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Armstrong

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Letters

It was interesting to read your article "Indigenous high-tech" about the university hospital in Pakistan by Thomas Payette and Mozhan Khadem (Teheran-born), where "older traditional building vocabularies have been transformed for contemporary use" [ARCHITECTURAL RECORD, May 1987, pages 136-149].

The continuous spaces that "surround" the observer rather than an "object building," the transitional spaces and entry portals, the courtyards, the surface treatments and cross ventilation are all excellent indigenous ideas. But it seems that the architects were so engaged with these ideas and so insistent on using them at any cost that they neglected many essential points.

Planning and movement: At the end of your article, you ask, "Does the horizontal organization of services along the 1/4-mile-long corridor, taking the place of more typical vertical configurations connected by elevator shafts, work efficiently?" I think the architects' excuse of "power shortages and difficulties of maintenance" is not enough excuse. If the Aga Khan University Hospital can't afford to maintain its elevators, how could it then maintain its huge mechanical services and the sophisticated operating rooms needed for a modern hospital?

Generally, vertical planning in hospital design is much more feasible, practical, and economical, and a personnel time-saver. For these reasons, I don't agree with you that this hospital could serve as a model for medical facilities in the Third World, where building costs are primary factors.

Appearance: This medical complex, with its heavy and bulky masses of hot-colored red brick and monotonous treatment of elevations, has more the appearance of an industrial complex. Even such neutralizing elements as glass are not seen. A more calming and cooler color, even white, would have been more suitable for the worried patients and their worried, waiting relatives.

Roof slopes: Giant sloped roofs (inclined to the inside rather than the outside), lattices in front of windows, and sloped windowsills are places for gathering *dust* in areas of dust abundance, as is the case in most of the Middle East.

Cross ventilation: The sloped roofs are an imitation of the traditional wind-catchers, which are supposed to provide cross ventilation. They are impractical, however, because, along with the wind, a great amount of dust will enter a medical center, where clean and hygienic air is much needed.

Entrances: The main entrance, with its imitation of a hanging red carpet, recalls a carpet museum more than a hospital's main entrance. It is too flat, repulsing, and unwelcoming, with its pierced door and its hot reddish-orange colors, and is thus contrary to the traditional recessed, shadowed entrances that capture and welcome with cool (blue and green) colors.

The other entrance (shown on the cover) is so huge, heavy, frightening, and fire-colored that I doubt it could give any comfort to a patient entering it, who would even feel its burden on his shoulder.

Interiors: The interiors in general are a salad mixture of eclectic decorations gathered from everywhere (from Spain to India), resulting in a composition of unharmonious interiors (the auditorium, for example). The patients' waiting room (page 145) is an uncomfortable huge box with an ill-proportioned roof-height compared to its width, with nerve-agitating reddish-orange colors (again), rather than the cool and calming colors and space needed for a nervous waiting patient. It seems that the interiors fit a theological school more than a medical one.

Selim A. Nazerian
Teheran, Iran

The small illustration of the proposed Broadway high-rise by Fox & Fowle [ARCHITECTURAL RECORD, February 1987, page 59] gives me encouragement that Manhattan might retain some of its real qualities.

As compared to the monolithic PoMo klunkers proposed for Times Square by Johnson-Burgee, this building seems (in rendering form, at least) to have some of the strength and impressive setback massing of notable high-rises of pre-World War II days. One can imagine a swirling black chalk rendering by Hugh Ferriss. The street level, aside from its commendable cantilever over the Broadway Theater, has the kind of imposing main entrance that distinguished many of those early commercial buildings. The setback elements sliding across the side elevations relate the building to Rockefeller Center a few blocks east.

This kind of building is usually tossed aside by architectural critics as just another commercial potboiler. I hope you keep track of this one and let us know how it turns out in its midtown Manhattan context.

Jim Burns
Take Part Community Planning Consultant
San Francisco

Corrections

The Greycoat Group PLC was the developer of Embankment Place in London, which was designed by the Terry Farrell Partnership and engineered by Ove Arup & Partners [ARCHITECTURAL RECORD, September 1987, pages 132-133].

The photograph of the Centre Georges Pompidou [RECORD, September 1987, page 123] should have been credited to Richard Einzig.

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The Codex World Headquarters Building, Canton, Massachusetts
Koetter, Kim and Associates, Architect
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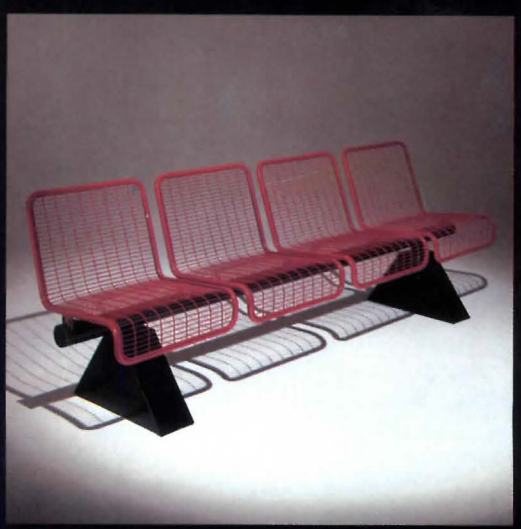

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The apprentice system: Should it make a comeback?

The National Institute for Architectural Education held a workshop/conference in New York City this fall to further its ongoing purpose—improving the means and methodologies by which both the profession and architectural schools perform their shared purpose of educating architects-to-be. Among those participating were practitioners, deans, teachers, researchers, and several journalists, including myself. All the principal speakers but one discussed teaching and learning strategies conceived as workable within the school and practice frameworks in place today. John F. Hartray, Jr., the exception, invited us to reflect upon the merits of the long abandoned apprentice system, and made a strong case for bringing it back.

Introducing his theme with a broad historical grasp that embraced architectural education from antiquity to the present, Hartray noted that prior to the 15th century, design and construction were considered a single activity learned by pupils working on actual building projects with their builder/teachers. Although little is known of how these men lived and worked, this on-the-job training in architectural design was conducted, in the words of Hartray, "... within castes of slaves, monastic orders, guilds, families and architectural offices." He went on to understate: "We must also acknowledge that there are some excellent buildings to attest to the effectiveness of the system." Formal schools of architecture emerged in the Renaissance, concurrent with the desire to impart correct usage of classical styles, but elements of the apprentice system persisted in these new academies.

In the United States, Hartray reminded us, the apprenticeship system prevailed until the early 19th century. It was gradually nudged out by the Neoclassic revival, a depression, and World War I, an aggregation of forces that caused the teaching of architecture to be reinvented within the university system. "This experiment does not seem to have been a complete success," said Hartray. "It would seem prudent to keep other educational options open." And particularly the apprenticeship option. Hartray next gave us a stirring roll call of "fearless youngsters" who began their careers by directly participating in the making of buildings: "Brunelleschi, Michelangelo, Palladio, Paxton, Sullivan, Burnham, White, Wright, Mies, Fuller, and a few of my personal friends." For Frank Lloyd Wright, once apprenticed to Sullivan, "The Charnley House can be thought of as a sophomore project." On Stanford White, once apprenticed to Richardson: "This messiah of Old World grandeur had been a poor boy with no formal education beyond high school."

For the apprenticeship system to have more than the lure of nostalgic remembrance, however, there must be a good deal wrong with today's architectural schools. Just ask Hartray. On design theory: "... [salvaged] from the dumpster behind the philosophy department. In the '50s our professional schools provided a life-support system for the Zeitgeist. Now we are rendering the same service for semiotics and the obscure backwaters of comparative literature." On the quality of studio critics: "... requiring a passive response to six or seven years of often inane criticism should produce a subculture which is largely devoid of the qualities which made Daniel Burnham such a useful citizen." On usefulness: "University faculties are also short of the carpenters, masons, and plumbers upon whom architects must rely to answer simple questions." On employment and compensation for young aspirants: "Young people who have not attended a university cannot compete for jobs in offices with the large number of available graduates. These graduates have each invested up to $70,000 to qualify for entry-level drafting jobs. We might ask ourselves if this will not eventually lead to a profession dominated by the downwardly mobile offspring of the upper middle class."

Is there hope that the schools will improve? Unfortunately, they may not have to. Since, with few exceptions, no one can take the professional licensing exam today without an architectural degree, the schools have become the gatekeepers to the profession, a monopoly that Hartray believes bodes ill for constructive change. He doesn't expect or want the schools to close, but insists that change must come. And he wants the vital minority that can't afford university schooling to have a chance to become architects, through the apprenticeship option. Tough talk for the NIAE, but Hartray was good to hear, because he's right.

Mildred F. Schmertz.

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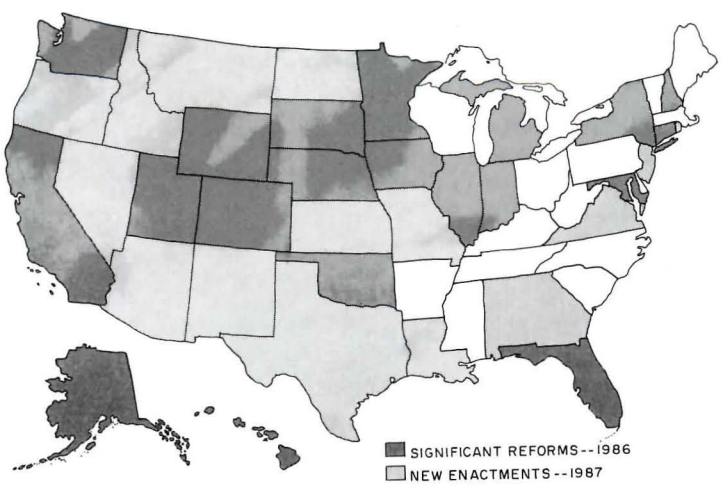
Tort reform scores significant victories

What seemed a few years ago to be far-off solutions to skyrocketing liability litigation have now become law. The American Tort Reform Association reports that many states (map) have already reformed their laws to impede the wholesale onslaught.

Among the reforms that affect architects and engineers in the more populous states:

- California has abolished joint-and-several liability when the damage was not loss of money. (Under joint-and-several, parties found only a small percent at fault may be held responsible for the entire liability because other defendants cannot pay.)
- Florida has abolished joint-and-several for most awards of more than $25,000, has reduced awards for bodily injury by the amount of compensation from other sources, has limited punitive damages to three times real damages, and gives 60 percent of any award not to the plaintiff but to the state.
- Georgia has limited joint-and-several and has put a $250,000 cap on punitive damages.
- Illinois has abolished joint-and-several if the defendant is found less than 25 percent at fault, has reduced bodily-injury awards by the amount of other compensation (within limits), has stopped plaintiffs from pleading for punitive damages in their initial suits, and has provided for the assessment of fees for frivolous suits.
- Michigan has limited joint-and-several except in cases in which the plaintiff is fault-free, has reduced bodily-injury awards by the amount of other compensation, and has decreed the payment of all attorneys' fees by the plaintiff in cases found to be frivolous.
- Minnesota has placed a $400,000 cap on awards for emotional distress and embarrassment and has restricted claims for punitive damages from initial complaints.
- New Jersey has required that malice or wanton and willful disregard must be shown to claim punitive damages.
- New York has limited the amount of joint-and-several to noneconomic losses in most cases in which the defendant is less than 50 percent at fault, has reduced the amounts for bodily injury by other payments, and awards attorneys' fees in frivolous cases.
- Texas has abolished joint-and-several except in pollution cases, has capped punitive awards by four times actual damages or $200,000 (and then only when the defendant's conduct is found seriously remiss) and allows for sanctions against attorneys in frivolous cases.
- Virginia has allowed sanctions against plaintiffs in frivolous suits. *Charles K. Hoyt*



New financing for preservation

While the Tax Reform Law of 1986 made the preservation and restoration of buildings much more difficult, Susan Baldwin, vice president of Landmark Properties, which specializes in the development of historic properties, urges the exploration of creative financing—for instance, the combination of Urban Development Action Grants with preservation tax credits or, for industrial buildings, partnerships with corporations that can use investment tax credits.

Advocates of preservation are cautiously optimistic that recently enacted tax-credit restrictions can be liberalized and they urge activists to become involved politically. "Write and lobby your congressmen," urges Baldwin. She is encouraged by the support expressed for preservation by Representative Daniel Rostenkowski (photo above), chairman of the House Ways and Means Committee. He has expressed interest in new tax-credit proposals, but he needs the support of other lawmakers.

A handbook published by the Department of the Interior, *Tax Incentives For Historic Buildings*, explains in detail how rehabilitation of historic buildings has been affected by the 1986 tax provisions, the preservation tax credits that are still available, and how to get them. The investment tax credit for low-income housing is discussed, and rehabilitations involving governments and tax-exempt entities are explored. *Jeff Trewhitt, World News, Chicago*

Engineers expand peer-review programs

The process by which comparable professional-service firms exchange advice on the expeditiousness of their operations was pioneered for most engineers by the American Consulting Engineers Council. The ACEC now reports a collaboration with the American Society of Civil Engineers to form a new program for specific design projects. Meanwhile, the Coalition of American Structural Engineers is forming a program aimed specifically at those who engineer buildings. Contact the ACEC, 1015 Fifteenth St., N. W., Washington, D. C. 20005 (202/347-7474).

Yesterday's landmark becomes today's obstruction

Chicago and the Landmarks Preservation Council of Illinois have locked horns over the city's willingness to raze the McCarthy Building, a designated local landmark. The 114-year-old building is located in a redevelopment district where the developers plan two new 900,000-square-foot office towers and 300,000 square feet of shops. Originally, they had planned to relocate the facade, designated by the Chicago Landmarks Commission, but then they and city officials said the technical feasibility could not be proven. *Jeff Trewhitt, World News, Chicago*

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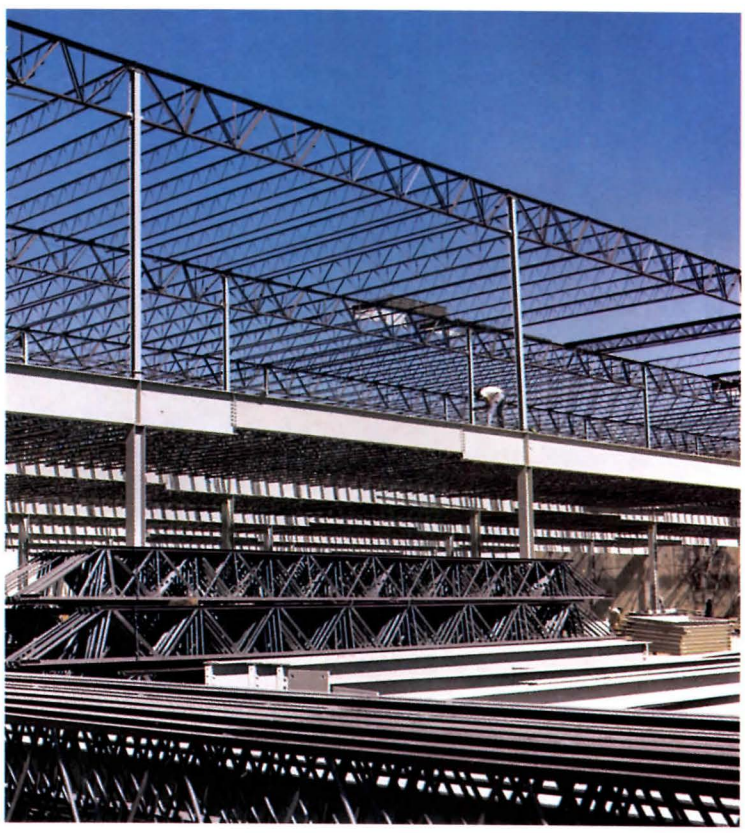

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Construction economy outlook: Down we go but, with luck, not too far

As forecasts go, this one bears a higher-than-usual risk factor; more than anything else, interest rates will make the difference between a shallow and a steep decline of construction activity in 1988

By George A. Christie

Broad measures of population change no longer excite the imagination of anyone involved with the construction/building materials industry. Quite the reverse, they explain why "growth" is no longer the appropriate word for the construction sector.

Take total population, for example. Back in the mid-'60s, the U. S. population was expanding at the robust rate of 1.2 percent per year. As populations of mature societies go, that was a pretty good clip. But by the mid-'70s growth had slowed to 1.0 percent, and over the next 10 years, to its current 0.9 percent. By the mid-'90s, growth is projected to diminish to 0.7 percent.

Try another measure—one that's more directly related to construction demand. In the mid-'60s, the rate of household formation (newly formed households, whether by marriage, some other arrangement, or just persons living alone) was an unimpressive 1.1 million per year. By the mid-'70s, when the baby boomers were reaching their twenties, household formation hit its all-time high of 1.6 million. (It was no coincidence that housing starts were also at a peak.) By the mid-'80s, household formation had slowed to 1.4 million annually, and in another 10 years will be down to 1.2 million—almost where we were back in the 1960s.

Migration is another source of demand for construction. If the 1960s can be considered a period of more or less normal movement of the population along a Northeast-to-Southwest axis, the 1970s—remembered by the label "Sunbelt Shift"—were anything but normal. Responding to the above-average population influx, building activity was never stronger in the Southwest than in the late '70s and early '80s. But it's all over now that migration has settled back into a stable pattern once again.

All of these broad demographic measures are saying the same thing: As a basic source of demand for construction, population dynamics are not what they used to be. But wait. . . those baby boomers aren't finished yet.

Deep within the total of our 250-million population is where some of the most interesting changes are taking place. More important for the construction market than the 0.9 percent overall growth are the specific age groups which are responsible for most of it. Here's how it looks between now and 1992 (tentatively the next peak of building activity):

- *Although the total population will be 4 percent larger by 1992, 4 percent less of it will be between the ages of 55 and 65.*
- *Two groups which will be growing somewhat faster than average are the Under 15s (the birth rate picked up in the late 1970s) and the 65 and Overs (the longevity angle).*
- *And where are those kids born in the '50s and '60s now? Swelling the ranks of the 30-to-50 age group, which, not surprisingly, will be the fastest growing category of any during the next 5 years: up 14 percent!*
- *Just as important to construction-market planning for the '90s is awareness of the baby bust—the young adults, now age 15 to 30. By 1992, there'll be 9 percent fewer of them.*

Relating these plusses and minuses to specific building types isn't very hard. Above-average growth at the ends of the population spectrum translates into needs for elementary schools, retirement housing, and health-care facilities. Shrinkage of the young-adult group could mean reduced demand for apartments, offices, and higher-education buildings. But unless social customs have changed greatly, early middle age is still the age of acquisition. Single-family houses and condos, retail buildings, and recreational facilities are where the demographics of the early 1990s appear to be taking us.

Getting older, not better, characterizes construction and the economy

Superannuation has become an issue in the near-term outlook both for the construction sector and for the economy as a whole. The expansion of the construction market began as long ago as the third quarter of 1982; the economy's recovery dates from the first quarter of 1983. And now—some four-and-a-half years later—the continuity of both these aging expansions is getting more tenuous with each passing quarter.

Conventional widsom (the consensus forecast of the economics profession as expressed in October's annual survey of the National Association of Business Economists) is that economic policy will yield to political considerations in 1988, deferring the risk of recession until 1989. But even if the general-business expansion can be stretched out for another year, the construction sector, which often leads general-business activity, can't hold out that long.

As a point of departure for this *1988 Dodge/Sweet's Outlook*, it is worth considering how the construction market is *supposed* to behave when the economy approaches an upper turning point. The first thing to recognize is that the construction sector does not react monolithically. Housing often leads the general-business cycle into decline, and for good reason. It is notoriously credit-sensitive. As the economy approaches its peak, the many demands on the credit market drive interest rates up, and housing usually gets crowded out. Commercial and industrial building, on the other hand, is supposed to behave like other forms of business-capital spending, which is to lag the movements of general business activity. And finally, public-works construction, which is traditionally used as an instrument of countercyclical support of the sagging economy (remember the accelerated public-works program of the mid-'70s), may well be rising while residential and commercial building are declining.

With these textbook stereotypes of the construction sector's proper role in the unfolding of the business cycle as a yardstick, how typically is the building market behaving this time around? Instead of following the time-honored script, construction activity is perversely doing its act backwards. Commercial building, which should be at its best late in the cycle, has in fact been leading the construction sector into decline since early in 1986. Public-works construction has been unusually erratic for the past year as Congress and the Administration wrangled over major legislation. Meanwhile, single-family housing, traditionally the first building market to crack as the cyclical clock runs out, instead has been one of the key sources of support through 1987.

This is anything but typical behavior, and some special situations are responsible for much of the current role reversal among the major construction categories. The uncharacteristic weakness of commercial building is, of course, the inevitable reaction to a five-year binge of overdevelopment that began with ERTA's accelerated depreciation and ended with tax reform. Public-works construction is temporarily above

C R Y S T A L I N E

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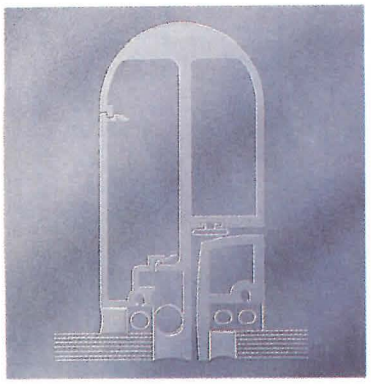

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1988 National Estimates

Dodge Construction Potentials

Nonresidential Building	1987 Preliminary	1988 Forecast	Percent Change 1988/87
Floor Area (millions of square feet)			
Office Buildings	265	225	−15
Stores and Other Commercial	565	505	−11
Manufacturing Buildings	145	145	—
Total Commercial and Mfg.	975	875	−10
Educational	120	117	− 2
Hospital and Health	76	72	− 5
Other Nonresidential Buildings	144	141	− 2
Total Institutional and Other	340	330	− 3
Total Nonresidential Building	1,315	1,205	− 8
Contract Value (millions of $)			
Office Buildings	$21,800	$19,125	−12
Stores and Other Commercial	23,775	22,125	− 7
Manufacturing Buildings	7,075	7,450	+ 5
Total Commercial and Mfg.	$52,650	$48,700	− 8
Educational	$11,200	$11,500	+ 3
Hospital and Health	8,300	8,275	—
Other Nonresidential Buildings	12,800	12,775	—
Total Institutional and Other	$32,300	$32,550	+ 1
Total Nonresidential Building	$84,950	$81,250	− 4
Residential Building			
Dwelling Units (thousands of units*)			
One Family Houses	1,015	975	− 4
Multifamily Housing	585	550	− 6
(*F.W. Dodge basis)			
Total Housekeeping Residential	1,600	1,525	− 5
Floor Area (millions of square feet)			
One Family Houses	1,674	1,609	− 4
Multifamily Housing	600	561	− 6
Nonhousekeeping Residential	86	80	− 7
Total Residential Building	2,360	2,250	− 5
Contract Value (millions of $)			
One Family Houses	$ 85,050	$ 83,775	− 1
Multifamily Housing	27,275	26,200	− 4
Nonhousekeeping Residential	6,750	6,475	− 4
Total Residential Building	$119,075	$116,450	− 2
Nonbuilding Construction			
Contract Value (millions of $)			
Transportation Construction	$ 26,400	$ 25,800	− 2
Environmental Construction	15,000	15,500	+ 3
Total Public Works	$ 41,400	$ 41,300	—
Utilities	$ 3,000	$ 3,000	—
Total Nonbuilding Construction	$ 44,400	$ 44,300	—
All Construction			
Contract Value (millions of $)			
Total Construction	$248,425	$242,000	− 3
Dodge Index (1982 = 100)	158	154	

normal, as this market makes up for a six-month lapse of the federal highway program. And single-family housing has simply been responding (until recently) to the lowest mortgage rates available anytime in the 1980s.

There was a two-tier construction market in 1987

More about these special situations later. For the time being, they leave 1987 construction activity in a curious kind of partial or selective cyclical decline. While offices, apartments, and a few other strung-out building markets are making their adjustments to the reality of tax reform, some other categories are doing quite nicely. Enough of them were still leading last year's rate of contracting through 1987's third quarter to stabilize the total.

Selectivity is just as apparent in the geography of the 1987 building market. Because most of the surplus of new offices and apartments that were encouraged by accelerated depreciation is concentrated in the South and the West, these previously booming regions can now be found in the minus column. By contrast, the better-balanced Northeast and North Central regions are where the action is this year.

Until recently, it could be said that as long as you were not exclusively into offices or apartments, and not totally committed to the Southwest, you weren't in any real difficulty in 1987. You can't say that anymore. The reversal of interest rates since mid-1987 has changed things. By threatening to erode the market's remaining support, higher interest rates could turn what, up to now, has been a partial recession into a general decline.

Tighter credit may be the newest risk the construction sector faces in 1988, but isn't the only one. Renewed effort at deficit reduction could spell trouble for public-works programs. The correction of the overbuilt office and apartment markets is by no means completed.

On the other side of the ledger, election-year economics could stretch the economy's creaking expansion through 1988. The trade deficit may finally begin to narrow. So, too, will the budgetary deficit. And inflation will remain below 5 percent, even if not much below.

A brief evaluation of these environmental influences on the construction sector in 1988 precedes specific forecasts of the major building market.

Interest rates show their influence

Apart from a brief interruption in 1984, interest rates declined steadily from their 1981/82 peak through early 1987. More than anything else, the reversal of monetary policy, from extreme restraint to accommodation, made possible the long period of expansion for the credit-sensitive construction sector and for the economy at large. Another reversal of monetary policy in 1987, back to restraint, puts both of these expansions in jeopardy.

If the current tightening of credit is what it appears to be—a *temporary* departure from the central bank's basic position of monetary accommodation, and not a major policy shift to anti-inflationary restraint—the recent rise of interest rates could be transient and limited. The most credible explanation for tightening credit in 1987 has less to do with the strength of inflation at home than with the weakness of the dollar abroad.

With reasonably vigorous growth of the domestic economy in 1987, along with only moderate inflation, the fed has had the opportunity this year to modify its priorities in favor of international financial problems. Next year will not offer that luxury. The political realities of 1988 require giving top priority to domestic affairs which, in this instance, means coaxing a tired economy through yet another year of growth. Not only does the fed have the motivation to be more stimulative in 1988, but it has the justification as well. The fiscal drag of deficit reduction is, by itself, reason for some monetary relaxation. Good economics can sometimes be consistent with good politics.

If the dollar is dominating monetary policy in 1987, and domestic considerations will be foremost in 1988, what will be

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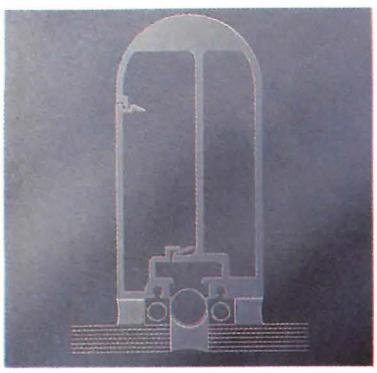

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1988 Regional Estimates

Dodge Construction Potentials

Northeast CT, ME, MA, NH, NJ, NY, PA, RI, VT	1987 Preliminary	1988 Forecast	Percent Change 1988/87
Contract Value (millions of dollars)			
Nonresidential Building			
Commercial and Manufacturing	$10,875	$10,525	− 3
Institutional and Other	5,725	5,850	+ 2
Total	$16,600	$16,375	− 1
Residential Building			
One Family Houses	$13,525	$14,375	+ 6
Multifamily Housing	5,950	5,550	− 7
Nonhousekeeping Residential	1,225	1,050	−14
Total	$20,700	$20,975	+ 1
Nonbuilding Construction			
Transportation	$ 5,175	$ 5,175	—
Environmental	3,000	2,975	− 1
Utilities	925	700	−24
Total	$ 9,100	$ 8,850	− 3
Total Construction	$46,400	$46,200	—

North Central IL, IN, IA, KS, MI, MN, MO, NE, ND, OH, SD, WI	1987 Preliminary	1988 Forecast	Percent Change 1988/87
Contract Value (millions of dollars)			
Nonresidential Building			
Commercial and Manufacturing	$12,100	$11,175	− 8
Institutional and Other	6,725	6,900	+ 3
Total	$18,825	$18,075	− 4
Residential Building			
One Family Houses	$16,125	$16,000	− 1
Multifamily Housing	5,250	4,700	−10
Nonhousekeeping Residential	1,325	1,200	− 9
Total	$22,700	$21,900	− 4
Nonbuilding Construction			
Transportation	$ 5,725	$ 5,700	—
Environmental	3,425	3,600	+ 5
Utilities	450	500	+11
Total	$ 9,600	$ 9,800	+ 2
Total Construction	$51,125	$49,775	− 3

influencing interest rates in 1989? By then, the risk of recession will be even greater. In 1989, the prospect of weak loan demand, in combination with continued monetary ease, should be pulling rates down.

Unless new international complications arise, the period of maximum stress for interest rates should not extend much beyond early 1988. For the near term, it is assumed that short-term rates will reach their peak in the first quarter of 1988. Mortgage rates will peak in the second quarter at just under 12 percent, and decline through the remainder of next year to 10 1/2 percent at year-end. By mid-1989, conventional fixed mortgages will again be below 10 percent—close to the rate prevailing in the first quarter of 1987.

And there are other influences

Most of the remaining external influences on the construction market in 1988 are familiar carryovers, although some are taking more favorable directions.

• *Deficit Reduction.* Despite false starts, the process of mandatory deficit reduction that began with the Gramm-Rudman Act is finally beginning to yield results. With the help of tax reform and some one-time spending cuts, the 1987 deficit will come in at about $160 billion, a major reduction from the record $221 billion reached in 1986.

New legislation has strengthened the budget-balancing law. By requiring automatic spending cuts (half from the military budget) if Congress and the Administration fail to agree on a budget that meets revised deficit targets, it establishes a tentative goal of another $23-billion reduction for fiscal year 1988. As always, however, revenue is the wild card in the budgetary game. An unrealistic revenue assumption can produce the *appearance* of deficit reduction; a tax increase (which can be rationalized by euphemisms such as "closing loopholes" and "user fees") may be necessary to make it happen.

Further progress in deficit reduction is a trade-off for the construction sector. It will hasten the return to single-digit interest rates, but is likely to restrict funding for public programs. Throughout the 1980s, budgetary restraint has had a mixed impact on the availability of federal construction money. Traditional reliance on earmarked user taxes has virtually insulated highway construction from all but temporary interruptions, but HUD's housing programs have been in steady decline since early in the decade. New housing legislation—the first in six years—already bears the Administration's label of "budget buster," and faces the inevitable veto treatment. Meanwhile, the recent passage of three major infrastructure bills has reinforced the higher federal priority given to public-works construction in the 1980s.

State and local governments have not only put through substantial tax increases in recent years, but have been taking advantage of falling municipal-bond rates. They are finally in a position to respond to the challenge of the "New Federalism," which demands greater local participation in publicly financed construction.

• *The trade gap.* Besides exerting upward pressure on interest rates as well as generally dampening the economy's growth, it bears selectively on the manufacturing sector. As imports displace domestic production, excess capacity lingers, depressing industrial construction. Even as the trade gap closes a bit in 1988, stimulus to industrial construction will not materialize until excess capacity is taken up—a process that could take several years.

• *Tax reform.* It changed the rules for commercial real-estate development in 1987 by eliminating the considerable advantages of accelerated depreciation and sheltered income. Actually, the 1987 tax act did little more than write an official conclusion to a five-year building boom, which the saturated marketplace recognized was over by 1986. Largely a regional problem, the need to absorb vast quantities of recently built offices and apartments throughout the Southwest will retard new construction there for the

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PROJECT REPORT

No. 101887

MBCI Ultra-Dek® Roof System Offers Maintenance Relief to San Marcos School

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The San Marcos Consolidated Independent School District, San Marcos, Texas wanted its new school to have a virtually maintenance free roof.

The architect chose an Ultra-Dek® standing seam roof system from MBCI.

According to John Fowler, Administrative Assistant for Special Services for the school district, San Marcos has unstable soil conditions which cause buildings to sink and rise. This factor, coupled with extreme temperature changes which cause expansion and contraction of roofs, creates cracking in built-up flat roofs.

This unique roof system is attached to a floating clip system which is attached to the structural. The clips allow the roof to expand and contract during extreme temperature fluctuations. This means the entire roof membranes stays intact with no cracking or separating where water seepage can cause problems.

"Our flat roofs require a lot of maintenance in time and expense, Fowler said. "That is why we wanted a gabled, sloped metal roof for this new school building. We did not want to spend any time and expense on it," he added.

William "Moe" Johnson, of the architectural firm Pfluger Associates, agreed. "We used metal to design this gable roof to provide a classic look. The school district received not only a beautiful building, but also a long-life structure that will last for many, many years."

The school, Lorenzo de Zavala Elementary has 67,500 square feet of covered area and 6,500 square feet of canopy and bus area. It is one of the 10 buildings in the school district of 5,700 students. According to Fowler, the school district has a little under one million square feet

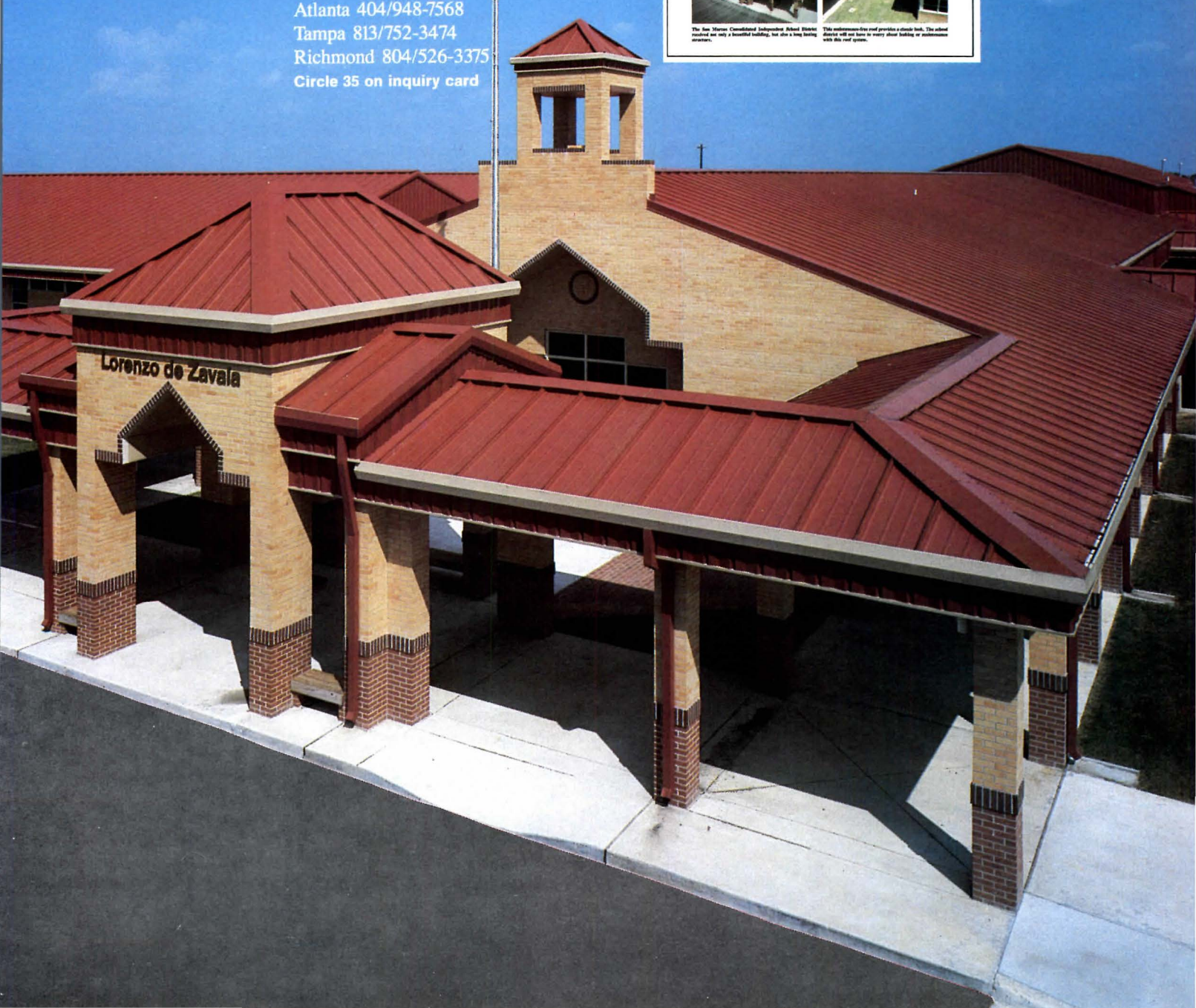
(continued on other side)

Project Facts

Project Name: Lorenzo de Zavala Elementary School, San Marcos Independent School District
Location: San Marcos, Texas
Roofing Contractor: DynaBuild Systems, San Antonio Texas
General Contractor: B.P.W. Construction Co., Temple, Texas
Designer: Pfluger Associates, Austin, Texas
MBCI Preformed Metal: Ultra-Dek® standing seam roof system; "A" Panel on fascia; and Action 1 for soffit.

The San Marcos Consolidated Independent School District resolved not only a beautiful building, but also a long lasting structure.

This maintenance-free roof provides a classic look. The school district will not have to worry about leaking or maintenance with this roof system.



1988 Regional Estimates

Dodge Construction Potentials

South AL, AR, DE, DC, FL, GA, KY, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV	1987 Preliminary	1988 Forecast	Percent Change 1988/87
Contract Value (millions of dollars)			
Nonresidential Building			
Commercial and Manufacturing	$17,225	$15,925	– 8
Institutional and Other	12,225	12,100	– 1
Total	$29,450	$28,025	– 5
Residential Building			
One Family Houses	$32,975	$31,225	– 5
Multifamily Housing	8,225	8,000	– 3
Nonhousekeeping Residential	2,300	2,300	—
Total	$43,500	$41,525	– 5
Nonbuilding Construction			
Transportation	$10,025	$ 9,675	– 3
Environmental	5,675	5,825	+ 3
Utilities	975	1,075	+10
Total	$16,675	$16,575	– 1
Total Construction	$89,625	$86,125	– 4

West AK, AZ, CA, CO, HI, ID, MT, NV, NM, OR, UT, WA, WY	1987 Preliminary	1988 Forecast	Percent Change 1988/87
Contract Value (millions of dollars)			
Nonresidential Building			
Commercial and Manufacturing	$12,450	$11,075	–11
Institutional and Other	7,625	7,700	+ 1
Total	$20,075	$18,775	– 6
Residential Building			
One Family Houses	$22,425	$22,175	– 1
Multifamily Housing	7,850	7,950	+ 1
Nonhousekeeping Residential	1,900	1,925	+ 1
Total	$32,175	$32,050	—
Nonbuilding Construction			
Transportation	$ 5,475	$ 5,250	– 4
Environmental	2,900	3,100	+ 7
Utilities	650	725	+12
Total	$ 9,025	$ 9,075	+ 1
Total Construction	$61,275	$59,900	– 2

balance of the decade.

• *Inflation.* It will be getting a low priority among the nation's economic problems for at least another year. Price pressures of about 4 percent—a little higher in consumer prices, a little lower as measured by the GNP deflator—offer the Federal Reserve enough flexibility in the use of monetary policy to help stretch a long period of business expansion through 1988.

• *Demographic change.* This takes place too slowly to have a strong influence on construction activity in any individual year, but over the course of a full building cycle, population movements can be quite dynamic. A comparison of demographic profiles at the time of the last cyclical peak of construction (the late 1970s), the present, and the next probable peak (the early 1990s) says a lot about how the construction industry will emerge from the cyclical decline that has barely begun.

Population characteristics are the single most important determinant of the nation's construction needs, but they should be thought of as *potential*, not as actual demand. The realization of demographic potential for housing, schools, offices, and other construction depends, at any time, on the multitude of economic and political variables that go into making demand effective: employment and income, interest rates, tax laws, public programs, and more.

For at least three decades, the maturing of the Fifties Generation has been the driving force of the construction market. The advance of this group into early middle age (30 to 50) and the void that follows it (15 to 30) will be no less important in shaping the construction markets of the 1990s.

Here is what all the influences on construction mean for 1988

With interest rates the biggest risk, the other external influences on construction in 1988 are reasonably predictable. Together, they lead to a second step down from the 1986 cyclical peak.

What takes place in the construction sector during the year ahead is, of course, only one segment of a sequence that began a year ago, and will extend beyond 1988. It is, however, our immediate concern here.

Nonresidential building

As the nonresidential building market begins its third year of decline, this *1988 Outlook* is more in the nature of a progress report than a forecast. There is little mystery about which way nonresidential building will be going in 1988. It is only a matter of how far down and for how much longer.

Do previous nonresidential cycles offer any useful insights? Conveniently, the last three cyclical declines all started from similar peaks of 1.4 billion square feet. From 1973 to 1976, nonresidential building declined a total of 34 percent over three years before reversing. From 1979 to 1982, also a three-year decline, the loss was 31 percent.

So much for similarities. The current cyclical decline, which is now two years along, is still within 8 percent of its 1985 peak. Either this one has a lot of catching up to do in its third year (1988), or it is taking a different path from the others.

Two features of the current cycle support the notion of a different path. One is the regional character of the commercial and industrial building market—strong in the Northeast, weak in the Southwest. The other is the stablizing influence of institutional building—still expanding in 1987. These departures from the typical behavior of nonresidential building are leading to a shallower, but longer, decline than either of the last two cycles.

Commercial and industrial building

The decline of commercial and industrial building since 1985 is mostly the story of the collapse of the 1980s office building boom. In two years, contracting for offices has plummeted 25 percent—three times as fast as the decline of other commercial and industrial building. Since the story of the overdeveloped office-building market has

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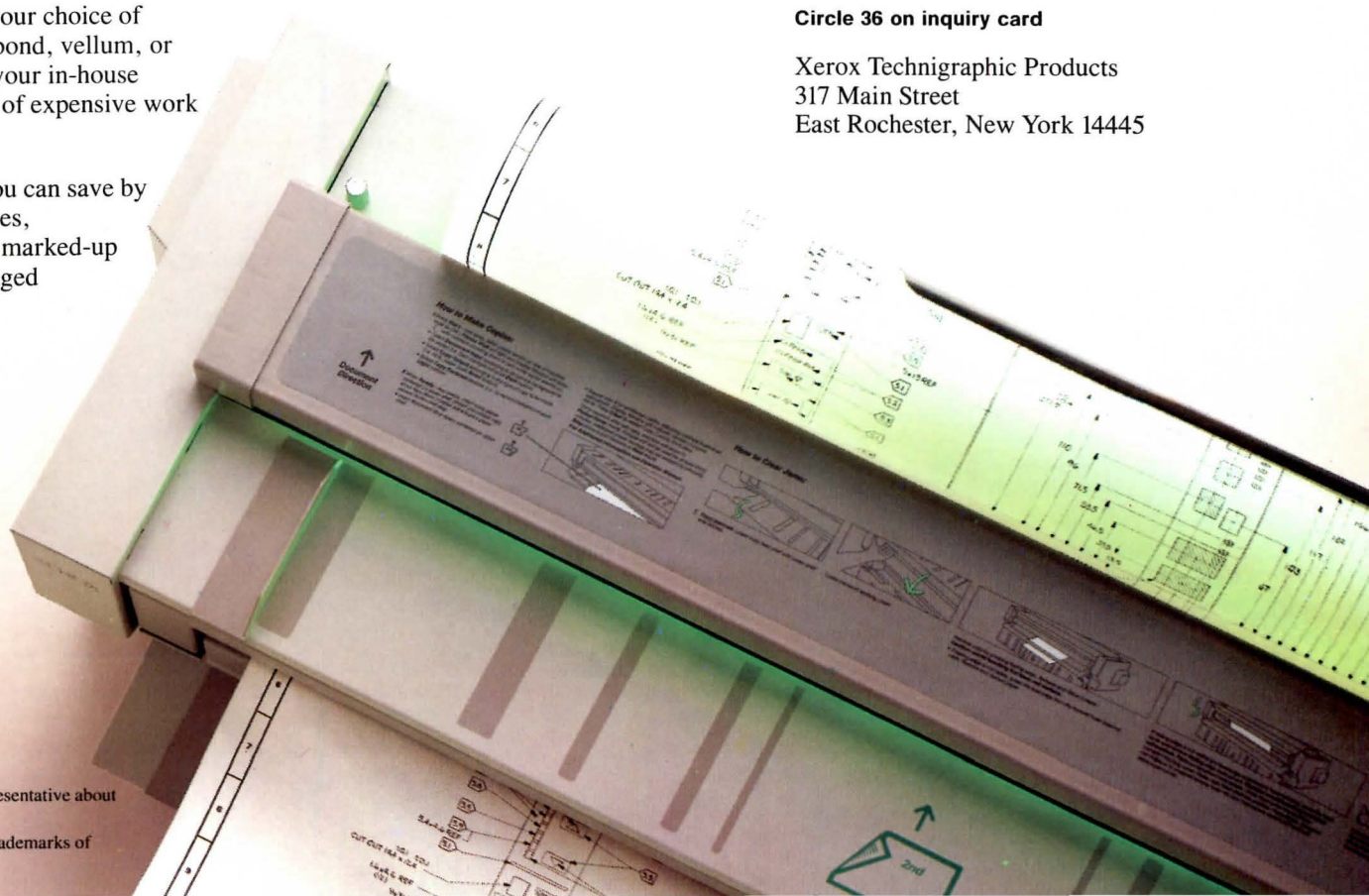

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achieved the status of one of the great legends of the construction industry, only an update is necessary. Some observations:

- The 1987 rate of contracting, although only three-quarters of 1985's peak volume, is still an impediment to the assimilation of the vast surplus of space accumulated during the five years of accelerated depreciation. At the current rate of new construction, the average vacancy rate will decline only very slowly, if at all.
- A further decline of almost as much as has already occured is required to restore equilibrium to the market.
- Even though all of the decline since 1985 has been confined to the South and the West, local-market analysis indicates that two-thirds of the remaining decline must also come from those regions.
- The decline of office building is expected to level off at 175 million square feet (U. S. total) during 1989 and 1990.
- 1988 will be just one more step in the process of assimilation as contracting for office buildings recedes another 15 percent to 225 million square feet.

While office building continues to cope with past excesses, other types of commercial and industrial building will be responding to stresses in 1988:

- Retail building (stores, shopping centers, warehouses), much of which is a derivative of residential development, will be following the decline of housing starts in 1988. Allowance for lags means that 1988 should bring a steeper (11-percent) drop for retail building than for housing as retailers adapt next year to 1987's housing setback.
- Industrial building has failed to advance from a plateau of 150 million square feet since reaching that level in 1984. Imports are the problem and, with no quick-fix to the trade gap at hand, 1988 will bring more of the same low volume of industrial building.
- Total commercial and industrial building, still dominated by the office glut, will be sliding another 10 percent in 1988 to a total of 875 million square feet. This will not be the end of the decline, although the end is coming into view.

Institutional buildings

By the mid-1980s, circumstances in the institutional-building market had improved greatly over what they were in the depressed early years of the decade. Falling bond rates and rising tax revenues triggered a catch-up boom in 1985-86-87, when state and local governments were finally able to proceed with previously postponed projects. During the three most recent years, contracting for institutional buildings averaged almost 25 percent higher than during the blighted years of 1981-82-83.

One problem with catch-up building is that sooner or later you get caught up. A slowdown from the recent hectic pace of building is inevitable, and the combination of rising interest rates and the expiration of revenue sharing could be the catalysts. In 1988, these developments are expected:

- Educational building is both benefitting (elementary schools) and suffering (higher education) from current demographic developments. But overall, the long decline of school building throughout the 1970s has been reversed. After a temporary easing in 1988 (2 percent down to 117 million square feet), educational building is expected to settle into a gently rising trend.
- Recent changes in health-care policy have encouraged the substitution of clinics and other nonhospital facilities for general hospital care, and changes in tax policy (via ERTA) have helped make their funding available. The result: between 1980 and 1986, construction of nonhospital facilities rose from one-half to two-thirds of all health-care construction. Tax reform introduced a new dimension in 1987, and a reduction of 5 percent in total health-care construction in 1988 to 72 million square feet is anticipated as investment in clinics and nursing homes loses some of its appeal.
- Total institutional building, including public-administration buildings, recreational facilities, etc., is forecast to settle back 3 percent in 1988 to 330 million square feet, a level which should be sustainable for the next several years.

With all but a very few of the building categories that make up nonresidential construction headed for declines in 1988, the total of commercial, industrial, and institutional building is expected to fall 8 percent to 1,205 million square feet. After three years of decline, this would leave 1988 nonresidential building 15 percent below its 1985 peak.

Contract value of total nonresidential building will decline 4 percent to $81.3 billion.

Residential building

The mid-1980s annual rate of 1.4 million household formations establishes an upper limit for total shelter demand (including replacement of losses from the housing stock) at or close to 2 million units per year. With mobile homes currently satisfying between 250,000 and 300,000 units of demand annually, the net *potential* demand for conventional single-family and multifamily housing during the second half of the decade is not likely to exceed 1.75 million units per year for very long.

As the trend of household formation drifts slowly and steadily downward from its mid-1970s peak, the changing age distribution of the population takes on greater importance. The closer we get to the 1990s, the more housing demand will be shifting in favor of single-family houses—from a 57-to-43 ratio in the early 1980s to more like 65 to 35 in years ahead. Since the construction value of the typical new single-family house is roughly one-and-three-quarters times the value of an apartment unit, the improving quality of future housing demand will compensate for its diminishing quantity.

Even so, two barriers stand in the way of realizing the housing market's full potential in the short run—high vacancy rates and rising interest rates.

- *Multifamily housing.* Almost everything that has been said about the office-building boom (and bust) pertains to apartments as well. Both markets were overstimulated between 1982 and 1986 by the availability of accelerated depreciation. Both were distorted by the abuse of tax shelters. Both have been overbuilt, and apartments currently have their highest vacancy rate in 20 years. Both suffer from lopsided geography—severe glut in the Southwest (10 percent vacant); viability in the Northeast (4 percent vacant). And both face the prospect of unfavorable demographics as the young adult segment of the population continues to shrink in the years ahead.

Like offices, apartment construction reached its peak in 1985—at just over 850,000 units (F.W. Dodge basis), a full year before tax reform.

The process of absorbing the accumulated surplus of five years of overbuilding is already in its second year. In 1986, the first step down was not even adequate to halt the rise of the vacancy rate, which only began to stabilize at 7 1/2 percent in 1987 when multifamily starts receded to 585,000. Virtually all of the 30 percent decline to date has been confined to the South and the West, leaving apartment building in the Northeast and North Central regions approximately where it was two years ago.

Bringing the vacancy rate down to an acceptable 5 or 5 1/2 percent requires the assimilation of several-hundred-thousand empty units. If new construction were to fall as far below its equilibrium level as it was above that level at the 1985 peak, a year of multifamily starts as low as 350,000 units could be imagined. But because the South and West have already experienced deep cuts, and because the Northern regions are not particularly over-extended, national apartment starts are more likely to stabilize in the low 500,000s—not much below the current level. This implies an extended period of depressed multifamily building, rather than a quick-and-dirty adjustment. In 1988, a further decline of between 5 and 10 percent to 550,000 multifamily starts is anticipated.

- *Single-family houses.* In 1986 and early 1987, the housing market was doing something it doesn't often do: going both ways at once. For a time, increases in *single*-family

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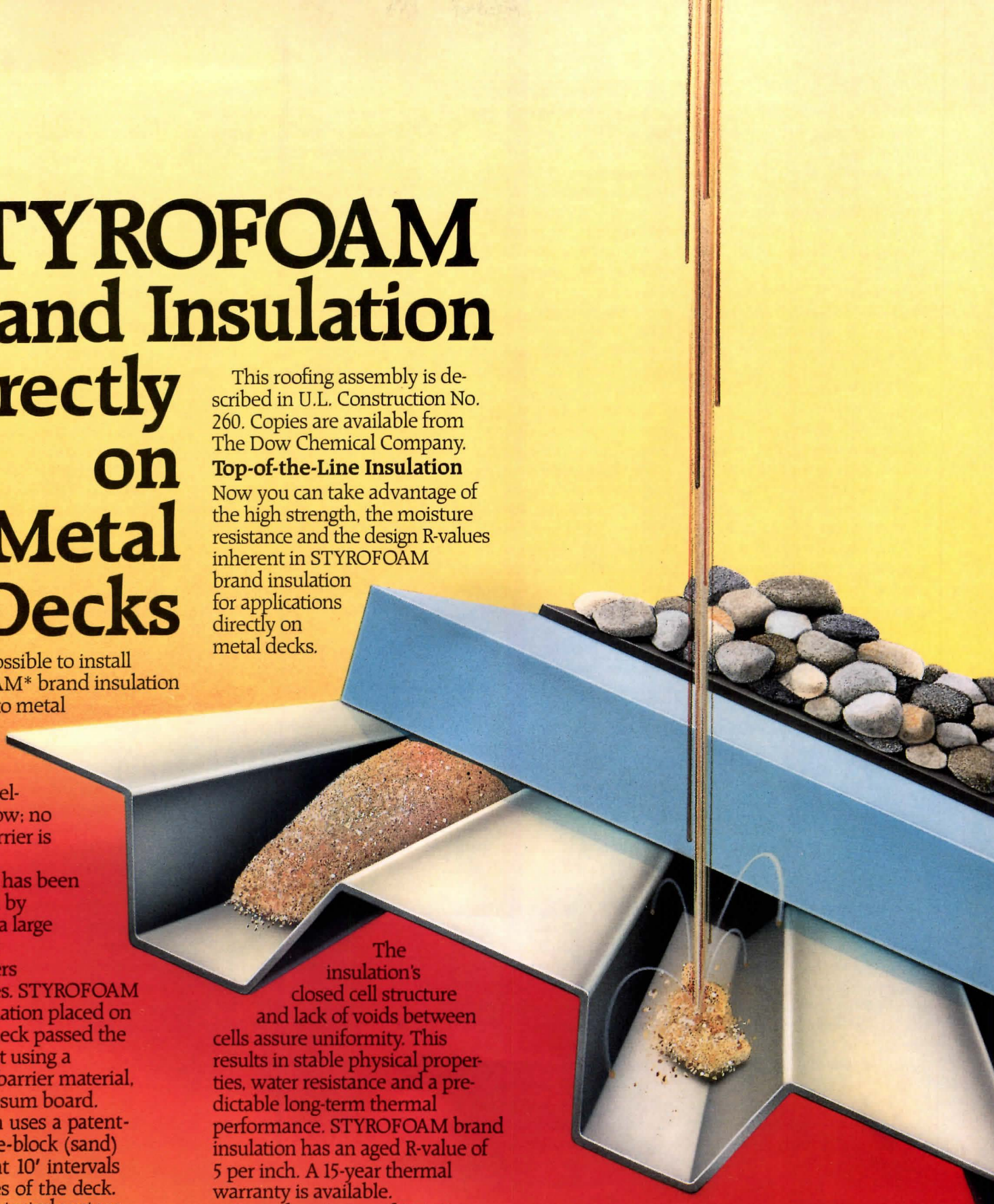

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building were buffering the collapse of the apartment sector, but not for long. The upward march of interest rates that began in 1987's second quarter has brought back the more familiar one-way housing market. In this case, the way is down.

Analysis of the sensitivity of single-family house building to fluctuations in mortgage rates shows a closer relationship on a quarter-to-quarter basis than over a several-year span. This simply bears out two important principles. Over an extended period, several variables besides interest rates (general business conditions, affordability, public programs, demographics, etc.) all have an influence on how much housing gets built. But, in the short run, credit conditions rule the marketplace.

A rationale for the expected movement of mortgage rates through 1988 was offered earlier here mainly for the purpose of applying it at this point. Since the long-term forces that shape housing demand will change little in only a year's time, 1988's single-family housing starts—like mortgage rates—should be pretty much a reversal of the 1987 pattern. This means weakest in the first half (below the 1.0-million rate) and recovering in the second half as mortgage rates recede.

The expected timing of the reversal of mortgage rates suggests that the 1988 recovery of one-family building will develop too late to bring next year's total equal with the current year's 1.0 million starts (F.W. Dodge basis). A total of 975,000 one-family units in 1988, with a strong finish, will prepare the way for fuller realization of the market's 1.1-million-unit potential in 1989.

Total housing starts

For different reasons, market forces will be depressing both one-family and multifamily building in 1988. As a consequence, total housing starts are headed for their second consecutive decline from the 1986 peak to 1,525,000 units.

Contract value of total residential building, including nonhousekeeping structures (hotels, motels, and dormitories), will decline 2 percent in 1988 to $116.5 billion.

Public-works construction

If the recent flurry of Congressional action is any indication, public works programs have moved up the federal priority ladder. Now it remains to be seen whether state and local governments can come up with the matching funds necessary to implement new federal-aid programs to their full potential.

Passage of three major federal laws between mid-1986 and mid-1987—the Water Resources Act (1986), the Clean Water Act (1987), and the Surface Transportation Assistance Act (1987)—established a new financial base for public works construction that reaches from here into the 1990s. In general, these new programs define federal and local government responsibilities for sharing the cost of a continuing level of infrastructure development at least as high, in constant dollars, as the peak reached in 1986. The fact that two of these acts were passed over the President's veto indicates change toward a more workable federal/local partnership in public works construction. It contrasts with the early stage of the "New Federalism," which was little more than federal withdrawal.

• *Transportation.* Getting the $88-billion 1987 highway act passed by the time-consuming veto/override process proved highly disruptive to highway and bridge construction during the past several quarters. Because the old (1982) program expired September, 1986, and its successor didn't become law until the following April, there was a period of more than six months when DOT was operating on ICU's. Contracting for transportation construction sagged during the 1986 third quarter and the 1987 first, then rebounded sharply in the 1987 second, as federal money was released. The net effect of stop-and-go disbursements appears to have been the deferral of perhaps half-a-billion dollars of 1986 construction into 1987. The upshot: a small decline for last year as a whole, and a higher than expected increase (5 percent) in 1987. In 1988, the backlash of this bunching of highway work in 1987 will result in another distortion—a small decline of about 2 percent.

A recent survey of state highway and transportation departments bears this out. Responses to the survey suggest that more federal funds are currently available from the new highway program than the states are capable of matching. As state DOT's search for new sources of construction revenue, their 1988 plans indicate a temporarily reduced level of contracting for highways and bridges.

• *Environmental.* The two new water-related programs provide for an expanded federal role in water-resource development (via the Corps of Engineers), but a reduced role in water quality (via EPA), where local governments will play a bigger role. But not right away.

On balance, it is expected that the shift from direct federal grants to revolving loans—through the imposition of user fees—will make a larger annual total of construction money available for sewage-treatment plants beginning in 1989.

Recent high rates of homebuilding have been responsible for above-average gains in 1987 contracting for local water supply and sewer lines, boosting total environmental construction 6 percent to $15 billion. In 1988, with homebuilding in decline, water-resource development (i.e., large-scale Corps of Engineers projects) will set the pace for a smaller overall advance of 3 percent to $15.5 billion.

Total public-works construction in 1988 is headed for approximately the same $41-$42-billion total reached in 1987 as developments in the two broad categories offset one another. Transportation construction, settling back to normal, will suffer by comparison with 1987's artificially high total. At the same time, the environmental group will be showing a typical 3-percent advance.

Over a broader time span, implementation of the new legislation will partially reverse a pronounced trend toward transportation construction that began with the passage of the 1982 STAA with its 5-cent-per-gallon fuel tax. Highway and other transportation work, at 58 percent of the public-works total in 1981 (the last pre-STAA year), rose to 66 percent four years later. Over the balance of the decade, a transfer of resources to environmental construction will alter the "mix" of total public works to a 62-to-38 ratio.

Across the board

In contrast to 1987's offsetting gains and losses, the construction sector faces something closer to an across-the-board decline in 1988. Most of next year's setbacks will be relatively small ones, however, leaving total construction-contract value at $242.0 billion, only 3 percent below the estimated 1987 total. In constant dollars, next year's decline will be more like 6 percent.

As forecasts go, this one bears a higher than usual risk factor. Barring an unlikely general recession, nonresidential building (–4 percent) is perhaps the most predictable of the three major categories, but all the risk is on the down side nonetheless. Public-works construction (no change from 1987) carries the risk of program cuts that might be needed to satisfy next year's deficit reduction target. The biggest risk of all, however, concerns housing (–2 percent), which requires some hazardous assumptions about the direction and timing of mortgage rates. More than anything else, interest rates will make the difference between a shallow and a steep decline of construction activity in 1988.

Keep the option open, but for the time being, the shallow cycle is the odds-on choice.

Prepared October 1987
by the Economics Department
McGraw-Hill Information Systems Company,
George A. Christie, vice-president and chief economist

Architectural education: On NCARB's horizon— a computer-adaptive exam

A remarkable session at NCARB's last annual meeting detailed plans to phase in the use of computers for registration exams over the next several years. Walter Carry outlines here the aims, benefits, and status of the pending process.

By Walter T. Carry

Two years ago, NCARB began research on new, state-of-the-art testing and related psychometric activities, and on the feasibility of using computers to examine candidates for registration. We soon discovered significant new developments in the testing methods and procedures being used by other professions, and by the military, industry, and government. It was learned, notably from the medical profession, that computer-adaptive examination of candidates for licensing holds considerable promise.

Creating the Architect Registration Examination in its present form is an extraordinarily labor- and resource-intensive enterprise. Thus, we have been able to produce the A.R.E. just once a year, though eager to make it available more often. Computer-adaptive testing will allow greater frequency, plus many other benefits. So, we have accelerated our research efforts to develop a "computer mastery test," or CMT. This looms as a formidable project, since NCARB will continue to prepare the A.R.E. annually while simultaneously pursuing the R&D work on a computer-adaptive counterpart.

Walter T. Carry, AIA, is current president of the National Council of Architectural Registration Boards, and principal of the architectural firm, Cooper, Carry & Associates, Inc., Atlanta.

Our strategy calls for the CMT to be developed in an orderly, phased fashion. The first phase of this process entails the pretesting of exam questions, and the assembly of test forms that incorporate the examinees' responses to these questions in a test-development procedure called "item response theory." Then, if the Council is able to proceed as planned, a pilot CMT covering the subject matter in two of the A.R.E.'s nine divisions will be ready for field testing by volunteer member boards in late 1988. Additional A.R.E. divisions will be adapted for computer testing in succeeding years, until a complete new NCARB computer-adaptive examination is ready for use by member boards.

NCARB has already carried out an assessment of a computer-adaptive test that, though not part of the A.R.E., has enabled us to utilize and become familiar with the computer technology used in testing. This project came about as an opportune response to the needs of some member boards for a seismic/lateral forces exam, to be administered to applicants for registration who have not otherwise been examined on this subject. NCARB decided to create a conventional test *and* a computer-adaptive test. A preliminary assessment indicates that the computer-adaptive examination will be an effective methodology.

Considering the heavy investment in energy and money the CMT will require, some may wonder—is it worth it? The answer is yes, the computer will provide benefits and opportunities not offered by the familiar pencil and paper format. They include:

Frequency. We anticipate that the CMT will be administered at the outset several times a year. Eventually, it is conceivable that a candidate will be able to take the CMT *on request*. There is no question as to the feasibility of such on-request convenience; in the medical profession, it will soon be offered to examinees.

Reporting. The frequency with which the CMT may be administered, together with the simplicity of the grading process, will enable examinees to receive their grades in a much shorter period, and eventually, as the process is refined, to receive their grades immediately on completion of the exam.

Efficiency and scoring. Through the use of the "item response theory"—a proven testing and scoring procedure —it is possible to program a computer-adaptive examination so an examinee's ability can be demonstrated *progressively*; that is, one question will have a bearing on the difficulty of the next. Thus a more able examinee, by answering fewer, difficult questions, may complete the examination in less time than a less able examinee. Equally significant is the fact that the "item response theory," by virtue of its impressive characteristics, will establish a precise dividing line between those who pass or fail.

Reliability. The A.R.E. was developed to test an examinee's entry-level competence to practice the profession of architecture; that is, to show that he or she has the necessary skills, knowledge, and abilities to be a practicing architect. Our preliminary research persuades us that the CMT is well suited for entry-level testing, and will also make it possible to test for that special quality which, above all others, distinguishes the qualified architect: namely, professional judgment.

We will be able to present remarkably "lifelike" simulations of everyday office situations, and then invite the candidate to choose from an extensive databank those particular pieces of information that he or she thinks will contribute to the problem's solution. It will be possible to place a value on each decision an examinee makes in drawing from the databank, and, far more significantly, to determine the quality of judgment demonstrated through serial decisions. If, for example, an examinee asks the computer for certain items of information and uses them to arrive at a sound decision, the CMT will reward that person for understanding the nature of the problem and demonstrating the knowledge and professional judgment required to solve it. In principle, then, each examination taken may be a unique personal expression of one's qualifications, and will allow each candidate's skills, knowledge, and abilities to be measured in a more equitable and precise manner than possible with any of the standard forms of testing used in the past.

It is fair to say that NCARB's research thus far provides a basis for cautious optimism. As in the recent past, when the A.R.E. was being developed, the Council will move forward with this new project because of our commitment to the examination as an important means of safeguarding the public health, safety, and welfare. The work ahead can be significant because of its potential for further refining the examination as both a process and a product.

It is true, of course, that the computer cannot do anything by itself. But as a tool through which tomorrow's computer-literate candidates for registration may demonstrate their knowledge and professional judgment, its vast potential demands our continued efforts toward the development of a practical and affordable computer-adaptive examination.

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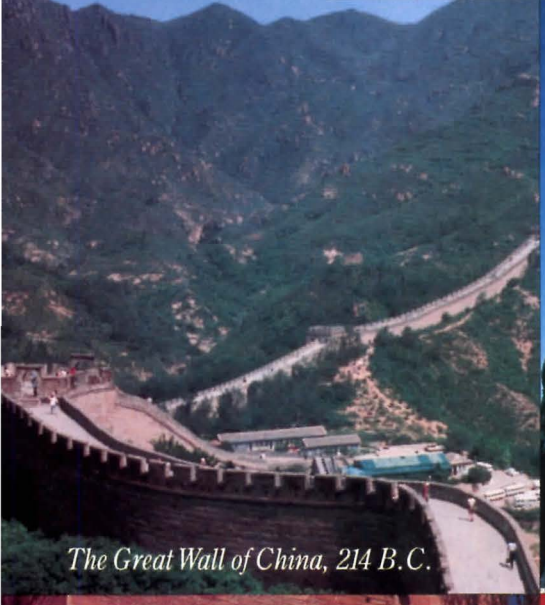
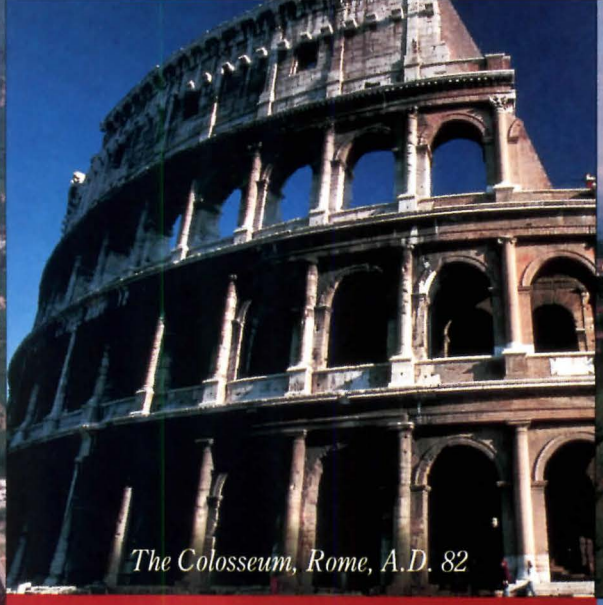
On the waterfront: Investing in Detroit's future...

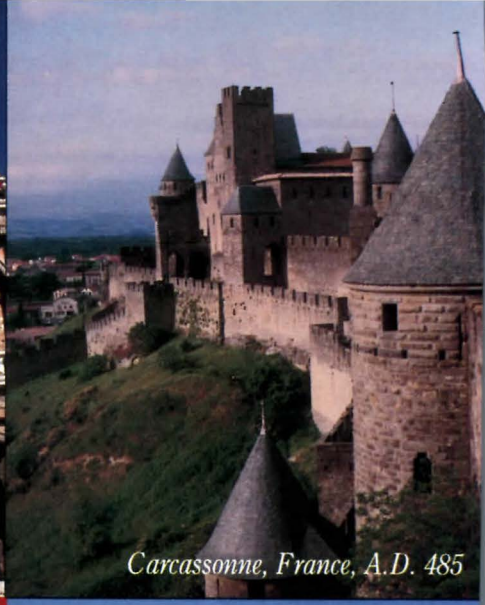
A 30-story office-and-retail tower now under construction represents Detroit's first major private development project in a decade. Situated along the city's riverfront, the mixed-use building, designed by Heller & Leake of San Francisco for the John Madden Company, will boast an elliptical glass-enclosed lobby and direct access to a People Mover urban transit station. According to the architects, the design was inspired by the city's more venerable structures—an influence evident in the proposed colonnaded roof terrace that will embellish the newcomer's top floors. The 500,000-square-foot tower will be clad in a combination of granite and precast concrete, and the elongated bay window facing the river will be glazed in green glass. Completion is scheduled for January 1989.

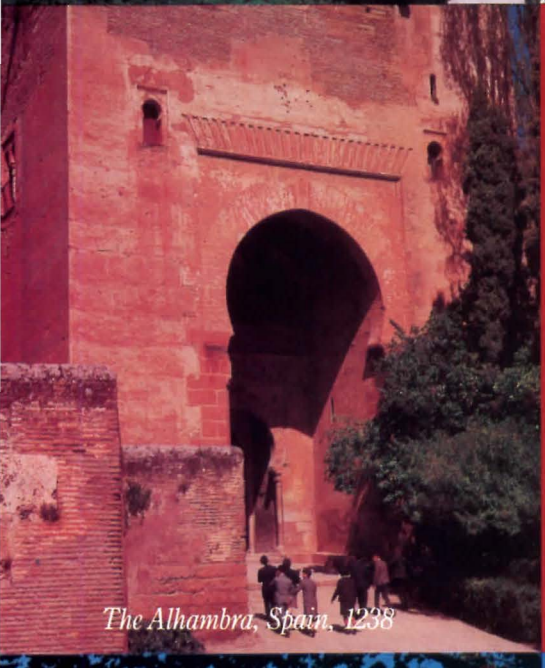
...and capitalizing on Chicago's past

For a site next door to its celebrated curved green-glass structure on West Wacker Drive in Chicago, the firm of Kohn Pedersen Fox, in association with Perkins & Will, has designed a 31-story office building with lobby-level retail space for The Palmer Group. KPF's partner-in-charge, A. Eugene Kohn, asserts that granite and marble cladding embellished with stainless steel and decorative bronze work will make the tower "a solid terminus to the series of masonry buildings, dating from the first half of this century, that line the street and form the riverfront."

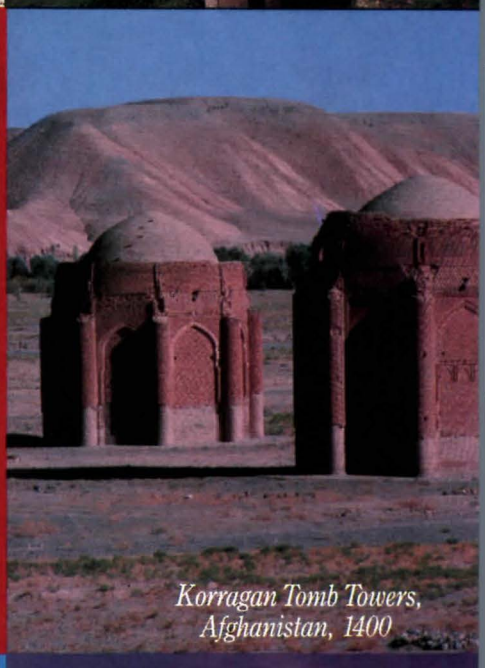

The Great Wall of China, 214 B.C.

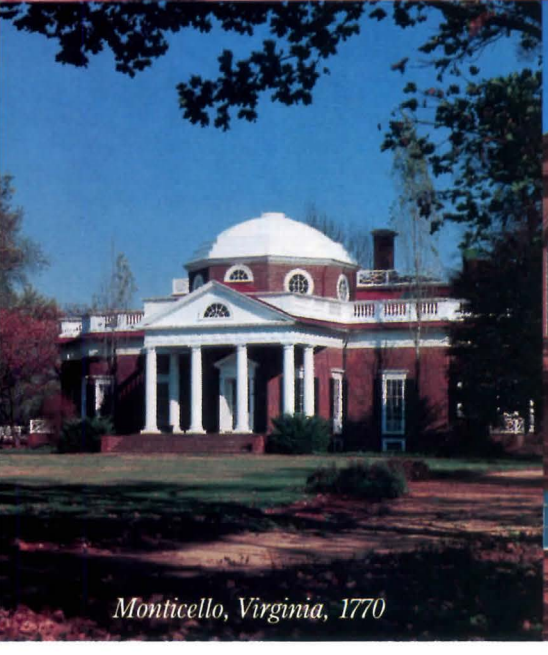

The Colosseum, Rome, A.D. 82

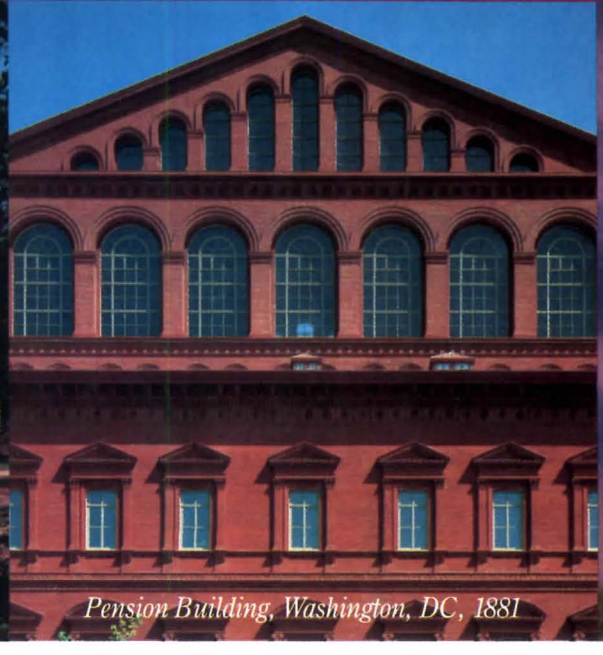

Carcassonne, France, A.D. 485


The Alhambra, Spain, 1238

Give an architect a brick and just look what can happen.


Korragan Tomb Towers, Afghanistan, 1400


Monticello, Virginia, 1770


Pension Building, Washington, DC, 1881


Tycon Tower, Virginia, 1986

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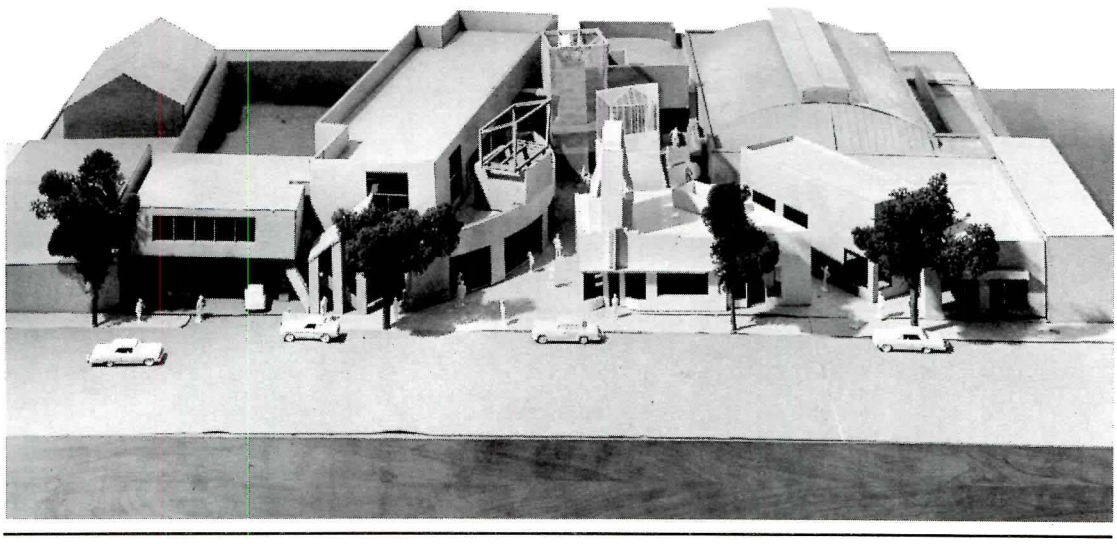
Main Street, Santa Monica

Museums have been cropping up in some unlikely places lately, thanks to artful recycling, and the soon-to-be-opened Santa Monica Museum of Art is a prime example. Designed by Frank O. Gehry and Associates, the 10,000-square-foot museum occupies the renovated Edgemar Farms egg-processing plant, now a cultural and commercial complex that will also comprise newly constructed shops, offices, and eateries. One block from the Pacific shore, the Edgemar development is itself part of a larger scheme to recycle and rejuvenate the building stock along Main Street.

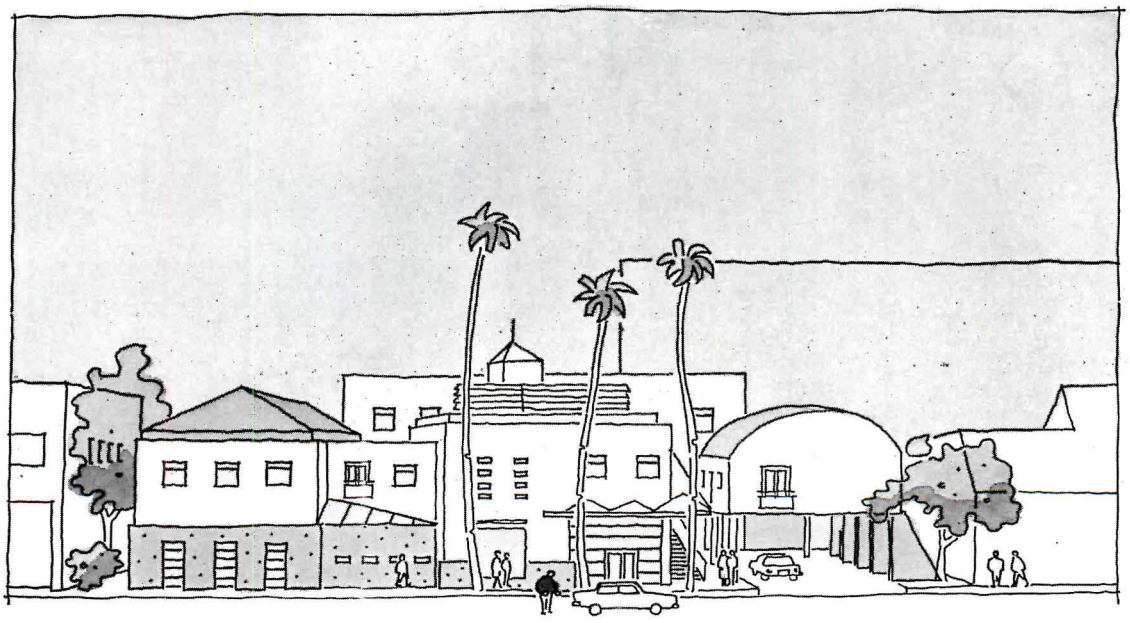


Competition calendar

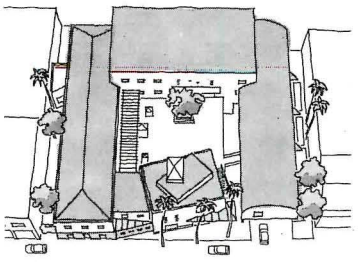
• The Sony Corporation's "Design-A-Vision" competition is open to all students enrolled in colleges or universities with accredited programs in interior or industrial design. Entrants are asked to "create the television of the future," and may submit proposals of either fixed or portable models. The deadline for entries is December 15, 1987. For additional information write Sony "Design-A-Vision," c/o Geltzer & Company, 1180 Avenue of the Americas, New York, N. Y. 10036.

• The American Consulting Engineers Council (ACEC) seeks entries to its 21st annual Engineering Excellence Awards competition. Projects ranging from engineering studies to buildings are eligible for awards, and entrants must apply through an ACEC member organization. Entry deadline is March 2, 1988. For more information contact Steve Graham at 202/347-7474.

Hôtel de ville



Australian architects transplanted to Los Angeles, Hank Koning and Julie Eizenberg are working on their largest project to date, the Ken Edwards Center for Community Services in Santa Monica. The building houses two nonprofit senior-citizen agencies in facing



wings and a volunteer center in the middle. Eizenberg likens the parti of the through-block complex to that of a French hôtel, wherein a unified whole accommodates disparate activities. A pavilion at the courtyard entrance will provide social-service information.

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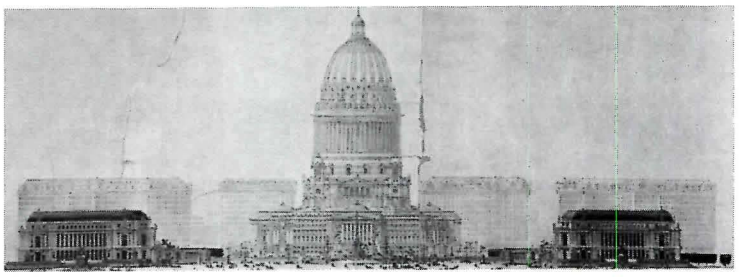
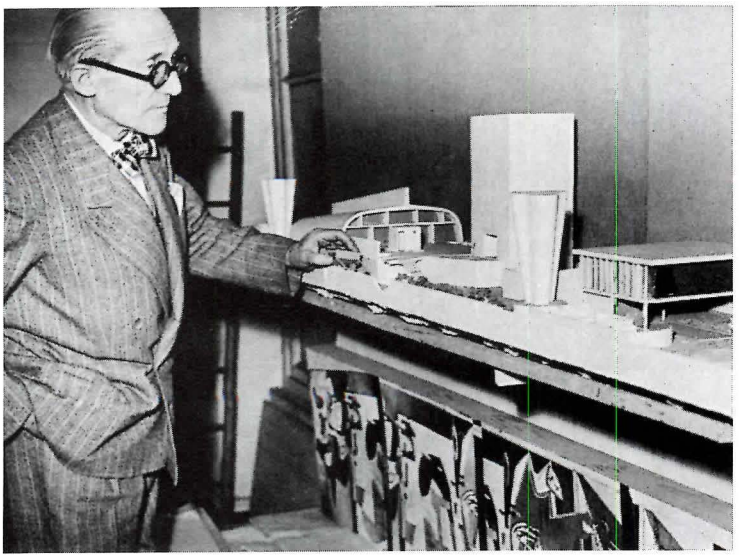
Report from Paris: No small plans



The City of Light remains in the spotlight as various *grands projets* of President François Mitterand reach completion. Like dynasties of kings before him, the Socialist leader is eager to leave his own indelible mark on Paris—and with the unveiling last December of the transformed Gare d'Orsay into a national museum (RECORD, March 1987, pages 128-139), Mitterand is well on his way.

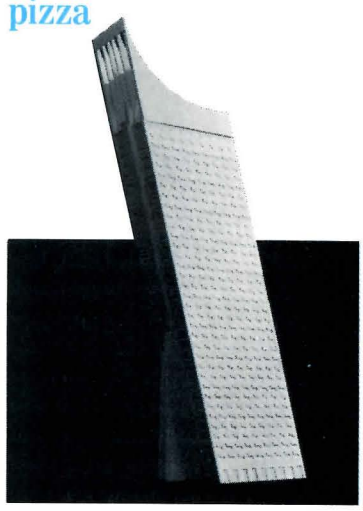
The Musée d'Orsay continued year-long *vernissage* festivities last month with the inaugural show in its new temporary-exhibition space: "Chicago Architecture, 1872-1922: Birth of a Metropolis." There is a poignant appropriateness to the seemingly unlikely subject matter—the rise of the Chicago School skyscraper from the ashes of the Great Fire of 1871—since the galleries that house the exhibition were also resurrected out of ruins. Organized by John Zukowsky, Curator of Architecture at The Art Institute in Chicago, the show consists of more than 300 drawings, models, and furnishings. The predictable Wrightiana are present but, happily, so are some surprises by other designers, such as several Louis Sullivan sketches of a man's face. Unlike Sullivan's more familiar studies for nonfigurative terra-cotta panels—delicate pencilings often captioned in a spidery script—these crudely rendered grotesques hint at a turbulent private vision at odds with Victorian propriety. Altogether different dreams of public grandeur triumph in a thorough presentation of Daniel Burnham's 1909 Plan of Chicago, which confidently depicts the city as an amalgam of the capitals of the U. S. and other nations (above). The exhibition remains in Paris until January 4, 1988, before traveling to Frankfurt and returning to the Art Institute, in July.



Across the Seine, a more ambitious undertaking is on view at the Centre Georges Pompidou (popularly called Beaubourg) until January 3, 1988. In honor of the centennial of Le Corbusier's birth, the Beaubourg has mounted a mega-show devoted to the master's *oeuvre complète*, consisting of some 350 drawings, 70 models, 400 photographs, 250 study sketches, 45 paintings, 10 collages, six scale-model reconstructions, and seven audiovisual presentations (below left). Covering the entire sixth floor of the immense "cultural fun palace," "L'Aventure Le Corbusier" is the product of an international collaboration—Bruno Reichlin, of Zurich, and François Burkhardt, of Paris, were the curators, and the installation was designed by Gregotti Associati, of Milan. Divided into six chronological periods, the exhibition presents both an orderly narration of Le Corbusier's life and a critical reading of his professional accomplishments. Much of the material on view has till now been under wraps at the Fondation Le Corbusier. Remarkably, this exhibition is one of few to take full advantage of Renzo Piano and Richard Rogers's idiosyncratic museum. At the time of its hanging, rumor had it that the architects themselves had commented that the expansive showing had at last validated their design of a cultural warehouse.

The Pompidou *grand projet* remains controversial a decade after its opening, as will the most prominent and hotly-debated of Mitterand's—the I. M. Pei-designed 60-foot-high glass pyramid being built in the middle of the Louvre Palace's Cour Napoléon. A haunting steel shell at present, the Grand Louvre is scheduled to open in November, 1988. When finished, this new presence in Paris hopefully will be more than the unwelcome intruder it is now. *K. D. S.*

The leaning tower of pizza



Domino's Pizza has unveiled plans for an $80-million corporate education conference center to be built at Domino's Farms in Ann Arbor, Michigan. Designed by Gunnar Birkerts and Associates, the complex's 35-story tower will tilt 15 degrees and have a bronze metallic skin and copper roof. The fast-food chain, whose CEO is a noted Frank Lloyd Wright buff, had planned to construct Wright's 56-story Golden Beacon apartment proposal for Chicago, but abandoned the project when it proved too costly. Company spokesmen call the Birkerts scheme "rural sculpture."

Separate but not equal

California is breaking new legal ground with legislation that aims at ending long lines at public women's restrooms. In September, Governor George Deukmejian signed a bill requiring the State Building Standards Commission and State Architect to adopt regulations "for the ratio of restroom facilities needed to end inequitable delays," according to an article in the *San Francisco Chronicle*. The standards will apply, beginning January 1989, to construction of new arenas, convention centers, and ski resorts; hotels, restaurants, and schools are exempted.

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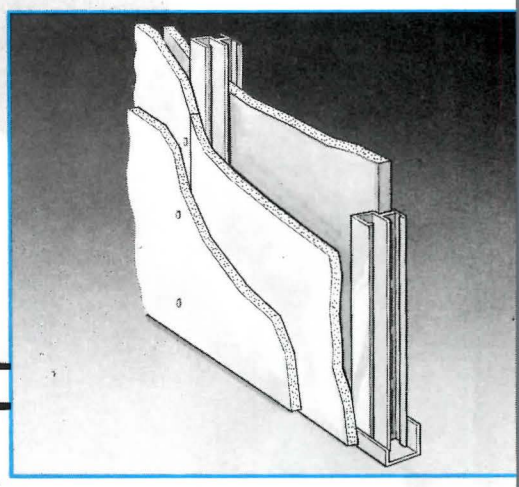

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News briefs

Ruth Moore Garbe and her husband, Raymond Garbe, have established a new professorship in architecture and urban studies at Harvard University's Graduate School of Design. Last year, Mrs. Garbe and her brother, Norman G. Moore, donated funds for a similar endowed chair at the School of Architecture at Washington University, in St. Louis.

Thomas S. Monaghan, president and founder of the Domino's Pizza chain (see page 69), recently set a world record with his $1.6-million purchase of a Frank Lloyd Wright dining-room set. The solid-oak table and eight high slat-back chairs were designed in 1899 for the Joseph W. Husser house in Chicago, which was demolished in 1923.

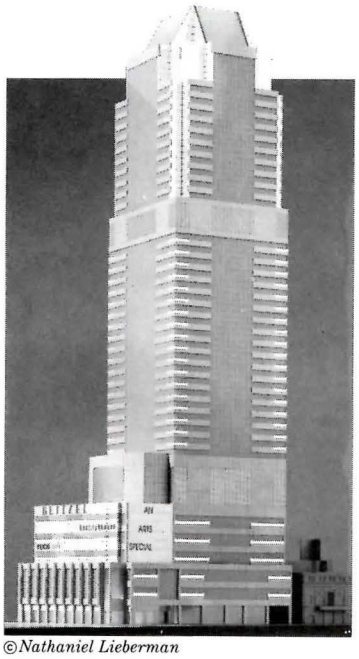
Marshall Field's flagship department store in Chicago will undergo a major restoration/renovation, which is expected to be completed in 1992. As part of the $110-million facelift, architect Hambrecht Terrell has proposed an 11-story atrium flanked by escalators and glass-enclosed elevators at the center of the store.

The Architects Collaborative has been commissioned to design a $9-million research and office center at Harvard University's John F. Kennedy School of Government. The new facility is scheduled to open in August 1989.

The Cloisters, the Metropolitan Museum of Art's Medieval branch in Fort Tryon Park, New York City, will mark its 50th anniversary next year with the renovation of its Treasury gallery. The restoration and expansion, by Stephen Saitas Designs, are scheduled to be ready in time for the actual anniversary date, May 10, 1988.

New lights on old Broadway

Local critics have voiced fears that the cluster of high-rise buildings intended for Manhattan's Times Square would turn the now flamboyantly lit theater district into a dull corporate wasteland. However, zoning regulations for the hotly debated area now require architects to incorporate commercial signage and lighting into their designs. Brokered by the New York City Planning Commission last year, the compromise among developers and city planners also stipulates that most of the new towers have setbacks above 60 feet in order to accommodate the required graphics and allow daylight to reach pedestrians. The major additions proposed for the northern end of the "square" (uptown from the controversial quartet by John Burgee with Philip Johnson) include 1580 Broadway (right), to be located on a triangular island formed by the intersection of Broadway and Seventh Avenue, designed by Mayers & Schiff Associates, and across the way, 1585 Broadway at 48th Street, by Gwathmey Siegel & Associates with Emery Roth & Sons (left). More prominently sited than its neighbor, 1580 Broadway goes beyond the mandate for signage by proposing a 26-story



©*Nathaniel Lieberman*

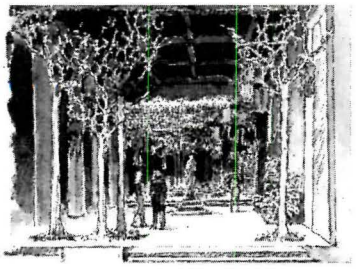
superstructure for neon supersigns. Capped with a rotating circular sign and a beacon, the skyscraper will carry billboards all the way up its narrow southern facade. The angled sides, exhibiting a more restrained demeanor, will be sheathed in bands of horizontal windows. The designers of 1585 Broadway offer a more sober solution: elegantly patterned facades of aluminum panels, polished stainless steel, and mirrored, etched and blue/green glass that integrate signs at their base and terminate in a glass gable. Although the three additional schemes planned for

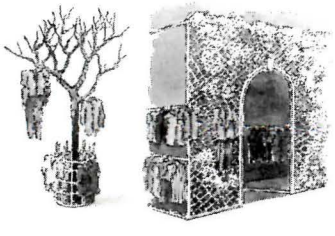
the area—Alan Lapidus's Holiday Inn Crowne Plaza Hotel, another hotel complex by Murphy/Jahn, and an office tower by Kevin Roche John Dinkeloo and Associates—will contribute to an overall effect of corporate-style image-making, each architectural firm is trying in its own way to maintain some of the old Broadway razzmatazz.

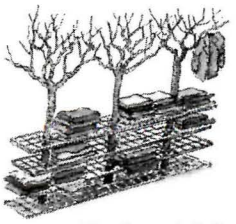
Model left: 1585 Broadway, by Gwathmey Siegel & Associates with Emery Roth & Sons. Photomontage right: 1580 Broadway, by Mayers & Schiff Associates

Street clothes

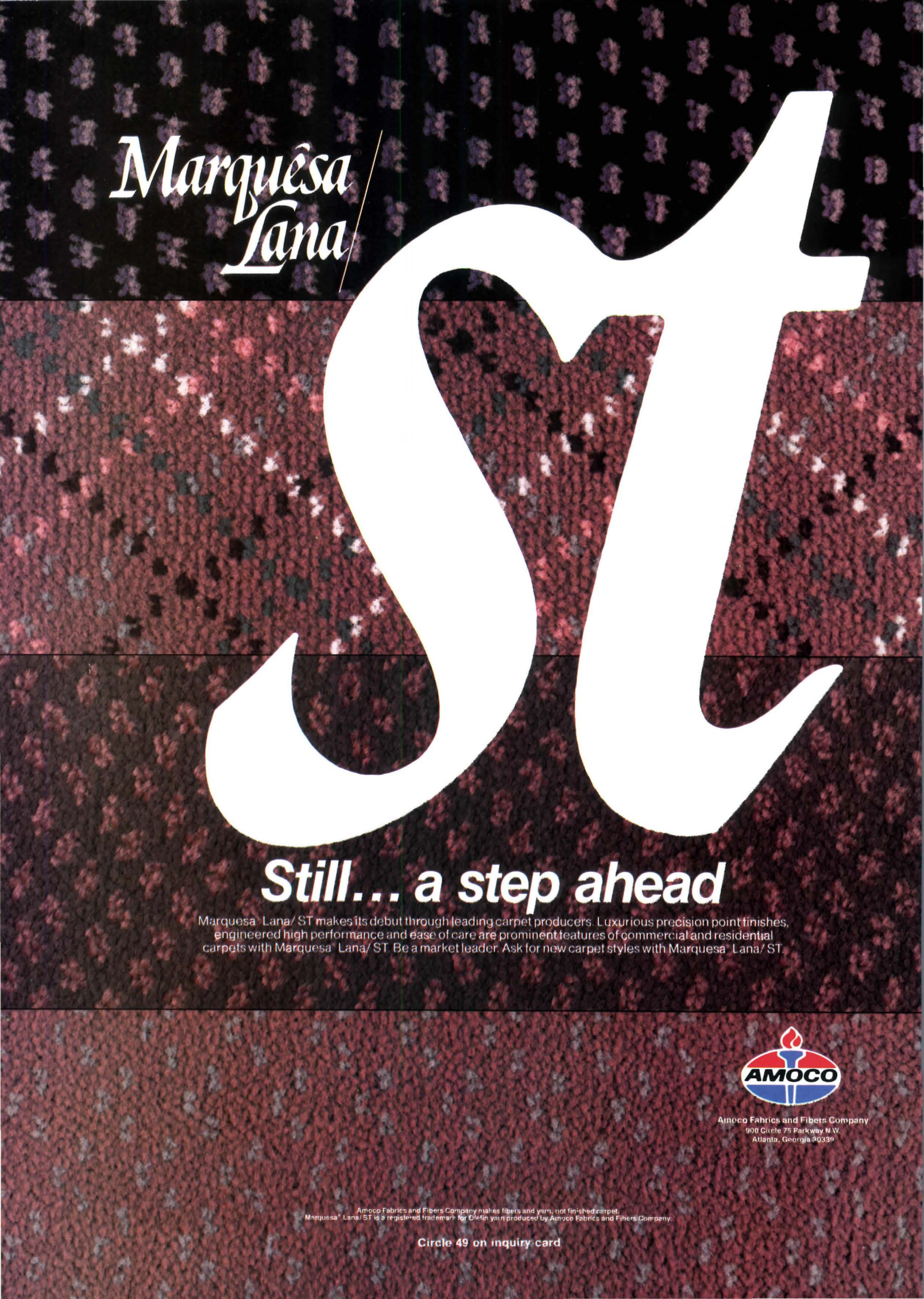
WilliWear, the American clothing manufacturer, has been easing into the retail business, and SITE Projects is helping the company make a splashy streetfront debut in New York City by designing its main store on lower Fifth Avenue. The group of artists and architects led by Alison Sky and James Wines has conceived an urban-park theme for the downtown space—complete with replicas of street lamps, ornamental ironwork and gratings, and fountains—as a nostalgic backdrop to the company's line of brightly colored, up-to-the-minute-style sportswear.







Drawings courtesy of Max Protetch Gallery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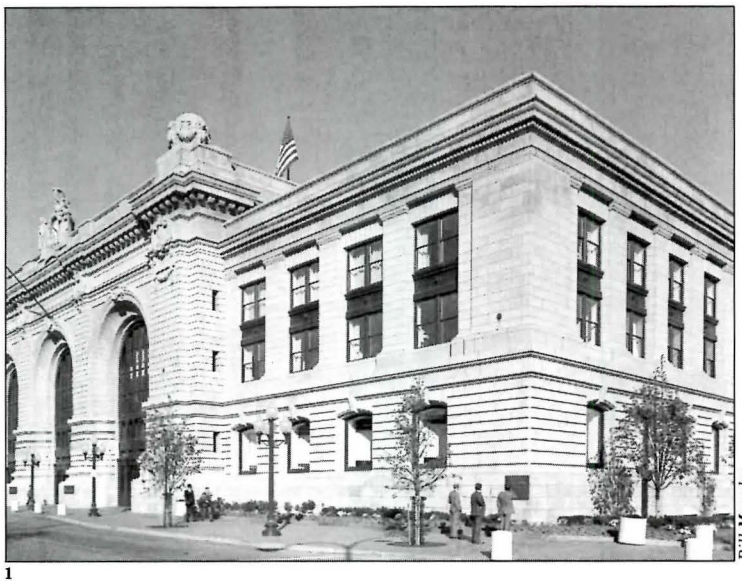
Design awards/competitions: Building Stone Institute 1987 Tucker Architectural Awards

Winners were selected in five categories: Nonresidential Building, Residential Building, Stone Structure Completed at Least 40 Years Ago, Landscape Project, and Renovation/ Restoration/Adaptive Reuse. The jury consisted of Richard Bergmann, of Richard Bergmann Architects, New Canaan, Conn.; Howard N. Horii, of The Grad Partnership, Newark, N. J.; and Stephen P. King, of Swanke Hayden Connell Architects, New York City.



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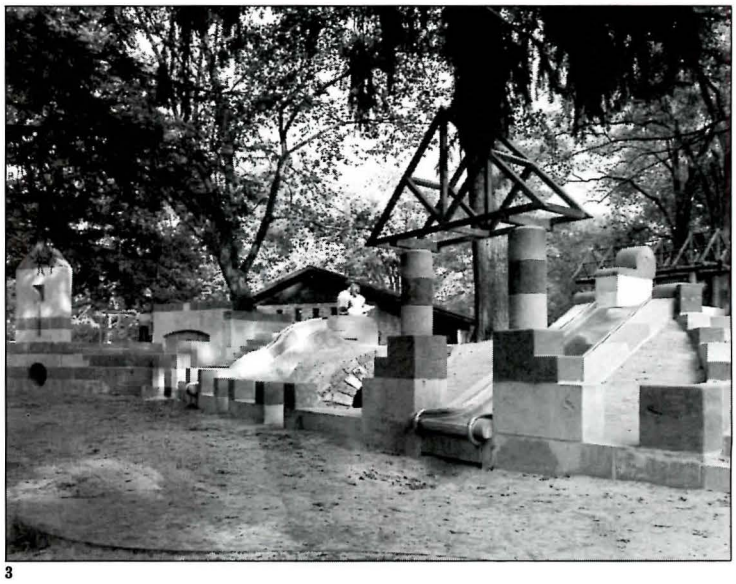

Bill Murphy

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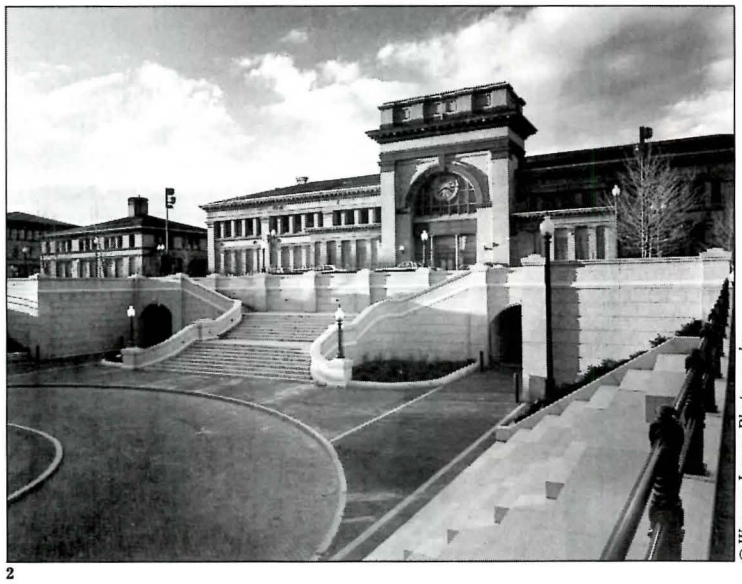

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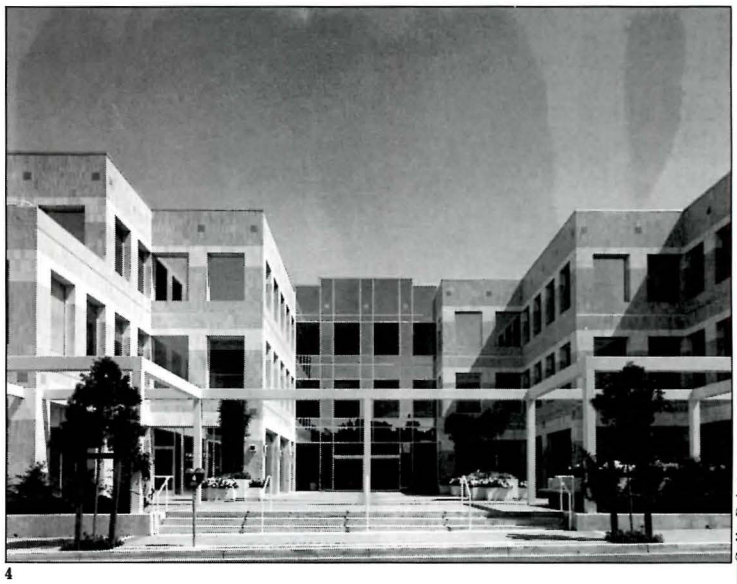

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1. Norstar Plaza, Albany, New York; Einhorn Yaffee Prescott, Architects (Restoration). The transformation of the 1899 Beaux-Arts style Union Station into corporate headquarters included laying a new lobby-level marble floor over existing railroad tracks. The exterior was cleaned and repaired with pieces of granite salvaged from interior wainscoting. The jury praised the architect's sensitive restoration, commenting that "when you look at the completed project, you would think it had always been there in its current state."

2. Grand Stairway, Kennedy Plaza, Providence, Rhode Island; Albert Veri & Associates, Architects (Landscape). Besides creating a public plaza suitable for outdoor performances, the stairway forms pedestrian connections among a complex of government, financial, and office buildings. The jury admired the scale of the project, noting that "it relates well to the monumental buildings across the street."

3. Ritter Park Playground, Huntington, West Virginia; Bohlin Powell Larkin Cywinski, Architects (Landscape). The playground structures, which are set amid a grassy oval-shaped hollow that was once a pond bed, are intended to recall children's building blocks as well as evoke mysterious architectural ruins. "It's just plain fun," said the jury, "and it promises to get better with age."

4. Alpine Square, Walnut Creek, California; Kaplan/ McLaughlin/Diaz, Architects (Nonresidential). Vine-covered trellises and small, recessed windows were designed not only for energy efficiency but also to make the office building more appropriate to its suburban setting. The jury commented on the use of three shades of 6- by 12-inch Italian travertine tile, observing that "the small blocks of stone add a much-needed sense of scale."

5. 1001 Pennsylvania Avenue, Washington, D. C.; Hartman-Cox Architects (Nonresidential). Clad in variegated units of Indiana limestone, this block-long building stands midway between the Capitol and the White House. Belt courses and

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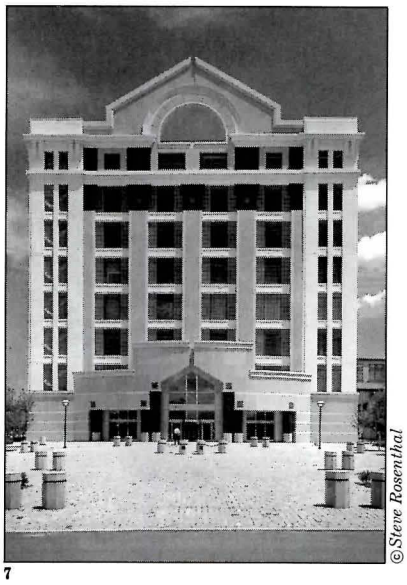

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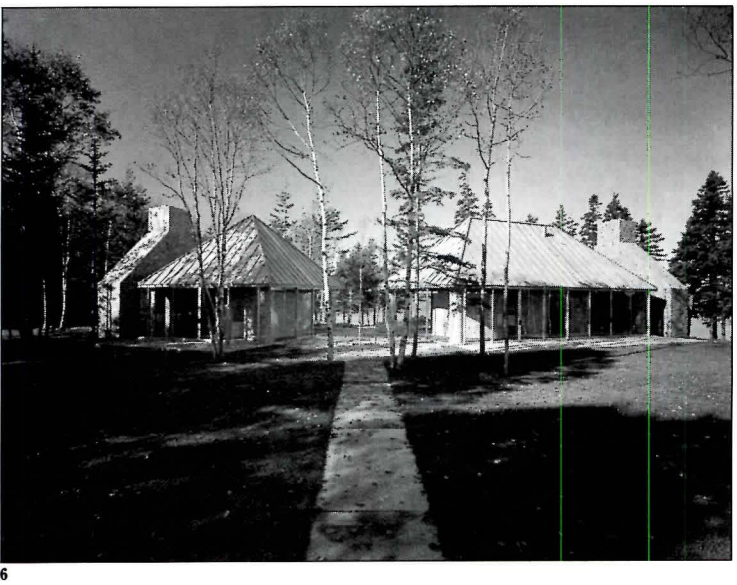

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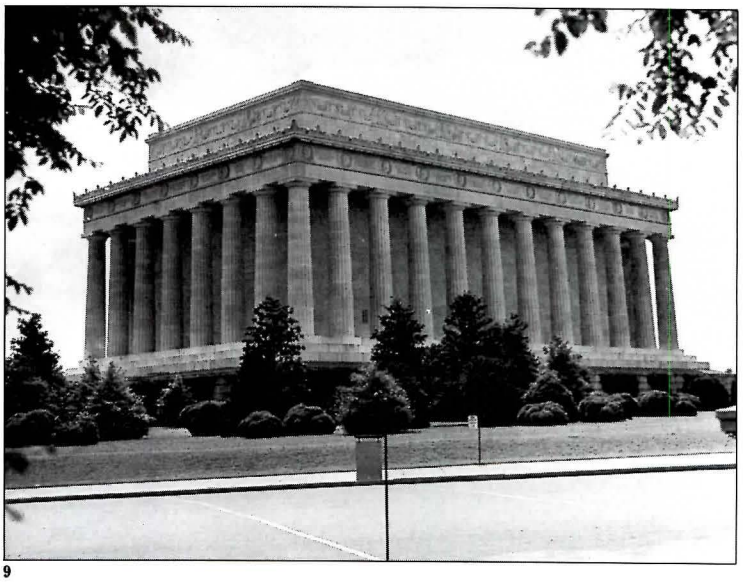

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cornices give scale to the stepped volume, while textured inset wall surfaces add visual interest. The jury pronounced the structure a "truly Washingtonian building," adding that it "skillfully incorporates the existing facades of historic buildings."

6. Vacation House, Penobscot Bay, Maine; Peter Forbes and Associates, Architects (Residential; RECORD, mid-April 1986, pages 140-145). In both of the two pavilions that compose this family vacation compound, massive stone chimneys contrast dramatically with glass walls. Concrete piers at the corners of each structure support trusses spanning all interior spaces. "This very simple project is at the same time sophisticated and beautifully executed."

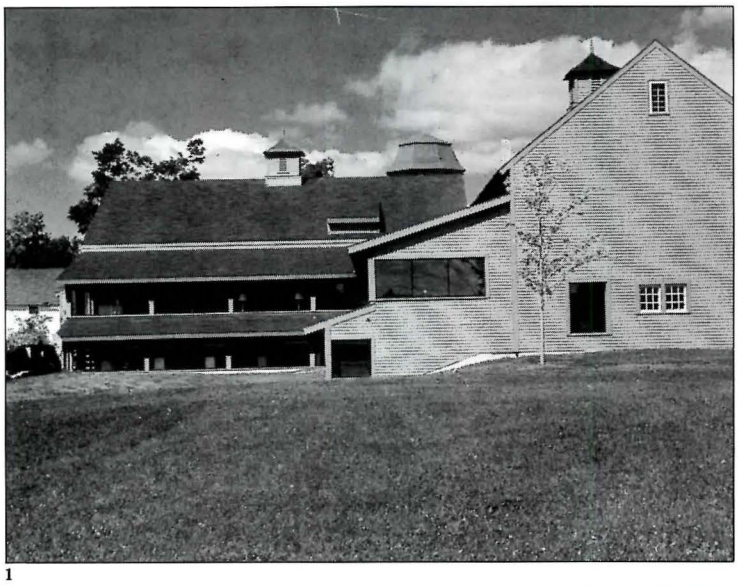
7. Boston Design Center, Boston, Massachusetts; Earl R. Flansburgh + Associates, Architects (Adaptive Reuse). The conversion of a 1919 Army warehouse into a mart and showplace for the furnishings industry included a two-story lobby extension meant to establish a visual transition between the eight-story main structure and a public plaza.

8. 500 Park Tower, New York City; James Stewart Polshek and Partners, Architects (Nonresidential). Located on a narrow Manhattan site, the office-and-residential tower (RECORD, July 1984, pages 86-95) adjoins a 1960 midrise building designed by Skidmore, Owings & Merrill. Utilizing air rights over the SOM building, the present architects were able to create a granite backdrop for the existing glass-and-aluminum curtain wall. A 28-story cantilever interlocks the volumes of the old and new structures.

9. Lincoln Memorial, Washington, D. C.; Henry Bacon, Architect (Stone Structure Completed at Least 40 Years Ago). The presidential memorial, which consists of a granite base, marble exterior walls, limestone interior walls, and a giant marble figure sculpted by Daniel Chester French, was "the obvious choice" in its category.

American Library Association/AIA 1987 Library Building Awards

Six projects received 1987 Library Building Awards, conferred jointly by the American Library Association and the American Institute of Architects. Presented biennially, the awards recognize excellence in all types of library architecture, including academic, public, and private commissions. This year's jurors were Harold Roth, of Roth and Moore Architects, New Haven, Conn.; Frank Hemphill, of the Baltimore County Library, Towson, Md.; Robert Herman, of Robert Herman



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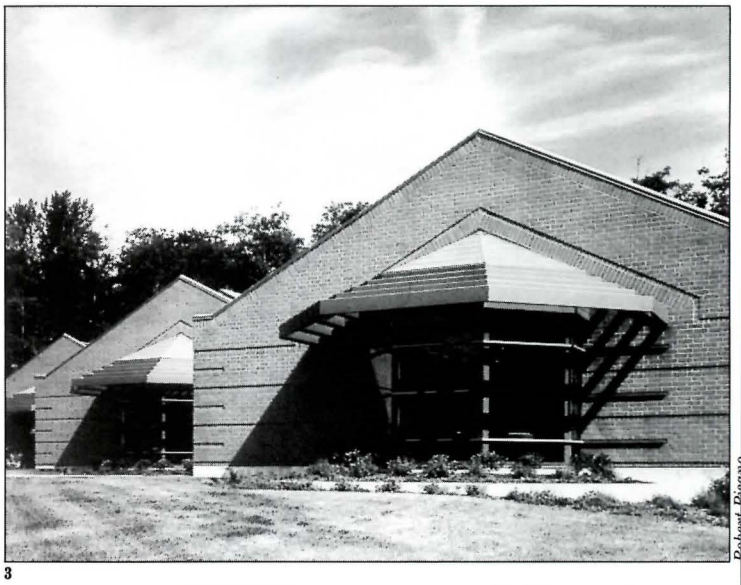

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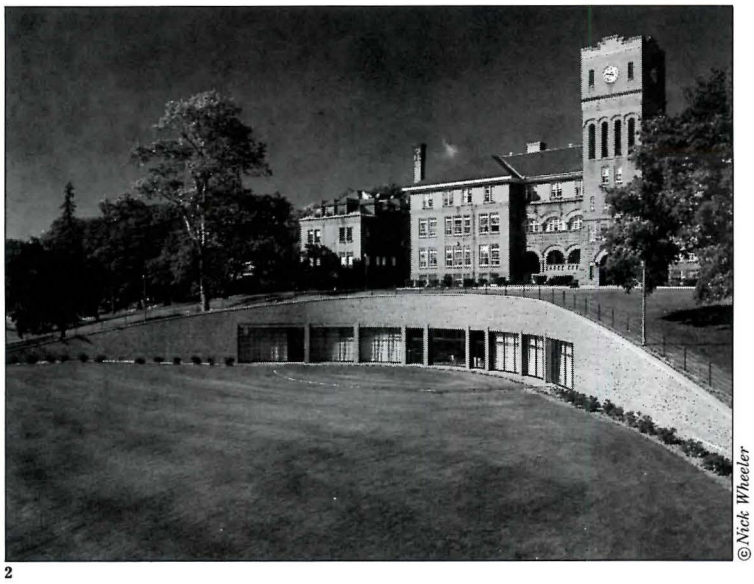

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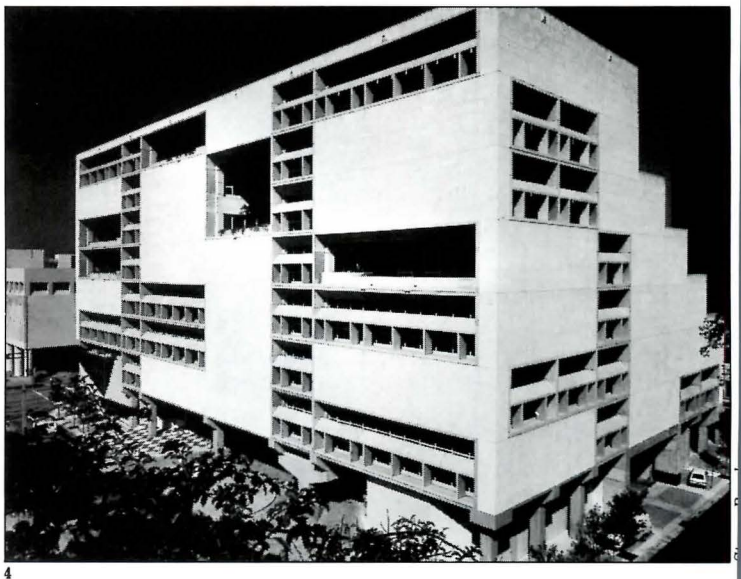

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1. Susan Colgate Cleveland Library/Learning Center, Colby-Sawyer College, New London, New Hampshire; The Burley Partnership, Architects. The jury described the conversion of two pre-Civil War dairy barns into a college library as a "superb example of adaptive use." Entered through a remodeled silo, the facility comprises reading rooms contained in new sheds, which are spanned by hand-hewn timber frames, and book stacks housed in the former barns.

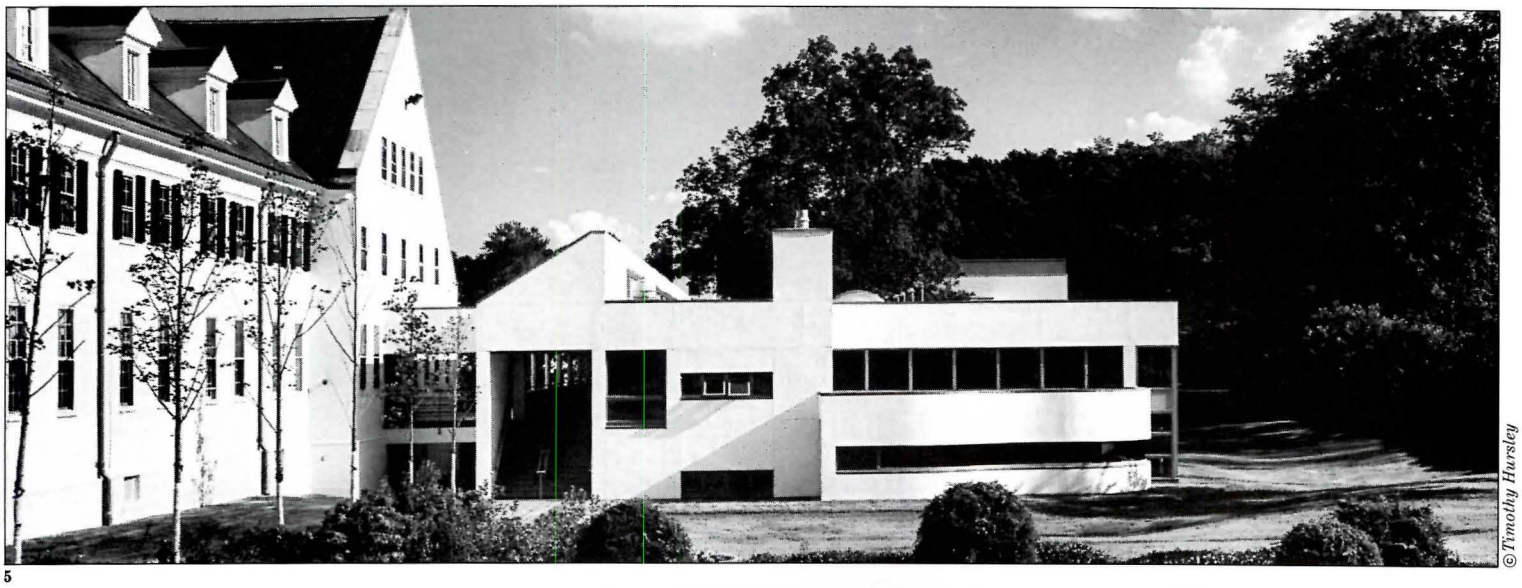
2. Fisher-Watkins Library/ Learning Center, Cushing Academy, Ashburnham, Massachusetts; The Stubbins Associates, Architects. The U-shaped front facade of the 15,000-square-foot subterranean library forms a Modernist plinth for an adjacent Romanesque Revival building. Generous windows admit sunlight and open onto views of the wooded campus. "A blend of outstanding design and functional layout."

3. Fairwood Library, King County Library System, Seattle, Washington; Mithun Bowman Emrich Group, Architects. Pitched roofs, glass-enclosed reading bays, and skylights give a residential character to an urban library.

4. Broward County Main Library, Fort Lauderdale, Florida; Gatje, Papachristou, Smith and Miller, Meier, Kenyon and Cooper, Joint-Venture Architects. South Florida's subtropical climate required recessed balconies and shaded south-, east-, and west-facing

According to the jury, "This open-plan,'classic' library design provides a convenient, accessible, and flexible community library with strong architectural character."

Associates, San Francisco; Pamela Hopkins, of Snowdon & Hopkins Architects, Vail, Colo.; Nolan Lushington, of the Greenwich Public Library, Greenwich, Conn.; and Kenneth E. Toombs of the University of South Carolina, Columbia, S. C.



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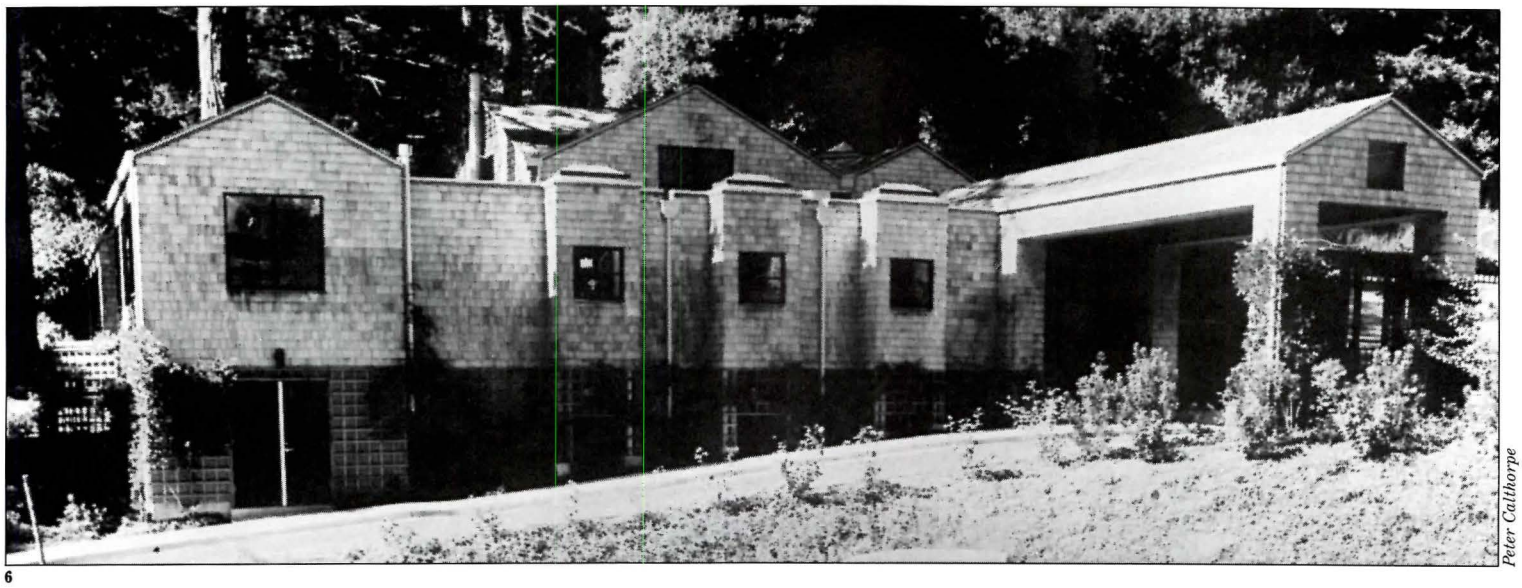

Peter Calthorpe

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windows to minimize penetration of the sun's heat into the interior. The poured-concrete column-and-beam structure of the 265,000-square-foot facility permitted open-plan stacks and reading areas. The jury praised "a spectacular offset opening on each floor [that] creates a natural interior lighting effect while. . . making all areas of the library unusually accessible from any level."

5. Adams Library and Whittaker Science Center, Westover School, Middlebury, Connecticut; Gwathmey Siegel & Associates, Architects (RECORD, February 1985, pages 124-133). Adjoining an arcade adapted from an existing 1909 cloister, Gwathmey Siegel's complex links new and old portions of the campus. The interior affords a variety of study spaces; the card catalog and teaching areas occupy an upper level overlooking reading tables below. The jury lauded the "masterful use of natural light," remarking that "light from the side and indirectly from above bathes book-lined surfaces, balancing interior and exterior light levels."

6. Boulder Creek Library, Santa Cruz City-County Library System, Boulder Creek, California; Peter Calthorpe, Architect. Wood siding and latticework, gables, decks, skylights, and a variety of differently shaped windows create a rustic lodge-cum-library appropriate to its setting in a grove of redwoods. Visitors find "a relaxed atmosphere conducive to reading and thought."

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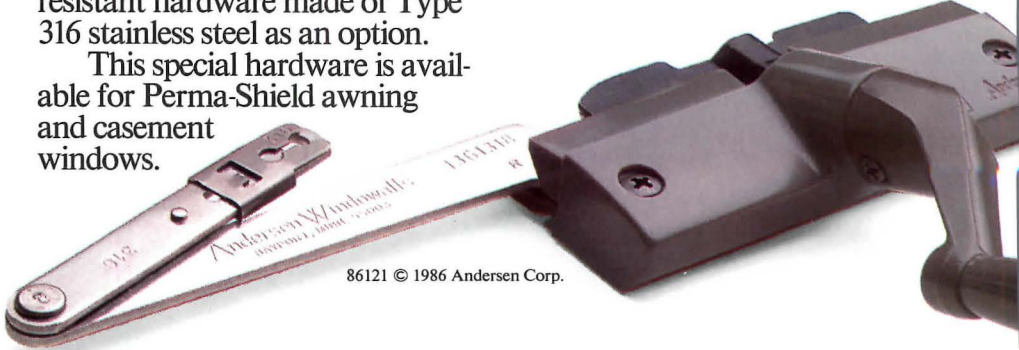


Le Corbusier at 100: Conversations on his legacy

As the centennial year of Le Corbusier's birth draws to a close, we present two articles that re-examine the French architect's distinguished career. Roger Kimball focuses on the Le Corbusier legacy through interviews conducted recently with several American architects. Thomas Matthews offers a re-evaluation of Le Corbusier's urban theories, based on a visit earlier this year to the garden city that Le Corbusier designed at Pessac, near Bordeaux, in 1923.

By Roger Kimball

October was the centenary of the birth of Charles-Edouard Jeanneret, better known by the aristocratic-sounding sobriquet that he adopted from his mother's ancestors when he was 33—Le Corbusier. It is only natural that architects, critics, and, indeed, anyone concerned with the development of modern art and culture should pause to reflect on the legacy of this acknowledged giant of 20th-century architecture.

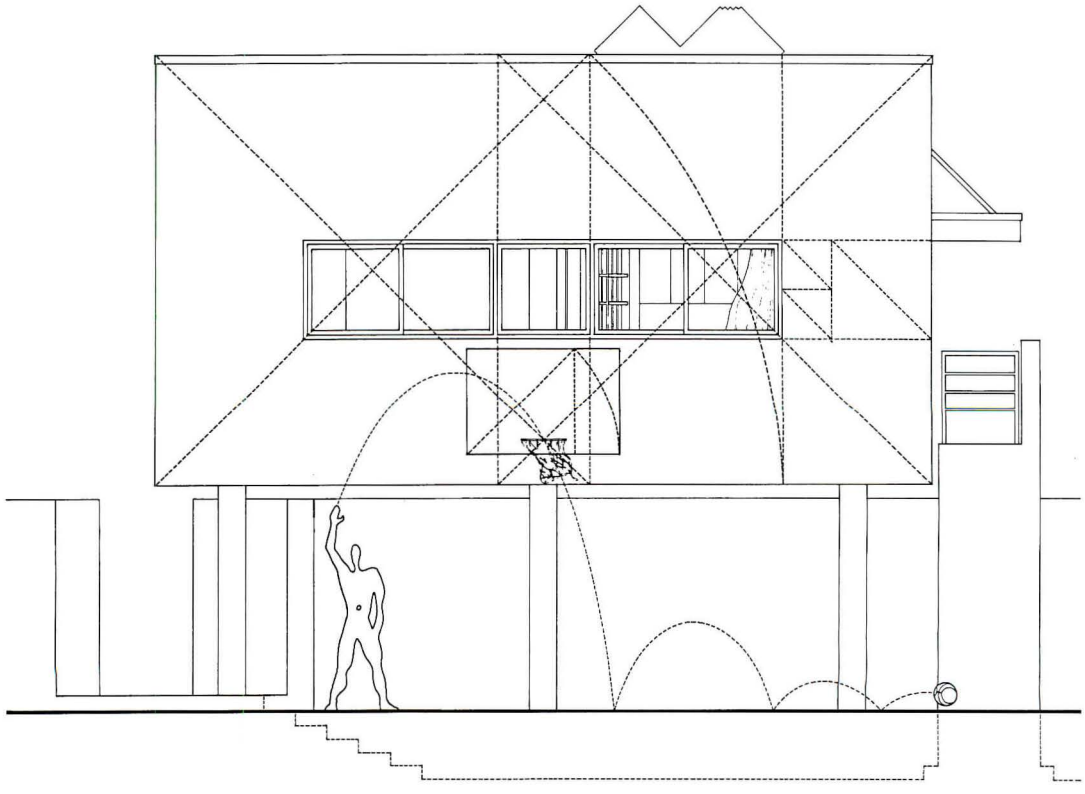
In many ways, the Swiss-born French architect is the most enigmatic of the great Modernists. By the time he died in 1965, he had been hailed for his dazzlingly original architectural forms, but had also been excoriated for what many have charged are brutally functionalist ideas about urban planning. His influential theories have been championed as pioneering a truly "classical" Modern architecture and denounced as obscurantist ramblings or public-relations hype. Architectural monuments such as the Villa Savoye, the chapel at Ronchamp, and the Parliament at Chandigarh have clearly emerged as masterpieces of the age, while his Plan Voisin—the notorious proposal to "reconstruct" the center of Paris by replacing its maze of twisted streets and ramshackle buildings with a series of towering skyscrapers, vast esplanades, and broad, straight boulevards—continues to be held up as the epitome of all that is crude and insensitive about modern city planning.

What, then, is Le Corbusier's current place in the architectural firmament? There can be little doubt that his visible influence on the shape of architectural practice has declined in the 22 years since his death. Has he receded into the textbooks and ceased to be a living presence for contemporary architects? Or do his ideas and principles continue to be a source of inspiration, provocation, and even contention? What is living and what is dead in Le Corbusier's legacy? In an effort to get a better sense of what—if anything—architects are thinking about him today, I recently spoke with some dozen, mostly younger, architects across the country. Their informal replies, while representing a wide range of architectural taste and opinion, suggest that Le Corbusier does indeed continue to be an inspiration, but not always in ways that are immediately apparent—or, one suspects, that the master would necessarily have approved.

Most of the architects I spoke with were introduced to Le Corbusier in architecture school. Several mentioned Colin Rowe, the distinguished critic and historian whose essays and teaching at Cornell University were instrumental in bringing Le Corbusier to life for a whole generation of American students. Some first encountered Le Corbusier's work on architectural tours of France in their early 20s, and the experience was almost always a revelation. Rob Wellington Quigley, who practices in San Diego, recalled that when he first saw Le Corbusier's chapel at Ronchamp, "it was like walking into one man's soul."

Yet it seems that the revelatory force of Le Corbusier's influence may be waning. Alan Chimacoff, an architect from Princeton, N. J., speculated that older architects are more deeply influenced by Le Corbusier than are those just beginning to practice, who, in his observation, tend to consider Le Corbusier a historical figure and relegate his buildings to a chapter in architectural history. And Thomas Beeby, who practices in Chicago and is dean of the architecture school at Yale University, noted that most of his students seem to concentrate on Le Corbusier's late work and to regard him primarily as a "pure artist" rather than as a practical architect who propounded a vital theory of architecture and society.

Almost all the architects I talked with distinguished between Le Corbusier's sometimes idiosyncratic formal vocabulary and the underlying principles that animated his architectural practice. For example, Antoine Predock, of Albuquerque, spoke of a "power" and "palpable spirit" in Le Corbusier's architecture that could not be reduced to his "formal moves" or compositional tricks. Similarly, Rob Quigley noted that Le Corbusier's influence has little to do with



An American homage to Le Corbusier, by Anthony Ames.

Roger Kimball, a frequent contributor to RECORD, *also writes for* The New Criterion, The London Times Literary Supplement, Commentary, *and other publications.*

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any particular "stylistic conceits." In Quigley's view, the real lesson of Le Corbusier's buildings is that his architecture is always best appreciated emotionally.

More generally, Fred Koetter of Boston distinguished between Le Corbusier's visual effects and his fundamental architectural principles, which Koetter, like many others, described as "classical." Despite the familiar images that we associate with Le Corbusier's name, the architects were in general agreement that, to quote Peter Forbes, also of Boston, "fashion was irrelevant" for Le Corbusier. What mattered were the underlying principles of composition that transcend any particular forms. As Le Corbusier himself put it in what is possibly his second most famous slogan from *Vers un Architecture*: "Architecture has nothing to do with the various 'styles'." (The most famous surely is his much maligned and misunderstood section heading from the same book: "A house is a machine for living in.")

The one definite compositional innovation that the architects alluded to again and again concerned Le Corbusier's liberating handling of space, in particular his development of the open plan in his houses of the 1920s. In this context, Thomas Beeby referred admiringly to his masterful "sense of space" and "plasticity of form." And it is worth noting that the appeal of Le Corbusier's spatial composition does not depend on the beholder's professional training. Cathy Simon, who practices in San Francisco, tells the charming story of touring Le Corbusier's buildings in Paris with her four-year-old daughter, who declared the Maison La Roche to be her favorite building because "you could be everywhere at once." I do not believe that anyone with a degree in architecture could have put it better.

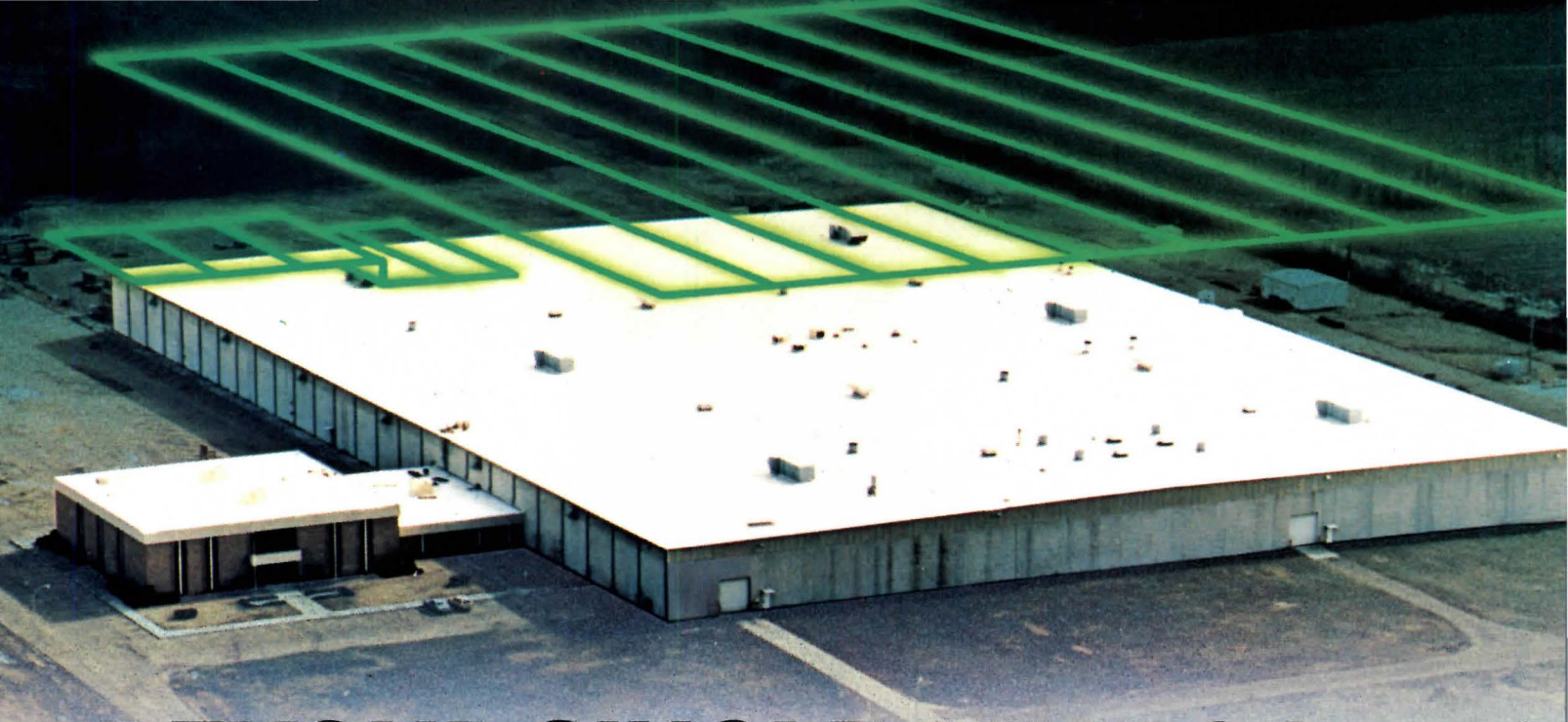
Le Corbusier is known as much for his proselytizing and his architectural theories as for his individual buildings. From his early celebration of "The Engineer" to his elaboration of "Modulor" proportions in the 1950s, his theoretical writings always sought to grapple with the fundamental principles of modern architectural design. His prescriptions, as he put it in 1926, "in no way relate to esthetic fantasies or striving for fashionable effects, but concern architectural facts that imply an entirely new kind of building, from the dwelling house to palatial edifices." And it is also worth noting that his allegiance to theory never degenerated into a slavish pedantry. For example, as architectural historian William Curtis observes in his excellent new study of the architect, *Le Corbusier: Ideas and Forms*, "he never hesitated to ignore the Modulor if it got in the way of a proportion that his eye told him was just right, and was furious when he found some of the less talented members of his atelier justifying atrocities on the grounds that they were being 'Modulor'."

What is the relation between theory and practice in Le Corbusier's work? Some of the architects I spoke with, such as Alan Chimacoff, found they formed an "inextricable duo," even if the theories were often laced with irony and playfulness. Others discerned a disjunction between the theories and the buildings. Thomas Beeby, for example, criticized the "utopian vision" expressed in Le Corbusier's writings, and complained they were often a form of intellectual "posturing." Most conceded that Le Corbusier's ideas about architecture were an essential guide to his achievement, but felt, as the New York architect Tod Williams put it, that "in the end it was the *work* that is the true text."

On Le Corbusier's urban theories there was a fair amount of agreement. "Disastrous," said Rob Quigley. "Very problematic," said Fred Koetter. "Abysmal," said Alan Chimacoff. "His greatest influence and his worst influence," observed Cathy Simon. "Architecture in the guise of social planning is always extremely dangerous," said Antoine Predock, who described Le Corbusier's urban ideas as "a big mistake" that contributed to the urban "lobotomies" of the 1960s.

Yet even here there were dissenting voices. For example, both Anthony Ames, of Atlanta, and Tod Williams noted that the usual criticisms of Le Corbusier's urban ideas—that they are dictatorial, oblivious of tradition, "anti-contextual," and so on—have tended to view them out of context and to blame Le Corbusier for depredations committed by others in his name. Similarly, Peter Forbes cautioned that it was too soon to arrive at a final judgment about Le Corbusier's urban theories, and that they must be seen in the context of the enormous social problems that they were formulated to solve: the devastating aftermath of World War I, the abominable sanitary conditions of Paris in the 1920s, the unprecedented effects of industrialization on the urban fabric. To quote Curtis again: "That Le Corbusier's urban model contained basic flaws is beyond question, but some alternative to a critical urban situation was needed. He prophesied with uncanny precision the building types and transport systems that would dominate the industrial cityscapes of the future and tried to give them order and the enrichments of nature. However, it would be a little too easy to blame him for every banal modern downtown full of crude high-rises surrounded by a wilderness of parking lots. Centralization, real-estate profiteering by means of tall buildings, dumb urban renewal, massive traffic schemes cutting through old fabric—surely these would have happened without him."

Poet and rationalist, architectural visionary and tyrannical social utopian: the Le Corbusier who emerged from my conversations was a compact of apparently irreconcilable impulses. But as the observations of these architects suggest, one should not be too hasty in delivering critical judgments about Le Corbusier's contribution to Modern architecture. In attempting to assess his achievement, one's best counsel is caution. In many ways, we are still too close to Le Corbusier to be able to untangle his complications and ambiguities with assurance, not least because to a great extent they also remain *our* complications and ambiguities. His guiding ambition—and perhaps his lifelong frustration as well—was to forge an architecture that remained rooted in the classical tradition, but that faced up honestly to the contemporary exigencies of mass population, industrialization, and technological advance. It is not at all clear that his rivals and successors have done better by this stringent ambition than Le Corbusier himself did. As the distinguished literary critic Northrop Frye observed, when one is "up against something the size of Shakespeare," it is less the artist than we ourselves who are being judged: our own provincialities, prejudices, imperfections of taste. In the world of modern architecture, Le Corbusier has as legitimate a claim as anyone to that surpassing stature.



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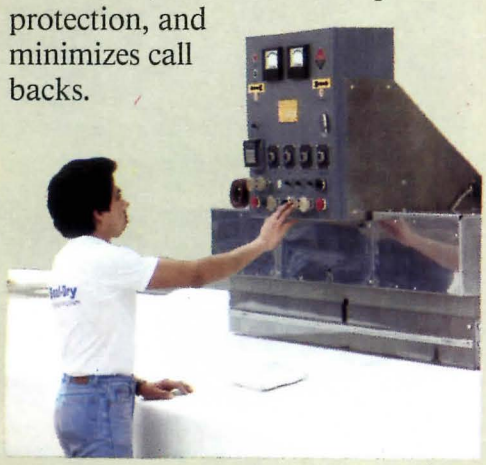

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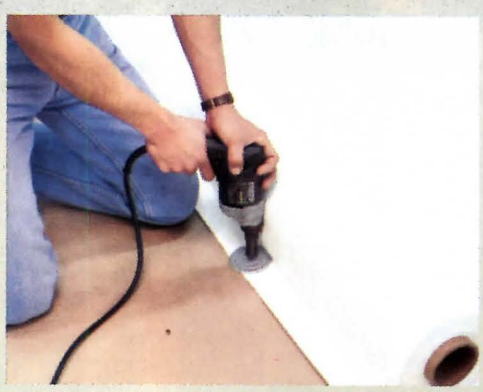

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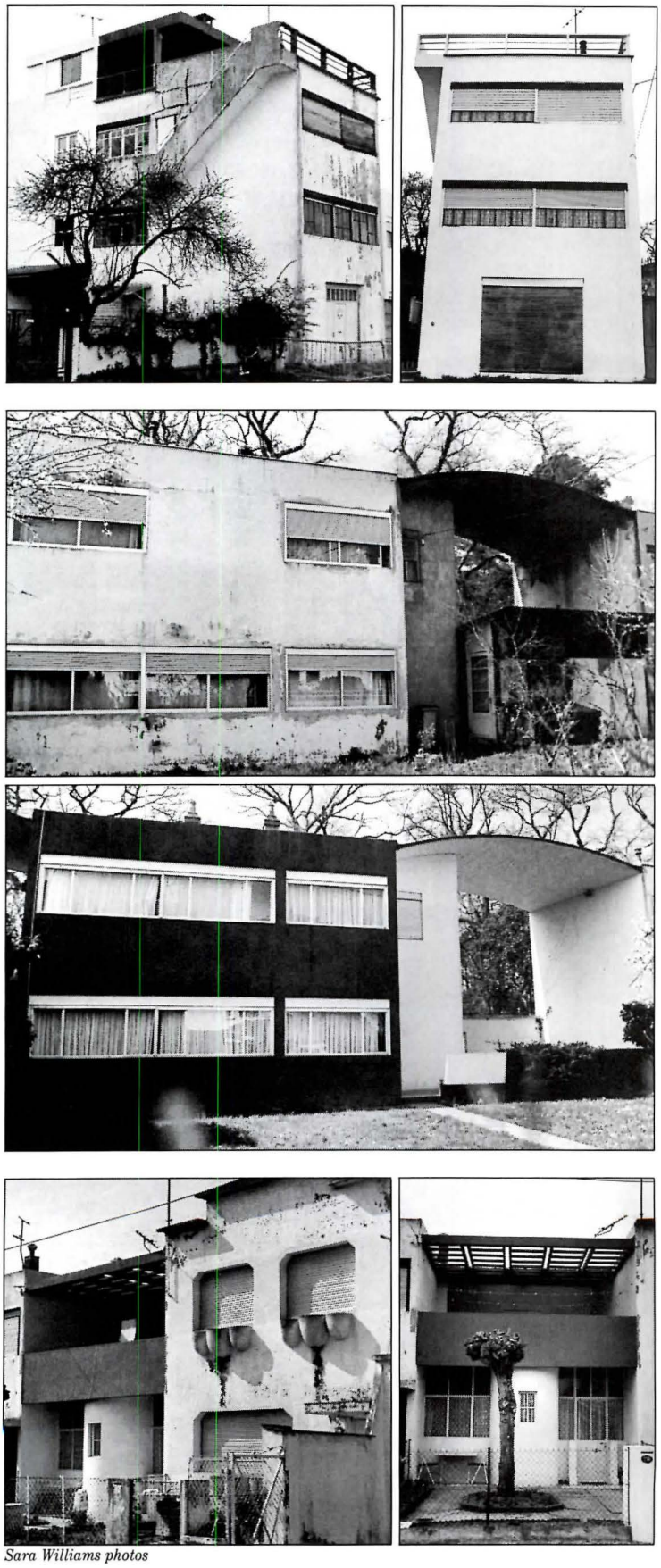
Le Corbusier's Pessac: An experiment in urbanism continues

By Thomas Matthews

In 1923, Henri Frugès, a French sugar manufacturer, engaged Le Corbusier to build a garden city for worker housing in Pessac, near Bordeaux. Crippled by construction setbacks and community hostility, the project was a disaster, and only the poorest tenants, enticed by easy financing, could be persuaded to move in. But time changes judgments. In 1980, a house restored to its original specifications was declared a national historic monument; in 1984, the town of Pessac acquired another to rehabilitate as a museum for the project and its protagonists. Does this late recognition of Le Corbusier's accomplishment imply a validation of his architecture and urban theory? After 60 years of empirical testing, perhaps one can draw some conclusions.

The man who financed the "Quartiers Modernes Frugès" (QMF) was an artist and a visionary. He wrote Le Corbusier, "I authorize you to realize your theories in practice, even in their most extreme consequences. . . . Pessac will be a laboratory." Those theories had developed from the Domino prototype (1914) to the Cité Contemporaine (1922), and Pessac was their first extensive test. In 1924, 10 prototypical houses were built for Frugès's employees near Lège. Le Corbusier dreamed of "a construction site become a factory," where concrete guns filled iron-reinforced molds in modules five meters square—standard components for his *machines à habiter*. But the novel techniques were difficult to master, and when construction began at Pessac in 1925, the concrete was already failing in the roofs at Lège. Building costs doubled, and two-thirds of the QMF project was abandoned.

Thomas Matthews is a freelance architectural writer who lives near Bordeaux, France.



Sara Williams photos

Views of Le Corbusier's three housing types at Pessac include unrestored and restored "skyscrapers" (top photos), unrestored and restored "arcades" (middle), and a pair of unrestored "quinconces" (bottom).

Fifty-one houses were erected, in three types: two-story "arcades" linked by concrete arches over open terraces; two-story "quinconces" built in compact rows, alternating in their orientation to the street; and three-story, two-family "skyscrapers." Identical in their elements, the types varied markedly in their composition. The arcades balanced mass and void, while the skyscrapers opposed their cubist volumes to the linear ensembles of the quinconces. Selected walls were painted light green, blue, brown and white (Frugès's idea), articulating the abstract planar unity of the QMF as a whole.

The houses conformed admirably with Le Corbusier's Five Points of Modern Architecture. All were meant to have roof gardens (abandoned in the arcades), all had banded windows extending the width of the facades, and, in the skyscrapers, *pilotis* lifted the main floor one level above ground. Inside, service areas were kept to an efficient minimum, while living spaces were defined only by open stairs rising through the center of the house. Floor space averaged 750 square feet, which was generous for the era and the anticipated prices. But the public responded with derisive references to sugar cubes and Arab souks, and in 1930 Frugès went bankrupt.

As years passed, Pessac's inhabitants transformed their houses, building gabled roofs and shuttered windows, walling open spaces, adding rooms. Like a costume party gone wrong, a ragtag individuation masked the quarter's indentity, as if to reconcile it with the wider world. Then, in 1973, William Heraud, a Corbu enthusiast, moved to the QMF. With the guidance of architect Christian Gimonet, director of the Fondation Le Corbusier, Heraud restored an arcade to its original design. The house was classified a national

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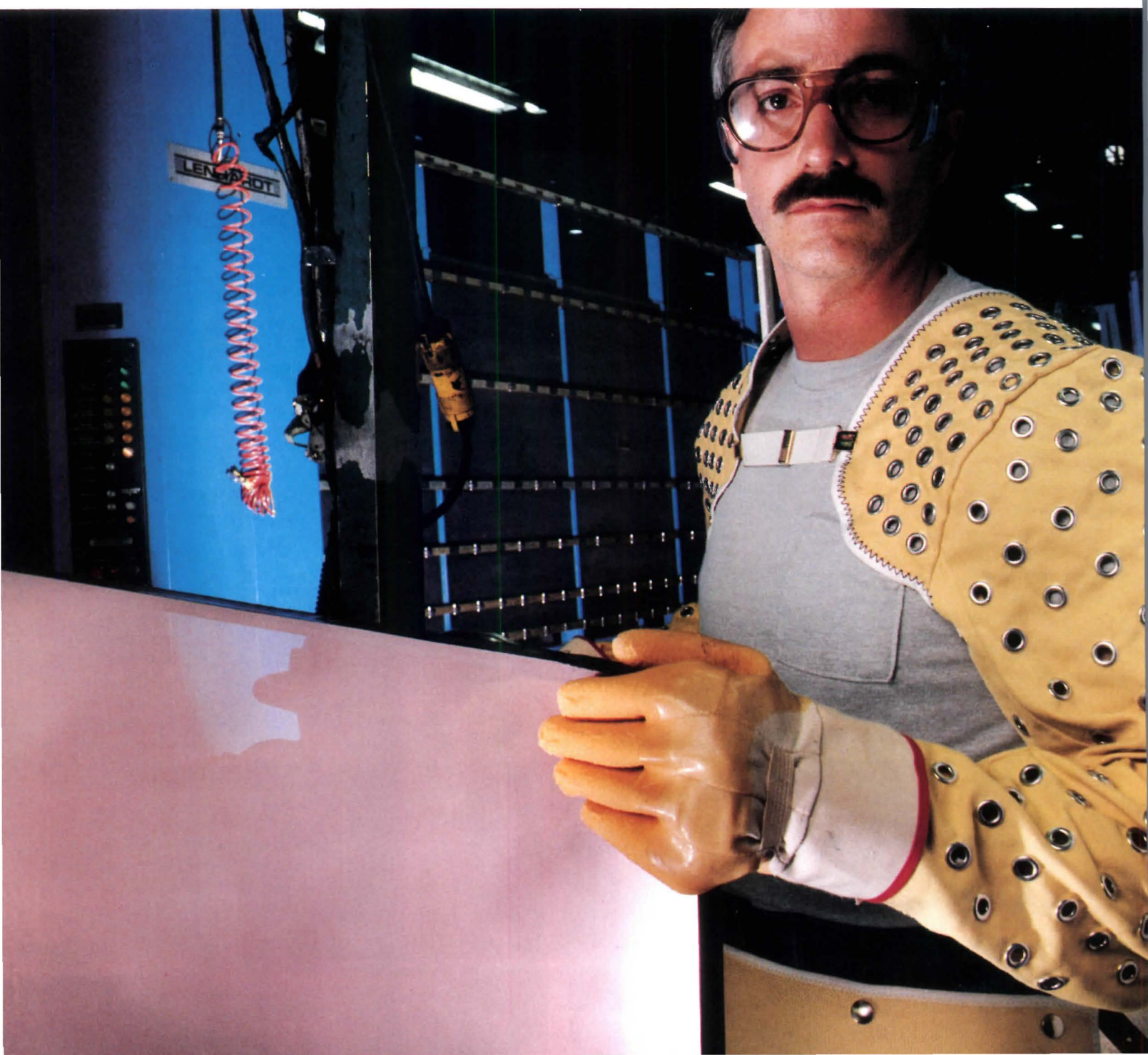

historic monument, and a rule monitoring its surroundings brought the entire QMF under protective regulation. Pessac's future is no longer a matter of chance.

Although most QMF residents would welcome rehabilitation if funding were provided, some have rushed to make changes before rulings prohibit them. Because the safeguard/rehabilitation project has little power and less money, current plans are modest. The municipality has bought a skyscraper, degraded but unaltered, which it will use as a laboratory for restoration techniques and eventually convert into a museum. For the QMF, the first priority is to repair the public space—i.e., bury electrical lines, rebuild original fencing and mailboxes, and replant shrubbery. Owners will be encouraged to maintain or restore original volumes and colors and will be prevented from undertaking any additional alterations. Ultimately, assistance may be given to recreate interior plans as well. As the QMF gradually returns to Le Corbusier's original design, the architect's vision will become clearer to modern eyes.

Pessac has survived. But has it been vindicated—or does the very need for rescue demonstrate the failure of its animating theories? Le Corbusier maintained that "it is possible to build well-organized houses if the inhabitants will adapt their mentalities to them." Do the intervening transformations imply a rejection of his architecture? Philippe Boudon, in a 1968 study, claimed that the designs permitted, even governed, these changes as the interaction between house and inhabitant articulated evolving needs. Brian Brace Taylor, curator of a 1972 FLC exhibition on Pessac, disagreed, asserting that the architect's "absolutely meticulous" designs manifest his desire to control the project in its smallest details.

Both views are partial. Architecture is surely more than habitable sculpture, and the true relation of form and function materializes through use. Inhabitants respond to forces imbedded in a design by adjusting the structure. This dialectic completes what the architect can only project. Not all such reaction can be attributed directly to the dynamics of design, however, for no architecture is a completely closed system. The QMF tests three hypotheses at once: industrial construction, Modern architecture, and rational urbanism. Evaluation of their results must distinguish accidents from those effects that truly issue from each experiment.

Le Corbusier wanted Pessac to demonstrate the cost-efficiency of houses built like machines. But their integrity was compromised by inadequately tested techniques and incompetent installation. The most advanced architectural elements were structurally the weakest: roof terraces weren't watertight, and metal windows didn't fit in the concrete walls. Jean-Luc Veyret, a Pessac architect working for the rehabilitation project, concludes that most transformations simply repaired building flaws. The failures of Le Corbusier's pioneering construction both diminished the impact of his architectural innovations and obscured their effects.

Certain transformations can be read as direct responses to the houses' designs. Negative changes include widespread construction of interior corridors—echoing typical regional architecture—which stifled the free plan. But the rooms designated *parloirs* had no equivalent in traditional French distribution, and their nature seems less functional than poetic. Can modification of space so purely potential be considered rejection? Pitted against their inhabitants' reluctance to "adapt their mentalities," the QMF houses were neither convincing nor coercive enough to prevail. But Le Corbusier's architecture was more flexible than his rhetoric. His buildings offered significant adaptable space, and if its appropriation deformed esthetics, it ensured survival.

Le Corbusier's urbanism, perhaps the least obvious component of the QMF design, has had the most perceptible impact. His theories demanded a systematic restructuring of traditional public and private space by dissolving the corridor/barrier of the street. The QMF retained conventional streets (including a rue Le Corbusier), but their properties were subtly undermined. Open spaces under the skyscraper *pilotis* and through the arcades set up competing transparencies. Principal entrances alternatively faced street and garden. The polychromy ignored the unities of house and street in a composition that linked the community as a whole. Suave, almost sly, Le Corbusier achieved the effect of tower and plaza in this modest garden city.

Though consistent transformations demonstrate the power of this urban scheme, systematic resistance questions its principles. Owners have deformed the "rear" skyscrapers in order to make entries visible from the street. The open ground-floor spaces in the quinconces, uniform with respect to their plans, have been appropriated differently according to their location on the street (shed, entry) or garden (toilet). But the architect's influence has also been absorbed. The view from a skyscraper roof garden shows a striking blend of density and privacy, a syncopated visual rhythm reflected in the individuality the community allows its residents, and the unity it presents to the external world—features noted in every survey of the quarter.

Most current critiques of Le Corbusier's work celebrate the sculptural quality of his architecture while dismissing his urban theories. But a close reading of the QMF's history suggests that his urbanism has had a powerful effect on the community's everyday life. Exclusive focus on its esthetics will miss the point. Rehabilitation should intervene where accidents impede direct interaction between inhabitant and architecture, but it should avoid stifling that interchange for the sake of safeguarding some abstract authenticity. A proposal to congeal the quarter like a latter-day Williamsburg was considered, but rejected for financial reasons. One suspects Le Corbusier would have vetoed it on moral grounds, preferring the uncertainties of the laboratory to the museum's airless embrace. After all, it was Pessac that prompted his admission, "It is always life that is right, the architect who is wrong."

Pessac is a family neighborhood, where children ride bicycles and old men rake leaves. Domestic touches range from birdbaths to chicken coops. The houses are cubist Gullivers, pinned by ornament to the past, their dignity preserved by the architecture's compact strength. Gentrification has begun—the effect of new money on old houses is evident—but the response to Le Corbusier, if more affirmative, remains ambivalent. Heraud's arcade house is startling, with its reddish-brown facade and light green trim, but its unity is compelling: this is the original; the rest, variations on the theme. Can it conduct the quarter to harmony? The experiment is clearly still underway.

How to get blemish-free surfaces in strong, natural light.

Open design is a popular concept. Glass curtain walls, large expanses of windows, skylights, lofted ceilings—all flood interior surfaces with strong, natural light.

Such critical light conditions can accentuate even slight surface variations, either across the face of the panels, in treated joints or over fastener heads. Butt end joints, for example, are more difficult to conceal because they have no recess or taper like gypsum panel edges. And the exposed paper on the cut ends may become wet, expand and cause visible ridging or beading.

Another problem aggravated by critical light is "joint banding" or "photographing". Here, drywall surfaces that have been treated with joint compound show through with color and sheen variations after painting. The cause is the difference between the surface texture and suction (porosity) of gypsum panel face paper and the finished joint compound. Glossy paints typically magnify both of these problems.

Under these critical light conditions, gypsum panel surfaces require special treatment to assure attractive, blemish-free surfaces.

What's the best way to conceal butt joints? Advance planning will help. By using the longest practical panel lengths, the number of butt end joints is kept to a minimum. Where they do occur, end joints should be staggered, not centered on a wall, and not above doors and windows. To minimize ridging of butt joints, bevel the gypsum panel ends approximately ⅛″ at a 45° angle with a sharp utility knife before applying them. Also, peel back and remove any loose paper from the end. Gypsum panel ends should be loosely butted together. Finish the butt joint at least twice the width of a recessed edge joint.

Is the placement of gypsum panels with respect to light direction important? Yes. In the best installations, the gypsum panel (edge) joints run parallel with the direction of the light. But natural light changes directions and there are always butt joints somewhere. Extra care and quality workmanship are still needed.

Such as care in sanding? Right. Paper roughened by sanding has raised fibers that will show up after painting when the light is strong. For best results: finish the joint compound as smoothly as possible so that little or no sanding is required; use sandpaper or mesh cloth with grit as fine as possible; and do not scuff the gypsum panel face paper during sanding.

Special note: All surfaces must be ***completely dry and dust-free*** before decorating.

After sanding, then what? A skim coat of joint compound over the entire surface is the best way to minimize surface defects. Skim coating fills in imperfections, smooths the paper texture and gives a uniform surface for decorating. Skim coating should be incorporated in architectural specifications included in the performance bid. And if gloss paint is to be the finish coat, a high-quality primer/sealer should be applied over the skim coat.

If skim coating is not done, what is recommended? Use SHEETROCK® First Coat or a good quality, undiluted flat latex paint with high solid content to prime the entire surface before decorating. SHEETROCK First Coat is a latex basecoat paint designed specifically to minimize "joint banding" by equalizing the differences between the surface texture and porosity of the gypsum panel face paper and the finished joint compound. A further step is to use a textured rather than a smooth finish. This method produces a deliberately irregular surface that helps mask imperfections and diffuse light across surfaces.

Any other tips? There is no substitute for frequent job inspections after the gypsum panels are installed, when the joints are being treated, and before the surfaces are decorated. These inspections show whether the manufacturer's directions are being followed and whether good workmanship is being practiced.

These recommendations are based on field experience and testing at the USG Research Center. For more information, write **United States Gypsum Co.**, 101 South Wacker Drive, Chicago, IL 60606-4385, Dept. AR1187.

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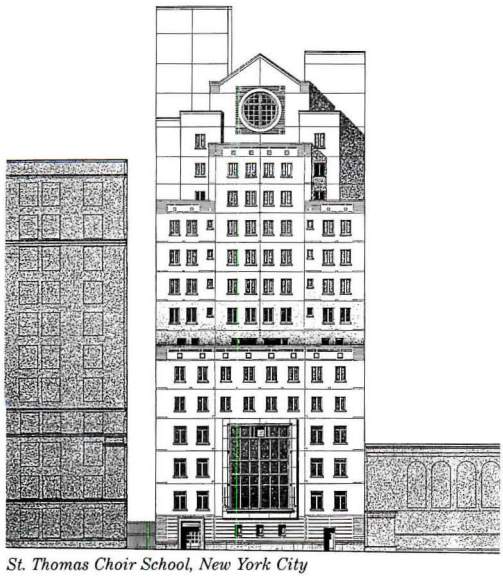
Group consciousness

During a panel discussion on the current state of architecture at this year's AIA national convention in Orlando, *New York Times* critic Paul Goldberger observed that architects are designing too many "foreground buildings," and he rightly suggested that our cities have suffered for it. Many architects, afraid of being criticized (or ignored) by the press for producing boring architecture and encouraged by developers seeking a highly marketable design statement, engage in a visual shouting match, at times extolling a thin "contextual" veneer of some arbitrarily chosen historical mode to justify overscaled, poorly planned, or esthetically dissonant work. Cities bent on maintaining a secure property-tax base contribute to this increasingly cacophonous state of affairs by allowing developers to shoehorn larger and larger structures into smaller and smaller sites. What municipal officials preoccupied with the bottom line too often forget is that any city's most valuable physical asset is its urban fabric—the network of streets lined with sympathetically scaled *background* buildings. And what would-be virtuoso architects frequently overlook is the subtle, yet lasting, satisfaction that can come with applying the unwritten rules of common sense.

This month's Building Types Study on urban infill focuses on three buildings that exemplify the power of architectural understatement. Faced with complicated programs and tightly constricted inner-city sites, the architects of these projects have produced designs that at once defer to the style, scale, and materials of neighboring structures and assert their own distinctive, albeit muted, voices. Among the three buildings, the condominium-tower addition that Richard Henriquez & Partners designed for a venerable hotel in Vancouver (pages 108-111) is perhaps the most obvious proof that sensitive urbanism and intriguing architecture are by no means mutually exclusive. More quietly compelling are the new museum that Booth/Hansen & Associates has inserted unobtrusively among the elegant shops of Chicago's North Michigan Avenue (pages 112-115), and the private choir school that Buttrick White & Burtis designed for a side street in midtown Manhattan (pages 116-119). Beyond anything else, these buildings remind us that major monuments are not the only measure of a city's—or an architect's—greatness. *Paul M. Sachner*

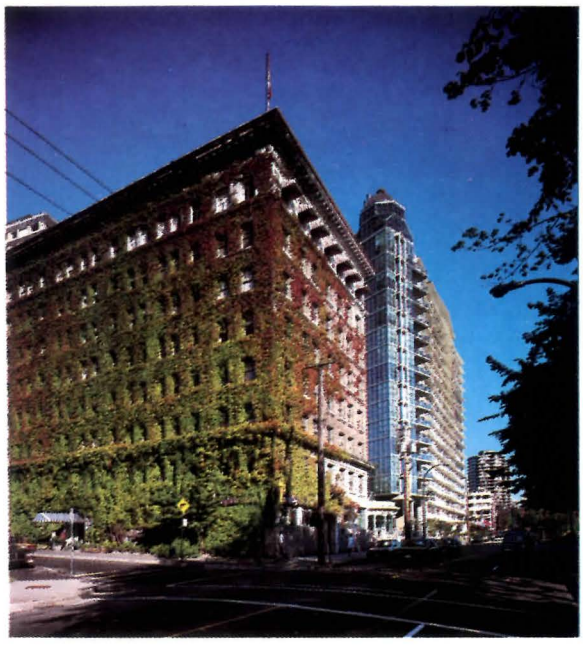


St. Thomas Choir School, New York City

Addition to the Sylvia Hotel
Vancouver, British Columbia
Richard Henriquez & Partners,
Architect

A slice of history

Simon Scott photos



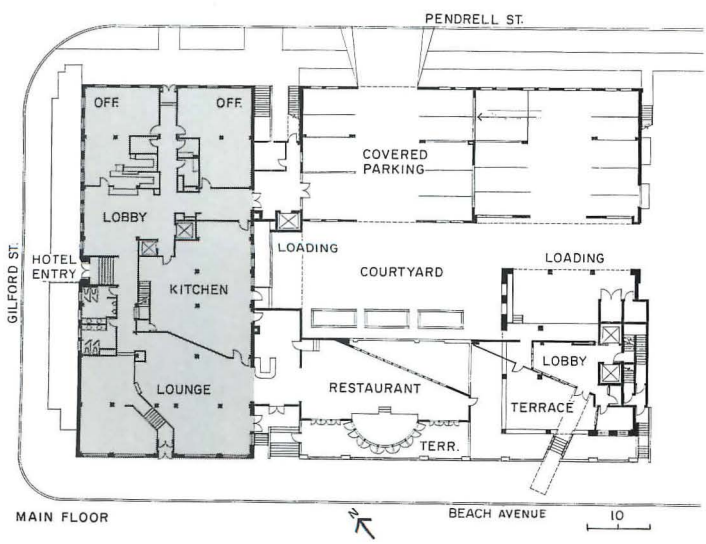
Vancouver is on most levels an estimable city—a gracious, cosmopolitan metropolis where the parks are unimaginably lush, the streets impossibly spotless, and the public transportation improbably efficient. Nowhere are the Canadian city's charms more apparent than in the West End, a classic in-town residential neighborhood sandwiched between the central business district and Stanley Park. During the last 30 years, as the West End evolved from a community of single-family dwellings into an enclave of high- and low-rise rental apartment houses, the area lost many of its early 20th-century landmarks. One significant, if atypical, survivor of the postwar building boom is the Sylvia Hotel, an eight-story ivy-covered palazzo that began life in 1912 as a luxury apartment house but was converted into a transient hotel during the 1930s.

In recent years the Sylvia's slightly shabby, but by no means seedy, atmosphere has continued to appeal to tourists seeking accommodations along the curved esplanade fronting English Bay. A persistent problem, however, was on-site parking—just 20 spaces for 100 rooms—and in 1983 the hotel's long-time owner Norman Sawers asked Richard Henriquez & Partners to develop a proposal for two adjacent 66-foot-wide lots that would incorporate a 110-space underground garage, 16 additional guest rooms, and an expanded restaurant—all of which would be subsidized by income derived from a new 17-story, 14-unit condominium tower.

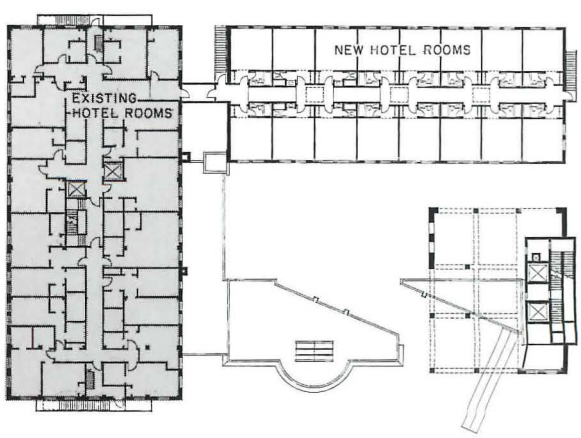
The resulting 50,000-square-foot building ensemble responds both to a variety of specific conditions in its surroundings and to Richard Henriquez's more generalized interest in what might be termed "historical overlay," as a way of mediating between past and present. There are, to be sure, some rather literal visual references to the Sylvia's neo-Renaissance architecture, especially on the bow-fronted restaurant pavilion and two-story guest-room/garage wing, where rusticated concrete facades and sheet-metal cornices echo the proportions of the old hotel's terra-cotta detail. The beige brick cladding, punched windows, and modillioned cornice of the condominium tower similarly refer to the original Sylvia, but here Henriquez indulged in more than another exercise in archaeological replication. He has commented on the passage of time with an ingenious tongue-in-cheek design meant to appear, at first glance, as if the tower had been built in 1912 and altered more recently with a green-glass insert that reveals the structure's poured-in-place concrete frame. The incorporation of this seemingly anomalous element is in fact contextually appropriate, given the aggressive 1950s Modernism of Ocean Towers next door and the visual stridency of other high-rises along the bay.

By rotating the pyramidal-roofed corner 22.5 degrees, Henriquez addressed the tower's prominent location at the oblique intersection of Beach and Morton avenues, and provided an extra balcony in each apartment. Most significantly, for condominium owners, the skewed glass corner takes advantage of west-facing vistas over English Bay from upper-story living rooms. (Henriquez's deliberate response to the view is also a sly comment on the 1912 hotel's relative *unresponsiveness* to the same setting.) For Vancouver residents and visitors, however, the most important prospect is not from the tower but back toward it: Henriquez's addition adds a welcome third layer to the existing historical strata, reconciling the stately Sylvia with its less refined waterfront neighbors. *P. M. S.*

The current building code for Vancouver's West End imposes a 60-foot height limit—a provision enacted in 1974 to control perceived overdevelopment during the 1950s and '60s. Richard Henriquez was able to obtain a variance for a 206-foot tower by ensuring a view corridor toward English Bay for residents of a tall apartment building east of the site. The means to this end are a one-story bow-fronted restaurant pavilion (below left) and a two-story guest-room/garage wing (below right) set between the Sylvia Hotel and the new condominium structure. The two low-rise buildings flank a mid-block service court for vehicles making deliveries to both the hotel and the condominiums. In order to soften the view into this utilitarian space from the hotel's new dining room, Henriquez diagonally sliced off the rear of the restaurant pavilion and inserted a small triangular lily pond identical in size to the condominium-tower lobby (opposite left). The free-form, curvilinear shape of the restaurant window wall is



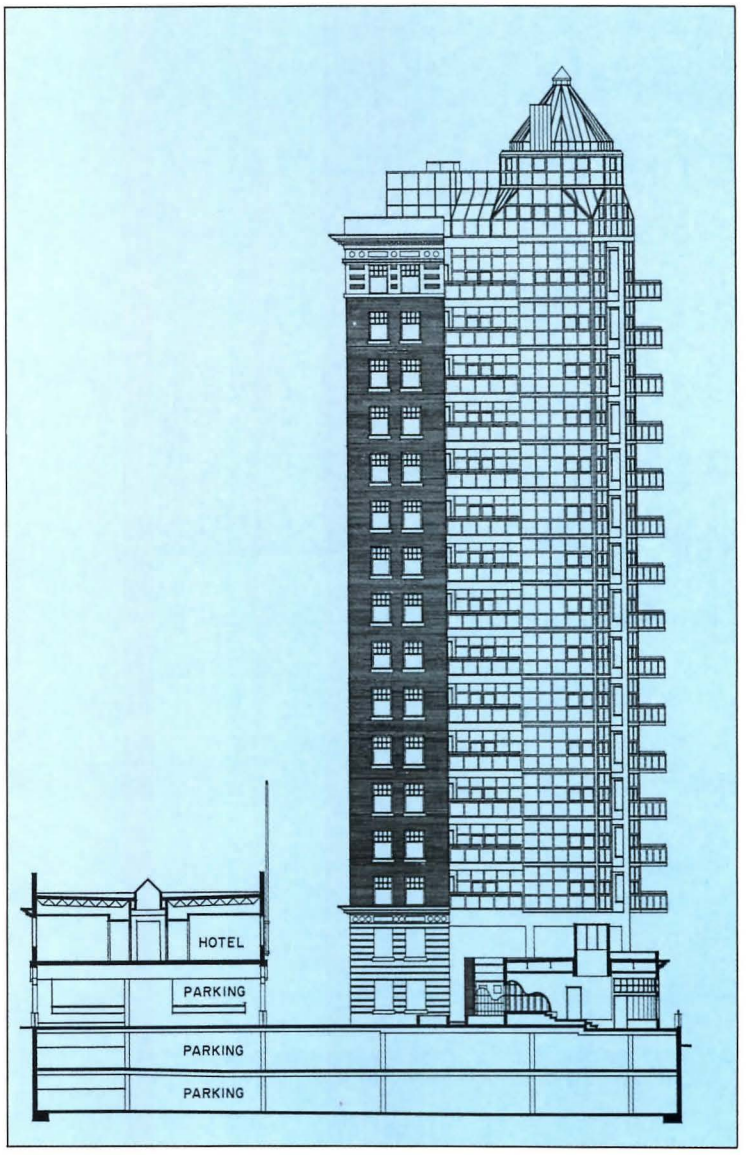
MAIN FLOOR

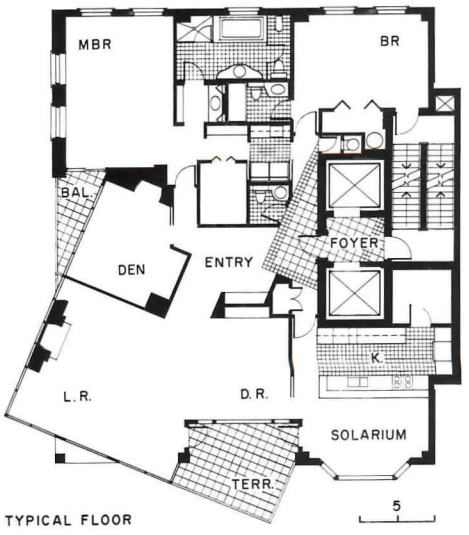


SECOND FLOOR

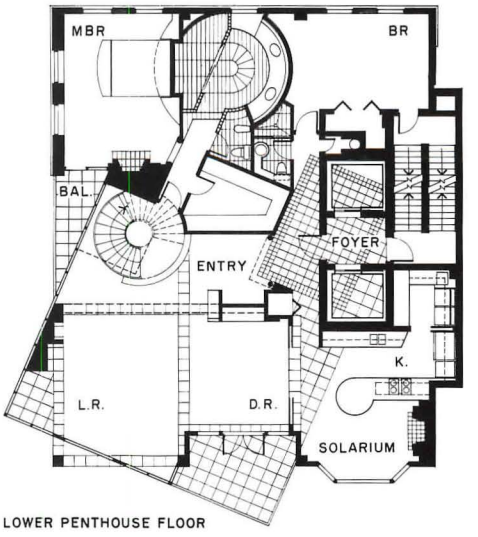
repeated in a red-painted steel screen marking the main entrance to the condominiums (below left). Despite the tower's idiosyncratic shape, the floor-through condominiums feature straightforward plans that revolve logically around the elevator core (bottom).

Addition to the Sylvia Hotel
Vancouver, British Columbia
Owner:
Sylvia Hotel Ltd. (Norman Sawers, president)
Architect:
Richard Henriquez & Partners—Richard Henriquez, partner-in-charge, design; Donald Taylor, partner-in-charge, technical services; Glenn Burwell, project architect; Frank Stebner, models
Engineers:
The MSS Group (structural); MSS Consultants Ltd. (electrical); Park & Djwa Engineering Co. and J. D. Kern & Co. Ltd (mechanical)
Landscape architect:
Jeffrey J. Phillips Consultants
General contractor:
Intertech Construction Ltd.

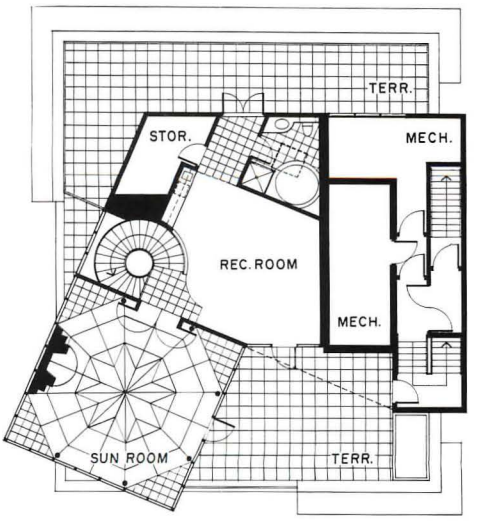




TYPICAL FLOOR



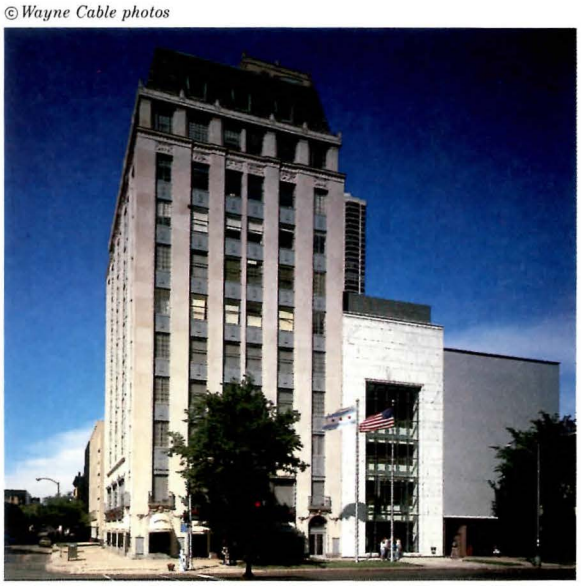
LOWER PENTHOUSE FLOOR

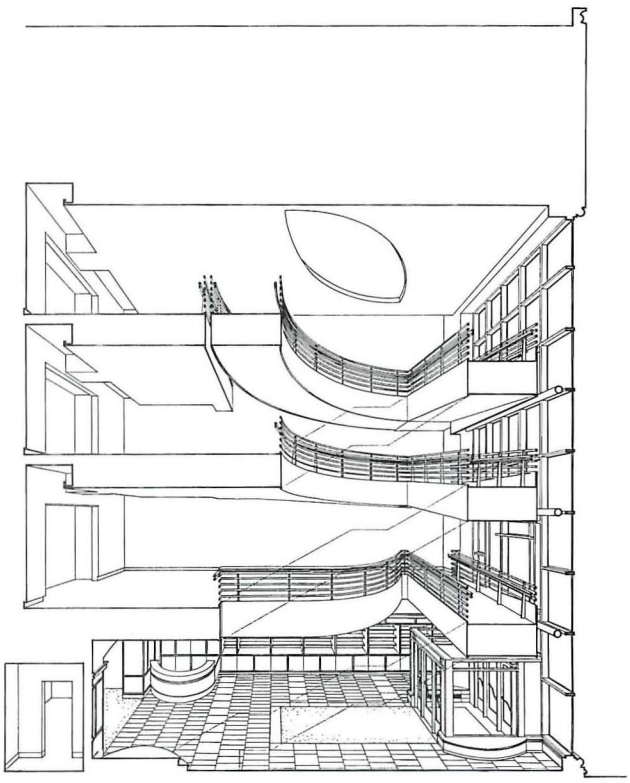


UPPER PENTHOUSE FLOOR

The Terra Museum of American Art
Chicago
Booth/Hansen & Associates,
Architect

Soft sell

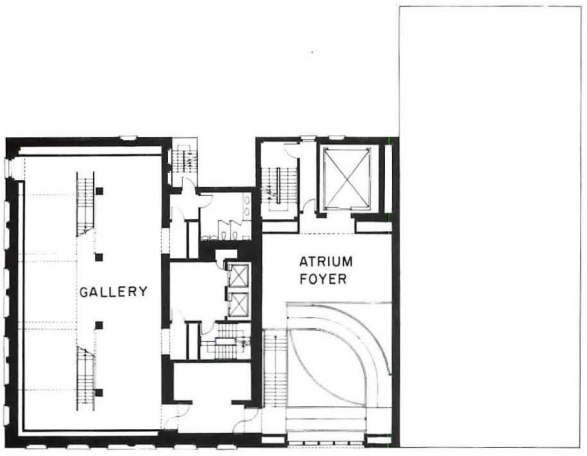




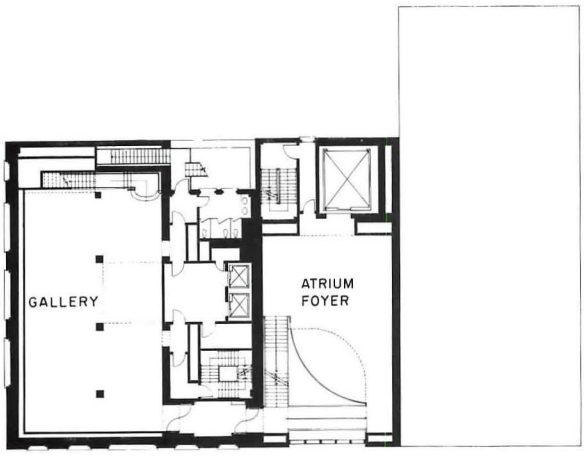
If shopping has replaced baseball as America's best-loved pastime, Chicago's North Michigan Avenue has emerged as one of its favorite arenas. The 14-block stretch of North Michigan dubbed "The Magnificent Mile" has developed over the past half-century into an unbroken string of department stores and specialty shops housed in a heterogeneous, though mainly masonry-clad, group of buildings running the gamut of architectural distinction from anonymous one-story taxpayers to Howells and Hood's celebrated Tribune Tower. Although North Michigan has its share of civic landmarks, its urban excitement stems less from architecture than from street-level ambiance—the crush of shoppers strolling down carefully landscaped sidewalks past enticing display windows.

Following sound business instincts, industrialist and former ambassador Daniel Terra looked here too in his search for a high-visibility, in-town location for the museum of American art he had established in suburban Evanston in 1980. Terra, whose collection ranges from 18th-century portraits to contemporary non-representational work, acquired three adjoining buildings at 664, 666, and 670 North Michigan in 1985, and commissioned Booth/Hansen & Associates to draw up a 60,000-square-foot master plan that would knit the three properties into a unified museum interior without destroying the retail character of the 140-foot-long avenue frontage. (Besides fostering urbanistic continuity, ground-floor leases to commercial tenants would help subsidize museum operations.) Booth/Hansen's scheme, the first phase of which is now complete, called for leaving the classical exterior of the 11-story corner building at 664 unchanged (left in small photo this page) and converting its interior into 11,000 square feet of galleries on four floors and museum offices on the remaining stories. The slender five-story middle building at 666 (opposite), the former Chicago outlet of Helena Rubenstein cosmetics, has been radically altered into what partner-in-charge Laurence Booth calls "the museum statement"—a highly recognizable, five-story pavilion that includes the museum's main entrance hall, a bookshop, and a five-story atrium. The third element of the group, a nondescript medical-arts building at 670, is currently unused, though Booth/Hansen's master plan calls for its eventual demolition and replacement by a second gallery wing.

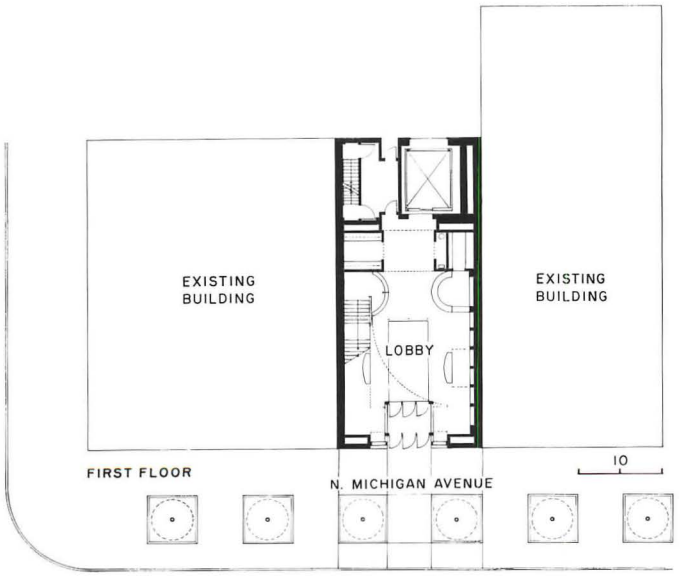
In designing the Terra's signature central pavilion, the architects were challenged by seemingly contradictory impulses: not only to establish an image of monumental permanence befitting an important cultural institution but also to create a welcoming transparency in keeping with the structure's commercial neighbors. For inspiration Booth turned to the New York flagship store of Tiffany & Company. He borrowed Tiffany's mausoleumlike massing, but exchanged its granite cladding for gray-veined white Vermont marble, and relieved its monolithic aloofness with an inviting 45-foot-high curtain wall. Inside, the architects faced the problem of drawing people upward through the core into large galleries on the second through fifth floors of the corner building. The solution combines straight flights of stairs supplemented by curving ramps that bridge the gap between different floor heights in the two buildings and allow handicapped visitors access to the museum's two principal galleries (perspective left). In addition to the ramps' functional role, their sloping profile forms an alluring set piece when viewed from North Michigan Avenue—a discreet bit of salesmanship for art's sake. *P. M. S.*



FOURTH FLOOR



SECOND FLOOR



The gentle arcs of the Terra Museum's ramps define a vesica-shaped atrium that widens as it rises like the Guggenheim Museum's famous spiral (opposite and below). Unlike the Guggenheim ramp, however, the Terra's inclines are solely for vertical circulation, not for display. Traveling shows and works from the museum's permanent holdings are installed in two 65- by 32-foot galleries (bottom), whose double height can accommodate even the largest works of contemporary American art.

©Timothy Hursley photos

Phase I of the Terra Museum of American Art
Chicago, Illinois
Owner:
The Terra Museum of American Art
Architect:
Booth/Hansen & Associates—Laurence Booth and Paul Hansen, principals; David Woodhouse, senior associate; James Fraerman, project architect; Mike Siegel, Herbert Hodgman, project team
Engineers:
Beer, Gorski & Graff (structural); Gamze, Korobkin, Caloger, Inc. (mechanical/electrical)
Consultants:
Mitchell B. Kohn (lighting); Rolf Jensen & Associates (fire-protection and building code)
General contractor:
Morse/Diesel, Inc.

St. Thomas Choir School
New York City
Buttrick White & Burtis,
Architect

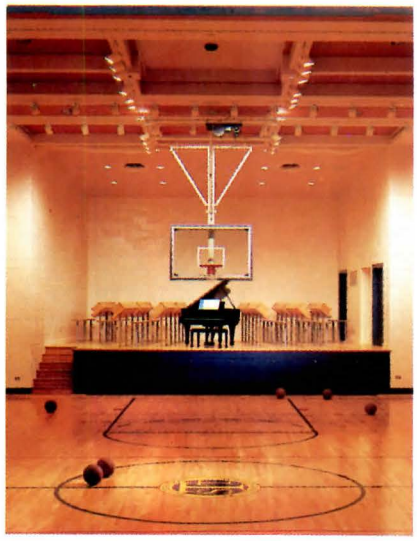
Perfect pitch

"Choir-school education is not limited to the pursuit of excellence," according to Gordon Clem, headmaster of St. Thomas Choir School in New York. "It is involved with the willingness of people—boys and adults—to allow others to become more fully human, to be respectful of all life, to be religious in the broadest sense." Given Clem's decidedly nonelitist educational philosophy, the prosaic setting of St. Thomas's new midtown Manhattan home—the block of West 58th Street between Broadway and Seventh Avenue—seems altogether fitting. Unpretentious surroundings are nothing new for the nation's only church-affiliated choir boarding school, which for years occupied modest four-story quarters on West 55th Street, not far from the neo-Gothic Episcopal church on Fifth Avenue where the school's students—40 boys ranging in age from 8 to 12—regularly sing. When a local developer offered to help underwrite a new building for the school on 58th Street in exchange for St. Thomas's underused, but commercially valuable, 55th Street property, the church commissioned Buttrick White & Burtis to devise a plan that would incorporate the essential components of a traditional school campus—classrooms, library, dining hall, gymnasium, chapel, dormitory rooms, and faculty apartments—within a single 80,000-square-foot structure.

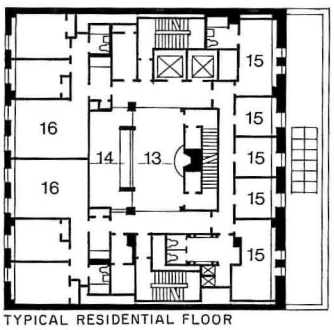
The 15-story red-brick tower that St. Thomas moved into this fall responds to issues of zoning, context, and academic imagery. New York City's building code permitted two basic massing strategies for the 75- by 100-foot site: a sheer tower set behind a 15-foot-deep plaza, or a stepped tower, built to the sidewalk, set back 20 feet at the sixth floor with additional, shallower setbacks above. By choosing the latter configuration, Buttrick White & Burtis reinforced the existing urban fabric of West 58th Street, which, with its continuous street wall of brick and masonry-trimmed buildings, did not seem the appropriate place for a major public gesture. The architects also felt that the image of a choir school could be expressed more convincingly in a setback structure than in a freestanding tower (the latter, especially in midtown Manhattan, has obvious commercial connotations), and they visually exploited the setbacks to reflect a distribution of school-related spaces in the building's base, faculty and clergy residences in its shaft, and a small chapel in its crown. Although such specific details as an oculus in the gable-roofed chapel (opposite) and a stylized, multipaned "oriel" in the center of the street facade (bottom left) refer to the school's Anglican forebears, the architects deliberately underplayed historical allusion. The goal, said partner-in-charge Harold Buttrick, was to design "a Modern building that exhibits a tension between current technology and the humanist traditions of an English choir school."

With its combination of dignified oak-paneled public spaces and more workaday classrooms and residential quarters, St. Thomas's interior reflects that tension. In order to discourage students from using the elevators, Buttrick White & Burtis have organized the school around a central stair core, enabling the youthful choristers to move easily between their dormitory rooms, situated off a three-story-high "great hall" on floors five through seven (page 119), and the library, classrooms, and dining hall below. This "vertical quadrangle," a building-within-a-building where the school's live-in community of students, faculty, and clergy come together, physically embodies the egalitarian philosophy that St. Thomas so assiduously espouses. *P. M. S.*

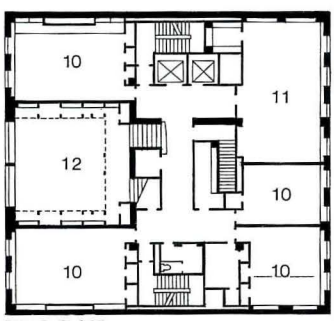
Because St. Thomas is a choir school, it needed rehearsal space with the highly reverberant acoustics of its parent church on Fifth Avenue. Toward that end, Buttrick White & Burtis placed the school's practice stage at one end of a basement gymnasium (top right) whose coffered ceiling was made more sound-reflective with a double layer of sheetrock. The stage has built-in choir benches and carrels. A formal stairway leading from an oak-paneled hall to the dining room and administrative offices seems tailor-made for academic procession (bottom right).



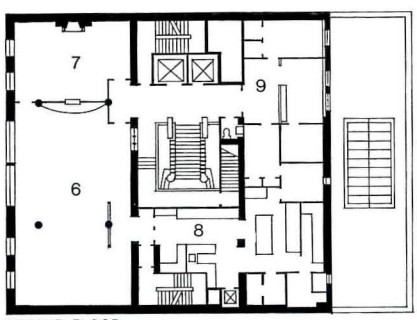
St. Thomas Choir School
New York City
Owner:
St. Thomas Church
Architect:
Buttrick White & Burtis—Harold Buttrick, partner-in-charge; Michael M. Dwyer, project architect; Peter W. Murray (job captain), William W. Braham III, Theodore A. Burtis, Kelli W. Dobbs, R. Wade Johnson, Timothy Nissen, Francesca Rogier, Robert S. Shedrofsky, William A. Halsey, project team
Engineers:
Weidlinger Associates (structural); John L. Altieri (mechanical)
Consultants:
Jules Fisher & Paul Marantz (lighting); Klepper Marshall King Associates (acoustics)
General contractor:
FST Construction Corporation



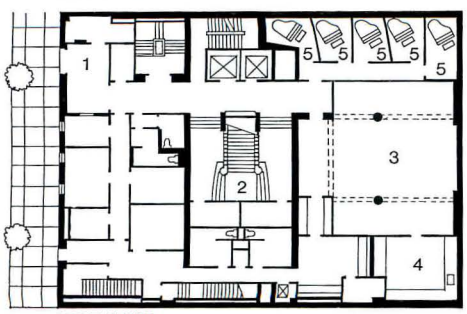
TYPICAL RESIDENTIAL FLOOR



THIRD FLOOR



SECOND FLOOR



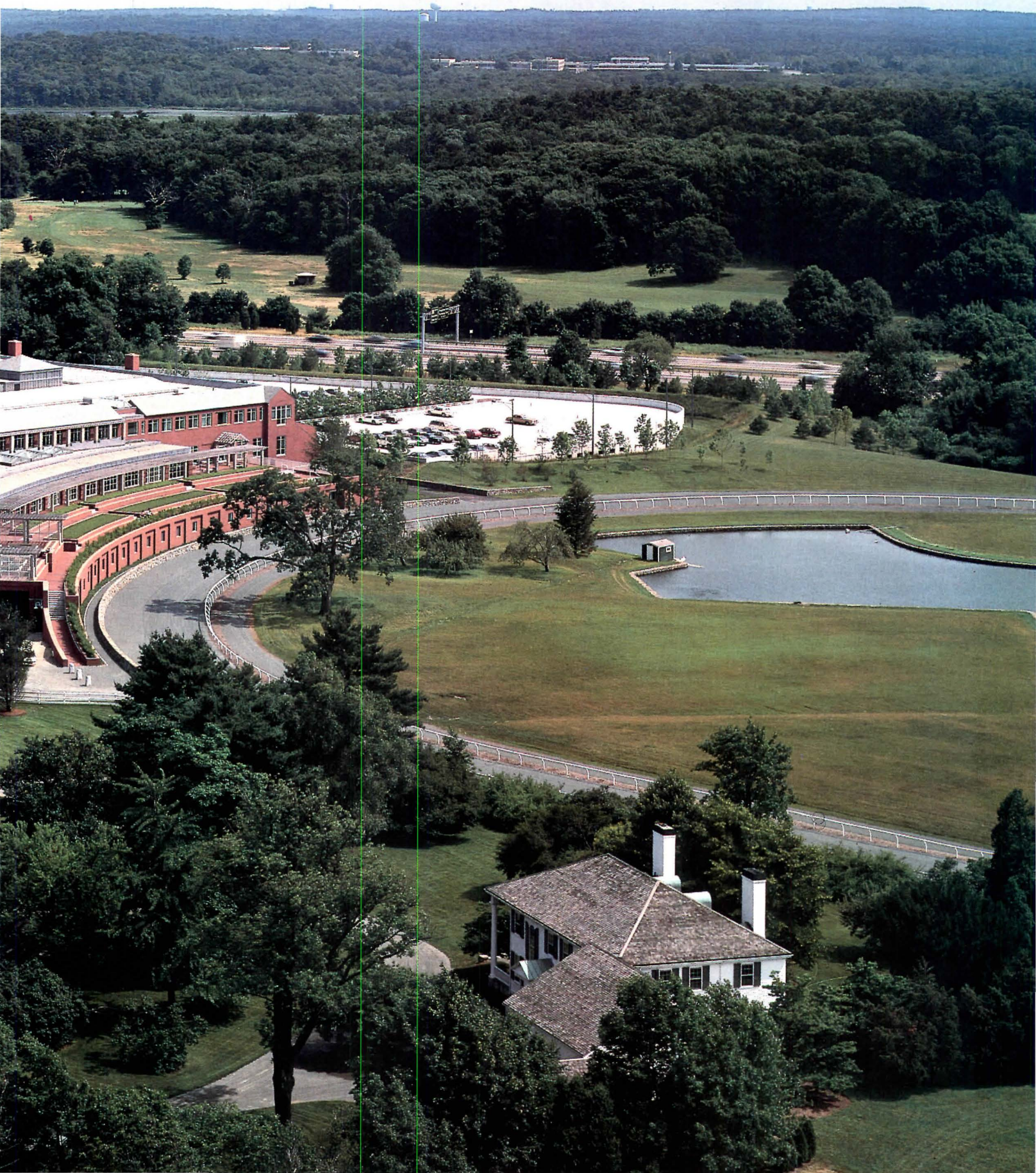
FIRST FLOOR

1. *Entry vestibule*
2. *Main stair hall*
3. *Recreation room*
4. *Hobby shop*
5. *Piano room*
6. *Dining room*
7. *Living room*
8. *Kitchen*
9. *Office*
10. *Classroom*
11. *Study hall*
12. *Library*
13. *Great hall*
14. *Television room*
15. *Dormitory room*
16. *Faculty apartment*


EXIT

A corporate villa

The Codex World Headquarters Building
Canton, Massachusetts
Koetter, Kim and Associates, Architect



The architects of a suburban corporate headquarters find timely lessons in the forms and amenities of bygone country life.

Though hardly residential in size, the Codex Corporation's big red-brick headquarters embodies Fred Koetter's and Susie Kim's joint contemplations of affinities between modern suburban office buildings and rural dwellings of the past. Koetter, who has written at some length on the phenomenon and who deplores the disappearance of the social magnetism exerted by the small-town Main Street, thinks that in the suburbs "the workplace becomes a kind of substitute or *de facto* public location, one of the only places where appreciable numbers of people actually come face to face on a regular basis, where the better part of their waking hours is spent in close proximity one to another." In terms of architectural history, he likens the circumstances to those applying at the great Roman and Renaissance country villas. Those villas often fed and sometimes housed vast and varied populations of family and servants—civil, domestic, and agricultural—populations very roughly analogous to 20th-century managerial, clerical, and maintenance staffs. "In postmedieval times, the actual work force of the farm-villa was not in residence at the villa itself but was assembled on a day-labor basis from the nearby countryside . . . . The villa possessed within its precincts most of the industrial paraphernalia, resources, and daily life amenities to sustain not only the pleasures of the proprietor but the needs and diversions of its attendant work force."*

When Codex acquired this site for its headquarters, it took matters seriously enough to underwrite a broadly based, generously funded architectural competition (ARCHITECTURAL RECORD, June 1983, pages 64-69). Despite the splendor of the rural site (55 acres overlooked by the commonwealth's Great Blue Hill Reservation and including the 11-acre Maresfield Farm, still cultivated) and despite the technological nature of the company's business (modems and other sophisticated equipment for electronic data communication), the corporation told the invited competitors firmly that its architectural aim was neither pastoral nor high-tech but "to generate ideas in creating a different way of life for Codex employees."

The winner of the two-stage competition was the quite small, all but unknown Boston firm Koetter, Kim & Associates. The firm still keeps in its office the beat-up cardboard and string model it devised at the very outset, a concept conforming in virtually every way to the finished plan. But the partners' first thoughts, however appealing their visions of farm-villas, were less idealistic than practical. They recognized that, as Kim puts it, "when you've got a large modern office building with a big footprint, you're dealing with a square building and double-loaded corridors if you want efficiency and flexibility."

The resultant plan, or at least its essential working area, is indeed square and does indeed have a large footprint—about 300 feet on each side to house an eventual population of 800. A simple square would not answer all conditions, though. One noticeable factor impinging on the buildable site was Maresfield Farm's racetrack, which even when shortened from 3/4 to 5/8 of a mile manifests a strong and undisguisable shape. The architects did not, however, relegate the oval to a merely axial role but rather absorbed its shape as part of the building's overall massing. The tangential wing that curves and slopes away from the main building follows the track exactly, so that it neatly fills in a piece of land awkwardly caught between straight-edged building and elliptical track (see photograph, taken from the Great Blue Hill across the road, on preceding pages). The wing encloses adjuncts like dining and the semipublic auditorium, as well as a circulation link that leads both tenants and the public from the main entrance through exhibition rooms to the auditorium. Compositionally, the roof terraces outside the dining spaces, used at lunchtime for saunters beneath the pergola, step back as a transition from agricultural to office-building scale.

The implantation of a 250,000-square-foot building is indeed a strain on the rural landscape—and this landscape is emphatically rural, in spite of the heavy traffic on Route 128 along one edge of the site. Koetter, Kim strove to minimize the strain by imposing not the scale of a megastructure but rather of a congeries of small buildings. The expression of discrete volumes on the exterior was encouraged by the number of discrete functional areas inside, which the architects think of as "little buildings within the building." Among these functional areas are separate lobbies for visitors and personnel, the entrances respectively set off with a brick colonnade in front and a round library tower at one corner. The architects further softened the building's impact by relying on the fine scale of such regional building materials as red brick and white sash. And if the textured brick walls, individually framed windows, and well-defined stories remind one of New England's familiar Georgian architecture, so much the better: the architects say they had such buildings much in mind as they designed, along with such regional icons as big windowed barns and curved riparian mills.

What ultimately most distinguishes the building, though, remains unguessed at until the visitor penetrates the interior. Behind those brick walls is radiance. Light enters through an abundance of skylights. The most dramatic source of light is the high central garden, its large hipped glass roof supported by slender white columns, its volume filled with date palms and shrubs, its walls even now being covered with the greenery of creeping fig (see cover). Intended chiefly as public space, it succeeds beyond question in impressing the visitor, who upon coming through the front door immediately sees through a large window the image of the Temperate House at Kew Gardens and other such romantic settings. The basic purpose of the garden is less romantic, though equally impressive: the natural illumination of the office floors that are served by windows piercing the brick walls on three sides. (These windows have also, at least so far, proved a drawback for wider use of the space. Though handsome wood garden benches were installed for the ease of personnel, people seem to fear that colleagues observing them through the windows will think they're loafing.)

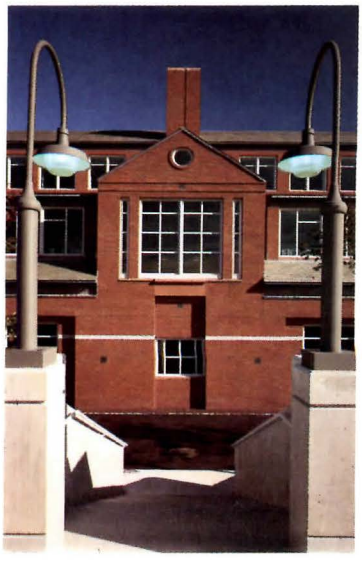
The workhorses of interior daylighting, and almost as powerful in esthetic effect as the garden room itself, are the three-story light trenches excavated through the height of the office space on three sides. These skylit trenches, which function in a way as the double-loaded corridors the architects considered the key to office-planning efficiency, ensure that no desk in the 300-foot-square building is more than 20 feet away from daylight. One visitor can attest that even on a rainy day there is lots of light. As an architectural bonus, the high gables of the light galleries add rooftop pavilions to the facade in an up-to-date form of the flourishes on a classic villa. *Grace Anderson*

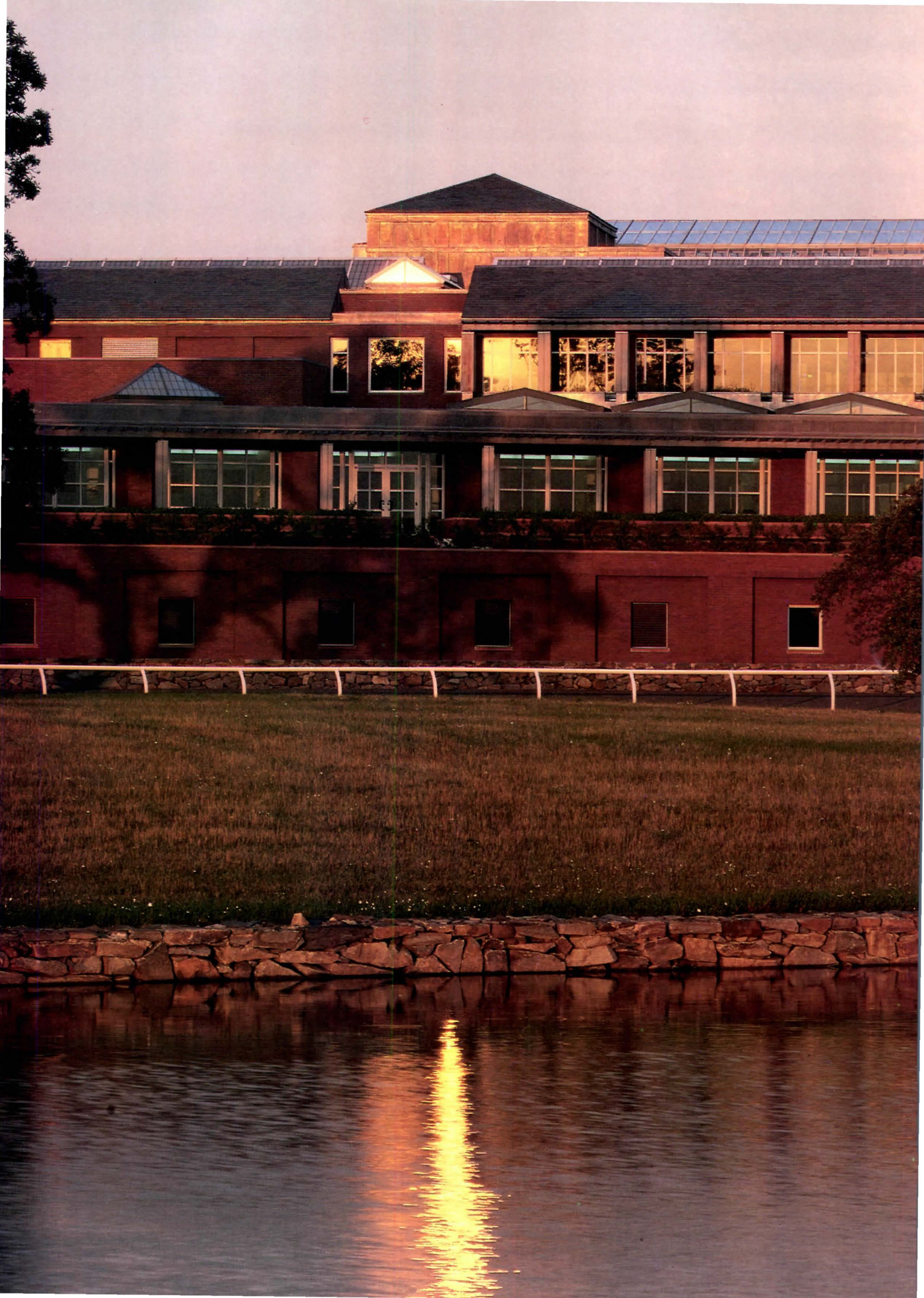
* "The Corporate Villa," by Fred Koetter, *Design Quarterly 135,* published by The MIT Press, Cambridge, Massachusetts, and London, England, for the Walker Art Center, Minneapolis, Minnesota, 1987.

A brick colonnade flanking the visitors' entrance to Codex (directly below) combines a touch of grandeur with an absence of intimidation at the end of a formal allée (preceding pages). A small round tower, which encloses a "secret" spiral stairway joining dining facilities with ground-floor exhibition galleries, softens the angle between the main building and the dining/auditorium wing (bottom left). The expanse of glass that hovers above the entrance serves the central conservatory, while glass gables on the roof line (one is shown at far left directly below) mark the deep light trenches that cut through office floors. Executive offices have private terraces with pergolas on the top floor (bottom right).

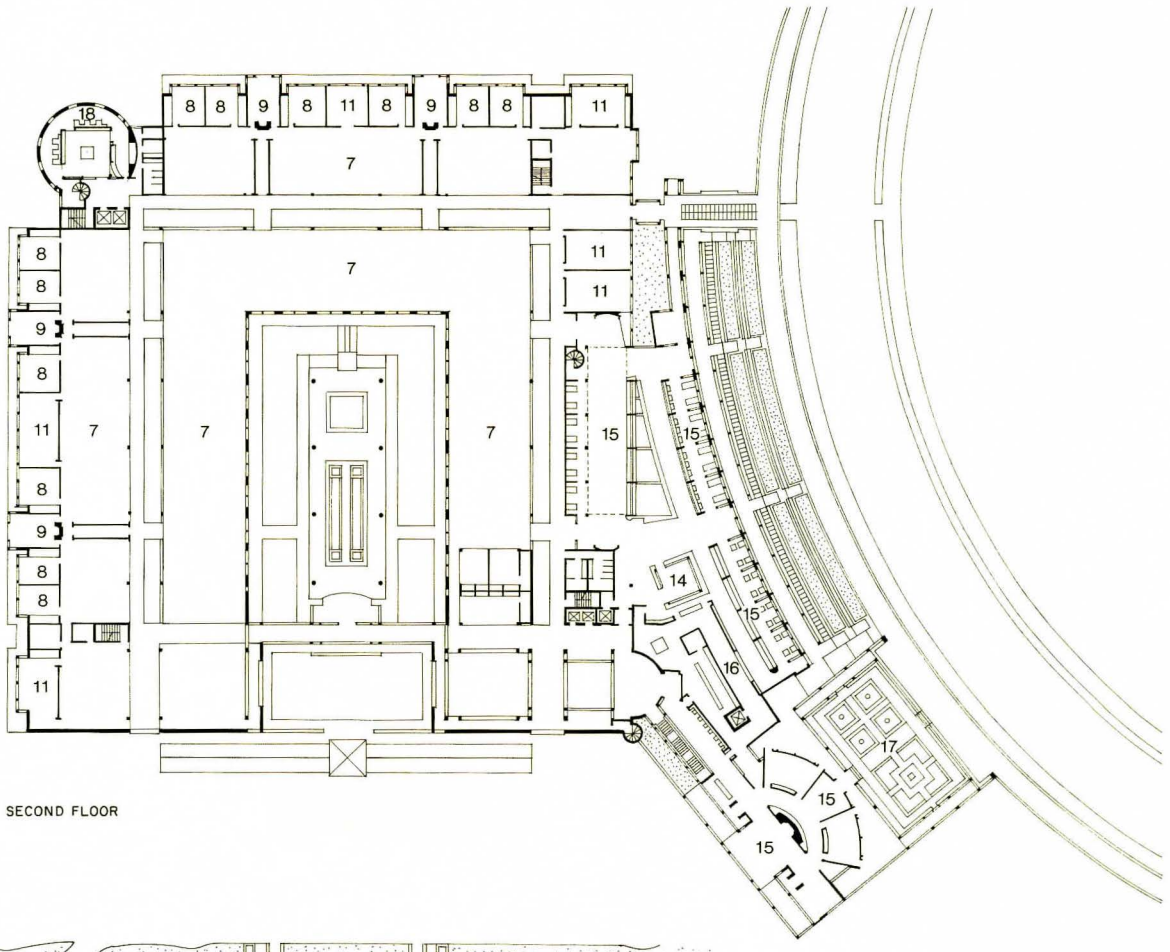
The east face of the building (directly below) overlooks one of two retention ponds. Though Koetter, Kim confess that they initially thought of these as esthetic embellishment, mechanical engineers Flack & Kurtz found ample practical use for them: the ponds replenish the aquifer that gives a year-round supply of 52F water for a well-water heat-pump system that eliminates boilers and chillers and reduces rooftop impedimenta. (The engineers reckon that construction costs were roughly equal to those of a conventional

system, while operating costs are 40 percent.) The pavilions that punctuate the building's second story with multipaned bay windows and chimneys (directly below and bottom center) are "quiet rooms" interspersed among perimeter offices; the rooms were required by Codex as comfortable quarters where staff members could read without distraction. Employees park their cars in a bermed structure across from the south facade (bottom left and center) and enter at the base of the round library tower (bottom right).

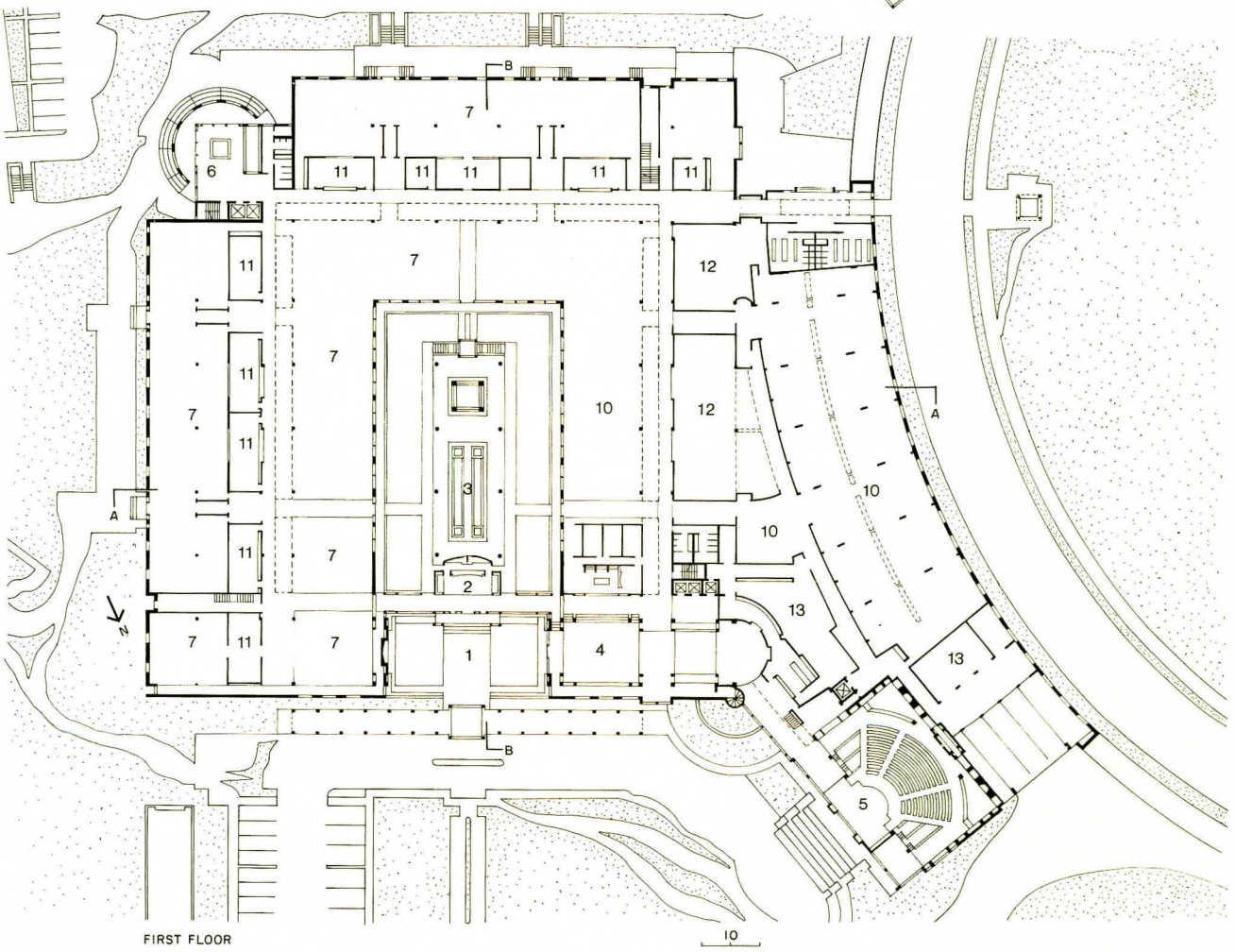




The west facade (opposite and above), facing another of the retention ponds, is a curving wing that contains such auxiliary facilities as dining, auditorium, laboratories, and locker rooms. Its low concave brick front, designed for laboratory space, follows precisely the edge of the oval racecourse. (Codex intends to operate the track as part of Maresfield Farm.) The wing forms one side of a curvilinear wedge that fills in an unshapely piece of land defined by square office building and elliptical racecourse. The planted terraces on the roof of the low front mediate the relative scales of farm and corporate headquarters, at the same time offering lunchtime strollers a lord/lady-of-the-manor fantasy as they review the neighboring farm. External materials, chosen with an eye to both the New England and rural precincts, include Chelmsford granite courses, cast-stone lintels matching the granite, a lead-coated copper cornice below the eaves, and a Vermont slate roof, as well as a carefully modeled and shadowed surface of local brick.

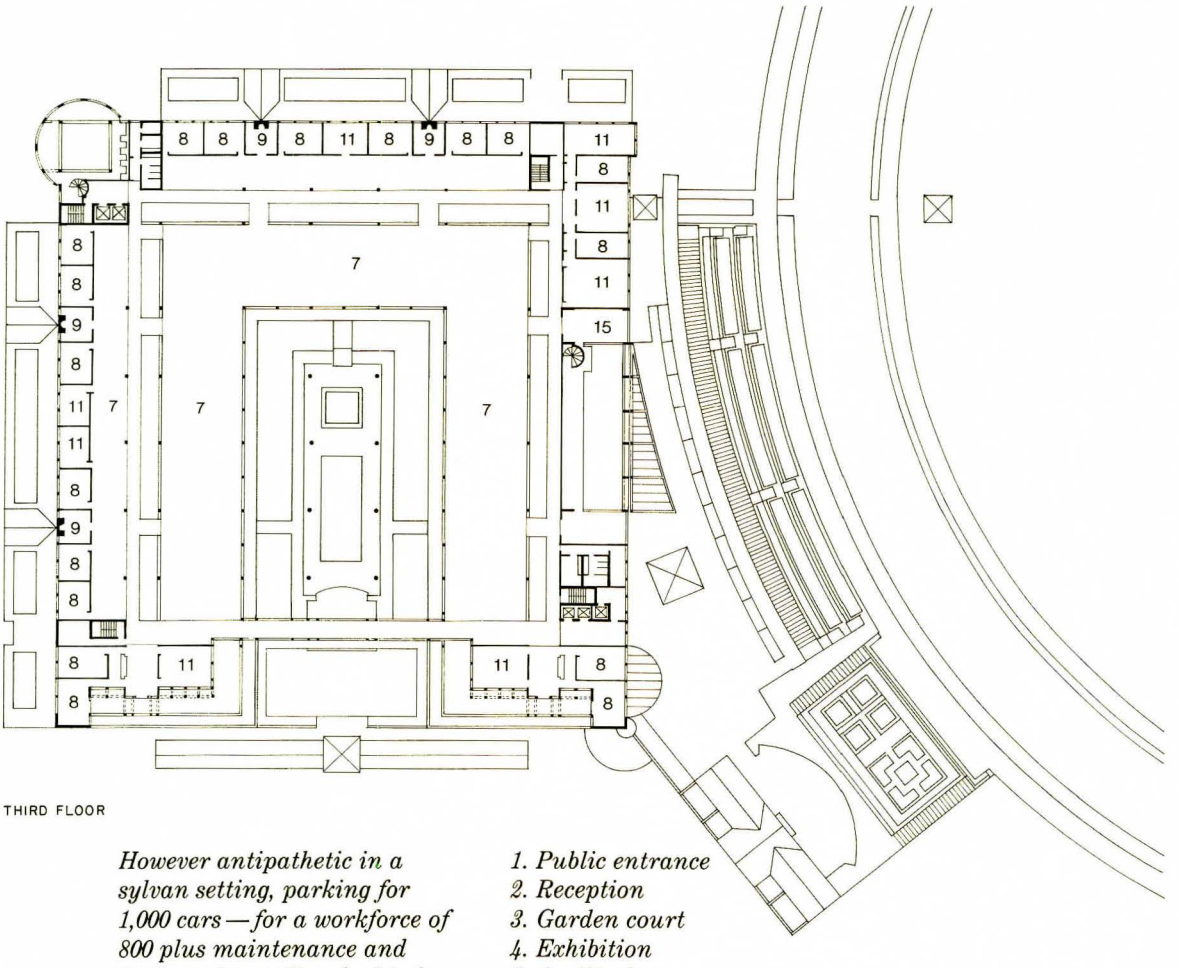


SECOND FLOOR



FIRST FLOOR

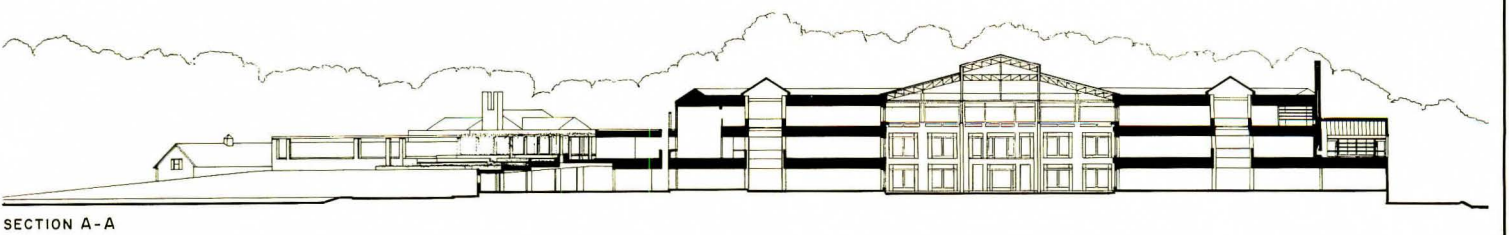
10



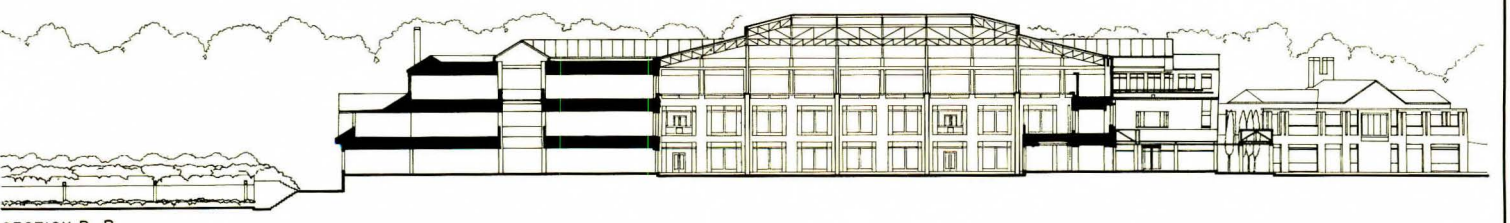
THIRD FLOOR

However antipathetic in a sylvan setting, parking for 1,000 cars — for a workforce of 800 plus maintenance and food-service staffs — had to be inserted on the site. The architects reduced the garage's bulk by berming a two-level structure south of the building (section at bottom) and disguising the roof with planting. The structure also serves as an acoustic and visual barrier to the bustling six-lane Route 128.

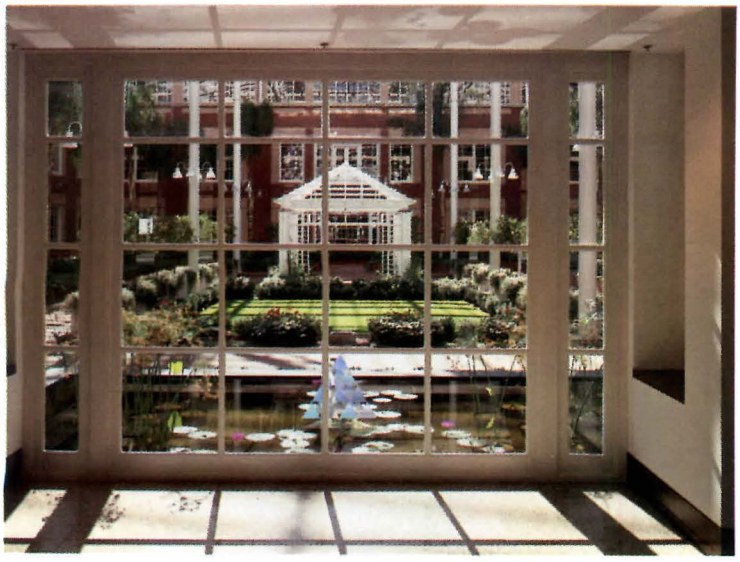
1. *Public entrance*
2. *Reception*
3. *Garden court*
4. *Exhibition*
5. *Auditorium*
6. *Employees' entrance*
7. *Open offices*
8. *Executive office*
9. *Quiet room*
10. *Laboratory*
11. *Conference room*
12. *Computer room*
13. *Shipping and service*
14. *Cafeteria line*
15. *Dining*
16. *Kitchen*
17. *Herb garden*
18. *Library*



SECTION A-A



SECTION B-B



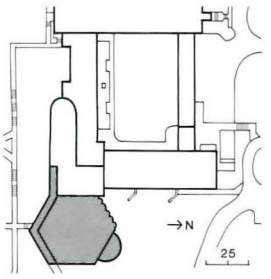
During the day, during even an overcast day, natural light bathes the interior of this large building. A major instrument of this feat is the U-shaped light trench that opens up the office floors (opposite); even workers sitting in the center of the open-plan offices need look no farther than 20 feet on either side to see light in the trench and in the central garden (bottom left, seen from the reception room across a lily pond). These are the building's largest skylights, though by no means its only ones. Among others, a smaller skylight illuminates the library's central reference room (top left)—and a pane of glass in the center of the reference table transfers light to the employees' entrance lobby below. Along the front of the building, exhibition galleries (center left), their polished cherry floors gridded with marble inlay, are open to the public as a community facility. Like the auditorium, they can be segregated from the rest of the building for evening use.

The Codex World Headquarters Building
Canton, Massachusetts
Owner:
Codex Corporation
Architect:
Koetter, Kim and Associates—Fred Koetter, Susie Kim, partners-in-charge; Kent Knight, Mark Chen, team leaders; Neil Denari, Jim Favaro, Deborah Fennick, Sophia Gruzdys, Steve Johnson, Steve Moser, Carolyn Rufo, Kelly Wilson, competition project team; Ken Bishop, Kathy Busch, Charles Carlin, Greg Conyngham, John Hathaway, Linda Hockett, Steve Johnson, Myles Katz, Ioannis Kythreotis, Tom Peterman, Lois Rosenblum, Augie Shaefer, Craig Spangler, Terry Steelman, William Tecu, Wilven Van Campen, production project team
Engineers:
LeMessurier Associates/SCI (civil, site, structural); Flack & Kurtz Consulting Engineers (mechanical/electrical)
Space planning and interior design:
Carol Fippin, Inc.— Carol Fippin, principal; Laurie Lieberman, Arthur W. Pinkham, Thomas Peterman, Ray Pohl, Henry Fernandez, Eve Baltzell, project team
Landscape architects:
Hanna/Olin, Ltd.
Consultants:
Hubert Wilke, Inc. (audiovisual); Cavanaugh Tocci Associates (acoustical)
General contractor:
Turner Construction Company

Climbing Jacob's ladder

St. Andrew Abbey Church
Cleveland, Ohio
Woollen, Molzan and Partners, Architect

The architectural geometry of a monastic sanctuary composes an emblem of spiritual and physical transcendence.



He dreamed, and behold a ladder set up on the earth, and the top of it reached to heaven. Genesis 28:12

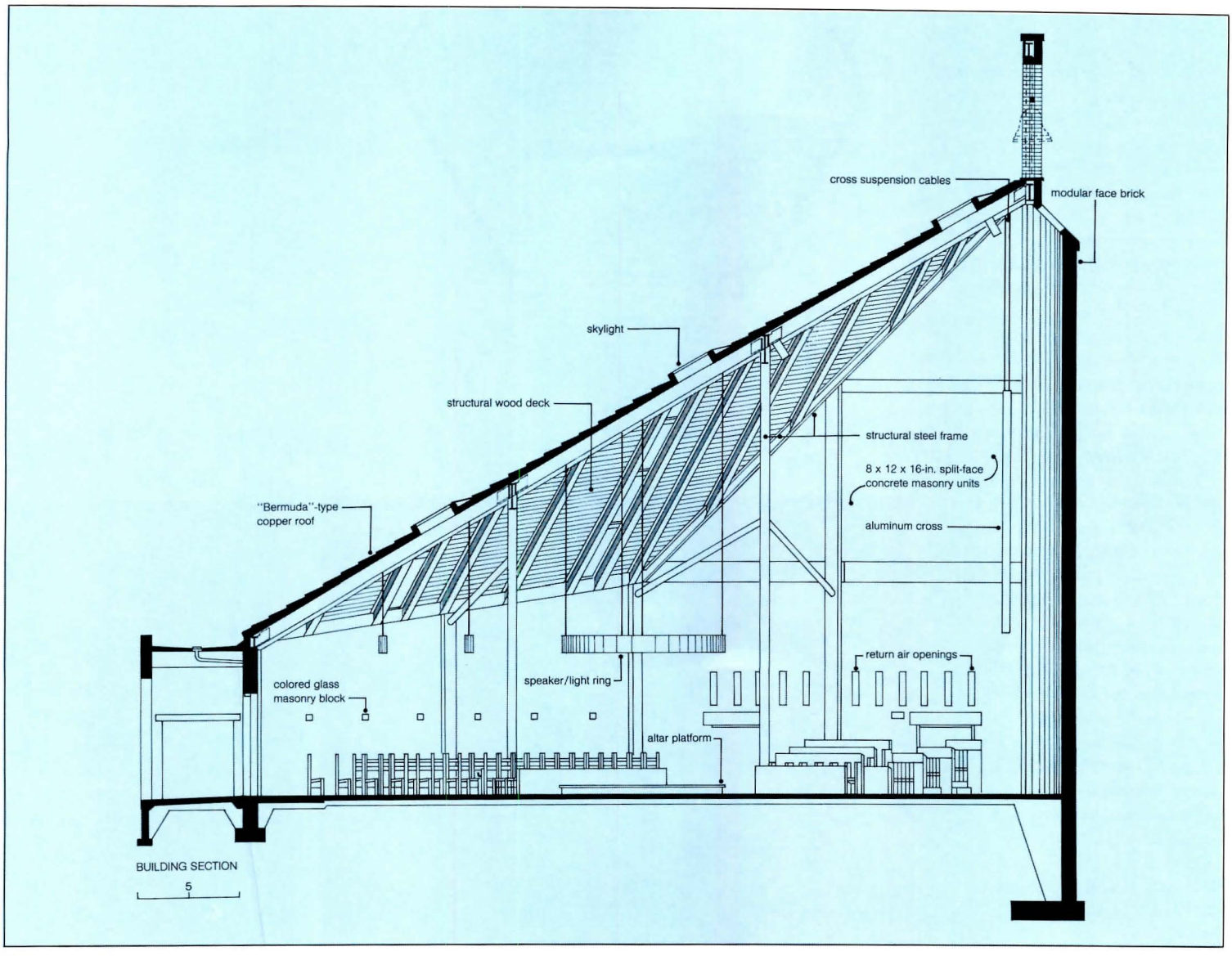
To Benedictines, Jacob's vision symbolizes the ladder of humility on which the faithful strive heavenward, a spirit of modest aspiration the monks of St. Andrew Abbey sought to also embody in their new church—though the imagery of the ladder may have borne as well a more literal, if subliminal, appeal. Astonishingly for a community whose days are ordered around prayer, the 65-year-old abbey has till now had no church of its own; for 35 years its monks have worshipped in a basement chapel, descending through dark passages to a cramped, narrow room whose high, dark stained-glass windows deepen the subterranean gloom.

From a shoestring beginning in the persons of three young monks who formed the vanguard of a spiritual and educational mission to Cleveland's burgeoning Slovakian population, the abbey has evolved to a 15-acre monastery and high school complex on a height overlooking the city to the west. Throughout its years of growth, however, the dream of a church to crown the hilltop has been relinquished to more immediate needs—and the church's similar fate under the current development program was averted only by a restricted gift of $1 million (the whole of the church budget) from the First Catholic Slovak Ladies Association.

Given the promise of rising Jonah-like from their basement deep, the monks not surprisingly voiced their hopes for the long-awaited church in terms of ascent, adding to the imagery of Jacob's ladder the ideas of uplift and transcendency conveyed through height and prominence. These themes first emerged during architect Evans Woollen's two-week stay in the monastery, but the splendid austerity of the final design, and the refinement of its rich and many-layered symbology, were born in the light (and heat) of a review process stringent enough for a cathedral. Sitting as a committee of the whole, each of some 60 monks responded to each of many presentations of alternate schemes with both his vote and his comments—many, Woollen recalls ruefully, "going straight to the midsection."

They also went straight to the point of a fitting outward manifestation of the community's faith and works. Eager to exchange the usual facing choir stalls for a freer configuration

Crowned by a belfry that echoes its Romanesque porch, the church's skylight-banded copper roof sweeps upward in a single broad plane, then down in shallow triangular wings. Evans Woollen wrapped the sturdy base in warm beige brick chastely ornamented with limestone ribbons—including outsize sills under one-block "stained-glass" windows. Disguised by the asymmetrical roof, the hexagonal plan is further obscured by the outcroppings of a near-rustic wooden porch (preceding page) leading to the narthex, and a counterposing semicircular chapel. An airy structural web (section) props the central roof span, which comes to rest on a 60-ft-high masonry wall that structural engineer Richard Gensert ingeniously buttressed to self-support by forming it as a series of joined half-cylinders.



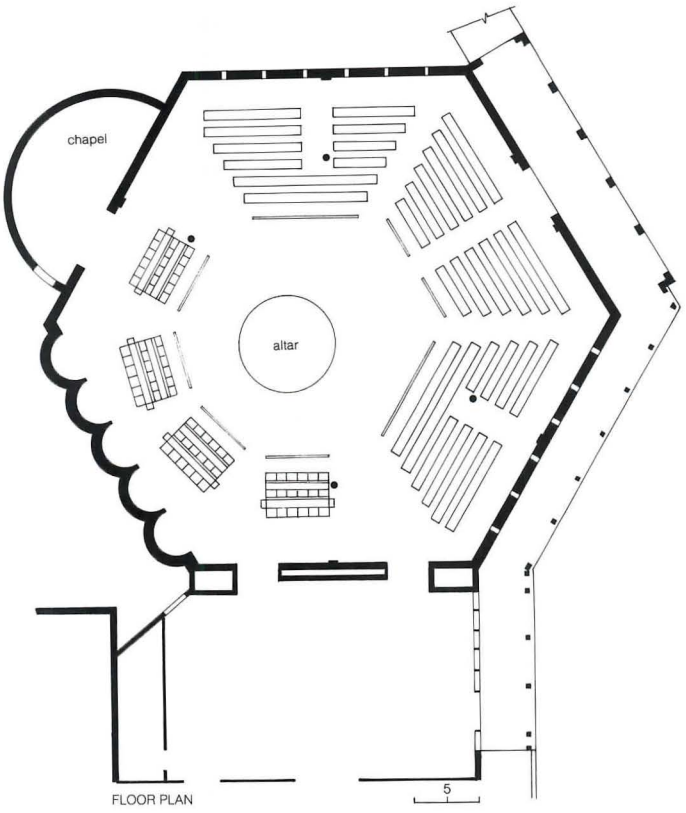
encircling the altar, and to ensure future flexibility, the monks readily agreed to a polygonal plan. A pure circle being difficult acoustically and a square too static, Woollen proposed a hexagon, which provides distinct faces for the several approaches to the church, as well as smooth jointure with the existing abbey. Less obviously, the figure inherently commands the combined senses of embrace and rotational movement around an altar that have made the circle an immemorial emblem of worship.

The most controversial aspect of the final design—anathema to proponents of a traditional central solution—was the asymmetrical envelope that wraps the polygonal plan. Yet it is this that gives the small church a rooted transcendence evoking at the most profound level of awareness the heaven-bound span of Jacob's ladder. The sturdily grounded brick base disguises its regular facets with extensions carrying diverse messages: the formal welcome of a Romanesque porch, the casual invitation of a rustic wooden side verandah, the secret arc of a semicircular chapel. All portray a complexity contradicted by the surging clarity of the canted roof planes, which nonetheless reinforce the denial of the underlying form. As a result, its sudden revelation in the soaring reach of the sanctuary wrapped by the church's decorous cloak becomes an almost palpable expression of humility leading to grace. The scriptural text is paraphrased in an exposed-steel and split-face concrete-masonry structure building ladder-like to the climax of a high, top-lit, scalloped wall whose serried arcs mediate between the severity of the frame and the mellow warmth of its contents. From the spare rectilinear elegance of architect-designed choir stalls and throne-like presider's chair to the recurring circles of chancel cross and chandelier, altar and ambo, and dashes of color in the deep red and heavenly blue tones of the Benedictines' treasured 1880 jubilee medal, the least detail resonates with spiritual or liturgical meaning.

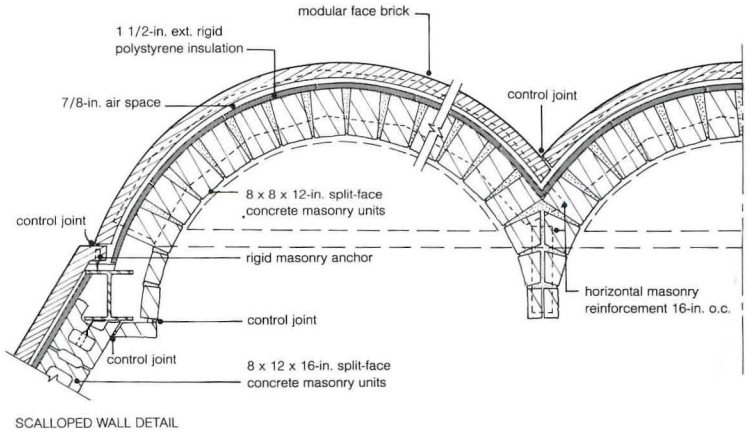
The triumph of the abbey church, though, is the tangible serenity of a container brimming with shadowless, seemingly sourceless, light pierced by shafts of sunshine streaking through ribbon skylights. Sunbeams swoop and dance across the scalloped wall in ever-changing patterns that resolve when the sun is low to the tilted, broken bands of a sky-born ladder. *Margaret Gaskie*

Although the height of the sanctuary is evident in the reach of its roof from porch to belfry, the taut cylindrical rank marching across the chancel wall (section bottom right) withholds from exterior view its focal role in the church interior, where it receives the concentrated thrust of structure and incidental light. The mellow curvature reflects the embrace of a hexagonal floor plan chosen to accommodate worship-in-the-round and provide flexibility in choir and nave. Circles also constitute a major theme in St. Andrew's liturgical artifacts—a Benedictine cross with arms abstracting the tree of life, a metal chandelier above the gray granite slab of an altar set on a circular platform, the half round of the sacramental chapel with a granite pillar holding a sculpted tabernacle of clustered bronze cylinders signifying the Pillar of Fire. There are even concave niches for a traditional statue of Our Lady of Sorrows and a doll-like Infant of Prague as reminders of the abbey's ties with the Slovak community.

St. Andrew Abbey Church
Cleveland, Ohio
Owner:
Benedictine Order of Cleveland
Architect:
Woollen, Molzan and Partners—Evans Woollen, design; Lynn Molzan, project architect; Debbie Burkhart, Joseph Mitchell, project team
Engineers:
Gensert, Bretnall, Bobel (structural); Denk Associates (mechanical/electrical)
Consultant:
William M. C. Lam Associates (lighting)
Construction manager:
Gilbane Building Company



FLOOR PLAN



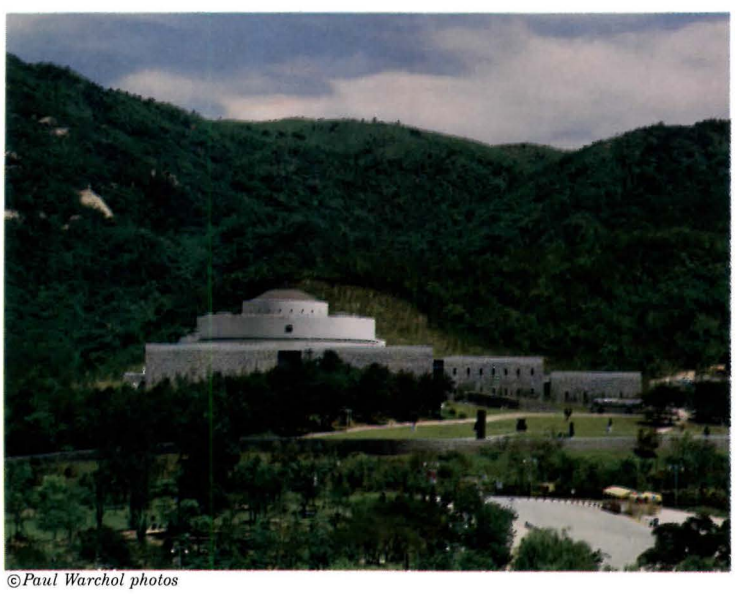
SCALLOPED WALL DETAIL

Bastion of culture

Amid political unrest, the South Korean government has unveiled its first major monument, a museum of modern art that reflects a continuing cultural duality.

Behind the tear gas clouding its streets in recent months, Seoul maintains the face of a boom town. New concrete-and-glass office towers and hotels loom over ancient palaces and temples. Identical high-rise apartment blocks fan out from the Han River in endless rows, housing a growing workforce employed by the industrial giants Hyundai, Goldstar, and Samsung. Further south, the stadiums, arenas, and housing for the 1988 Olympic Games are nearing completion with the confidence that all political tensions will be resolved within the year. Meanwhile, the beleaguered regime of President Chun Doo Hwan continues a long-term effort to prove that the cultural development of South Korea is keeping pace with economic growth.

In 1981, the government decided to move its then 12-year-old National Museum of Modern Art from a two-story Neoclassical building on the grounds of the venerable Deogsu Palace, in downtown Seoul, to Grand Park, a mountainous recreational area on the outskirts of the capital which includes a zoo, campgrounds, and a Korean version of Disneyland called Seoul Land. In '82, Hwan's ministry of cultural affairs sponsored a limited competition for the design of the new museum. Invited to submit proposals were two local firms, Seung Joon Yoon and Soo Keun Kim, and a Korean-born, Yale-educated architect who has practiced in the United States since 1962, Tai Soo Kim, of Hartford, Connecticut. The museum's advisory committee of artists, architects, and government officials promptly awarded the commission to Tai Soo Kim on the strength of his conceptual sketches, which he completed during a one-week visit to Seoul. The committee was particularly struck by the architect's compelling vision of the cultural complex as both an active institution and a civic monument to renewed national pride.



©*Paul Warchol photos*

"The biggest design challenge was creating this large-scale building so that it would look prominent but not overshadow the landscape," Kim explains. After visiting several historic stone temples and castles south of Seoul, he decided to emulate their site planning and materials in a design elevated onto a stepped granite podium set within the slope of Mount Chonggye. And to underscore the museum's monumentality, he plotted a picturesque route of arrival that gradually reveals the building's variegated massing. From the entrance to Grand Park, visitors approach the museum over a bridge spanning an artifical lake (opposite) that borders the western edge of a sculpture garden. The predominantly horizontal composition visible from this northern vantage point shifts to a vertical stack of concentric cylinders when seen from the west (this page). Both tiered formations echo the peaks behind, as if the building had sprung from the mountain itself.

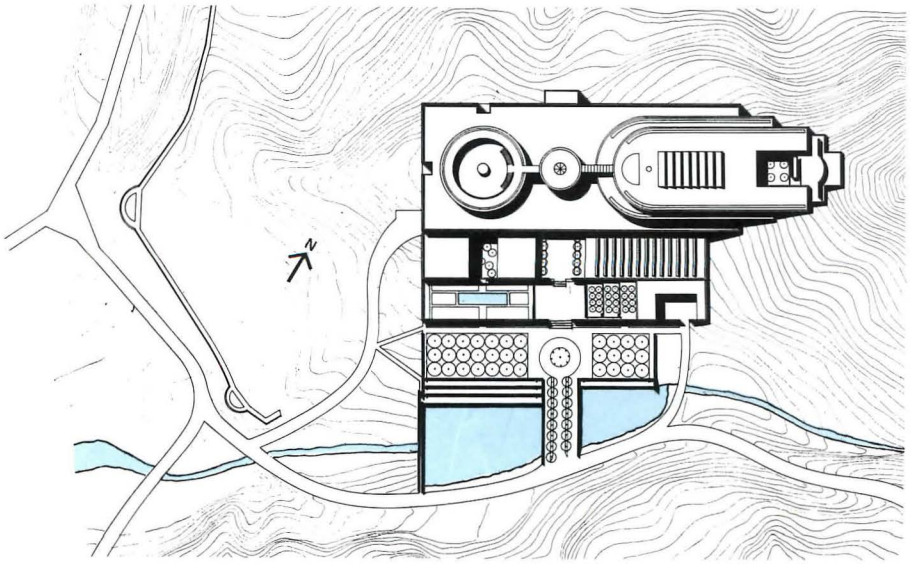
After arriving at the southern edge of the museum grounds, visitors cross a footbridge over a pond and ascend a series of tree-lined sculpture terraces to the main entrance. It is this processional arrangement that most closely resembles the rusticated masonry platforms and formal gardens of ancient Korean palaces and temples. Though the building, like the terraces, is rendered in local pink granite, its three smooth-faced volumes shun the ornamentation of traditional Korean architecture in favor of strong, abstract geometry. Punctuated by a few square openings, the ensemble of stepped curves and drums conjures a hybrid image of an Asian fortress crossed with an Italian Rationalist school.

The stateliness of the exterior is reflected inside by a clearly defined spatial hierarchy, which divides the interior into autonomous functions. Kim has maintained a continuous connection to the landscape by introducing an atrium, courtyards, and skylit corridors among the 365,205 square feet of galleries, offices, art school, shop, and lounge. A freestanding rotunda forms an appropriately grand centerpiece, boasting a skylit spiral ramp obviously modeled on Frank Lloyd Wright's Guggenheim Museum. As a circulation hub, the rotunda unites the east wing of the building, which contains a permanent collection of both Western and Oriental art, with a projecting drum at the western end, which houses temporary exhibition and sculpture galleries. Kim has divided each wing into flexible, daylit interiors meant to be subdivided as the museum reorganizes its collections, although the curatorial staff has so far hesitated to customize the raw spaces for specific artworks. Regrettably, clumsy track lighting, inexpensive finishes, and unimaginative display techniques diminish the impact of the new museum's architecture and the unusual contemporary Korean art hung in the main galleries. However, given the ambitious vision and eclectic taste of director Kyung Sung Lee, who opened the museum with an exhibition of artworks amassed by the renowned Los Angeles collector Frederick R. Weisman, the quality of the exhibition design should improve as the National Museum expands its staff and collections, and gains its hoped-for international stature.

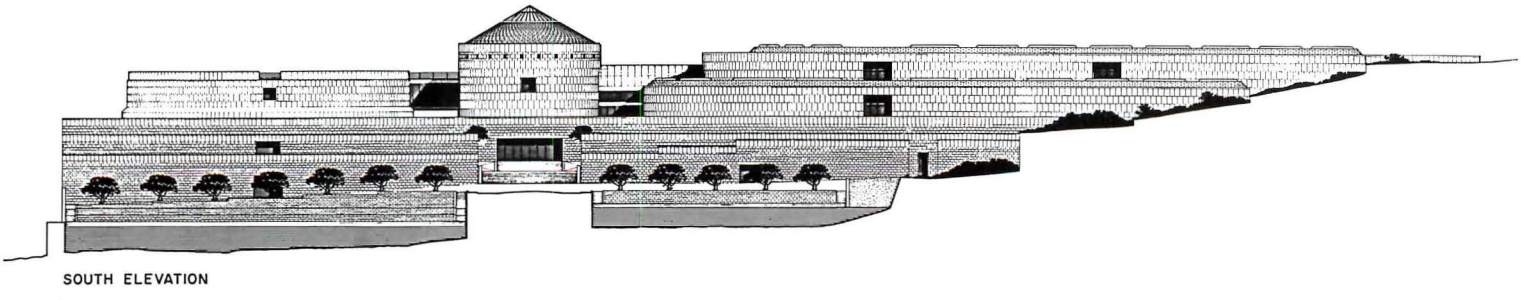
Kim admits that his primary goal was to establish a comprehensive identity for the fledgling institution rather than to deliberate over the intricacies of each gallery. "I'm not particularly concerned about the shape and decoration of a building," he maintains. "I'm more interested in conveying an overall emotion." His latest design conveys a serenity rare in a country beset with political upheaval and in a capital whose physical identity continues to be obscured by the bankrupt legacy of the International Style. By grounding the National Museum of Modern Art in Korean tradition as well as Western innovation, Kim has created a powerful symbol for a country caught between the two. *Deborah K. Dietsch*

National Museum of
Modern Art
Seoul, South Korea
Tai Soo Kim Associates,
Architect

Tai Soo Kim has interpreted the procession to South Korea's National Museum of Modern Art as a contemporary version of the stone podiums and gardens of historic Korean temples and palaces. Visitors coming from the south cross a pond, formed by damming a narrow stream (below), and ascend three terraces to an entrance forecourt. Faced in rusticated local granite, the terraces have been landscaped as walled sculpture gardens, with rows of trees planted on the lowest level (photo opposite and elevation) and a



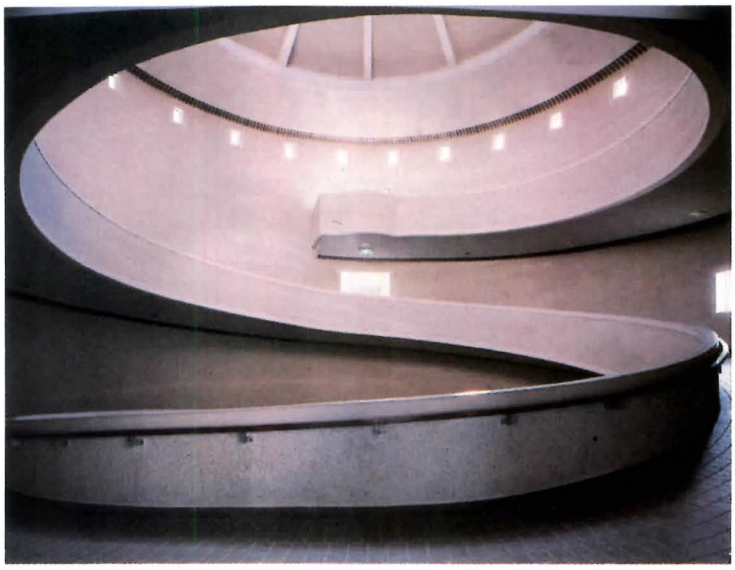
reflecting pool on the second tier (below). Under the platforms are curatorial offices, an art school, two auditoriums, art storage, conservation, and service areas. Kim designed the galleries as independent geometric volumes, linked by a central rotunda and second-floor corridors vaulted in tinted glass (below). Punctuated by a few small openings, the cylindrical forms recall castle turrets, reinforcing the image of the new museum as a cultural fortress.

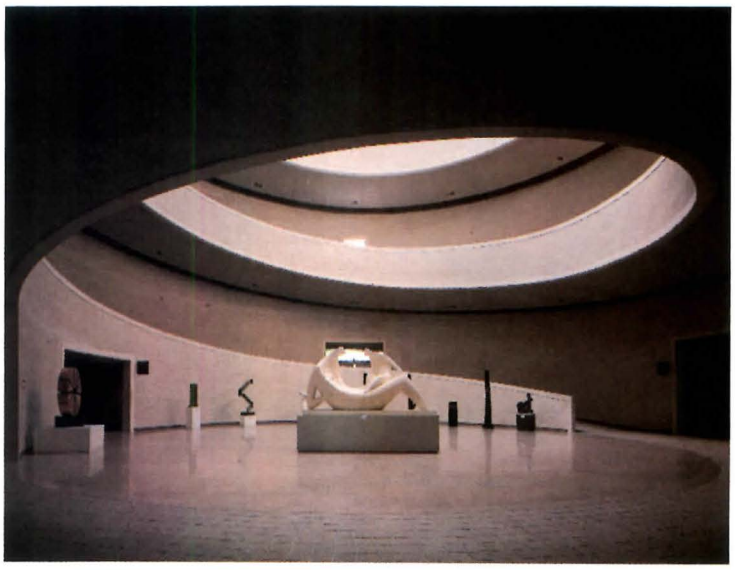


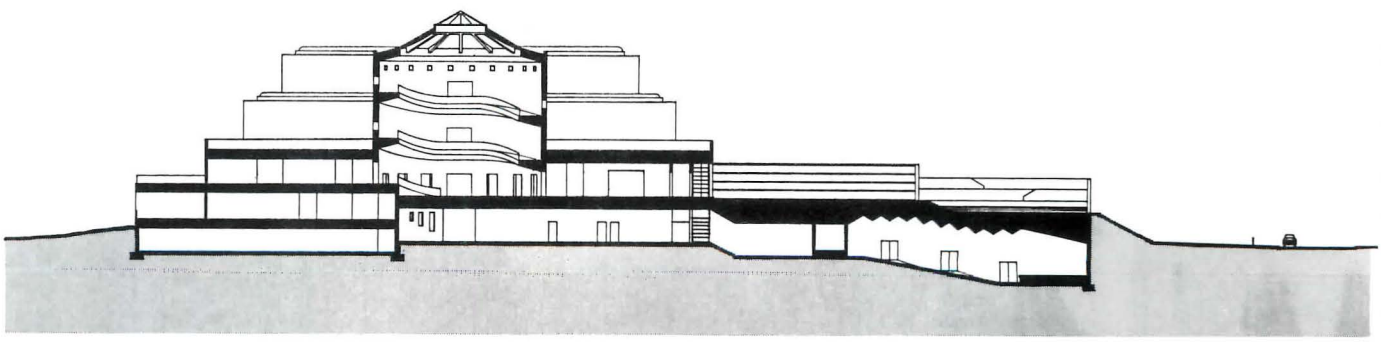
SOUTH ELEVATION

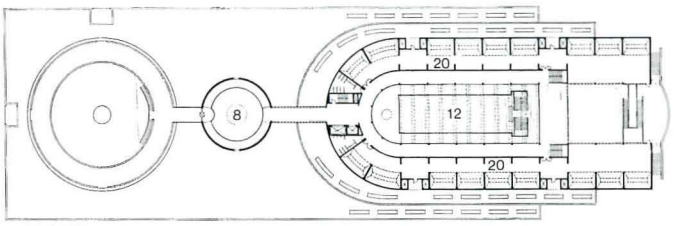
The museum nestles into the base of Mount Chonggye in Seoul's Grand Park, a recreation area south of the capital which focuses on an artificial lake and recently completed visitor information center (middle of top). Bordering the park are apartment blocks typical of the new housing that encircles the city (top). As the museum's roofscape reveals (top), Kim has stepped the building to provide outdoor gallery space. Views of the park and surrounding mountains are available from atop the west wing, which incorporates a circular plaza for sculpture around the shaft of the service elevator (above). The courtyard between the art school and curatorial offices (opposite) will occasionally house exhibitions of student artwork.

The 150-foot-high, 66-foot-diameter Guggenheim Museum at the core of the building is primarily for circulation, linking the entrance lobby (second level, right of section) to the visitors' lounge (second level, left of section) and upper levels of the east and west wings. The uneven ramp that winds around the perimeter of the toplit drum possesses a sculptural plasticity, as if modeled from a coil of clay (right). The rotunda's rough granite paving, coarse-grained stuccoed walls, and wood-slatted light baffles (opposite) reinforce an atmosphere of gritty majesty. The dedicatory inscription encircling the skylight was contributed by the government. Next year, the museum plans to replace the Modern bronzes in the center of the rotunda with a sculpture comprising 1,000 video monitors, by the Korean artist Nam June Paik.

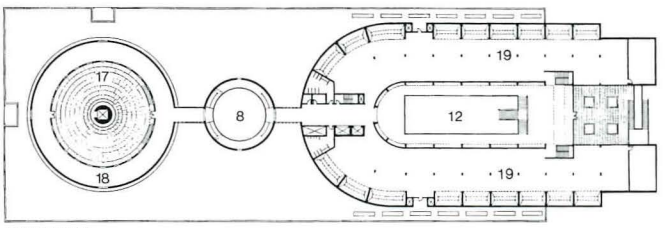




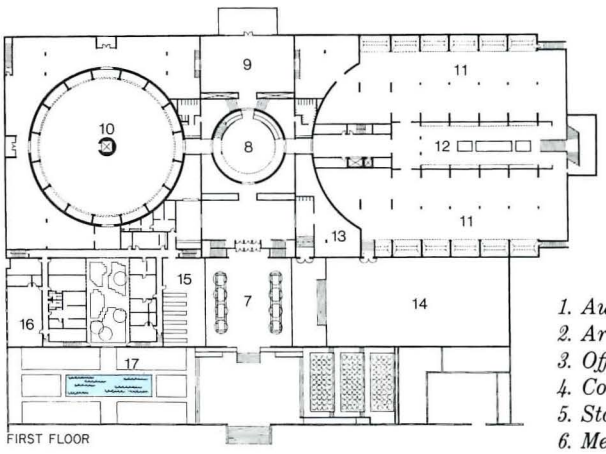




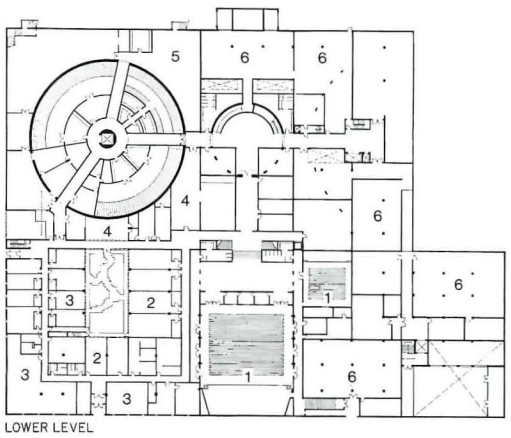
THIRD FLOOR



SECOND FLOOR



FIRST FLOOR



LOWER LEVEL

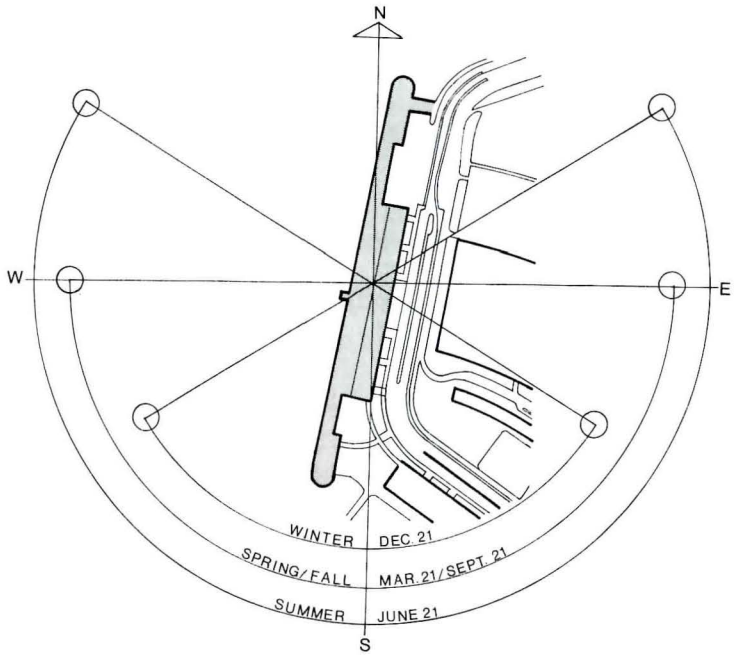
1. *Auditorium*
2. *Art school*
3. *Offices*
4. *Conservation*
5. *Storage*
6. *Mechanical*
7. *Entrance ct.*
8. *Rotunda*
9. *Lounge*
10. *Multipurpose*
11. *Temp. exhib.*
12. *Atrium*
13. *Shop*
14. *Rental gal.*
15. *Library*
16. *Admin.*
17. *Outdoor exhib.*
18. *Sculpture*
19. *Permanent col.*
20. *Special exhib.*

Tai Soo Kim has managed to daylight every interior of the museum, despite its varied configuration. In the east wing, three levels of galleries are arranged around a skylit atrium (top and opposite), including toplit bays for special exhibitions (bottom). In the west wing, the circular exhibition area on the first floor receives natural illumination through an opening cut around the service elevator shaft (middle). The granite of the exterior reappears on the floors and stairs of the atrium (opposite) and first-floor galleries (middle).

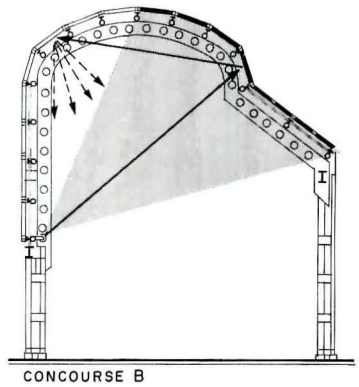
National Museum of Modern Art, Seoul, South Korea
Architect:
Tai Soo Kim Associates—Tai Soo Kim, principal; Richard Szczypek, project manager; Peter Chow, job captain; Betsy Hickox, Jeffrey Silberstein, Paul Tackowiak, designers
Associate architect:
Illkon International—In Seuk Kim, associate architect; Oh Chung Won, job captain
Engineers:
Ma Choon Kyoung (structural); Moo Eh Engineering (mechanical/electrical)
General contractor:
Dae Woo Construction Co.

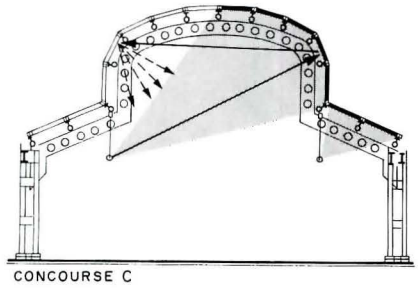
United Airlines Terminal
O'Hare International Airport
Chicago
Murphy/Jahn, Architect

Lighting the way



The sections through Concourse B and C, right, indicate the distribution of luminaires. In Concourse B (above) cylindrical luminaires with four 400-watt metal-halide lamps—two per bay—are mounted on structural tube/purlins. The light from these luminaires is aimed at the opaque structural panels. At night, reflected light from the opaque panels strikes the white frit-pattern glass on the facing wall and reflects light back into the concourse. The pattern becomes "luminous" and creates a sense of enclosure, which avoids the appearance of "black glass." In Concourse C (lower section), cylindrical luminaires are pendant-mounted from the structural tube/purlins. Cylindrical luminaires (two per bay) with three 400-watt metal-halide lamps were used on the glass side; luminaires with one 150-watt metal-halide lamp (two per bay) were aimed at the surfaces finished with opaque structural panels. Above: site plan indicating solar orientation.





By Sylvan R. Shemitz

The recently opened United Airlines Terminal at O'Hare Airport is a unique design of immense size and high visibility. As architecture it is a milestone project. From my perspective, as lighting designer for the complex, I believe that the terminal marks significant advances in the art and technology of illumination as well. Inevitably, in addition to the many solid successes in the project, there were a few details lost with regret. But like any project that involves new approaches, it took mutual support and encouragement from, and communication and sympathetic interaction between, dedicated designers. Helmut Jahn and Martin Wolf led an exciting and exceptionally brilliant team. We had fun. Let me tell you what we did and how we did it.

Daylighting

Daylighting control at the new terminal was of primary importance because of its greenhouse-like design. The most challenging areas were the two 1,600-ft-long concourses. The vaulted ceiling in Concourse B, adjacent to the ticketing pavilion, ranges in height from 35 to 45 ft (top section at left, and photographs on facing page). The outlying Concourse C vault is 22 to 32 ft high (bottom section at left). Supported on a skeleton of exposed structural members, both concourses' east-facing enclosure is primarily opaque and the west-facing enclosure is transparent. For such spaces to be comfortable and pleasant in daylight, the brightness contrast between the glazing and opaque surfaces must be reasonably low.

We recommended white ceilings and structural members (85 percent Reflectance Factor) and medium reflectance floors (50 percent Reflectance Factor). For light transmission at the glazing, the use of white frit on clear glass was recommended in patterns giving approximately 50 percent reflectance and 50 percent transmission. This combination does not distort colors observed in the space or through the glass. Since the frit-covered, clear half of the vault faces west, the opaque surface opposite is lighted by the direct sky brightness as well as by the slight diffusion and diffraction caused by the patterns of white frit. As a result, no electric light is required during the day.

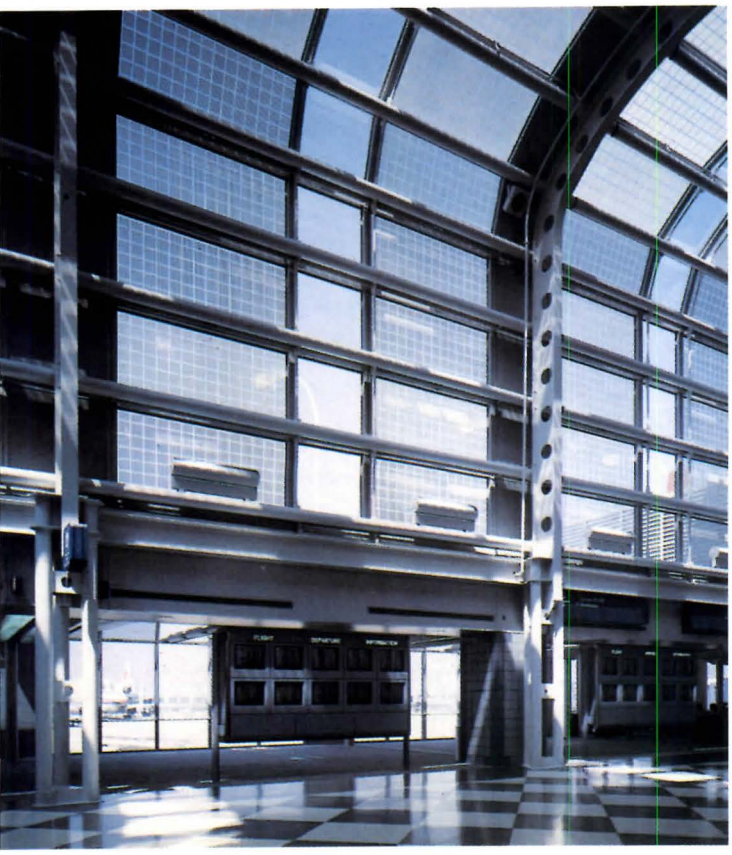
The second daylighting challenge was to provide a daylight control system for the linear skylights in the ticketing pavilion (photos page 151) and holdrooms (photos page 155). In the 800- by 120-ft ticketing pavilion, the 5-ft-wide skylights are 30 ft on center at the peaks of the folded truss roof. The goal was to prevent entry of sunlight to control discomfort from excessive brightness contrast, radiant heat, and reflections on the ticket agents' computer screens (the latter a requirement of United Airlines), yet provide a comfortable daylighted environment for passengers.

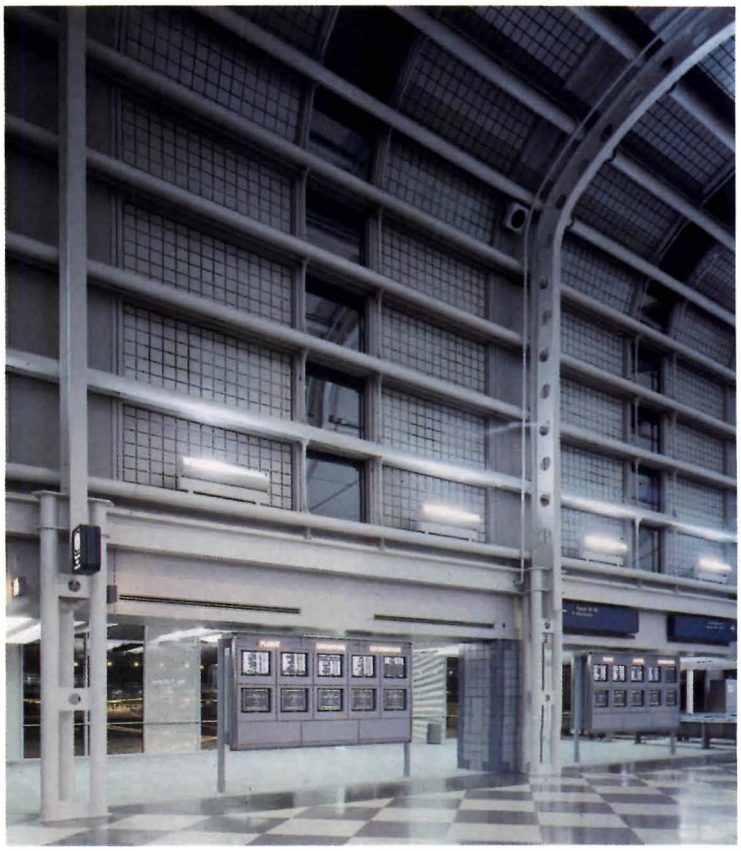
Louis Kahn's Kimball Museum (lighting design by Richard Kelly) inspired a series of section studies with inverted "gull wing" baffles that intercept and reflect direct sunlight from the east-to-west oriented openings. Mocking up a wide range of samples, we looked for apertures small enough to diffract the light (resulting in diffusion of the light that penetrates) and frequent enough to allow substantial direct contribution to the space below. Since, at certain short periods, sun does enter the space, we recommended additional baffling in the form of a canopy over the ticket counters where video display terminals are

Sylvan R. Shemitz is a lighting designer and principal in the firm Sylvan R. Shemitz Associates, Inc. in West Haven, Conn.

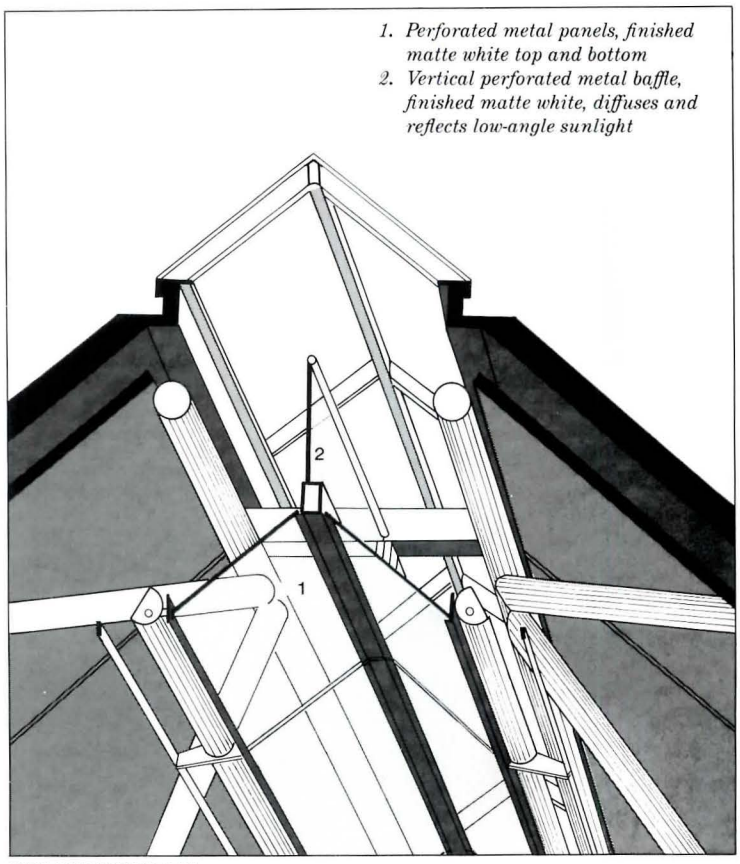
Pushing the boundaries of current design practice, lighting engineer Sylvan R. Shemitz tells how he has synthesized daylighting and nighttime illumination techniques integral to the architecture of the new United Airlines Terminal.

©Steinkamp/Ballogg Chicago

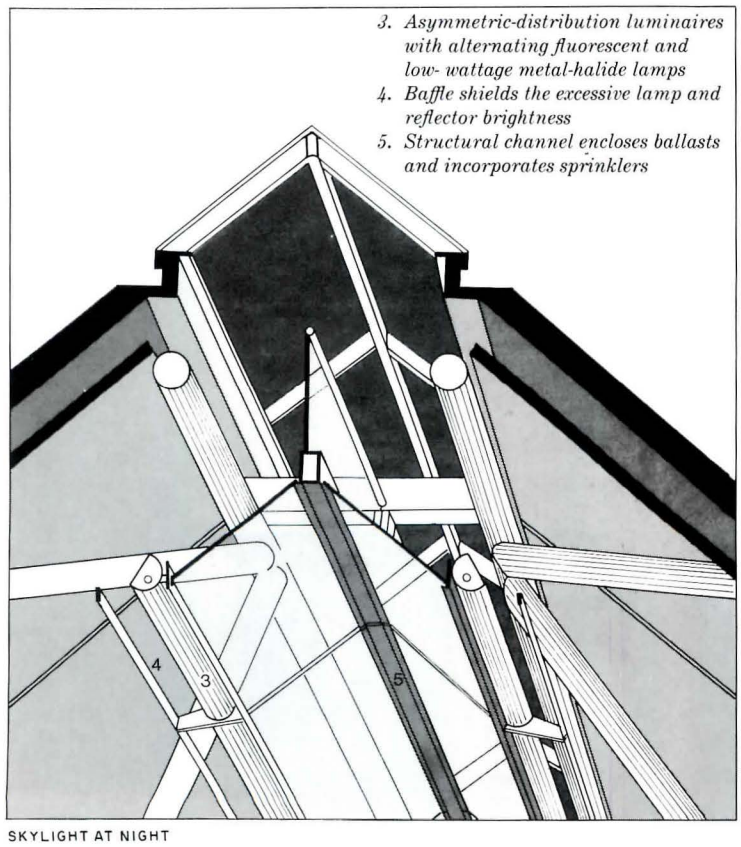




"The lighting of buildings is most often and most unfortunately thought of as fixtures suspended from, placed on, or recessed in them. Lighting is too frequently an afterthought resulting in a cosmetic solution."



SKYLIGHT DURING DAY



SKYLIGHT AT NIGHT

viewed. The holdrooms, which are of similar form, though lower and with shallower folds, used a similar gull wing baffle (see page 154-155).

Artificial lighting

Night follows day. In the concourses, we were concerned with the large expanses of glass at night. When brightness perceived through glazed surfaces is less than the brightness of surfaces within the enclosed space, the glass will reflect an image of those surfaces. The glass will look like a black mirror.

To combat this effect in large areas, methods traditionally used are: closely spaced bare lamps in endless chains, neon tubes, or lighted banners or plants hung below the glazed surfaces. But almost always the black mirror is dominant—and always, the building structure is "decorated" or obscured.

As an alternative to the standard solution, we recommended the use of a white frit pattern fired onto the clear glass of the concourse vaults. During the day, when the outside environment is brighter than the interior environment, people see through the fritted pattern to the sky and plane traffic beyond. At night, the interior environment becomes brighter than the exterior environment. Any light reflected from the opaque vault surfaces is re-reflected by the frit, thereby completing the sense of enclosure at night and contributing to the illumination in the concourse below.

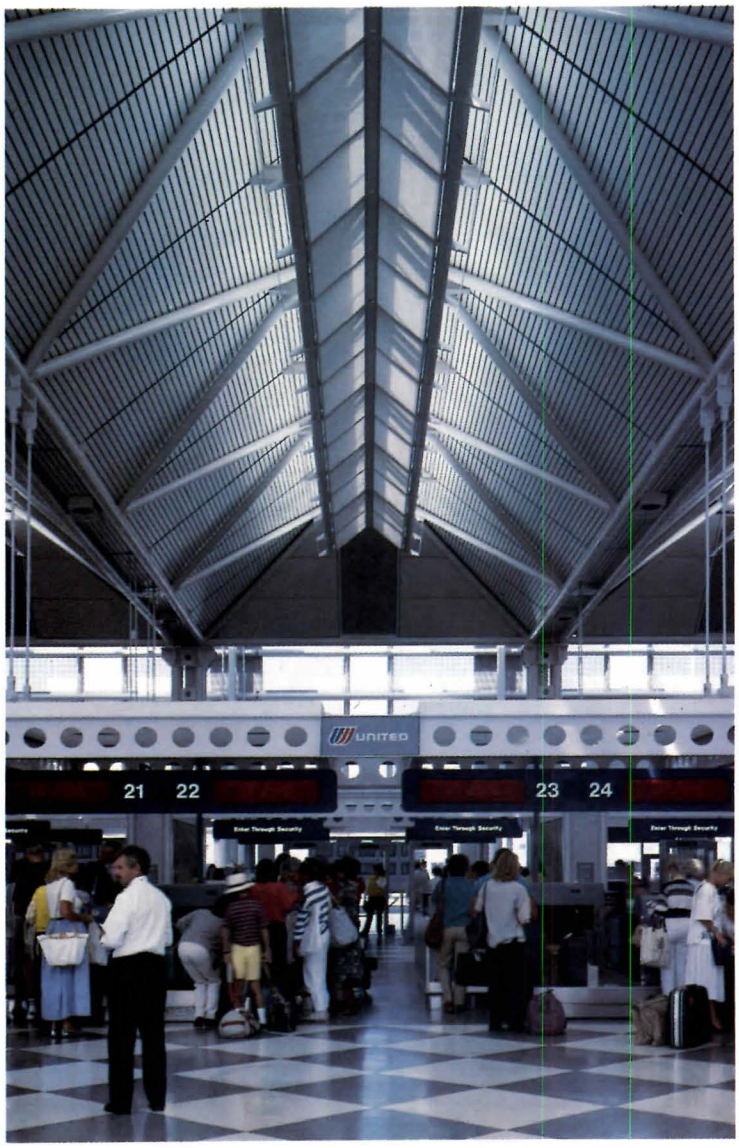
The minimum lighting level required by the city of Chicago for the concourses was set at 25 footcandles. The Illuminating Engineering Society's standards for such areas is 5 to 10 footcandles. Our concept was to light the ceiling and walls to reveal the architecture and obtain indirect illumination of the concourse to a level between 10 and 25 footcandles. This level was deemed appropriate by us because lighting from large area sources provides greater task visibility than direct downlighting. However, convincing the owners to accept levels below city standards took some doing. I pointed out that existing O'Hare Airport Terminals were all lighted by traditional downlight systems, requiring a great amount of light reflected from floors to illuminate the ceilings and walls to pleasant brightness levels. Our new approach was to directly illuminate the ceilings and walls to make the space pleasant, thereby reducing the need for excessive footcandles at the floor while increasing visibility of the architecture and the task.

For the concourses, symmetrical-distribution luminaires with sharp horizontal cutoffs were specified to light the opaque portions of the vaulted ceiling (see light distribution diagrams, page 148). Highly efficient horizontal burning metal-halide lamps (4,500 deg K color temperature) were selected to be compatible with the colors used by the architect. Standards were set for the distribution of light, and those were used to develop schematic reflector designs. The illumination of other major terminal spaces (the underground pedestrian corridor, and passenger hold areas) are discussed on the following pages.

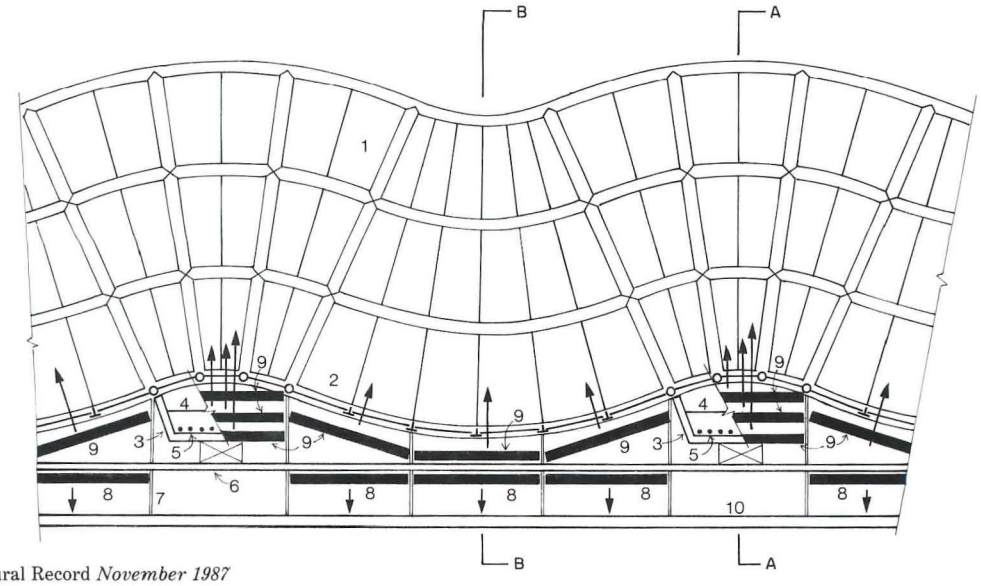
Lighting is architecture / Architecture is light

The lighting of buildings is most often and most unfortunately thought of as fixtures suspended from, placed on, or recessed in them. Lighting is too frequently an afterthought resulting in a cosmetic solution. In the new United Airlines Terminal at O'Hare,lighting and architecture are one.

The folded truss structure in the ticketing pavilion (photos below) supports linear metal-ceiling panels that serve as reflectors. During the day, the ceiling works with the "gull wing" light diffusers suspended beneath the skylight (top axonometric, facing page). At night (right photos below), asymmetrically distributed luminaires wash light down the ceiling. Fluorescent lamps reinforced by metal-halide lamps provide a smooth, uninterrupted wash to achieve comfortable levels of illumination at the floor below.

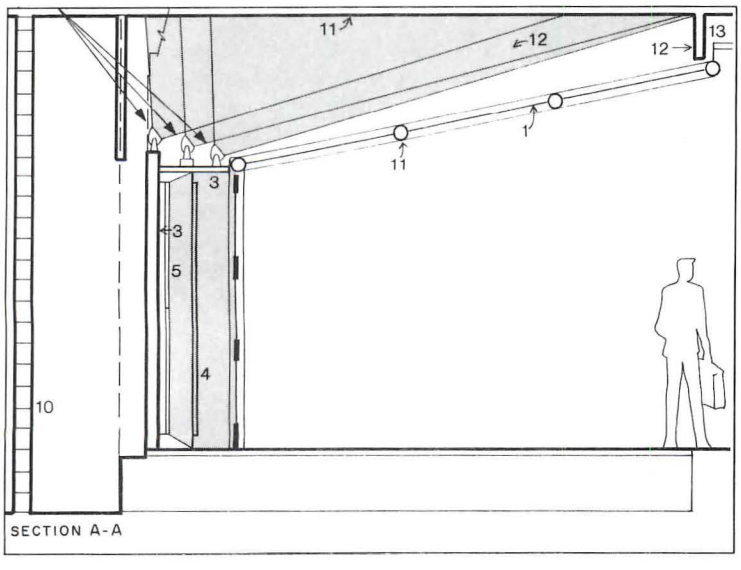


Between Concourse B and Concourse C, there is a connecting pedestrian corridor (illustrated below) that is reached by an escalator that descends 35 ft below grade. To conveniently speed people through this 800-ft-long by 68-ft-wide tunnel, four parallel horizontal people-movers are positioned in the center of the space. On each side, a travertine floor varying from 12 to 14 ft wide serves people who prefer to walk. Both the client and the architect felt it very important to make traversing the corridor a pleasant experience that would not only make the trip seem shorter for users, but also eliminate a claustrophobic feeling. Drawing on their very successful experience of colored back lighting of glass blocks in the O'Hare subway station (Carl Hillman Associates, lighting designer), the architects with Murphy/Jahn developed the abstract perimeter forest of luminous planes, pictured below. Shemitz suggested using a clear refracting glass for best transmission of light. The tunnel was to be kept as wide

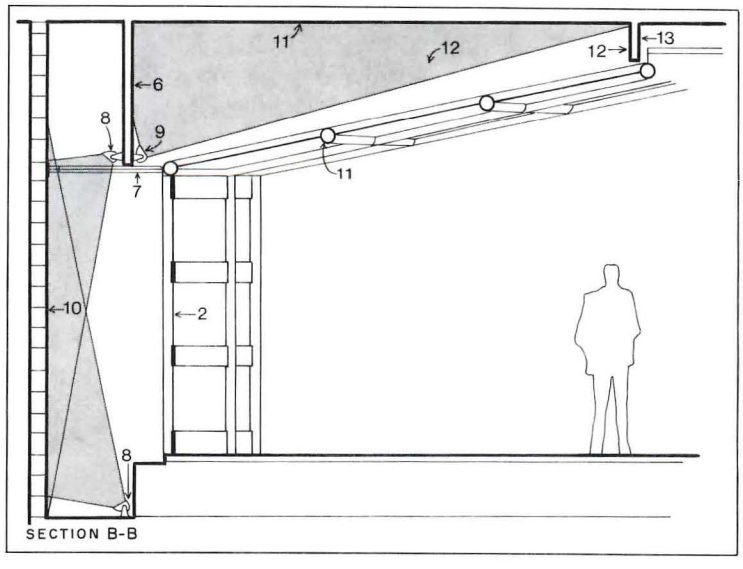


1. *Textured, clear glass ceiling panel(s)*
2. *Textured, clear glass wall panel(s)*
3. *"Light box" enclosure, finished matte white*
4. *Translucent, acrylic plastic diffuser*
5. *Fluorescent "channel" luminaire(s)*
6. *Suspended back partition, finished matte white*
7. *Steel channel supports*
8. *Asymmetric-distribution, high output, fluorescent wall washer (typical at top and bottom)*
9. *Asymmetric-distribution, high output, fluorescent ceiling washer.*
10. *Concrete block wall, finished with a variety of matte colored paints*
11. *Matte, white paint finish*
12. *Specular, white paint finish on side and back partition facings between trees*
13. *Specular black finish*

as possible so the distance between the glass and lighted back walls had to be kept to a minimum and was determined by the space needed for a person to service the equipment. Therefore, an asymmetric-distribution fluorescent luminaire was used again to graze light down and up the colored back wall, and out across the ceiling above the glass (see section drawings below). Shemitz increased the intensity of the abstract tree trunks to give emphasis to the stylistic trees and to project additional light out into the walking space. This was accomplished with fluorescent strips facing toward the glass, with a secondary diffuser placed between the glass and the fluorescent strips so that lamp images are not seen when looking through the glass (see plan, facing page). The pedestrian corridor composition was completed with handrail lights on the moving walkways and wall washers at the terminal walls. A neon sculpture by Michael Hayden was commissioned for installation at the ceiling plane.

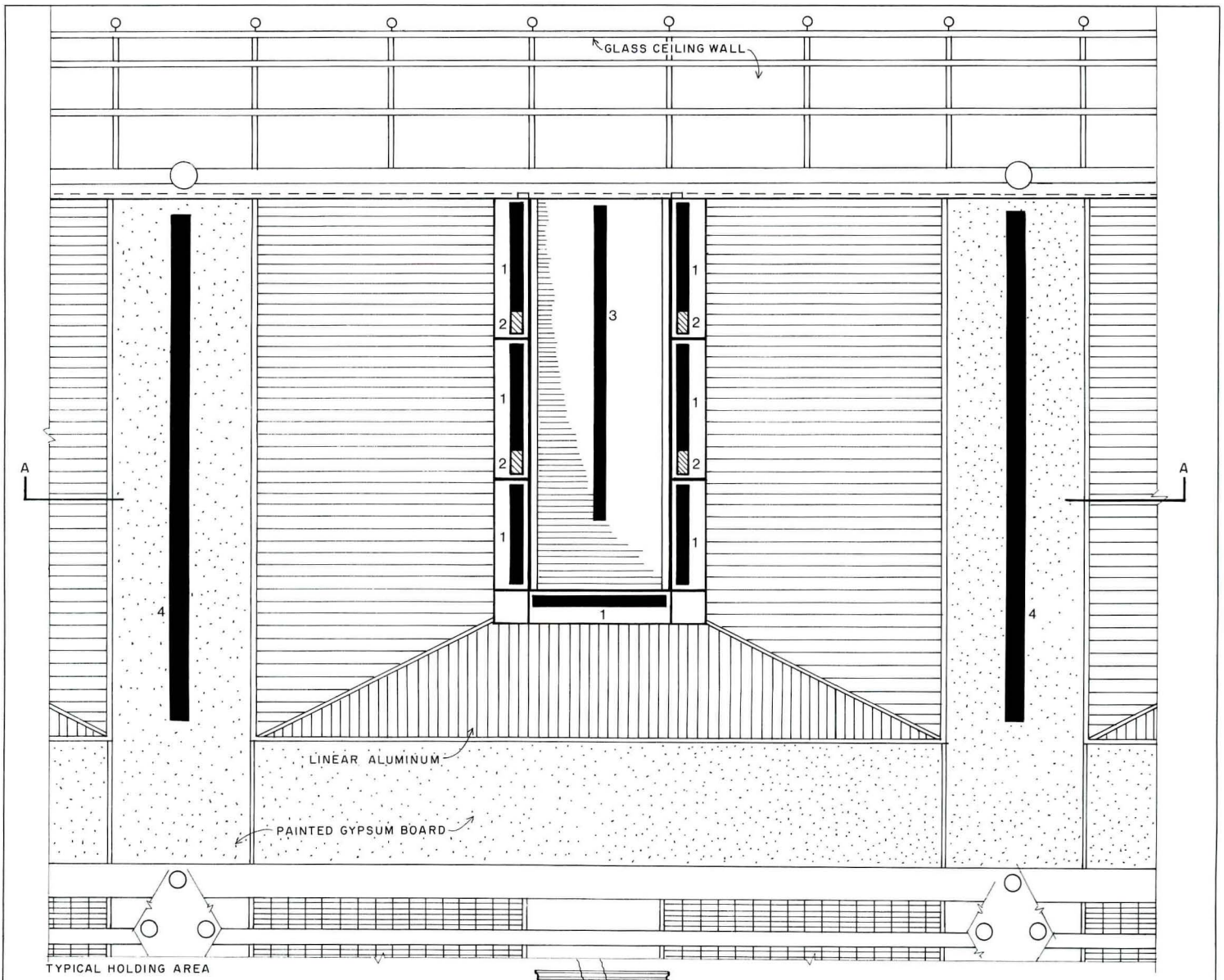


SECTION A-A



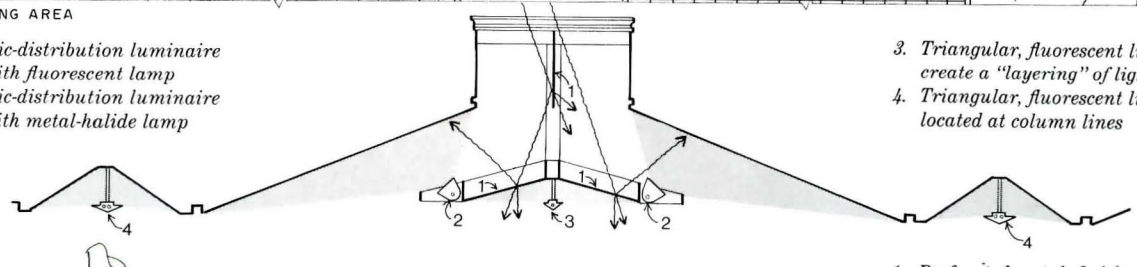
SECTION B-B

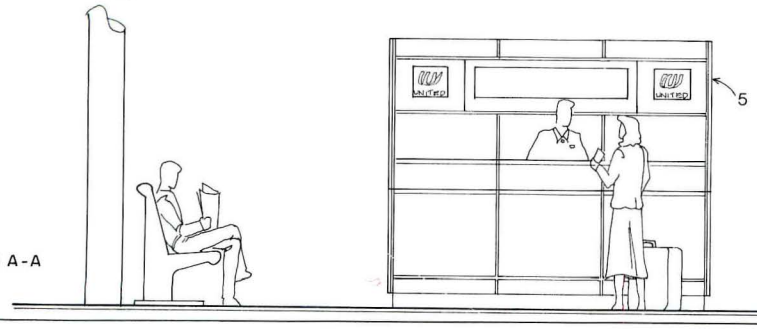
In the ticketing area, the concept was night follows day, with light to wash down the sloped ceiling from the "gull wing" light diffuser (see axonometric drawings, page 150, photos, page 151). A linear source was needed to create a smooth lengthwise pattern of light on the ceiling. Asymmetric-distribution reflectors housing new small-diameter energy-saving fluorescent lamps were considered. The illumination level was inadequate so Shemitz interspersed a new low-wattage compact metal-halide lamp he had just seen at a trade show in Germany. The color of these lamps matched the fluorescent light and provided the needed supplement. The suspended canopy over the ticketing counters incorporated additional task lighting. In the



TYPICAL HOLDING AREA

1. *Asymmetric-distribution luminaire segment with fluorescent lamp*
2. *Asymmetric-distribution luminaire segment with metal-halide lamp*
3. *Triangular, fluorescent luminaire to create a "layering" of light*
4. *Triangular, fluorescent luminaire located at column lines*

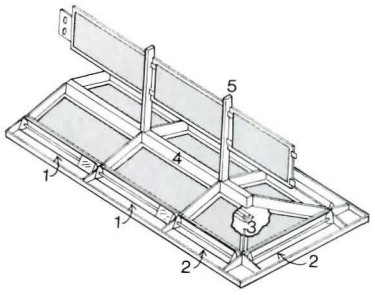




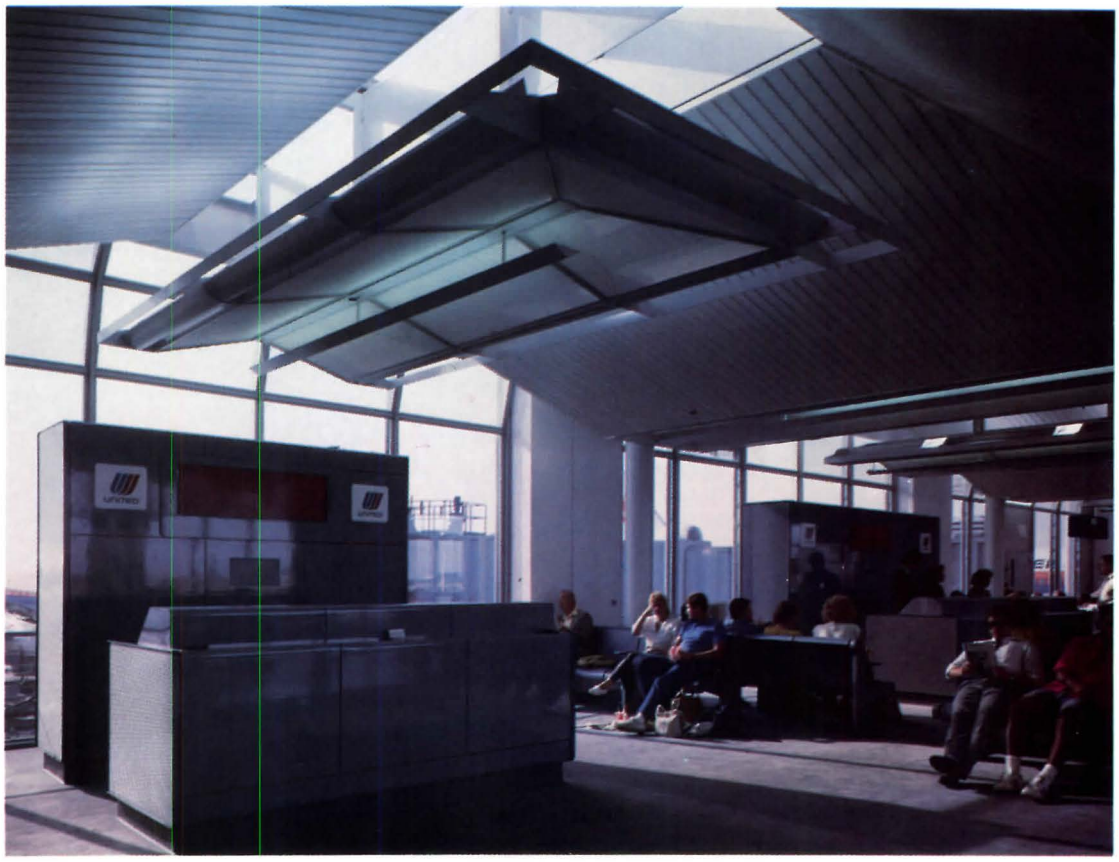
SECTION A-A

1. *Perforated metal, finished matte white (top and bottom)*
2. *Asymmetric-distribution luminaire to light inclined ceiling surface*
3. *Triangular, fluorescent luminaire to create a second "layering" of light*
4. *Triangular, fluorescent luminaire located at column lines*
5. *"Backdrop" behind attendant's counter to prevent video display terminals from reflecting an image of the hold room's glass wall*

holdrooms (photos below and drawings, facing page), a lighting system similar to the ticketing area was used. Sufficient light was needed for reading. Supplementary lighting in the form of V-shaped high-output fluorescent luminaires was added under the gull wing and at the column lines. These increased the illumination level to the goal of 25 footcandles and created another layer of light in the composition. The inspiration for this came from the Art Deco columns in the Radio City Music Hall. The baggage claim area, though it has no daylight, uses the gull wings similar to the holdrooms (axonometric below). Wall lighting from semirecessed luminaires equipped with a new 70-watt metal-halide lamp (3,000 deg K) gives vertical brightness at the terminal wall.



1. *Asymmetric-distribution luminaire with fluorescent and metal-halide lamps*
2. *Asymmetric-distribution luminaire with fluorescent lamp*
3. *Triangular, fluorescent luminaire to create "layering" of light*
4. *Structural channel/ballast compartment*
5. *Hollow-tube support/raceway*



United Airlines Terminal
O'Hare International Airport
Chicago, Illinois

Owner:
City of Chicago

Tenant:
United Airlines

Architect:
Murphy/Jahn (design architects)—Helmut Jahn, principal in charge; Martin Wolf, project architect; Stanford Gorshow, Tom Chambers, Nada Andric, Brian O'Connor, Jon Pohl, project team; A. Epstein & Sons (associate architects for production drawings)

Lighting design:
Sylvan R. Shemitz Associates, Inc.—Sylvan R. Shemitz, principal in charge; Eliza Frimmer, Linda Knight, Julie Leister, Jim Melling, David Miller, Benjamin Stahlheber, Joseph Zaharewicz, project team

Engineers:
Lev Zetlin Associates (structural); A. Epstein & Sons (structural, mechanical, and electrical)

Consultants:
O'Hare Associates, supervising consultants; Schirmer Engineering, fire protection; Thinking Lightly, art; Apple Designs, Inc., graphics/signage

New products: Designer's Saturday

Designers (more than 20,000 of them) came from all over to see new furniture and textiles, at the design centers all over New York City that participated in Designer's Saturday 1987.

1. Encore ergonomic
German designer Burkhard Vogtherr set out to reduce the mechanical elements—levers, knobs, lumbar air-bags—of some ergonomic seating concepts, and came up with the *Motion* chair. A unique spring provides synchronized back support, moving the back and seat in opposite directions as the body shifts. The height adjustment is placed under the center of the chair directly beneath the users' center of gravity to resist tipping. Davis Furniture, High Point, N. C.
Circle 300 on reader service

2. Italian-American
Constructed with a solid beechwood arm/leg unit that resembles a walking stick, the *Cane* executive side chair was developed in Milan by the Centro Design e Comunicazione for manufacture in the U. S. Seats and backs are formed of foam molded over steel, upholstered in leather (pictured), fabric, or vinyl. Atelier International, Ltd., New York City.
Circle 301 on reader service

3. Custom transitional
By selecting components offered in the *Architectural Options* collection (shown here, the *Arcus Series*) designers can assemble a custom office including corner and straight worksurfaces, lateral and two-box files, and a panel- or wall-mounted overhead cabinet with task lighting. The square meeting table and chairs are also from the *Arcus Series.* Modern Mode Inc., San Leandro, Calif.
Circle 302 on reader service

4. Contract fabrics
Designed to coordinate with new *Steelcase* paint colors, all-polyester *Regatta* fabric comes in 14 solid and 11 heathered colors for vertical panel and acoustical surfaces. Steelcase, Inc., Grand Rapids, Mich.
Circle 303 on reader service

5. Metal and glass table
A Rodney Kinsman design for *Bieffeplast,* the *Detroit* table has a frame and legs of cast aluminum. It is shown here with a glass top; other surfaces and sizes are available. Gullans International, Inc., New York City.
Circle 304 on reader service

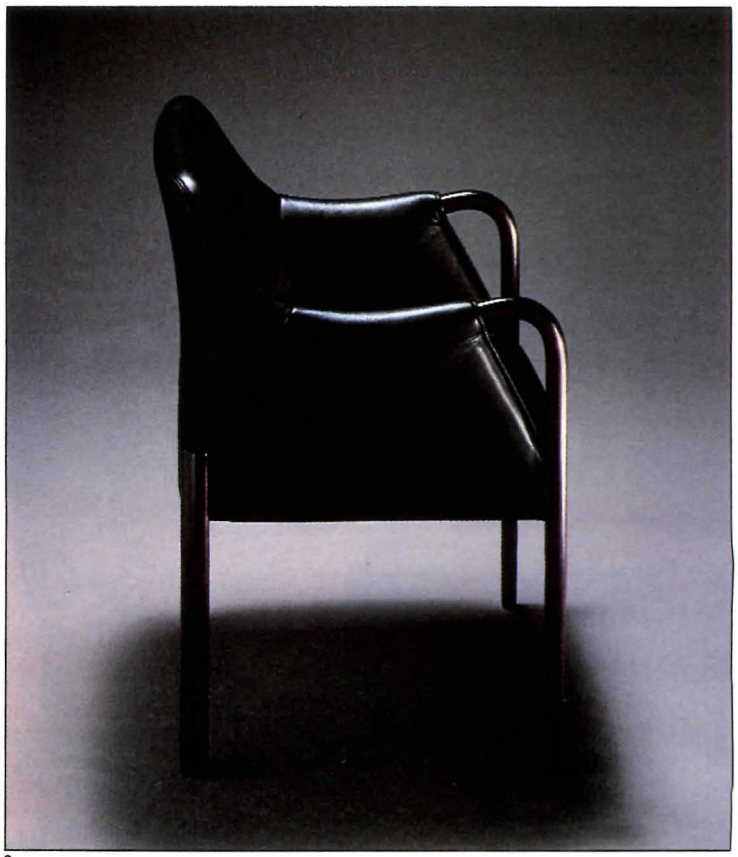
6. Lounge group
Chicago architect Robert Kleinschmidt has provided a number of options for this lounge seating. Set on bases of stone, wood, or self-skin urethane, units come in low-, wing-, and high-back versions, with or without arms, to create multiple-seat groups such as this L-shape in black leather. The table has a stepped-profile edge on its 3/4-in. glass top that reflects the contours of the seat. SunarHauserman, Inc., Cleveland.
Circle 305 on reader service

7. Contract chair
Designer Bruce Sienkowski has used bent, laminated white oak to give both a light scale and an aura of strength to his *101* Chair for office and dining areas. The cushioned seat and back are offered in leather, and a range of fabric upholstery. Charlotte Company, Belding, Mich.
Circle 306 on reader service

8. Side table
Mobile on four casters, Shiro Kuramata's *Sally* table has a laminated glass top with clear, tinted, and distressed segments, set on a two-level chromed metal base. The table stands about 30-in. high. Memphis Milano, Div. Artemide Inc., New York City.
Circle 307 on reader service

Continued on page 188


1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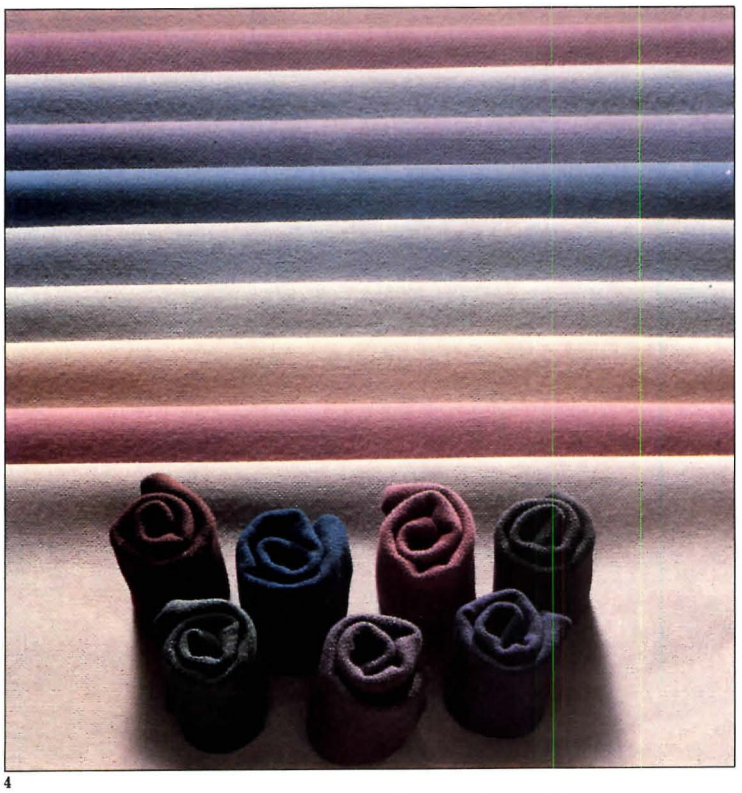

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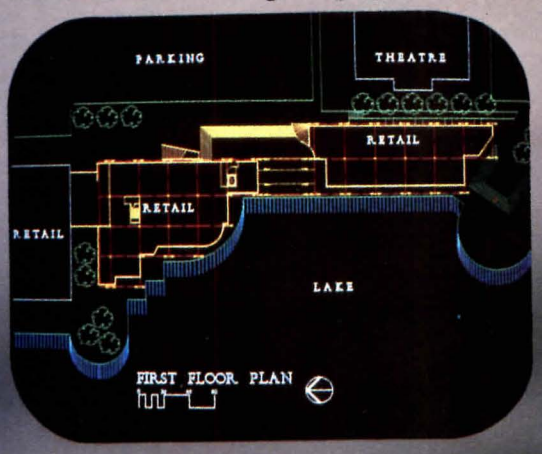
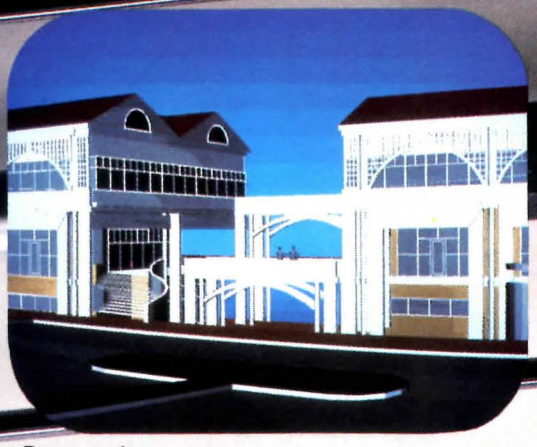
Finally, a CAD system created expressly for architects and building design professionals.



Production. Ordinary CAD does drawings one step at a time. ARRIS goes one step further. Simply feed in the basic design parameters, and the system *automatically* does the routine work, and makes any changes. And you can even add ARRIS to your existing CAD system, to complement, extend and enhance its capabilities.



Presentations. Ordinary CAD is a generic product. ARRIS has been created specifically for architects and building design professionals. It allows your clients to visualize your projects from any perspective. With sharp, colorful 3-D images that can be transferred easily onto slides.

Plus. Ordinary CAD was designed and intended for one person, one project. ARRIS is a multi-user, multi-task UNIX-based system. It was designed for the way architects and building designers *really* work, and to allow for future growth. It gives you the competitive edge, and will *keep* you competitive for years to come.

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ARRIS is a product of Sigma Design and is available in the U.S. and Canada. Computer images created by Jenkins-Peer Architects as part of Lakefront Shoppes at University Place project.

Software reviews for architects

By Steven S. Ross

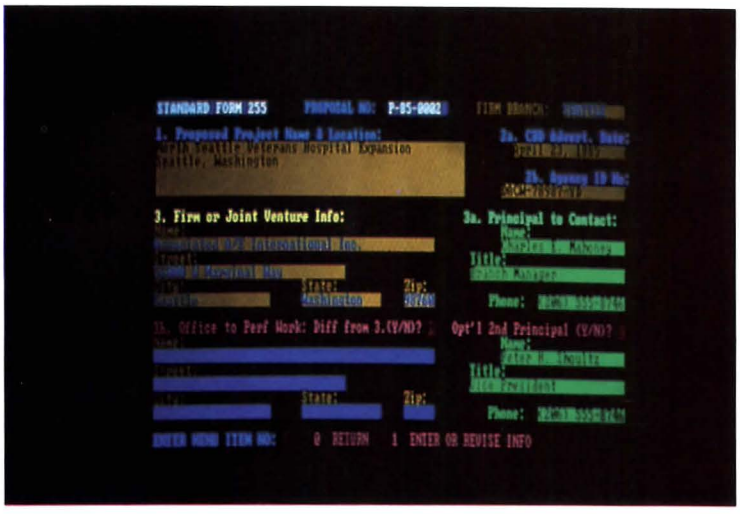
A/E Marketing Manager, version 2

A comprehensive system that can track prospects and your firm's previous projects. It can help generate promotional brochures, federal proposals (SF 255) and profiles (SF 254). If all your firm's proposals are handled through the system, A/E Marketing Manager will also generate tickler files, fee projections, and proposal-cost reports.
Equipment required: IBM PC, XT or AT, or compatible; 640K; hard disk; MS-DOS or PC-DOS 2.0 or higher; wide-carriage letter-quality, dot-matrix or laser printer with nonproportional 12-characters-per-inch font. The system files need at least 4 megabytes of hard disk space. It would be wise to provide at least another 5 to 10 megabytes for files describing your personnel, prospects, projects, proposals, and so forth.
Vendor: Infomax Corp., Box 1369, 8660 SW Cherokee Street, Tualatin, Oregon 97062 (503/692-6189).
Price: $2,495 for main system; another $695 for prospect tracking. Combined price is $2,980. Interactive demonstration (six disks and manual) is $88 for the main system and prospect tracking; $25 for prospect tracking alone. Demo price is rebated if you purchase the actual software. Price includes technical support by phone for six months, and a license agreement for a single computer. Multiple-computer licenses available. Not copy-protected.

Summary:
Manual: Well done. On-screen look and feel is excellent, with good use of color on a color monitor. It helps to have a copy of SF 254 and 255 handy to keep track of where you are in the form-filling process, because each screen only holds one to three categories at a time as you fill them in.
Versatility: Similar to a mainframe, but if you have several copies of the software, on several different personal computers, you cannot merge the client lists or project lists into a single master list. Form files can be sent to a disk file instead of a printer. Drafts can be printed out on continuous-form paper, single-strike; final copies can be double-strike printed on the federal forms themselves, or on forms you define.
Ease-of-use: Good. There are help-screens in the built-in word-processing program. There's no help for the rest of the program, but it really is not needed; on-screen menus allow only specific actions at each point. Requires your computer to be "configured" to handle 50 files and 50 file buffers at once. This may conflict with easy use of other memory-hungry software on the same computer, but the conflict can be overcome. Program automatically creates the subdirectories it needs when it is installed.
Error-trapping: Good. Questionable entries or improper actions (like trying to re-enter a nonexistent or misnamed form or trying to create a new proposal under an existing proposal number) provoke error messages. The master databases created by the program cannot be corrupted as items are combined for new reports.

So, if you're tired of manually typing federal proposal forms, tired of manually marking up resumés and project descriptions to highlight strong points for a specific proposal, A/E Marketing Manager, despite its high price, may be for you. Essentially, this software creates three databases—one for clients and owners, another for your personnel, and a third for your

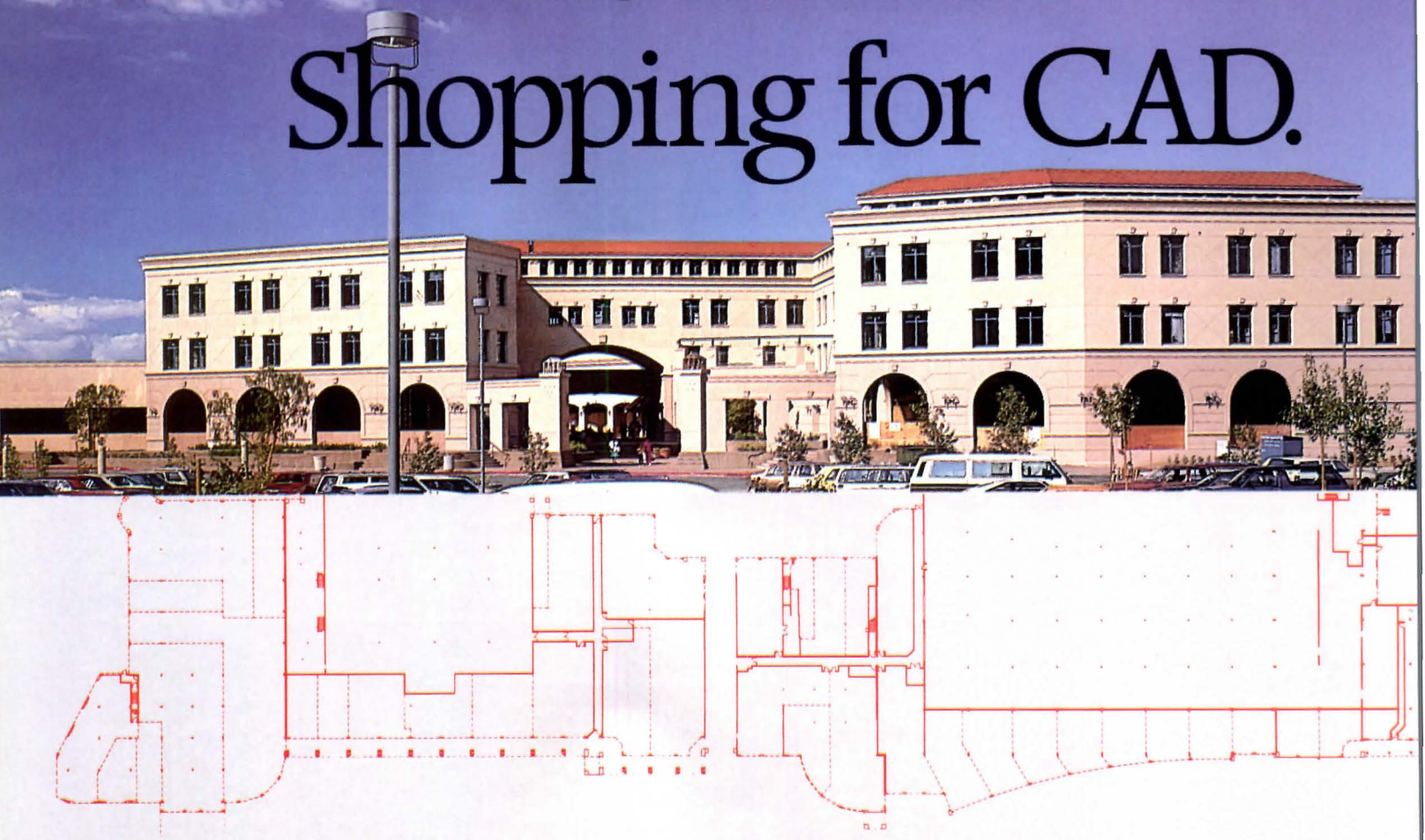
Software reviews continued



A/E Marketing Manager "knows" where things go on Standard Form 255 for federal proposals, as well as SF 254 for profiles, eliminating the need to manually type each one.

Steven S. Ross is past president of CCM, an educational software company in New York City, and now teaches journalism at Columbia University, where he also runs a large computing laboratory for students. He is often consulted on quality-assurance matters; his latest book, Construction Disasters: Design Failures, Causes and Prevention, *was published by McGraw-Hill in 1984.*

How to Go Shopping for CAD.



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Plans for the Corte Madera Town Center were generated on AutoCAD AEC and provided courtesy of Fielo/Gruzen Associated Architects, Rasmussen Ingle Anderson, Developer: Reining & Corporation.

*TechPointers Sept. 1986

A/E Marketing Manager creates three databases—one for clients, another for an architectural firm's personnel, and a third for current and completed projects.

current and completed projects. The software then draws upon the databases to meld new proposals and prospective client mailings together with a minimum of editing.

The program can keep track of up to 20 resumés—each highlighting a specific skill, perhaps—for each member of the staff. Project reports can be shuffled in 35 different ways, using 27 different criteria such as location, project type, size, earned fee, associated firm, and so forth. For instance, A/E Marketing Manager can be asked to assemble a list of retail projects your firm has worked on in Northern New Jersey zip code areas, for fees above $30,000. Federal Standard Form 254 requires firms making proposals to match details of specific projects with the project experience being claimed, and to match them in the same order (the codes are in section 10 of the form, while the projects are in section 11). The software handles that automatically—as long as you've correctly coded the projects in the first place (aside from the 117 standard federal codes, you can add five of your own). To avoid an embarrassment of riches, the software allows you to manually scan each project that fits the required experience, selecting the projects that put your best foot forward. Otherwise, the software tends to select the projects with the highest earned fees.

This software earns high marks for helping users position the forms properly in the printer. Printing individual sheets is always awkward.

But printing them on cramped federal forms is simply a tedious chore, not to be wished upon any secretary. To help, A/E Marketing Manager "knows" about where things go on the standard forms, October 1983 revision. It can also be set to disable the out-of-paper alarm on most printers. Finally, the software can be ordered to print two dots at the beginning of the first line on each side of the sheet. You can then manually adjust the sheets in the printer, if necessary, before printing the entire page. Or, you can use the software's controls to reposition the print head. That's especially handy because the federal forms themselves don't come with consistent margins.

Despite the software-controlled repositioning, I still found the process annoying on an old Epson dot-matrix printer (because the geometry of the print platen makes feeding cut sheets impossible, they must be taped to continuous-form fanfold paper), but a delight on a dot-matrix IBM Proprinter (it allows pages to be fed from the front, and positioned from side to side as well as up-and-down). The moral: If you are willing to spend almost three grand for the software, plunk down another $500 or so for a good dot-matrix printer. The printed characters on both the Epson and the IBM looked terrific, by the way, in double-strike mode. Infomax warned me about a problem that was unsolved by the company at press time—the software prints an extra two lines on my Hewlett-Packard LaserJet, series II. The problem is in the printer (it allows an extra two lines per page, and slightly wider margins, compared to the older LaserJets). Changing the allowable page depth solved the problem in my tests, using the built-in Courier font rather than a font cartridge.

The built-in word processor for typing in long resumés and project descriptions is PC-Write. It is a full-featured program, one of the very best available, and can be used as a stand-alone word processor. Or, you can use your own word processor, as long as it creates so-called ASCII files. Most do. (If you are using Wordstar, prepare files in "nondocument" mode; Multimate and Word Perfect come with their own utility programs for converting to ASCII.)

Because A/E Marketing Manager must keep track of many files at once, it modifies your computer's CONFIG.SYS file to allow 50 files and 50 buffers to be open at the same time. Each buffer increases the space needed by your computer's operating system by 512 bytes, and each file allowed open increases it by 48 bytes. Most architecture-related programs want about 20 files and buffers open at the same time. Thus, the extra "overhead," beyond the standard, is about 15K for this program. Having the extra buffers slowed down the speed of AutoCAD and Ventura, two other programs, on my computer. That's because these other programs use almost all the available memory that the computer can directly access. Your computer looks for CONFIG.SYS whenever it first starts up. To avoid this problem, if you have several memory-hungry software packages on your personal computer, create a special floppy "boot disk" with the A/E Marketing Manager CONFIG.SYS file and the operating system files on it. Use the boot disk, rather than the hard disk, to start your computer when you want to use the marketing-manager software.

HICAD GM-1000, version 6.0

A low-end two-dimensional drafting program that can be used on minimum-configuration, inexpensive computers. Drawings can be transferred to AutoCAD format with an additional utility program (not reviewed by us).
Equipment required: IBM PC, XT or AT, or compatible, with 640K, hard disk, MS-DOS or PC-DOS 2.1 or later, graphics board (CGA, EGA, Hercules, PGA, Amdek MAI, Conographic model 40, Tecmar Graphics Master, BNW, Control Systems Artist 1), and plotter (Amplot II, Calcomp 1043, Houston Instruments DM P-41, Hewlett-Packard 7475A, 7580B, 7585B, Nicolet Zeta 824 and 836, Optical Computer Systems 928). Laser printers are not supported. Digitizing tablet recommended; will accept mouse or keyboard input, however. Hard disk needs almost 3 megabytes for system files. HICAD will use a coprocessor chip (8087 or 80287) if there is one installed, speeding calculations.
Vendor: Hitachi America, Ltd., Computer Division, 950 Elm Avenue, San Bruno, California 94066 (415/872-1902).
Price: $1,950, including digitizer template overlay. Educational institutions get five copies for the price of one plus $300. License covers use on a single computer. A translation program to and from AutoCAD format will have been incorporated into HICAD, version 7.0, by the first quarter of 1988.

Summary:
Manual: Adequate.
Versatility: Works with standard digitizers, including Hitachi 1111, 1515, 1216, and 3648, Summagraphics 1201, 1218, and BIT PAD TWO, and any mouse that can emulate the Mouse Systems standard (all sold

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SYLVANIA GTE

Circle 72 on inquiry card

HICAD GM-1000 is a two-dimensional drafting program that can draw on 255 levels and is a useful tool for handling repetitive drafting tasks. Soon, users can run the program at home and translate it into AutoCAD at the office.

in the U. S. do). Text attributes (labels on figures) end up in an ASCII file, which can be edited with a conventional word-processing program. On-screen and plotted label fonts can be customized and saved. Up to 255 "levels" possible for each drawing.

Ease of use: HICAD is command-driven, like versions of AutoCAD up to versions 2.6. Commands to input complex series of lines resemble BASIC or FORTRAN codes—an advantage to those who know these languages. The program runs fast, even on an XT.

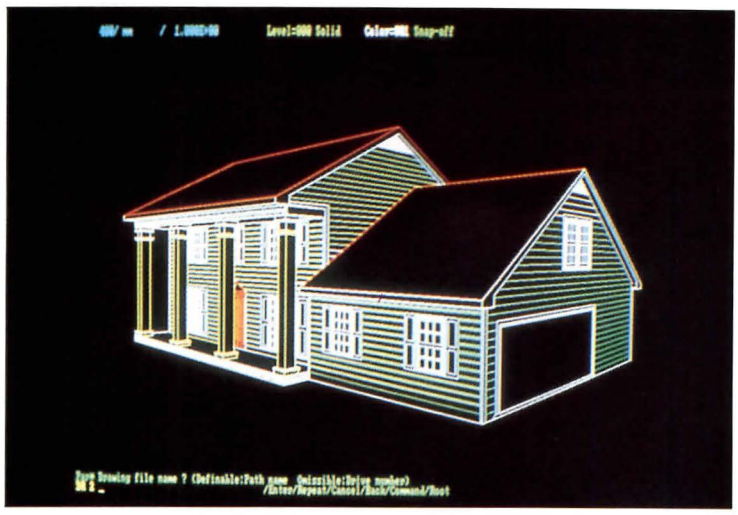
Error-trapping. Adequate. There's an "undo" command, and limited, although clear, error messages. Stores changes every 10 seconds on disk.

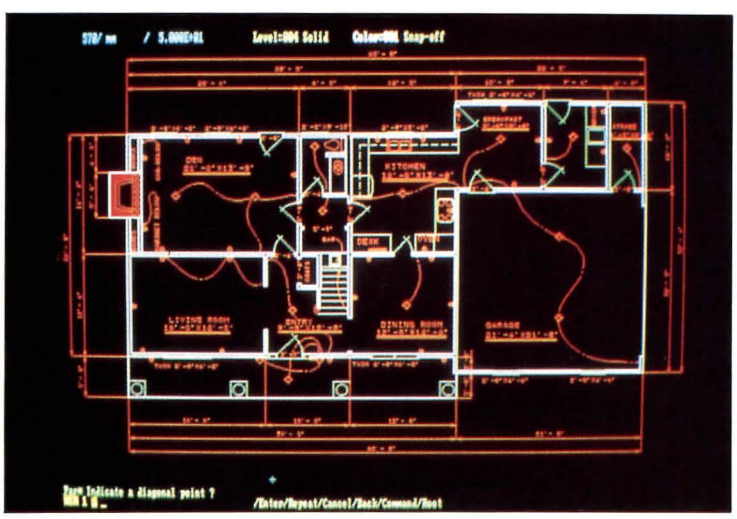
Thus, a power failure will mess up only 10 seconds worth of work. Also, levels of the drawing that are "blanked" (below) might be deleted accidentally.

HICAD GM-1000 is easy to install; just start your computer, insert the first of 10 disks into the floppy drive, log onto the that drive, and type INSTALL. The screen asks what drive you want to install the software on, then prompts you to insert one disk after another until all 10 are copied. If you started in a subdirectory of the hard drive, the installation program automatically moves down to the main, or root, directory and creates a new subdirectory named GM-1000. It then copies all the program files into this new subdirectory.

When you first invoke the program, you'll have to configure it. That is, you'll have to tell it about your monitor, plotter, and so forth.

Like most 2D programs, you can draw on a number of levels—in this case, 255—and stack the levels up so that any or all show on the screen at once. Thus, one level can contain a plan view of a wall, another the wiring, another the labels, and still another some specialized subsystem, like windows or doors. If the drawing becomes too confusing, you can "blank," or turn off, any number of levels. You can also zoom in on a tiny area of the drawing in each level—an area as small as 1/44th of the linear dimensions of the original screen.





Using the program with a digitizer (for this review, a Summagraphics MM 1201 with four-button cursor) is a snap, because the digitizer overlay allows direct access to subcommands, without going through intermediate commands. For instance, if you want to draw a circle, you can go directly to the proper circle box on the overlay, without first typing the FIG and CIR commands at the command line.

Amazingly enough, though, using the keyboard alone works rather well as a drawing device. The arrow keys move the cursor on the screen as little as a single pixel, or screen dot, at a time. Hitting the "page up" key makes the cursor move faster on screen. You can also type the coordinates at the command line, and the cursor will move to the point you select. You can also create custom menus to move directly to the commands you use most often, and you can store up to 64 of them. Likewise, you can create up to 250 custom-line styles, in addition to the five that come with HICAD. Macro-instructions look very much like programs in BASIC. To draw a line, for instance, you can either move the cursor or invoke a macro you've stored ahead of time. The macro (below) looks like the column on the left (explanations of each line's function are in parentheses; the explanations are not part of the macro itself):

```
PROGRAM $LINE (names the macro)
POINT P1,P2 (the line's end-points)
INPUT "start point", P1 (prompts for the start point)
INPUT "end point", P2 (prompts for end point)
CALL SEGMENT(1,P1,P2) (tells HICAD to draw line)
ENDP (tells HICAD the macro is done)
```

To run it, the user issues the command "$LINE" at the command line. HICAD will respond with a request for the coordinates of the starting point of the line. After they are entered, HICAD will prompt for the end point. Users can also create custom menus for a digitizing tablet.

Although text labels and dimensions can be passed to a file that can be picked up by a database program like Lotus 1-2-3 or dBase III, the process is awkward. Unless you are careful, lots of unneeded text gets into the file. But it can be done by putting specific descriptions on specific "levels" in the drawing. If you use a color monitor, the levels can be color-coded.

Thus, HICAD should be considered a useful tool for handling repetitive drafting tasks, either as a first entry into automated drafting, or as a way to take some pressure off saturated time-sharing systems. Soon users can run the program on a home computer, and bring a disk in to the office on Monday to translate into AutoCAD format.

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Product literature

For more information, circle item numbers on Reader Service Card

Custom aluminum windows
A 12-page design catalog describes single-, double-, and triple-glazed windows engineered for a number of specific architectural applications, including religious buildings, schools, and public institutions. Frame and muntin details are illustrated in sectional drawings; window projects pictured range from memorial chapels to department stores. J. Sussman, Inc., Jamaica, N. Y.
Circle 400 on reader service card

Wood light standards
Contemporary and traditional styles of lighting standards, fixtures, and bollards made of Western Red Cedar are shown in a 4-page color catalog. Also included are flagpoles, guardrails, trash receptacles, signs, and benches. All items are made to suit individual requirements, and may incorporate custom graphics. Ryther-Purdy Lumber Co., Old Saybrook, Conn.
Circle 401 on reader service card

Architectural railings
A full-line product catalog presents metal railings and fittings for crowd control and guidance, restaurant food service, bar hardware, and planters. Finish options include enamel in a variety of colors, as well as bright metal protected by a baked-on clear coating that eliminates polishing. Brass Smith, Inc., Denver.
Circle 402 on reader service card

Integrated ceilings
The advantages of snap-on, snap-off installation offered by *ColorTrak* ceiling systems are explained in a 20-page brochure. The 10 different profiles of linear ceilings come in over 120 standard colors. Integrated lighting and air-distribution components are illustrated; charts display photometric and performance data. Levolor Lorentzen, Inc., Parsippany, N. J.
Circle 403 on reader service card

Shingle design template
Nine patterns of *Fancy Cuts* decorative cedar shingles are provided on a plastic design template. The tool, at both 1/4- and 1/2-in. scale, indicates different exposures for exterior and interior applications, and identifies sq- ft coverage per 96-piece shingle carton. Shakertown Corp., Winlock, Wash.
Circle 404 on reader service card

Marble and granite
A 6-page color folder pictures 48 types of marble and granite offered by this custom fabricator of architectural elements and furniture. Cross sections show various edge profiles, such as classic ogee and modified bullnose, suitable for dimensional stone installations. John Eschmann & Sons, Inc., Edison, N. J.
Circle 405 on reader service card

Commercial gas boilers
An illustrated design-engineering manual contains ratings, dimensions, and location and venting data for commercial forced hot water systems using from two to eight gas-fired boilers. The manufacturer's *Easy-Fit* gas piping system is described. Weil-McLain, Michigan City, Ind.
Circle 406 on reader service card

Prestressed concrete
A 14-page capabilities brochure includes on-site and project application photographs of prestressed *TindallCast* concrete used in buildings, and in underground, highway, and heavy construction systems. Architectural concrete panels, a new product offered in several colors and textures, are pictured. Tincall Concrete Products, Inc., Spartanburg, S. C.
Circle 407 on reader service card

Sprayed-in-place roof coatings
A 12-page brochure, *Remedial Roofing Design Specification,* provides a nonproprietary specification for the application of polyurethane foam and elastomeric coatings used in retro-fit roofing. Isometric drawings show the correct way to apply foam around parapet walls, drains, and roof vents. Futura Coatings, Inc., St. Louis, Mo.
Circle 408 on reader service card

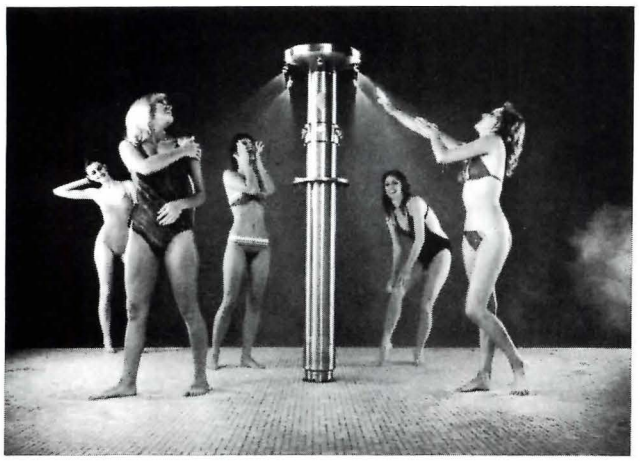
Applied design
An illustrated catalog describes a 20-volume *Library of Applied Design,* representing contemporary trends in such fields as graphic, exhibit, lighting, and store design. New publications listed include *Corporate Design Systems 3,* outlining the design strategies of nine multinational corporations, and a portfolio of award-winning interior and exterior illumination, *The Best of Lighting Design.* Letraset USA, Paramus, N. J.
Circle 409 on reader service card

Copper roofing design
A 16-page booklet provides specification and detail guidelines for the design and installation of all types of copper roofing, illustrated by photographs of religious, educational, and residential buildings. Ordering information is given for the revised, seventh edition of *Copper and Common Sense,* a spiral-bound text on the architectural uses of copper. Revere Copper Products, Inc., Rome, N. Y.
Circle 410 on reader service card

Merchandise display
Perimeters is described in a 14-page large-format brochure as a flexible, simple means of creating perimeter and center floor-display areas in retail environments without incurring construction costs and delays. The system's basic components are panels, pilasters, vinyl reveals, and steel standards, with compatible shelves of glass, mirror, MCP, and laminates. USG Interiors, Inc., Dover, Ohio.
Circle 411 on reader service card

Residential landscape lighting
Creative Lighting for Living Spaces contains 20 pages on the design fundamentals, techniques, and illumination levels necessary for effective lighting of residential and commercial landscapes. Sections of the brochure discuss drafting the lighting plan, uses of color, fixtures and accessories, and techniques for fixture placement. A chart displays the illumination levels provided by various light fixtures. Hubbell Lighting Div., Christiansburg, Va.
Circle 412 on reader service card

Security/access control
A capabilities brochure describes the single-source building security expertise offered by a design and hardware modification organization. Drawing from a variety of OEM and custom components is said to ensure an access control system that matches the environment, architecture, and function of the structure. Projects listed include hospitals, nuclear plants, corporate centers, and hotels. Architectural Control Systems, Inc., St. Louis, Mo.
Circle 413 on reader service card
More literature on page 186



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Shower more people in less space for less money with Bradley. Whenever space is at a premium and economy is essential, remodel or build with Bradley showers.

Meet any shower room need with Bradley. Column showers make the most of the space, water and money used. Or, choose from space-saving single-person, Wall-Saver® and Econo-Wall® models. Convenient Panelon® units are ideal for walls or corners.

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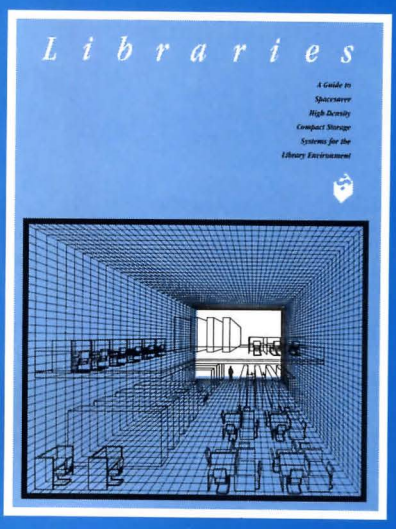
Circle 80 on inquiry card

LIBRARY STORAGE

SPACESAVER STORAGE SYSTEMS



Your Source for Planning High-Density Storage Systems in the Library Environment.

24 pp. Planning Guide presents data on selecting proper high-density storage systems for library needs. Aids in solving specific library storage problems such as calculating book-capacity in bookstack areas, activity & retrieval analysis, mutilation & theft, collections storage, open access and high-density configurations. This guide for the professional planner is yours for the asking. Call Toll-Free for details: 1-800-492-3434.

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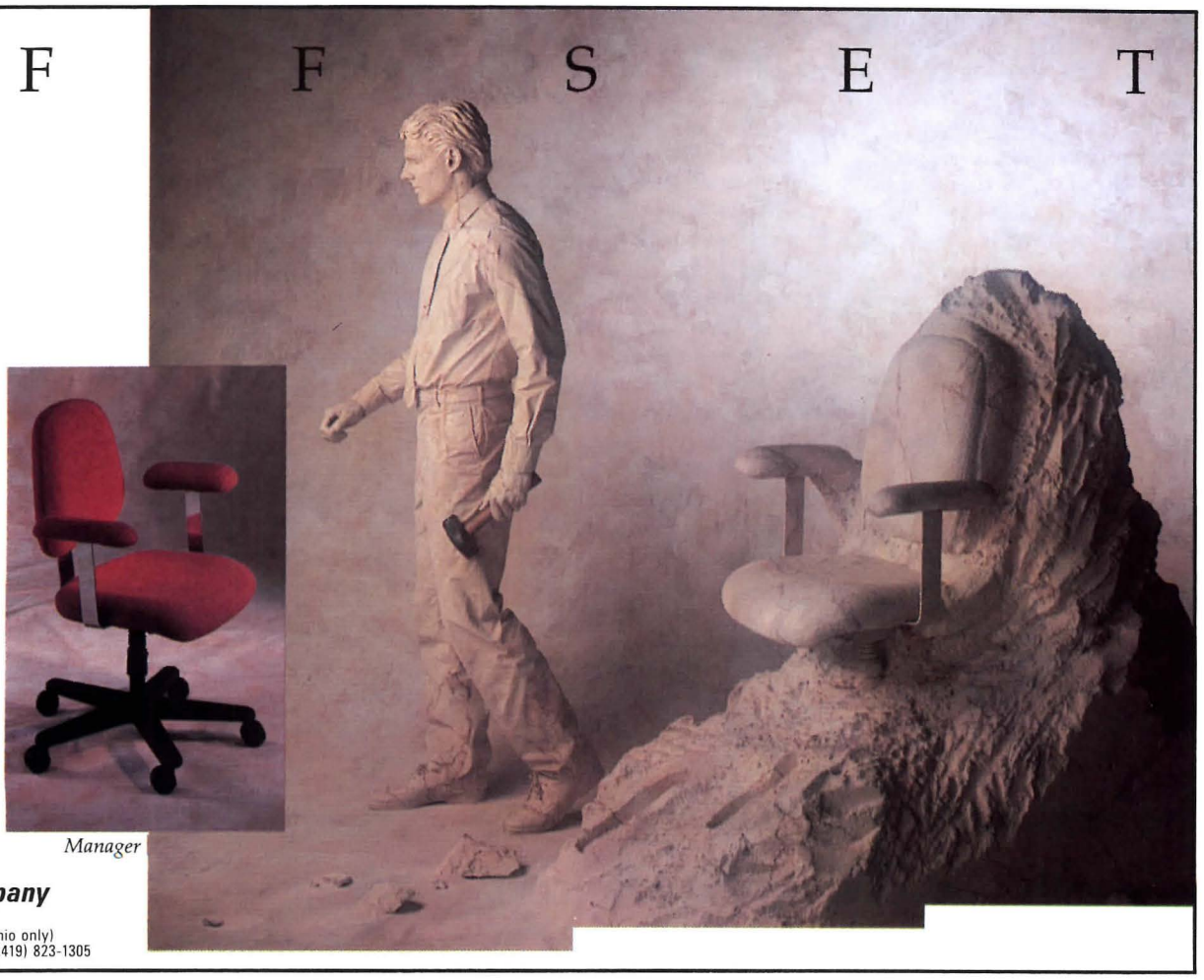
Spacesaver Mobile Storage Systems, 7027 Fir Tree Dr., Mississauga, Ontario L5S 1J7, (416) 671-0391

Circle 81 on inquiry card

O F F S E T

A new image of what office seating should be.
The Offset seating line. Ergonomically-designed in an intriguing palette of colors and appealing styles and options. From Ajusto, a chair company featuring personalized service and fast delivery. So you'll usually have your chairs shipped to you within three to four weeks.



Manager

Ajusto Equipment Company
P.O. Box 348, Bowling Green, Ohio 43402
(419) 823-1861 (800) 543-4996 (Outside Ohio only)
Telex – 5106015196 (Ajusto BG UQ) Fax – (419) 823-1305

Circle 82 on inquiry card

Product literature *continued*

For more information, circle item numbers on Reader Service Card

Roofing accessories
A 24-page catalog describes roofing product accessories, including *Expand-O-Flash* expansion joint covers, the *Flex-I-Drain* system, and fascia and flashing systems. For commercial and industrial applications, all products work with commonly-used built-up, modified bitumen, and single-ply roofing systems. A color spread shows where roof expansion joint covers, vertical wall expansion joint covers, and flexible gutter systems should be installed in commercial structures. Manville, Denver.
Circle 414 on reader service card

Cogeneration
The advantages of cogeneration—converting waste thermal energy into on-site power—are outlined in a 4-page brochure. *First Thermal Systems* provides total engineering, manufacturing, supply, project management, start-up, training, and service for cogeneration installations. Heater Technology Division, First Thermal Systems, Inc., Chattanooga, Tenn.
Circle 415 on reader service card

Stained-glass fixtures
A 20-page catalog covers stained-glass lamps and lighting fixtures, including 8 pages on new styles from the *Tiffany Designer Series.* Color photographs illustrate all lighting products; a price sheet is included. Meyda Stained Glass Studio, Utica, N. Y.
Circle 416 on reader service card

Construction products
Gravel stops, reglets, coping, gutters, and other roof-edge and drain products are presented in a 16-page color catalog. A section on formed products includes the *GalVee* fascia panel system. Seven baked enamel colors are standard on all aluminum products; custom matches may be specified. W.P. Hickman Co., Asheville, N. C.
Circle 417 on reader service card

Bath accessories
Solid brass hardware for the bath is shown in a 24-page color catalog. Towel bars and warmers, shelves, robe hooks, and soap holders are available in both contemporary and traditional styles. Most products come in either brass or chrome finish. Kraft Hardware Inc., New York City.
Circle 418 on reader service card

Network interconnectors
A modular voice, data, video, and power interconnection system is explained in an illustrated brochure. Designed to simplify network wiring for the contractor, the system is said to reduce the cost of installation. Thomas & Betts Corp., Raritan, N. J.
Circle 419 on reader service card

Multifamily housing
A 12-page brochure, *Concrete Suggestions* encourages the use of concrete masonry and precast hollow-core concrete slabs in low-rise housing projects. The life-cycle-cost and fire-resistive advantages of concrete construction are explained; color photos of several built units illustrate a range of design options. Joint Committee for Promotion of Concrete in Low-Rise Multihousing, Chicago.
Circle 420 on reader service card

Structural connectors
Framing connectors for wood construction are shown in a 44-page catalog, which includes drawings and load values to assist the specifier. Custom-made or modified connectors are available within three days. The Panel Clip Co., Farmington, Mich.
Circle 421 on reader service card

Fireproofing board
A lightweight, inorganic fire-proofing board, *Pabco Super Firetemp,* is said to have a high strength-to-density ratio, and to provide superior performance in structural fireproofing applications requiring up to a 4-hour rating. A product folder explains how the board withstands 2,000 F temperatures; it may be installed in any weather, indoors and out. *Firetemp* has a sanded surface that can be finished with paints, wall coverings, veneers, or water-proof coatings. Pabco, Houston.
Circle 422 on reader service card

Commercial flooring
Rubber and solid vinyl tile and sheet flooring, cove bases, trim, and stair treads are covered in an 18-page architectural catalog. Each pattern and color is shown in close-up photos; technical and hazard data are listed for each product. Flexco Co., Tuscumbia, Ala.
Circle 423 on reader service card

Automated filing
An 8-page brochure introduces the *Minitreve* high-density automated filing system, said to save floor space and operator effort. An installation of two facing banks of drawer-size metal file containers, the *Minitreve* has an electronically directed shelf that extracts the desired file and delivers it to the operator in seconds. Suggested for the large-volume data requirements of banks, insurance companies, and government agencies, the system provides automated charge-out and security controls. Supac Systems, Inc., Piscataway, N. J.
Circle 424 on reader service card

Lumber products
Dimensional Stability of Western Lumber Products contains 32 pages of technical information for architects, engineers, builders, and other users of structural lumber. Revised text explains the reasons for seasoning wood, its structure, moisture content, and how to prevent the defects caused by unequal dimensional changes. Western Wood Products Assn., Portland, Ore.
Circle 425 on reader service card

Door pulls
Architectural hardware for glass doors is shown in a color catalog. Dimensions, finish options, and mounting requirements are included for each door-pull item. B & B Products, Industry, Calif.
Circle 426 on reader service card

Concrete coatings
Written for architects and building design engineers, an information kit supplies technical data on *Chemglaze* polyurethane coatings for concrete floors. Products are said to increase abrasion resistance and outwear other coatings by a factor of 3 to 6. Surface preparation and application techniques are described for both bare and previously coated concrete. Lord Corp., Erie, Pa.
Circle 427 on reader service card

Porcelain tile
All 17 mirror-finish colors offered in the imported *Opaline Keramik* tile line are illustrated in a design brochure. Porcelain tiles come in a range that includes white, black, blues, warm pinks, grays, and green. Trans Ceramica Ltd., Elk Grove Village, Ill.
Circle 428 on reader service card

Stucco
Exterior stucco products offered in 30 pastel shades are shown in a color guide. Sample swatches simulate the texture of the stucco as well as the color. La Habra Stucco, Anaheim, Calif.
Circle 429 on reader service card

MATCHING EMERALDS.

Made possible by the PANTONE® Professional Color System.

Now *your* world of color has a PANTONE Color System all its own. A color system based on the colors designers need—from delicate to intense—for fashion, beauty, architecture, furnishings and product design.

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Using the PANTONE Professional Color Guide, you can select, specify and verify any PANTONE-identified color by its name and number. What's more, you can communicate it and be understood *around the globe*—even by phone.

And new PANTONE Coatings Color Paper (10" x 13" satin matte sheets) lets you show "oversize" chips or complete designs in 250 of the system's 1001 colors.

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PANTONE Professional Color Guide, including selector and specifier, $135.†

PANTONE Coatings Color Paper, $2.95† each

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† Suggested retail price

*Pantone Inc.'s check-standard trademark for color reproduction and color reproduction materials. Process color reproduction may not match PANTONE®-identified solid color standards. Refer to current PANTONE Color Publications for the accurate color.

NOTE: NOT INTENDED FOR SPECIFYING PRINTING INK COLORS.

Circle 83 on inquiry card

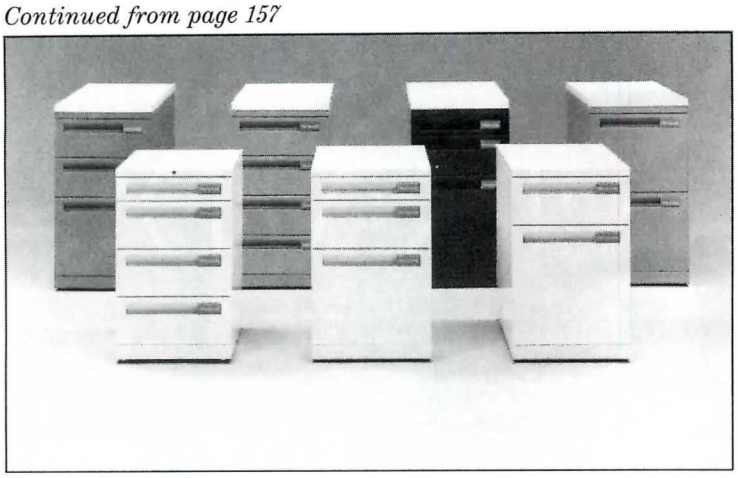
PANTONE® Professional Color Selector

PANTONE 17-5641 Emerald / Emeraude / Smaragd / Esmeralda / Smeraldo / エメラルド

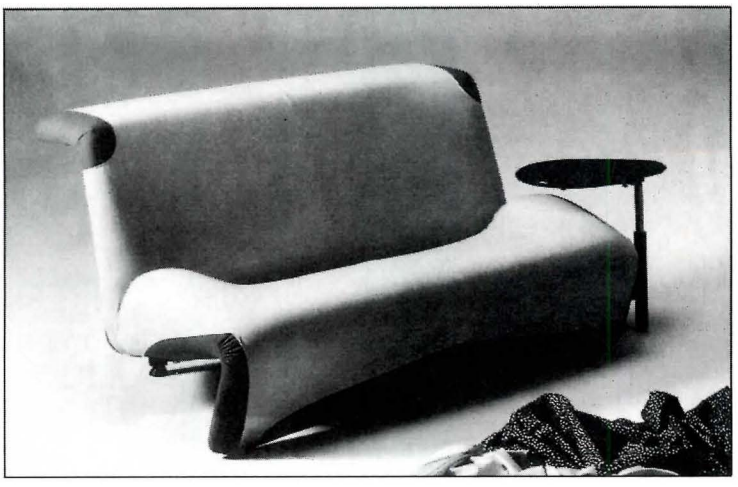
PANTONE 16-5533 Arcadia / Arcadie / Arkadien / Arcadia / Arcadia / アルカディア

PANTONE 17-6153 Fern Green / Vert Fougère / Farngrün / Verde Helecho / Verde Felce / ファーン グリーン

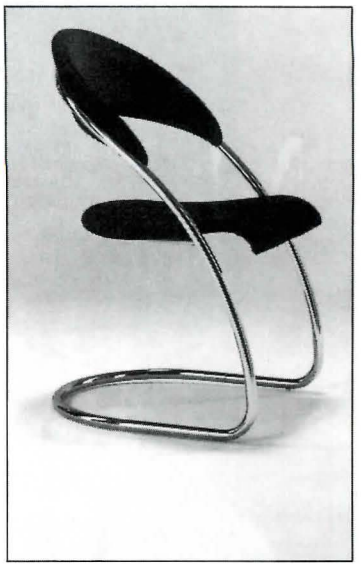
Continued from page 157



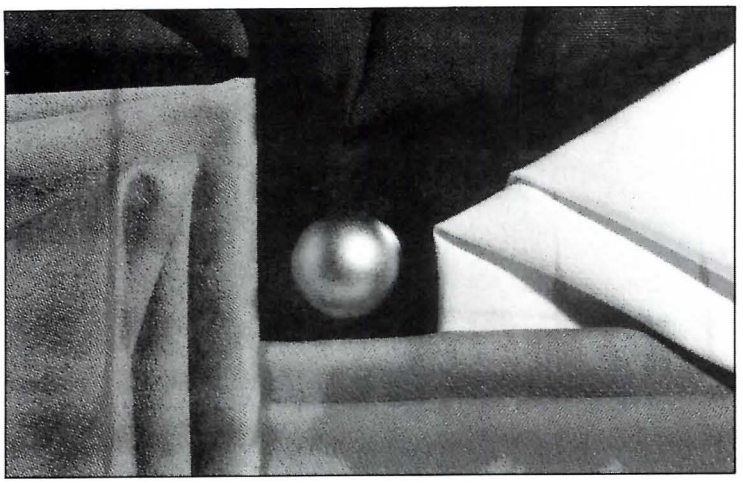
Modular storage
Offered with glides or double-wheel carpet casters recessed beneath the base aprons, *WorkStore Personal Pedestals* come in three depths and two heights for individual storage needs at office workstations. Finish options include any color of enamel on the steel bodies, as well as laminate or red oak-veneer fronts with recessed side pulls. Office Specialty, Chicago.
Circle 308 on reader service



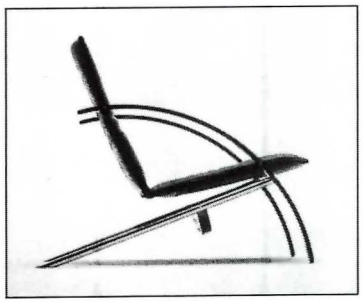
Upholstered Oriental
One does not sit on the *Luck* sofa: Its designer, Toshiyuki Kita, describes the maneuver as climbing into or onto it. Constructed of a steel armature molded with expanded foam, *Dacron*-padded, and upholstered in fabrics or leathers, the sofa has optional, removable covers stretched over the body and secured with rubber rings. Atelier International, Ltd., New York City.
Circle 309 on reader service



Reprise
Originally designed in 1929 by Wassili and Hans Luckhardt, this stainless-steel-framed chair is again in production. Seat and back are made of foam-covered veneer, offered in a range of colors. Brueton Industries, Inc., New York City.
Circle 310 on reader service

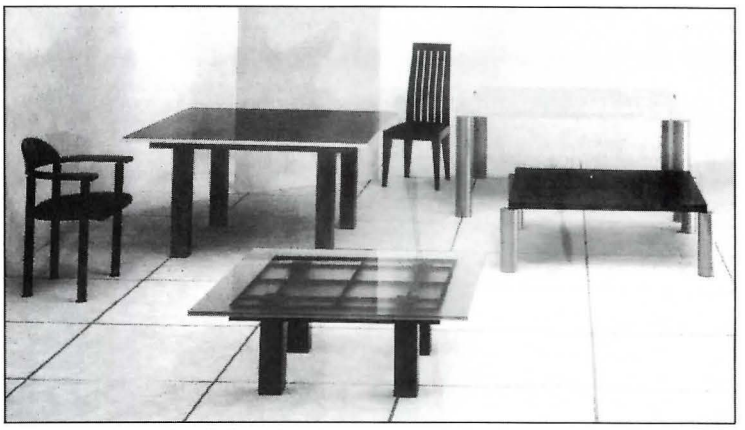


Wool fabric
Offered in a range of colors previously available only in silk, all-wool *Studio Cloth* is a twill with a two-dimensional appearance. Designed by Orlando Diaz-Azcuy, the textile is suitable for both heavy-use contract and corporate applications. HBF Textiles, Hickory, N. C.
Circle 311 on reader service

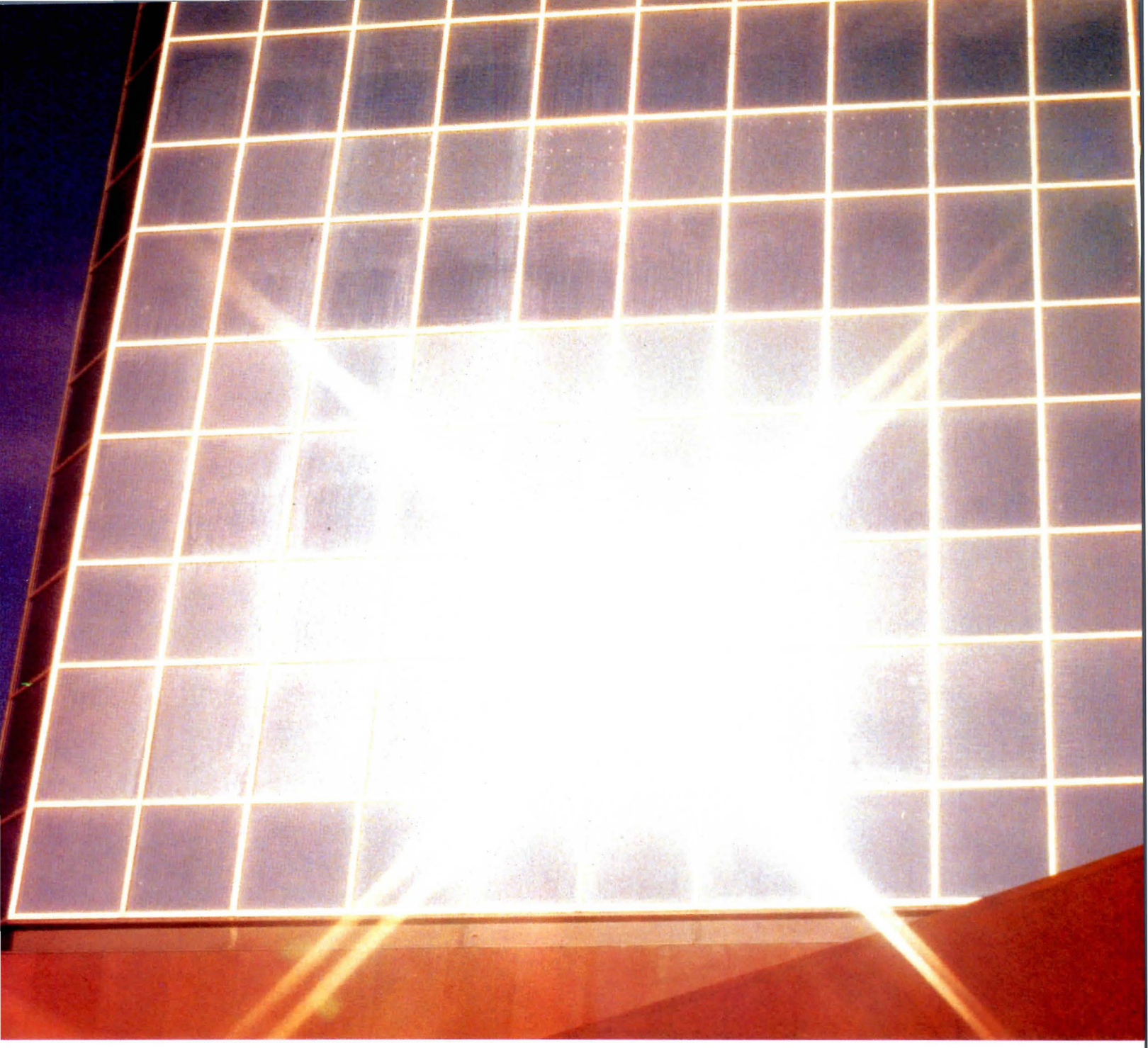


Chrome and leather
The solid-steel, mirror-finish frame of the *Arco Chair* reflects the skills of California sculptor Paul Tuttle, who designed the piece for manufacture in Switzerland. Arconas Corp., New York City.
Circle 312 on reader service

Functional table
Set on a slender, lightly-scaled base and offered in 16 choices of top shape and size, the *Wafer* table is suitable for dining, office, and general contract use. Shown here with a bullnose-edged laminate top, *Wafer* is also available with round glass or marble tops. Howe Furniture Corp., Trumbull, Conn.
Circle 313 on reader service



Architectural collection
Three Tables/Two Chairs include Eugene Criqui's *Rondel* chair; *Kiwara* tables by Paul Haigh; high-back chair by Joy and Alan Ohashi; and Richard Schultz's *Colonnade* table. Conde House, San Francisco.
Circle 314 on reader service
Continued on page 191



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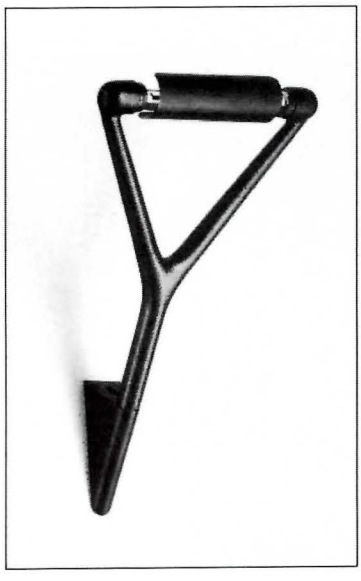
Glass that works.

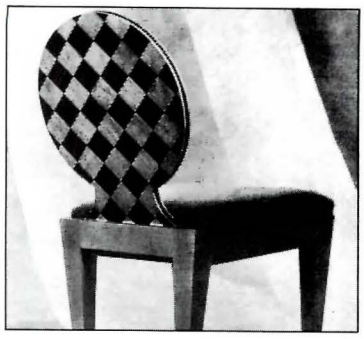
Continued from page 189

Adjustable table
Now available in a production model, Toshiyuki Kita's *Kick* table has a pneumatic device to adjust the height 3 inches. The oval wooden top comes in a glossy blue, yellow, red, or black lacquer finish, surrounded by a protective rubber edge. The steel base has casters on two of its three legs. Atelier International, Ltd., New York City.
Circle 315 on reader service



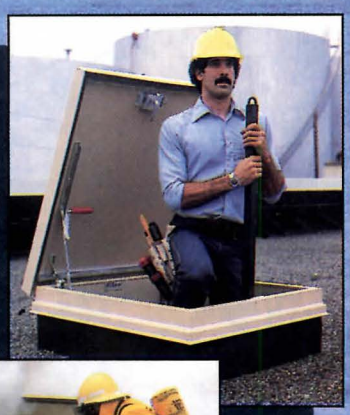
Wall light
Designed by Paolo Rizzatto and Alberto Meda for *LucePlan*, the *Lola* wall lamp is made of molded thermoplastic with an adjustable shade; the fixture takes a 300-watt halogen lamp. *Lola* is also available as a floor lamp. Artemide, New York City.
Circle 316 on reader service

Woman's touch
From a *Bieffeplast* collection that includes the *Alfa* barstool, *Campanella* lamp, and *Puck* table, the *Kite Chair* has been designed by Anna Anselmi with a tubular steel frame stretching a seat and back of sling leather. Metal parts are finished in baked epoxy. Gullans International, Inc., New York City.
Circle 317 on reader service



Veneered chair
Made of maple, with a harlequin-patterned seat and back, the *Paris Hall Chair* is suggested as a versatile accent piece. Donghia Furniture, New York City.
Circle 318 on reader service
Continued on page 195

Proving Ground



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Calendar

Through November 28
House, recent house designs by architects Steven Holl of New York, Ron Krueck and Keith Olsen of Chicago, Mark Mack of San Francisco, and Thom Mayne of Los Angeles; at the John Nichols Gallery, New York City.

November 11-23
First annual show, New York Society of Renderers, an exhibition of architectural and interior illustrations; at the Pen and Brush Society, 16 E. 10th St., New York City.

November 17 through March 6
Vienna/New York: The Work of Joseph Urban, 1872-1933, showing Urban's theatrical designs as well as his architecture and decoration; at the Cooper-Hewitt Museum, New York City.

November 18-19
"Build Boston '87," a regional convention and tradeshow for the design and construction industry, sponsored by the Boston Society of Architects, and including the National Architectural Research Conference sponsored by the American Institute of Architects and the Association of Collegiate Schools of Architecture; at the World Trade Center, Boston. For information: Richard Fitzgerald, BSA, 10 Midland Ave., Boston, Mass. 02158 (617/267-5175).

November 19-20
Seminar on cost planning and preventing cost overruns, sponsored by the School of Continuing Education, New York University; at NYU, New York City. For information: Anne Ballantine, School of Continuing Education, Midtown Center, NYU, 11 W. 42nd St., New York, N. Y. 10036 (212/790-1344).

December 3
Conference on roof problems analysis and reroofing options, sponsored by the National Roofing Contractors Association; in Columbus, Ohio. The conference will be repeated December 10 in Washington, D. C., April 7 in St. Louis, and April 14 in Atlanta. For information: NRCA Education Department, One O'Hare Center, 6250 River Road, Rosemont, Ill. 60018 (312/318-NRCA).

December 6-9
Conference, "The New Tools," on computer graphics for design, sponsored by the Pratt Center for Computer Graphics in Design; at the Grand Hyatt New York, New York City. For information: Pratt Center for Computer Graphics in Design, 45 Stephenson Terrace, Briarcliff Manor, N. Y. 10510 (914/741-2850).

December 17 to January 16
Exhibition of the work of Mies van der Rohe; at Max Protetch, 5560 Broadway, New York City.

January 29-30
Regional seismology workshop, sponsored by the American Institute of Architects and the Association of Collegiate Schools of Architecture; in San Francisco. A similar workshop will be offered in Boston in April. For information: AIA/ACSA Research Council, 1735 New York Ave., N. W., Washington, D. C. 20006 (202/785-2314).

March 1-3
RHIDEC '88, The Restaurant/Hotel International Design Exposition and Conference; at Expo Center, Chicago. For information: National Exposition Company, 49 W. 38th St., Suite 12A, New York, N. Y. 10018 (212/391-9111).

March 12-15
Worldstore '88, first international retail trade exhibition; at Georgia World Congress Center, Atlanta. For information: National Exposition Company (see item above).

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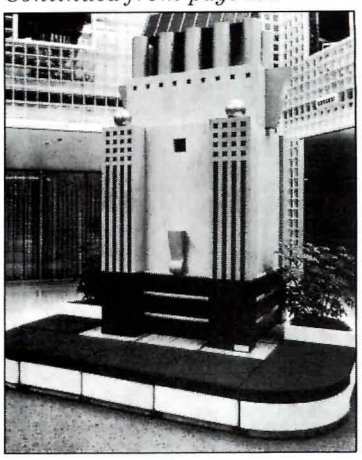
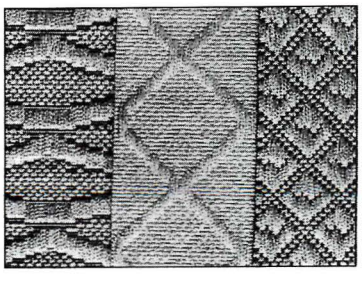
Continued from page 191



Site furniture
Set on square or quarter-circle precast bases, the *Shogun Contour Group* is said to bring scale and balance to large public areas. Units may be stacked. USG Interiors, Inc., Chicago.
Circle 319 on reader service

Urbane chair
For the executive, Nicos Zographos's *City Chair* has a contoured rim in cherry or ash. The swivel-tilt base comes in stainless steel or finished in powder-coat black. Zographos Designs Ltd., New York City.
Circle 320 on reader service



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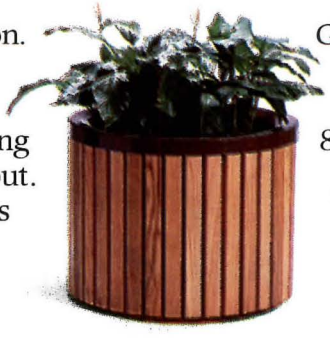

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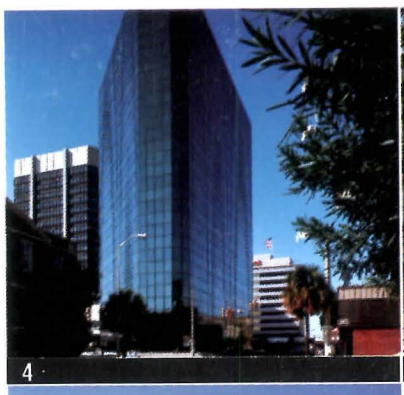

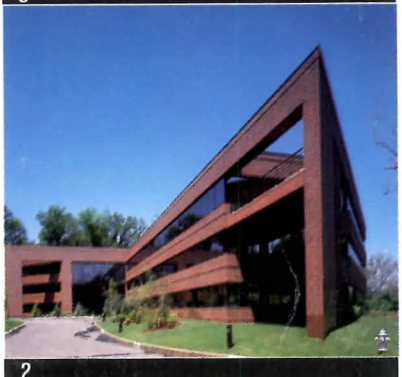

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