it all on a tight budget.

Set in a park that already had mostly outdoor recreation facilities—basketball courts, baseball fields, a pool, tennis courts, and an existing but aging community center—the site was something of an urban war zone, ruled by local gangs. The decision to build a new gymnasium with club facilities was the result of a community-outreach program conducted by the City of Los Angeles Recreation and Parks Department.

That process, drawn out over several years, produced the building program presented to the architects, who had previously applied to the department for work and been placed on a list of qualified architects. Although there was some initial discussion about remodeling the existing center, the decision to build a new one had as much to do with providing updated facilities as with the community's desire to take back territory from warring gangs. "It's about taking space anybody can use and making it controlled in its use," says Eizenberg.

Because of the need to make the project both vandal-proof and inviting, the building is a hybrid: a 10,000-square-foot structure composed of durable standardized parts like concrete block, glass-block windows, and bright finishes. (Though wood-frame construction would have been cheaper, the materials chosen are efficient in terms of construction, making the total project, at \$120 per square foot, relatively inexpensive.) While the client required the architects to use concrete block for its sturdiness, they devised an unusual checker-

board pattern of colors—reds, acid greens, and three subtle shades of tan—that, they say, is meant to reduce an overall appearance of severity and uniformity. "It's a barn [draped] with a picnic tablecloth," says Ralph Lew, project manager for the Department of Recreation and Parks, of the effect. Completed in May, 1995, the gymnasium remains remarkably free of graffiti, a telltale sign to those involved in the project. While the Department employs a "graffiti doctor" to remove gang signing from its buildings as soon as possible, Lew reports that visits to this building have been unnecessary. "People in the area appreciate the building as their own," he says.

Indeed this unconventional building sends a powerful message, not only to the community it serves, but also beyond. The project, Eizenberg argues, presents a model for future recreation development. "There is a suggestion at the moment that the only type of architecture that is appropriate must be specific to a community. There is a preoccupation with one-off-ness rather than the quality of the object." Eizenberg maintains that this building's design, with slight modifications for site, could be repeated in other locations with equal effectiveness. The City of Los Angeles Recreation and Parks Department concurs. It's building a similar project south of the city, in San Pedro. *Karen D. Stein*

Credits

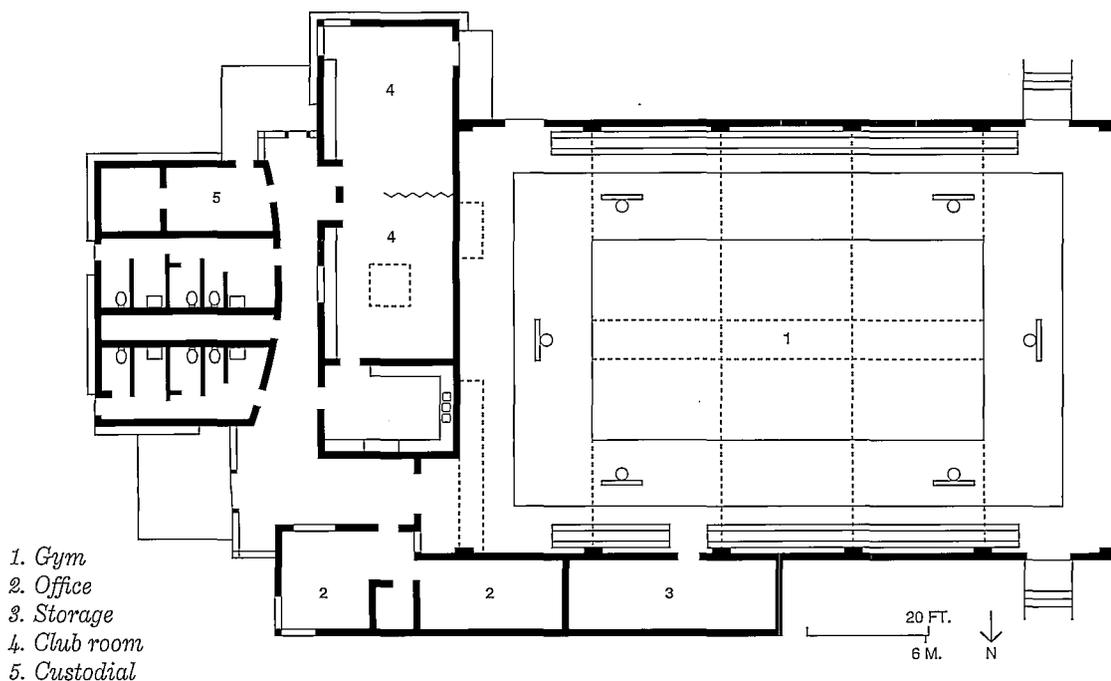
Sepulveda Recreation Center Gymnasium
Los Angeles

Owner: Los Angeles City Recreation and Parks

Architect: Koning Eizenberg Architecture—Hank Koning, Julie Eizenberg, partners-in-charge; Tim Andreas, project architect; Neil Peoples, project manager

Engineers: Parker-Resnick (structural); Mel Bilow & Associates (mechanical); Electrical Building Systems (electrical); Fine Line Systems (civil)

General Contractor: Fishbeck Construction



Offices, a club room, a kitchen, public restrooms, and custodial facilities wrap the main space of the gym (plan left). Daylight is admitted to the 10,000-square-foot building through glass block on the east-facing front of the building. Inside, skylights in the lobby and clerestory windows in the gym reduce daytime electrical costs.

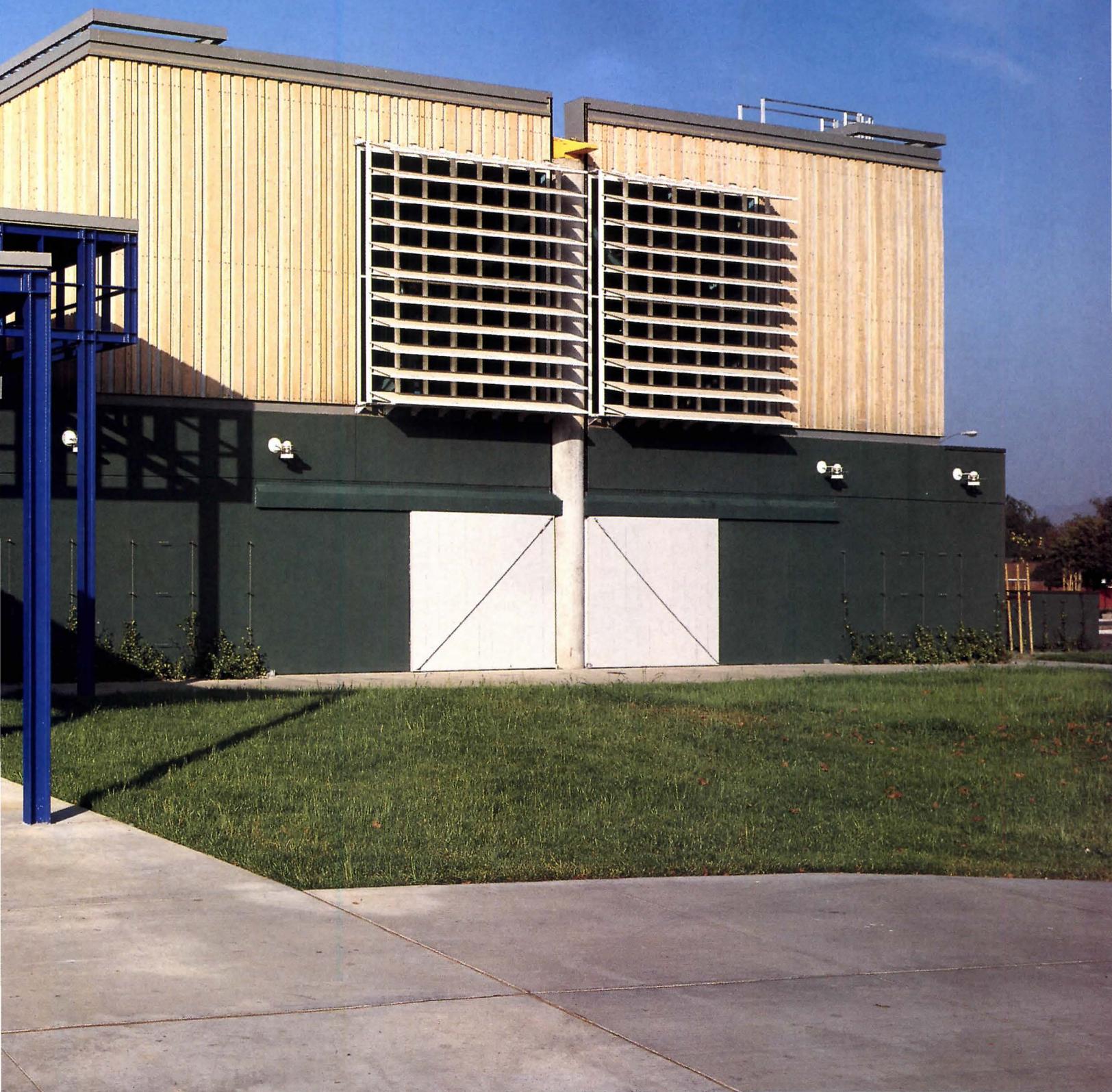


Separate But Equal



*The Irvington Community Center
beautifully fulfills program needs
without sacrificing the architects'
favorite form of expression.*

*Irvington Community Center
Fremont, California
ELS/Elbasani & Logan Architects*



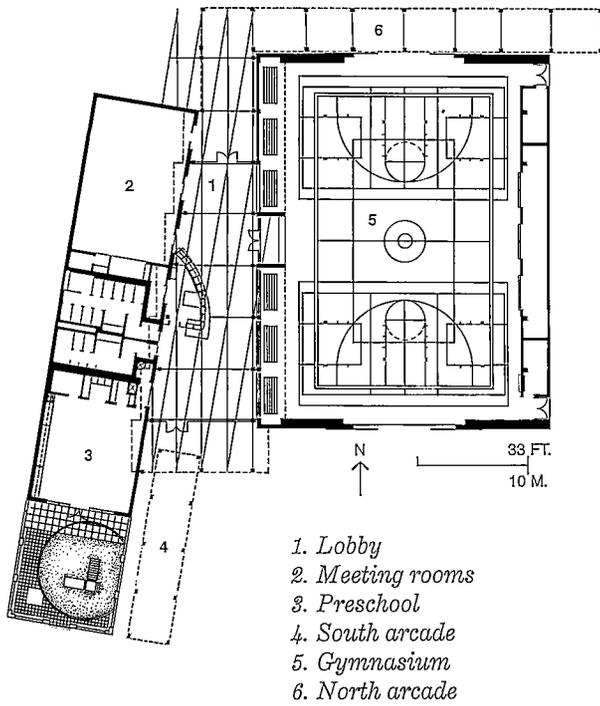
The success of a community center can be measured by how well the architecture responds to neighborhood context, the issues of vandalism and durability as well as how it deals with the programs offered there. Happily, the Irvington Community Center deals well with all three. The Irvington Community Center is home to preschool learning programs, basketball games for a nearby high school, as well as organized and pick-up games of basketball and volleyball. Community rooms are available for rental by church groups, homeowners' associations, and or anyone else who might wish to use them.

As architect Donn Logan of ELS/Elbasani & Logan discusses the project, several community center design issues emerge. The first is neighborhood context, and the exterior appearance of the building. "It's a residential neighborhood, so the volumes relate more to the school buildings across the street than anything else." One solution to bringing the building back into scale with the neighborhood was to use earth berms to lessen its height, and to provide stainless steel espaliers to support flowering vines; these also discourage graffiti.

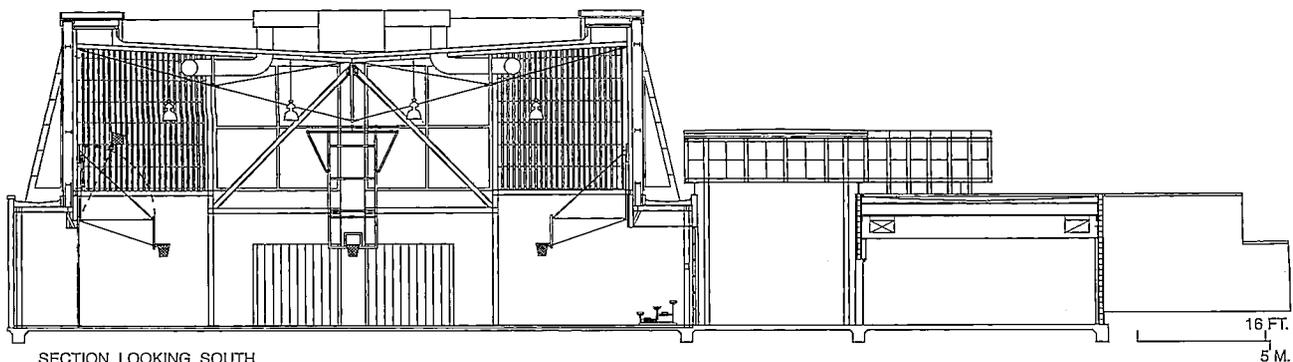
"Our tendency is to make things Modern," he says, "but the materials we chose are mostly drawn from our notion that people in the community wouldn't find it acceptable for us to do something so 'hard', so we looked for a way to bring together some things that we were interested in that the community would still like. We wanted to do something that would be soft, but would still express a precise tectonic. This is part of what led to the use of the wood and vines on the exterior of the building."

To accommodate the quieter functions of the meeting and classrooms, and the very noisy athletic programs, the architects separated them with a common lobby area. The most distinguishing feature there is a concrete reception desk topped by a sculptural partition made of laminated glass. For security reasons, the owners had originally asked for a secure, lockable office. "We convinced them that most burglars wouldn't be carrying around a 25-foot step ladder," says Logan. To further control noise in the gymnasium, wood strips over steel framing conceal noise-absorbing insulation batts, and perforated metal decking was used in the ceiling.

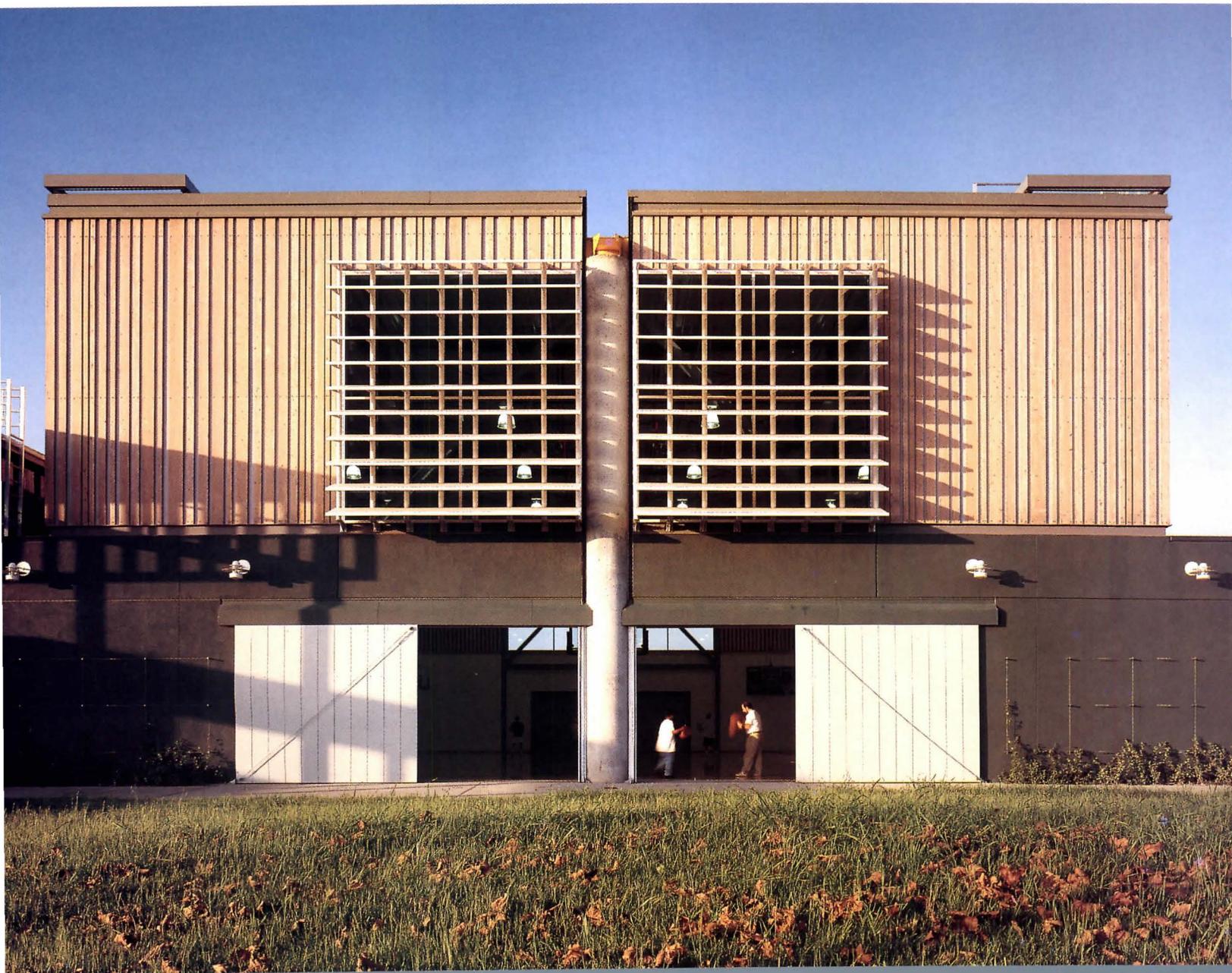
The gym is also daylit by clerestories on the perimeter; windows shaded by aluminum louvers behind the baskets. "Many owners fight letting daylight into a gym, but they went along with it," says Logan. "You just don't want to go sailing in for a layup and have the sun hit you right in the eye. So you have to control it." *Charles Linn*



Berms are used to lower the scale of the Irvington Community Center (opposite top). The aluminum sunshade (opposite bottom) reflects sunlight into the gym, as steel barn doors open for cross-ventilation.



SECTION LOOKING SOUTH





Staff can supervise the goings-on in the gymnasium through a glass wall without leaving the reception desk (opposite top). The architects persuaded their client to build a concrete desk, topped by a laminated-glass partition for use as an office in lieu of a “shed” that would have protruded into the reception area (opposite bottom). Details (bottom) show how the aluminum sunshade seen on the exterior of the building is constructed, and the architects’ solution for controlling noise in the gym using boards that echo the finish on the exterior of the building. On warm days, steel barn doors in each end of the gym can be opened to allow a cross-breeze (left).

Credits

*Irvington Community Center
Fremont, California*

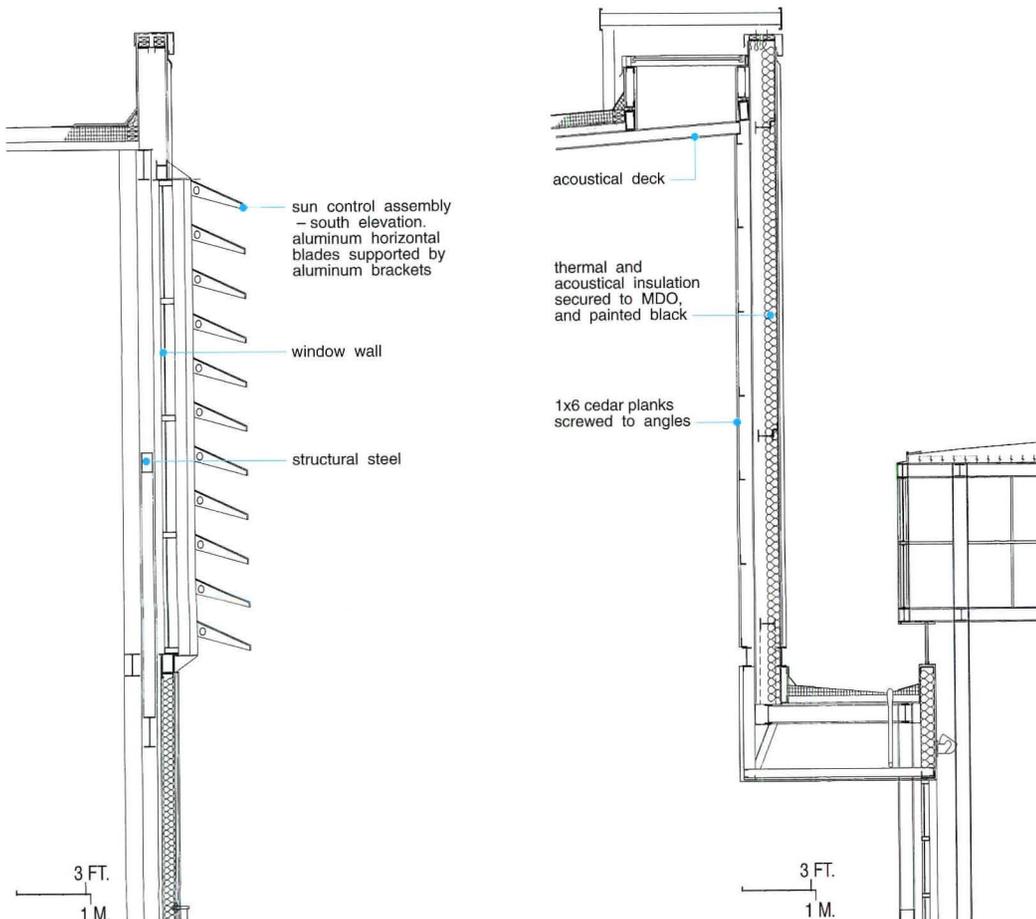
Owner: City of Fremont

Architect: ELS/Elbasani & Logan Architects—Donn Logan, principal-in-charge; David Petta, Clarence Mamuyac, Jr., Karen Tham, design team

Interior Designer: ELS/Elbasani & Logan Architects

Engineers: E.G. Hirsch & Associates (structural); MCT Engineers (electrical and mechanical); G.T. Kuntz Consulting Engineer (civil)

Consultants: ZAC Landscape Architect; Stephanie McAllister Landscape Architect (landscape); Becca Foster Lighting Design (lighting); John Raeber (specifications)



DETAIL OF ALUMINUM WINDOW SHADES

NOISE CONTROL DETAIL IN GYMNASIUM



Youth Oriented



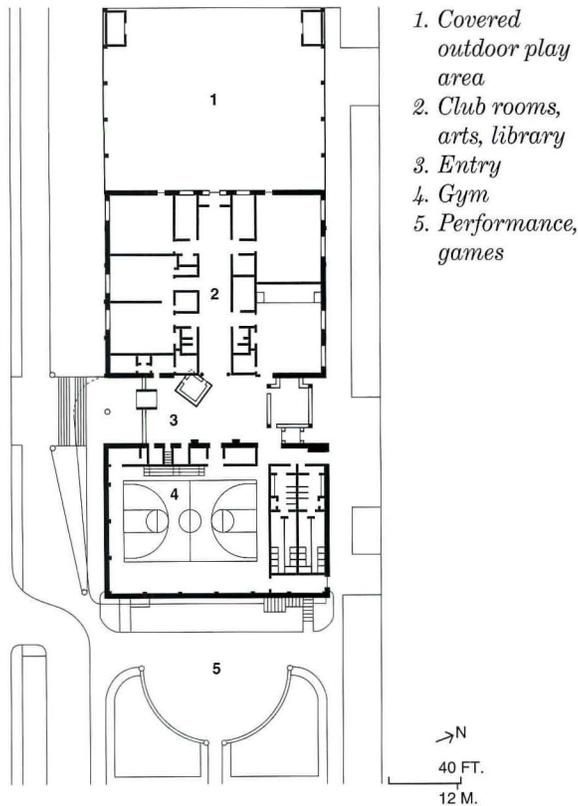
8FT

10FT

*A team of architects helps the
Boys and Girls Clubs of Boston
provide a safe haven for kids.*

*George Robert White Youth
Development Center
Boston
Leers Weinzapfel Associates, Architect
Chisholm Washington Associates,
Associate Architect*





The architects transformed an unused ice-hockey rink into a new facility for the Boys and Girls Clubs of Boston, incorporating an outdoor pool into their design. Using existing foundations for the concrete-block gym, they inserted a new entry in place of two bays of the former rink. The rink's bowstring trusses cover new clubhouse facilities and, at the east end, a semi-enclosed play area.

Avastly under-served community," is how Frances Moseley, president and CEO of Boys and Girls Clubs of Boston, characterized the availability of youth programs in the city's Blue Hill section prior to the opening of her new facility. A review of the attendance rates for the George Robert White Youth Development Center since it opened in June, 1995, would support her claim: 1,700 kids, from 6 to 18 years old, enrolled in the first quarter alone—more than had been anticipated for the entire year. After less than a year of operation, the facility is looking to expand. How much of that success is due to the building itself? "A lot," says Moseley. "It has surpassed our every goal."

For architect Andrea Leers, the project's main goal was "to create an energetic, exciting community magnet." While her agenda was straightforward, the prospect of a three-headed, public-private client—the George Robert White Trust gave money to the Boys and Girls Club, a non-profit which runs the facility, while the city's Public Facilities Department administered the architect-selection process and construction—was anything but. What's more, in order to meet minority participation requirements, Leers Weinzapfel, inexperienced in associations, was required to partner with another Boston-based firm. Leers selected Chisholm Washington Associates. Over time, an arranged marriage blossomed into a true partnership. Micheal Washington, who already had worked in the community, ran a series of public meetings to determine a program and obtain consensus.

Located between two housing projects with opposing gangs, the site had been a place of confrontation. With an abandoned ice-hockey rink and an outdoor pool already present, the architects chose to literally build on givens rather than create the appearance of waste by razing what was there and starting over. Part of the rink was demolished to make an entry foyer, signaled from two sides of the corner lot by the bright yellow metal canopy and punctuated by a red mast/light fixture meant, says Leers, to be "a beacon" to the economically depressed community. A concrete block gym was built atop existing foundations; an art studio, library, teen lounge, and other game rooms were inserted beneath the bowstring trusses of the rink in bright boxes ("world beat colors," says Leers); and four bays of the rink were left open and wrapped with hurricane fence to create an enclosed play area.

"An imposing structure speaks to solidity, stability, both of which this neighborhood doesn't have," says Moseley of the result. While it is one of only five of the some 1,100 Boys and Girls Clubs around the country to have a metal detector at the door (at the request of the kids), Moseley says it's only a matter of time before this community accepts the Boys and Girls Club tradition as safe haven.

Karen D. Stein

Credits

Robert White Youth Development Center, Boston

Owner: City of Boston

Architect: Leers Weinzapfel Associates—Andrea Leers, principal-in-charge; Jane Weinzapfel, consulting principal; Josiah Stevenson, project manager/project architect; Jim Vogel, project manager/construction

Associate Architect: Chisholm Washington Associates—Micheal Washington, principal-in-charge; Nick Safina, designer

Engineers: LeMessurier Consultants (structural); TMP Consulting Engineers (mechanical/plumbing/electrical); Green International (civil)

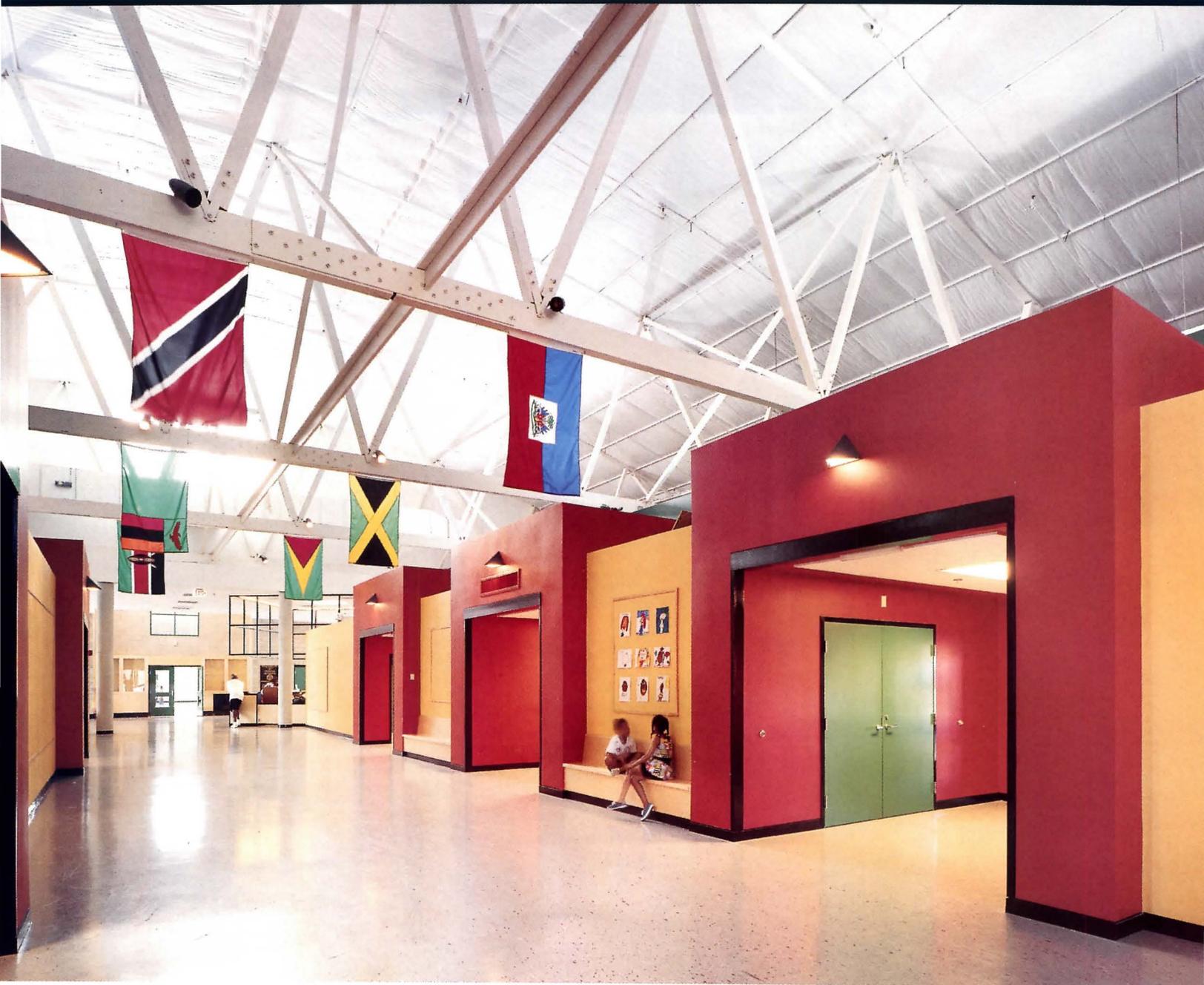
Consultant: Mary Smith Associates (landscape)

General Contractor: Boston Building & Bridge Corp.



Continuing Education

For learning objectives and instructions, turn to page 65.



Recirculating the Library

*Ross-University Hills Branch Library
Denver, Colorado
Michael Brendle Architects*



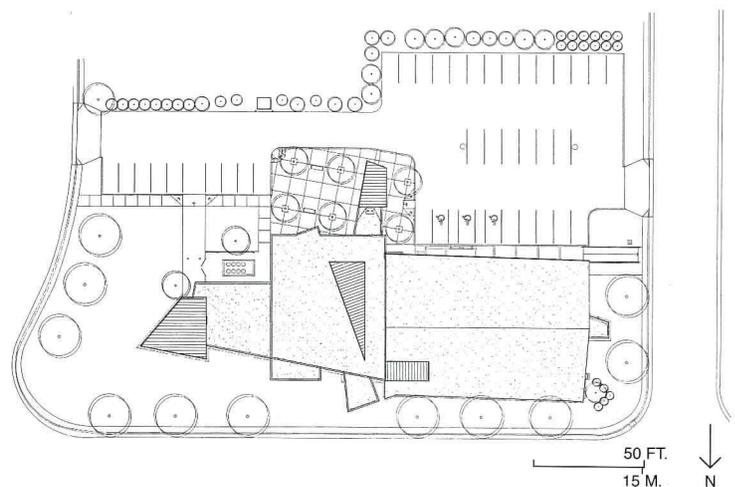
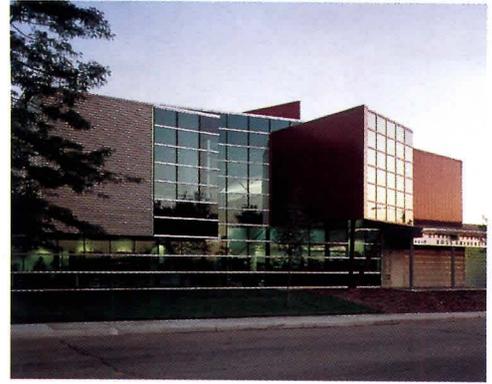
Most community libraries circulate far fewer than the 50,000 books a month that Ross-University Hills Library, Denver's largest branch, checks out to its members. The building committee overseeing a major renovation and expansion said it wanted a straightforward functional facility. But Michael Brendle Architects' somewhat startling result turned out to be much more. "It comes on you as a surprise in its location," says Brendle, in an understatement. On three sides, the new building nestles into a compact residential neighborhood and, on its fourth side, it faces a shopping mall across a major street to the north. At every step during design, Brendle and his project team offered the building committee choices. "The committee [comprising members from the library staff, the head branch-library staff for all Denver, and the department's project management group] always chose the most aggressive alternative," reports Brendle.

Of course, the committee knew it would be getting more than basic design from this building's architects. It had already commissioned the firm to design another Denver branch library in an affluent neighborhood, a design that provoked early criticism over its industrial esthetic, criticism later giving way to praise. (All of Denver's libraries are the beneficiaries of a massive public commitment in bonds intended to make its system pre-eminent.)

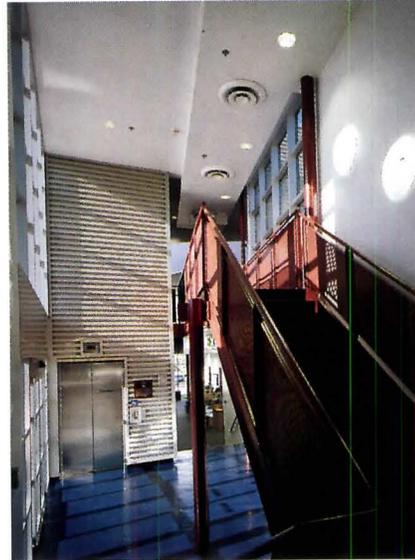
The original 1963 building (right in site plan) had become so inadequate that the majority of stacks were sequestered in the basement. The old building was gloomy. The eye rose past exposed glue-lam beams to acoustic tiles and glaring fluorescent fixtures applied directly to the underside of the sloping shed roof. The new program called for all stacks to be publicly accessible on the main floor. In addition, the facility needed greatly increased staff offices and meeting rooms, a new children's library, community meeting room, wiring for electronic communications, and a climate-control system. All basic library operations, including circulation, were to occur on one unbroken level, the organization of the building to be clear, and spaces to be bright, spacious, and inviting to users.

Among challenges the architects faced was a steep upward grade change to the south, which effectively blocked expansion on the existing floor level in that direction. Instead they built on the original parking lot to the east, leaving the corner portion as landscaped "breathing space." Brendle's team members' design called for demolition of 20 percent of the original structure toward the planned new wing (left in plan, following page). This allowed a clear central circulation axis, emphasized by its skylit two-story height. To the right as one enters from the parking lot is a new children's wing, behind an office and staff workroom. More space was gained when Brendle's team placed the conference and community rooms on the new second floor. To the left, in the original building, the bulk of the stacks fill the central space. The ceiling has been dropped to conceal new mechanical equipment, including a variable-flow warm-air heating system that supplies zones as needed through thermostatically controlled mixing boxes. Lights are now directly above the stacks for better views of books with less wattage required. The whole north wall was turned into glass that brings daylight to perimeter reading areas.

Structurally, the addition's means are simple and economical—steel frame and deck. The only theatrics are in the standard system's angled and stepped configuration and, of course, that pop-out conference room on the second floor, held in place by a V-shaped strut (opposite and top right). *Charles K. Hoyt*



To emphasize the desired sculptural liveliness of the exterior, the architects designed geometric volumes that use two types of insulated metal-panel wall systems—a tan-colored tubular panel with a strong horizontal pattern and a flat red-colored panel. They further emphasized horizontals by detailing the window walls with bright silver horizontal rails and black vertical mullions.



© Cheryl L. Opperman photo

Ross-University Hills Branch Library's use has doubled since Michael Brendle Architects completed its \$1.9-million renovation and addition. It includes 12 electronic work stations dedicated to public use and a totally computerized card-catalog system. Automated communications give the branch virtually all capabilities of the main library, including delivery of any book available in Denver's system to local users within hours.

On the branch's main floor, the only interior change of levels occurs at the parking-lot-entrance vestibule to the south (bottom right), where handicapped visitors can take an elevator down half a flight (north-south section opposite) or up to the conference and community rooms. The projecting vestibule not only invites users in, but its location outside the body of the building allows closing off the main part of the library when the community facilities are used at night. The dark interior of the original building has been greatly brightened by the new two-story main lobby (bottom left and sections), which reaches up to bring daylight deep inside the surrounding half a space through skylights and clerestories. Stacks, previously located in the basement, now occupy the central part of the floor away from new windows, which are now devoted to readers' enjoyment of outside views from perimeter reading areas.

Credits

Ross-University Hills Branch Library
Denver, Colorado

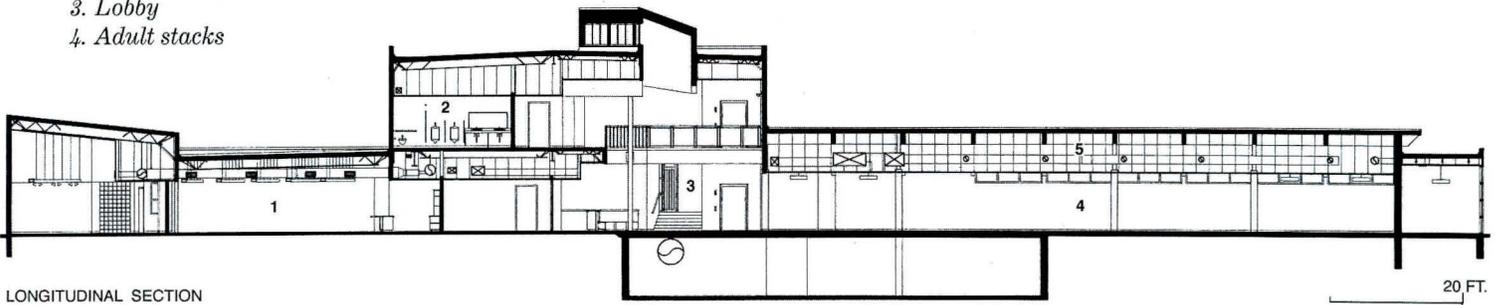
Architect and Interior Designer: Michael Brendle Architects—J. Michael Brendle, principal-in-charge, project designer; James L. Bazzanella, project architect; Thomas L. Groves, Robert Biesk (project team); Linda Purcell (model maker)

Engineers: The Sheftin Group, Inc. (structural); Abeyta Engineering Consultants, Inc. (mechanical); Gordon Gumeson and Associates, Inc. (electrical); S. A. Miro, Inc. (civil)

Consultants: Land Mark Design, Inc. (landscape); Architectural Resource Consultants, Inc. (costs); David L. Adams, Inc. (acoustics)

General Contractor: FCC Construction, Inc.

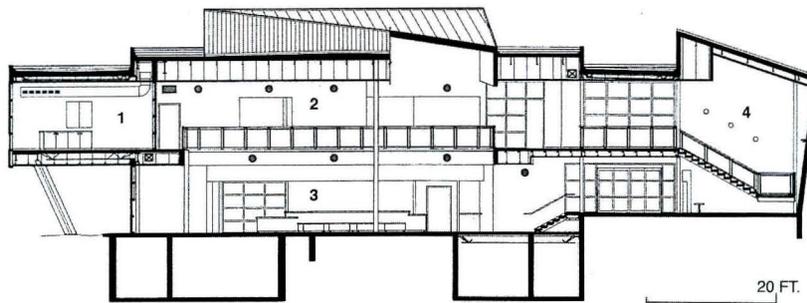
- 1. Children
- 2. Community
- 3. Lobby
- 4. Adult stacks



LONGITUDINAL SECTION

20 FT.
6 M.

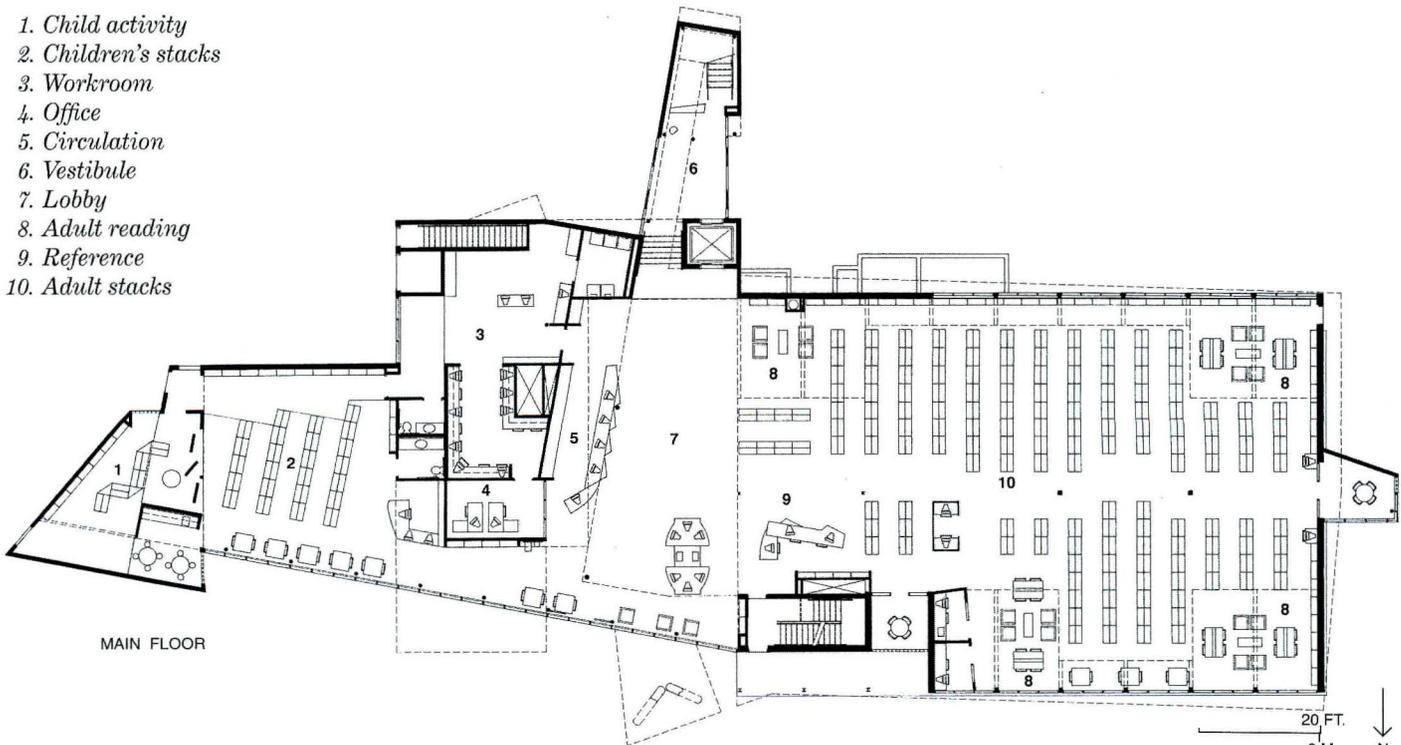
- 1. Conference room
- 2. Balcony corridor
- 3. Lobby
- 4. South vestibule



TRANSVERSE SECTION

20 FT.
6 M.

- 1. Child activity
- 2. Children's stacks
- 3. Workroom
- 4. Office
- 5. Circulation
- 6. Vestibule
- 7. Lobby
- 8. Adult reading
- 9. Reference
- 10. Adult stacks



MAIN FLOOR

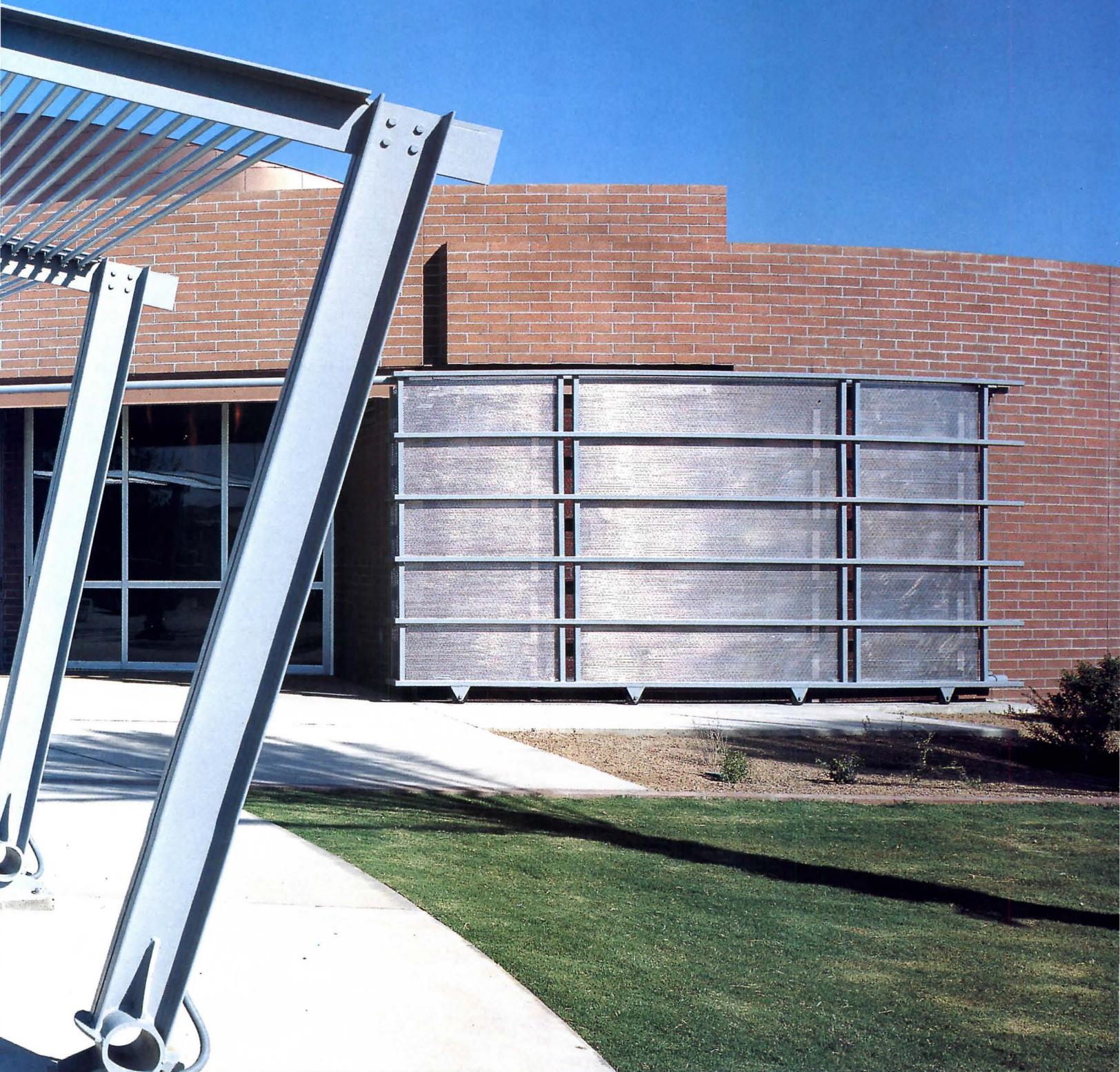
20 FT.
6 M. N

With Open Arms



*Community policing receives a
sassy architectural face in a move
to welcome public and deter crime.*

*City of Tempe Police Substation
Tempe, Arizona
Architekton, Architect*



The police have not had a good press in recent years. Broadcasts of televised sequences of patrolmen beating up citizens, and court testimony hinting at the institutionalized practice of police violence, have created a police profile which is certainly not typical though it plays well on television. In part to offset this image and in part because of its real promise to cut crime, there has entered the vocabulary the concept of community policing. It's based on sending the police into the community and the community into the police station.

Other architectural types too have reconsidered their public face. Banks, for one, pushed along by pressures to popularize their image, have long shed their Ionic columns in favor of drive-ins, and cashiers have been replaced by the ATM. By contrast, courthouses, another building type with a tradition of grandeur, are at every level hanging on tight to stern dignity, as recently published projects show [RECORD, March 1996, pages 100-103].

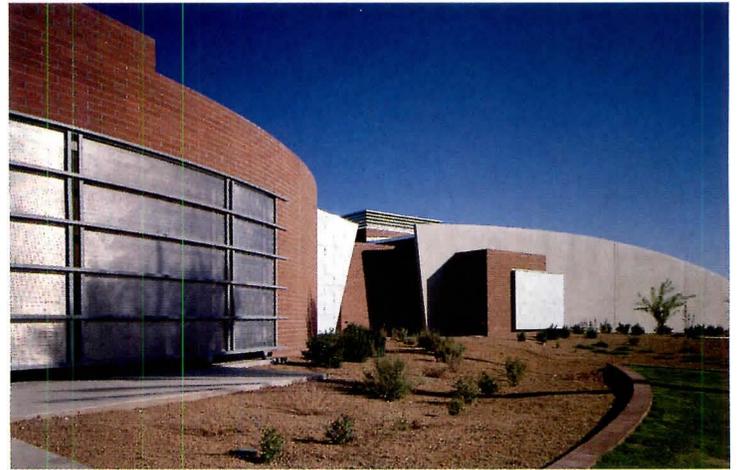
The Tempe Police Substation strikes a brilliant balance between those two extremes. A suave, 28,000-square foot, \$4.2-million horizontal assemblage of simple forms and prosaic materials used with great élan, the structure has as its symbolic center the circular community room, expressed on the outside by a truncated cone faced with copper panels (previous page and below). (A slightly macabre touch was introduced by the use of spent aluminum shell casings from the practice range as fasteners for the panels).

The parti is simple; its execution less so. If you draw a diagonal across the plan, the spaces above it, open and accessible, are for the public. The spaces below it house record, detention, and training functions, and are secure. The curvilinear plan seems forced until one arrives on the site and confirms the logic of it. "At the center of the building's

concentric layering," says Architekton partner John Kane, "is the symbolic space or community room. Complementing the public component, the facility diverges into complete patrol functions, holding areas, and a shooting range. A curving, daylight circulation spline [helps link] the primary internal components." The patrol operations, which face outwards, are organized along a kind of unfurling arced corridor (see photo, last page of story). This tangential wing is then bridged back to the primary circulation by the briefing and debriefing rooms (items 12 and 13 on floor plan).

The material palette is in subtle tension with the bright blue sky and harsh southwestern daylight. It comprises integrally colored masonry units (the coloring is so realistic that the units actually read as large Norman bricks) and cast-in-place concrete, plus copper, steel, aluminum, and glass. Shrewdly applied, glazing captures views and reinforces sightlines. Two special features add a quirky touch. The idiosyncratic pergola that marks the public's entrance (previous page) is made of standard rolled-steel sections and topped by parallel lengths of electric raceway that cast an intriguing moving shadow. The item has become the kind of fun feature that helps endear the structure to the community. More subdued but more ingenious, the rolling grille (previous page, at right) borders a meeting room, and moves on a set of casters. Seen here in the open position, it rolls to the left to enclose the room for solar control and security.

The public gave the building thumbs-up (Says former commander and now Schaumburg, Illinois, police chief Jim Palmer: "Citizens come into a business, not a law-enforcement environment"). The police took longer. "They thought at first it was weird," says station commander Martha Burkett. "Everything they had ever seen before was somehow boxy. But they came around." *Stephen A. Kliment*



© Timothy Hunsley photos

1. Community room
2. Training auditorium
3. Lobby
4. Breakout room
5. Public vestibule
6. Commander's office
7. Patrol conference room
8. Lieutenant offices
9. Investigations
10. Women's lockers
11. Men's lockers
12. Debriefing room
13. Briefing room
14. Sergeant offices
15. Traffic enforcement
16. Motorcycle parking
17. Sally port
18. Evidence yard
19. Booking room
20. Holding cells
21. Interviewing
22. Interior commons
23. Physical fitness
24. Range shop

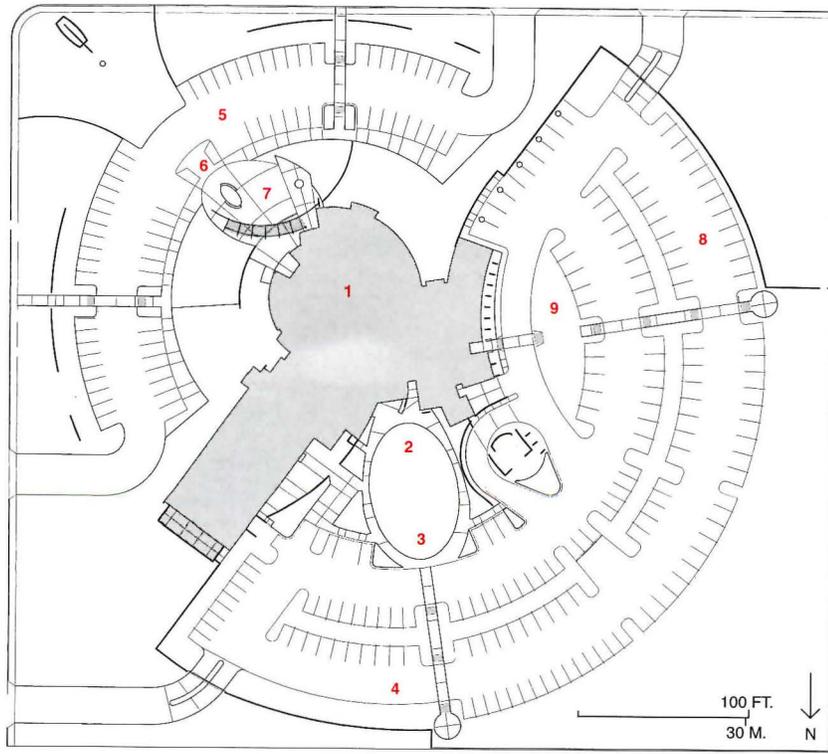


The public-entry vestibule (5) and the police commons (22) are at opposite ends of the curved glass-topped internal thoroughfare. Visitors see the long facade from the parking lot (opposite, bottom photo). Employees' social area is on opposite left photo; rolling grille and practice range are on opposite right photo.

To adequately fill the cast-in-place concrete forms, plasticizers were added to the mix. Even after vibrating the forms, there was some honeycombing, so a light slurry coat was added to obtain acceptable quality without tearing down the work. The form holes were partially plugged to obtain a more monolithic look.

25. Tactical firing range
26. Static range
27. Firearm training simulator room
28. Gun cleaning
29. Armory
30. Rangemaster

1. Main building
2. Employee entry
3. Exterior commons
4. Employee parking
5. Public parking
6. Public entry
7. Public plaza
8. Patrol parking
9. Patrol entry



Continuing Education
 For learning objectives and instructions, turn to page 65.



The training auditorium (above left) seats 60 and looks down on the community room. The two can be separated by movable walls. The round shape of the community room, its reflective surfaces and background electric hum, make for mediocre acoustics. The public-entry vestibule leads to the copper-clad community room (bottom left). Public and police spaces are connected by a glass-topped curved atrium. (opposite page).

Credits

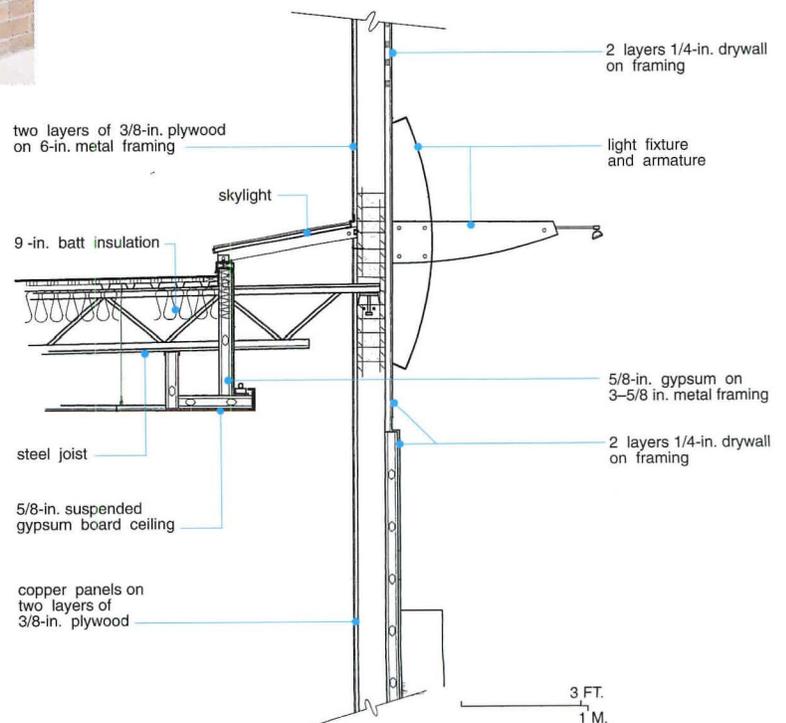
City of Tempe Police Substation
Tempe, Arizona

Architect: Architekton—Douglas R. Brown, principal-in-charge; John F. Kane, principal and design lead; Robert Briggs, Stephen Jaycox, Tessa Jones, Charles Nissen, project team

Engineers: Drottar Priniski & Associates (structural); Tesco Engineering (mechanical); Lutz Engineering (electrical); Allen Consultant Engineers (civil).

Consultants: Morse Landscape Architect (landscape architect); Towne-Kleinschmidt (furnishings).

General Contractor: Sun Eagle Corporation



SKYLIGHT DETAIL



Focus on: Creating Communities

The projects on these pages not only serve communities. Each in its own way helps to create the essence of community—togetherness. Alameda's emergency-control facility provides residents shaken by natural disasters with a reassuring mutual place of refuge. Mid-Valley's library gives a sense of place where there was none. The Tonnelle Avenue Firehouse creates a new model for symbiotic urban planning. McConnell Air Force Base's community center brings together people from previously scattered locations for social interaction. And the Fleetwood Civic Center unites activities of diverse town residents. Charles K. Hoyt

Emergency Operations Center

*Alameda County, California
Michael Ross & Charles Drulis, Architect*

Most days, Alameda County uses this \$7.9-million, 25,638-square-foot facility as a training and conference center for the county sheriff's Office of Emergency Services and for public functions and meetings. Hence the interior—built around an interior courtyard—is brightly daylight. During emergencies, however, the facility becomes a highly secure three-part operations center. Communications and management systems developed after the Loma Prieta Earthquake come into play. The sheriff takes control of his command center in the rear portion of the building; the large multipurpose room (left in photo) becomes a staff and evacuee shelter, and the normally public spaces (right in photo) can be sealed off. The strongly braced steel structure is designed to withstand the maximum credible seismic stress, and electronic and life-function systems are supported by dual generators.



© Robert Buelteman Studio photo

Mid-Valley Regional Library

*Los Angeles, California
Killefer Flammang Purtil Architects*

The architects were called on to create a strong civic presence for a suburban community that had previously lacked focus. The resulting 28,000-square-foot building gains a suitably monumental scale by the large size of its various elements, including the main entrance (right), a tall pyramidal roof over the lobby, and a landmark clock tower (right of entrance). The length of the building is perpendicular to the main street to allow motorists' appreciation and surveillance of a park at the back of the site. The architects met a limited budget by choosing an economical steel-frame structure and a stucco finish. A low band of precast-concrete wall panels makes a suitably monumental base. Interior facilities include a children's library (inset) enhanced by a tepee containing carpeted seating and a storyteller's throne. The building also acts as the local library system's regional headquarters.



Tonnelle Avenue Firehouse

*North Bergen, New Jersey
Dean Marchetto & Associates, Architect*

Occupying a sliver of land 200-feet-long by only 25-feet-wide, architect Dean Marchetto's economical steel-frame fire house serves a dual purpose. First, it houses two fire engines that enter and exit through overhead glazed doors at either end. The firefighters occupy the floor above and reach their respective vehicles by two direct stairs located for speedy access, replacing the traditional slide-down pole. The second role of the facility is to be a friendly neighbor to an adjacent playground. A glass-block window in the split concrete-block wall facing this open space gives youngsters an entertaining view of the apparatus within, while a red "eye" above—in reality, a window in the projecting tile wall of the firehouse kitchen-dining area—keeps watch over their welfare. The obvious symbiotic nature of the two facilities together creates a welcome model for future community development.

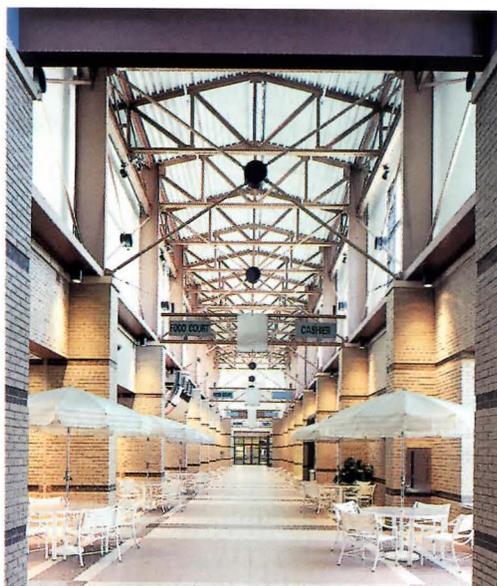


© Stephen J. Carr photo

Emerald City Center

*McConnell Air Force Base, Kansas
Gossen Livingston, Architect*

Destruction of the base's scattered facilities in a 1991 tornado gave architect Gossen Livingston the opportunity to reinforce community spirit by uniting all recreational functions in one large complex at the site's center. The connecting spine is an airy central indoor mall (right). Athletic uses anchor either end. These include a gymnasium, large indoor swimming pool, and the "Tornado Alley" bowling lanes. Between them, restaurants, bars, and the "Emerald City Ballroom" surround a large kitchen. The ballroom doors and fast-food eateries, including "The Rendezvous Food Court," face the mall. On the outer side of the kitchen, facing perimeter windows, more-formal dining rooms look out over an adjacent golf course. The long-span steel structure is exposed in many areas. In relaxation spaces, it is screened by suspended wire-mesh arches pierced by down lights.



Fleetwood Civic Center

*Surrey, British Columbia
IBI Group, Architects*

For a village outside Vancouver, British Columbia, this civic center combines under one roof a library, seniors' gathering place, and multi-purpose spaces for social events and exhibits, assuring comfortable passage between components when the weather is rainy or grey. The 40,000 square-foot center is spread out around an oval courtyard (right), where ample glazing brings in precious daylight and promotes visual contact between varied functions. Design architect Paul Zajfen reduced the resulting large building mass's impact on the surrounding neighborhood by creating several distinct parts, including a welcoming house-like pavilion containing the library entrance. Part of the local success of the \$6-million project is due to the future users' major participation at each step of design development.



© Paul Zajfen photo

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Awards Commentary

Continued from page 51

new sports stadium caused Tom Hanrahan to exclaim, "This is demented! It presents a sports stadium as an extension of the living room, an extension of the TV set. It denies structure and material, presenting the building as abstract bands of color instead of surfaces."

The jurors found entries prepared by third-party video-production services least successful. These entries were more likely to contain inappropriate soundtrack music and

heavy-handed special effects. Too many used camera angles and cinematographic gimmicks to obscure rather than explain a project. Most had a computerized sameness akin to the standard acrylic renderings favored by developers.

Jurors rewarded animations that conveyed information that would not be possible in physical models or in print. One second-prize winner, "The Amiens Project," used computer animation to convey the proportioning, construction, and structural concepts embodied in the 13th-century Gothic cathedral. The

First Prize Winner, "Logic Error" by Paul Q. Davis, isn't a presentation of an actual proposed project, but an evocation of an architectural idea through the use of computer-generated animation. Much like a no-holds-barred MTV video, it pulsates with visual and audio stimuli. While the entry does not represent the way a typical firm would present itself to a corporate board of directors, the jury acknowledged the use of the computer's unique powers. Davis made architecture that is unbuildable, not even very comprehensible, but which might feed inspiration back to the realm of actual architectural design.

A C M E B R I C K

Amazing Shapes.



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The appropriateness of realism

Though it didn't win a prize, jurors discussed at length the merits of a computer-generated tour of a lab by HOK. It lacked artistic pretension, and was successful simply because it conveyed by the most realistic means possible the precise arrangement and feel of the rooms to users, who probably find reading plans difficult. Lighting and effects skillfully softened the hard-edged look common in animations. As Hanrahan noted, "you are really brought in to touch and see." Too many other animated entries, though superficially dramatic and apparently realistic, "fly" the viewer through projects without making the spaces and sequences understandable.

There were many student entries, the most successful of which was an honorable mention design by Darius Kuzmickas, of the University of Utah. Kuzmickas' prepared an animation of his masters' thesis, showing the surrounding site and context. He gave the project a careful, slow, approach and walk-through, showing its development and spatial relationships. As Tucker Viemeister noted, "It's like being within a live TV show. It's explanatory."

The "gee whiz" look of the computer imaging we now see all around us may have created a "techno-expectancy." What this means is that jurors with little first-hand knowledge of what the technology can do presume that the possibilities are unlimited. They do not know exactly what to expect, but when confronted with real-life examples, they are disappointed. I agree with jurors who criticized entries where hyped effects replaced substance, but they also seem to have fallen prey to visual hype in the selection of some of the prizes. While jurors seemed turned off by the evident salesmanship of some images, selling an idea is exactly the point of any architectural presentation, whether generated by sable brush or ink-jet printer. ■

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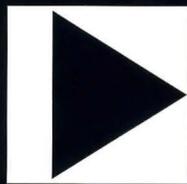
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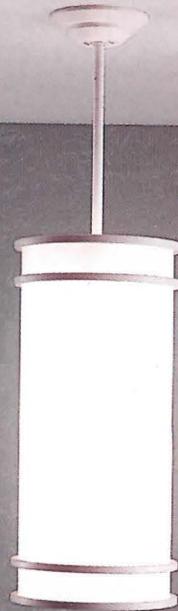
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Health care *continued from page 43*

facilities to lower-overhead settings for the elderly. By the year 2000, 25 percent of beds will be continuing- and extended-care, skilled-nursing, or transitional subacute-care facilities, providing recovery for orthopedic, rehab, and stroke patients in less-costly settings than traditional hospitals. Higher insurance and government reimbursement rates, along with shorter stays at acute-care hospitals, make these attractive alternatives for cost-conscious providers.

Enter private investment

"Insurance dictates where people go for care," says architect Charles Consagra, principal of Highland Associates, Clarks Summit, Pa. Increased profits attract private capital for expansion into new market niches. In Florida, Texas, California, and the mid-Atlantic states, private developers are financing and leasing new outpatient facilities, designed to physician needs, for cancer treatment, coronary care, and imaging. These private medical facilities do not require the high-overhead spaces that add costs at acute-care hospitals, such as the emergency room and intensive-care unit.

Some states regulate hospital-owned outpatient facilities but not those privately owned and financed, giving for-profits a cost advantage. This may change. "The new federal guidelines on health-care construction are intent on creating a level playing field," says Sprague. Not-for-profits often don't have cash reserves and can't access private capital, particularly in highly regulated states like California and New York (which prohibits for-profit hospitals).

Regulatory policies can undermine the best-laid plans. In California, upgraded seismic codes have prompted hospital retrofits, although there is no funding now available for studies or upgrades. In New Jersey, insurance reimbursement for 24-hour lengths-of-stay were used to calculate the needed number of birthing rooms. "New Jersey pulled the rug out by mandating 48-hour hospital stays, doubling the number of rooms required," notes Beers, but officials didn't offer added capital. Such an unfunded mandate is just one example of what happens as lobbying by doctors, hospitals, insurance companies, and consumers continues to affect policy. The prognosis for health care, then, is for still more change. ■

Schools *continued from page 41*

the community, and an interest in energy-efficient and environmentally friendly designs. One school BOORA recently completed in Newberg combined an elementary and middle school with a senior center and a community sports field, permitting shared dining, meeting, and parking facilities.

An even more ambitious melding of schools and the surrounding community is taking place in Orange County, Calif. There, a pilot project for a state "space saver" school program is placing an \$18.8-million, 1,300-student school on the parking lot of a large shopping center. Scheduled for completion in 1998, the school will serve a largely Hispanic student population with a design that emphasizes team teaching and cooperative learning.

To solve the funding bind, some districts also are turning to unusual partnerships. The "education village" envisioned by Charlotte-Mecklenburg schools anticipates sharing resources among different school levels and mentoring by its corporate neighbor, IBM (photo page 41). In Osceola, Fla., the showcase Celebration School will begin construction this summer with nearly \$10 million in help from the Disney Development Corp., which hopes to use the school as a magnet for home buyers interested in its new Celebration community. The school, designed by William Rawn & Associates in Boston and Schenkel & Shultz Inc., Orlando, used full-size mockups to test a design approach that will group its 1,100 students in "neighborhoods" of 100 youngsters and four teachers. Although plagued with construction cost overruns, the project already has proven to be a magnet for teachers, with hundreds of would-be faculty members from across the U.S. sending in resumes.

Interestingly, that alone could be the best barometer of whether a school will do well by its students. Although scant evidence supports the notion that slick new schools produce bright young scholars, says Jeff Schneider of the National Education Association, studies have shown a clear relationship between student performance and how teachers view their physical surroundings. Teachers, it seems, do their jobs better when they like their workplace. Reason enough, perhaps, to build new schools and remodel old ones. ■

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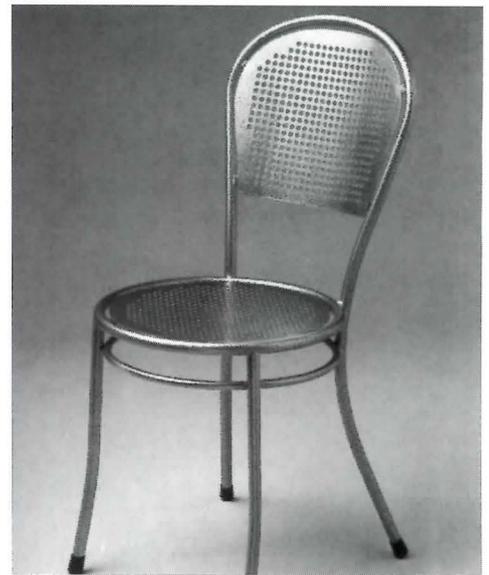
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New Products



169. Thermal/acoustic insulation

The manufacturer says its K-13 product, a spray-on cellulostic material, has been improved by a new adhesive formulation that allows for a spray depth of up to 5 inches in a single application. The adhesive component also reduces the risk of insulation falling out during application, and upgrades the R value to 20. Acoustic performance is also improved, at whichever thickness the site conditions require. UL-listed Class A, K-13 adheres to wood, steel, concrete, and glass. 713/433-6701. International Cellulose Corp., Houston.



170. Food-court/cafe seating

Part of a new, extensive line of chairs designed to meet the heavy-use needs of shopping-mall food service, Atlantis has a perforated-metal seat and back. Powder-coat colors and floor bumpers are standard; brochure illustrates chairs with list prices from \$200 to \$300. 414/468-8100. KI, Green Bay, Wis.

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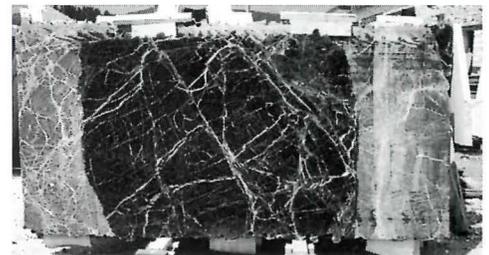
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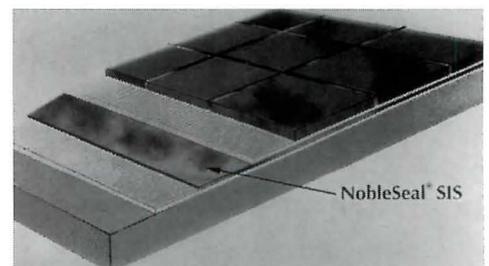
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171. Comparing green marbles

Windham Green serpentine is available in tile, slab, and cut-to-size formats from a new fabrication firm. Offered without charge, a relative comparison study ranks 19 green marbles by compressive and flexural strengths, hardness, and density. 800/729-6168. Tennessee Marble, Wadsworth, Ohio.



172. Quieter tile floors

A thin (only 3/64-in. thick) way to reduce impact noise through tile floors, the NobleSeal sound-isolation sheet is said to be easy to install. 800/678-6625. The Noble Co., Grand Haven, Mich. *Continued on page 120*

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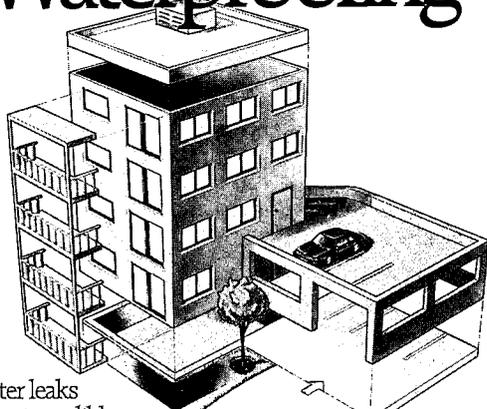
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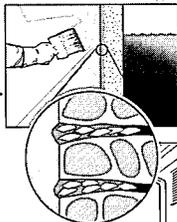
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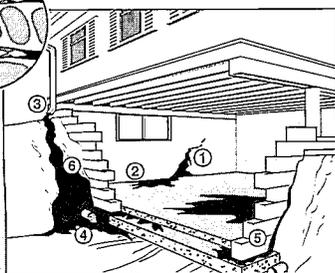
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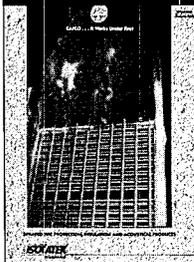
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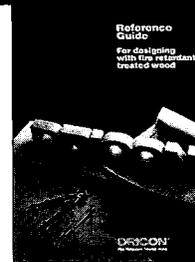
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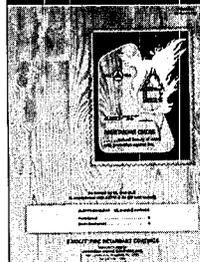
Product Literature/Fire Retardant Products



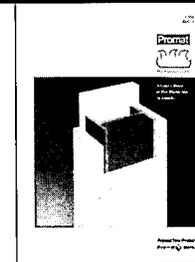
200. Spray-on fire protection
An eight-page brochure describes all CAFCO fire-retardant and noise-control products, including Blaze-Shield II, a dry fireproofing said to have good density and compressive strength, and CAFCO 400, a new medium-density wet spray offered in ratings of up to four hours. Design manuals offered. 201/347-1200. Iso-latek International, Stanhope, N.J.



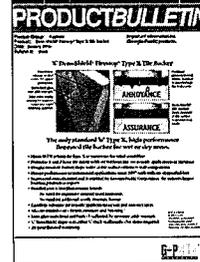
201. Fire-retardant wood
Written for architects and specifiers, an 18-page *Reference Guide* for designing with fire-retardant-treated wood outlines complying applications as referenced in National, Standard, and Uniform model building codes. Includes detail drawings, identification marks, test methods, standards, and a sample spec. 770/801-6600. Hickson Corp., Smyrna, Ga.



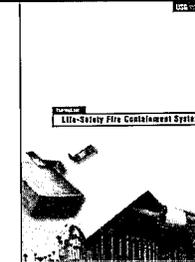
202. Clear FR coating
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203. Fire-protection boards
A four-page brochure describes Promat boards as highly impact- and moisture-resistant, with the appearance of cement precast. Available in ratings of up to four hours, boards are easy to install around steel cross sections without special framing, and do not require a final spray layer. 800/277-6628. Promat Fire Protection, Div. Eternit, Inc., Elandon, Pa.



204. Fire-rated tile backer
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205. Fire-containment systems
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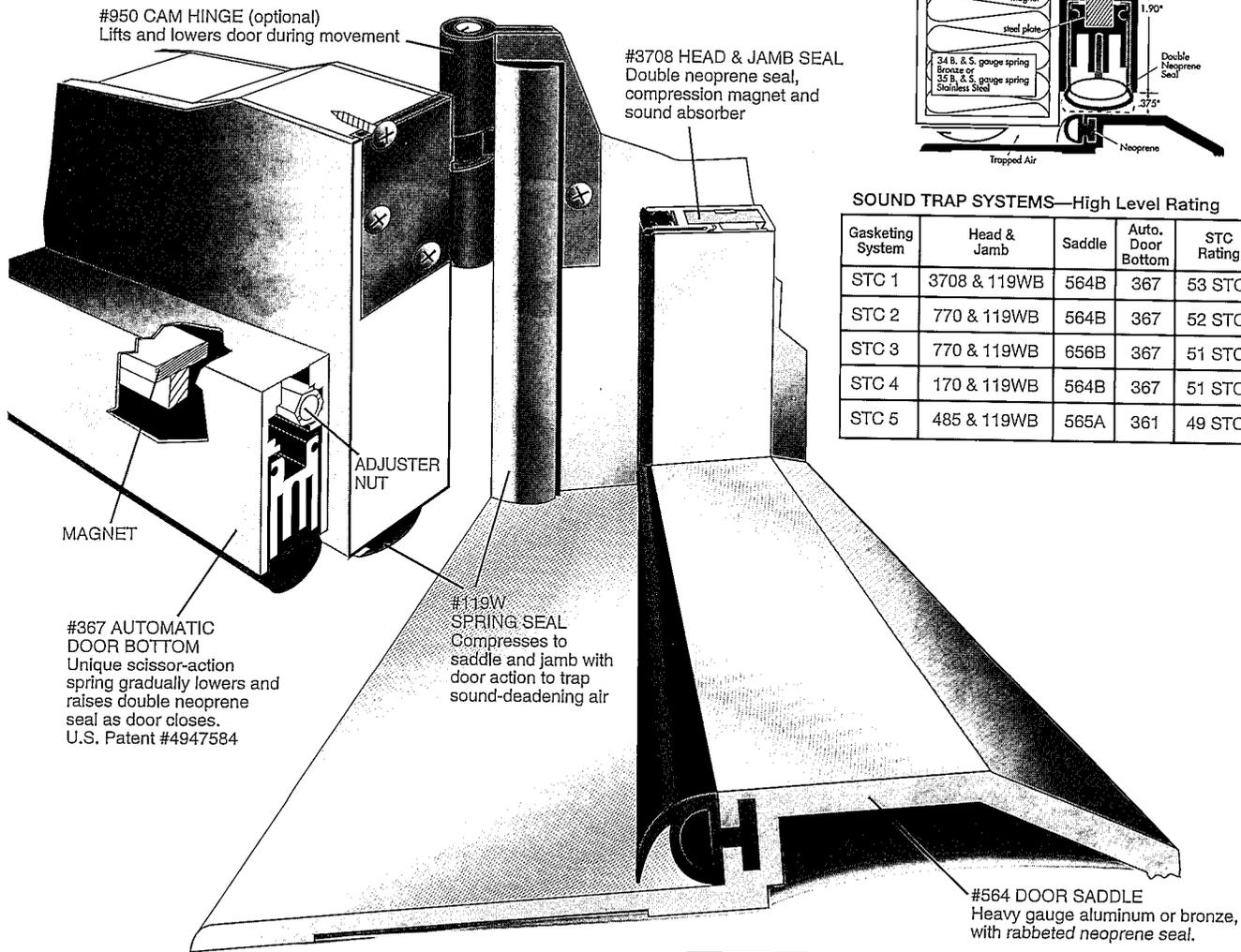
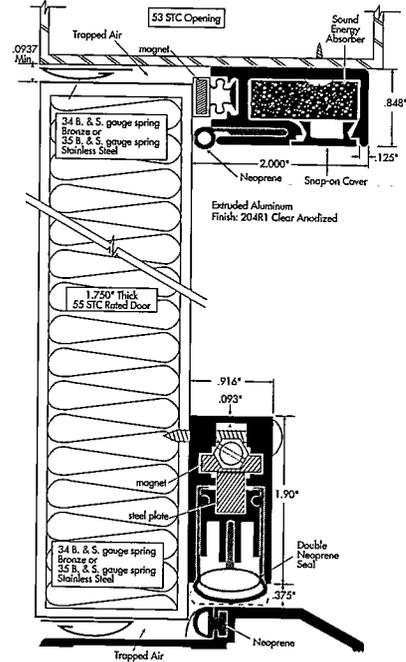
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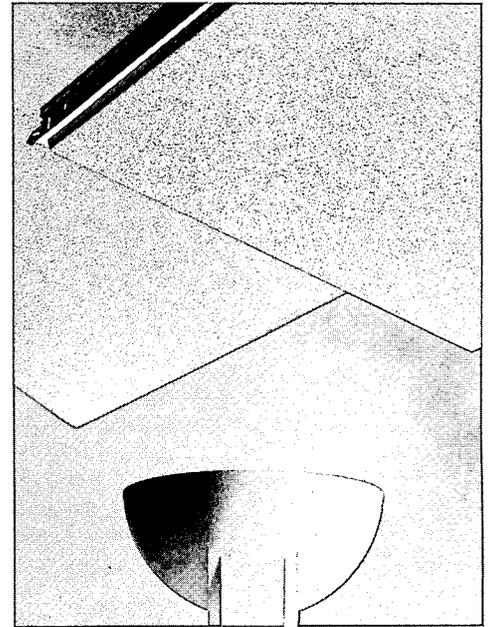
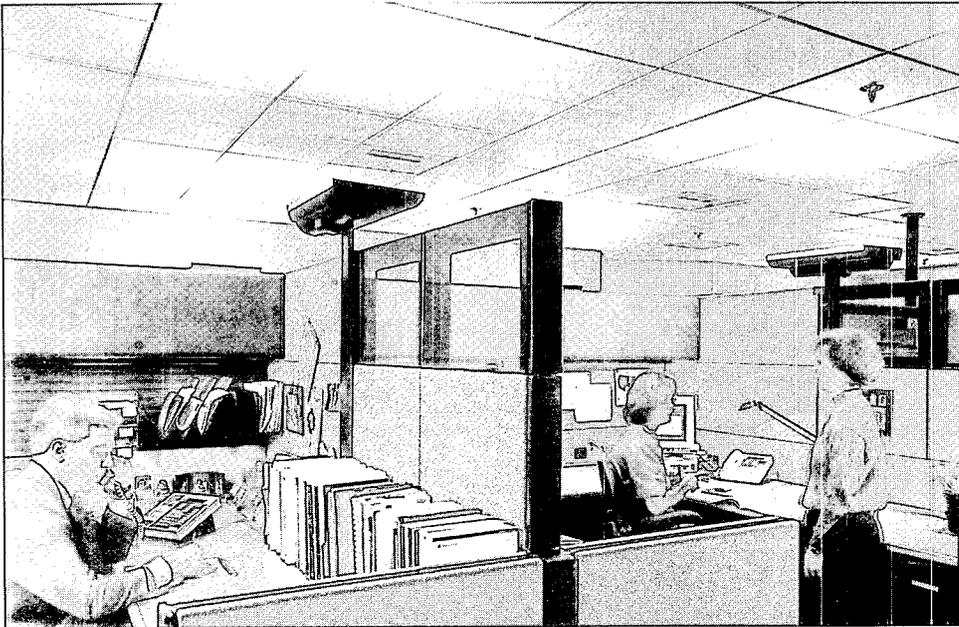
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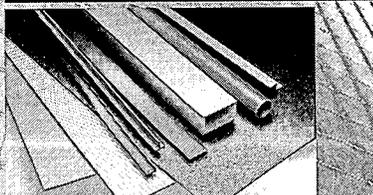
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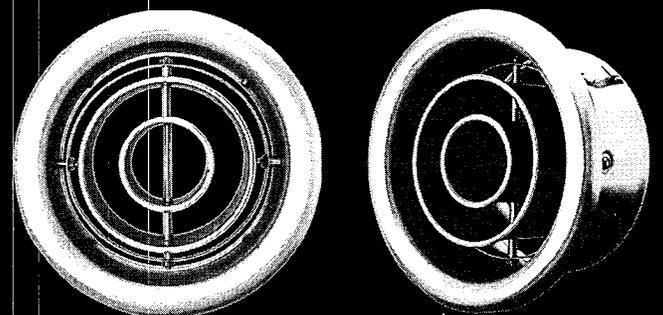
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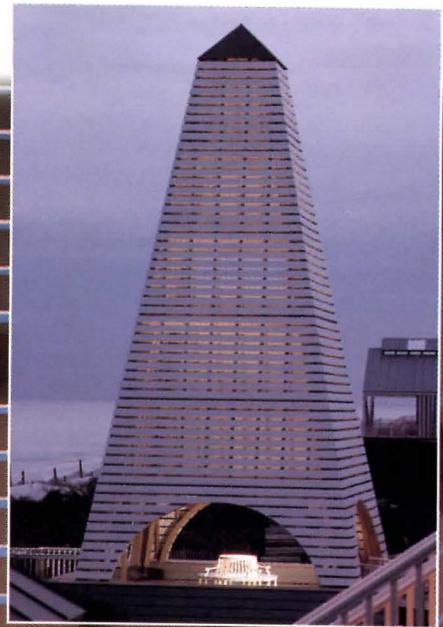
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Manufacturers' Sources

Pages 68-73

Great Northwest Branch Library, San Antonio Lake/Flato Architects
Bowstring trusses: TrusJoist MacMillan. Builtup roof: Schuller. Galvanized roof: Berridge. Windows and entrances: Architectural Aluminum. Locksets: Schlage. Hinges: Hager. Closers: Rixson. Drywall: Gold Bond Building Products. Cabinetry: Baring Enterprises. Carpet: Mohawk. Lighting: Hubbell.

Pages 74-77

Clayton Community Library, Clayton, Calif. Simon Martin-Vegue Winkelstein Moris, Architect
Curtain wall and entrances: Kawneer. Glazing: Libby-Owens-Ford. Solar film: Southwall Technologies. Skylights: O'Keeffe's. Metal roof: Carlisle.
Builtup roofing: Schuller. Wood doors, cabinetry, and custom woodwork: NorCal Millwork. Locksets: Schlage. Closers: LCN. Exits: Monarch. Ceilings: Sono-Ceil. Reading tables and carrels: Worden.
Lounge furniture, reading chairs: Bernhardt. Slate counters: Kirkstone. Acoustic-panel fabric: Carnegie (Xorel); Designtex. Laminate: Nevamar (reading tables); Abet Laminati (stacks). Concrete floor: L.M. Scofield. Carpet: Prince Street Technologies. Stack fixtures: Gamalux. Fluorescents: Ledalite. Decorative sconces and pendants: SPI. Exterior lighting: Moldcast; Bega; Greenlee.

Pages 78-81

Sepulveda Recreation Center, Los Angeles Koning Eizenberg Architecture, Architect
Standing-seam metal roofing: Custom Metal & Air Conditioning. Glass block: Pittsburgh Corning (Vue

pattern Security Block). Lobby flooring: Azrock. Trusses: Lee & Daniel Steel Fabricators. Skylights: Acralight. Exterior doors, window frames: Los Angeles Fireproof Door. Locksets: Best Lock. Exit devices and closers: LCN. Glazing: GE Plastics (Lexan). Solid-maple gym floor: Horner Flooring. Water fountains: Acorn. Integral-color CMU: Orco Block. Polished wire glass: Pilkington.

Pages 82-87

Irvington Community Center, Fremont, Calif. ELS/Elbasani & Logan Architects
Storefronts and windows: U.S. Aluminum. Glazing: PPG Industries, Glass Group (Solex). Fixed sunshade: custom by architect, fabricated by W. A. Thomas. Alaskan Yellow Cedar cladding: Delta Cedar Products. Laminated-glass enclosure at reception: Brite-Vue. Sliding doors: Horton Automatics. Barn doors: Amweld. Locksets: Best Lock. Exits: Von Duprin. Gym ceiling: Acoustideck. Wood ceilings: Potlatch. Builtup roofing: Schuller. Cabinetry: BK Mills. Laminate surfaces: Formica. Stained concrete floor: QC Products. Carpet: Collins & Aikman. Gym floor: Robbins. Gym lighting: Halophane. Exterior fixtures: Poulsen. Low-voltage cable lights: Translite Systems. Downlighting and exterior wallwashers: Elliptipar. Task lamps: Chicago.

Pages 88-91

George Robert White Youth Center, Boston
Leers Weinzapfel Associates, Architect
Chisholm Washington Assoc., Associate Architect
Storefronts and entrances: EFCO. Glazing: Libby-Owens-Ford. Roofing: Firestone Building

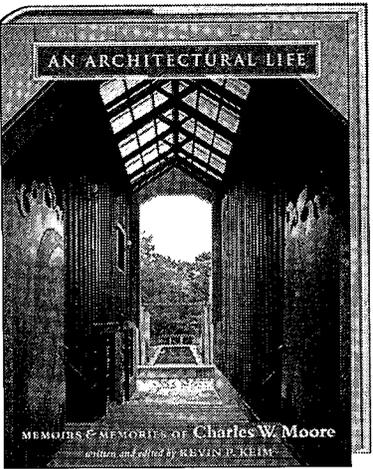
Products. Gym floor: Robbins Sport Surfaces. Wood doors: Weyerhaeuser. Locksets, closers, and exits: Sargent. Acoustic ceiling: Armstrong. Resilient flooring: Tarkett. Paints: Sherwin-Williams. CFL fixtures: Quality Lighting. Metal-halide: Lam Lighting. Exterior: Lithonia.

Pages 92-95

Ross-University Hills Branch Library, Denver Michael Brendle Architects
Curtain wall: U.S. Aluminum. Glass block: Pittsburgh Corning. Builtup roofing: Schuller. Standing-seam roof and cladding: Tomen. Glazing: Libbey-Owens-Ford. (Evergreen). Reflective coating: Viracon. Perforated-metal rail: McNichols, fabricated by Metro Steel. Wood doors: Weyerhaeuser. Locksets: Best Lock. Exits: Von Duprin. Entrances: Besam. Ceilings: Armstrong. Paints: Devco & Raynolds. Cabinetry: Chambers Millwork. Resilient flooring: Freudenberg (Norament). Carpeting: Bentley. Shelving: Montel. Downlighting: Kurt Versen. Elevators: Schindler. Task and ambient fixtures: Litecontrol; Columbia. Exterior lighting: Prescolite. Furniture: Herman Miller.

Pages 96-101

City of Tempe Police Substation, Tempe, Ariz. Architekton, Architect
Translucent panels: Kalwall. Storefronts, sliders, and entrance: Southwest Aluminum. Security glass: HGP. Wood doors: Fenestra. Locksets, closers, and exits: Corbin. Ceilings: USG Interiors. Operable walls: Hufcor. Paints: Dunn Edwards. Integral-color CMU: Superlite. Tile: Dal-Tile. VCT: Armstrong. Exterior lighting: Kim; Lithonia. ■



AN ARCHITECTURAL LIFE

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— Publishers Weekly

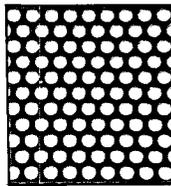
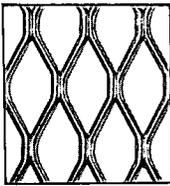
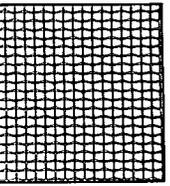
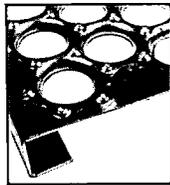
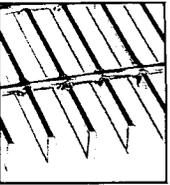
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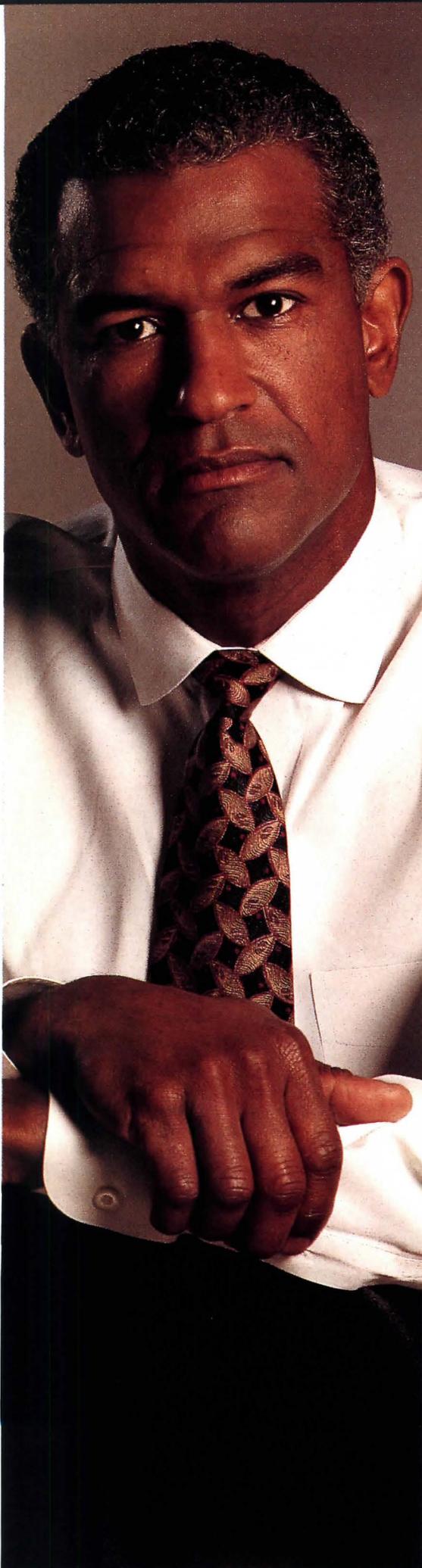
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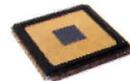
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A 75-Person "All Macintosh" Architectural Firm

ADD Inc, Cambridge, Massachusetts



This year is ADD Inc's 25th anniversary and, as a 75-person architectural firm, there is no aspect of architectural practice that is not addressed in their office – and they do it all on Macintosh computers.

ADD Inc's computer use started in 1984 with a UNIX system that was "very powerful, but very complex" according to Jill Rothenberg the Information System Director of ADD Inc. The role of CAD operators was very important then, because the operation of CAD stations required individuals specifically trained to use the system. Principals, designers, and most project managers did not use the machines. And often, to complete a project, the project team would resort to hand drawing efforts to finish the drawings.

In 1992 ADD Inc switched to Macintosh computers. "Our choice to switch to the Mac was about ease of use," states Rothenberg. "With a firm this size, we do a lot of business management and administration, as well as designing and drafting. Macintosh computers allow us to offer all firm members the ability to perform the variety of work activities required in architecture practice, on one machine."

ADD Inc still has computers that function principally as CAD stations, but the same stations can also be used for word processing, spreadsheets, desktop publishing, and graphics. What they don't have anymore are "CAD operators", or designers and

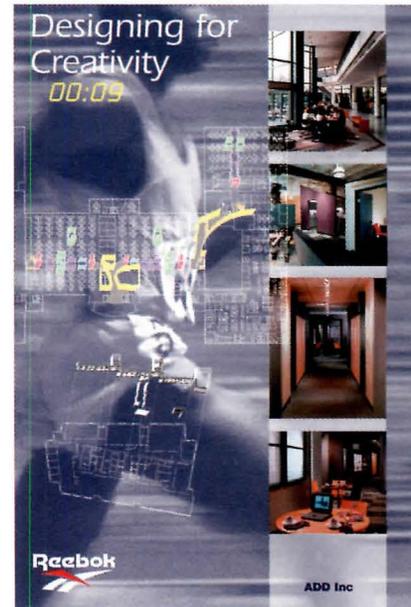
principals that are dependent on a specialized CAD or technical person to make changes to project drawings.

All of ADD Inc's designers and architects are very computer literate and the firm provides training for everyone. This has been very liberating for designers and upper management. It has also reduced the number of people dedicated to "administrative-only" or "CAD-only" functions.

It is interesting to note, that when ADD Inc is interviewing prospective employees, the focus is not on the candidate's computer skills. They have found that the speed with which they can train new employees on the use of a Macintosh "allows us to concern ourselves with a job applicant's design abilities and management skills".

With the Macintosh computer platform throughout the office, Add Inc is able to easily assemble various types of information, from a variety of software programs, into one presentation and do their own desktop publishing. "Our presentations look GREAT. Because of the graphic strengths of the Macintosh, all of our reports – ADA, site reports, programming documents – have a high-end, beautiful look to them," says Rothenberg.

ADD Inc creates presentation graphics from construction documents drafted in PowerCAD. These drawings are then combined with other graphics and text using Adobe Persuasion, a computer presentation program, or they can be printed or mounted on presentation boards. We use FastTrack



ADD Inc's projects include architecture and interior design for retail and corporate clients including Hewlett-Packard, 3COM, Reebok's Corporate Campus, as well as several multi-unit housing designs.

Schedule in our presentations to clients for graphically conveying project schedules. "We do all of this, both for prospective clients and during a project, so that our clients can better understand our work," Rothenberg adds. They have recently even used ArchiCAD's VR capability in a presentation to Reebok.

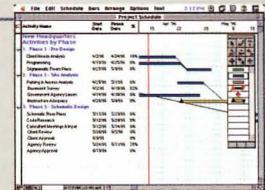
"Our choice to use Macintosh computers was definitely about ease of use – we were interested in giving our staff the tools they needed to be effective and efficient. I've seen a lot of large firms switch to Macintosh for the same reason."

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FastTrack Schedule allows architects to quickly create graphic displays of "timeline" or Gantt (bar) charts. Tasks can be linked. Task information such as start date, finish date, and duration can be entered graphically or numerically. The program allows you to easily draw activity bars right on the screen.



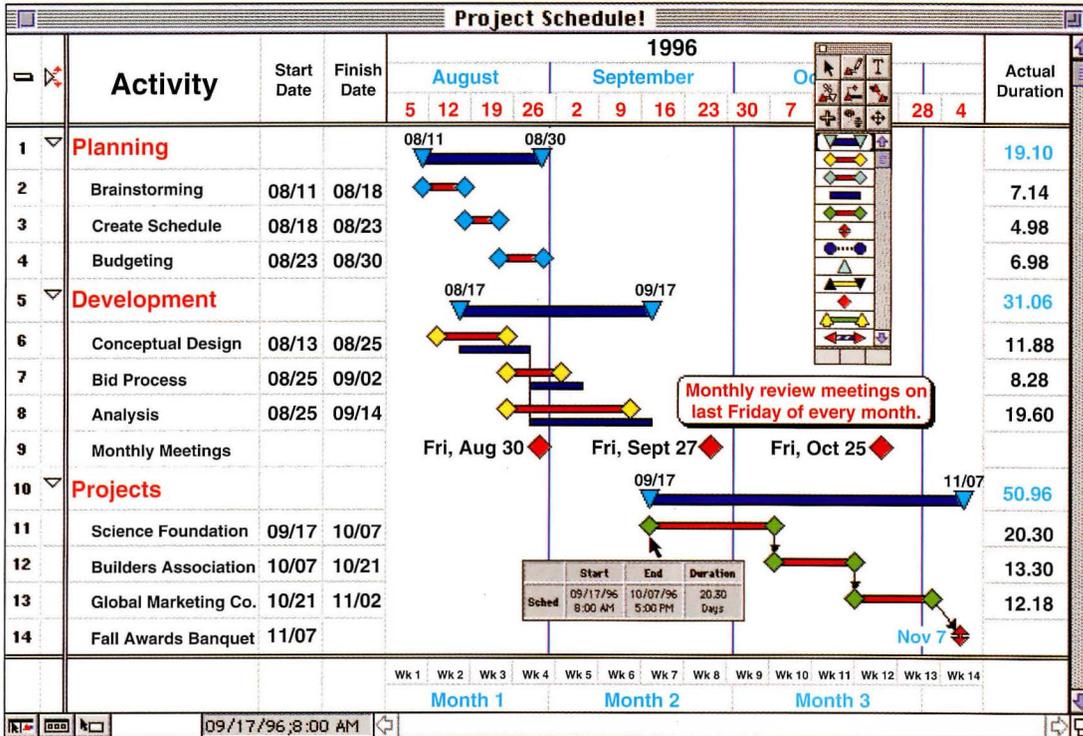
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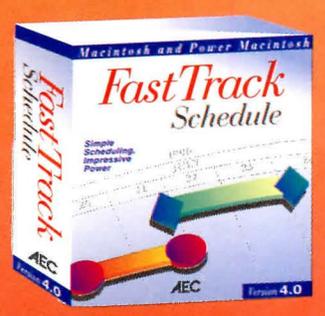
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The Transformation of Drawing: Computers at Eisenman Architects

Eisenman Architects, New York, New York

Architecture has traditionally been read as a dialectic condition of positive or negative, figure or ground; we have never measured architecture as contingent space, the possible interstitial condition between solid and void, between interiority and exteriority, between profile and blurred figures. The electronic environment helps us to register changing impressions effecting an other space in architecture: a space between building mass (for example, a wall, a column, a surface) and a void that is the negative of that solid. This kind of architectural inscription would be otherwise impossible without the incorporation of a certain kind of digital representation.

Computer software allows us to look at possible analogies that can be brought to architecture from other, more dynamic systems, such as the properties of liquids and crystals, impulses of energy, radar and radio waves, and musical harmonics. Our work is an ongoing attempt to discover the possibility of an architecture that realizes its process of making, and therefore its conceptual strata, in the three-dimensional object itself. Thus, the computer is used as a tool to analyze interactive, even hypothetical physical phenomena as they might effect three-

dimensional space; it allows unpredictable events to emerge as unpredictably as form, thus circumventing the architectural consequences of formal composition or externally imposed rules of organization.

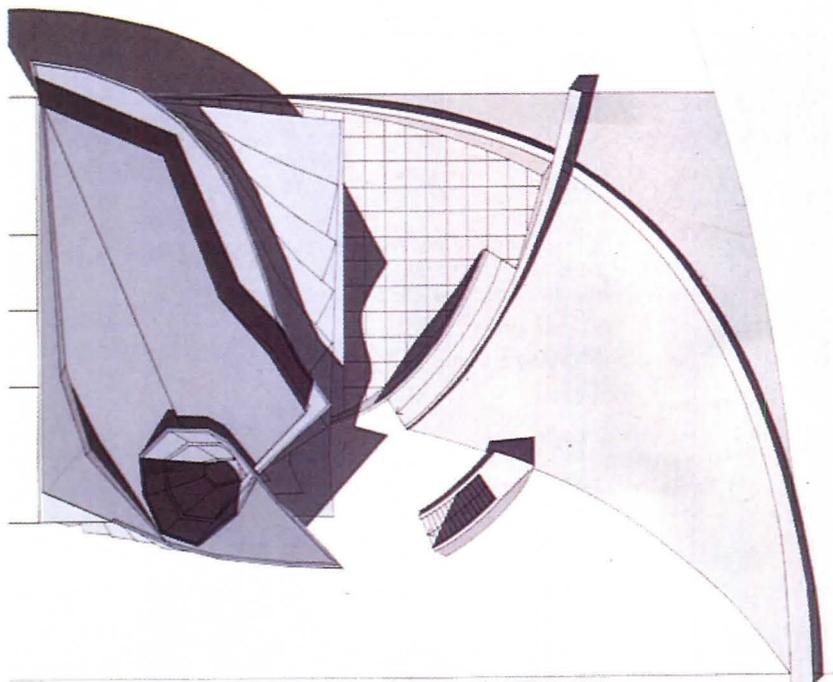
In our Haus Immendorff project for an artist's cafe and studio on the Dusseldorf Harbor, for example, the soliton wave was used as an analogy to generate a self organizing or emergent form. Solitons are pulses of energy moving through solids, liquids, or gasses to form non-linear interactions binding sine waves together. The twisting form of the Haus Immendorff building derives from a computer analysis of soliton wave phenomena, which resulted in the structure's inner and outer volumes whose oblique surfaces intersect each other as they twist vertically. Similarly, the computer was used as a conceptual tool in the design of the Max Reinhardt Haus, a multi-use high-rise building in Berlin. The design team began by digitally mapping the Moebius strip, a three-dimensional form with an unbroken continuity between its interior and exterior surfaces.

The form of our Center for the Arts at Emory University in Atlanta, Georgia is the result of a rigorous computerized investigation of the geometrical properties of a point

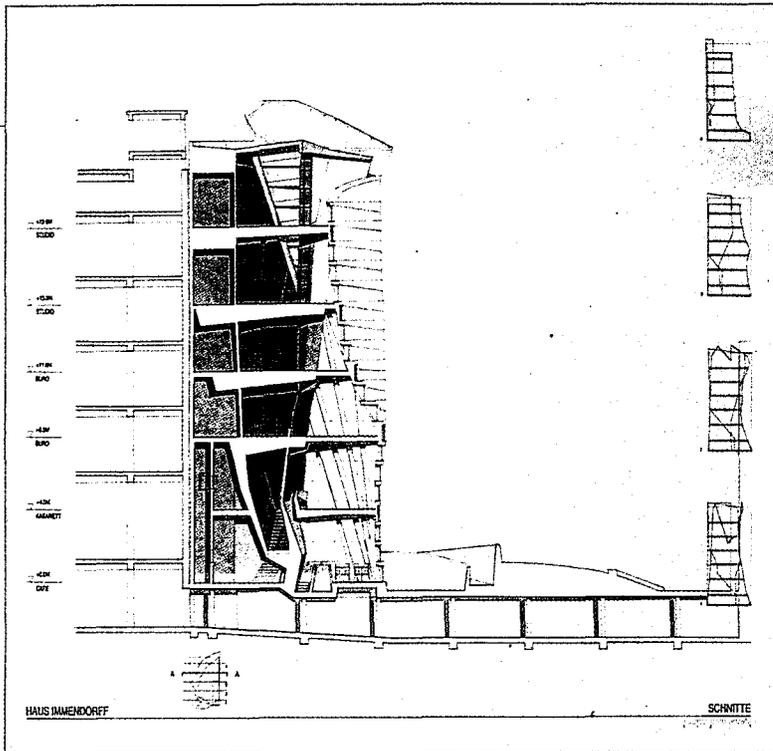


in space. The Center is a 160,000 square foot facility accommodating four major performance spaces along the east side of a sculptural, multi-level lobby. The building's undulating folds derive from an exploration of musical harmonies and the topographical profile of the ravines that cross the Emory campus; the folds that occur on the outside surface of the building are transformed to the inside through a mathematical and geometrical process involving computer analysis. The design team first looked at the way in which the hypothetical fields of force represented by the ravine topography distorted the original campus grid extended over the site. This distortion resembled the sine and cosine waves of musical harmonics, and when applied to the surfaces of four basic typological boxes, resulted in a structure composed of "large scale" and "small scale" folds. The complexity of the structure required a computerized analysis of the folds and volumes to generate the precise geometric calculations needed for construction documents. In a section of the fold separated by transverse planes, for example, the four points thought to constitute a plane do not in fact lie in the same plane. This results in a surface similar to a hyperbolic paraboloid, which would pose difficulties in construction. As a solution, a triangular system was devised using the computer to create multiple planar surfaces, each with three points; these pyramidal surfaces connect to form the cubic volumes of the building. For this work the client, Emory University, provided additional computer support to resolve the complex Boolean operations that

Haus Immendorff - site model.
Photo: Dick Frank



Haus Immendorff - Roof Plan.



Haus Immendorff Section.

in-house computers are unable to perform.

Eisenman Architects use Macintosh and IBM PC compatible computers in all phases of their work, including conceptualization, design development, presentations, and construction documents. The office uses two different platforms for architectural design and drafting, linked through a network: form•Z soft-

ware runs on Macintosh Quadra computers and is utilized as a conceptual, three-dimensional design tool. AutoCad software studies the drawings in further detail and is used more specifically for architectural drafting.

The Editor would like to thank Eisenman Architects for providing the content for this essay.



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"Computer software allows us to look at possible analogies that can be brought to architecture from other, more dynamic systems..."

- Eisenman Architects

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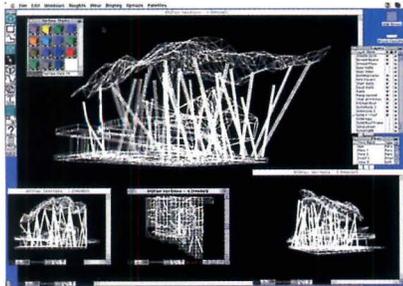
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Multimedia Presentations and QTVR

Brown Consulting, Atlanta, Georgia

Alan Brown has been creating "a lot of QuickTime VRs." Using form•Z as the 3D modeling software and Electric Image as the animation and rendering software, Brown creates drawings of a space and then imports these images into Apple's QuickTime VR (QTVR) software. The QTVR software creates a navigable 3 dimensional view of the room. "My clients are wowed by it. Once I design the room in 3D, I can create VR's from any location and give everyone a view of the design from their vantage point."

For Brown, "QTVR is the perfect tool for 3D visualization and because Apple's



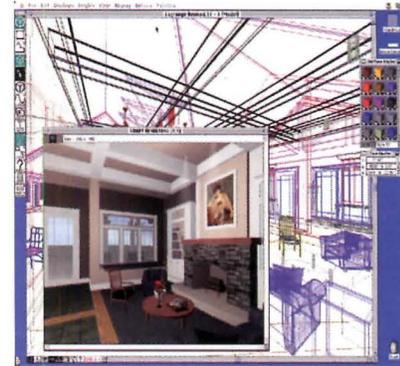
This model of the "Atlanta Pavillion," was modeled in form•Z and then used to derive plans and sections for construction documents.

Architect: Scogin, Elam & Bray
(Brown Consulting, Computer Consultant)

QTVR technology will run on both Macintosh and Windows machines. "Anyone with a PC can view it. QTVR is an amazing new technology to add to my multimedia production capabilities" explains Brown. "I designed several signs for a company and then created a QTVR view that enables the client to stand at the front door and see what the sign will look like from the entrance to the store." That company is now interested in designing their entire store using QTVR.

Alan is collaborating with, and training other architectural firms in the use of QTVR. "A lot of the projects I am involved in must be done quickly. With two people in two days, we can create a very nice presentation that is quite effective in communicating design ideas."

Brown believes that one of the advantages of using a Macintosh is the variety of creative tools available. The consistent user interface of many software programs available on the Macintosh makes experimenting with new tools easier and the innovation of new methods for design possible. For example, Brown may start with a drawing in Adobe Illustrator or Blueprint, import the file into form•Z for 3D modeling, and then render the results in Electric Image. For a more complex project he'll use MiniCAD



This image of the Hospice Lagrange Lobby was modeled in form•Z and then rendered using Electric Image Animation. The animation of the interior and exterior of this project was shown to potential donors.

Architect: Nix Mann Perkins & Will (Brown Consulting, Computer Consultant)

and then export a DXF file into form•Z.

Brown has consulted with a number of firms, who design in plan and elevation and then try to produce 3D models after the fact. "They first use CAD equipment and then want to "do something neat" with the building. It isn't until they see the 3D views, that they learn what the building really looks like." Brown suggests developing the design in 3D from the beginning of the project.

"Architecture is not a linear process." The flexibility of the Apple system allows a designer to begin in either 2D or 3D, explore 3D forms quickly, and then work in 2D, drawing plans and elevations. The Macintosh can allow architects to easily transfer design ideas into working drawings.

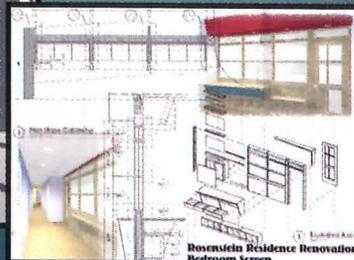
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CREDITS: *From left:* Piano by M. Del Grosso; Hong Kong Hyatt by Teresa Williams (EI); CyberWasp by David Teich (Strata); Oglethorpe by H. Hambricht; Rosenstein Residence by Greg Randal; Le Corbusier's Ronchamp by M. Niemi. Unless otherwise noted, all models rendered with form•Z RenderZone. Ad design by Alberto Scirocco.

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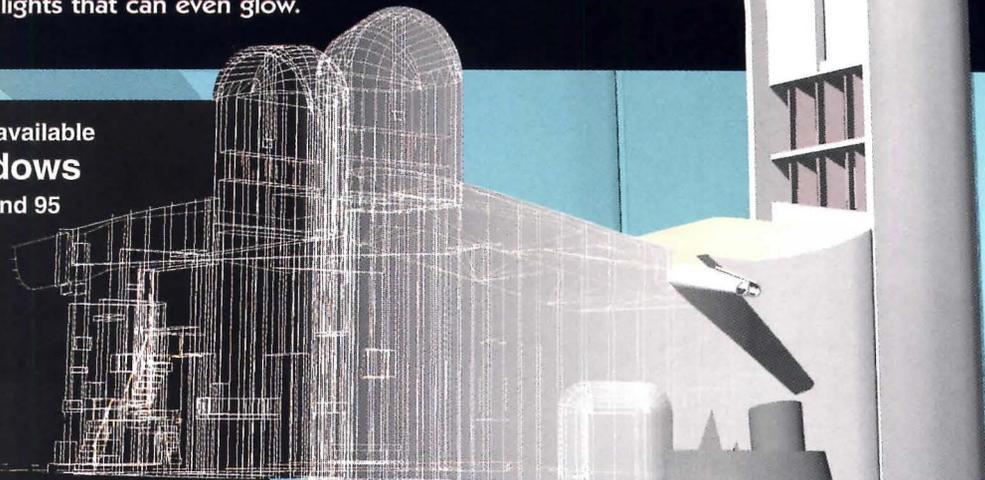
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Apple QuickTime VR

RDC Interactive Media, Inc., Palo Alto, California

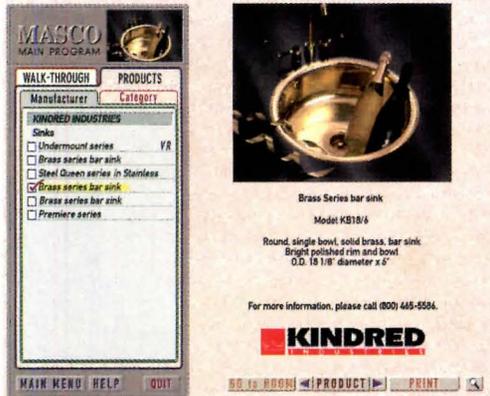
In addition to changing the way architects design, new computer technology is changing the way we receive and view new product information. This architectural example of an implementation of Apple's QuickTime VR technology was a major feature at MacWorld in San Francisco, was a hit at the National Association of Home Builder's Show in Houston, and has received regional television and newspaper coverage. This project fully demonstrates

the capability of QTVR as a tool for viewing existing spaces. Working with the support of Apple Computer, Inc., RDC Interactive Media produced a virtual tour on CD-ROM, of an existing 8,000 square foot house in Columbia, Maryland for Masco Corporation, a world class manufacturer of building products.

An innovative and intuitive interface allows the viewer to navigate to over 60 locations in the house in three different ways: using the cursor in the VR window, clicking on designated locations on the floor plans, or selecting from a list of rooms. The CD also contains product information on over 50 products installed in the showhome and several "object VRs" which enable the user to view a product from any angle. The Masco Virtual Reality ShowHome CD-ROM is available by calling (800-241-2537).



This screen shows the interface developed for the Masco VR Showhome with three ways of navigating 1.) list of rooms 2.) floor plans 3.) VR-window.



In addition to being able to navigate the 8,000 square foot house, product information is also available for over 50 products

"Quick Time VR is the killer application that architects have been waiting for."

- Terry Beaubois

RESOURCES...

3D VISUALIZATION - CREATING AND VIEWING 3D OBJECTS AND SPACES:

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QuickTime VR
Apple Computer, Inc.
Phone: (800) 776-2333

QuickTime VR is a new technology from Apple which enables users with the appropriate software to create virtual navigable environments from a series of rendered images or photographs.



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auto•des•sys Inc.
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form•Z is a sophisticated solid modeling application. True Boolean operations, meshes, splines and other high-end capabilities are supported permitting the creation of any shape. form•Z RenderZone includes texture mapping and ray tracing. The RenderZone version is \$1,995.



Byte by Byte Corporation	Sculpt 3D	\$495	512-795-0150
Electric Image, Inc.	ElectricImage Animation System 2.5	\$7,495	818-577-1627
Microspot USA, Inc.	3D World	\$199	800-622-7568
Ray Dream, Inc.	Ray Dream Designer	\$99	800-846-0111
Virtus Corporation	Virtus Galleries	\$39	800-847-8871
Virtus Corporation	Virtus VR	\$99	800-847-8871
Virtus Corporation	Virtus WalkThrough Pro 2.5	\$495	800-847-8871



Once again, BMW showcases some of the world's best technology.

Only in this case we're talking about BMW's amazing new web site. The web site that actually lets you test-drive the Z3 roadster in the comfort of your living room. And how did BMW put one of the most innovative web sites on the Internet? With Apple technology, of course. As Jim McDowell, VP of Marketing at BMW of North America, puts it, "We wanted our web site to have the same performance and excitement as our BMW products. Apple was the perfect partner." So visit www.bmwusa.com to check out some technology that really moves. Oh yeah, and while you're at it, check out the car.

Macintosh® for webmasters, webcasters and websurfers.



QuickTime movies. Digital videos so realistic that the only thing missing from taking the Z3 roadster for a test-drive is the wind in your hair.

To serve up their web site, BMW uses the Apple® Internet Server Solution, one of the easiest ways to put a site on the Net and powerful enough to handle over 200,000 hits per day.



Digital Design

DES Architects & Engineers, Redwood City, California

In addition to being Associate in Charge of Digital Design at DES Architects & Engineers in Redwood City, California, John Marx is also teaching "Digital Design" at the University of California at Berkeley's Department of Architecture. His lectures at Berkeley emphasize the ability of digital design to enhance the design process. Marx has found that digital design offers architects the ability to quickly edit ideas and drawings and to easily design in 3 dimensions.

One of the software programs in the DES arsenal is Adobe Photoshop. Marx uses

Photoshop, not only to combine photographic and computer generated images into presentation graphics, but also as an architectural design tool. "I design much more 3 dimensionally using Photoshop. I use Photoshop as a digital sketching tool - not just as a way to paste a cloud behind a building."

After rendering a view of a building in Photoshop, it is possible to quickly change mullions and other architectural features. Realistic images of alternative building colors and textures may also be quickly generated. Using Photoshop, architects can easily generate "before and after" images of remodeling or alteration projects.

DES has created many impressive images using a digital "collaging" techniques by combining several images from different sources with photo-realistic backgrounds. Marx and his staff at DES have even produced their own CD-ROM that features these presentations.



A presentation drawing of the Pacific Athletic Club project by DES Architects.

"I use Photoshop as a digital sketching tool - not just as a way to paste a cloud behind a building."

- John Marx



A digital rendering of Pacific Athletic Club.

PRESENTATIONS & DESKTOP PUBLISHING:

Adobe Systems, Inc.	Adobe PageMaker	\$895	800-628-2320
Adobe Systems, Inc.	Adobe Persuasion	\$395	800-628-2320
Adobe Systems, Inc.	Adobe Premiere	\$795	800-628-2320
Allegiant Technologies, Inc.	Allegiant SuperCard 2.5	\$399	800-255-8258
Apple Computer, Inc.	HyperCard	\$99	800-776-2333
Frame Technologies	FrameMaker	\$895	800-628-2320
Gold Disk	Astound	\$170	408-982-0200
Macromedia, Inc.	Director	\$1,199	800-288-4797
Proxima Corporation	Desktop Projector 2810	\$7,495	800-447-7692
Proxima Corporation	Proxima Ovation+ 920	\$10,995	800-447-7692
Stellar Solutions	Video VI with Video Companion	\$450	707-579-1733

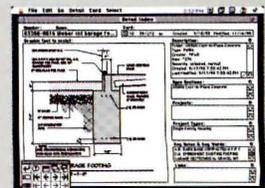
WORKING DRAWINGS, CAD & ENGINEERING:

American Small Computers, Inc.	DesignCAD 2D/3D Macintosh	\$499	918-825-4848
Archforms, Ltd.	MaxBeam	\$149	800-958-ARCH
Archforms, Ltd.	MaxQuake	\$149	800-958-ARCH

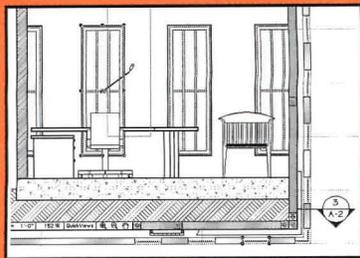


Detail Manager
\$195
Architechnica
Phone: (310) 376-7054

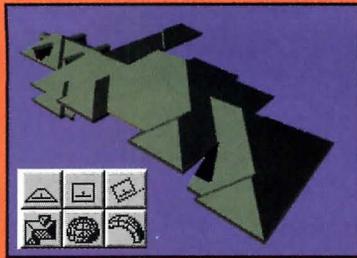
Detail Manager is a comprehensive system for storing and managing details in a detail library. It can be used with most Macintosh CAD programs including PowerCAD, MiniCAD, ArchiCAD and other applications such as Excel.



Architechnica	Sheet Planner	\$50	310-376-7054
Argus Interware, Inc.	Argus MeshMaker Pro	\$1,000	516-931-4725
Avian Systems	GAIA Software	\$2,000	201-224-2025
BAGH Technologies	New Architriion V16	\$4,495	800-561-0522



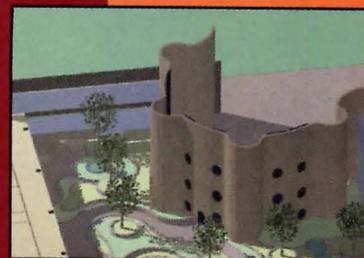
WORK IN PLAN, SECTION, & ELEVATION
 Select, move, and edit elements in section or elevation views • changes are updated on floorplan, 3D view, and bill of materials



GENERATE COMPLEX ROOFS EASILY
 Automatic hip, vaulted, and domed roof generator follows plan or any outline • Cut openings at any angle • Freely set fascia angle, thickness, and materials



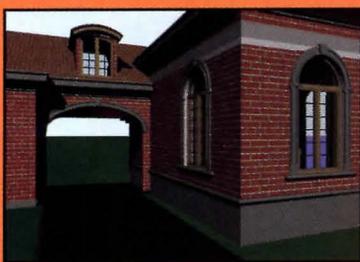
OFFER CLIENTS A "VIRTUAL TOUR"
 QuicktimeVR maker incorporated in ArchiCAD (Macintosh version only) • Enhanced QuickTime® VR capabilities to produce object movies & multi-node scenes



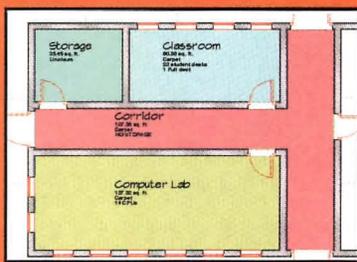
MODEL CURVILINEAR FORMS
 Splines and Bezier curves can be transformed into walls, slabs, or roofs, or used for drafting • Create true curved walls, slabs and roofs with curved openings

Announcing... ArchiCAD® 5.0

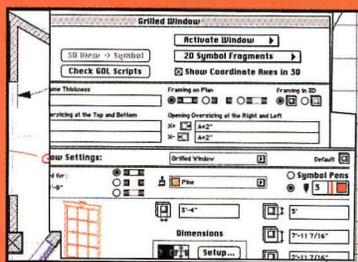
CONNECT WITH THE INFORMATION AGE



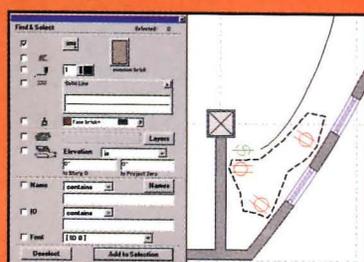
IMPROVE VISUAL COMMUNICATION
 Add textures to any surface • Dozens of textures included or add your own • Generate sunstudy movies for any location and time period • Faster shading and 3D generation recalculates only changed elements



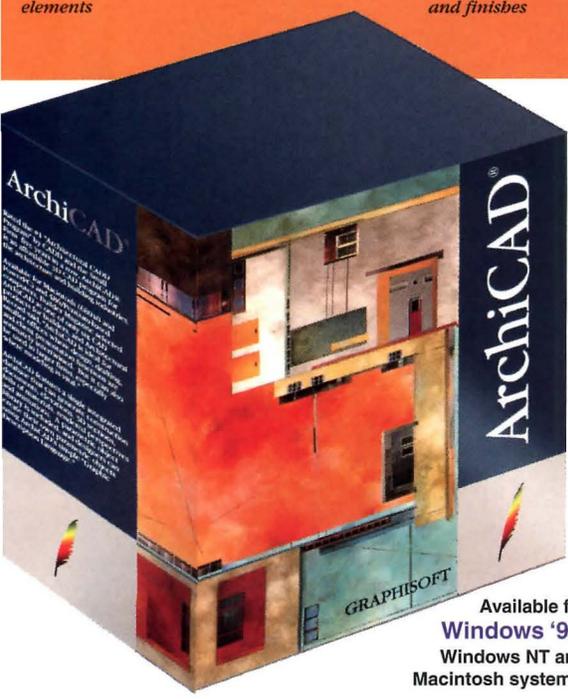
OPEN THE DOOR TO FACILITIES MANAGEMENT
 Zone feature automatically recognizes rooms and zones & label by color and "stamp" • Properties import/export object attributes • Two way connection to external databases and spreadsheets • Tracks objects and finishes



CUSTOMIZE INTELLIGENT OBJECTS
 Alphanumeric string variables • Parametric properties • View objects (such as stairs and flues) across all stories • Quantify object area and volume • Parametric cutting planes in GDL • New object browser with dynamic 3D preview



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Available for Windows '95, Windows NT and Macintosh systems.

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 call GRAPHISOFT at
 1-800-344-3468
 Or visit us on the World Wide Web at www.graphisoft.com



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 Circle 20 on inquiry card

A "Computer-Aided Practice" Resource

Architectonica, Redondo Beach, California

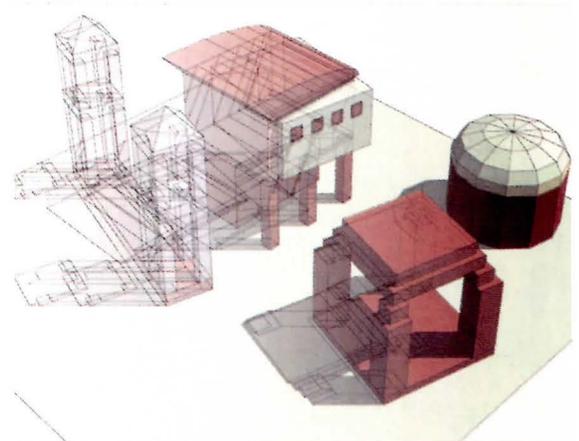
Though architecture can be a competitive sport, there are professionals that make themselves available as "resources" from whom we can benefit. Architectonica, founded by Barry Isakson, AIA in 1988 specializes in providing computer-aided practice consulting services using Macintosh computers. Isakson has been involved in the architecture and construction industries since 1971, and has used Macintosh computers in architectural prac-

tice since 1984. Isakson is a nationally-recognized expert on all aspects of computer-aided practice, including CAD.

In addition to offering individual consulting services, Architectonica also offers a series of seminars around the country on topics which include Drafting Automation, Macintosh in Architectural Practice, and Computer-aided Presentation.

As a Macintosh architecture wunderkind, Isakson has developed a collection of software tools for architects and designers interested in automating their work and also publishes a quarterly newsletter that educates Macintosh users on computer tools and computer aided practice.

The editors would like to thank Barry Isakson for providing the DXF Translation Tips and the reviews of featured products.



These abstract forms were quickly generated by Isakson to demonstrate a three dimensional view of spaces and objects.



"Computer-Aided Practice is not an event, it is a process. It is not about buying computers, it is about using them."

- Barry Isakson

RESOURCES...

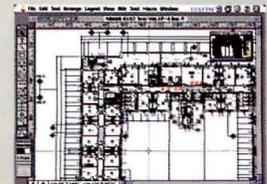
WORKING DRAWINGS, CAD & ENGINEERING CONTINUED...

Bentley Systems, Inc.	Microstation	\$3,950	610-458-5000
CADSoft Solutions, Inc.	CSI-CADD	\$795	817-284-3609
Canadian Home Builders Association	HOT2000 Version 7.1	\$325	613-230-3060
CIGRAPH s.r.l.	cumTerra	\$1,800	011-39-41-932388
CIGRAPH s.r.l.	HouseMap	\$900	011-39-41-932388
ComGrafix, Inc.	MapGrafix Mapping System	\$2,995	813-443-6807
COMPUnearring Inc.	Structural and Landscape software	Call	905-738-4601
Daystar Software, Inc.	RetainWall	\$195	816-741-4310
Desktop Architect	Desktop Architect 2.0	\$199	614-469-9906
Desktop Architect	Desktop Architect 2.0+ (MiniCad Version)	\$199	614-469-9906
Eclactus, Inc.	CMIS 3.0	\$3,800	800-625-5972
Eclactus, Inc.	Punch Box	\$295	800-625-5972



PowerCad
\$795
Engineered Software
Phone: (910) 299-4843

PowerCad is 2D CAD software which can be used to create 2D production drawings and details. WildTools, which includes a "squiggle" command, is available for \$150.



Engineered Solutions	MacCulvert	\$100	407-349-9985
Engineered Solutions	MacFlood Route	\$200	407-349-9985
Engineered Solutions	MacStorm Sewer	\$550	407-349-9985
Eric Rojo	MacHeliodon v.3.0 *	\$32	604-682-6929
ESRI, Inc.	ArcView	\$995	909-793-2853
Etlon Software	ESLib Foundation Class Library	\$195	303-702-9274
Freemyers Design	Architectural and Landscape Graphics	\$50	916-533-9365
Future Graph, Inc.	Future Graph Clipart Libraries	\$49 - \$99	800-LEARN-FG
Graphic Magic, Inc.	Engineering Software	Call	408-464-1949

From Concept to Reality

When you sit down to draw, you want to have that old feeling of drawing on a piece of paper. You want to move about the drawing quickly, draw perfect lines, move around effortlessly, knock in windows and doors, detail things in a heartbeat and swiftly dimension the whole drawing. You don't want to fight with a computer.

PowerCADD lets you draw like that. It's extraordinarily easy to use and yet it's as

powerful as the most expensive systems around. PowerCADD lets you concentrate on drawing, and it doesn't get in your way. It's tailored to your needs and lets you customize things to the way you want them, and with add-on tools like WildTools—the most powerful drawing tools in the world—you can draw circles around those other CADs.

With PowerCADD, you're not only productive, you're having *fun!*

 **Fast.**

 **Intuitive.**

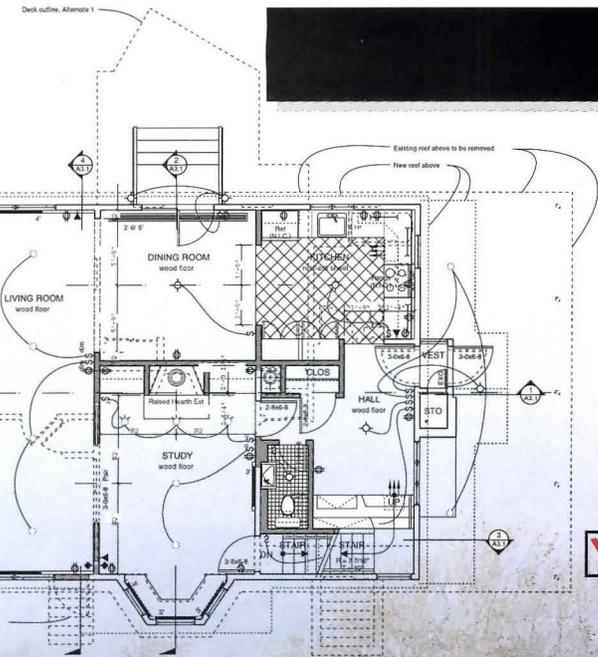
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2 FIRST FLOOR PLAN
A:1:1 3/4" = 1'-0"

Drawings and photograph
by Robert T. Coolidge, AIA



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DXF Translation Tips

DXF (Drawing Exchange Format) file format is the most commonly used method for transferring information between different CAD programs. This usually means moving drawings between AutoCAD DOS or Windows and your Macintosh CAD program. There are two issues involved. The first is transferring the files from one platform to another. The second is translating the files from DWG to DXF and then from DXF to the format of your CAD software.

If your CAD program supports the DWG format (AutoCAD's native file format), then you need only transfer the files from one platform to another. This can be accomplished with floppy disks using utilities such as PC Exchange. All Macintosh computers running System 7.5 have PC Exchange installed and can read DOS format 3-1/2" floppy disks from PC users using DOS or Windows.

Macintosh CAD programs which can read DWG files directly include: ArchiCad (Graphisoft), Microstation (Bentley Systems), and AutoCAD R12 for Macintosh. Contact your CAD software provider to determine if the software you are using can read DWG files directly.

If your CAD program does not read DWG files, then you will need to have the party sending you the file, translate the file from the format of their CAD software to DXF. Once the DXF file is transferred to your system, you can then translate it from DXF to the format of your CAD program.

Translation Software

If your CAD program does not support reading and writing DXF files you will need to acquire some additional software. Translation software can usually be purchased directly from the publisher of your CAD software. If your CAD software publisher cannot provide you with translation

software you may be able to use software such as CADMOVER to translate the files. CADMOVER is published by Kandu Software (703) 532-0213. Be sure to inquire whether your CAD program is supported.

Additional DXF Translation Tip information:

For the following additional information on DXF Translation Tips, go to the Apple website (<http://www.technical.apple.com>).

- Receiving DXF Files
- Export Instructions for AutoCAD Users (*Give these instructions to AutoCAD users who will be providing you with files*)
- Import Instructions for Macintosh Users
- Sending DXF Files

"Getting a file to firms that still use AutoCAD is more like sending a fax now."

- Alan Brown

WORKING DRAWINGS, CAD & ENGINEERING CONTINUED...



ArchiCad
\$4,450
Graphisoft
Phone: (800) 344-3468

ArchiCad is sophisticated CAD software which integrates 2D production drafting, bill of materials, 3D modeling, rendering, and animation in a single application. Library objects are parametric. Lighting effects and texture mapping are supported. QuickTime movies and QuickTime VR environments can be created.



Graphisoft, Inc.

Blueprint

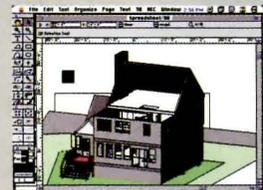
\$225

410-290-5114



MiniCad
\$795
Graphisoft, Inc.
Phone: (410) 290-5114

MiniCad is a powerful 2D drafting and design program with a built-in 3D modeling environment. Includes database and spreadsheet capabilities and a "Design & Drafting Toolkit" which offers over 2950 tools, commands, and templates. Create QuickTime movies and fly throughs. Export 3D models into high-end rendering programs.



Illumination Data Systems	DataLight 3	\$69	405-340-3892
IMSI	TurboCAD	\$145 - \$295	800-833-4674
Intuïtec Software Inc.	FrameMac Section Tables	\$165	416-631-6603
Intuïtec Software Inc.	Static Footing	\$50	416-631-6603
Knowledge Revolution	Working Model v3.0	\$2,500	800-766-6615
MapInfo Corporation	MapBasic for Macintosh	\$795	800-327-8627
MapInfo Corporation	MapInfo for Macintosh	\$1,295	800-327-8627
ModaCAD	ModaCAD Design, ModaFINITY	\$12,500	310-312-6632
Neal Alan Duncan Architect	Ft-In Calc 2.6	\$39	202-667-1494
Northstar Engineering Design	Engineering Symbols Library	\$89	612-937-5038
nuLogic, Inc.	nuControl	\$1595-\$1995	617-444-7680
Onyx Computing	Tree Pro	\$495	617-876-3876
PCAM Solutions Inc.	EZ-EPS	call	212-249-5832
Revelar Software	ConstructionMac! 3.1	\$445	800-669-5191
Revelar Software	Punch Box	\$495	800-669-5191
Revelar Software	Scaler•Mac	\$199	800-669-5191

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DesignWorkshop is available from MacZone, MacWarehouse, and direct from Artifice. Model and Radiance rendering by Peter Horne, Univ. of Oregon. ¹Macintosh Sci. and Eng. Report, ²MacUser UK, ³MacWEEK, ⁴MacWorld.

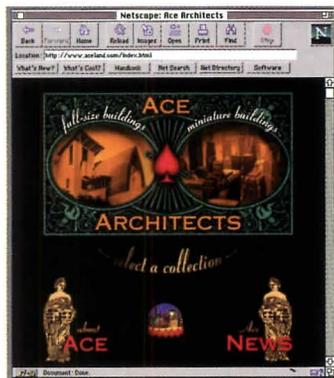
800-203-8324 • 541-345-7421

541-345-7438 fax. Eugene, Oregon.

Artifice, Inc.

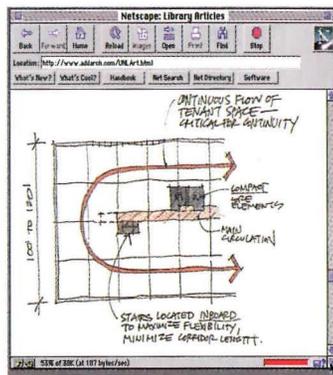
Architects Online

In last year's Macintosh & Architecture special section we urged architects to get online. Since then there has been an impressive number of architects with creative web sites. Here are just a few of the hundreds of the sites that feature architecture firms and universities.



Ace Architects
Berkeley, California
<http://aceland.com/aca/>

This web site was developed by Brad Johnson Presents of Oakland, California and won first prize in the Advertising Category in Communications Arts magazine's prestigious annual design competition.



Add Inc.
Cambridge, Massachusetts
<http://www.addarch.com/>

Using the metaphor of the city, ADD Inc has created a web site that introduces potential clients to their staff and projects. Among other compelling graphics included in this site are these hand drawn sketches which reveal ADD Inc's incorporation of traditional media and new media. The sketches are from the article "Office Design for the Marketplace" written by Michael S. Hass, AIA.



Hellmuth, Obata+Kassabaum, Inc.
St. Louis, Missouri
<http://www.hok.com/>

HOK's comprehensive and elegant site size includes information on completed projects, publications, and profiles of each HOK office. This site also features an easily navigated outline that allows users to quickly view information and images.



Chris Luebke
Department of Architecture
University of Oregon
<http://darkwing.uoregon.edu/~struct/>

Luebke is currently developing a course that will explore using the internet as an interactive teaching tool. His site includes a database of structural typologies, course outlines, case studies, and a fascinating look at the architecture of Hong Kong.

RESOURCES...

WORKING DRAWINGS, CAD & ENGINEERING CONTINUED...

RockWare, Inc.	Digitize for the Mac	\$299	800-775-6745
SeaSoft Systems	SPMsim	\$60,000	805-683-3002
Softin s.r.l.	MacSap	\$3,800	011-39-6-44291061
StormWorks	OfficePRO WorkPlan	\$32	919-286-6638
StormWorks	StormWorks DitchBuilder	\$89	919-286-6638
StormWorks	Super SCS	\$89	919-286-6638
Tap Software	Beam Builder	\$69.95	800-245-5493
Terrace Software	bel Terre Plant Symbols	\$89 - \$295	617-396-0382
University of Oregon	Energy Scheming 2.5	\$195	503-346-5647
Warren Design Vision	BeamCALculator	\$125	501-224-7434
Warren Design Vision	ConvertULATOR: Conversion Factors	\$25	501-224-7434
Williams CadCo	Professional Series Drafting Symbols	\$99 - \$199	800-321-9193
...by Design, Inc.	DATICA II	\$65	800-527-7472

PRINTING:

CalComp, Inc.	Plotters	\$1500-\$35,000	800-225-2667
Encad, Inc	NovaJet color plotter	call	619-452-0882
GDT Softworks Inc.	Plottergeist	\$399	800-663-6222
GDT Softworks Inc.	PowerPlot	\$599	800-663-6222
GDT Softworks Inc.	PowerPlot/LT	\$799	800-663-6222
Hewlett Packard Co.	Plotters, Laser printers	call	208-396-6000
Mesa Graphics, Inc.	Mesa Graphics Plotter Utility	\$125	505-672-1998
Mesa Graphics, Inc.	Mesa Graphics Terminal Utility	\$195	505-672-1998



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are traditional ele-
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Raymond Enkeboll Designs
16506 Avalon Blvd.
Carson, CA 90746
Phone: (310)532-1400
Fax: (310) 532-2042

Raymond Enkeboll Designs.

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ATLAS DOORS ENHANCE NAVY PIER



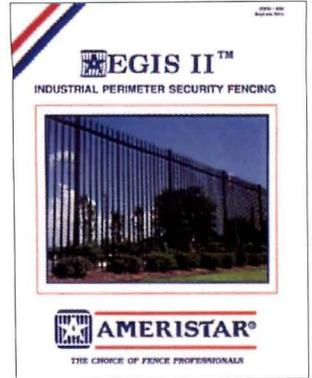
Atlas Door Corporation's Rolling Service Doors, Fire Doors, and Counter Shutters were a prominent part of the \$150 million Chicago Navy Pier redevelopment. About 25 Atlas doors and 18 counter shutters were installed by House of Doors in this massive renovation that included improvements to nearly every aspect of the 3,300-foot-long-Pier.

Call 800-959-9559

Atlas Door Corporation

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OPENINGS, 40 West Howard,
Pontiac, MI 48342
1-800-852-6660

Openings

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Hoehst Celanese Corp.

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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

(800) 621-9419

Rinnai America

Circle 92 on Inquiry card



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.

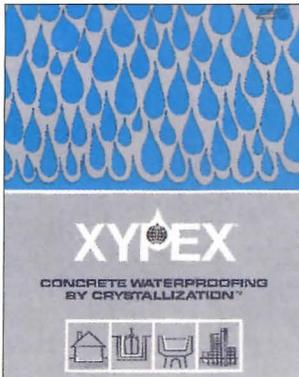
Dowcraft Corporation

Circle 89 on Inquiry card

Manufacturers' Spotlight

To Advertise: Call 1-800-544-7929
Fax: 212-512-2074

Concrete Waterproofing by Crystallization

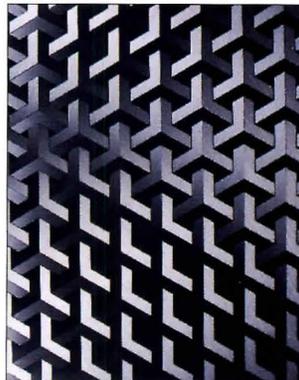


Applied as a slurry coating, Xypex is a chemical treatment that waterproofs by penetrating the concrete with a crystalline formation that 'plugs' the pores of the structure preventing water seepage. Xypex is ideal for use on the 'inside' of wet underground structures.

Xypex Chemical Co.

Circle 93 on Inquiry card

Sheet Metal Decoration



INTRODUCING THE NEW ALPHA COLLECTION FOR 1995. 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

Circle 94 on Inquiry card

Decorative, Thin-Film Intumescent Fireproofing



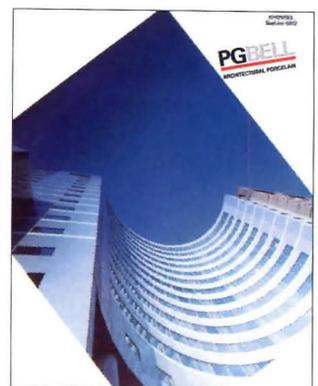
Now Certified for beams and columns for ratings up to 2 hours! A/D Firefilm permits the designer to use the appearance of exposed steel with the steel fully protected from fire. It is applied as a thin-film coating 0.4 to 3 mm (0.02 to 0.12 in.) thick. During a fire A/D Firefilm expands to form a meringue-like layer up to 100 mm thick, which insulates the steel from the fire. The topcoat is available in a wide choice of colours.

A/D Fire Protection Systems, Inc.
(416) 292-2361
1-800-263-4087

A/D Fire Protection Systems, Inc.

Circle 95 on Inquiry card

PG BELL

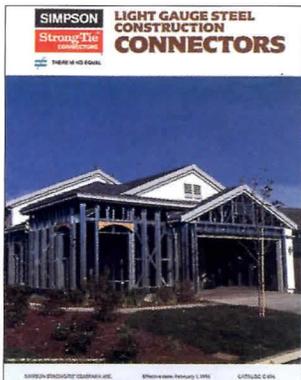


Porcelain Enamel panels offer designers a solution that has an almost unlimited choice of color; a permanence that will not fade when attacked by the weather, or be marred by vandals. PG Bell is North America largest manufacturer of heavy gauge porcelain enamel panels, supplying both wall systems and signage to the architectural market. We offer design assistance, engineering, manufactured panels, and installation services. Our markets are not limited to North America - but are worldwide

PG Bell

Circle 96 on Inquiry card

Strong-Tie® Light Gauge Steel Connectors



These framing connectors have been developed and load-tested using screw fasteners to obtain actual load values. This 1996 edition includes updated specifications, load charts, and application drawings -- plus information on holdown anchorage design. Professional framers find these connectors install quickly and easily

For a copy of the
1996 catalog (C-96S), write
Simpson Strong-Tie Company
P.O. Box 10789,
Pleasanton, CA 94588

Simpson Strong-Tie

Circle 97 on Inquiry card

Wood Windows and Doors



For 75 years, Zeluck has served both architects and custom builders with architectural wood windows and doors unparalleled for flexibility, quality and service. Zeluck offers a wide selection of glass and hardware, and timber from responsibly managed forests. Our triple hungs, European casements, tilt & turns, copper clad, bent units, bi-folding doors, lift-sliding doors and French doors are but a portion of our product line. Whether a custom home, hotel, institution or historical project, we can make your fantasy a reality.

For a free catalog, call
800-233-0101 • 718-251-8060

Zeluck

Circle 98 on Inquiry card

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

Circle 99 on Inquiry card

Duraflake FR fire-rated particleboard



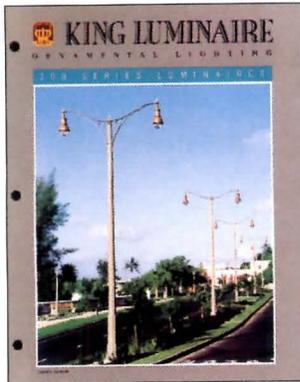
Duraflake FR provides Class A fire protection in wall systems, store fixtures, furniture and case goods. It has a UL flame spread rating of 20 and a smoke developed rating of 25. Its smoothness, machinability and uniformity make it an ideal substrate. It even resists warping and won't leach chemicals.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

Duraflake

Circle 100 on Inquiry card

Manufacturers' Spotlight

Fixtures & Poles



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.

Circle 101 on Inquiry card

The Right Combination of Efficiency and Aesthetics

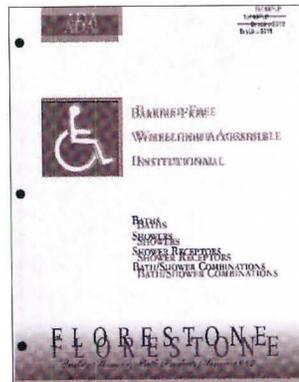


Custom designed **VISION CONTROL** consists of pivoting blinds, manually operated or motorized, **HERMETICALLY** sealed between glass of various shapes and types. **Dust-free, CORD-FREE** and **MAINTENANCE-FREE**. Provides privacy, control of sound, light and energy. Ideally suited for interior partitions in offices, conference rooms, courthouses. Can be installed in vertical and sloped applications, interior or exterior, in doors too.

UNICEL

Circle 102 on Inquiry card

Barrier-Free Products Catalog

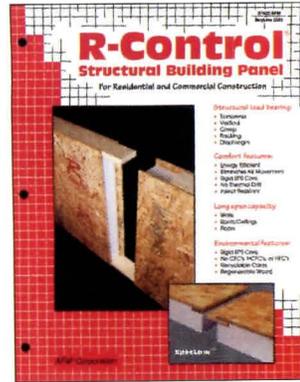


New Florestone brochure describes ADA compliant, barrier-free, wheelchair accessible and institutional showers, shower/bath combinations, and shower receptors. Drawings and listing of Building Codes and Testing Standards, as well as a section on the codes is included. Call (800) 446-8827.

Florestone

Circle 103 on Inquiry card

R-Control® Structural Building Panels

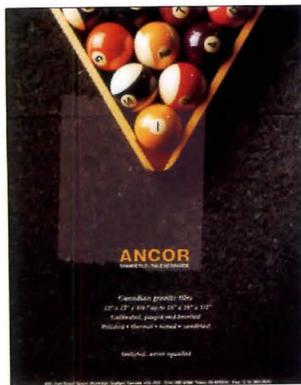


R-Control® Structural Building Panels provide superior insulation for walls and roofs in residential and commercial applications. EPS insulation is adhesively welded between stranded lumber facings, creating a panel that won't warp. R-Control has passed structural and fire tests as prescribed by national building code authorities. AFM's EPS contains no CFC's, HCFC's, or HFC's. R-Control Panels are manufactured across the nation.

AFM Corp.

Circle 104 on Inquiry card

Anchor Granite Tile



Anchor produces over fifty No. American and imported granites in a full range of colors and finishes for residential, commercial and institutional use. Standard format is 12 x 12 x 3/8"; other sizes up to 18 x 18 x 1/2" available. Honed finish tile is particularly suitable for high traffic commercial areas. 435 Port Royal West, Montreal, Quebec, H3L2C3, Canada Ph# (514) 385-9366. Fax# (514) 382-3533.

Anchor Granite

Circle 105 on Inquiry card

Rubber and Vinyl Stair and Floor Systems



Choose the best safety application for your stairs and floors. Recent government safety regulations have brought many of our products to the forefront such as fire safety, grit strip, visually impaired and glo strip stair systems. Matching entry flooring including disco, low disc, square, diamond, fluff cord and traffic tiles are displayed with related accessories.

To request copies, contact
Bob Segers
Musson Rubber Co.
P.O. Box 7038, Akron, OH 44306
1-800-321-2381
Fax: 1-330-773-3254

Musson Rubber Co.

Circle 106 on Inquiry card

1996 Western Woods Use Book



Through October 1, 1996, buy the 1996 Western Woods Use Book for just \$55. It's compatible with all model building codes and comes with software to aid in design of columns and beam tables and comes in a handy binder that makes future updates easy.

Western Wood Product Assoc.

Circle 107 on Inquiry card

"Rugged Indoor/Outdoor Intercom"



ADCO Intercoms give CLEAR voice communication despite outside interference in noisy work area. No bleed or popping/crackling noises. Easily installed. Capabilities include: splicing into existing systems, selective switching systems and much more. **TAILORED TO YOUR SITE'S NEEDS.** Works in temps ranging from MINUS 50 degrees F. to PLUS 150 degrees F. Pick-up is extremely sensitive. **ATKINSON DYNAMICS, 405 ECCLES AVE., SOUTH SAN FRANCISCO, CA 94080-1964. TELE: 415/583-9845, FAX: 415/876-0111**

Atkinson Dynamics

Circle 108 on Inquiry card

Manufacturer's Spotlight

Mount for LC Projectors

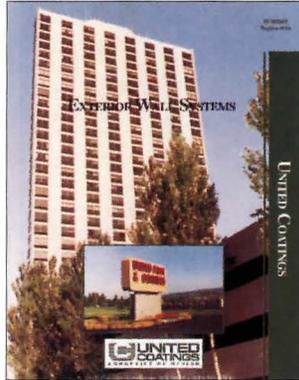


Designed to accommodate LC projectors weighing up to 75 lbs. the new Peerless PJRL30 Projector Mount is adjustable in height (5 5/8" - 9 3/8") and width (10" - 25 3/4"). It features 0° to 10° forward and backward tilt, heavy-gauge steel construction, rubber-lined clamping mechanisms at the four corners, and full 360° rotation when used with the optional extension column. Available in gray or black, the PJRL30, may be mounted directly to the ceiling.

Peerless Industries

Circle 109 on Inquiry card

Exterior Wall Coating Systems

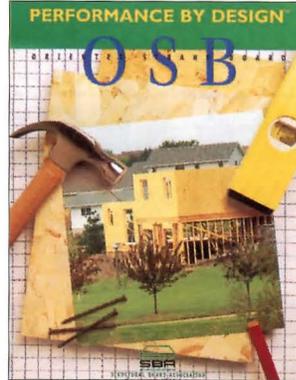


United Coatings, manufacturing quality finishes for over 50 years, offers 3 different exterior wall systems. Canyon Tone Stain provides damp-proofing and color uniformity without altering the surface texture. Aquathon waterproofs with an elastomeric membrane which bridges hairline cracks, and Uni-Tex incorporates the ultimate in EIFS technology in providing a weatherproof textured finish. **United Coatings ... Longevity By Design.**

United Coatings

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OSB Performance By Design



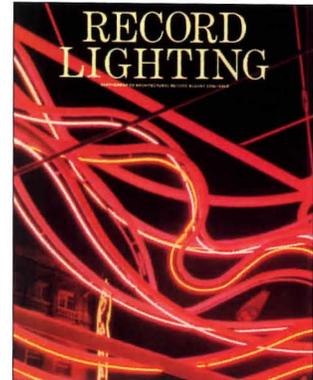
Virtually every new home built today incorporates Oriented Strand Board (OSB), the fastest growing structural panel. OSB affords a greater range of uses and flexibility because it's *engineered* to perform. Learn about OSB through SpecRite, the Structural Board Association's new software program for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

call (416)730-9090 or fax
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Structural Board

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Back Issues of Record Lighting



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

Record Lighting

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Here are answers to some commonly asked questions:

Q: Will ARCHITECTURAL RECORD become the publication for members of the American Institute of Architects?

A: Beginning with the January 1997 issue, AIA members will receive a subscription to *Architectural Record* as part of their member benefits. *Architectural Record* will continue to sell and serve subscriptions to architects and other professionals who are not members of the AIA.

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Q: Will the AIA have editorial control of ARCHITECTURAL RECORD?

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- ARCHITECTURAL DESIGN (*Computer Applications*)
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The successful candidate must have a PhD in the field of Architecture, plus teaching experience in a qualified architectural institution for a minimum of 5 years.

Application forms and additional information may be obtained from:

Embassy of the State of Kuwait
Kuwait University Office
3500 International Drive, NW
Washington, DC 20008
Tel: 202-363-8055

Completed applications and copies of Diplomas and Transcripts of all degrees obtained must be forwarded to:

Office of the Dean
College of Engineering and Petroleum
Kuwait University
P.O. Box 5969, Safat 13060 - Kuwait
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Associate Architect (Intern) - Assist in planning, designing and producing plans for commercial, industrial, and governmental building projects, under the direct supervision of a licensed architect. Must possess strong graphics / artistic rendering skills for highly quality visual productions in a variety of mediums such as acrylics, watercolors and markers. Must be able to produce documents using the metric system with the ability to instruct others in the same. Requires Bach. in Architecture or its foreign educational equiv. & 3 yrs exp. as an intern or Architect. Related experience must include minimum 2 years experience designing concrete or masonry structures, and at least one year experience developing drawings using metric system (may be concurrent). Minimum 1 year university course each in Urban Planning, Industrial Building design, Historic Preservation, Fine Arts courses in watercolors or other painting techniques, and perspective drawing. \$29,120/yr. 40hr/wk. 8a-5p. Send resumes to: 7310 Woodward Avenue, Room 415, Detroit, MI 48202, Ref # 50096. Employer paid ad.

Urban designer project manager. Manage and participate in the design of towns, villages, neighborhoods and community revitalization projects based on the principles of traditional urban planning. Prepare and organize intense design sessions for specific projects in urban planning (charrettes) which include teams of designers, consultant professionals (engineers, marketing and retail experts, historians, ecologists), as well as interested citizens and municipal officials. Coordinate the communication with clients (private and city officials) during the preparation period of the charrette, during the charrette, and the post-charrette period. Deal with the urban projects on their macro level of neighborhood structure, traffic and pedestrian circulation, greenway and open space network, as well as on the micro level of specific design of street sections, parking, pedestrian promenades, civil spaces (squares, plazas, parks) mixed use developments, commercial cores, etc. Participate in the design and drafting of the Master plans and the regulating plans for the projects, write verbal descriptions of the projects, produce final data, calculations and comparisons for the clients. Prepare and edit the Urban and Architectural regulations (codes) for the new towns and neighborhoods, as well as the overlaying documents of existing zoning codes and urban recommendation for revitalization projects. Deal with enhancing and editing of existing historic preservation ordinances. Prepare final records and documentation of urban projects. Assist the clients in the permitting process of the projects. Coordinate and review the construction documents (engineering, landscape & architectural) of developments under construction, 40 hpw; 9-5, M-F; \$17,95/hr. Requires: Masters in suburb and town design or bachelors in architecture with 1 yr. exp. in job offered. Resume to Job Service of FL, RM 47, 701 SW 27 AV, Miami, FL 33515-3014, Job Order #FL-1422680.

POSITIONS VACANT

Park Landscape architect for cent. OH landscape architecture firm. Duties to be performed: plan & design development of landscape for recreational & entertainment projects such as theme parks; confer with clients; confer with domestic & foreign government officials, architects, engineers & construction personnel; obtain & analyze data on site conditions; using metric system, prepare plans & drawings for projects structures, transportation and utilities as they relate to landscape development; develop cost estimates; coordinate landscape development construction activities; and illus-

trate design proposals with three dimensional graphic renderings for communication with the client; government officials & other consultants. Requirements include Bachelor's degree in landscape architecture; 1 yr exp in landscape design of recreational & entertainment projects; 1 yr exp in Chinese landscape Architectural Design Standards; must be able to read, write & speak Mandarin Chinese; 1 college level course in computer-aided design. Exp may have been gained in the job described or in another job or jobs. 40 hrs/wk, 8:30 am-5:00 pm, Mon-Fri, \$36,300/yr. Send 2 resumes & cover letters (no calls) to ES Sp Prgms, Ref# 1642, Ohio Bureau of Employment Services, PO Box 1618, Columbus, Ohio 43216.

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Dowcraft Movable Walls for quick and quiet privacy: Install overnight or over the weekend. Install over the carpet and under the ceiling tile.

No muss or fuss. No dirt or damage. No disrupted routines. Dowcraft floor-to-ceiling walls can be moved (and depreciated) like any other piece of office furniture. They cost less than drywall, and eliminate the environmental disposal problems of drywall.

Let's talk about your next project. Our 1995 catalog is yours for the asking.



Dowcraft eliminates the environmental recycling problems of drywall.

Dowcraft Movable vs Permanent Drywall

Installed	\$100./ft Academic wall	\$ 40./ft drywall major city
Move #1	\$ 7.50 remove	\$ 30. tear out and trash
	\$ 15.00 move & install	\$ 40. rebuild & repair
	\$122.50 total Move #1	\$110. total Move #1
Move #2	\$ 22.50 move & install	\$ 70. tear out-trash-rebuild
	\$144.50 cost after Move #2	\$180. cost after Move #2
Move #3	\$ 22.50 move & install	\$ 70. tear out-trash-rebuild
	\$166.50 paid for itself	\$ 250. costs 1.5 times more

Circle 65 on inquiry card

DOWCRAFT

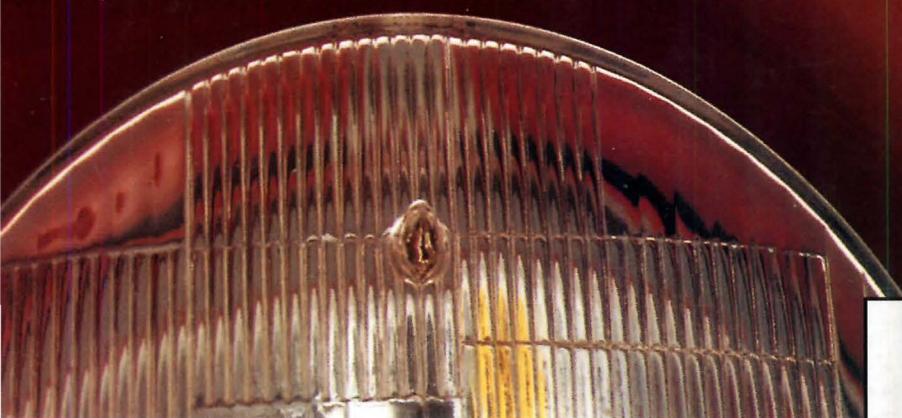
MOVABLE WALLS

Dowcraft Corporation

65 South Dow Street
Falconer, NY 14733
Phone 1-800-990-9255
Fax 716-665-2743

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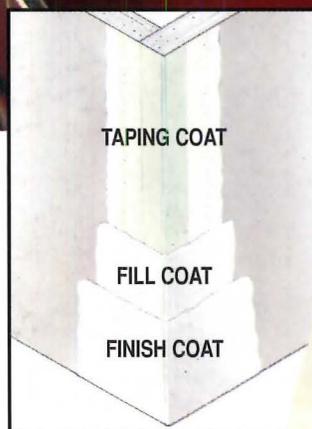
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