

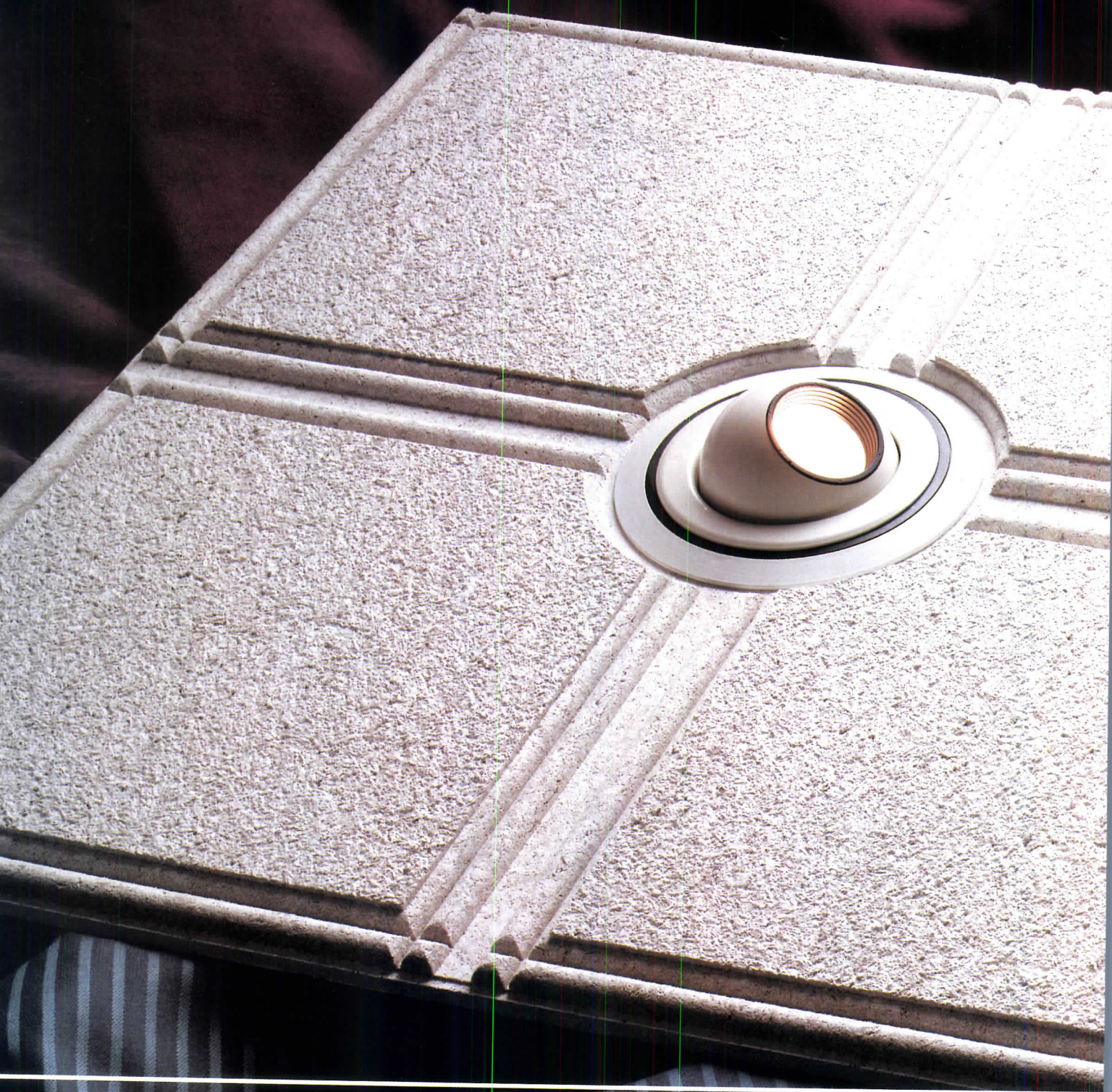
ARCHITECTURAL RECORD

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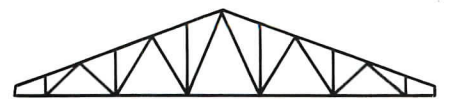
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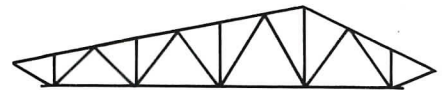
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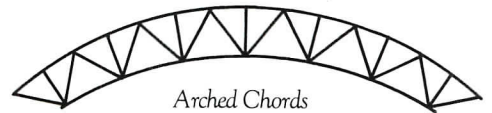
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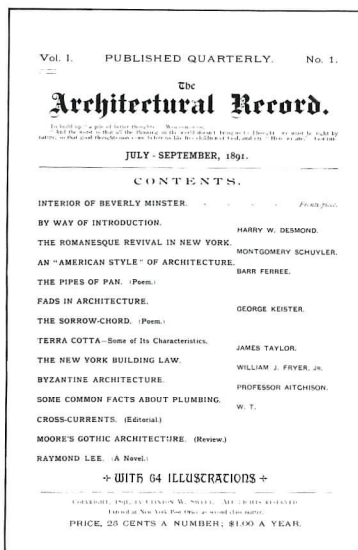
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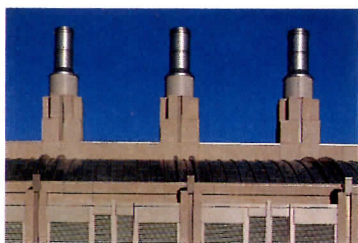
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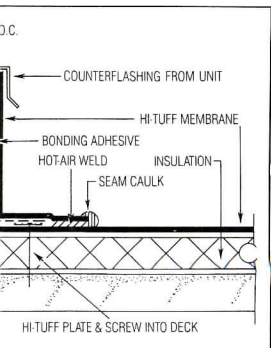
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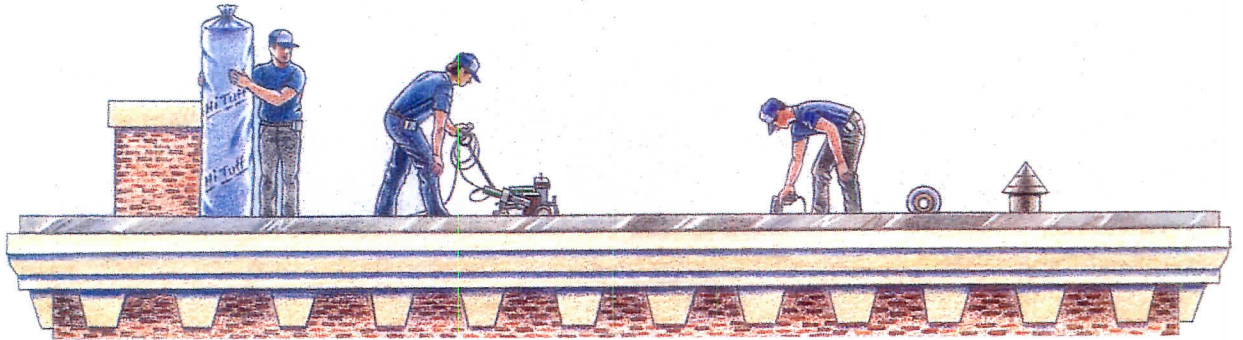
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COVER: Bank of China Tower, Hong Kong;
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San Diego's "New Town"

Donald Canty's article on San Diego's successful Uptown District mixed-use development [RECORD, October 1990, pages 62-67] was well chosen, but Canty's shallow research provides little understanding of the real process that gave birth to the project. The article completely omits a vital six-month process of urban design studies and citizen participation that preceeded the city's selection of the developer and subsequent work of the developer's architects.

The city of San Diego did not simply issue a developer RFP at the outset of the project, as the article suggests. In March 1987, City Council appointed a prominent citizens' task force and selected an urban design consulting team that worked hard to define the recommended land use mix and urban design guidelines for the site. The essential ideas behind the project—the mixed-use concept, pedestrian emphasis, Vermont Street link to the city grid, and many other design elements that were realized—came from this process. They were clearly documented, approved unanimously by the City Planning Commission and City Council in November 1987, and became a part of the developer RFP issued by the city the following month.

As principal consultant to the city, our firm led the multidisciplinary team that conducted urban design, financial, and transportation studies for the site's redevelopment. The hard work and creative efforts of the City Planning staff led by Michael Stepper, and the citizens' task force capably chaired by Planning Commissioner Yvonne Larsen, were instrumental in establishing a consensus on an imaginative development concept and key design elements before the developer was selected by the city. Canty did a great disservice to all of those involved in the early part of the process to completely neglect this important groundwork.

This should not detract from the fine work of the development team and their architect, who met the objectives of the city and worked effectively with the local neighborhood as the

project design evolved.

If ARCHITECTURAL RECORD continues its coverage of complex urban design and architectural projects, and pretends to review their background, its correspondents have a professional responsibility to do a reasonable amount of homework, and not rely entirely on the public relations releases of project developers and their architects.

**GERALD GAST
ARCHITECT AND URBAN
DESIGNER
GAST & HILLMER
San Francisco**

U. K. practice

The subtleties that differentiate British practice from U. S. practice are such as to confound the most well intended [RECORD, October, page 23]. Quantity surveyors are "gods" unto themselves, and can be a valuable asset to any practice, since they are often retained long before the architect. Utilizing consultants the British way also has its pitfalls. While for the most part extremely competent, they are not quite as flexible as American engineers. For those prepared to make the investment, the rewards will ultimately be there; however, it is a long, sometimes frustrating road.

**E. MANNY ABRABEN,
AIA, RIBA
Boca Raton, Florida**

Height limit

I am writing to take exception to the piece in Design News [RECORD, October 1990, page 19] that begins "Given Washington, D. C.'s rigid 130-foot height limit and its industry of federal bureaucracy..." Washington's architectural failures are not caused by its height limit, or even by that catch-all of blame, the federal bureaucracy, but by greedy developers and the cynical architects who cater to them. If Washington's streets are lined with shoddy International Style and watered-down Postmodernist knock-offs, the architects who designed them and the businessmen who bought them must answer for them, not the height limit, which has saved us from taller horrors.

**JONATHAN REEL
Washington, D. C.**

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100 YEARS OF ARCHITECTURAL RECORD

A look back and a look forward

Eighteen ninety-one was ARCHITECTURAL RECORD's first year. A quarterly, it was 7 in. by 9 3/4 in. high, set in hot type and printed letterpress. The 55-pound coated paper is now brittle and yellowed at the edges. New buildings were shown mostly as linecuts done from superb ink drawings, but a few photographs did find their way in, including a heavy Richardsonian townhouse at 848 Fifth Avenue in New York, designed by Charles Haight, and the San Antonio National Bank Building done in the Byzantine manner by George Post.

There was a long essay by Montgomery Schuyler on the state of the Romanesque style in New York, and a four-page editorial by the first editor, Harry Desmond, an interesting but rambling piece which raps the sort of crass materialism of the day that elevated the railroad as the "culmination of civilization." There is a piece by George Keister denouncing fads in architecture (how familiar!), a technical piece on terra cotta and another about plumbing, a couple of poems, the first installment of a novel, and about 25 advertisements. Subscription: one dollar.

The magazine was well-named and the name still fits. A review of its pages over those hundred years yields a fascinating grand tour of buildings, ornament, products, the evolution of building codes, the education of architects, the emergence and change of building types, details, construction forecasts, graphic design. RECORD spans unique periods in this nation's history, from the end of the Brown Decades and the Chicago Exposition, through Art Deco, four major wars, the rise, decline, and survival of the Modern Movement, the tremendous surge in building technology, the legitimization of the business of architecture, and the ongoing ebb of the drawing pencil in favor of a keyboard and a mouse.

Contributors have included giants: Schuyler, Mumford, who wrote some 20 pieces between 1930 and 1965, Wright. We kick off our centennial year with some pithy excerpts from Wright's writings for RECORD, which began in 1908 and span 44 years [see pages 12-17].

July is the actual anniversary month. To celebrate the event, we're preparing a spectacular souvenir issue. In addition to a series of articles by top critics covering the major architectural periods, we will bring you the RECORD Album, made up of highlights from older issues; an interview with a 100-year-old architect; and the winning buildings from a major survey of our readers whom we are asking to identify the most important buildings of the past century (be sure to send us your ballot, which faces page 52).

And we'll look at the future—of design, of architectural education, of the architect's own office, as seen by today's sharpest thinkers.

But let's not forget: a centennial is merely a marker on a road. Think of our pages as a series of brief camera takes in time, a look back and a look forward, in this constantly moving procession which those who come after us will assess when their turn comes.

STEPHEN A. KLIMENT

FRANK LLOYD WRIGHT: ON THE RECORD

Throughout his career, Wright used the pages of ARCHITECTURAL RECORD as a pulpit to preach his gospel of Organic architecture.

Editor's note: Although ARCHITECTURAL RECORD can hardly take credit for Frank Lloyd Wright, the magazine was one of the first to recognize his genius and remained a friend through thick and thin. Before Wright became known much beyond Chicago, RECORD took note of his achievements. In April 1904, the magazine looked at the new spirit of architecture in Chicago and stated, "It really derives its momentum and inspiration chiefly from the work of Mr. Louis Sullivan, and from a very able architect, who issued from Mr. Sullivan's office, Mr. Frank Wright." Two decades later, when Wright's career was considered over by many observers, RECORD provided him with a powerful pulpit from which to preach his gospel of Organic architecture. Shortly thereafter, his career took off once again.

Wright was a frequent contributor to RECORD throughout his career. Never one to soft-pedal his ideas, Wright spoke out on a variety of topics—from the nature of materials to the evils of "Modern-architecture." In March 1908 he wrote an essay for RECORD entitled "In the Cause of Architecture," which outlined his principles of Organic architecture and included his six "propositions" of good design. Six years later, in the May 1914 issue of RECORD, Wright further elaborated on his philosophy of architecture, again under the title "In the Cause of Architecture."

From May 1927 through December 1928, Wright penned a series of 14 essays that elaborated many of the points he had made in his previous articles. Although set below the now-familiar heading "In the Cause of Architecture," the 1927-1928 essays carried subtitles such as "The Architect and the Machine" (May 1927), "The Logic of the Plan" (January 1928), and "What 'Styles' Mean to the Architect" (February 1928). Wright was paid the very generous sum of \$7,500 for these articles, money he sorely needed at the time. Years later, he would remind RECORD editors that he had been hired to write 15 articles for the series, but had only produced 14. "I still owe you one article," he would joke. Finally, in May 1952 he came through with his missing piece, a sharply worded critique entitled "Organic Architecture Looks at Modern Architecture."

What follows is a selection of quotations from Wright's writings for RECORD, organized by topics, and reprinted in Wright's sometimes idiosyncratic writing style. C. A. P.

Wright's six "propositions" of 1908

I.—Simplicity and Repose are qualities that measure the true value of any work of art.

But simplicity is not in itself an end nor is it a matter of the side of a barn but rather an entity with a graceful beauty in its integrity from which discord, and all that is meaningless, has

been eliminated. A wild flower is truly simple. Therefore

1. A building should contain as few rooms as will meet conditions which give it rise and under which we live which the architect should strive continually to simplify the ensemble of the rooms should be carefully considered. Comfort and utility may go hand in hand with beauty. In the entry and necessary work rooms, there need be but one room on the ground floor of any house, living room, dining room, and kitchen, with the possible addition of a 'social room'—really there need be but one room, the living room with rooms otherwise sequestered from it or screened within means of architectural contrivances.

2. Openings should occur as integral features of the structure and form, if possible, its natural ornamentation.

3. An excessive love of detail ruins more fine things from the point of fine art or fine living than one human shortcoming—it is hopelessly vulgar. Too many houses, when they are not little stage settings or scene settings, are mere notion stores, bazaars, junk-shops. Decoration is dangerous unless you understand it thoroughly. You are satisfied that it means something good in the scheme as a whole; if not present, you are usually better off without it. Merely that it 'looks rich' is no justification for the use of ornamentation.

4. Appliances or fixtures as such are undesirable. Assimilate them to the structure with all appurtenances into the design of the structure.

5. Pictures deface walls often if they decorate them. Pictures should be decorative and incorporated in the overall scheme as decoration.

6. The most truly satisfactory furniture is that in which most of the furniture is built in as a part of the structure.

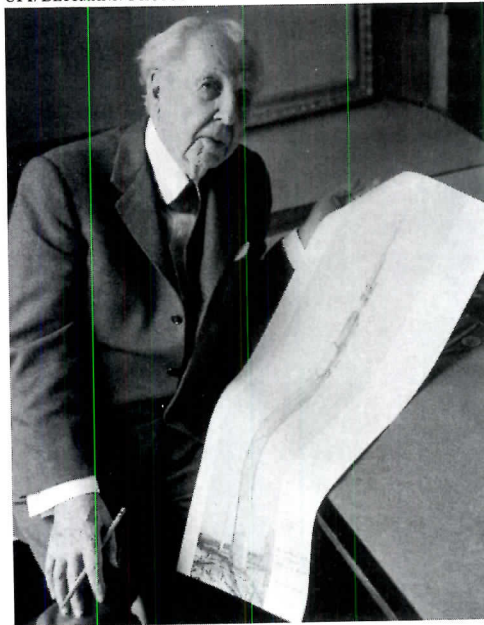
original scheme considering the whole as an integral unit.

II.—There should be as many kinds (styles) of houses as there are kinds (styles) of people and as many different houses as there are different individuals. A man who has individuality (and what man lacks it?) has a right to its expression in his environment.

III.—A building should appear to grow easily from its surroundings and be shaped to harmonize with its surroundings if Nature manifests there, and if not try to make it as quiet, subtle, and organic as She would have been were the opposite. Hers. (In this I had in mind the barren town lots devoid of natural incident, town houses and board walks and evidence.)

We of the Middle West are living on the prairie. The prairie has a beauty of its own and we should recognize and appreciate this natural beauty, its quiet level. Hence, gently sloping roofs, low proportions, quiet sky lines, suppressed heights

UPI/BETTMANN PHOTOS



Wright in 1957 with drawing of his never-built Mile-High Skyscraper.

The
Architectural Record

Vol. XXIII

MARCH, 1908.

No. 3.

In the Cause of Architecture

The reader of architectural discourses encounters with increasing frequency discussions on American Architecture, Indigenous Architecture. These are generally to the effect that in order to establish a vital architecture in the United States, it is necessary for the architect to sever his literal connection with past performances, to shape his forms to requirements and in a manner consistent with beauty of form as found in Nature, both animate and inanimate. Articles in this strain have appeared, from time to time, in this and in other architectural journals, and have been in most cases too vague in their diction to be well understood, either by the lay reader or the architect.

The sentiment for an American architecture first made itself felt in Chicago twenty years ago. Its earliest manifestation is the acknowledged solution of the tall office building problem. An original phase of that early movement is now presented, in the following article and illustrations, the work of Mr. Frank Lloyd Wright.

—Editors of THE ARCHITECTURAL RECORD.

Radical though it be, the work here illustrated is dedicated to a cause conservative in the best sense of the word. At no point does it involve denial of the elemental law and order inherent in all great architecture; rather, is it a declaration of love for the spirit of that law and order, and a reverential recognition of the elements that made its ancient letter in its time vital and beautiful.

Primarily, Nature furnished the materials for architectural motifs out of which the architectural forms as we know them to-day have been developed, and, although our practice for centuries has been for the most part to turn from her, seeking inspiration in books and adhering slavishly to dead formulae, her wealth of suggestion is inexhaustible; her riches greater than any man's desire. I know with what suspicion the man is regarded who refers matters of fine art back to Nature. I know that it is usually an ill-advised return that is attempted, for Nature in external, obvious aspect is the usually accepted sense of the term and the nature that is reached. But given inherent vision there is no source so fer-

tile, so suggestive, so helpful aesthetically for the architect as a comprehension of natural law. As Nature is never right for a picture so is she never right for the architect—that is, not ready-made. Nevertheless, she has a practical school beneath her more obvious forms in which a sense of proportion may be cultivated, when Vignola and Vitruvius fail as they must always fail. It is there that he may develop that sense of reality that translated to his own field in terms of his own work will lift him far above the realistic in his art; there he will be inspired by sentiment that will never degenerate to sentimentality and he will learn to draw with a surer hand the every-perplexing line between the curious and the beautiful.

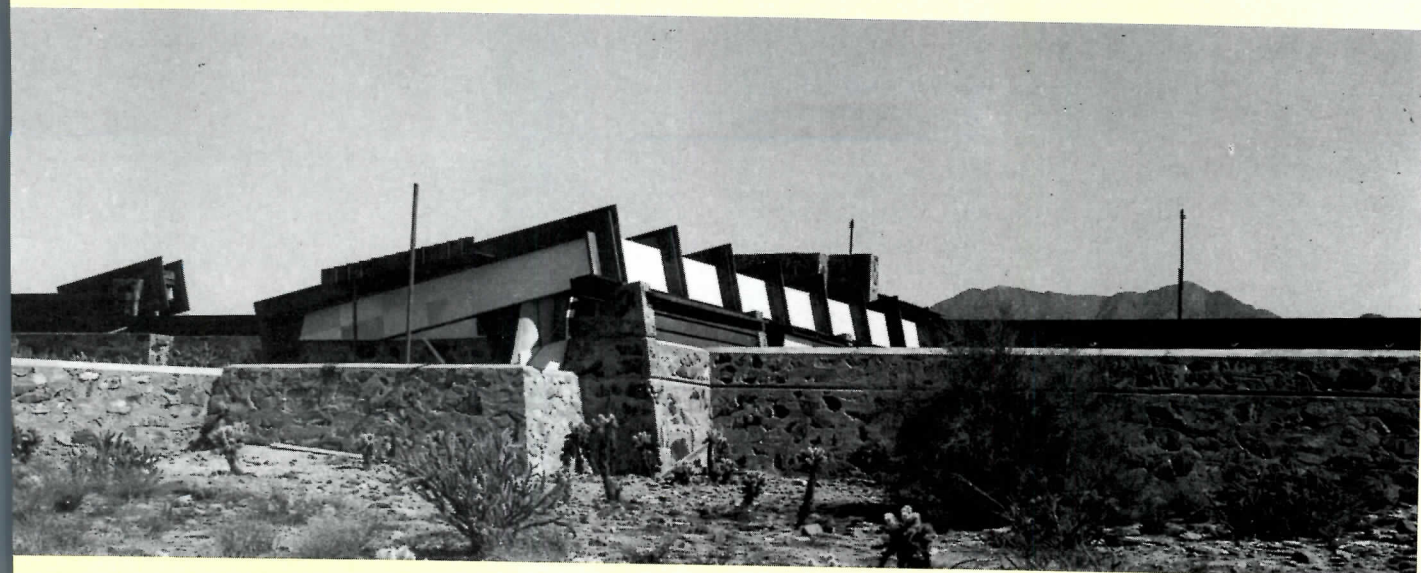
A sense of the organic is indispensable to an architect; where can he develop it so surely as in this school? A knowledge of the relations of form and function lies at the root of his practice; where else can he find the pertinent object lessons Nature so readily furnishes? Where can he study the differentiations of form that go to determine character as he can

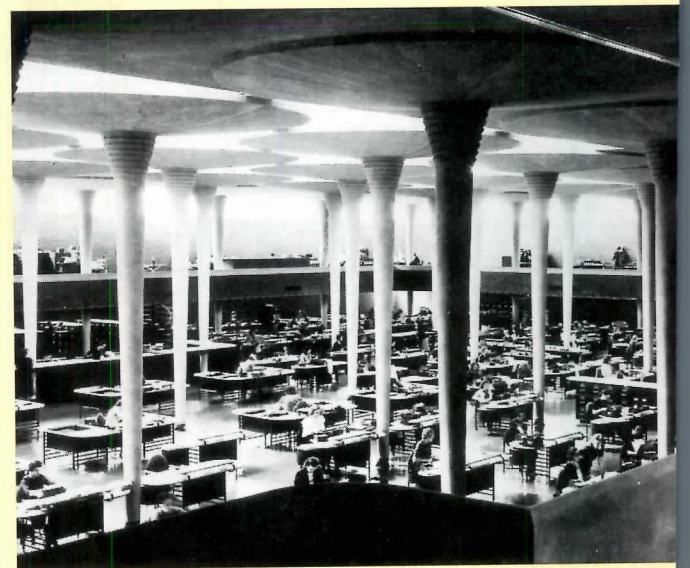
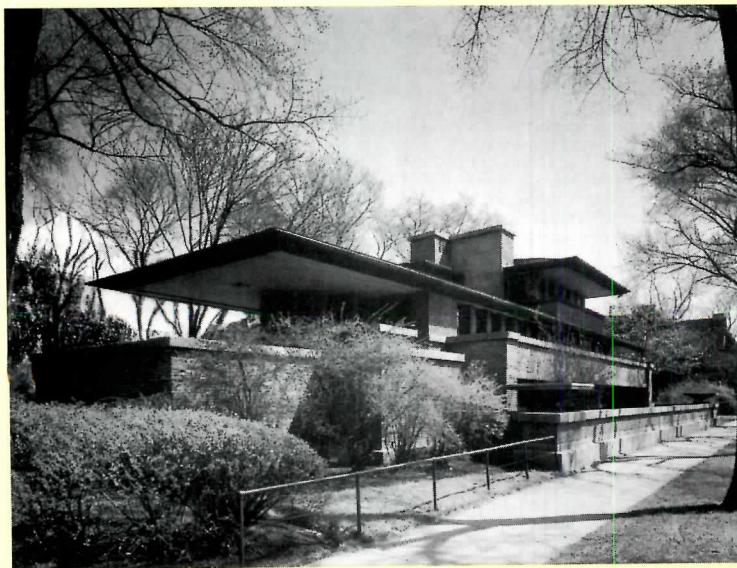
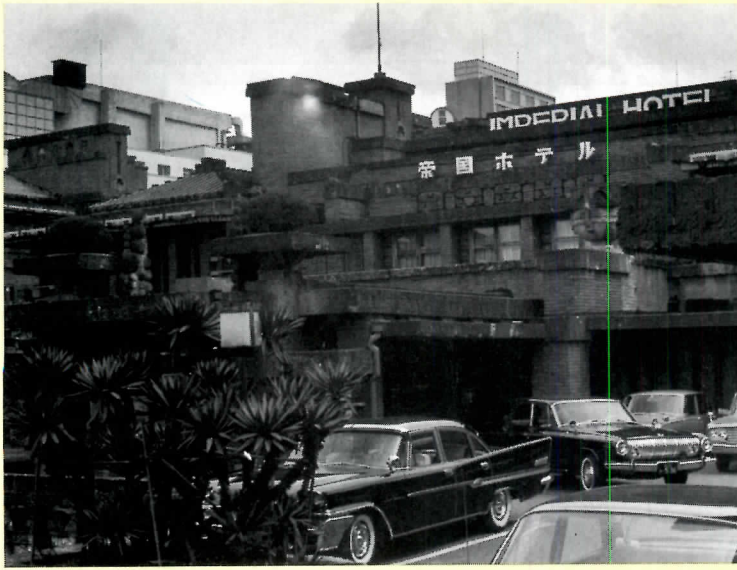
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The opening salvo: Wright's first article for ARCHITECTURAL RECORD in March 1908 (above right) included his "six propositions" of good design. Throughout his career, Wright applied his principles of Organic architecture to

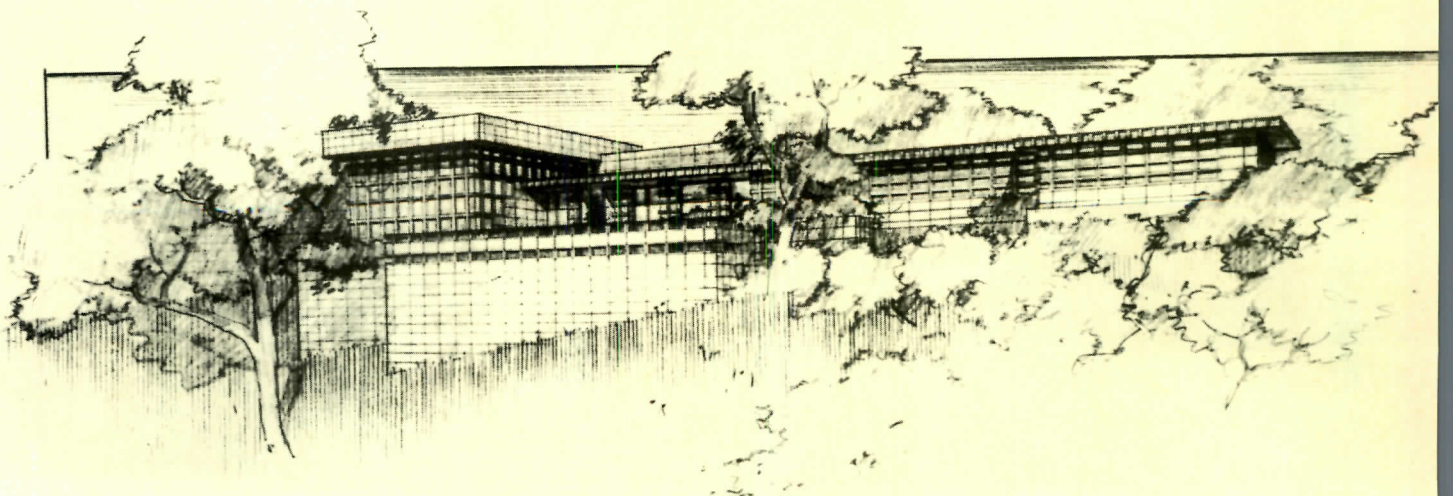
works such as Fallingwater in 1939 (top left), the interior of Taliesin in 1925 (above left), and Taliesin West in 1940 (below). The buildings carefully melded natural materials and Modern construction with their rugged sites.





Wright's Imperial Hotel in Tokyo (built in 1923) used volcanic stone and a sophisticated earthquake-resistant foundation. The Robie House (above), built in 1907, epitomizes the Prairie Style, with its strong horizontals and

flowing spaces. The Johnson Wax headquarters (top right and above right) pioneered a new kind of corporate design, while the Sussman House of 1955 (below) represented Wright's Usonian ideas.



neys and sheltering overhangs, low terraces and out-reach- walls sequestering private gardens.

—Colors require the same conventionalizing process to e them fit to live with that natural forms do; so go to the s and fields for color schemes. Use the soft, warm, opti- c tones of earths and autumn leaves in preference to the mistic blues, purples, or cold greens and grays of the n counter; they are more wholesome and better adapted in cases to good decoration.

—Bring out the nature of the materials, let their nature ately into your scheme. Strip the wood of varnish and let ne—stain it. Develop the natural texture of the plastering stain it. Reveal the nature of the wood, plaster, brick, or in your designs; they are all by nature friendly and iful. No treatment can be really a matter of fine art when natural characteristics are, or their nature is, outraged or cted.

—A house that has character stands a good chance of ng more valuable as it grows older while a house in reaviling mode, whatever that mode may be, is soon out ashion, stale and un- able. . . .

ldings like people must e sincere, must be true hen withal as gracious ovable as may be. . . . e all, integrity. The ma- is the normal tool of our ation, give it work that do well—nothing is of er importance. To do this e to formulate new in- al ideals, sadly needed. 1908.

Nature:
rily, Nature furnished aterials for architectural out of which the archi- al forms as we know today have been devel- and, although our prac- centuries has been for ost part to turn from eking inspiration in books and adhering slavishly to dead ae, her wealth of suggestion is inexhaustible: her riches r than any man's desire. I know with what suspicion the regarded who refers matters of fine art back to Nature. that it is usually an ill-advised return that is attempt As Nature is never right for a picture, so is she never or the architect—that is, not ready-made. Nevertheless, s a practical school beneath her more obvious forms in a sense of proportion may be cultivated, when Vignola rruvius fail as they must always fail. *March 1908.*

Organic architecture:
e of the organic is indispensable to an architect; where develop it so surely as in this school? A knowledge of ations of form and function lies at the root of his ; where else can he find the pertinent object lessons so readily furnishes? Where can he study the differenti- f form that go to determine character as he can study n the trees? Where can that sense of inevitableness eristic of a work of art be quickened as it may be by rse with nature in this sense? *March 1908.*

organic building (an integument rather than a box) as one with its site and occupancy. Nor could these s be imagined anywhere else nor for any other purpose r than where and for what they were built. *May 1952.*

Plan and elevation:
ve endeavored in this work to establish a harmonious

relationship between ground plan and elevation of these build- ings, considering the one as a solution [to] and the other an expression of the conditions of a problem of which the whole is a project. *March 1908.*

Moreover, these ground plans are merely the actual projec- tion of a carefully considered whole. The 'architecture' is not 'thrown up' as an artistic exercise, a matter of elevation from a preconceived ground plan. The schemes are conceived in three dimensions as organic entities, let the picturesque perspective fall how it will. No man ever built a building worthy the name of architecture who fashioned it in perspective sketch to his taste and then fudged the plan to suit. Such methods produce mere scene-painting. A perspective may be a proof but it is no nurture. *March 1908.*

Plan! There is something elemental in the word itself. A pregnant plan has logic—is the logic of the building squarely stated. . . . A good plan is the beginning and the end, because every good plan is organic. That means that its development in all directions is inherent—inevitable. . . . Scientifically, artisti- cally to foresee all is "to plan" . . . All is there seen—purpose,

materials, method, character, style. The plan? The prophetic soul of the building. . . . *January 1928.*

To judge the architect one need only look at his ground plan. He is master then and there, or never. *January 1928.*

On scale:

In the matter of scale, the hu- man being is the logical norm because buildings are to be humanly inhabited and should be related to human propor- tions not only comfortably but agreeably. Human beings should look as well in the building or of it as flowers do. *January 1928.*

On styles:

I do not believe we will ever again have the uniformity of type which has characterized

the so-called great "styles." Conditions have changed; our ideal is Democracy, the highest possible expression of the individual as a unit not inconsistent with a harmonious whole. The average of human intelligence rises steadily, and as the individual unit grows more and more to be trusted we will have an architecture with richer variety in unity than has ever arisen before; but the forms must be born out of our changed condi- tions, they must be *true* forms, otherwise the best that tradi- tion has to offer is only an inglorious masquerade, devoid of vital significance or true spiritual value. *March 1908.*

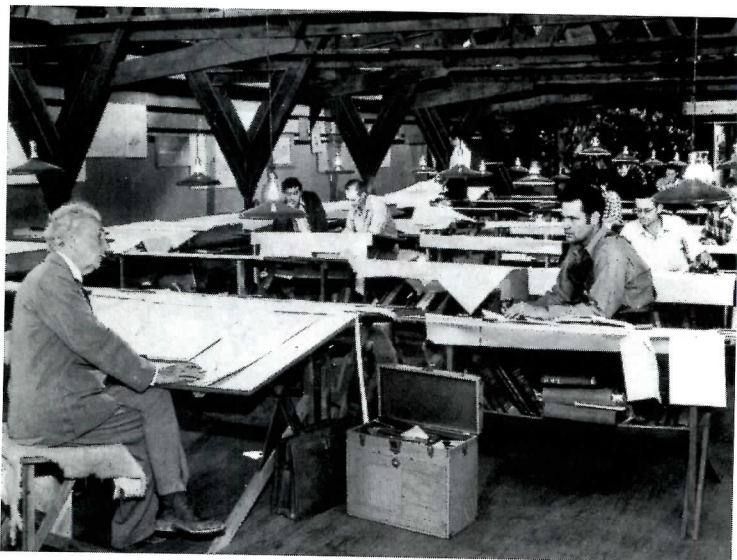
"Styles" once accomplished soon become yardsticks for the blind, crutches for the lame, the recourse of the impotent. *February 1928.*

On ornamentation:

In the main the ornamentation is wrought in the warp and woof of the structure. It is constitutional in the best sense and is felt in the conception of the ground plan. *March 1908.*

Our esthetics are dyspeptic from incontinent indulgence in "Frenchite" pastry. We crave ornament for the sake of orna- ment; cover up our faults of design with ornamental sensuali- ties that were a long time ago sensuous ornament. We will do well to distrust this unwholesome and unholy craving and look to the simple line. . . . *March 1908.*

Unfortunately, there is a conviction in certain quarters—if it amounts to a "conviction,"—chiefly European—that ornamentation is untrue to the Machine in this, the Machine Age. That



Wright addresses his apprentices in 1945 in the studio of Taliesin West in Scottsdale, Arizona.

the use of ornamentation is a romanticism and therefore inappropriate The contrary is the case But it is true that ornamentation in the old sense as an "applied" thing, as something added to the thing superficially, however cleverly adapted or "composed" is dead to this new world. *August 1927.*

On the machine:

The machine is here to stay. It is the forerunner of the democracy that is our dearest hope. There is no more important work before the architect now than to use this normal tool of civilization to the best advantage instead of prostituting it as he has hitherto done in reproducing with murderous ubiquity forms born of other times and other conditions and which it can only serve to destroy. *March 1908.*

The Machine is the architect's tool—whether he likes it or not. Unless he masters it, the Machine has mastered him. *May 1927.*

On standardization:

An Oriental rug . . . gleaming with all the brilliant pattern opulent Oriental imagination conceived, has a . . . basis of standardization in warp and woof. In the methodical stitches regularly taken with strands of woolen yarn, upon that regular basis of cotton strings, stretched tight, lies the primitive principle of standardization Standardization here serves the spirit well—its mechanics disappear in the glowing fabric of the mind *Standardization* should have the same place in the fabric we are weaving which we call civilization—as it has in that more simple fabrication of the carpet. And the creative artist must put it into the larger, more comprehensive fabric. *June 1927.*

On sin:

The sins of the Architect are permanent sins.

May 1914.

On criticism:

To promote good work it is necessary to characterize bad work as bad. *May 1914.*

So the standard of criticism is not only low—it is often dishonest or faked somewhere between the two, largely manufactured to order for profit or bias. Criticism is worked as an advertising game, traders' instincts subject to the prevailing commercial taint.

May 1914.

On discipline:

Discipline! The architect who undertakes his work seriously on these lines is emancipated and imprisoned at the same time. His work may be severe; it cannot be foolish. It may lack grace; it cannot lack fitness altogether. It may seem ugly; it will not be false. No wonder, however, that the practice of architecture in this sense is the height of ambition and the depth of poverty! *May 1914.*

On designing from the inside out:

The building is no longer a block of building material dealt with, artistically, from the outside. The room within is the great fact about the building—the *room* to be expressed in the exterior as a *space enclosed*. This sense of the *room* within, held as the great *motif* for enclosure, is the advanced thought of the era in architecture, and is now searching for exterior expression.

February 1928.

On materials:

Steel is the epic of this age Steel has entered our lives as a "material" to take upon itself the physical burden of our civilization This is the Age of Steel. And our "culture" has received it as ancient Roman culture received the great gift of the masonry arch. For centuries the Romans pasted the trabeated Greek forms of their "culture" on the arch in front as architecture, while the arch did the work behind Finally the noble virtue of the arch overcame the sham culture of the period and came forth and lived as a great and beautiful contribution to mankind Steel is still smothered in esthetic gloom, insulted, denied and

doomed by us as was the masonry arch by the Romans. Inherent virtue will triumph here, too, in course of time. So much was time! *August 1927.*

In most Architectures of the world stone has suffered imitations of the stick. Even in oldest cultures like Chinese civilization, constructions of stone imitate wood posts and beams in every The ideas of forms that became associated with ideas of the beautiful in this use of wood took the more enduring mark on the ignorant of its nature, and foolishly enslaved it to the idea of the ornamented stick. *April 1928.*

The rock-ledges of a stone-quarry are a story and a long one. There is suggestion in the strata and character in the formations. I like to sit and feel it, as it is. Often I have thought, if any great monumental buildings ever given me to build, I would go to the Grand Canyon of Arizona to ponder them. *April 1928.*

It [wood] is the most humanly intimate of all materials. Man loves his association with it, likes to feel it under his hand, sympathetic to his touch and to his eyes. Wood is universally beautiful to Man. *May 1927.*

But the essential difference between stone and concrete is still unconsidered. And that essential difference is the plasticity of the material itself as distinguished from natural stone, which has none at all. I should say that in this plasticity of concrete lies its esthetic value. As an artificial stone, concrete has no great, certainly no independent, esthetic value whatever. As a plastic material—eventually becoming something like in character—there lives in it a great esthetic property, as yet inadequately expressed. *August 1927.*

On the Renaissance:

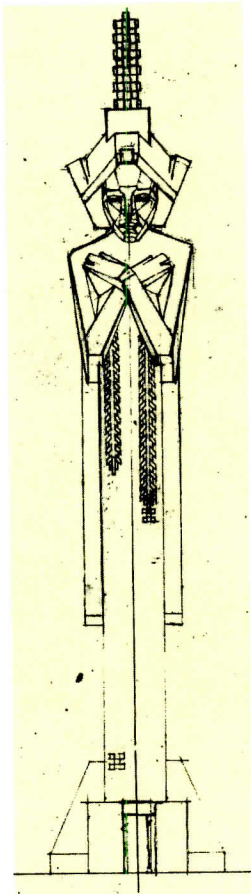
The "re-birth" of architecture. Unless a matter of wrong and died too soon there could be no occasion for "re-birth." But according to architects, architecture has been in this matter of getting itself completely re-born for several centuries until one might believe it never properly born, and now thoroughly dead and repeated "re-birth." As a matter of fact, architecture never needed to be born again *February 1927.*

On Michelangelo and St. Peter's

Let the architect cling, always, to the normal human figure for his scale and he cannot go so far wrong as Michelangelo did in St. Peter's in Rome. St. Peter's is invariably disappointing as a great building, for until the eye deliberately catches a human figure for purposes of comparison does one realize that the building is vast. All the details are likewise huge, but the sense of grandeur it might have if the masses were qualified by details kept to human scale—this effect of grandeur—is lost in the distortion of the human figure. A strange error for an architect to make. *January 1928.*

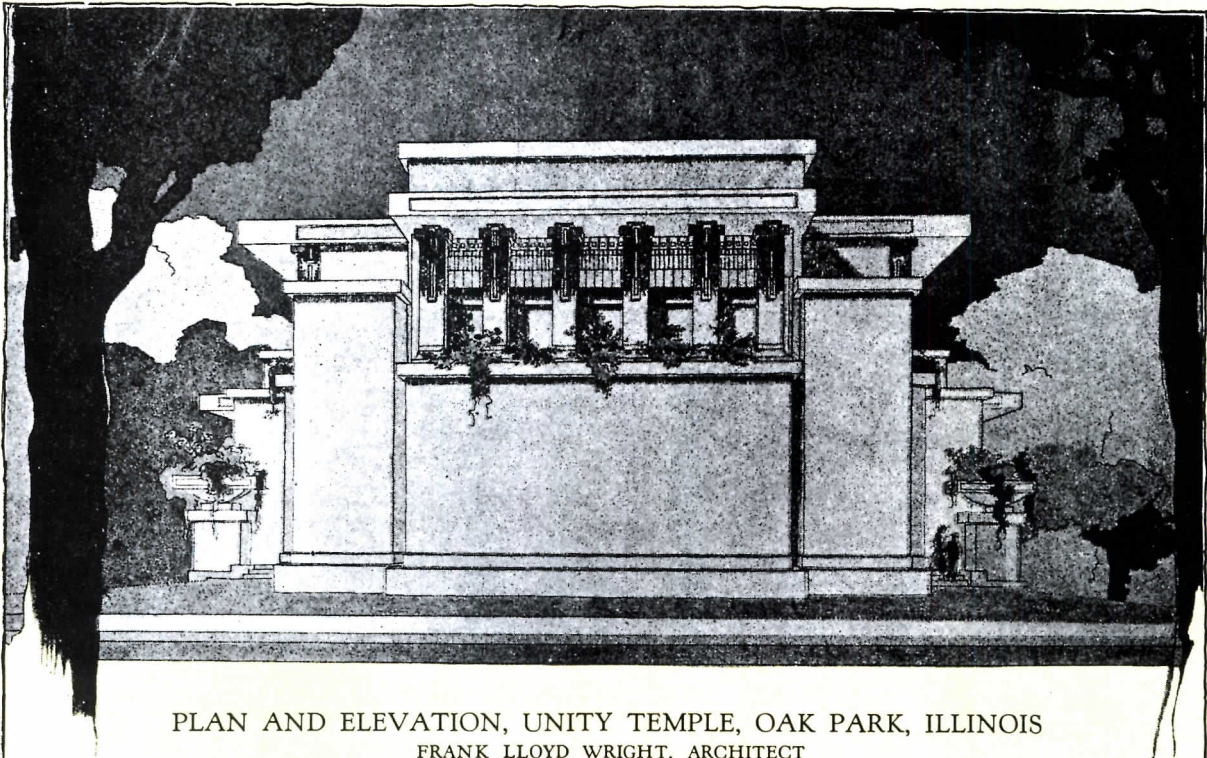
On the impact of European Modernism in America:

Well, this import was not an affair of construction at all, mere "esthetic," a painter's, not an architect's. Soon a cliché of fruitful [contributions] made by Organic architecture in three dimensions now reappeared as a two-dimensional affair. Architecture was scraped off. A high box would be contrasted with long low box, or square boxes would be placed together along very tall boxes. Or one came the nude box cut open, or set the air on posts without pants. But always, nevertheless, notwithstanding—the BOX. Thus surfaced, the box was usually painted white to emphasize the fact that it did not belong being a becoming feature of the ground upon which it put The imported cliché was not only easy to teach, but "more" unless less, already little, becomes less than nothing and "much ado about nothing . . ." Thus Modern-architectured Organic-architecture deprived of a soul Any "international style" would probably be a cultural calamity fit for Fascism intolerable to democracy. *May 1952.*

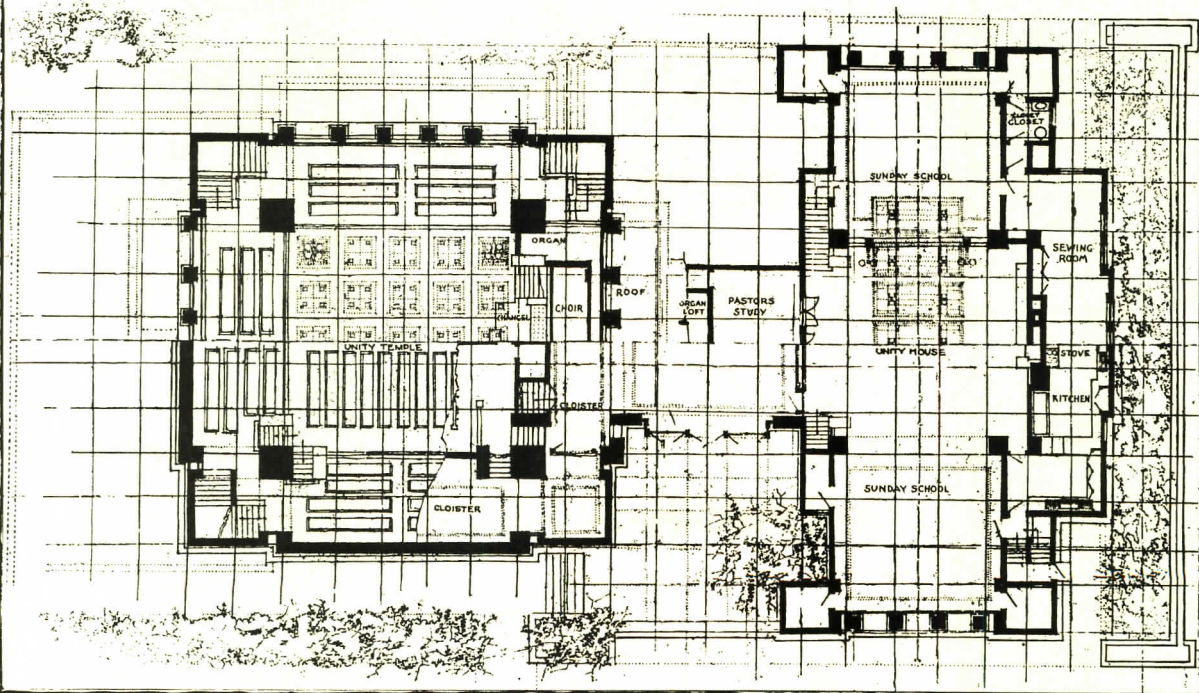


Wright designed decorative figures for Midway Gardens.

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Rejecting the nave and transept plan derived from cathedral architecture, Wright designed Unity Temple in Oak Park, Illinois (1906), as a less hierarchical place of worship with congregants

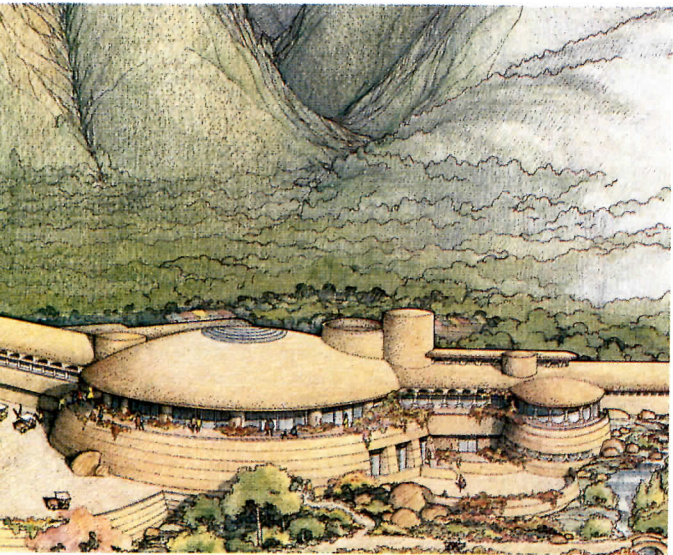
seated around a pulpit. The building is a poured-in-place concrete structure with concrete-slab roofs. The simple cubical masses of the project "are in themselves great concrete blocks," said Wright.



Contact Kawneer, Department C, Technology Park—Atlanta, 555 Guthridge Court, Norcross, GA 30092. 404-449-5555.

DESIGN NEWS

Maui Clubhouse from Wright Designs



Backed by Japan's Shimizu development corporation, an American developer based in Hawaii is going forward with plans for a 600-acre "golf park" on Maui. The centerpiece of the project will be a 70,000-square-foot clubhouse, synthesized by John Rattenbury of Taliesin Associated Architects from unbuilt Frank Lloyd Wright designs. The designs, spanning 1949 to 1957, were intended for homes for Robert Windfohr, Raphael Balleres, and Marilyn Monroe and Arthur Miller, in Texas, Acapulco, and Connecticut, respectively. A second phase of the development will include up to 30 houses, also drawn from unbuilt Wright designs. Con-

struction will begin soon and take about 18 months.

The clubhouse's main dining room is also the building's focal point, a 100-foot-wide, 32-foot-high central dome topped with an inverted skylight. Projecting to left and right are a series of smaller restaurants and terraced lounges, an equipment shop, and administrative offices. In order to preserve the integrity of Wright's designs, says Rattenbury, almost two-thirds of the structure will be below grade, where locker rooms and mechanical services will be located. The steel-framed structure will be covered with reinforced concrete and faced with synthetic stucco. □

Cast-Iron Redux by Hartman-Cox

Completion of freestanding columns wraps around 1501 M Street, a speculative office building designed by George Hartman-Cox. Although the 11-story building is rising in the many 1960s office buildings in Washington, D. C.'s commercial district, the colonnade recalls—and was inspired by—the late 19th-century cast-iron buildings of New York City's SoHo, a landmarked historic district.

The precast columns are cast in one piece and acid-etched to match limestone. To keep down costs on the \$80-million,

180,000-square-foot project, the columns do not change orders as they rise. They are set on 3-foot bases at each level, 8 inches away from the metal-and-glass recessed facade. The 11th floor is set back and opens onto a terrace surrounded by a balustrade. A windowless dome of wood and copper caps the corner tower, which projects some 20 feet above the roof.

The two-story, domed lobby is also loosely modeled on turn-of-the-century mercantile opulence, with marble floors and cherry columns and wainscoting. It should make an inspiring



LEN RIZZI PHOTOGRAPHY

entry for the art students of Washington's Studio School, which will occupy two floors. □

Briefs

• **For a second time**, Murphy/Jahn's Cityspire in New York City is in trouble with the law. First it topped off 11 feet higher than its allotted 803-foot height. Now it's being fined for whistling. Neighborhood residents and workers complain that the building's louvered dome emits a loud whistle under certain wind conditions, and the city's Department of Environmental Protection issued an \$880 fine for noise pollution. Solution? If that dome is 11 feet too high. . .

• **Barton Myers** has been tapped to design a \$70-million, 2,700-seat performing arts center for Newark, New Jersey. The center will fit into James Polshek's master plan for the area, and is the first part of a \$149-million redevelopment effort.

• **In association** with architects Renzo Piano/Building Workshop, Cambridge Seven is developing content and design for the \$60-million Genoa Aquarium, planned as part of the Expo '92 celebration in Christopher Columbus's birthplace. Cambridge Seven has formed IDEA, Inc., a management arm, which will oversee the interior exhibits when the aquarium opens. □

London Confab Hits Tourist Pollution

Address at the first European Monuments Forum on November 6, Professor Sir Ernst Gombrich raised the notion that it is impossible to restore a monument to its original glory." The remark underscored the dilemmas facing Europe's historic preservationists as they met at the Spencer House, in a conference sponsored by the European Monuments Fund.

Julius Norwich, a noted architectural historian, spoke of

"tourist pollution," and suggested the use of appointments to tour historic monuments. He cited the harrowing number of visitors to Venice—up to 36,000 per day—and the devastation from the July 1989 Pink Floyd rock concert in the Piazza San Marco.

Suzanne Massie, author of *Pavlovsk, The Life of a Russian Palace*, recounted the construction, destruction, and reconstruction of the 1777-1825 palace

as mirroring the life of the Soviet nation. Miroslav Masak, architectural adviser to Czechoslovak President Havel, spoke on the need to preserve 36,000 Czech architectural monuments. English country gardens specialist John Harris, noted that select "modernist buildings, too, need to be addressed."

Jacob Rothschild, citing the meticulously restored Phoenix Room in Spencer House (a WMF project), wished the Fund "many many Phoenixes in the future." **DAVID MASELLO**

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Museum-Mad Frankfurt

With its nickname "Bankfurt" and its status as Germany's financial capital, Frankfurt, is fast developing into a museum metropolis. In the past 10 years Frankfurt has attracted architectural talent from America and Europe to create, extend, and/or build museums around the River Main. "Museum Bank."

Two spectacular museums are on the way: Hans Hollein's new Art Museum, wedged into a site in the historical city center, and Richard Meier's Ethical Museum, set near his firm's headquarters for Applied Arts.

Frankfurt has made a serious effort to incorporate its new institutions into the historical fabric of the city. Some are housed in their original villas,



such as the Liebig collection of antique sculpture, and the paintings of collector Friederich Stadel. The Stadel extension (left), completed in 1990, a monumental white marble building by Viennese architect Gustav Peichl, is a strong addition to the cityscape. Next door, work is in progress on Peichl's design for the highly respected Stadel art school. Two Rothschild mansions on the north bank were renovated by Ante Josip von Kostelac to form the Judisches Museum. A Carmelite convent served as the basis of Josef Paul Kleihues's Museum for Pre- and Early History.

For the Deutsche Postmuseum (right), Gunter Behnisch & Partners joined an airy, almost aeronautic modern building in glass and metal to a 19th-century stone villa, now converted into the museum's library and offices. In order to obtain the required volume of exhibit space and to save trees on site, Behnisch went underground. Inside, bulges in the below-grade exhibition hall indicate tree roots. A huge conical glass wall soars up and over the round opening in the ground floor that provides entry to the main exhibit hall.

Frankfurt's building craze is not confined to the arts. Helmut



ROBERT ORLEMANS

Jahn and Kohn Pedersen Fox are at work on major commercial projects. After all, Frank-

furt wouldn't be Bankfurt if the boom had passed the business world by.

TRACY METZ

Design for Schmoozing

William H. Whyte, author of "The Way of Zen," the happy art of people-watching, is the keynote speaker at the conference. But schmoozing spaces are being dissipated by suburban sprawl and destroyed by the intrusion of malls and parking lots. Whyte spoke last October at the Second International Symposium on Architecture and Culture, held by Texas Tech and the University of Pennsylvania schools of architecture. In the mid-1960s, a new town outgrowth in Houston, formed the backdrop for the symposium.

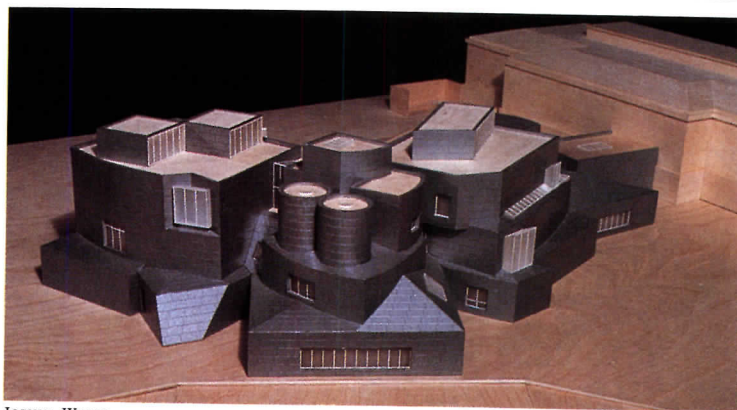
Richard Eisenman lectured that the mass media has forced us into the concept of the "real" world, of reality: "The object is no longer the content of the message; every object is a question of interpretation." Thus, architecture becomes merely episod-

ic. Modern utopian city planning extracted from historical models often ignores social theory, warned Kaisa Broner-Bauer, professor of architecture at Finland's Oulu University. She urged a search for "a new spiritual basis" for city planning.

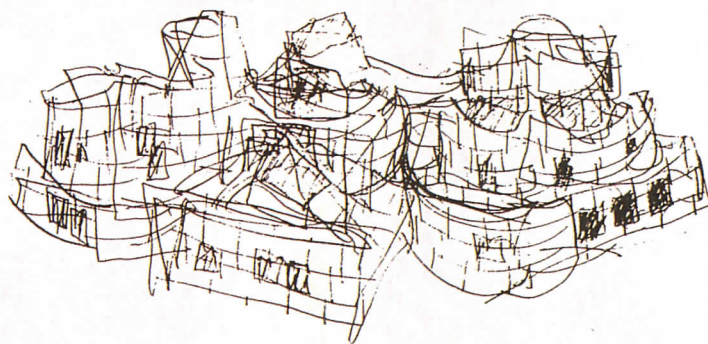
Peter Calthorpe presented his "remedial urbanism" approach, the insertion of pedestrian pockets into existing urban/suburban environments. New York landscape architect Anthony Walmsley, who sees landscape as essential to a balanced urban environment, warned that "our future is linked to protection of nature and natural processes."

"People will go to Disneyland and pay good money to walk through a simulation of an old-fashioned street," said Whyte. "Why can't we build a real urban experience?"

GERALD MOORHEAD



JOSHUA WHITE



Gehry Art School in Toledo

One of Frank O. Gehry's most overtly sculptural buildings to date is the recently announced University of Toledo's art school, a \$10-million, 51,000-square-foot new building that will rise adjacent to the Neoclassical Toledo Museum of Art. Phase I of a long-range two-part project, the L-shaped, three-story structure forms a courtyard with the museum's leafy East Lawn. A glass-walled corridor

surrounds the courtyard. The school's pewter-toned, lead-coated copper and glass facing contrasts with the museum's white marble exterior, but it is a contrast that serves to unify the grouping. Studios and classrooms requiring natural light are on the top two floors, and skylights atop the two main structures are aligned to catch northern light. Groundbreaking is set for June.

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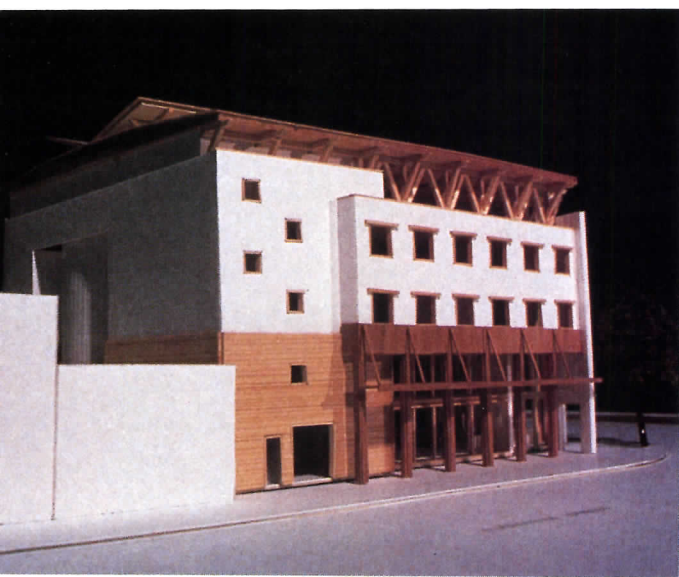
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San Francisco AIDS Center



Shiro Hakomori's design for San Francisco's Life Center, a dedicated HIV/AIDS service organization, was chosen in a redesign competition for the way with which it expresses three functions: a sanctuary on the clerestory level; AIDS service offices at the third and fourth floors; a home for the

Names Foundation on the lower levels. The Names Foundation's main project is the AIDS Memorial Quilt, a gigantic, ongoing quilt made up of panels dedicated to people who have died of AIDS around the world; because of the quilt's size, only part of it can be shown at one time, and much storage space is required.

The competition's joint sponsors, the Names Foundation and Trinity United Methodist Church, liked the serenity and regularity of the design by the 32-year-old, U.S.-educated Japanese architect, intended to create a sense of welcome to visitors and provide a contrast to the commotion of Market Street.

Searching for "an image that would represent the AIDS crisis," the architect placed a tree in front of the building. "I wanted to show a positive force—the tree as a metaphor for the cycles of life." That metaphor is echoed in the large timbers—"a grove of trees"—that support the roof and form the clerestory.

Hakomori is returning this month to San Francisco from Tokyo to oversee work on the project as design architect; the architect of record on the project will be the San Francisco firm of Robinson Mills & Williams. Life Center officials hope to start construction later this year on the \$4-million building, which probably won't be completed before early 1993. **P. D. S.**

Charles W. Moore Wins Gold Medal

Charles W. Moore has been awarded the American Institute of Architects' highest tribute, the Gold Medal, in recognition of decades of achievement as architect and educator.

Moore, who is known for his highly personal design style, becomes the 49th recipient of the Gold Medal since the award was established in 1907. The medal joins the architect's four previous national AIA Honor Awards for best design of the year, spanning 1967 to 1988. □



Competition Calendar

Pont Flooring Systems is accepting entries through February 15 for its ninth annual Annual Design Award. The competition is open to interior designers and architects in the United States and Canada, and includes several categories: large and small commercial, hospitality, health care, residential spaces, and store plans. For information: 212/614-8800 or 800/448-9835.

- The Architectural League of New York is accepting entries in its tenth annual Young Architects Forum competition. This year's theme is "Practice"; the deadline for entries is February 23. The competition is open to entrants 10 years or less out of college or graduate school. For information: 212/753-1722.

- An international call for entries is issued in a design competition, titled "A Square With a Monument," for Keihanna Interaction Plaza, the center of Kansai Science City, now under

construction near Kyoto. Several substantial cash awards. Request registration forms and information in writing from the Office of the International Competition, A Square With a Monument, Yachiyo Bldg.-Higashi-Kan, Kita 1-21 Tenjinbashi 2-chome, Kitaku, Osaka 530, Japan. Postmark deadline for application: February 12.

- Santa Clarita, Calif., is sponsoring an open two-stage competition to select architects to develop a master plan for its new civic center and to design a city

hall. First-stage submissions are anonymous. Distribution of competition programs begins March 1. Contact the competition secretary: 805/259-2489.

- A two-stage design competition is being held to select an architect for a new Museum of Scotland, to be built in Edinburgh. Application materials and information: Kate Comfort, Royal Incorporation of Architects in Scotland, 15 Rutland Square, Edinburgh, EH1 2BE. Deadline for first-stage (anonymous) submissions is April 15. □

the (Very) Well-Dressed Table

They go again. The current Addie Powell offering of architecturally designed objects for the home is a tasteful spendthrift's delight. Having sailed down in an up market by offering relatively inexpensive, mass-produced tabletop objects in the 1980s, they are now swimmer upriver by presenting a costly, limited-edition collection of hand-crafted items in a new market.

Swid and Addie Powell and their architects to follow their most mineral-encrusted designs when designing their

objects. Thus we get Robert A. M. Stern's 13 1/2-by-9-inch sterling silver ice bucket surrounding a drum of cobalt-blue glass and topped with a gold finial (far right), in an edition of 20. Ettore Sottsass's centerpiece of marble, colored Venini glass, and bronze objects (right) is more restrained. The collection, with prices ranging from \$2,500 to \$45,000, also includes pieces by Frank Gehry, Stanley Tigerman, Richard Meier, Laurinda Spear, and six others, and plans are afoot to expand the offerings in the fall. □



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Angeles: Recent Urban Design

Los Angeles has finally come to grips with its dual heritage: the open spaces of its boulevards and the themed communities bred by the film industry and adopted by shopping and residential developers. The contrast is yielding a new mix of strips and enclosed environments that ignore the reclusive wisdom of grid planning that characterized most cities in the U.S.

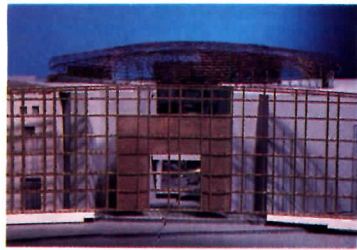
Hollywood Boulevard and the Downtown Urban Design Plan, put forth by the Community Reinvestment Agency of Los Angeles, is an attempt to revive the best strip of them all, by "re-zoning" the district after the fashion of the days of Hollywood.

The redevelopment scheme is taking shape around the Chinese Theater and the Pantages. The City of Stars seeks to bring back the once vital—though almost somewhat seedy—experience along this strip. The rezoning, says John Kaliski, principal architect of the CRA, recognizes that this is a working stage set, one store

The plan proposes a massive change in the single zoning of the area, in order to encourage dense development heavily oriented toward entertainment. Density transfers and area ratio bonuses would encourage rehabilitation of historic Hollywood theaters, while design guidelines govern signage, materials, and

The idea that parts of Los Angeles can be developed following the same scheme has long driven the city. Jon Jerde, the designer of the 1984 Olympics. The core of the work remains in shopping and design: "Shopping centers which were designed to meet the needs of large numbers of people in the suburbs, that," says Jerde, "but can't have anything emotional about them. So we need to bring smallness out and make it into town centers."

His most recent effort in this area is the so-called City Walk (photos this page), a strip of shops, restaurants, and attractions that will connect three of the city's largest destinations: the Universal City Studio



Tour, the Universal Amphitheater concert venue, and the 18-screen Universal Cineplex Odeon—a hilltop company town for Universal's parent, MCA Corporation. The site will contain facilities for the UCLA Extension Program and an MTV-run series of clubs and record stores, designed by Morphosis.

For Jerde, the challenge was to turn this artificial community core into "a real part of Los Angeles." He designed a street of scaffolding for signs, and convinced the client to eliminate all restrictions on tenant improvements. The result is an area organized around focal points such as major billboards, which give a giant scale to this purposefully "unknowable" linear experience.

Yet even the vitality of this new kind of outdoor shopping mall without rules remains bounded. When asked about the absence of those who cannot afford to shop at City Walk, an MCA official responds that "if we need bums to make it more like a real city, we can just call central casting."

"What's left out in all of this," notes Bill Fain, partner in the firm of Johnson Fain Pereira, "is open, public space." Fain recently did a comparative study



of New York, San Francisco, Boston, and Los Angeles. He found that while New York devotes some 17 percent of its land area to open space, and Boston and San Francisco each about 8 percent, only 4 percent of Los Angeles is to be found in parks and other public outdoor spaces.

In their designs for the 5-million-square-foot Los Angeles Center [RECORD, November 1990, page 15], Johnson Fain and Pereira proposed a system of linear parks with small, vest-pocket open spaces radiating out through the blighted areas around it, and connecting to existing public spaces like MacArthur Park. At the University of California at Irvine, designed by the founder of the firm, William Pereira, Fain has proposed inserting a spine of retail and housing, connecting the circular campus layout to a shopping mall across the street.

It is the issues of closed-off artificiality, single-use zoning, and the dominance of the strip that the Playa Vista Design Team seeks to address in the largest urban design project currently underway in Los Angeles, a long-term, \$30-billion effort to develop a community of residences, office buildings, and retail. The site stretches for two miles from the ocean to a major freeway between the airport and some of L. A.'s fanciest residential communities.

Recent development efforts ran into massive community resistance, until developer Maguire/Thomas, known for its sponsorship of high-quality architecture and for its responsiveness to community pressures, acquired the property.

The developer engaged a team made up of Elizabeth Plater-Zyberk, Andres Duany, Stefanos Polyzoides, Peter de Bretteville, Ricardo Legoretta, Buzz Yudell, and landscape designer Laurie Olin. They devised a scheme that gives nearly 40 percent of the land over to public wetlands, concentrating all buildings in dense configurations. Combining local traditions with the small-scale blocks, public focal points, and the deference to the vernacular that Duany and Plater-Zyberk had pioneered in Seaside, Florida, the team created a grid of multi-unit buildings based on the hybrids between courtyard housing and apartment blocks that make up much of Los Angeles.

These blocks—12,000 units of housing in all—are grouped around multi-use neighborhood functions, while major avenues also contain ground-level retail. Only an "office campus" re-

mains relatively isolated, its 5 million square feet of speculative construction tucked away at the back of the site. An elaborate landscape plan creates recognizable plantings for each neighborhood, while tying the development together with Royal Palm trees.

Playa Vista promises to be one of the most intelligently designed new neighborhoods in



Los Angeles. Yet its success is due not only to the complete suppression of the automobile, but also to the economic pressures on this area. The whole development is to be raised on parking plinth, so that cars will be present, but hidden. The inclusion of a large percentage of low-income units, spread throughout the project rather than concentrated in future ghettos, is also an important factor in keeping Playa Vista from becoming a totally exclusionary community.

The same team of designers has been hired by the city to produce a Downtown Specific Plan. It must now convince thousands of property owners banking land for future office buildings to agree to zoning changes and new neighborhood guidelines, plans that could cost landowners.

Will these urban design approaches lead to a more comprehensible city? Developments like Playa Vista or City Walk will either produce a more integrated urban texture, made up of a patchwork of carefully themed, well-defined environments, or leave a set of barricaded, "secure" neighborhoods turning their backs on the communal needs of Los Angeles.

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PRACTICE NEWS

ling the cycatters

ane of cypcat buildings is ally a thing of the past now he President has signed a copyright law giving archi- copyright protection of designs. (The old law pro- only drawings.) Cypcat ings have caused several y reported legal wrangles RECORD, May 1989, pages w architects may seek an tion to stop construction ven may obtain a court or- demolish or seize infring-

ing buildings if the infringement is clear. On the other hand, the new law allows building owners to make design changes to their buildings without authorization by the copyright owner.

The non-controversial "Architectural Works Copyright Protection Act," sponsored by Representative Robert Kastenmeier, passed the House with virtually no debate in late November just before adjournment. (It was an amendment to H. R. 536, the Judicial Improvements Act of 1990.) It had already passed the Senate. Testifying for the law were the AIA,

The Frank Lloyd Wright Foundation, and architect Michael Graves.

"The law fullfills a treaty obligation under the Berne Copyright Convention," says AIA federal-liaison director Albert Eisenberg. The U. S. recently joined that international convention, which has tougher requirements than old U. S. law.

The copyright legislation was initiated by a U. S. Copyright Office study last year, which found that existing copyright laws were insufficient to protect architects' output and that they lagged substantially behind the

protection afforded architects in other countries. Says Eisenberg: "In some countries you can't even photograph buildings without permission of the architects, but in the U. S. you can as long as it is publicly visible." He says the bill's sponsors sought a provision to ban photography if the purpose is infringement, but this section was thrown out. He adds that, in some countries, owners are not allowed to make alterations to buildings without the architects' permission, "but we didn't think that was a good idea."

PETER HOFFMAN
Washington, D. C.

the Press l Downturns?

as the question asked of a at this year's Build Boston ence (see right). "This urn is not as bad as the e of '74-'75," said Keith onds of *Business Week*. of what we're seeing is ology feeding itself— ing inventory, delayed ng." Why this psycholo- A business downturn is a ig story and we will cov- oroughly and aggressive- d one newspaper editor. is the situation as dire as urnalists would have us ? A thick pile of clippings ent Northeast construc- orts shown by *S/F* maga- ublisher Douglas Green d that many types of con- n are still active—elder- ing, affordable housing, dominiums among them. are pockets, but they're obvious as they used to said.

nalists are expected to ble sources of informa- aid moderator Joan Cap- ecause they are targets unending flow of data essage unflagging curios- ts may not be the only killed by curiosity in tuations.

C. K. H.



Marketing in a Ski Suit: a Boston Report


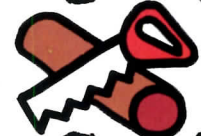

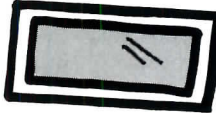




"Showmanship, if tied to substance, can distinguish a firm from its competition—and wake up a selection committee," said Adel Foz, director of strategic planning at Masssport. One architect, showing how he would go after a commission for a mountain resort, showed up in a ski suit. Such was the substance of the workshop *Winning Presentations* at this year's annual trade show and conference Build Boston held in that city on November 14-16. Originally the Boston Society of Architects' annual convention (and still organized by that group), the event has grown over the years by including other related cosponsors such as the ACEC, the American Society of Interior Designers, and the Associated General Con-

tractors. Not surprisingly, considering the Northeast's depressed economic condition [RECORD, December 1990, page 22], show attendance (8,500) and exhibitors (some 250) held nearly steady with last year, but, for the first time, failed to rise. And a good number of the workshops dealt with the business of getting business.

In *Winning Presentations*, three Boston architects competed for the same hypothetical project. A group of public and private developers played the selection committee and the audience, too, pitched in. Discussion centered on the mix of substance and spirit that produces successful proposals. Everyone agreed that good presentations are detailed and structured, and

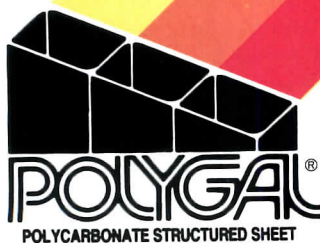
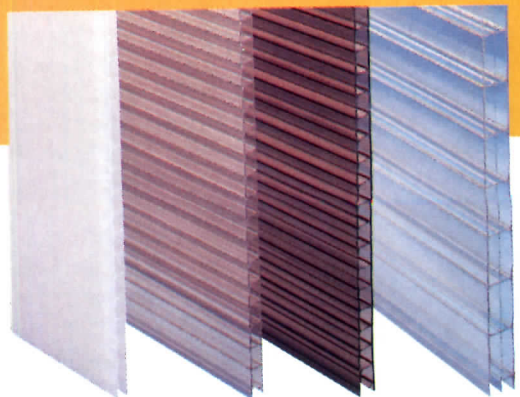
go beyond generic discussions of credentials. "It's important to connect with the client's needs and to address the specifics of the site and the project," said Carol Gladstone, a vice president of The Beacon Companies, who clearly argued for substance. But, said Gregor Smith, a corporate architect at General Cinema Corporation: "Personal rapport is enormously influential in determining who gets the job."

Management consultant Mark Zweig led a session, *Motivating, Appraising, and Developing Design Professionals*. His observations: "Human resources aren't as precise as the design of a sewer line, but not as intuitive as you'd think. Design firms will be happier and more

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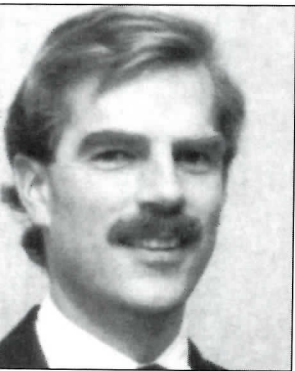
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: Switching horses



: Pushing rapport

able if principals develop a tent hiring process, listen early to employees, promote within whenever possible, prize superior performance higher pay, and avoid using a standard for management staff."

Value Pricing for Engineers and Architects, Frank Stasiowski of Practice Management Associates Ltd. challenged owners to be as creative about businesses as their build-ers. Architects are comparatively poorly paid, he argued, in part because they do not demand adequate compensation for their work and, in part, because they have stuck too long to traditional ways of doing business. "Most architects bill for the time it takes to do a project, and that's the problem," he said. "Never bill instead for the value of the products and services provided." Stasiowski advises clients to negotiate lump-sum-price, or percentage-construction-cost contracts, to avoid work on per-diem or fixed rates, and contracts with "no-exceed" clause.

Assessing the Future of Architecture and Construction in England, Robert Kuehn of Development Corpora-

tion in Cambridge, Mass., noted that cycles in affordable housing often run counter to cycles in the rest of the real-estate industry: "It's hard to have affordable housing on unaffordable land." The provision of moderately priced housing, he suggested, might help New England recover from its recession by encouraging businesses and people to stay or settle in the region. "Massachusetts in the '80s became unaffordable," he said. "That's bad for business."

Alternate Approaches to Careers for Architects assembled a panel whose training took them in unexpected directions. In architecture school, Lionel Spiro found: "It was hard to get supplies." As a young practitioner, he took a three-month leave to start a design-supply business. That was 26 years ago and the business is Charrette.

Mentoring explored growing importance for the NCARB's intern-development program. Elizabeth Ericson (Shepley Bullfinch Richardson and Abbott) and Susan Wright (Bergmeyer Associates) agreed that mentoring is especially meaningful to women, given their thin representation at the highest levels of the field.

Cutting staff and expenses, and developing new markets were explored in *Midsized Firm Survival and Transformation Strategies*. James Crissman of Crissman & Solomon Architects affirmed the importance of upholding, even in hard times, high standards of design. Warren Freedendfeld of Freedendfeld & Associates suggested that this can be a time for introspection: "Many of us have time now to think about things we probably haven't examined in a long while," he said. "When times improve, we'll be in better shape."

The BSA would like Build Boston to broaden local architects' horizons. To that end, its sponsors plan to take a version of the show to Budapest this spring. To be cosponsored by Boston's World Trade Center, *Building for Business Budapest: North American Design and Construction*, will, its planners hope, be a showcase for local architects abroad and thus provide them with an exciting new market. NANCY LEVINSON
Boston

Greener Pastures?

Thinking of pulling up stakes and striking out for greener professional pastures? With work soft in many locations, you may be considering just that. What are your chances of success? Richard Fitzgerald, executive director of the Boston Society of Architects, decided to find out.

He prepared four basic questions: What is the current market status in your area (five choices, from boom to bust)? Is that status improving, worsening, or stable? Where do you think the hot markets are? And should architects move to your region, stay put, or call? Fitzgerald mailed about 60 of his one-page questionnaires to AIA chapters nationwide and, within a week, had received 39 back.

Boom: Idaho, Wisconsin, Hawaii. Bust: Arizona, Washington, D.C., and New Mexico. Eleven chapters reported steady growth, but four of those—Detroit, Seattle, Pittsburgh, and Iowa—predicted that conditions might worsen.

There was no consensus on where hot markets are, though suggestions ranged from Mars to Minneapolis. Several respondents suggested the Pacific Northwest. Portland and Seattle did report "purring" markets, but neither was convinced of market strength or depth.

Thirteen chapters are in declining markets, nine in flat. Most of both types were in the East, Midwest, and Southwest, although Houston reported improving conditions (as did central Oklahoma and Oakland, California).

A whopping 28 chapters urged everyone to *stay put*. Eight chapters—up, down, and flat—suggested calling for information: Oakland, Michigan/Detroit, Portland, Oregon, Utah/Salt Lake, Baltimore, Houston, Louisiana, and Eastern Oklahoma.

Surf's up: The only state suggesting architects should move there—after securing a job—is Hawaii. PETER D. SLATIN

Report from Eastern Europe

Gunnar Birkerts is one of an increasing number of U.S. architects practicing in foreign countries. And he relishes the prospect of his firm, located in a Detroit suburb, taking on more projects abroad.

In the last two years, more and more U.S. architects realized the potential for practicing abroad [see roundtable report, page 37]. In fact, U.S. design firms topped the design billings in Asia, Australia, and Europe, as well in America, according to a survey conducted by *ENR* and reported in its August 2, 1990, issue. Overall, the top 200 international design firms worldwide posted \$7.4 billion in foreign billings for design services in 1989, the survey shows. Responses came from a variety of architecture, engineering, and engineering and construction firms.

Opening relations with Eastern Europe contributed to Birkerts's recent commission to design the Latvian National Library in his birthplace, Riga. (see *RECORD*, December 1990, *Design News*, page 20). His firm also works in Italy and South America.

Birkerts acknowledges there are complications involved in carrying out projects in foreign countries. Plans to finance the library in Latvia, for instance, are unresolved at this time. Latvia is still controlled by the central government in Moscow, but negotiations are underway on Latvian independence. Regardless, the library will be built, Birkerts says, and adds: "The Latvians would like to finance their own cultural building as a matter of pride." If he has any concern, it

Continued on page 56



SUSAN SLEZNICK

Birkerts

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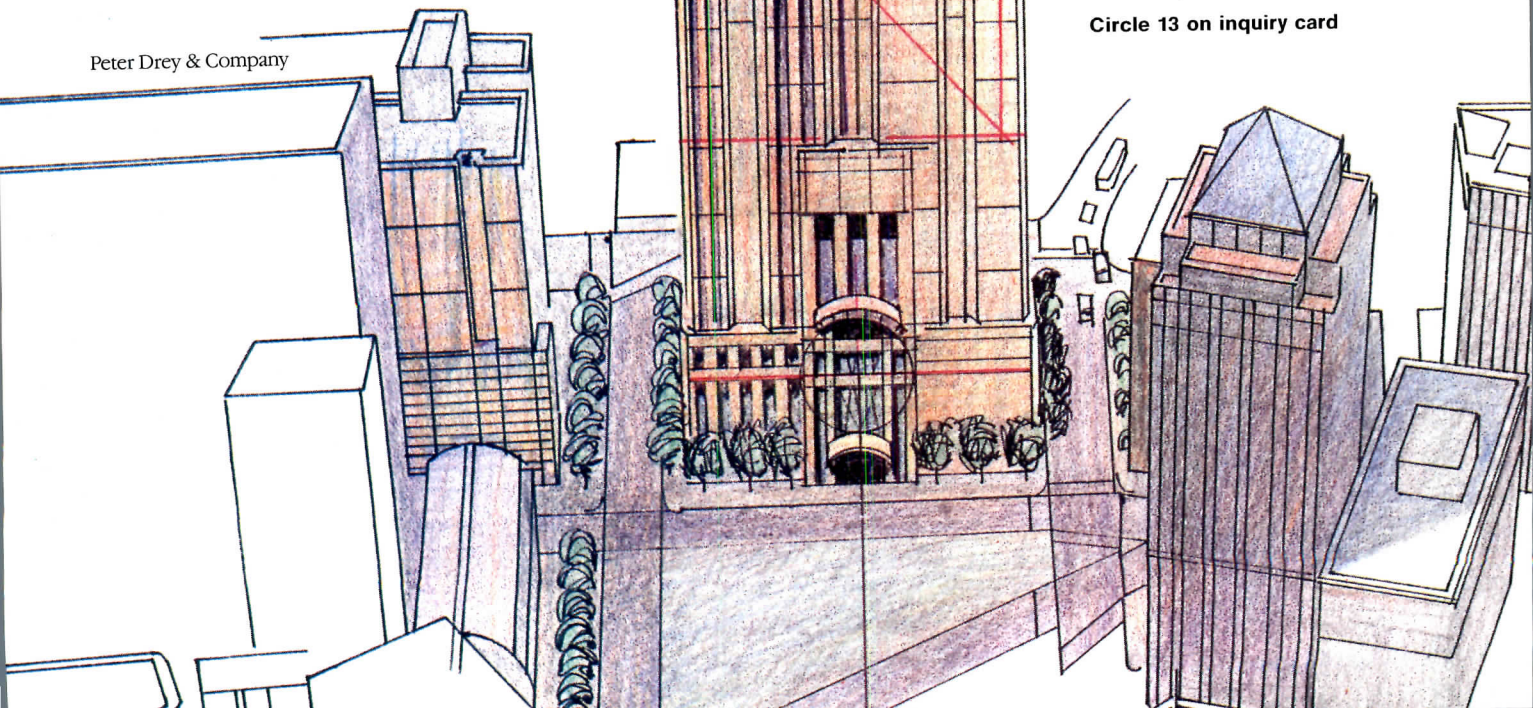
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OVERSEAS WORK: WHERE IT IS AND HOW TO WIN IT

A RECORD roundtable calls on the experts to impart their experience. Part one of this report tells where the work is and how to find it.

...some time, the large U. S. architectural firms have developed work abroad in the normal course of expanding their markets. Smaller firms have been doing work abroad—usually because the principals had the right contacts rather than aggressive marketing strategies. The big firms saw an opportunity to ride out the perennial up-down swings in the volume of buildings they design. In the meantime, it has become the natural step in geographic diversification.

...now that many firms, large and small, are having serious trouble finding work, interest in foreign markets has become keener. This matches the general attitude of our times in the U. S.—where people in all fields have come to realize that the country is not alone, but part of a global economy.

...at what have the adventurous firms learned when they went abroad? Did their experiences match their expectations? Did they avoid the pitfalls and what they learn if they fell in? Where and how did they know to find work?

...these were just some of the questions RECORD wanted to answer when it invited the principals of large and small firms who were seasoned in overseas work from around the country (plus one expert on foreign practice) to come to New York last fall. They were:

Daniel T. Balen
Executive vice president; National Council of Architectural Registration Boards

Robert Chan
Partner; Prentice & Chan, Ohlhausen

Robert P. Cooke
Partner; Perkins & Will International

William Fallon
Partner; Computer Technology Management, A. Epstein Companies

D. Hinklin
Partner; Skidmore, Owings & Merrill

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Perkins: Making sure it is worth it. Sobel: Finding the right contract. Thomsen: Looking beyond technology.

Fred Koetter
Partner; Koetter, Kim & Associates

L. Bradford Perkins
Principal; Perkins Geddis Eastman

Robert Sobel
President; Emery Roth & Sons

Charles Thomsen
President; 3D/International

“We see Eastern Europe as a huge market—especially for modern offices, hotels, and industrial facilities.”

RECORD editor Stephen Kliment moderated with the help of senior editor Charles Hoyt. Here are the panelists' answers:

Knowing where the work is may mean digging deeper than the obvious locales
“A country's dollar volume of construction, taken by itself, is not the only major criterion for deciding whether or not there are opportunities there,” said Perkins. “One of the major criteria is strong need for American services even though there

may be a relatively small dollar volume. Strong need may create much better opportunities than in, for instance, some of the countries of Western Europe that may have high volume, but also lots of very good architects.” His experience abroad includes managing two foreign offices for Llewellyn Davies International and project teams in 15 countries, and his observation seems particularly apt, considering recent downturns in, e.g. the U. K. He was once a partner in that British firm and now does work

in Spain and South America.

“The World Bank is one good barometer,” said the NCARB's Balen. “Its work is primarily with Third World countries and it's looking at Poland, Pakistan, and China.” He is currently assembling and comparing foreign standards for U. S. architects who want to work abroad.

“We see Eastern Europe as a huge market,” said Epstein's Fallon. “Epstein has 30 to 40 people in its Warsaw office. The only reason it hasn't more is that there's not enough office space. There's a tremendous need for modern office space, hotels, and industrial facilities. It is promising because we see very little U. S. competition there—especially in the industrial sector.” The most competitive countries? “West Germany, Sweden next.” Epstein is also being approached to work in Hungary.

Who are the clients? “You're no longer looking to governments to fund projects,” responded Fallon. “Often, you're looking to Western money.” This may mean going in with outside developers and it may mean taking an equity interest in outside businesses opening up there (which requires the same sort of economic-feasibility research as for a U. S. project).

Cooke concurred in the importance of taking on such risks.

Epstein has equity arrangements with a U. S. manufacturer and a U. S. meat processor; both ventures have Polish partners. Some advantages of Poland? “Essentially there are no restrictions about taking money out and the exchange rate is fairly stable,” explained Fallon.

If You Have A Design Problem, We Have An Angle.

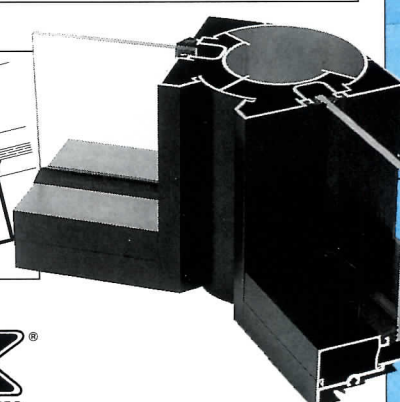
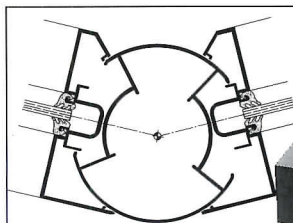
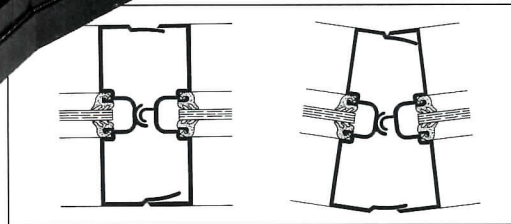
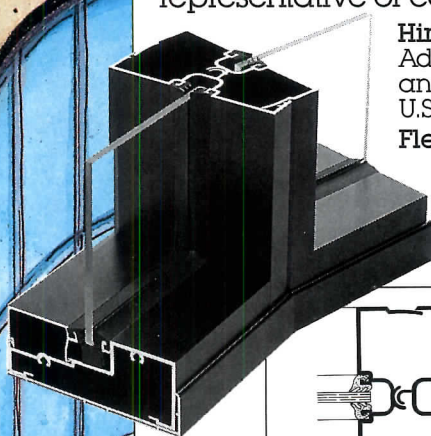
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wing what you are wanted for—in fulfilling a craving for technology and World countries, in their drive for modernization, will adopt all kinds of modern technology,” said Chan. “And modern technology often brings with it modern architects. They understand it better than the locals—even the simplest things like air conditioning.” His firm’s spearhead into China was the National Crop Germplasm Center in Beijing. “When we started working overseas, we were told that we were going to be experts in the transfer of technology,” said Sobel. “But, after becoming experts, we found there was no such thing as the transfer of technology. There is only the practice of architecture and the selection of systems.” Sobel has worked on projects in Bangkok, Kuala Lumpur, a gigantic condominium in Singapore, and the massive China Trade Center in Beijing. He has created the China/U.S. Architectural Alliance to pursue projects there, here, and elsewhere. “If you are in an environment where it’s appropriate to select sophisticated systems, or if you’re dealing with building types unfamiliar to the locals,” adds Sobel, “then probably you have a contribution to make in that market.” In other words, not all is technology; it’s basic planning. Sobel told of being interviewed by a newspaper in Singapore 12 years ago. The reporter asked: “What do we need you for? Our guys went to Harvard; you went to Harvard, so you have the same education. Our guys worked for big American firms; you work

for a big American firm, so we have the same experience.” Replied Sobel: “If you feel our experience with a particular building type exhibits the synergies, relationships, and organization for which you have no models, then I think we can help.” He adds: “It was the architects who were asking why they needed us. The clients didn’t have a problem figuring it out.”

“Obviously, we have some technology that somebody wants,” observed Thom-

sen. “They come to us for that technology. But, look at the technology of Western Europe and Japan. Where do we lead?”

Sobel: “We have a tremendous opportunity to lead.”

Chan: “We certainly have a lead in such areas as security.” He talked about his current project for a museum in China: “Chinese architects seldom, if ever, design museums. We can offer that technology.”

Thomsen allowed that we could export some kinds of technology—for instance, the ways certain types of buildings work or advanced mechanical, electrical, and plumbing systems. The design of especially high-rise buildings involves both technologies together, responded Chan.

Knowing if there is a market

“Do you think there is a market for office buildings in Surabaya?” a group of architects in this large industrial city in Indonesia once asked a panel of Americans that included Sobel. “Don’t you have office buildings?” asked the Americans. “Not really,” responded the Indonesians. “We have shop houses like all of Asia.” The exchange was repeated for apartment houses. “But where do you live?” asked the Americans. “In bungalows,” responded the Tunisians. It was the same for shopping centers. “So there are building types in America, which we take for granted, that are not in demand all over the world,” concluded Sobel.

But, what if clients do want American building types? “Because of the size of the U.S. market, we’ve had a lot of volume,”



**Top: Koetter and Chan.
Bottom: Hinklin and Balen.**

Will the State of Our Profession Help Us Abroad?

“We live and practice in a world of contrasts,” said RECORD editor Stephen Thomsen in opening the meeting. “It’s a world of specialization [by some firms] and of other firms that feel they can handle all tasks with the help of the new practice aids.

“There’s change in other ways. Overhead expenses are up enormously and net operating income tends to be leveling off or sliding downward. The workplace is changing for architects and for junior drafting people. There is a trend toward downsizing toward leaner firms—to get more out of less.

“New management tools are very sophisticated. New software comes on the market almost daily. It is supposed to make managing offices easier—and starting branch offices, running them, and possibly closing them.

“But, how do you train those who are to make use of these new kinds of tools? We are told that computerization, especially the use of CAD, is supposed to make offices more productive.

“In practice, it’s not really happening. You still have to have somebody run the CAD system and you must depreciate the capital cost of the equipment. So, when you add these two together, you may not have greater productivity so much as a valuable by-product: probability of controlling quality, greater accuracy, and greater inter-office sharing of data bases.

“Architects are in a tough environment. Their jurisdiction is being nibbled away by specialists—construction managers, facilities managers, specialists in all the little pieces that you can slice practice into. It’s almost to a point where design itself is looked at by clients as a commodity much like soybeans or pork bellies, bought at the lowest price.

“On the marketing side, the process seems to have come full circle to having the person who will be doing the work doing the marketing. There was a period through the mid-1980s when much of the marketing was given over to people

with titles such as marketing coordinator. There’s also a curious dichotomy between sophisticated promotion tools such as CAD-generated videos and the enormous power of individual personalities to make the actual ‘sale.’

“Some things haven’t changed, and won’t. Networking as a source of leads will continue to be a major source of work. Track records will continue to be major client turn-ons. And last but certainly not least, the rewards will continue to be commensurate with the risk that you take.

“So what does all this have to do with work abroad? What I have just described in capsule form is the environment in which U.S. firms practice. It is the professional baggage that we bring to getting work overseas and to overseas practice. And the questions we hope to address are how much of this works, how much has to change, what net benefit do we bring overseas, and what are the challenges and opportunities facing us.”

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ted Thomsen, "so the traditional architect's knowledge of how to house a client's function is an exportable thing. We people come to the U. S. to find someone who knows how to put together a floor plan of an office building or hotel. The Saudis came to the U. S. because we built more colleges and universities anybody else in the world."

"Experience is exportable," seconded Sobel, "There is the impression we have put together and are well organized." "And we know a lot about what clients want because we have been talking to our clients," added Thomsen.

"The level of sophistication in modern multi-tenant office buildings, even in very sophisticated countries with many architects, is very limited," observed Perkins. He also pointed out the advantage in Americans' higher energy level and greater interest in client concerns. "The typical architect here has developed a lot of knowledge much earlier than his foreign counterpart."

American architects bring different responses to problems and more flexibility in interesting situations," added Thomsen. He spoke from the experience of his firm's fast-growing two-year-old branch in London set up to do large scale projects [RECORD, October 1990, pages 23-25]. "Probably true on the continent as well, but Britain certainly gives the advantage to Americans." There still is to be a market for U. S. architects in the established market despite local downturns.

"Where are Americans at a disadvantage? "I worry about the Pacific Basin," said Thomsen. He cautions about the Japanese; they are gaining construction technology. The big construction companies sell design as a turnkey package.

Best ways to structure your fees
 "Americans' fees are a little higher than they are, but so are expenses," said Koettner. "One might take economic advantage of knowledge gained over time, but it's tremendously expensive to learn, so the high fees aren't really valuable to us." The message: Wherever you go, you will have to pay higher fees to break even.

Cooke: "In the U. K., they do have a published rate structure for fees, but that's changing. U. S. and EEC architects have made things more competitive. Still, we are profitable, which implies greater efficiency in delivering our product."

Hinklin: "It's built into us to be quicker, more efficient, and use systems."

What about Eastern Europe? "We're not looking at fees," said Fallon in reminding the panel how her firm now works. "Our industrial projects in the 1970s were turnkey, lump sum. We designed it, built

draw. And by the way we would like it paid in U. S. dollars net of local taxes." Roth also works with a lump sum for expenses. "I hate reimbursables," Sobel quotes one client as saying. "You rent yourself out by the hour like a taxi." But, cautions Sobel, "The client wants them rolled into the fee and the locals will then want to tax you on them as revenue."

"Most countries want fixed price contracts," said Cooke. "People want to know how much is it going to cost in advance."

"Having said all this," added Sobel, "we are being paid partly in Hungarian currency, which is not interchangeable. We have a bank account there with money we can't spend except in that country, which is a very good argument for opening an office there. It's about the only way we can do business. It's not the best of all worlds. We are living for the day when the currency is convertible or else we are going to have to start buying things."

Thomsen: "We had a project years ago in Egypt with an Egyptian client who paid in dollars. Then we did a project for the State Department. We got the project because we accepted Egyptian pounds."

Collecting fees

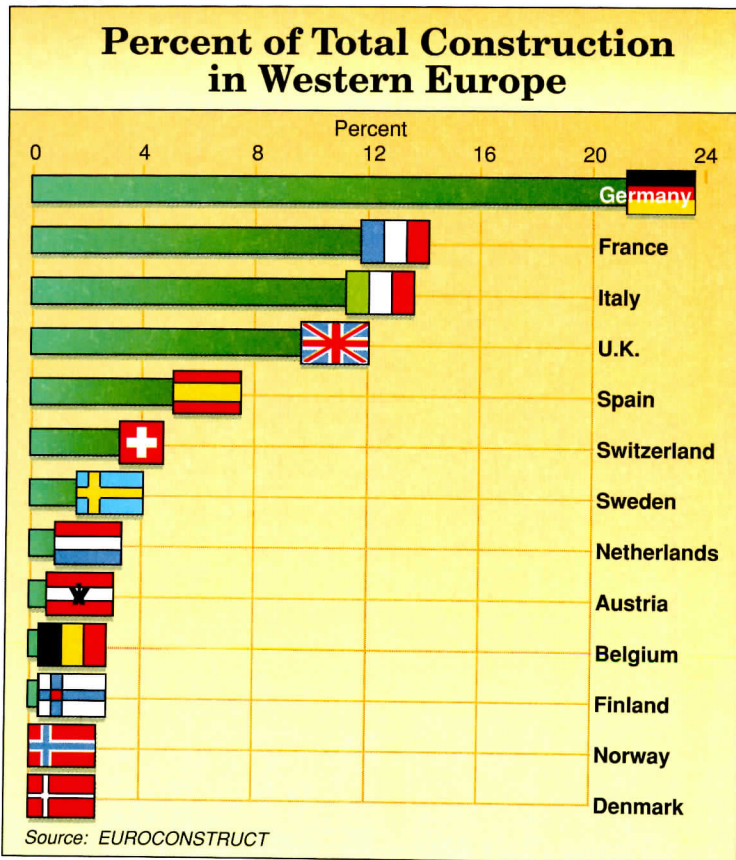
"If you ask about problems collecting fees in the U. S., the answer depends on the caliber of clients you are dealing with," said Thomsen. The principle applies abroad as well. "If you don't know your client in the U. S., you can be in as much trouble as if you don't know him overseas," added Sobel.

"Take an American attitude about sending bills," advised Cooke. "Say 'payable in 30 days or interest will be added.'" But, he cautioned: "Foreign clients may accept these terms in contract negotiations, but still wait four months to pay. You have to do your homework and understand the reality of how you are going to be paid irrespective of what the contract requires. I usually gamble on it taking longer. The first thing you must do is take a minimum of 10 to 15 percent of your fee and put it away as a contingency."

Perkins listed two warning signs of trouble before you get involved: currency that is not totally convertible and a lack of appropriate tax treaties with the U. S., meaning, for instance, that you may be taxed for expense reimbursables even though they are not part of the fee.

Sobel spoke of trying to sell work as intellectual property abroad because sales

LEONOR M. GLYNN



Western Europe has a current total of \$330 billion in construction (compared to \$264 in the U. S.), but demand for our services may be limited. Source: EUROCONSTRUCT.

it, equipped it, trained the operations people, sold it back to the government, and the money we made, we made. It's still similar. Today we even consider operations involvement. The measure of success is the return on investment."

"We think, based on practice there, that percentage fees are very dangerous," said Sobel. "First of all, you can only compute them in the local currency and you're already in never-never land when you start doing that. Second, try to find out the construction cost of a project there. Try to get a client there to open his books so you can run after that final 10 percent. Try to figure out construction costs at the beginning of a project and then at the end after currency fluctuations."

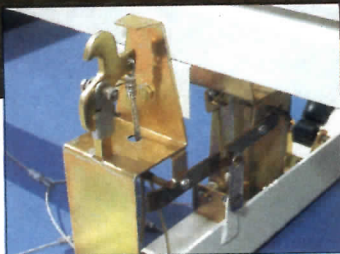
"What we have done is estimate construction costs, converted a percentage to a lump sum, and said that's it, win, lose, or

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s always less than tax on services. But... because the various tax jurisdictions would not accept it. "Whichever way... the most money, that's the way they interpret the rules." He asked if any of the... had been successful in collecting... fees up front. They had not.

Chance for small firms abroad

nsen: "The specialized knowledge we... exporting can come in small as well as... packages. There's no place for a big... abroad that doesn't have that knowl... It's not production capability."

t has to be much more of a rifle-shot... approach," advised Perkins. "Targeted... dependent much more upon personal... relationships. I have a lot of very close... in other countries, and I'm their... resource for doing things when they... to bring in American expertise."

What brought us overseas were con... in the States," said Chan, "people... were interested in giving something... in one instance.

Sobel saw similar promise for work in... ern Europe—"Europeans who made... in America and would like to give... something back. Take a \$10-million project... million comes from the States. With that... es an American architect. That's a... et for the small firm."

"You get some of that in Israel," said... n. "Americans wanting to contribute... pool or other special facility."

"You get one or two such opportuni...," cautioned Chan. "You can't build a... ce on them."

oke talked about the traditional path... large and small firms finding clients... seas—U.S. companies investing... e. "If you have established a rapport... ad, U.S. clients will take you with... when they invest there. Show them... know some of the pitfalls, how you... help them mitigate some of the prob... that, to them, seem like a mine field."... small firms have focused decision mak... said Koetter. "Working abroad is a... situation for clients and architects,... there are many adjustments taking... on an almost daily basis. If one per... n a firm makes decisions as well as... ns, there's a great advantage."

small firm has to look very long and... at why it pursues work abroad," said... ns. "The glamour of international... wears off the third or fourth time... suitcase arrives in Istanbul when... e in Madrid. Small firms are built... d a few key people. If you're drain... their energy, it can be devastating to... ctice back home."

Other route for small firms abroad:... iation with big ones. "Skidmore gets... big projects because it's a big firm,"... inklin. "Often the clients want them... quickly. Many times, when that hap... we associate with smaller firms and

divide up the work." Also: "U.S. develop... ers sometimes have worked with smaller... firms on smaller projects and we put to... gether a collaboration."

The impact of 1992—sweeping yes, but probably not soon

Cooke: "One of the problems I don't see be... ing solved is the wide variety of codes, building requirements, and government-ap... approval processes in Western Europe."

"Currently within Western Europe, peo... ple have national practices," said Fallon.



Cooke and Fallon

There's very little crossing national bound... aries. That, I think, will change. Issues of... reciprocity and licensing will be resolved. We will see more competition, say, from... the Germans for work in England or Brit... ain for work in Spain."

"Some of the people making that happen... are U.S. developers," asserted Koetter. "Disney in Paris awarded construction... management to an Italian firm."

"Most countries will allow architects not locally registered to practice in joint venture with a local one—or hire one."

"Every country surveyed by the NCARB... about registration requirements," said Bal... en, "indicated a free flow of people from... one country to another, but more limita... tions on U.S. architects."

"We shouldn't underestimate residual... national barriers," said Perkins. It's not... just codes, but cultural differences. There... is a free-trade agreement between the... U.S. and Canada, but, having had an of... fice there, I can tell you it's hard to cross... that open boundary. Many of the pres... sures that make practices local in the U.S... will exist in every sophisticated society."

Koetter observed that, despite the inter... nationalization of economies and construc... tion, local traditions run counter to the... trend. "The confrontation is going to be in... teresting and exciting to see."

"The Treaty of Rome states that compa... nies already established in the European... community, regardless of ownership, will... be treated the same," revealed Fallon. "Hence the flurry to get a subsidiary es... tablished before 1992 to maintain rights."

Leaping the registration barrier

Sobel spoke of being met at the airport in... Kuala Lumpur by a group of architects... saying that his group was illegally repre... senting itself as architects because it... lacked registration in Malaysia. "You in... troduce me to your wives in the U.S.," he... had responded. "You weren't married in... my country but I still deem you married."

"Registration or lack of it is used for... business bargaining purposes," observed... Chan. "Local architects know you must as... sociate with them. Hong Kong architects... negotiating for work in the Peoples Re... public have long complained of the high... percentages local associates demanded."

Balen reported on the results of ques... tionnaires sent by the NCARB to over 50... countries around the world; 75 percent re... sponded that local registration was re... quired to practice. But most of the coun... tries will allow unregistered architects to... practice in a joint venture with a local ar... chitect—or by hiring one. The panelists all... favored a local partner in any case.

Any surprises in the NCARB survey? "The Soviet Union does not require regis... tration and Austria won't let a non-native... practice even if he could get it." All of the... countries registered individuals, not firms. In Ontario, you must carry the Ontario As... sociation Insurance as well as your own... because the Ontario Association sells in... surance. What about registration reciproc... ity with Canada? "We expect to implement... new reciprocity in September 1991." Why... did England drop reciprocity with the... U.S.? "We changed our standards."

Balen talked about the importance of... recognizing local sensibilities. One point:... Appearing to take the money and run... breeds local resentment—especially in Af... rican countries where outside architects... are expected to not only provide architec... tural expertise, but fulfill a teaching role.

"There can be great expectations for our... small fees abroad," observed Cooke. "Quite often we don't have enough dia... logue with each other to know exactly... what it is that each one of us wants to get... out of a particular opportunity. That's... what misunderstandings are about any... where."

CHARLES K. HOYT

Next month in RECORD, the panelists will talk about getting the work done after you get the commission.

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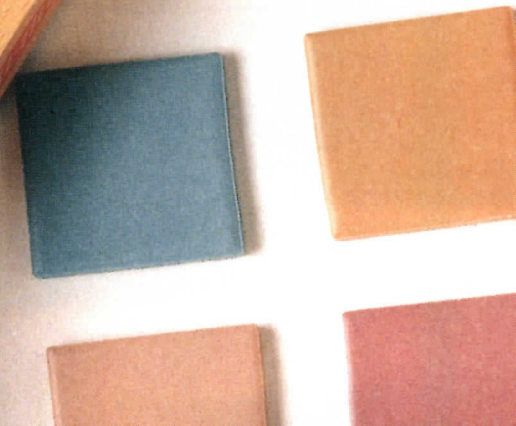
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A STITCH IN TIME

What to do when your financial statements look like these.

By Peter Piven

1987	Smith & Jones	1988	Smith & Jones	1989	Smith & Jones
Profit (Percent of net revenues)	12%	Profit (Percent of net revenues)	6%	Profit (loss) (Percent of net revenues)	(24%)
Payroll utilization (Direct project salaries divided by all salaries)	64%	Payroll utilization (Direct project salaries divided by all salaries)	57%	Payroll utilization (Direct project salaries divided by all salaries)	50%
Overhead ratio (Total indirect expenses divided by direct salaries)	1.6	Overhead ratio (Total indirect expenses divided by direct salaries)	1.8	Overhead ratio (Total indirect expenses divided by direct salaries)	2.3
Earned multiple (Net revenues divided by direct salaries)	3.0	Earned multiple (Net revenues divided by direct salaries)	3.0	Earned multiple (Net revenues divided by direct salaries)	2.7
Current ratio (Short-term assets divided by short-term liabilities)	1.7	Current ratio (Short-term assets divided by short-term liabilities)	1.5	Current ratio (Short-term assets divided by short-term liabilities)	1.1
Accounts receivable divided by accounts payable	1.7	Accounts receivable divided by accounts payable	1.3	Accounts receivable divided by accounts payable	.8
Equity divided by net revenue	.27	Equity divided by revenue	.20	Equity divided by net revenues	.13

Smith & Jones applies measures of firms' financial health to give early-warning signals of needed action. Had the hypothetical firm tracked their own progress, it could have headed off a difficult bind.

The common belief is that the profession is in a tailspin and everyone is going. Not so! Some firms continue to grow successfully. What can be learned from others that have not fared well? This is a composite of recent situations.

The ball starts rolling...

In 1987, Smith & Jones' revenues grew substantially and its profit (before interest distributions, and taxes) was 12 percent of net revenues. Its overhead was below the profession-wide mean and its earned multiple was respectable. It added money to produce increased work and borrowed money to finance growth; its interest expense was 1 percent of its revenue. Strong. Its clients included some of the area's largest developers and it began to incorporate and institutional work.

Rolls...

By 1988, Smith & Jones looked forward to continued growth. Backlog was strong and, in response, the firm did what was appropriate—reorganized to create a management level of department

directors and added CAD hardware, a CAD manager, architects, administrative, marketing, and clerical personnel. One consequence was that payroll utilization fell. While work and revenues increased 20 percent, expenses—including interest on substantial new borrowing—increased almost 30 percent, eroding profit.

... and rolls too far

At the beginning of 1989, the picture changed dramatically. The firm's developer clients stopped building. Revenues fell 50 percent. Although direct expenses had remained reasonably constant, indirect expenses had climbed to 73 percent of revenues. Operations had produced a 24-percent loss.

How it got that far

The fundamental problems:

- Firm-wide and project structures inappropriate to a needed downsizing.
- A focus on long-range marketing vs. short-range selling.
- Inattention to financial obligations.
- Inability to make timely decisions.

In this situation, a basic choice has to be made: to continue being motivated by goals that may not be achievable or become survival-driven.

The lessons to be learned:

1. Understand the pros and cons of specialization vs. diversification. Focusing the firm's efforts on a limited market yields beneficial results when that market sector is very active, but is disastrous when that market turns abruptly and/or severely.
2. Know what it costs to produce projects and run a firm. For any but the smallest, this means having a good management system and knowing what to look for yourself or finding someone who does.
3. Firms change for various reasons, including expansion and contraction. The organization, structure, process, roles, and responsibilities that are appropriate at one size may be inappropriate to another.
4. Act promptly to meet changing needs, if not in anticipation, then as soon as an emerging situation becomes clear. Economic cycles may be inevitable. So too will be your need to react to them. □

CONSTRUCTION COSTS UNDER PRESSURE

The construction downturn has its silver lining as new construction becomes more affordable.

Architects who send construction documents out for bids from contractors these days may be noticing that bids are a lot more reasonable. Contractors are more eager for work due to slack volume. (All construction had just slid 5 percent and housing 16 percent at the end of the second quarter of 1990, the period analyzed by this report.) And both contractors and material manufacturers are cutting their profit margins a lot closer. So whereas the number of projects being designed and built is down, costs are under pressure.

Costs in the second quarter did manage to rise, but just slightly on a national basis—0.11 percent. Curiously, an aberrational swing of upward pressures from the Eastern half of the U. S. to the Western half, noted in the last report [RECORD, October 1990, page 38], reversed itself in the second quarter as the Eastern U. S. resumed its traditional role of leader in cost increases, despite the depressed volume of construction in

SUMMARY OF BUILDING CONSTRUCTION COSTS

	Number metro areas	4/90 to 7/90	7/89 to 7/90	1977* to 7/90
Eastern U. S.				
Metro NY-NJ.....	18	0.24	1.59	2009.69
New England States.....	33	0.13	0.43	1858.14
Northeastern and				
North Central States.....	120	0.22	0.97	1767.73
Southeastern States.....	106	0.12	0.32	1824.61
Average Eastern U. S.	277	0.17	0.70	1815.99
Western U. S.				
Mississippi River and				
West Central States.....	122	0.03	0.50	1715.20
Pacific Coast and Rocky				
Mountain States.....	106	0.03	0.71	1823.90
Average Western U. S.	228	0.03	0.60	1765.73
United States Average	505	0.11	0.65	1793.30

*Using only cities with base year of 1977

the Northeast (down 24 percent), disappointing returns in the Southeast (down 15 percent), and the relative health of construction in the West, which held steady.

As usual lately, labor the cause of the rises that occur. All materials held steady or declined. The biggest loser Structural steel was down 10 percent and concrete was down some 3/4 percent.

What of the future? How volume (which constituted more than half of all construction) declined a further 20 percent in the third quarter. It is expected to stabilize in the fourth but nonresidential construction is expected to decline another 10 percent [RECORD, November 1990, pages 33-43]. We will see costs come down as they did in last quarter of 1990 before they go up again.

A good number of individual cities are already exhibiting this trend—including Dallas, Baltimore, Birmingham, Dallas, Los Angeles, Minneapolis, Philadelphia, Pittsburgh, and St. Louis.

CHARLES K.

Data supplied by Dodge Cost Systems Marshall + Swift

Metropolitan area	Average of all Nonresidential Building Types, 21 Cities										1977 average for each city = 1000.			
	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990			
											1st	2nd	3rd	4th
Atlanta	2098.6	2078.0	2360.6	2456.7	2448.7	2518.3	2561.9	2580.9	2697.3	2740.4	2726.7	2719.5		
Baltimore	1446.5	1544.9	1639.5	1689.7	1703.7	1743.8	1765.2	1780.2	1849.1	1886.8	1900.6	1894.6		
Birmingham	1407.2	1469.9	1468.1	1535.7	1594.7	1565.7	1587.4	1542.6	1612.5	1643.0	1647.1	1639.3		
Boston	1283.7	1432.5	1502.0	1569.9	1646.0	1721.0	1773.6	1883.0	1921.6	1917.2	1939.9	1941.3		
Chicago	1323.6	1344.7	1425.8	1439.5	1476.7	1528.0	1599.9	1591.4	1636.5	1672.8	1680.1	1688.3		
Cincinnati	1385.2	1350.4	1362.6	1430.8	1484.5	1486.6	1499.4	1510.9	1526.8	1560.7	1563.6	1570.3		
Cleveland	1388.2	1459.5	1511.4	1475.9	1464.0	1474.1	1525.7	1541.8	1550.7	1556.3	1559.7	1550.7		
Dallas	1481.9	1750.6	1834.3	1925.9	1958.0	1963.3	1973.9	1947.2	1927.2	1877.3	1889.3	1868.6		
Denver	1487.4	1632.2	1679.1	1800.1	1824.3	1821.8	1795.8	1732.7	1725.3	1725.9	1716.6	1692.3		
Detroit	1447.4	1580.3	1638.0	1672.1	1697.9	1692.6	1696.6	1689.3	1734.4	1751.2	1761.2	1766.4		
Kansas City	1233.2	1323.4	1381.8	1407.5	1447.1	1472.5	1484.7	1493.7	1505.6	1518.8	1526.4	1526.1		
Los Angeles	1387.5	1474.3	1503.3	1523.9	1555.1	1571.0	1609.7	1675.1	1789.5	1813.7	1831.5	1819.1		
Miami	1380.6	1369.1	1392.1	1467.6	1522.2	1540.6	1566.2	1589.2	1625.2	1641.3	1641.3	1640.4		
Minneapolis	1327.7	1442.6	1576.8	1624.6	1640.4	1661.0	1674.0	1677.0	1690.6	1712.5	1728.0	1706.4		
New Orleans	1505.7	1572.7	1616.9	1650.5	1691.4	1762.5	1760.2	1699.8	1707.3	1685.0	1707.7	1711.6		
New York	1319.4	1419.2	1491.8	1672.5	1747.2	1806.7	1899.9	1980.9	2065.3	2157.2	2148.4	2148.4		
Philadelphia	1539.5	1660.7	1769.4	1819.5	1922.1	1967.9	1992.7	2023.5	2171.4	2244.3	2290.7	2287.9		
Pittsburgh	1341.7	1493.2	1479.5	1497.2	1576.1	1611.0	1665.8	1647.3	1700.3	1721.3	1717.9	1713.4		
St. Louis	1320.0	1397.3	1451.2	1524.9	1625.5	1641.8	1647.4	1653.5	1705.7	1761.1	1759.8	1754.5		
San Francisco	1644.8	1776.4	1810.1	1856.8	1935.3	1961.8	1995.5	1992.0	2090.9	2114.3	2145.6	2155.7		
Seattle	1616.8	1814.9	1962.7	1979.0	1948.9	1937.9	1925.3	1874.7	1968.0	1987.0	1999.3	2012.8		

Costs in a given city for a certain period may be compared with costs in another period by dividing one index into the other; if the index for a city for one period (200.) divided by the index for a second period (150.0) equals 133%, the costs in the one period are 33% higher than the costs in the other. Also, second period costs are 75% of those in the first period divided by 200.0 = 75%) or they are 25% lower in the second period.

HITTING THE CEILING: HEIGHT WITHOUT ROMANCE

Critic Robert Campbell reconsiders the tall building and its place in American life and lore.

ight caps for buildings are all the age today. Yet I'm old enough to er a time when tall buildings were major thrill. A coming-of-age ritual and my siblings was a trip to New and I've never forgotten going to o of the RCA Building at night to ut, like a flabbergasted explorer Mars, over the unbelievable million of the great city.

ers were as wonderful then, to a kid he provinces, as Disneyland is to-'s impossible to imagine any red-American city back in, say, the egislating a height cap (always ex- the unique case of Washington).

buildings scraped God's own sky. vere expressions of everything dy- ebullient, Utopian, everything can, for heaven's sake. Tower after like so many Jack Dempseys or Joe s, sought and won the title of 's tallest building." America's lead- tic, Lewis Mumford, though a hu- nevertheless called his *New York*- lumn "Skylines." Our leading et, Frank Lloyd Wright, wowed the with his Mile High Skyscraper pro- for Chicago. Tourists (like me) to the top of the Empire State g and the other legendary giants.

y, 40 years later, the biggest tourist on in my own city of Boston is not a heric tower but a basement tavern oric neighborhood, one that has re- itself "Cheers" after a TV sitcom. mobbed is a crowded festival mar- e that first was built in 1826. Some- as changed.

e looking at a major symbol shift. ver was vertical, silent, lonely, and ; and it pointed toward the future. he architectural equivalent of tall ooper or the Lone Ranger, stalking at American plain. The tavern and lace in Boston, by contrast, are al, noisy, social, matter-of-fact, nk with the past. They are precisely by, confused, culture-bound com- that Cooper and the Lone Ranger disdained.

e it's in the context of cultural that we can best understand what ning to tall buildings. They appear ing out of fashion. Height itself is

now controversial. Proposals for Port America outside Washington and Colum- bus Circle in New York City were widely hated on the basis of height alone. When developer Donald Trump proposed yet another World's Tallest Building for a New York site five years ago, he was regarded not as a Utopian dreamer, like Wright, but merely as a pretentious boor.

Last year the city of Seattle, by popular initiative, cut the base height (before bon- uses) of buildings in its retail core from

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Yesterday's icon: the Empire State Building (top) stands aloof. Today's Houston: "the Oz view" (above) shows a cluster of towers on the plain.

240 to 85 feet. Boston, Portland, San Fran- cisco, and many others are finding less drastic ways to lower the skyline.

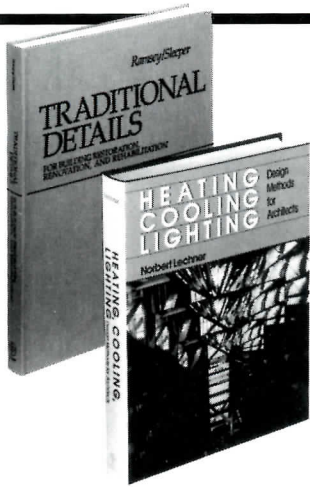
Or take the case of Washington. That city's famous rule—that nothing can be taller than the base of the cupola atop the Capitol dome—is ever more influential because it has succeeded in controlling the scale of new development. Washington doesn't possess much remarkable architec- ture, but it does possess something more important: sunny, well-scaled, well-defined street space. It's worth remembering that Paris, so famed for its beauty, doesn't have a lot of remarkable architecture ei- ther. Like Washington, it's largely the product of architects filling up zoning en- velopes to create streetscapes in which the interest is concentrated not at the skyline but along the sidewalk. My one-time em- ployer, the AIA Gold Medalist Josep Lluís Sert, accurately described Paris as "ele- phants and parrots"—a city where a typi- cal street frontage resembles a circus pa- rade of gray elephants (the buildings) and bright parrots (the shops and cafés with their awnings and bustle of people). Like Washington, Paris is a horizontal city.

Not to exaggerate: every city isn't out to kill the tower. Most American cities, espe- cially those in the South and Southwest, still permit heights governed only "by the market and the FAA," (to quote Beth Dun- lop, *Miami Herald* architecture critic and RECORD correspondent). Philadelphia re- cently abandoned an informal "gentle- men's agreement" restricting building



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This unique book collects in one source all the information designers need when creating the schematic design for a building's environmental systems. Providing a qualitative outlook, general theory, concepts and rules of thumb, the book shows architects how to have a major effect on the energy efficiency of buildings. Numerous graphs, photographs and sketches enhance the text.

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Mark C. Zweig
This practical, how-to book describes the fundamental aspects of human resource management for architects, landscape architects, interior designers and other design professionals. Contains a logical sequence of chapters ranging from the hiring process, orientation and career development to performance appraisals, compensation and law.

350 pp. (March 1991) 1-633740-7
\$49.95

FURNITURE: MODERN AND POSTMODERN, 2nd Edition

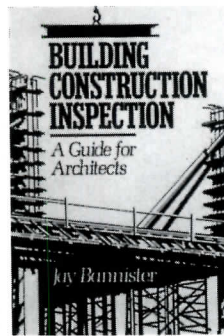
John Pile
Reflecting the recent resurgence in popularity of modern and postmodern furniture design, this book presents an integrated, up-to-date overview of the history, aesthetics, and techniques involved in the design and production of contemporary furniture. This revised edition focuses on new furniture products, the rise of new architecture and design firms and the future of the industry. Extensively illustrated.

312 pp. (1990) 1-85438-7 \$49.95

BUILDING CONSTRUCTION INSPECTION: A Guide for Architects

Jay Bannister
This practical guidebook to site inspection for architects and other building professionals reflects the author's 27 years of personal experience. Includes a series of detailed "memory jogger" checklists to help the reader review the various stages of on-site construction. Over 100 illustrations, drawings and photographs.

425 pp. (April 1991) 1-53004-2
\$45.95



UNDERSTANDING INFRASTRUCTURE: A Guide for Architects and Planners

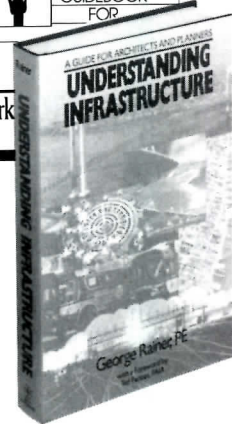
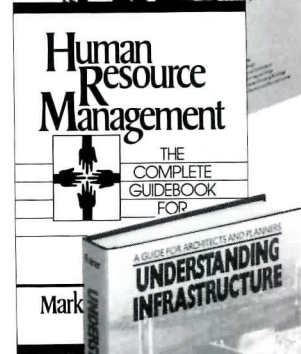
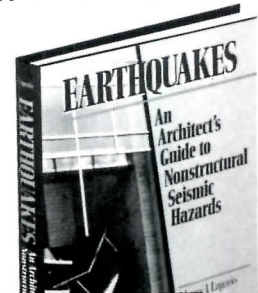
George Rainer
This unique work introduces architects and planners to the essential principles and concerns in every infrastructure area, including sewers, storm drainage, solid and hazardous waste disposal, bridges, streets, rail and waterfront. Each chapter is broken down into seven sub-areas: system description, components and current status, unique problems, solution including retrofit and innovation, applicable government regulations, legal aspects and costs.

278 pp. (1990) 1-50546-3 \$39.95

NEW CONSTRUCTION FOR OLDER BUILDINGS: A Design Sourcebook for Architects and Preservationists

Peter H. Smeallie & Peter H. Smith
Offering practical solutions to real-world situations, this timely, fully illustrated work focuses on the frequently faced challenge of contextual architectural design: the combination of new, old, and recent architecture. Projects of varying sizes and success—most from the 1980's—are employed to illustrate innovative and imaginative approaches and solutions to a host of contextual situations.

211 pp. (1990) 1-83134-4 \$54.95



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ht to the base of the statue of William
n atop City Hall. But even as it went
he Penn standard, the city also, in a
urban design plan by Robert Geddes,
ed the zone of tall buildings to a single
-west spine along a transit corridor.

y guess is that we're seeing only the
nning of the anti-tall-building move-
t. During the 1990s, it will join with a
ving environmentalist consciousness
ecome a commonplace concern of ur-
-planning. There are many reasons
the skyscraper is no longer the em-
ment of the American dream, and not
f them are obvious. I'd like to suggest
e: the rocket, the bomb, and the chip.

The rocket. It's hard to get excited
at the difference in height between the
ysler and the Empire State buildings
(feet, as it happens) in an era when
ets climb millions of miles into space.
ed, the rocket of today, standing at
n before take-off, is our equivalent of
pointed tower of the past. It too is si-
lonely, aspiring. Romance gathers
nd it. Compared to it, the static tall-
of buildings seems trivial.

The bomb. The arrival of the nuclear
b, with its promise of annihilation,
ged everything in ways we're only be-
ing to understand. Before the bomb, it
possible to believe in the future and in
lt of Progress in which everything
d be forever newer, bigger, faster,
taller. No one believes that today. So
skyscraper, architectural symbol of
rth and progress, feels suddenly hol-
In place of a belief in progress, we
stitute a belief in historic preserva-
—an unconscious response, perhaps,
e nuclear threat of the ultimate demo-
of all history. In the great era of the
craper, the Golden Age was in the fu-
something to aspire toward; now the
en Age is in the past, something we
o hang on to.

The chip. Every era has its essential
ool. Ours is a mysterious black box
aining an array of miniaturized silicon
s. We are perhaps the first period in
ry to possess for our symbol some-
g so close to invisibility: a black hole
ead of a bright star.

r all these reasons the tall building, as
architectural program, has become
othing less than a thrill. As the local
paper critic in Boston, I found I
n't get up the energy to review the
atest towers here by architects Kohn
rsen Fox. Both are excellent by the
ards of the recent past. They support
ctive pedestrian street life, they pos-
sible entrances and handsome lob-
and they look interesting enough to
rd at least momentary attention. But
e are qualities we should take for
ed, as basics of urban design. Beyond
the buildings offer little except two
ways to sculpt and ornament an office

tower. One is roundish, the other squarish.
One is finished in an Otto-Wagnerish pseu-
do-industrial manner with what look like
exposed bolts, and the other is a frosted,
wedding-cake, Beaux Arts kind of concoction.
Yawn. The last tall building to excite
me as architectural sculpture was the
First Interstate Bank (formerly Allied
Bank) in Dallas by Henry Cobb of Pei
Cobb Freed and Partners, and I suspect
that Cobb's masterpiece may prove to be
the end of a road. How many new shapes
and surfaces, after all, can there be? Why
even bother to seek individual expression
in a building type that, in principle, is noth-
ing but a repetitive vertical filing cabinet
for paper and people? Shouldn't that kind
of expression be devoted to buildings of
greater civic significance?

Architects who design skyscrapers are
nervous. They sense the loss of public in-
terest in the type. They've been respond-
ing in at least three ways.

One way, the Way of Kitsch, is to copy
the beloved skyscrapers of old in the hope
of trading on fond memories. Good exam-
ples are prominent new towers in Atlanta
by Philip Johnson and John Burgee (IBM),
in Minneapolis by Cesar Pelli (Norwest
Center), and in New York by David Childs
of SOM (WorldWide Plaza). All imitate the
towers of the '20s with understanding and
success. But all have the inevitable shall-
owness of knock-offs.

An opposite approach is the Way of Now,
the attempt to make the skyscraper seem
fresh. You can take your tower, for exam-
ple, to the haberdashery shop to try on a
new suit of Deconstructivist clothes, as
Burgess and Johnson did in their revised
proposals for Times Square.

Still a third approach is the
Way of the Wink, the sly mock-
ery of the whole concept of the
contemporary skyscraper. The
versatile Burgee and Johnson
once again head the class here,
with buildings in Denver and
Boston that appear to be sur-
faced with patterned wallpaper
that has been cut out with
scissors and wrapped tightly
around a steel frame. Since
wrapping a frame with a skin
is, in fact, the way we do build
today—let's face it, our sky-
scrapers are tall tents—these
examples have the virtue of
some ironic bite. But jokiness
is seldom a lasting virtue in
architecture.

The Way of Kitsch, the Way
of Now, the Way of the Wink:
none of them is going to re-
store the old thrill. Perhaps we
should admit that the tall build-
ing, at least as a myth, is hope-
lessly time-bound. It is a relic
of the American frontier.

American literature and art, especially
in the 19th century, repeat constantly a
single image, one of people looking across
great empty spaces, often westward, at a
tall object on the horizon—a mesa, a ship,
a mountain. That image is an icon of our
culture, and the skyscraper is a late ver-
sion of it. Crossing the desert or the plain
today by car, and seeing for the first time
the towers of Dallas or Denver rising in
the distance, we gain a pale taste of what
it must have been like to be a pioneer and
suddenly view, after weeks of travel, the
great range of the Rockies. David Dillon,
the architecture critic of the Dallas *Morn-
ing News*, is a native Easterner who has
come to love the office parks of suburban
Dallas by learning to see them in this way:
as surrogates for landscape forms, as
man-made mesas, as something essentially
of the frontier.

But skylines of the great frontier cities
are more than metaphors for landscape.
They are also metaphors for civilization.
Seen from afar, those Dallas or Denver or
Houston towers stand upright in a cluster,
like a sociable group of human figures
around a campfire, or perhaps like a circle
of wagons drawn tight against the danger
and emptiness of the surrounding land.
The towers are surrogates for ourselves,
writ large enough to matter in a North
American landscape. And in an example
like Houston, the towers all make a point
of looking as different from one another
as possible. This is an American society,
after all, a place of free individuals stand-
ing tall, jostling one another—not a Euro-
pean place of settled rules and institutions.

Continued on page 57

Drawn for ARCHITECTURAL RECORD
by Sidney Harris.



*"What I was hoping for was a 27-story glass
slab office tower that would say more than just
27-story glass slab office tower."*

EASTERN EUROPE...

Continued from page 31

the economics of working in the Eastern bloc—that is, how do you get paid? Payment in U.S. currency would be ideal, he says.

Legal matters can also be complex. Birkerts says attorneys handle them for him while he focuses on design. However, he admits: "We are not clear about all the legal aspects of projects because [American practice there] has not been tried out before." Contracts are written in Latvian and English.

How does Birkerts operate a project so far away? He finds that sheer distance between Latvia and Michigan hampers communication. Mail moves slowly, long-distance telephone service is poor, and fax machines are unavailable over there. He sometimes relies on "messengers"—people who regularly travel from the U.S. to Riga or visit the Soviet Union and return to the U.S.—to speed the flow of correspondence between the two countries by taking and bringing back documents with them.

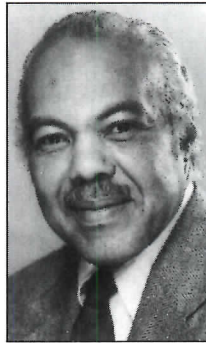
Language can be a barrier too, especially since Birkerts is the only one in his firm who speaks Latvian. While fluent in his native language, Birkerts sometimes has a struggle to explain technical subjects.

It is important for architects to understand the history and culture of the country they want to work in, Birkerts says. "You have to have a certain compassion for the country you build in." He sums up his experience working abroad: "The design process is the same wherever you build except the ingredients change. So you have to be very aware of the ingredients from the other side."

SUSAN R. BLEZNICK

Max Bond Joins Davis Brody

After 21 years as head of his own firm, Bond Ryder Wilson, J. Max Bond Jr. becomes a partner at Davis Brody & Associates of New York. Eight other architects from Bond Ryder have joined Davis Brody; the merger took place at the invitation of Lewis Davis following the retirement of Donald Ryder earlier this year. Bond remains dean of architecture at City University of New York.



□ Bond

The Domestic Architecture of Sir Edwin Lutyens, by A. S. G. Butler. Suffolk, England: Antique Collectors' Club, 1990, 297 pages, \$125.

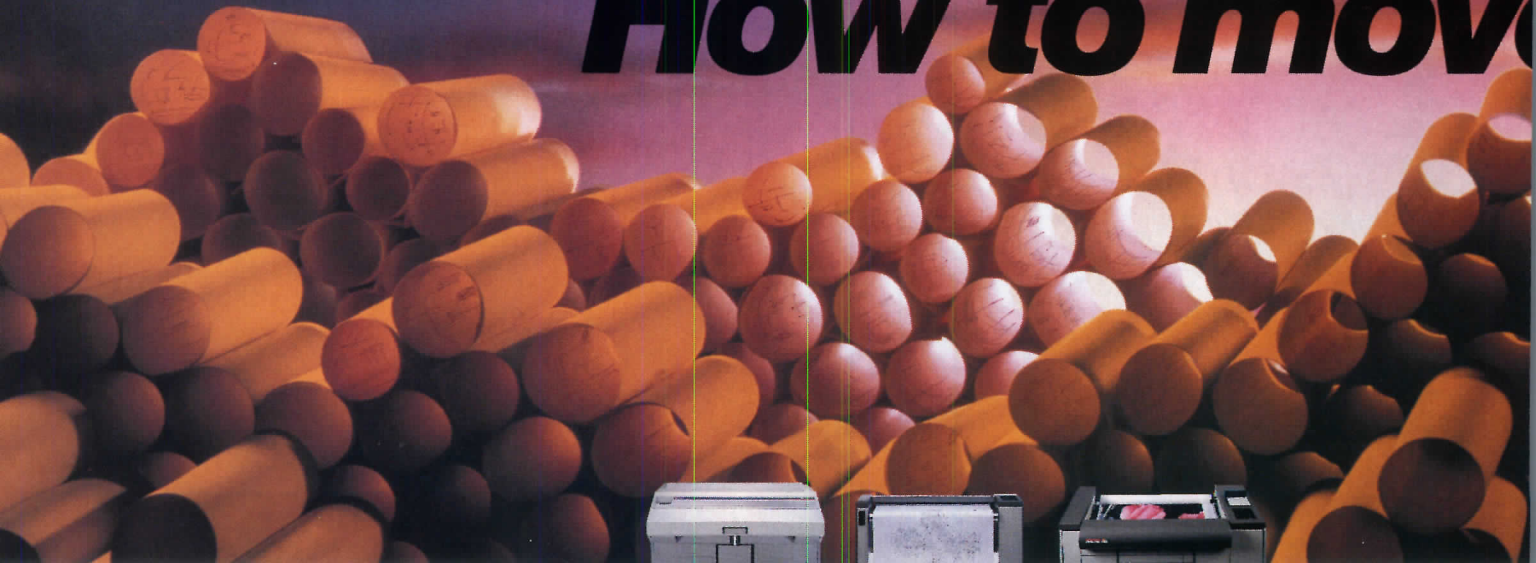
This impressive large-format book is a print of a three-volume set published in *Country Life* in 1950 (six years after Lutyens's death). The other two volumes covered the British architect's corporate and public buildings and have also been printed recently by the Antique Collectors' Club. All three volumes feature plans, elevations, sections, and detail drawings to convey Lutyens's great eye for composition and detail. Nearly 300 black-and-white photographs and five chapters of text help complete the story of Lutyens's domestic architecture.

Palladio Drawings, by Lionello Puppi. New York: Rizzoli, 1990, 108 pages, \$95.

Another large-format book, this publication displays 50 recently restored drawings and studies by Palladio that now reside in the City Museum of Vicenza. The drawings are mostly idealized reconstructions of ancient buildings and a few of Palladio's own projects. Historical notes on each drawing will please scholars, while the drawings themselves speak directly to architects.

Michael Graves: Buildings and Projects 1982-1989, edited by Karen Vogel N...

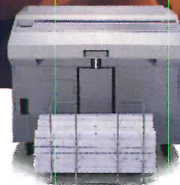
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Patrick J. Burke, and Caroline Han-
c. New York: Princeton Architectural
ss, 1990, 352 pages, \$49.95.

n the Humana Building in Louisville to
Bloomington's shopping bag, from
much-acclaimed Clos Pegase Winery in
Napa Valley to the passed-over plans
the Federal Triangle in Washington,
book runs the Gravesian gamut. Es-
s by Christian Norberg-Schulz and
ert Maxwell help put Graves's work in
pective, while texts accompanying
a project tend to give only the barest-
ones information.

nk Lloyd Wright Drawings, by Bruce
oks Pfeiffer. New York: Harry N.
ams, 1990, 304 pages, \$65.

ffer, the director of the Wright Ar-
es at the Frank Lloyd Wright Founda-
knows the architect's drawings better
anyone alive today. Organized into
sections, the book examines six build-
types (residential, religious, high-rise,
and cultural, hotels, and commercial
educational) and three other topics
Imperial Hotel, graphic and decorative
gns, and miscellaneous commissions).
n chapter begins with an introduction,
includes brief, but insightful, ana-
s of the drawings themselves. Rang-
from conceptual sketches to presenta-
drawings, the works still dazzle. □

HITTING THE CEILING. . .

Continued from page 55

Such symbolism is powerful. But it mat-
ters less with the passage of time, as the
Western cities grow more Eastern, adding
trees and suburbs and losing the raw
sense of encampments on the frontier.

Houston reminds us of another charac-
teristic of tall buildings. They are graphic
representations of the power structure.
Male culture is dominated by the concept
of hierarchy, as anyone who has ever sat
through a weekend of football on televi-
sion can attest. Throughout European and
American history, whoever has been on
top of the hierarchy has signified the fact
by building the tallest building. Succeed-
ing one another as boss have been the
Church (Chartres Cathedral), the king (Ed-
inburgh Castle), the oligarchy (San Gim-
ignano), the Republic (the U.S. Capitol),
and the Corporation (Sears Tower). The skyline
of an American city today is virtually a bar
graph of power and money in the business
community at a given moment.

Is it possible, then, that the current dis-
may over tall buildings is a revolt against
the whole value system of hierarchy itself?
I recently read a wonderful new book, *You
Just Don't Understand: Women and
Men in Conversation* (by Deborah Tan-
nen, William Morrow & Co.). It argues

that men and women communicate badly
because men view the world as a competi-
tive hierarchy, while women see it as a
community of mutual support. If that's
true—and I think it is—the concept of the
hierarchical city may be about to change.

Tall buildings undeniably have their vir-
tues. They can be an expression of fanta-
sy, like the glittering glass city that is
downtown Houston seen from afar, which
Houstonians aptly call "the Oz View" and
which recalls the magical "Invisible Cities"
of author Italo Calvino. They can assert
the presence of human civilization on a
barren land. They can express the physical
order of a city and even its history and ge-
ography, as does Boston's satisfying High
Spine above a historic transit corridor that
was also once the narrow neck of the origi-
nal Shawmut Peninsula.

My own view is that most American cit-
ies would be better off, for a host of rea-
sons, with a six- or eight-story height limit.
I'd quickly trade the aloof Emerald City of
Houston for a real downtown, jammed
with pedestrians enjoying access to every
conceivable human activity. I'd also trade
an office on the 80th floor of a silent tower
and its Berchtesgaden power vista for an
office that opened onto a private garden
with a few dozen restaurants in easy walk-
ing distance. □

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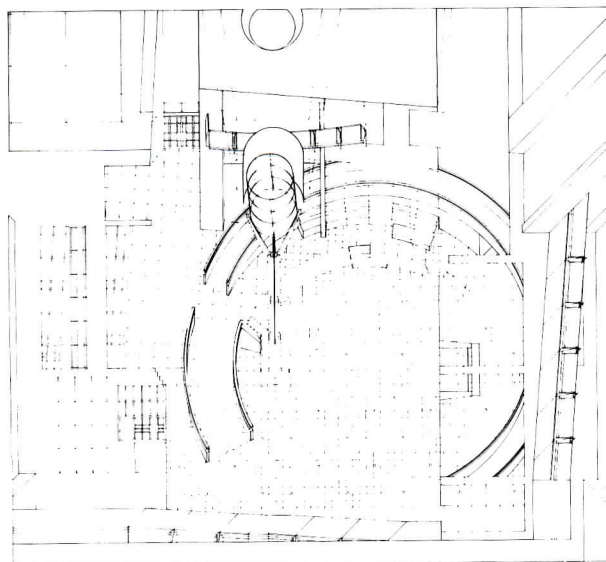
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In This Issue

RECORD's editors and correspondents traveled across the country—and in one case halfway around the world—to assemble the diverse group of projects featured on the following pages. For his review of I. M. Pei's Bank of China Tower (pages 76-83), Peter Blake journeyed to Hong Kong, where he found a building of truly international significance, blending extraordinary high-rise building technology with traditional Chinese bamboo symbolism.

A successful marriage of art and technology also characterizes featured buildings in this country. In Philadelphia, notes editor Margaret Gaskie, Geddes Brecher Qualls Cunningham's sleek expansion of the Franklin Institute both complements and completes its venerable predecessor (pages 62-67 and drawing below); in downtown Chicago, Perkins & Will has produced a state-of-the-art medical-research tower for Northwestern University that merges seamlessly with its Collegiate Gothic academic setting (pages 68-71); and in central Alabama, Valerio Associates' health and recreation center for Kimberly-Clark reconciles the opposing natures of a pine forest and a paper-manufacturing plant (pages 84-87). In our Building Types Study on schools (pages 91-105), editor Cliff Pearson reminds us that although new technology and the need for computer-equipped media centers are making public schools more complex, the time-honored lessons of community involvement and functional flexibility—along with old-fashioned concern for a child's small size—are still worth remembering. Three case studies that address these considerations are located in Florida and Indiana.

Not all of this month's featured projects were so far afield. To reach Philippe Starck's suave renovation of the Century Paramount Hotel (pages 72-75), editor Karen Stein simply had to leave RECORD's Rockefeller Center offices and walk five blocks south. The most original architecture, it seems, is sometimes right in our own backyard.



Futures Center, The Franklin Institute
Geddes Brecher Qualls Cunningham, Architects

The Benjamin Franklin whose four-times-lifesize seated figure gazes benignly on the rotunda of the Philadelphia science institute that bears his name (and usually on a swarm of children clambering around his white-marble feet) would delight in the building his image now introduces. Centered on a big lively atrium bright with light and crayon colors, the appropriately named Futures Center updates for a new century the hands-on science exhibits the Franklin Institute has pioneered. By expanding both space and content, it strengthens the original museum. And in resolving the sensitive issue of adding to a landmark, it also shows courtesy to the neighborhood around it.

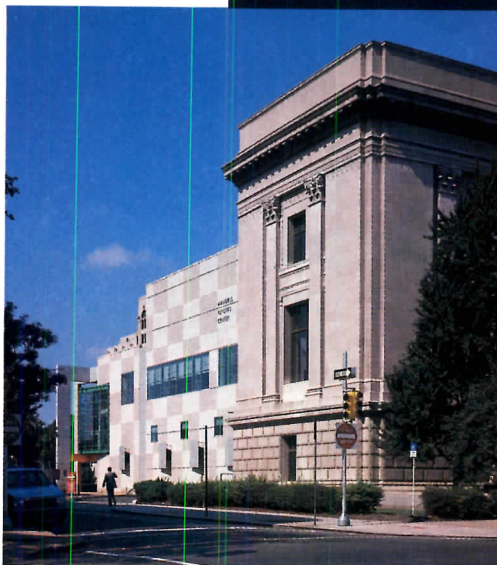
Designed in the late 1920s, the institute was conceived by architect John T. Windrim as a symmetrical full-block composition of galleries arranged in a hollow square around a grand exhibition hall. On the north its Beaux Arts facade edged a major thoroughfare, while the east-facing front, its colonnaded portal set atop a monumental flight of stairs, joined with the city's main library and art museum to frame the formal civic space of Logan Square. As the Depression took hold in the early '30s, however, and funding dried up, construction halted with the south and west wings and the great hall at the core of the Neoclassical scheme still unbuilt, reducing the museum to an L-shape rife with dead-end galleries—and reducing Franklin's rotunda, the imposing Memorial Hall, to a cul-de-sac.

The hiatus in development was shared by the area to the south and west, an enclave of small shops and houses on quiet narrow streets, where long years of benign neglect were broken only recently by a burst of spontaneous regeneration. The neighborhood's revival made local residents a force that the institute and architects Geddes Brecher Qualls Cunningham had to reckon with as they planned the museum's "completion."

The expansion had three goals. The first was to incorporate a number of complex (and unwieldy) new program elements—an Imax theater with a domed wraparound screen and steeply raked seating for 340 viewers, a smaller (150-seat) video-equipped lecture hall, and two galleries housing new futures-oriented permanent exhibits—as well as parking for 350 cars. The second was to integrate the new spaces with the old building. And a third rapidly emerged: to accomplish these aims with minimal impingement on the adjoining area.

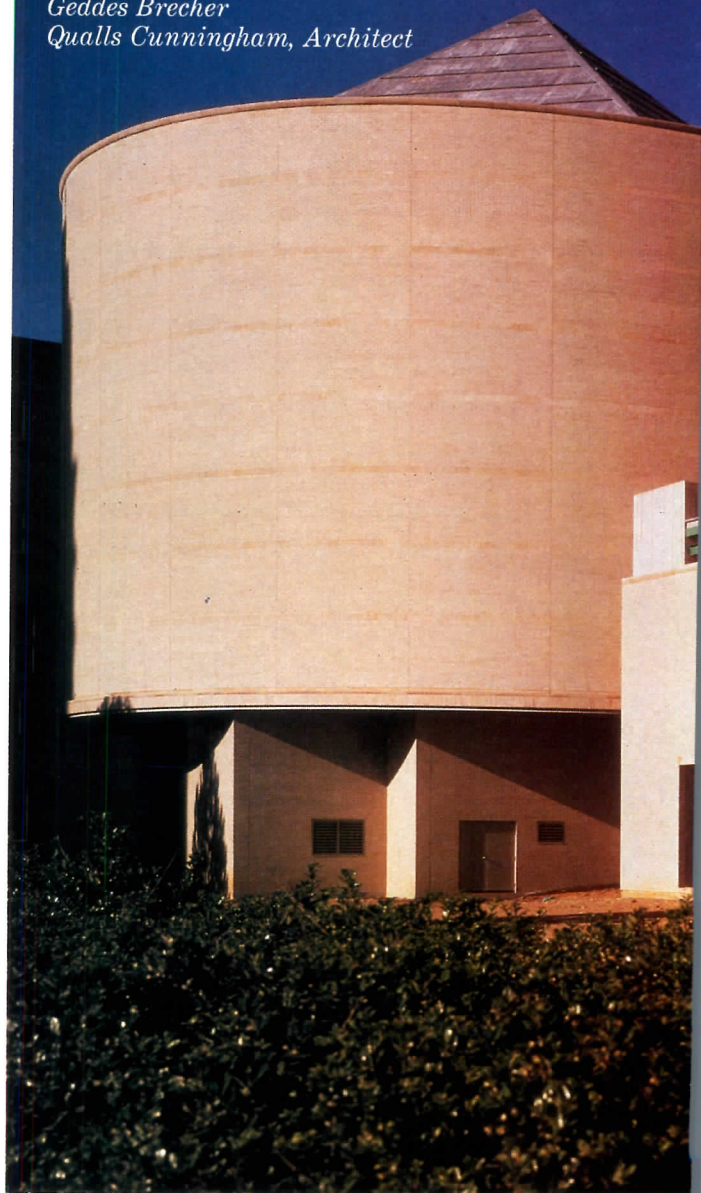
The urban issues raised by the community—concerns about both the sheer size of its neighbor-to-be (90,000 square feet plus parking) and the added volume of traffic it would attract—spurred the architects toward the taut and inventive scheme finally developed. Certainly these issues prompted the crucial decision not to pursue the original plan with its long institutional wings. Parking was not only placed underground but positioned to route museum visitors along the parkway and other well-traveled streets at the edge of the adjoining community. Over the garage, the addition's new spaces were stacked vertically and pulled away from the perimeter of the site, leaving space for a 38,000-square-foot science garden to act as a buffer landscape on south and west. Finally the building's major elements, augmented by bold exterior stair towers, were expressed as distinct volumes that break the larger mass into an assemblage of familiar forms—cube, cylinder, pyramid.

The exterior materials too are dominated by familiar limestone and gray brick that blends with both the older building and its immediate neighbors. (A subtle gray-on-gray grid plays on the 14-foot module of nearby house-lots.) Although the large window openings and thrusting components of brightly painted steel animate the sober backdrop, the addition's most striking accent



© TOM BERNARD

Futures Center
The Franklin Institute
Philadelphia, Pennsylvania
Geddes Brecher
Qualls Cunningham, Architect



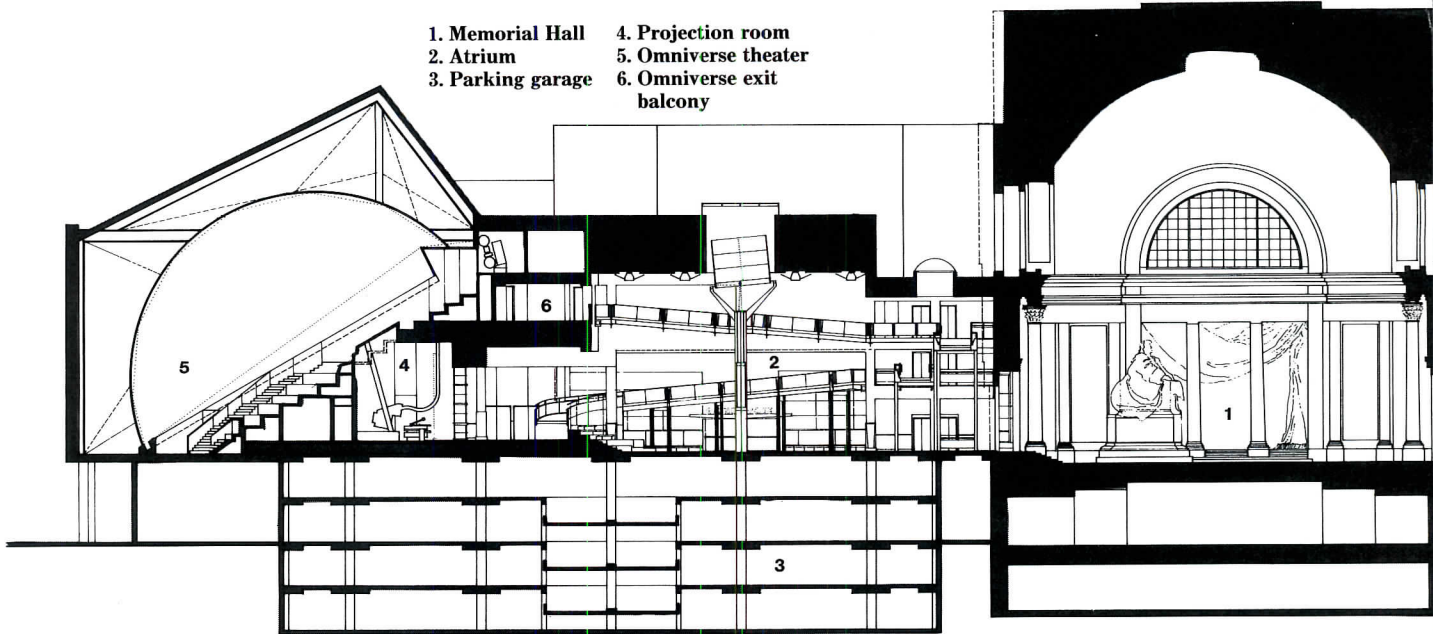
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Art for Science

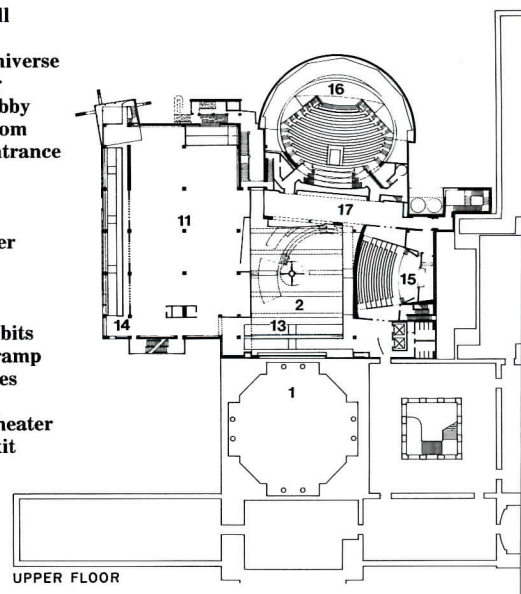
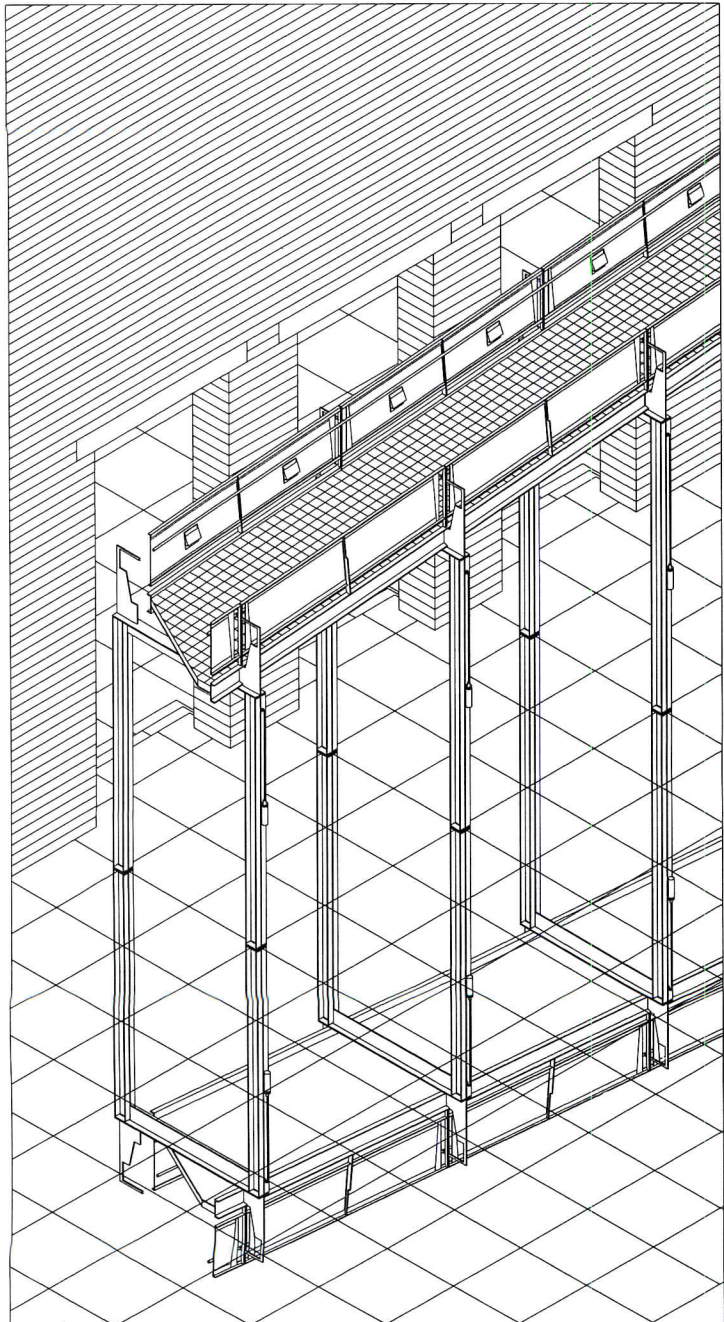
Though wholly different in style, the Franklin Institute's crisp new Futures Center both complements and completes its venerable predecessor.



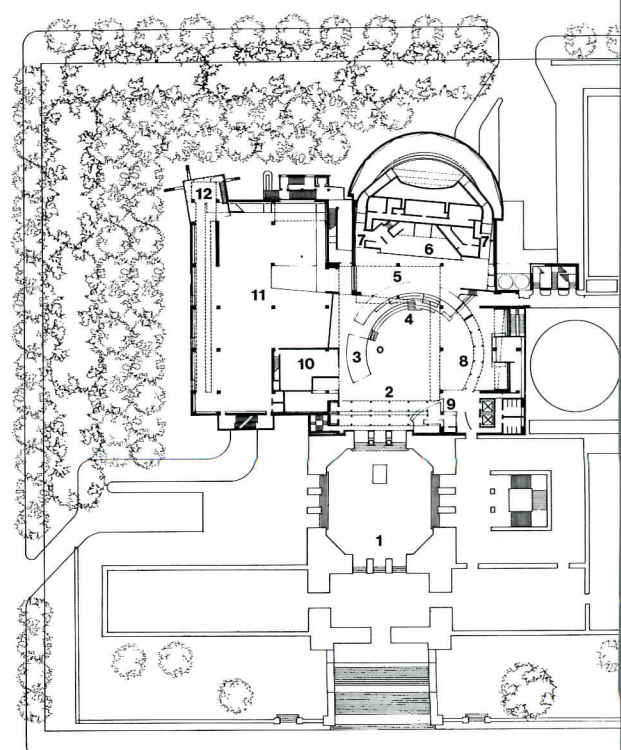
- 1. Memorial Hall
- 2. Atrium
- 3. Parking garage
- 4. Projection room
- 5. Omniverse theater
- 6. Omniverse exit balcony



- 1. Memorial Hall
- 2. Atrium
- 3. Ramp to Omniverse
- 4. Amphitheater
- 5. Omniverse lobby
- 6. Projection room
- 7. Omniverse entrance
- 8. Omni Café
- 9. Ticketing
- 10. Bookstore
- 11. Futures Center exhibits
- 12. Science Park overlook
- 13. Ramp to exhibits
- 14. Exhibit hall ramp
- 15. Future Choices Forum
- 16. Omniverse Theater
- 17. Omniverse exit balcony



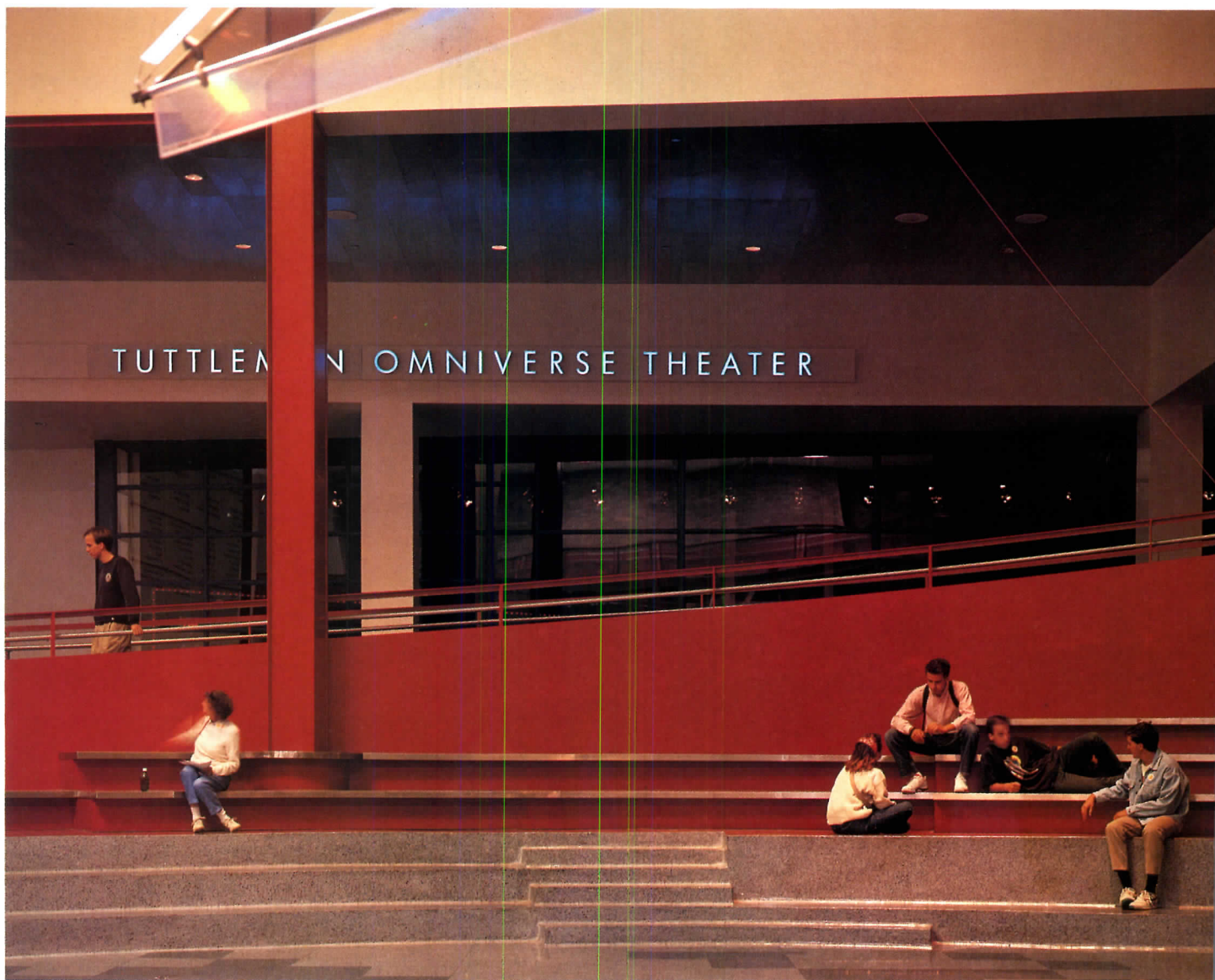
UPPER FLOOR



MAIN FLOOR

playfulness that makes
Futures Center's shell a
series of geometric forms
emanating in the pyramid-
shaped cylinder of the
OmniVerse Theater is also
evident in the atrium, where
space yields to such
bold materials as
concrete, glass and brightly
painted metal. The pivot of
the space is a 50-foot-high
column crowned by a light
fixture above a perforated-
metal sculpture known as
"the bucket." Around it
is a sweeping red ramp
(opposite left), the
building's key circulation
element, which connects all
leveling spaces save the
level exhibit galleries,
which are linked by an
independent internal ramp.





© TOM BERNARD

is the academic witticism of a transparent full-story corner “showcase” and garden overlook that follows the true compass, canting 9 1/2 degrees off the putative north-south orientation of the city’s street grid.

Despite the marked differences in style, however, the Futures Center honors the concept of its Beaux Arts predecessor by supplying the grand exhibit hall at its heart. Set into the angle formed by the original wings, the atrium serves as a circulation hub for the existing Science Museum as well as the addition’s special attractions. To one side of the open space, the crossing of the building’s original axes is commemorated with a vivid yellow steel column that flares to a stop just short of an overhead skylight. Around it winds a fire-engine-red spiral ramp (set at the correct pitch for wheelchair access) that lends cohesion to the huge space and imparts a sense of energy through the flow of visitors along its slope.

Although the atrium can be reached directly from the underground garage, the ceremonial passage is through Franklin’s rotunda. To one side lie the stacked permanent-exhibit galleries, which are linked by an internal ramp; on the other an open café (photo opposite) shelters beneath the second-level interactive lecture hall housing the Futures Forum. The Omniverse Theater on the opposite side of the atrium is reached by steps that form a miniature amphitheater (photo above) and a lobby where the glass-encased projection booth for the 70-mm reels itself becomes an exhibit. To smooth audience movement between film showings, viewers enter the theater from the ground floor but leave by way of an upper balcony that joins the ramp. Finally,

the atrium is a destination in its own right, a celebratory bridging past and future. Its public role is reinforced by admission that includes access to such special atrium-centered events as mime performances and science demonstrations well as the museum shop and café—and to matchless opportunities for people-watching.

MARGARET G

*Futures Center
The Franklin Institute
Philadelphia, Pennsylvania*

OWNER: *The Franklin Institute*

ARCHITECT: *Geddes Brecher Qualls Cunningham—Warr Cunningham, principal-in-charge; Michael Kihn, Robert Geddes, design principals; Charles Capaldi, James Row project architects; Thomas Buck, Adrienne Carruth, Maitland Jones, Daniel Russoniello, Kevin Scholl, Eric Sternfels, Brian Wait, Charles Berman, Nadia Breed, A Clark, Cecelia Denegre, Alejandro Firpi, Margaret Kampine, Charles Kelley, Gina Weckel, project team*

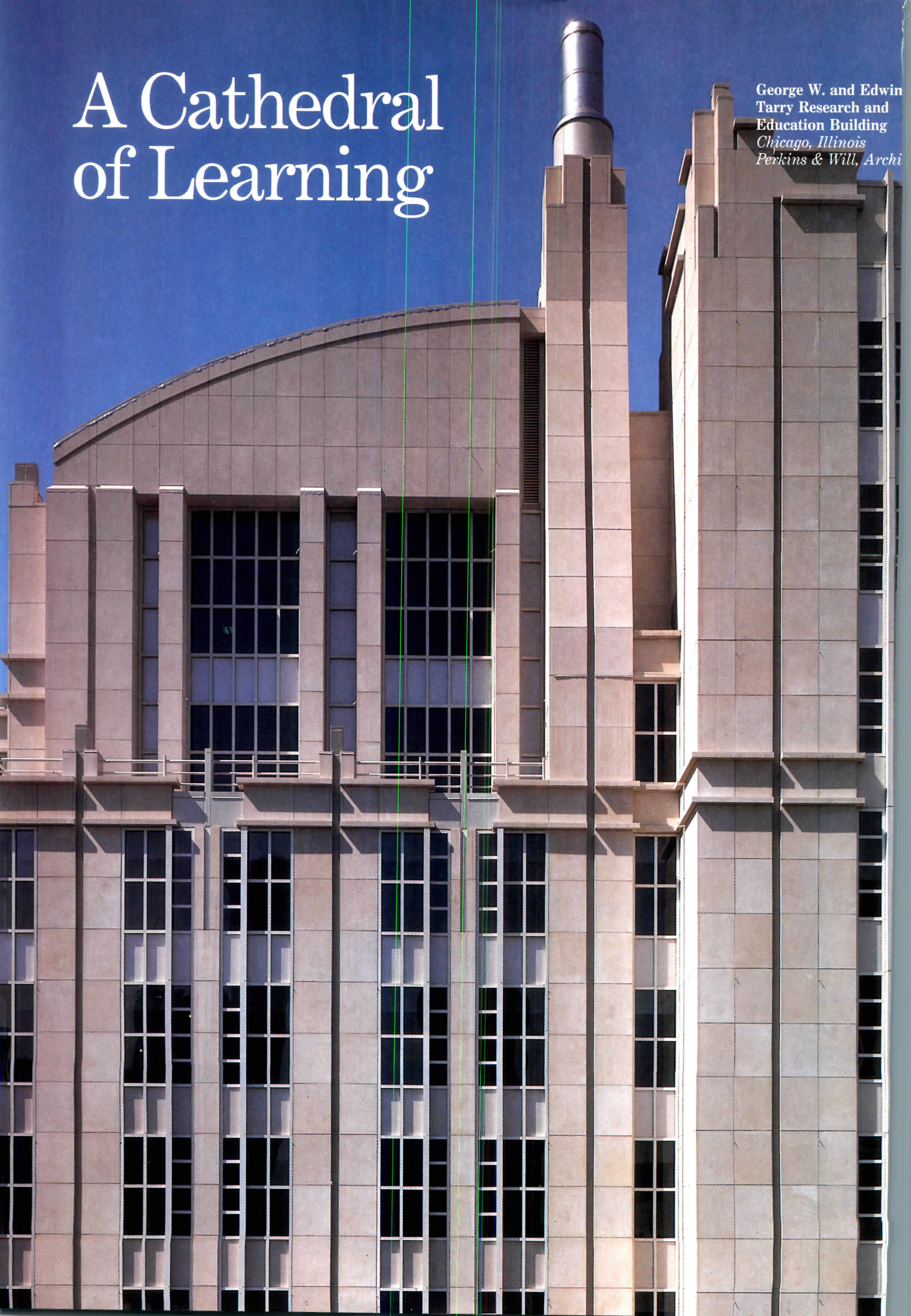
ENGINEERS: *Geddes Brecher Qualls Cunningham—E. F. Brecher, principal; Thomas Normile, Arun Parikh, project engineers (structural); Jaros, Baum & Bolles (mechanical)*
CONSULTANTS: *Hammel Green & Abrahamson, Architects (Omniverse Theater); W. Michael Sullivan (theater); Pu + Noppe + Associates (theater acoustics); Jerry Kugler Associates (lighting); Romano/Gatland (food service); S Milsom & Wilke (audio-visual and acoustics)*

CONSTRUCTION MANAGEMENT: *Barclay White, Inc.*



A Cathedral of Learning

George W. and Edwin
Tarry Research and
Education Building
Chicago, Illinois
Perkins & Will, Archi



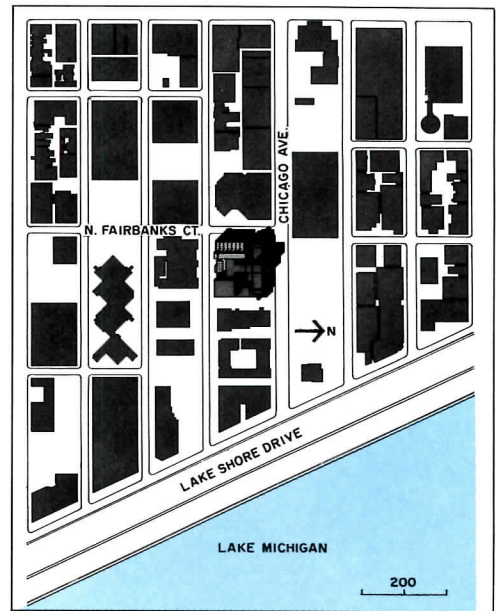
A successful marriage of art and technology,
Northwestern University's new medical-research tower merges
seamlessly with its Collegiate Gothic academic setting.

Whether it is viewed as completing the last empty corner of a dense urban block near Chicago's Lake Drive or as adding the final building to an academic quadrangle, the George W. Twina S. Tarry Research and Education Building is deeply engaged in a dialogue with its surroundings. Architects Skidmore, Peck, Kawano & Will chose to clad the 15-story, precast-concrete facility in a cloak of limestone that harmonizes with existing Collegiate Gothic buildings, erected mainly in the early 20th century that make up Northwestern University's downtown medical-school campus.

And being merely a handsome exurban urban contextualism, however, the building also addresses a difficult architectural agenda: to provide 280,000 square feet of flexible laboratory and teaching space, accommodate state-of-the-art mechanical systems, and provide convenient connections to existing academic departments in older buildings. Peter Will has responded with a clear design that wears its garb with assurance.

The modular laboratories designed after Louis I. Kahn's Richards Medical Research Building at the University of Pennsylvania have to measure up to the clarity that Kahn is known to bear on his design. On the other hand, Kahn has been faulted for subdividing the served lab space into tiny rooms, an arrangement that makes it difficult to expand an experiment and disrupts informal faculty interaction. Responding to these problems at the Salk Institute, Kahn used gigantic trussed mechanical floors to carry the mechanical systems and eliminate all subdivisions.

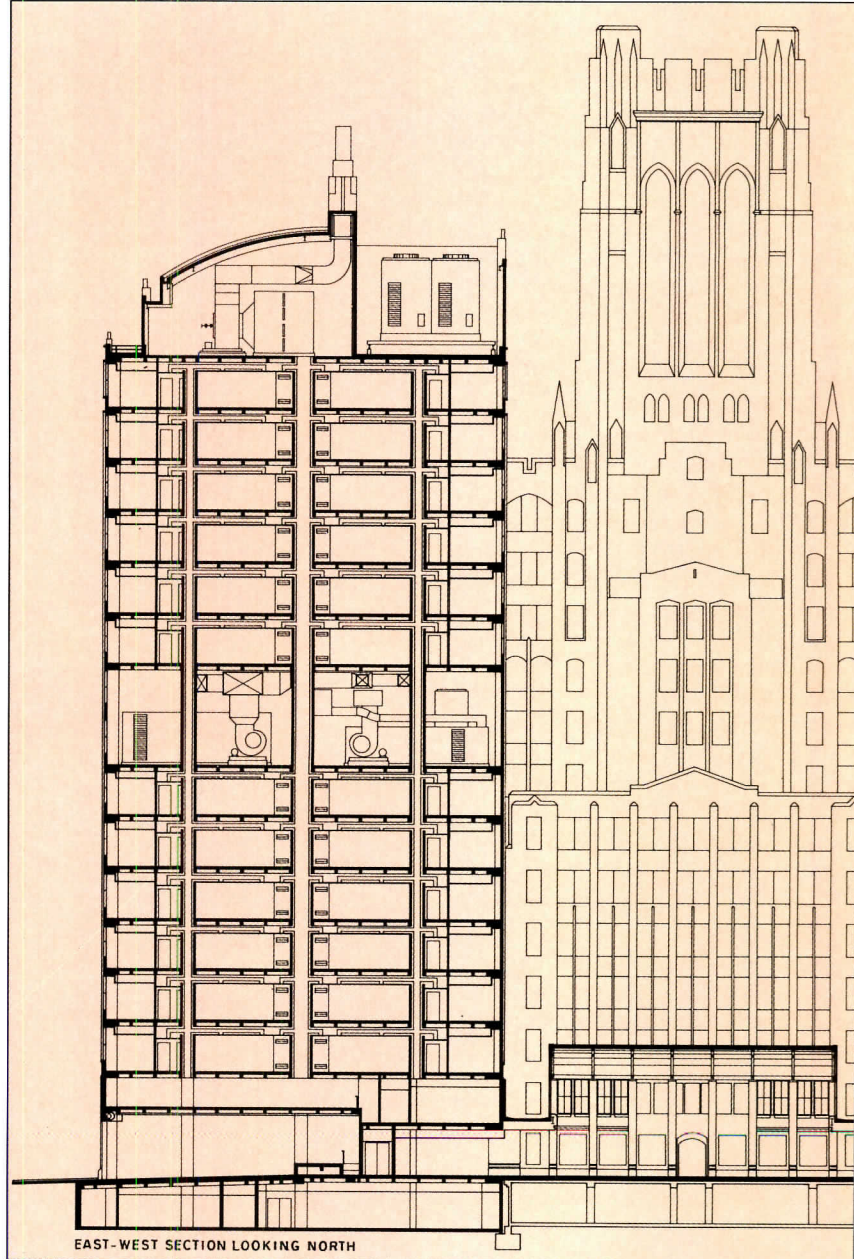
In the older Northwestern buildings, the use of a connecting departmental scheme makes an interstitial scheme impossible. To make up each new lab floor with the existing 12-foot floor-to-floor construction, the architects used most of the room needed for vertical ductwork, and forced the introduction of several vertical chases at the building's core. Modular laboratories are arranged around these mechanical shafts. Upper floors house teaching labs provided for classes of up to 180 students; lower stories accommodate research labs. Though individual labs are as small as 100 square feet, they are easily expandable to meet the requirements of research. The building's interrupted limestone piers, tall windows, and faculty offices ringing the labs, along with an expressed elevator core that steps outward toward the street all accentuate the building's verticality. Likewise the spire-



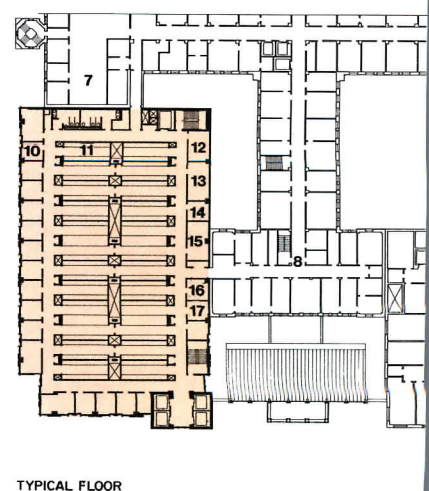
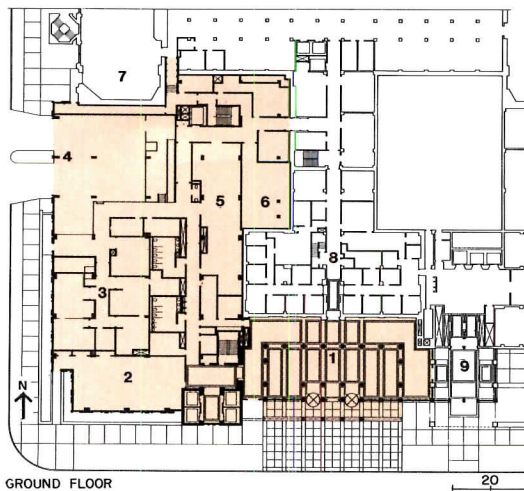
© GREGORY MURPHEY PHOTOS

Situated at the southwest corner of the Northwestern Medical School campus (site plan), the Tarry Building catches the sun and shadows with detailing reminiscent of adjoining neo-Gothic academic buildings (top left and opposite). Filtered exhaust ducts rising from limestone piers create spires on the Chicago skyline (above).

The Harold Method Atrium (below) serves as an entrance pavilion to Tarry and several older buildings. Its stone detailing echoes ornament found on existing campus buildings (bottom).

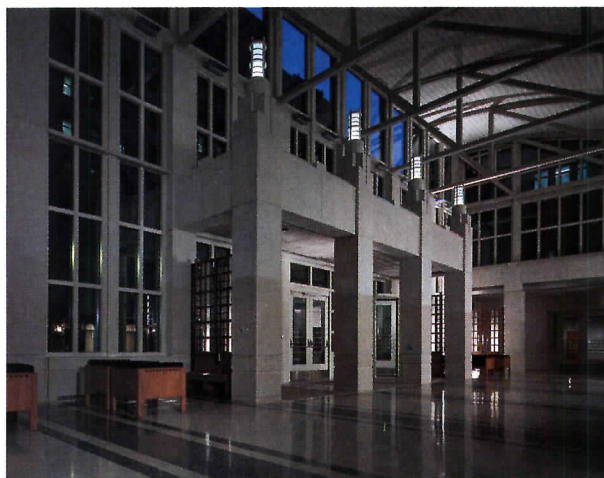


- | | |
|-----------------------------|----------------------|
| 1. Lobby | 10. Offices |
| 2. Seminar | 11. Laboratories |
| 3. Storage | 12. Equipment |
| 4. Loading | 13. Cold room |
| 5. Administration | 14. Electrical |
| 6. Mechanical | 15. Cell culture |
| 7. Existing Ward Building | 16. Glass wash |
| 8. Existing Morton Building | 17. Photo developing |
| 9. Existing Searle Building | |



exhaust stacks, which echo similar
 s on the adjacent Ward Building.
 e Tarry Building's ground-floor lobby
 ects the various neighboring buildings
 gives the entire quadrangle a much-
 ed front door. Atop the lobby, a
 ed half-vault presents a rakish profile
 e street. Inside, finely chiseled stone
 ling and wood paneling create an in-
 ing neo-Gothic contrast with the roof
 es, which reach up toward clerestory
 ows. Although a similar half-vault at
 uilding's crown at present houses gi-
 e exhaust fans, a faculty club is in-
 ed for part of this loftlike space.
 wo-story-high belt of clean-air supply
 rs is hidden midway up the building
 d limestone and aluminum curtain-
 detailing. Breaking the building into
 vertical zones fed from the middle
 the supply chases smaller, and al-
 d an entirely open educational labora-
 in the basement.
 e limestone blocks and painted alumi-
 extrusions of the building's skin are
 hung by stainless-steel clips from a
 porting grid of galvanized-steel an-
 —a system that has become the stan-
 for today's tall buildings. The ex-
 ordinary number of ledges and
 tations entailed in the neo-Gothic de-
 g, however, will surely test the high-
 sealants and weep channels that
 between Windy City weather outside
 the carefully controlled environment
 n.
ANDERS NEREIM

*George W. and Edwina S. Tarry
 Arch and Education Building
 Northwestern University
 Chicago, Illinois*
OWNER: Northwestern University
ARCHITECT AND ENGINEER: Perkins &
 Will—*Ralph E. Johnson, design
 principal; John E. Nunemaker,
 managing principal; James Tworek,
 project manager; Elizabeth Fakatselis,
 project designer; Robert Goldstead,
 senior technical coordinator; John
 Patsos, structural engineer;
 Kenji Kanazawa, mechanical/
 electrical engineer*
PREVIOUS DESIGNER: Perkins & Will—
*Frankel, design principal; Mark
 Frankel, project designer; Anita Ambriz,
 project designer*
CONSTRUCTION MANAGER: Schal
 Kammerdiener Associates



Soft daylighting through clerestory windows emphasizes the scale of trusses inside the Harold Method Atrium (above). Indirect fixtures provide nighttime illumination (left). Finely chiseled limestone detail and rich wood paneling and furniture give the room a grandeur that befits its function as a new front door to the Northwestern Medical School quadrangle.



In the lobby, a stucco and stone staircase is split in two by glass panels that act as a banister (above). On one side, the staircase is framed by a wall with hand-applied white-gold-leaf. The wall, which leans 17 degrees, is the dramatic

focus of Paul Marantz's lighting (previous page). Upstairs, Starck-designed chairs and tables fill a cozier mezzanine dining room (top). A typical guest room is shown opposite.

er long-running hit? He is leaving nothing to chance: v plotting his next venture on New York's Upper East S Schragger has temporarily moved into Paramount to make his carefully tuned extravaganza stays sharp. **KAREN D. S**

*Paramount Hotel
New York City*

OWNERS: Ian Schragger, Philip Pilevsky, Arthur Cohen
MANAGEMENT GROUP: Morgans Hotel Group—Michael Overington, project director; Anda Andrei, project manager

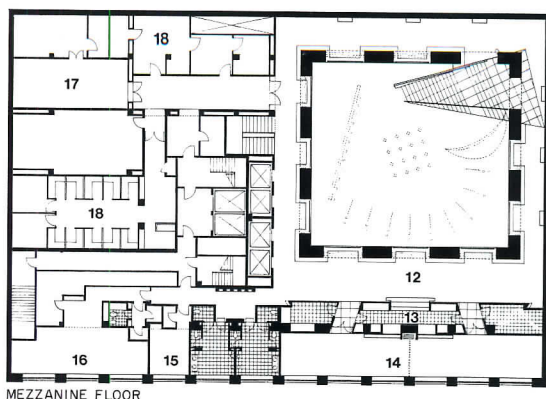
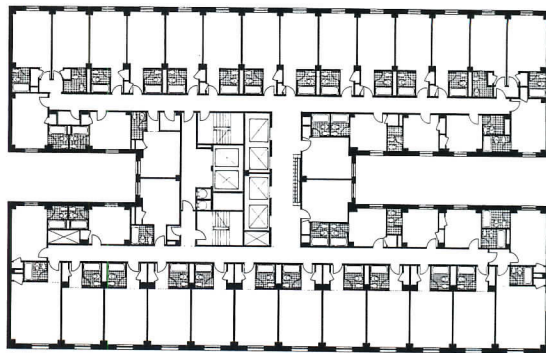
INTERIOR DESIGNER: Philippe Starck

ARCHITECTS: Haigh Space Architects (facade, lobby, mezzanine)—Paul Haigh, principal; Barbra Haigh, associate; Scott Weinkle, project architect; Nicolas Macri, Justin Bologna, team; Leitenberger/Bronfman Associates (guest rooms)—Gustavo Leitenberger, principal

ENGINEERS: Ambrosino DePinto & Schmieder—Dominick DePinto, principal (mechanical); Stanley H. Goldstein PC—Michael Guilfoyle, associate (structural)

CONSULTANTS: Jules Fisher & Paul Marantz, Inc. (lighting)—Paul Marantz, partner; Donald Kaufman (color); Tracy Turner (graphics); Pamela Durante, Helka Puc (F. F. & E)

CONSTRUCTION MANAGERS: Clark Construction Corp. (facade, lobby, mezzanine)—John Adir, Richard Dantes, project managers; Robert Werthamer, field supervisor; Morgans Hotel Group (guest rooms)—Nat Cusumano, project manager; Mark Robinson, assistant

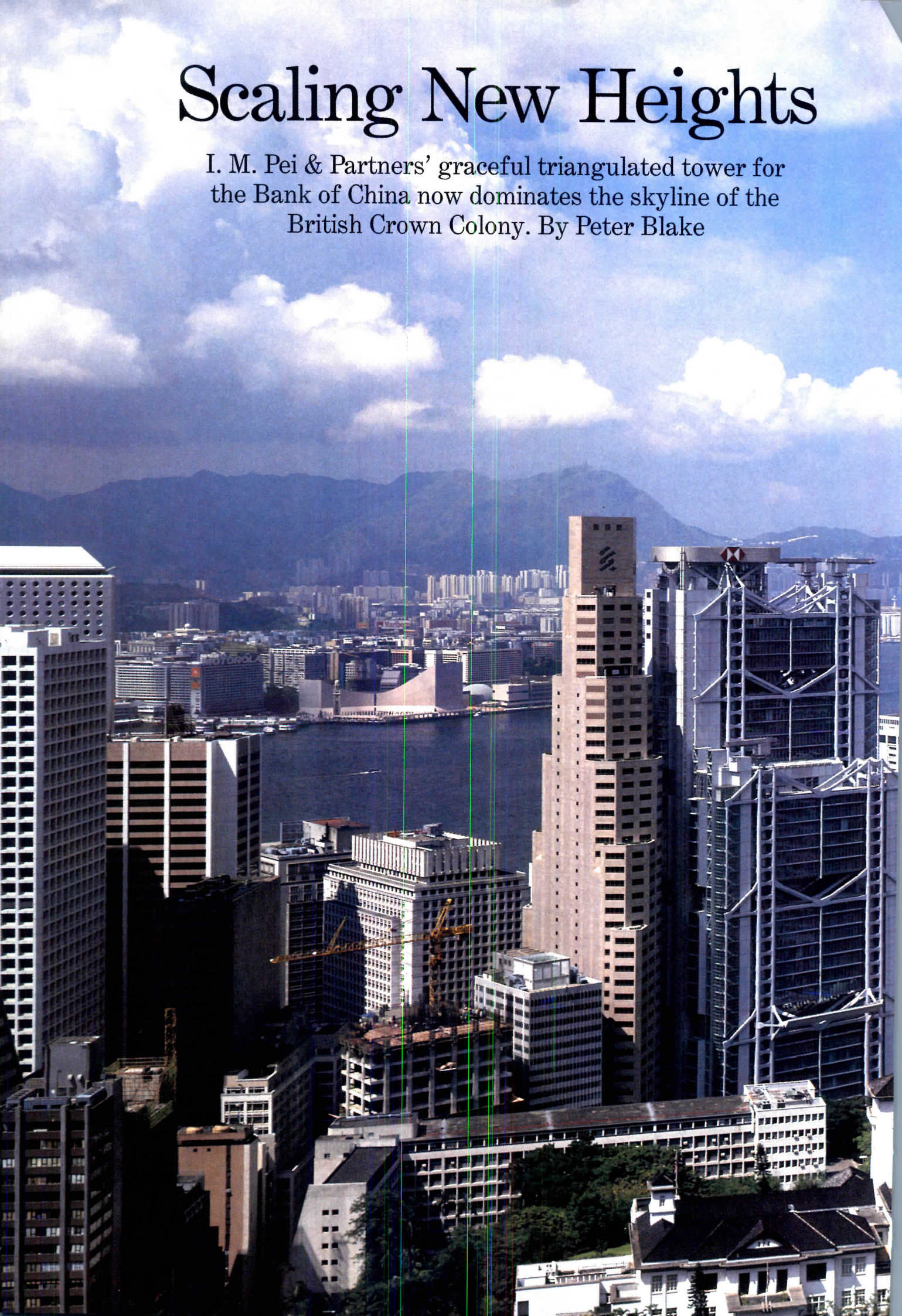


1. Hotel entrance
2. Lobby
3. Newsstand
4. Concierge desk
5. Front desk
6. Reservation office
7. Baggage storage
8. Food storage
9. Bar
10. Supper club
11. Restaurant
12. Mezzanine hotel dining room
13. Bar
14. Meeting room
15. Playroom
16. Gym
17. Movie theater
18. Office



Scaling New Heights

I. M. Pei & Partners' graceful triangulated tower for the Bank of China now dominates the skyline of the British Crown Colony. By Peter Blake



Bank of China Tower
Hong Kong
I. M. Pei & Partners, Architects



The new Bank of China Tower, designed by I. M. Pei & Partners and located in the center of Hong Kong, is a building of superlatives: at 70 stories, it is the tallest building in Asia and, as of this writing, the fifth loftiest in the world; it is probably the most innovative skyscraper structure built anywhere to date; and it is, in the view of many who have seen it (this writer included), the finest Modern skyscraper since Mies van der Rohe's Seagram Building was completed over 30 years ago.

Before discussing the Bank of China as a work of architecture and engineering, let me list some of its vital statistics. At 1,209 feet to the top of its aerial, it is the tallest skyscraper outside North America. It contains just over 1.4 million square feet of space, everything included, which makes it more than twice the size of the Seagram Building. At the ground floor, the enclosed area measures 29,000 square feet; on the 70th floor, the enclosed area (a "sky lounge") is only one quarter the street-level footprint, or 7,265 square feet. The Bank of China's public spaces are contained within the tower's three-story base, which is treated almost like a separate building that has been seemingly carved out of the site's bedrock. The skyscraper's four powerful legs rest on this rocky base. The building's cost: \$150 million.

Above the base, the bank's offices occupy about a dozen floors, which are topped by an elegant space that serves as a staff lounge and cafeteria. (The bank's offices are grouped around a 12-story atrium that runs all the way up from the ground-floor banking hall to the staff cafeteria.) The 50 floors above the Bank of China's offices contain speculatively leased office space, while the sky lounge, on the top floor, is for the use of the bank and its guests.

Because the two-acre site slopes quite steeply, there are two principal entrances to the tower: one, at the lower level and facing Queensway on the north, leads to elevator banks that serve the office tenants; the second entrance, on the south or uphill side of the tower, leads into the tall banking hall and serves customers as well as bank employees. Forty-six elevators and two pairs of escalators transport passengers and freight to the tower's various levels. Several underground levels contain, among other things, parking spaces for 370 cars.

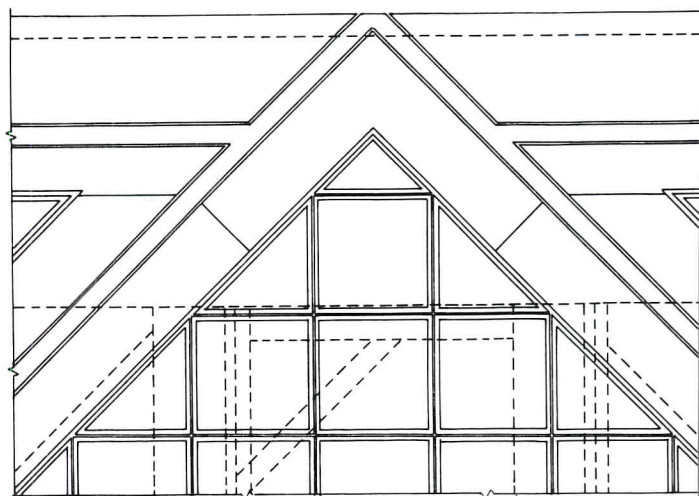
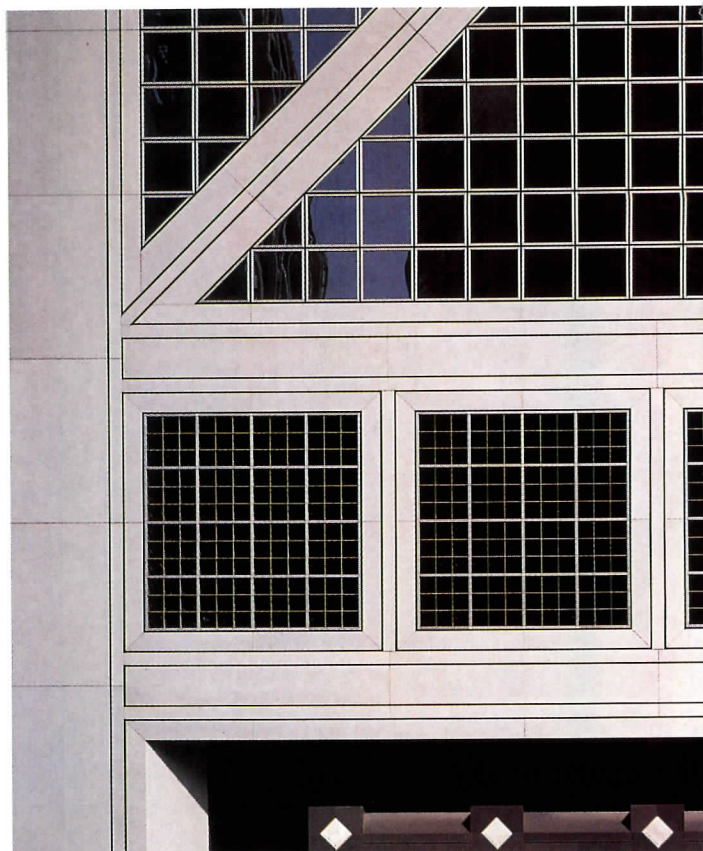
Setting a new structural standard

So much for the facts and figures. In the hands of a conventional architect and builder, the Bank of China perhaps would have been translated into a 50-story box, with a standard-issue rectangular cage of steel or concrete forming the structure.

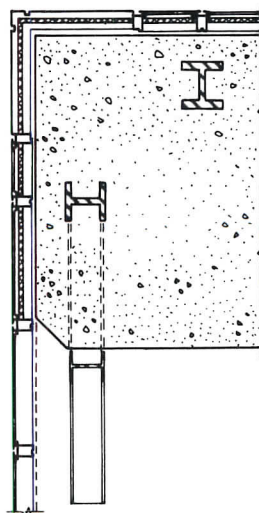
I. M. Pei realized from the start that the conventional way of building a skyscraper is, in fact, quite inefficient. As everyone knows, the forces that shape a skyscraper's structure are not primarily the vertical loads transmitted to the foundations but the lateral loads generated by winds and other natural forces. In Hong Kong, these can be fierce: winds there blow twice as hard as they do in Chicago or New York, and earthquakes can be four times as severe as they are in San Francisco. The conventional way of resisting these forces is, of course, to add diagonal bracing to the rectangular structural frame, and this is the way it has been done, routinely, ever since skeleton-framed skyscrapers came into being.

But Pei and others before him have long realized that this practice meant, in effect, making two structures to hold up one building. The wastefulness of such a configuration has been obvious to early pioneers like the Russian Constructivists and to more recent practitioners like Louis Kahn. But nobody had ever succeeded in translating his insight into built reality—a giant step, as it turned out. Now that Pei has done so, all skyscrapers built henceforth will be measured against this spare and splendid structure.

The geometry that Pei developed for the Bank of China Tower is quite simple: the building starts up from the ground

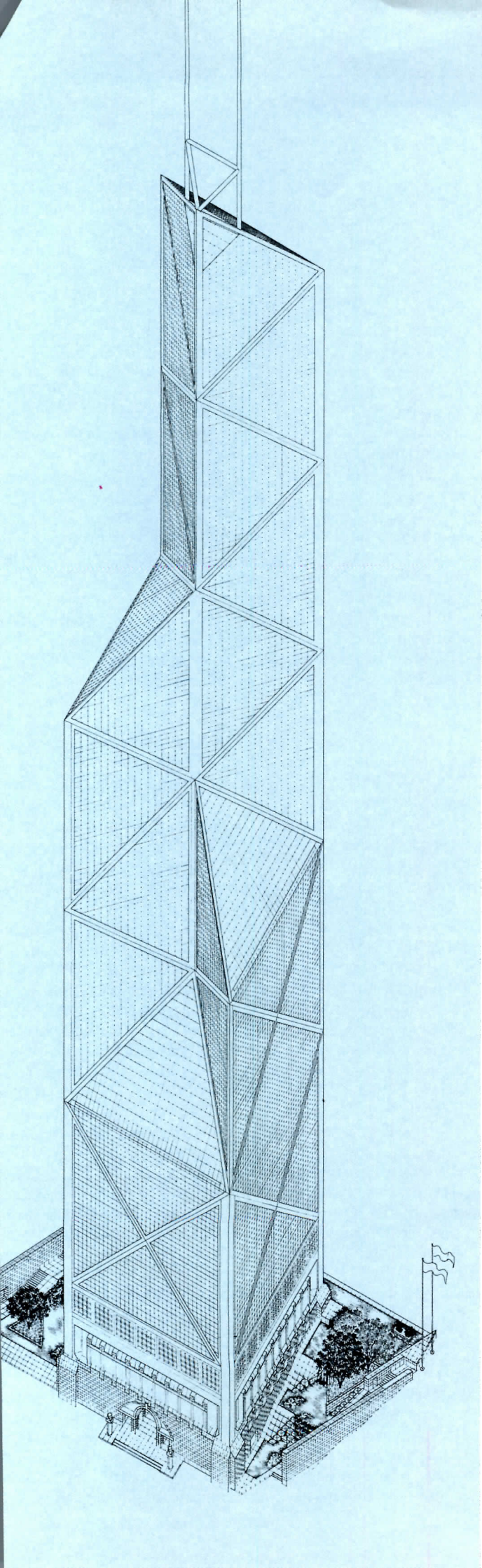


CORNER CONDITION OF CURTAINWALL AND COLUMN



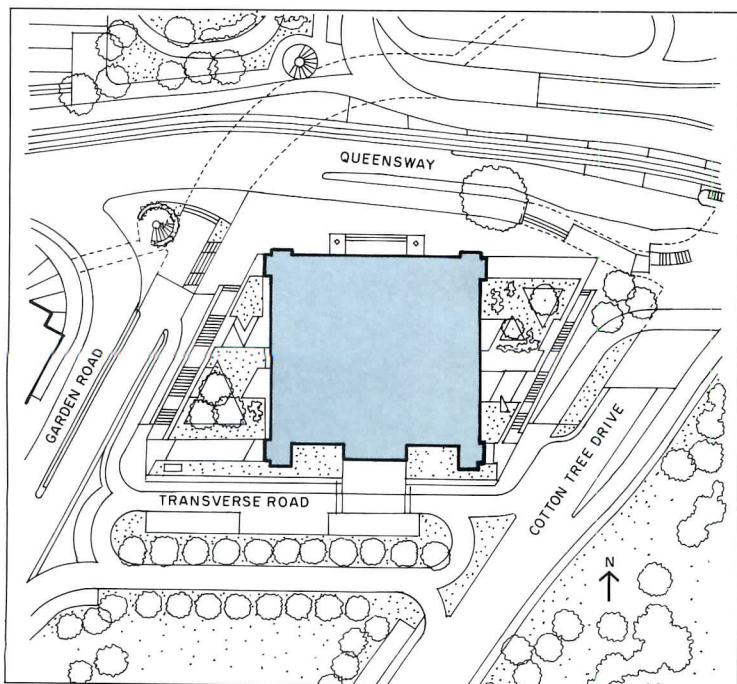
A curtainwall of anodize aluminum and reflective glass forms the skin of the Bank of China's triangulated structural frame (axonometric and photo opposite, and curtainwall detail top). Detail drawings of the curtainwall and column (above and left) illustrate the concrete connection that envelops steel members where they meet at the tower's corners.

© PAUL WARCHOL PHOTOS
EXCEPT AS NOTED





The north entrance (top) faces Queensway and serves upper-story tenants. Gardens on the tower's east and west sides (above) bridge the site's steep contours.



as a shaft about 165 feet square in plan. Pei divided this shaft into four triangular quadrants by crossing it with diagonals.

As the tower rises, the first quadrant falls away, about a fourth of the way up. The next quadrant disappears about halfway up the building, and the third quadrant drops away about three-fourths of the way up. The top floors of the tower are thus only one quadrant in area—a slender stalk that terminates in a triangular tip containing the sky lounge. The form of the tower is thus defined by the verticals, horizontals, and diagonals of the structural frame, and by huge triangular panels of reflective glass that make up the building's skin. The frame is clad in bright, anodized aluminum. The tapering silhouette of the building is not unlike that of a tall stalk of bamboo, though its reflective facets of glass and metal pick up light and shade the way a crystal might. Five principal columns hold up this 70-story stalk—one on each of the four corners and a central column that extends from the top of the tower down to the 25th floor, where its loads are transmitted diagonally to the corners.

Bamboo symbolism as architectural inspiration

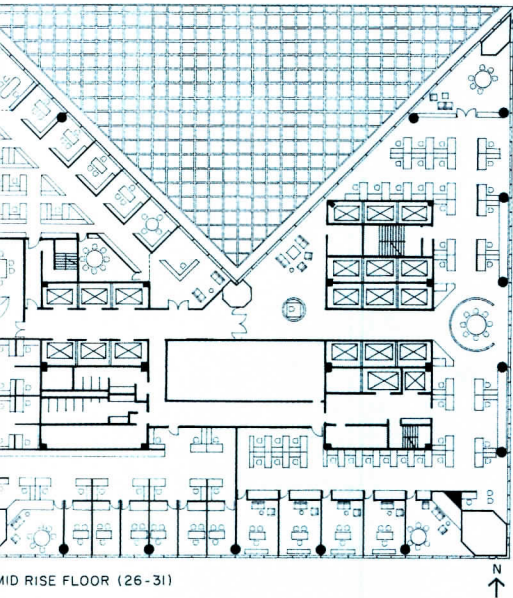
At the time the Bank of China commissioned Pei to design the tower, the architect saw that there were two principal problems: the first was the site, a steep slope surrounded by streets and fly-over highways that would require some realignment; and the second was the fact that the building parcel was almost invisible on the Hong Kong skyline when seen from Kowloon on the other side of Victoria Harbor. So the new tower had to be very tall indeed if it were not to be swallowed up by the surrounding skyscrapers.

Pei recalls the early stages of the building's design. "I asked my son, Sandi, to cut out four triangular wooden sticks of different lengths, and we started to play with them, recognizing that the building should taper as it went up." Pei sliced the ends of the triangular sticks, and assembled them into a tower. He recalls a Chinese proverb that uses the tapered bamboo stalk as a symbol: its sectional trunk, propelled higher and higher by each growth, is a metaphor for taking measured steps in a quest for strength and excellence.

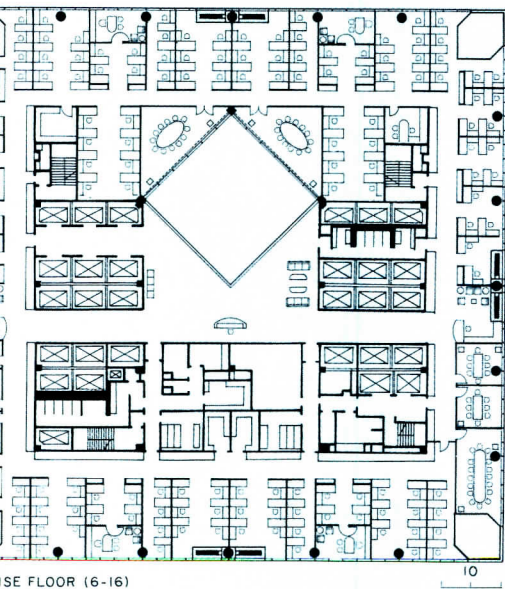
So this was how the formal architectural concept was developed. But it was New York City structural engineer Leslie Robertson who translated the concept into reality. "Les is not a theoretician and a very practical engineer," Pei says. "He knows how to make advanced theories work for him." Pei gave Robertson a good deal of the credit for coming up with the solution to the building's realization: a critical joint at which the vertical, horizontal, and diagonal members of the steel frame come together. This joint is not a welded connection, nor is it all-steel; it is, in effect, a block of reinforced concrete that envelops all the columns, stiffening trusses, beams, and braces.

"I saw the tower as a series of triangles," Pei recalls. "Les saw the triangles as a structure, as a superframe. That was his conception." The superframe—a kind of three-dimensional space truss—was surprisingly economical: Pei and Robertson estimate that the Bank of China tower used only 10 percent as much steel as a conventional skyscraper of this size would normally have used—and this despite the fact that Hong Kong is located in a typhoon zone that calls for exceptional wind bracing.

Given that Pei's tower is located just two blocks east of Norman Foster's highly publicized Hong Kong and Shanghai Bank Headquarters, comparisons between the two structures are inevitable. The Foster building—a super-high-tech architectural extravaganza—is, in reality, a fairly conventional structure with a central atrium and a brilliant display of structural and mechanical innards on its north and south facades. For the Bank of China building seems to use its dramatic structure as a form

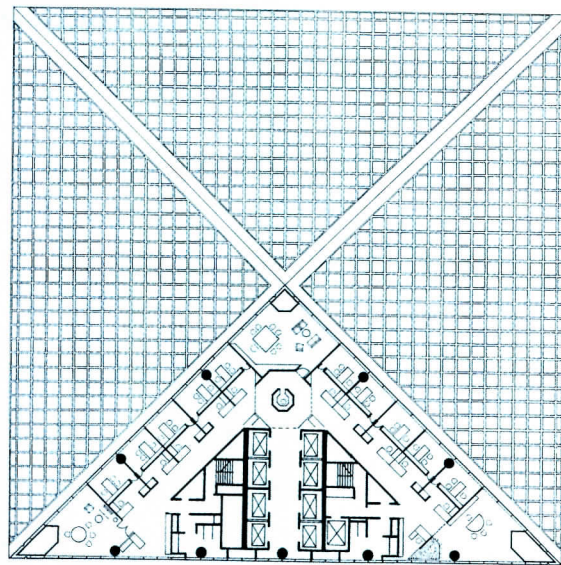
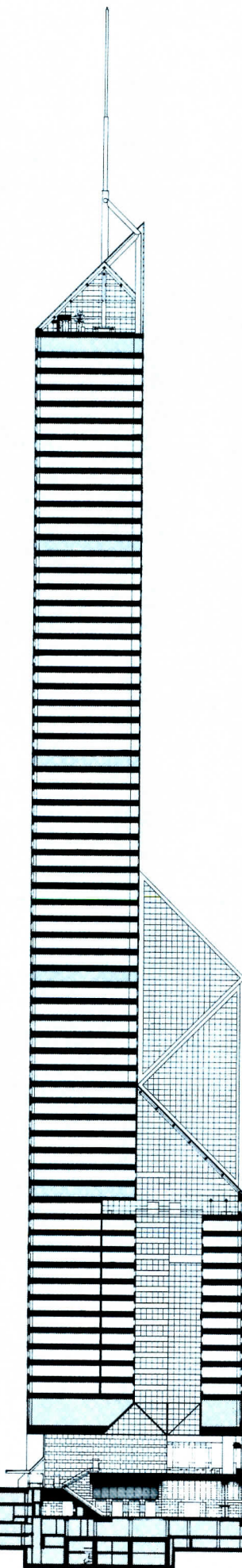


MID RISE FLOOR (26-31)

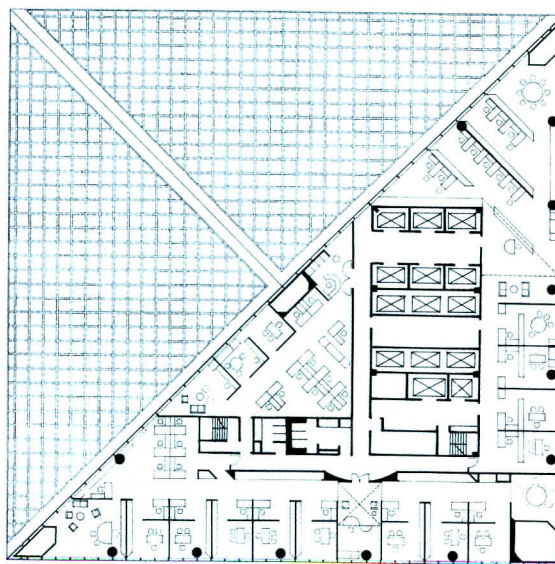


LOW RISE FLOOR (6-16)

Plans of the tower at four different levels show typical office layouts for the Bank of China's use (low-rise) and for tenants (low mid-rise, high mid-rise, and low-rise). A square atrium is located on the 17th story through the center of the lowest floors,

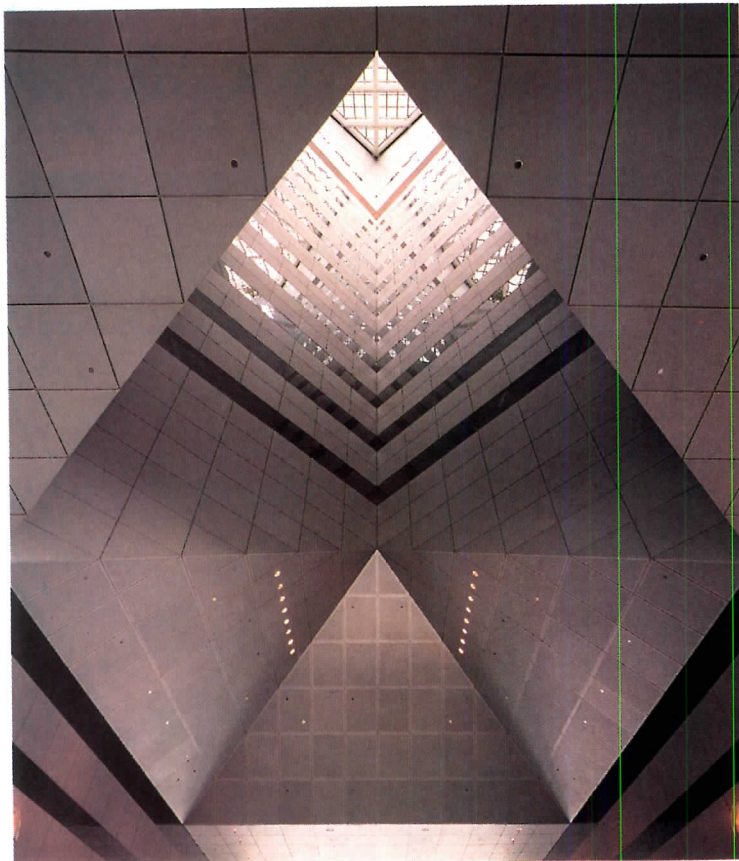


HIGH RISE FLOOR (51-66)



HIGH MID RISE FLOOR (38-44)

bringing natural light into the tower's banking hall. A lounge situated on the 70th floor is for Bank of China VIPs and guests. Upper floors also contain executive dining suites and apartments for visiting dignitaries.



decoration, whereas Pei's tower is a flawless integration of pure structure, function, form, and urban symbolism. Nothing could be added to it and nothing could be subtracted without doing damage to the whole. (What is more, the per-square-foot cost of Pei's building is only one-sixth the cost of the Hong Kong and Shanghai Bank.)

The office building as art

Will Pei's and Robertson's elegantly triangulated structure be widely copied in North American cities? Probably not. As it is, the Bank of China is less efficient in terms of rentable office space than most builders of commercial office structures would wish—although Pei points out that the great variety of rentable office spaces in the Bank of China, and the availability of spectacular views in all directions, serve the Hong Kong market exceptionally well. Even so, there may be problems with triangular-shaped corner offices, and with occasional cross-braces slicing across the interiors—or so some people will think.

Clearly, the Bank of China tower sacrifices a fair amount of potentially rentable square footage to—well, art. And until the commercial market recognizes the dollar value of art, builders will shy away from structures such as this one.

That, of course, is too bad. Mies van der Rohe once said that we would not be building any cathedrals in our time, and he was probably right. In some respects, the skyscraper may be the closest thing to the cathedral in this century and the next, especially if it takes its place on the skyline as gracefully as visibly as the Bank of China does. It is ironic that Hong Kong's new cathedral has been built by the present ruler of Beijing; and it is doubly ironic that the architect was the son of a former president of the Bank of China, who was driven out of his native land by the present rulers of China.

Still, perhaps this handsome new building will teach its owners a lesson or two about grace, civility, and integrity. It will not be the first time that architecture has played such a role.

Bank of China Tower Hong Kong

OWNER: Bank of China/Hong Kong
ARCHITECT: I. M. Pei & Partners—I. M. Pei, partner/design; Eason Leonard, partner/administration; Michael Flynn, partner/curtainwall; Kellogg Wong, associate partner/administration; Abe Sheiden, associate partner/product design; Bernard Rice, senior associate/design; Robert Heintges, curtainwall; L. C. Pei, stonework and public spaces; Calvin Tsao, water gardens; Senen Vina-de-Leon, cores; William Cunningham, job captain; Tom Woo, resident job captain; Gianni Neri, construction administration; Richard Gorman, specifications; David Litz, senior resident architect; Pat O'Malley, resident architect

ASSOCIATE ARCHITECT: Wong/Kung & Lee—Sherman Kung, principal-in-charge

ENGINEERS: Leslie E. Robertson Associates and Vallentin Laurie, and Davies (structural); Jaros Baum and Bolles Associated Consulting Engineers (mechanical/electrical);
CONSULTANTS: Fisher-Marantz (lighting); Rolf Jensen & Associates (fire protection); Cerami and Associates (acoustical); Peter McLaughlin Associates (security); Trautman Associates (traffic); R. J. Van Seters Co. (fountains); Vinciguerra & Associates (planning); Levett and Bailey (quantity surveyors); Verta Corp. (exterior maintenance); Peter X(+C) Ltd. (signage); George C. T. Woo & Associates (interiors)
GENERAL CONTRACTOR: Kumagai Gumi

Peter Blake is professor of architecture at Catholic University. He is a practicing architect and critic, and the former editor of *Architectural Forum* and *Architecture Plus*.



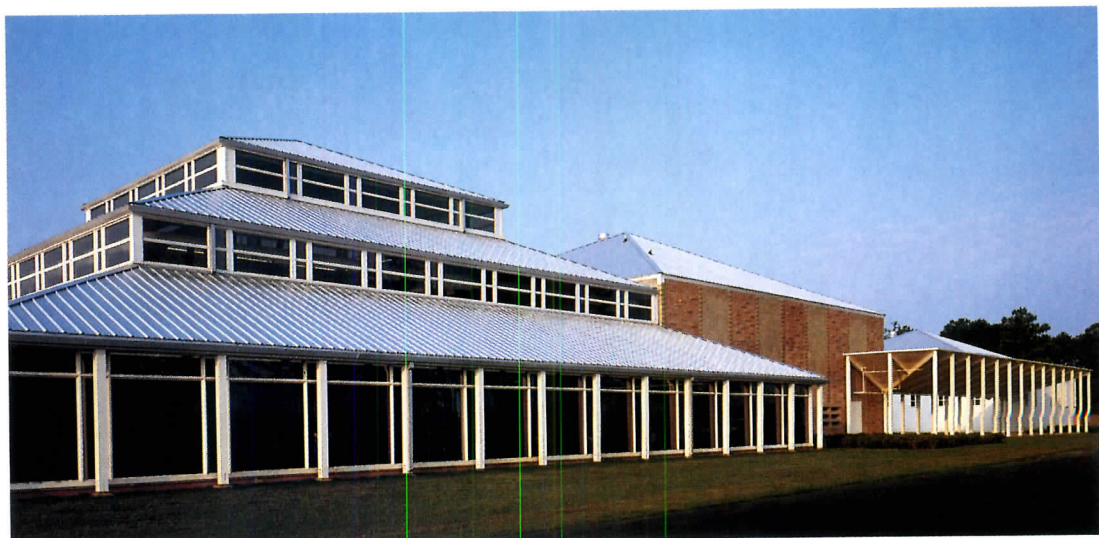
A skylit atrium (top) extends from the banking hall to a staff cafeteria and executive lounge on the 17th floor. The barrel vault of the north lobby (above) is sheathed in gray and white granite; floors are marble. A reception and

banquet hall, located in the 70th-floor sky lounge (opposite) enjoys 360-degree views across Hong Kong. A tubular steel superstructure supports and braces communications towers that rise above the building's apex.

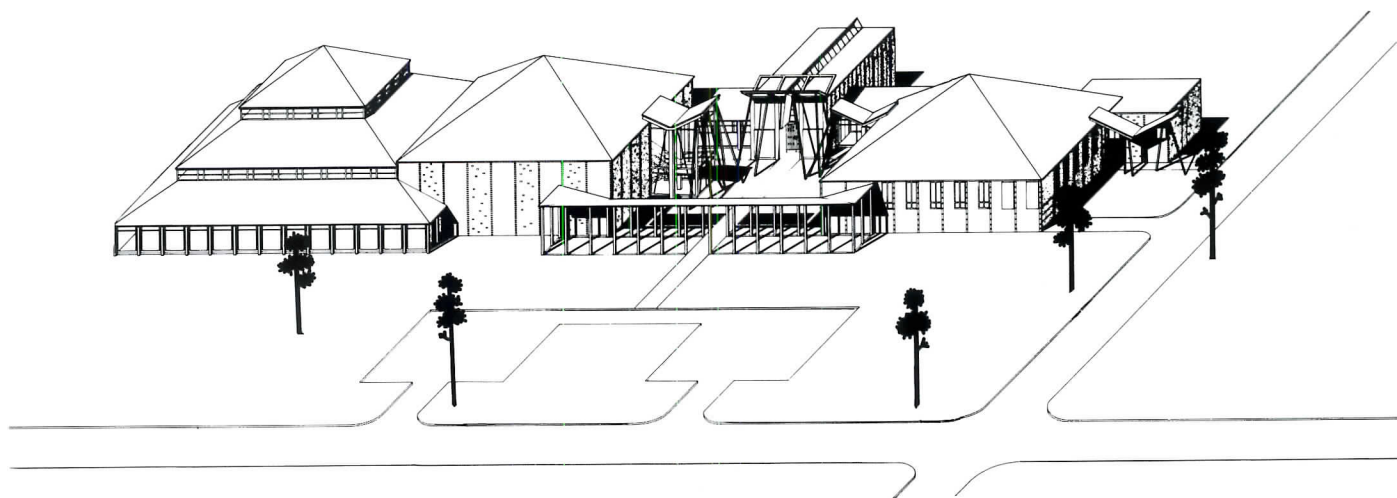


Exercising Options

Valerio Associates' health and recreation facility for Kimberly-Clark combines the opposing natures of an Alabama forest and a paper-manufacturing plant.



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Kimberly-Clark's Coosa Pines pulp and paper mill sits amid the vast pine forest that stretches southeast of Birmingham, Alabama. The huge mill has provided jobs in the area for generations, along with generous benefits that include voluntary employee counseling on fitness, diet, and exercise. The company's far-sighted policies are intended to keep employees healthy and happy, and at the same time reduce the costs of illness, injury, and insurance.

In designing Kimberly-Clark's new Coosa Pines Health Center, Valerio Associates was challenged to produce a 32,000-square-foot building whose program has two major components: health screening, which includes a diagnostic clinic and an occupational-health suite for industrial accidents, and recreation, which incorporates a gymnasium, lounges, and meeting rooms. The architects also had to contend with the jumbled industrial environment that characterizes any large paper mill. The mill's overwhelming size, together with its unavoidable noise and pollution, could easily have handicapped efforts at

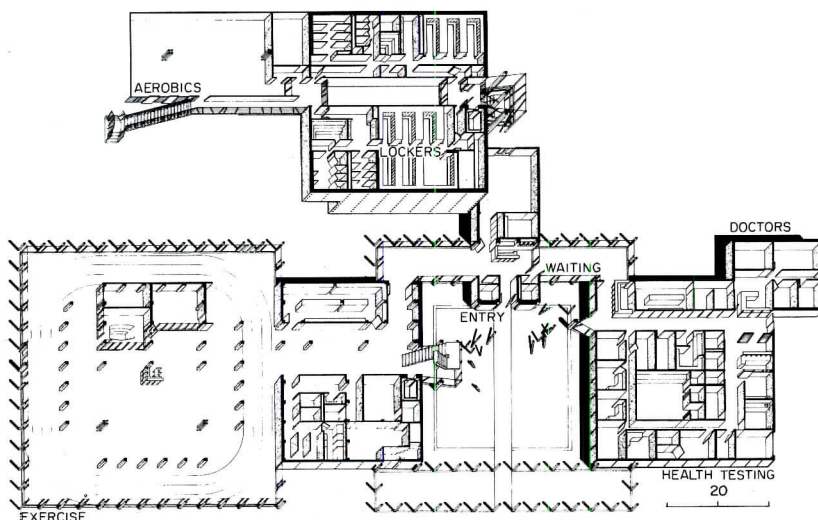
"place-making." By turning the building inward, and putting the entrance to the meeting room, exercise facility, and diagnostic clinic in a courtyard behind a skeletal colonnade, principal Joseph Valerio buffered the health center from the harsh environment and gave the building a more human scale.

Although the mill's existing buildings display no particular stylistic consistency, their vernacular form and scale dictated a straightforward approach to construction: a succession of hipped-roof pavilions with clerestories and repetitive structural bays. Anything fussy or pristine here would have seemed out of place. For formal precedents, Valerio looked to such unorthodox sources as an Early Christian entrance atrium and a Silesian multistaged wood belfry. The architect rationalizes his borrowing of seemingly alien historic form by observing that American culture's "total absence of history and tradition afforded [the] architect perfect freedom." If the result seems an odd contradiction—what does an Early Christian atrium have to do with a health center in an Alabama pine forest?—it is a contradiction.



cabulary of sloping elements appears just inside the center's entrance colonnade (above and below).





The exercise and health screening facilities (below left) are both entered through doors whose muntins have been cut to resemble pine trees. A corridor in the diagnostic clinic opens onto the entrance courtyard (below right), re-orienting first-time visitors. An elevated walkway from the women's locker room leads into the gymnasium (opposite). Women's aerobics classes held behind the wall to the right, are discreetly concealed from the weight room below.



that deliberately "embraces the ambiguities of modern times," according to the architect.

Upon entering this carefully thought-out building complex, one encounters the strangely sloping porticoes that surround the entrance courtyard. At first glance these look amusingly like the kind of angled shoring that holds up old porches while their classical columns are being replaced. Though it isn't hard to find man-made industrial precedents for these canted elements throughout the mill, the real source of their inspiration is the natural environment of the nearby pine forest. It is only when one reaches the gymnasium that the metaphor becomes clear. There the tall spaced columns and randomly sloping wind bracing seem like old-growth forest surrounding a clearing—a forest that has undergone an industrial transformation while losing none of its mystery and quiet light. (Another, perhaps more subtle reference to the nearby woods appears in the mullions of the center's entrance doors, which are cut in profile to resemble pine trees.)

The delicacy of the gymnasium's wooden roof structure made possible in part by hidden tension rings at the eave of each hip. The wood portion of the structure is then counterbalanced over a concrete peristyle that separates the running track from the weight room. Poured resin floors, simple finishes, and inexpensive aluminum lighting fixtures help keep the building within its modest budget. **ANDERS N**

*Coosa Pines Health Center
Coosa Pines, Alabama*

OWNER: *Kimberly-Clark Corporation*

ARCHITECT: *Valerio Associates—Joseph M. Valerio, Ramon Mattheis, David Jennerjahn, project designers; Brad Peck, Gregory Randall, Daniel Ikeda, project team*

ENGINEERS: *A. Epstein and Sons, Inc. (structural, mechanical, electrical); EWI Engineering Associates (civil)*

CONSULTANT: *Nancy Willert (interiors)*

GENERAL CONTRACTOR: *Universal Construction Company*





Making the Grade

While new technology makes schools more complex, a few old lessons—such as getting communities involved and keeping a child's size in mind—are worth remembering.

Fifty years ago a small elementary school in Winnetka, Illinois, set off a quiet revolution. School design has never been the same. The two-story Victorian box housing rigid classroom cells and scaled to impress parents (and intimidate children) was swept away. Buildings imprinted with an institutional stamp gave way to ones with a more residential feeling.

It all began with the Crow Island School, a one-story brick building that embodied the progressive educational program of the local superintendent, Carleton W. Washburne. Designed by the fledgling firm of Perkins Wheeler and Will with help from Eliel Saarinen, the school organized classrooms into three wings so each could have its own identity. Instead of shutting students off from the outside world, Crow Island provided classrooms with direct access to outdoor yards. It brought ceilings down to nine feet (from the more typical 12 feet) to establish a less formal environment, and lowered windows to a child's height.

While educational philosophies have gone through several cycles in the last half-century, the lessons of Crow Island are as valuable today as they were in 1941. The latest generation of schools maximizes contact between classrooms and outdoor spaces, placing important design elements at children's height, and creating relaxed settings for education—just as Crow Island did.

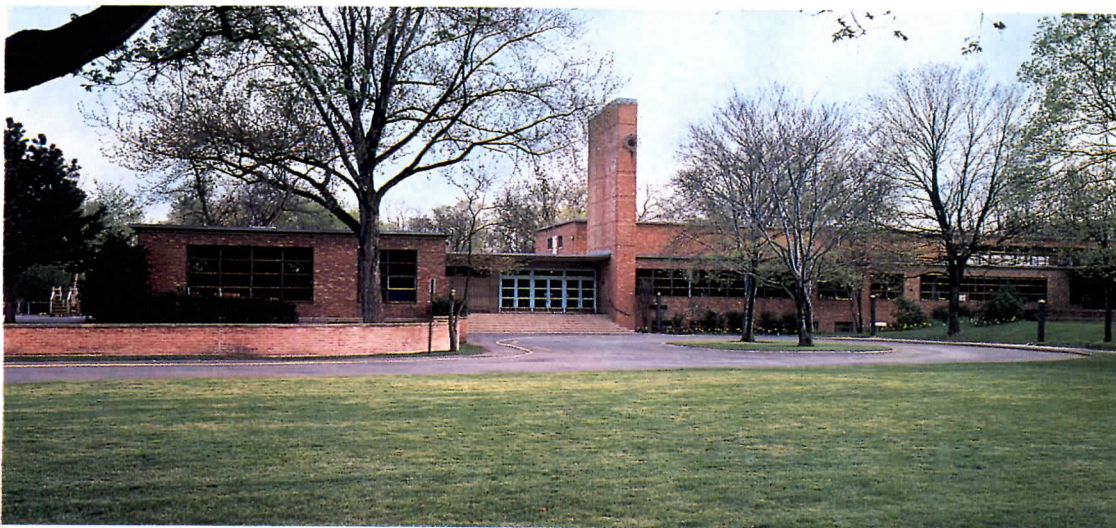
Although clearly a Modern building with flat roofs and rectangular blocks sliding past one another, Crow Island fits comfortably into its local context. Its residential scale helps it harmonize

with nearby houses, while its sensitive use of natural materials such as brick and wood allows it to rest easily on its wooded site. Such contextualism is also at work at the three projects profiled on the following pages. The Jane S. Roberts Elementary School in Dade County, Florida (pages 98-101), for example, responds to its tropical climate especially well by establishing a system of covered (but not enclosed) walkways and palm-studded courtyards.

Involving users in the design

Before designing Crow Island, Lawrence Perkins spent many hours listening to teachers, administrators, students, even janitors. Bringing these user groups into the design process is now standard operating procedure. For example, William Brubaker, a principal at Perkins & Will—the successor firm to Perkins Wheeler and Will—met personally with members of every department at Warsaw Community High School (pages 94-97) at least twice to discuss their suggestions. At each meeting Brubaker would translate their ideas into sketches and then listen to their reactions. “Is this what you had in mind?” Brubaker asked over and over again.

For a small town like Hope, Indiana, the design of a new school became a community event. Taft Architects carefully listened to what adults and children had to say. As a result, Hope Elementary School (pages 102-105) is as much a community resource as it is a school. Its main design feature, an indoor street, works equally well for parents heading for PTA meetings and for students on their way to class.



© WAYNE CABLE

The Crow Island School helped change the course of school design.

While the glut of office space now on the market will probably depress commercial building for the next couple of years, the need for new and renovated schools continues to grow rapidly. According to a study by the Education Writers Association, \$84 billion in new construction and retrofitting is needed to overhaul the nation's education infrastructure. Paul Abramson, president of Stanton Leggett & Associates, an education consulting firm in Westchester County, New York, projects that \$35 billion will be spent over the next three years on school construction. "The one cloud on the horizon," notes Abramson, "is whether the public will be willing to fund all this."

Tight budgets may slow construction

With exactly that cloud in mind, F. W. Dodge expects just a 2 percent increase in square-footage built in 1990 for the entire education sector, which includes college and university projects in addition to primary, junior high, and high schools. According to Dodge, tight state and local budgets will force new education construction actually to decline by 2 percent in 1991, from 141 million to 139 million square feet. Growth, however, should revive in 1992 and continue through at least 1995.

Some of the difference between Abramson's optimism and Dodge's caution reflects Dodge's inclusion of college and university construction. Because many Baby Boomers in their 30s and 40s just recently began to have children, most growth in the school-age population is now occurring at the elementary-school level rather than the college level.

No one, though, can deny the remarkable growth in education construction during the past several years. From 1982 to 1989 new building soared 87 percent to reach 139 million square feet per year.

Some of the nation's largest states and local districts have begun ambitious school-building programs. California, for example, has projected it will need 800 new schools by 1993, while Florida estimates it will need 816 new facilities within the next 10 years. Dade County (Greater Miami) alone has launched a \$1.5-billion school development program that will include about 50 new fa-

cilities and more than 300 renovated schools

A growing percentage of education construction now involves renovating and expanding existing schools. In 1970, 73 percent of the money spent on education building was for new facilities, with 21 percent going for additions and 6 percent for alterations. By 1989 new construction accounted for just 52 percent of the money spent, while additions had jumped to 21 percent and alterations had grown to 18 percent. Part of the reason for this change was increased activity in the Northeast and Midwest, where older stock of schools existed.

The rapid growth of the school-age population over the last decade has put great pressure on cities such as New York to expand facilities as quickly as possible. Until recently, New York's standard response was to erect pre-engineered metal annexes in school yards. When that was finally forced by a watchdog agency to develop a less dreary solution, it turned to architects Weintraub & di Domenico.

Silk purses out of sows' ears

Employing the same Type-V construction of corrugated metal as had been used in the past, Weintraub & di Domenico designed a series of four "minischools" whose playful, and bright-colored forms won immediate praise (three shown on this page). "We have a knack for turning silk purses out of sows' ears," says John di Domenico.

Instead of trying to disguise the humble pre-engineered construction technology, the architects worked to create a variety of whimsical pediment portals, and columns that give each building its own identity. "We didn't want to fudge it, we wanted to be plain," says di Domenico. "We didn't want to just put a brick veneer on a metal shed. So we took a palette of materials that's typical of this building type and shook it up."

The minischools are 60 feet wide with 20-foot classrooms loaded on either side of a central corridor. Each one cost about \$2 million and took about six months to build.

While the so-called Baby Boomlet and the migration of Americans to the Sunbelt have spurred much recent school construction, another major factor has been the expanding role



Using the same kind of pre-engineered construction that had previously resulted in unadorned metal sheds, architects Weintraub & di Domenico designed a series of lively school annexes for New York City (above and right). The rigid-frame, metal-skin structures provide fanciful elevations for classes to pose in front of and windows set at a child's height.



Increasingly complex function of schools. Simply put, schools are bigger today because more people place there. Increasingly seen as community resources, schools must now accommodate different classes, community meetings, senior-citizen groups, and year-round athletic events. At the same time, parents are demanding more sophisticated (and spacious) science facilities, computer labs, special-education programs, and dramatic-arts spaces. Not long ago, an elementary school library was a room with books; today it is a media center" with computers and elaborate audio and video equipment, as well as books.

According to Perkins & Will's Brubaker, meeting rooms, dining halls, and courtyards offer architects the opportunity to create "great spaces" that can serve as important meeting places for students and teachers and help establish strong identities for schools.

Schools are getting bigger

A study by *American School and University* magazine of 110 new schools nationwide showed that the typical elementary school today is 177,000 gross square feet and has 655 students. In other words, the average elementary school provides 271 square feet to each pupil. According to Clifford Abramson, 20 years ago that figure was just 62 square feet per pupil.

The survey also showed that the typical high school has 1,530,000 square feet for 967 students, 1,568 square feet per pupil. Twenty years ago, says Ben E. Graves, head of Educational Planning Consultants of Austin, Texas, the figure was 120 square feet. While increasingly complex education programs are forcing schools to grow bigger in terms of square-footage, judicial decisions and legislative mandates in many states are requiring fewer students per classroom. In Texas, for instance, the state legislature now limits all schools to no more than 22 students.

Many educators also advocate fewer students per school, especially in urban areas with social problems. "There's a lot of evidence to show that children do better in smaller schools," says Abramson. Last year the Architectural League of New York and the Public Education Association—a private advocacy group, organized an exhibit of designs for smaller schools.

At a proposed site in the Washington

Heights section of Manhattan, HMFH Architects designed a five-story structure with a rooftop playground (below and right). Shoehorned onto a site the size of two town-house lots, the school includes a ground-floor daycare center and second-floor community services office that work independently of the three floors of classrooms and school facilities above. An atrium rising the full height of the building brings natural light into the entire facility.

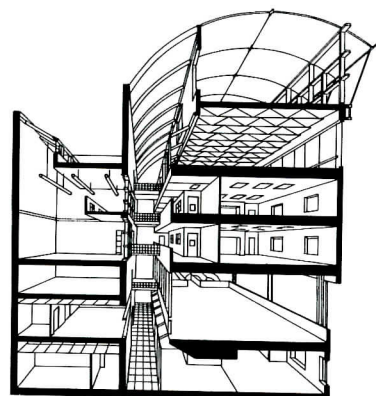
"The overriding concern," explains Stephen Friedlaender, president of HMFH Architects, "was to show it's feasible to build small schools that have all the amenities often lacking in New York City buildings—lots of light, outdoor recreation, and community services."

Although few educators want to repeat experiments with open classrooms, "teachers really do want flexibility," says Abramson. "They want to be able to plug in a computer or a television anywhere in the room." They also want classrooms that can accommodate different kinds of activities—from lectures to individual learning. Some teachers even want various activities to be able to take place at the same time—computer training at one table, reading at another, and storytelling across the room.

Because education is more diversified than ever before, classrooms must handle gatherings of varying size—from a special-education class of seven students to a traditional course with 27, says Ben E. Graves, head of Educational Planning Consultants of Austin, Texas.

Computers and video may be the hottest topics among educators, but Graves warns that technology shouldn't be the tail wagging the proverbial dog. "We don't want to repeat the mistake we made with language labs," says Graves, "creating large spaces that aren't really needed." Rather than setting up computer labs, Graves recommends integrating the new technology within traditional classrooms.

With members of the Baby Boom generation now focusing on their roles as parents, schools have become a top national priority. Finally in the limelight, schools are assuming more assertive places in many communities, while responding to new technologies and expanding educational programs. **CLIFFORD A. PEARSON**

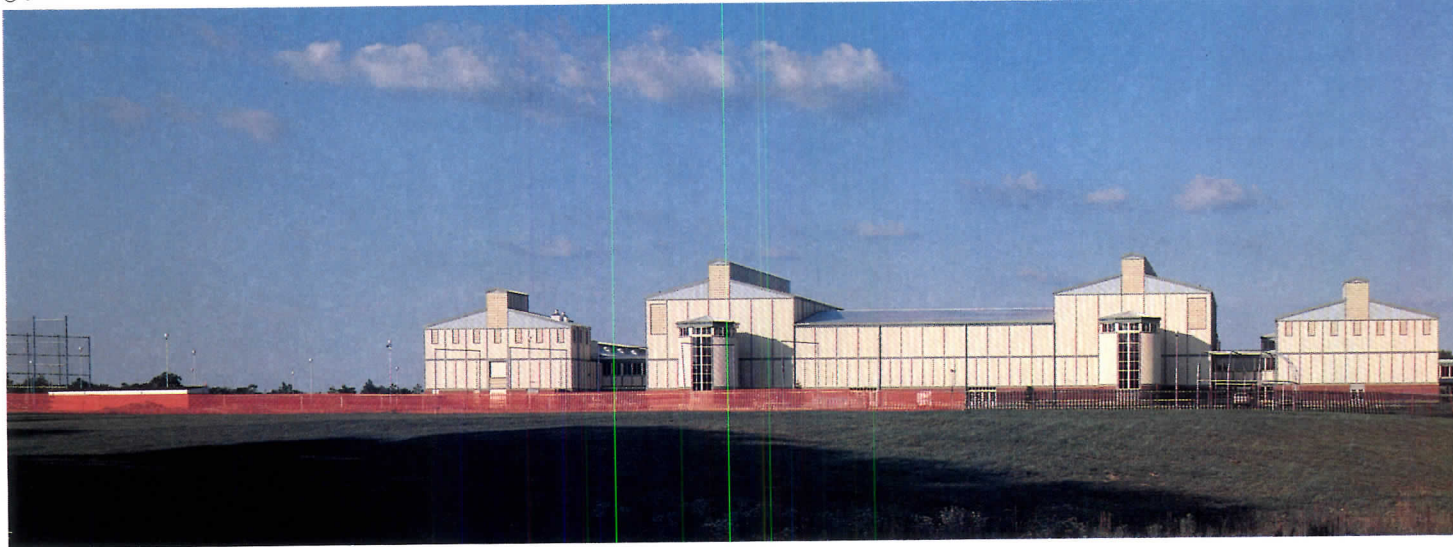


A design proposed by HMFH Architects makes the most of its small site in upper Manhattan by stacking three levels of school facilities above a two-story daycare/community services center (above and left). A rooftop playground and a five-story atrium provide amenities often missing in other urban buildings.



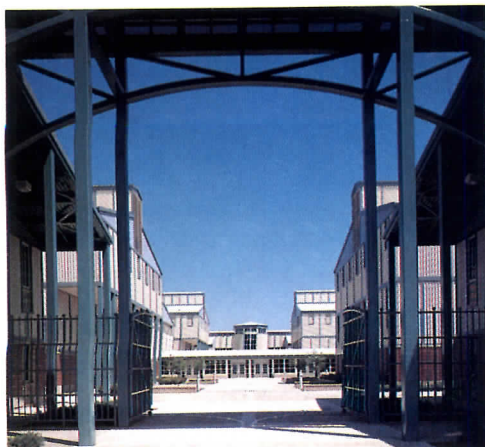


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PRAIRIE TECH

Warsaw Community High School
Warsaw, Indiana
Perkins & Will, Architect



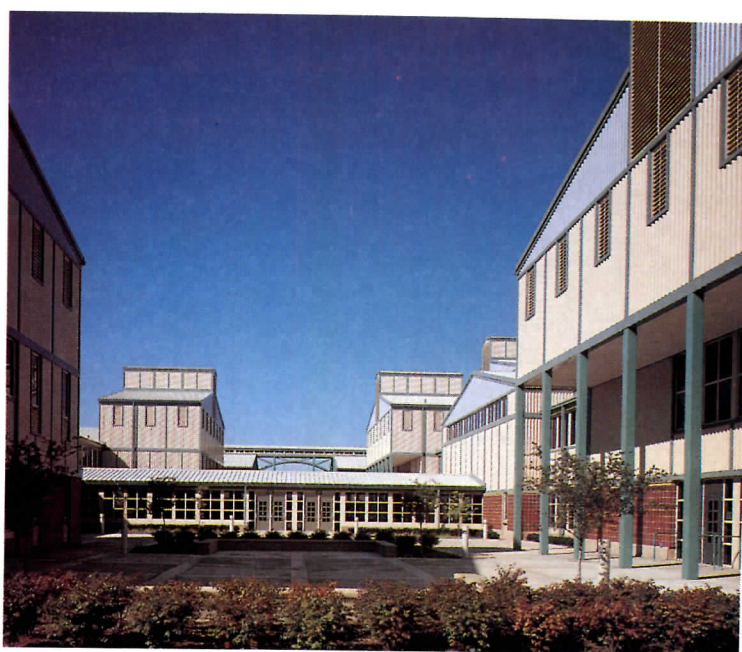
The references to Midwestern farm buildings—such as the grain-elevator roofs and silolike staircases—clearly tie Warsaw High School to its rural landscape. But Perkins & Will's design for this 256,000-square-foot project is more than a simple essay in regional forms. While farm clusters tend to be ad hoc groups of individual structures, Warsaw High School is a deliberately symmetrical campus that somehow marries a formal plan with unpretentious agrarian imagery.

The latest in a 50-year tradition of innovative school designs, Warsaw High School represents a remarkable degree of continuity at Perkins & Will. Ever since it collaborated with Eliel Saarinen in designing the Crow Island School in Winnetka, Illinois, in 1940, the firm has retained its position as one of the most important forces in school architecture. In the past several years partners William Brubaker and Ralph Johnson have infused a new sensitivity to regional architecture into Perkins & Will's work, picking up on the New Mexican Territorial Style at Capital High

School in Santa Fe [RECORD, September 1988, page 101] and other Southwest themes at Desert View Elementary School in Sunland Park, New Mexico [RECORD, September 1988, pages 106-108]. With abandoning the firm's roots in Modernism, Brubaker and Johnson have adapted their designs to fit into local contexts.

Set on the windswept Indiana prairie, Warsaw High School turns its tallest, flattest elevations to its surroundings. The thought of these surfaces as walls projecting the school," says Johnson. Within these "walls" lies a series of more than a dozen dimensionally defined structures—buildings that extend out to form covered walkways and step down to meet protected courtyards. A great circle of trees eventually will further enclose the site, bringing to mind the native-rock wall that encloses the Desert View school.

Entry to the building is through a peaked-metal arch that clearly separates the school from its surroundings. Beyond lies the project's main courtyard, a landscaped space that serves as the most



ant gathering place for students during warm months. The two halves of the school itself fall on either side of the courtyard: classrooms and media center to the south, gymnasium and cafeteria to the north. An enclosed ground-floor gallery connects the two wings and divides the court in two.

Here be light

"The teaching staff made it clear it wanted abundant natural light in all classrooms," recalls David Crabb, the superintendent of the Warsaw community schools. To bring the light into such a large facility, Perkins & Crabb supplemented the two halves of the courtyard with a series of rectangular courts inserted in both wings. The architects also used clerestory windows on the second floor to add light to double-height classroom corridors. The most innovative source of natural light, however, is the curving media center, whose three rows of windows flood the center of the two-story room wing with sunshine.

Adjacent to the high school and connected by two enclosed walkways is a

60,000-square-foot building that once was the town's freshman high school. At the architects' suggestion, the school district agreed to recycle the building as a vocational center equipped with industrial technology labs (formerly known as "shops") and rooms for teaching business skills such as word processing.

Because the Warsaw authorities wanted the school to accommodate new technologies as they develop, each classroom is wired for computers and video. An electronic resources room in the media center supplies video programs to classrooms at the touch of a button, eliminating portable VCRs individually operated by teachers.

Here in basketball-crazy Indiana, a 5,000-seat gymnasium was considered a necessity. The gym, which can be separated into seven practice courts, serves as an important community facility and therefore has its own entrance off the main court and separate access stairs in silolike structures along its perimeter.

To keep costs down and maintain a certain rural simplicity, the architects em-

Conceived as a protected campus set against the expanse of the Indiana prairie, the Warsaw Community High School turns inward, revolving around a central courtyard (top right). Stair towers and vernacular building profiles on the north elevation of the gymnasium wing (bottom opposite) allude to agrarian architecture of the region. The curving form of the media center/library (top opposite) is the school's most assertive exterior feature and helps bring natural light into the interiors.

ployed a straightforward structural system: steel frame infilled with masonry on the lower portion of the building and metal panels above. A variable-volume hvac system with fan rooms tucked under standing-seam metal roofs cools the building.

Classrooms are arranged by department (English, math, sciences, and so on) with department offices located nearby. Instead of isolating special-education rooms in their own area (and stamping them with a certain stigma), administrators required that they be integrated with regular classrooms. The client also asked that administrative offices such as those for the principal and assistant principals be located throughout the school, decentralizing the traditional administration block.

While the architects thought of the school as "a walled city" with classrooms around the perimeter and a courtyard in the center, the one element that asserts its presence on the exterior of the complex is the library/media center. "We wanted the library to be the most important feature in the most important building in town," explains Brubaker.

C. A. P.

Warsaw Community High School
Warsaw, Indiana

OWNER: *Warsaw Community School District*

ARCHITECT: *The Odle, McGuire & Shook Corporation—R. Duane Odle, president; Larry W. Phelps, design principal; Luky N. Ilioaia, project architect*

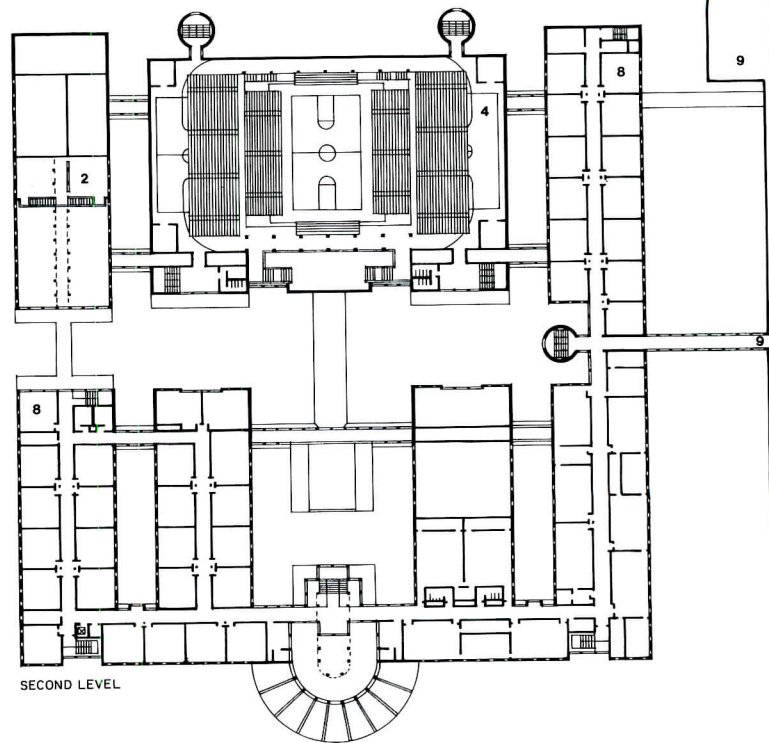
DESIGN ARCHITECT: *Perkins & Will—Ralph E. Johnson, design principal; C. William Brubaker, managing principal; James A. Toya, project manager; August Battaglia, project designer*

ENGINEERS: *Lynch, Harrison and Brumleve (structural); Fulk and Gardner (mechanical/electrical)*

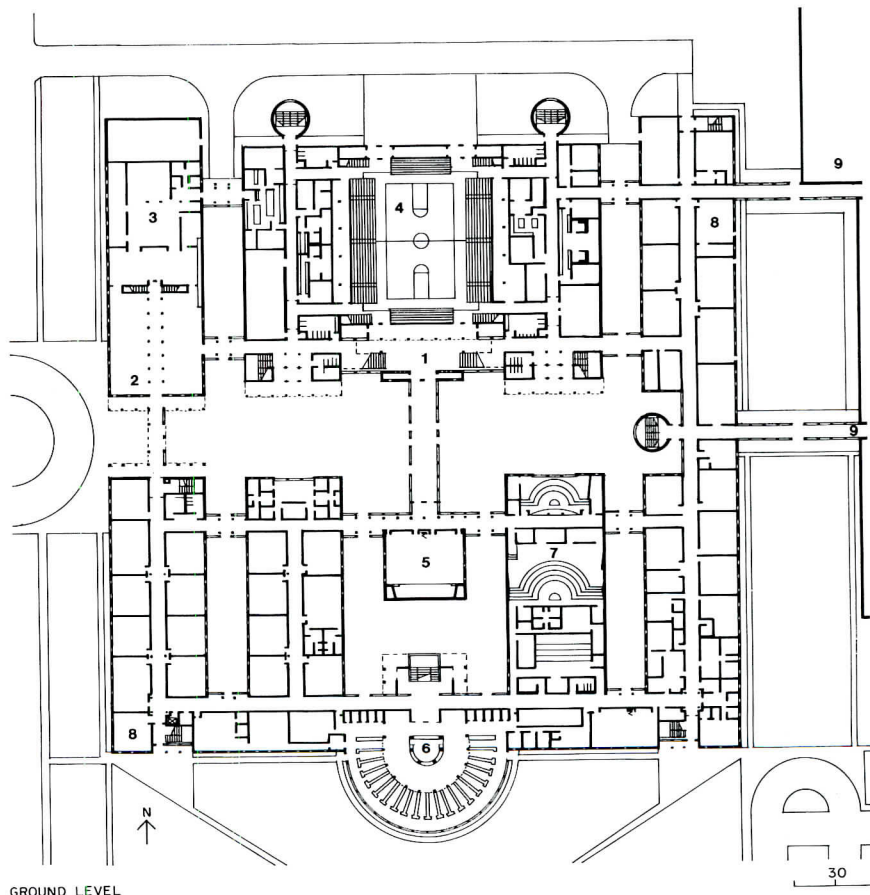
CONSULTANTS: *C. William Day (education)*

GENERAL CONTRACTOR: *Construction Control, Incorporated*

Placement of the main staircase (1 and 3, opposite) just north of the media center reinforces the library's central role in the school. The library itself (4, opposite) is a three-story space with media and resource rooms to the east and west. Specifically asked not to design a typical cafeteria, the architects created a two-story dining area with oak trim and a mezzanine (2, opposite).



SECOND LEVEL



GROUND LEVEL

- | | |
|---------------|-------------------------|
| 1. Commons | 6. Media center/library |
| 2. Dining | 7. Music |
| 3. Kitchen | 8. Classroom |
| 4. Gymnasium | 9. Existing building |
| 5. Auditorium | |



2



4



Two-story classroom buildings look onto the main courtyard with the elevator tower and media center anchoring one corner. An angled entry canopy runs past the administration building and into the school grounds (bottom opposite).

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TROPICAL PROTOTYPE

Jane S. Roberts Elementary School
Dade County, Florida
Hervin Romney, Architect

With its pink and turquoise roofs, its striking elevator tower, and its occasionally shifted grid, the Jane S. Roberts Elementary School seems to be one of a kind. But if the Dade County, Florida, school system follows through with its original plans, the building will be a prototype for schools in the area, a playful kit-of-parts spawning variations on a tropical theme.

Designed by Hervin Romney, a co-founder of the firm Arquitectonica who set out on his own in 1985, the school combines inexpensive materials and simple construction with a refreshing sense of whimsy. Just as importantly, Romney kept the local climate in mind throughout the design process. As a result, most corridors and stairways are covered but not enclosed, and all classrooms look onto outdoor courtyards.

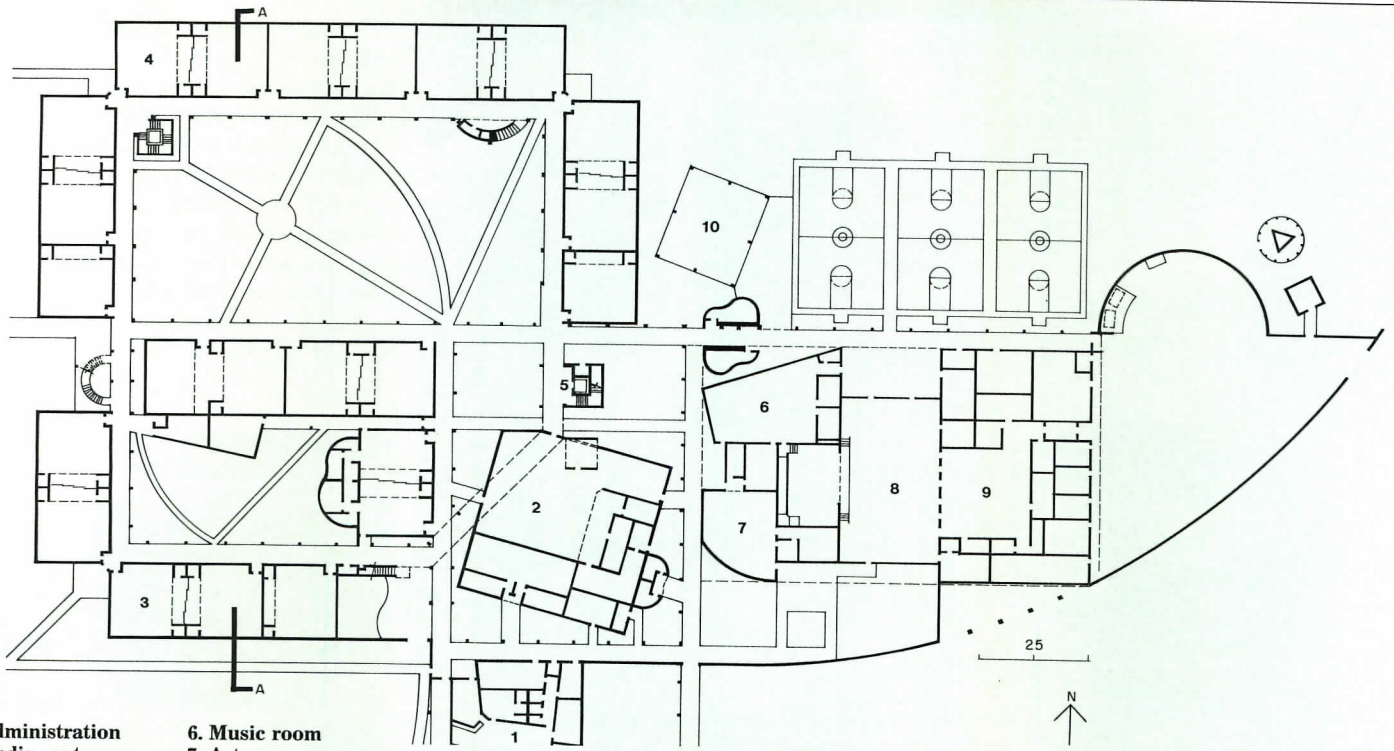
The plan of the 79,000-square-foot school is composed of four major elements—an administration block, a classroom quadrangle, a service wing, and an outdoor recreation area that fan out around an off-grid media center. (“Three solids and a void,” says Romney.) Each element serves as a

standard building block that can be adjusted to a particular site, Romney explains.

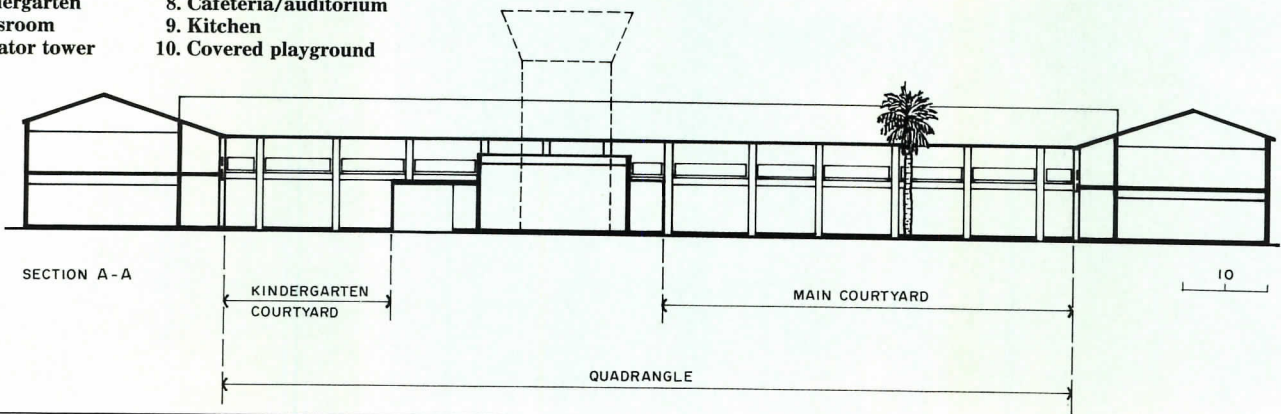
Instead of looking onto parking lots or streets, as many schools do, this school turns inward with grassy courtyards as its focus and a blue and yellow elevator tower as its visual anchor. This sense of enclosure is heightened by a curving concrete block wall to the right of the school’s entryways. The one-story administration building, which represents the most prominent element of the project, is the only block that sits outside the enclosure of the school proper. The building houses the principal’s office, support-staff offices, and a teachers’ lounge.

The service wing—which includes a cafeteria/auditorium, kitchen, music and art rooms, and mechanical spaces—has vehicular access at its east end and pedestrian access on the west, where it approaches the media center. Just south of the cafeteria, Romney carved out a small courtyard that can be used by students after lunch or by parents after PTA meetings.

The media center, which features a



- 1. Administration
- 2. Media center
- 3. Kindergarten
- 4. Classroom
- 5. Elevator tower
- 6. Music room
- 7. Art room
- 8. Cafeteria/auditorium
- 9. Kitchen
- 10. Covered playground





As on other projects, Romney carefully combined pastels with primary colors. In this project, he used pink and turquoise as signature colors on roofs, while reserving blue, yellow, and red for accent. A second-story bridge (left and below) slices through the media center and connects classrooms to the elevator tower.



story space traversed by an upper-level bridge, includes a traditional library, a resource room, and a storytelling pit. Its skewed orientation, in relation to the rest of the project's grid, highlights its special role as both the symbolic and circulatory hub of the school.

While the classroom quadrangle can be thought of as one element, in fact it acts as two—a pair of two-story buildings wrapping around separate courtyards. The smaller of the two buildings houses the kindergarten, while the other serves the upper grades. According to Romney, the courtyards are key elements in his design, bringing light and air to all classrooms and breaking down the 870-pupil school into smaller units with which students can more comfortably identify.

To provide flexibility Romney paired classrooms so they can work as either two spaces or one. A movable blackboard wall hung from a dropped soffit (1 foot 8 inches lower than the 9-foot ceilings) slides on tracks to turn two 34-foot-square classrooms into one large room. The dropped

soffit also provides space for hvac units.

Instead of squeezing work areas into each classroom, the architect grouped six to eight of them in faculty rooms scattered throughout the quadrangle. Such an arrangement encourages teachers to work together, says Romney, and provides them with much-needed retreats.

On the money

To keep the project within its \$7.25-million budget, Romney used inexpensive materials such as corrugated metal, stucco, and concrete block, and simple structural techniques (concrete-block piers for vertical loads and tubular steel beams and precast concrete joists for spanning).

Although limited to rather simple materials, Romney infused them with energy. Angled and chevron roofs of corrugated metal, for example, enliven covered walkways, while curving outdoor stairs add a touch of dynamism to vertical circulation.

Working with these energetic forms is Romney's unusual palette of colors: pink and turquoise for roofs, and primary col-

ors for accent surfaces. The combination of soft pastels with solid primaries somehow works to hold the building's composition together. At the same time, it helps the school assert a distinctive identity, one that students can easily understand and appreciate.

*Jane S. Roberts Elementary School
Dade County, Florida*

OWNER: Dade County Public Schools

ARCHITECT: *Hervin Romney, Architect*
Hervin Romney, designer; Ani Zabla, Nick Ranieri, Jeff Warmington, Mari Chael, design team; Louis Pedraza, G Neville, production; Silvia Lopez, project manager

ENGINEERS: *Riva Klein Partners (structural); Lagomasino Vital (mechanical/electrical); G. Van Meer (civil)*

CONSULTANTS: *Michael G. Asmar De (lighting)*

LANDSCAPE ARCHITECT: *O'Leary, Sh Cosio*

CONTRACTOR: *TGSV Construction*



The media center includes a two-story library (above), as well as a resource room and a storytelling pit. The center, which serves as a fulcrum between the school's four quadrants, is placed at an angle to the rest of the project's grid. Romney emphasized the special role of the media center and its off-grid orientation by angling a second-story bridge through the space. In the service wing, Romney designed a cafeteria that doubles as an auditorium (left). Just south of this facility, he carved out a small courtyard that can be used by students after lunch or by parents after PTA meetings.



© PAUL WARCHOL

HEARING THE COMMUNITY

Hope Elementary School
Hope, Indiana
Taft Architects



In a small town like Hope (population: 2,200), a new school brings out the concerned citizen in everyone. So when Taft Architects began designing Hope Elementary School, they spent a lot of time listening—to school administrators, teachers, parents, and students.

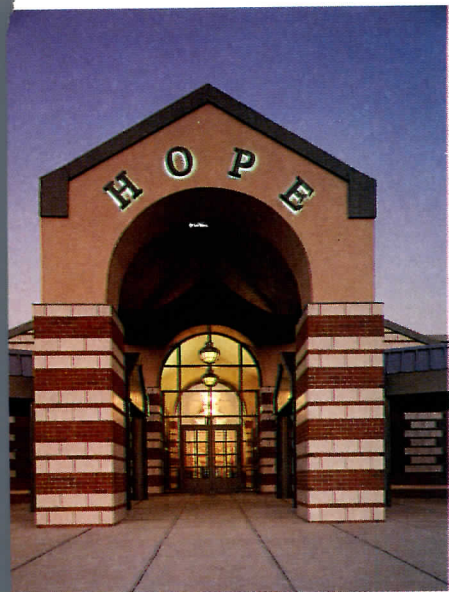
Administrators wanted a one-story structure that would be economical but at the same time eye-catching, says Glen Keller, the area's superintendent of schools. "Teachers wanted classrooms with lots of windows, lots of chalkboard space, and lots of storage," he adds. And everyone wanted a facility that would serve the community as a whole, a building in which they could all take pride. Finally, no one wanted a flat roof. (The last elementary school had a flat roof and it leaked.)

While most rural towns would probably have turned to a local architect to design a new school, Hope was able to take advantage of the Cummins Engine Foundation's standing offer to pay the architectural fees for public projects in Bartholomew County that use an architect from a list of

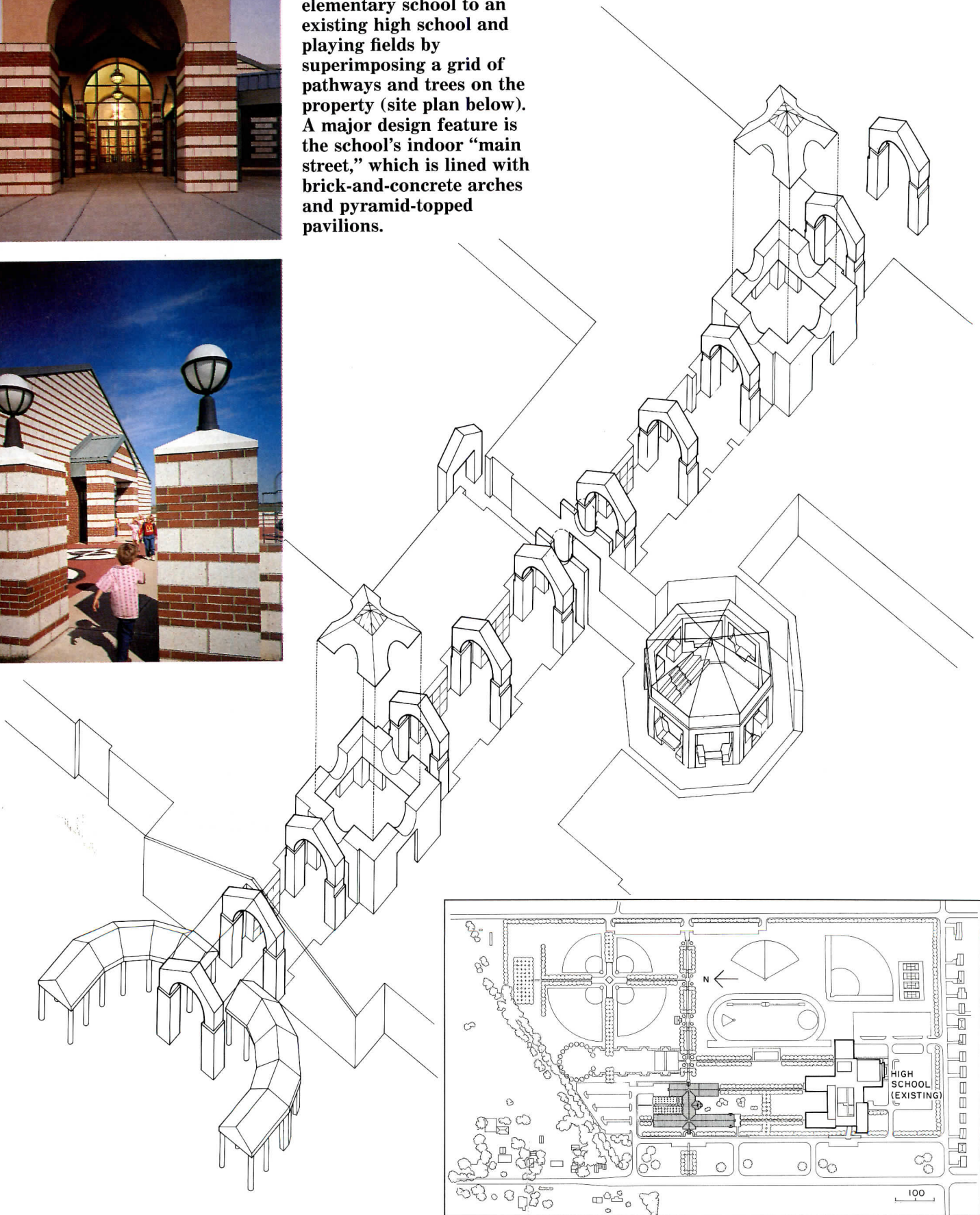
outstanding firms. After interviewing nationally prominent firms, the school board selected Houston-based Taft, in part for the firm's willingness to involve the community in the design process.

"The idea was to create an educational park, linking the elementary school to an adjacent high school and playing field," explains John Casbarian, one of the Taft partners involved in the project. Toward this end Casbarian and his partner Danny Samuels and Robert Timme selected the existing fields and continued the grid lines in the plan of their school. Once the new trees fill out, they also will help create a courtyard between the two schools.

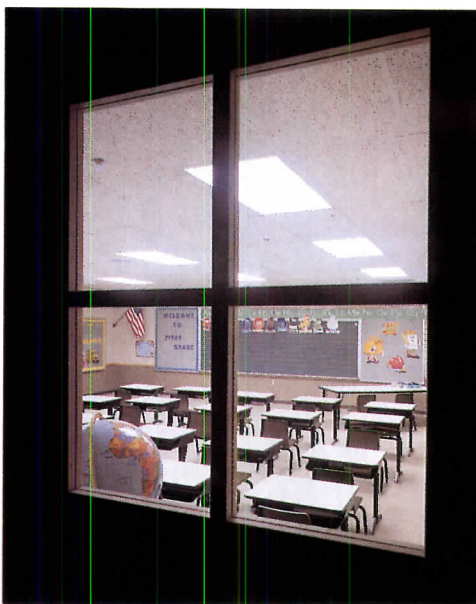
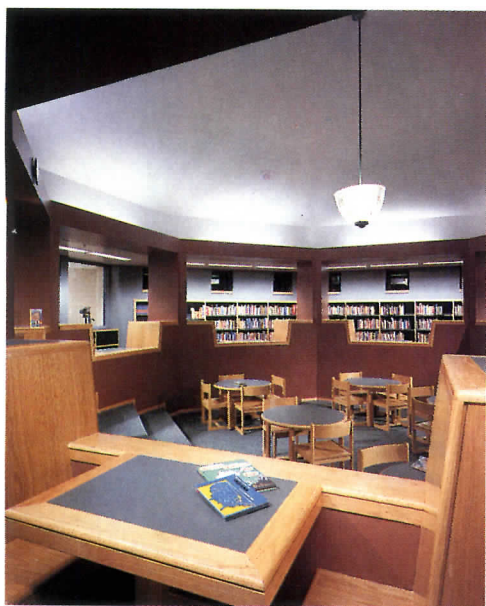
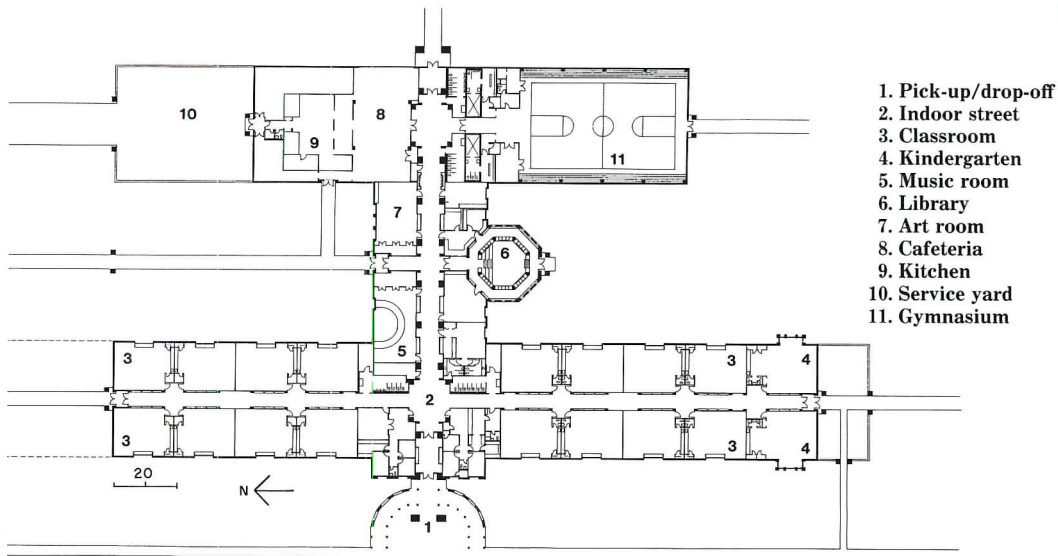
The key element in Taft's design is an indoor "main street" that serves as the school's major gathering space. Modeled after English arcades, the corridor features bay windows that look like storefronts but actually accommodate administrative offices, the art room, music room, a math/reading room, and a lounge. Two wings—one for class-



Restricted to a \$4.5-million construction budget (\$83/sq ft), Taft Architects used a 60-foot-wide repetitive steel frame and inexpensive materials such as brick and concrete block. The architects tied the new elementary school to an existing high school and playing fields by superimposing a grid of pathways and trees on the property (site plan below). A major design feature is the school's indoor "main street," which is lined with brick-and-concrete arches and pyramid-topped pavilions.



The school's east-west indoor street intersects two north-south wings—one for classrooms and the other for gymnasium and cafeteria. The octagonal library (below left) sits halfway between the two wings. With bookshelves around the perimeter and most tables half-a-level below, the library makes effective use of its space. The multipaneled walls of facilities such as the art room (below right) and the music room (opposite) were modeled after arcaded English storefronts to provide maximum visibility.



and the other for shared facilities such as cafeteria, kitchen, and gymnasium—cross the corridor. To break the long indoor street into smaller sections, Taft designed the intersections as pavilions with pyramidal skylights and thick masonry piers.

Reflecting its role as the hub of the 400-student school, the library sits exactly halfway down the main corridor. The octagonal facility works on two levels—bookshelves around the perimeter and reading tables six steps down in the middle.

To stay within a \$4.5-million construction budget, Taft built the school with a simple steel frame and masonry walls, and set a fixed width of 60 feet. “We used durable, inexpensive materials and made them look rich,” says Danny Samuels.

For the main entrance, the architects designed a grand portico with the project’s emblematic brick-and-concrete courses. Aligned with the school’s major axis, the entrance introduces the project’s most important architectural features—the indoor street, the arches framing this street, and the pavilion form. Stretching from the en-

trance is a pair of metal-roofed canopies that provide a sheltered area for children waiting for their buses.

Throughout the design process, Taft kept a child’s perspective in mind. The distinctive banding of brick and concrete, for example, was designed with one eye at a kid’s level. Windows in classrooms also start low (2 feet 4 inches above the floor) and reach to 8 feet.

“But we weren’t restricted to a child’s scale,” says Robert Timme. “We didn’t want all of the spaces to feel small.” Instead, Taft alternated large with small spaces, the ceremonial and institutional with the more intimate and residential.

In the classroom wing, the architects broke down the long corridor into clusters of four rooms (two rooms on either side of the hallway), enabling teachers to work together, if they so desire.

“We saw the school as a microcosm of the town as a whole,” says Casbarian. As a result, the architects kept in mind that adults, as well as children, would be using the building, and that community, as well

as educational, activities would take there. Like a good children’s book Hope Elementary School engages parents while at the same time educating children. C.

*Hope Elementary School
Hope, Indiana*

OWNER: Flat Rock-Hawcreek School Corporation

ARCHITECT: Taft Architects—John J. Casbarian, Danny Samuels, Robert Timme, partners; Larry A. Dailey, senior associate; Robert Bruckner, Hecht, Eric Morris, Mark Volpender, support team

ASSOCIATE ARCHITECT: James Architects & Engineers

ENGINEERS: James Architects & Engineers (structural, mechanical/electrical)

CONSULTANTS: Michael J. Underhill (programming)

LANDSCAPE ARCHITECT: SWA, Inc. (concept); Dan Cook (associate)

GENERAL CONTRACTOR: Repp & Mur





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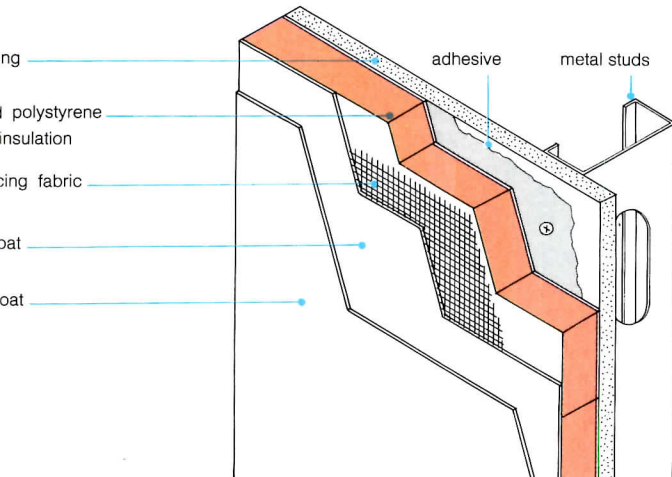


COMMERCIAL
D I V I S I O N

Support teams made up, not of glorified salesmen, but local architectural

TECHNOLOGY NEWS

Radiant Heat Tests for EIFS



Manufacturers hope that testing will confirm combustibility of cladding that incorporates foam plastics.

Manufacturers who favor exterior insulation and finish systems (EIFS) as cladding of choice for mid-rise structures could have to be thinking about alternative materials. Concerns about combustibility from radiant heat have forced code-writing commissions to take a closer look at use of EIF systems as cladding for buildings required by code to be constructed of incombustible materials. A new test has been developed that the industry hopes will put fire safety issues to rest. One of the concerns of code officials is the foam-plastic insulation that is a component of the systems. Though it is treated

with fire-retardant chemicals, some analysts claim it will ignite under radiant heat generated from a fire in an adjacent building or other outside source [RECORD, July 1989, pages 124-127].

Overnight changes in the building codes are unlikely. Two of the major code-writing bodies rejected proposed changes, put forward last fall at their annual code development conferences, that would either have restricted use of the material to combustible construction classes or imposed testing requirements. But last June, Building Officials and Code Administrators International (BOCA) approved code changes that categorized EIFS

materials as combustible unless testing shows otherwise. Limitations on EIFS use, including height restrictions, were also being considered by the two other code-writing bodies, the ICBO and the SBCCI. The industry's trade association, EIMA, claims the changes are promoted by masonry and concrete interests and could destroy its members.

The key to ending the controversy and to surmounting the new BOCA restrictions lies in definitive testing. "The industry was challenged to produce information," says Frederick Fisher, a fire-protection engineer with the Fire Research Laboratory at the University of California, Berkeley, who was hired by EIMA to develop the tests. "There is no nationally recognized test method that has been designed to evaluate the ignitability of these materials exposed to radiant heat."

Fisher hopes his tests will mollify code officials, and will be adopted as a standard certifying the systems' incombustibility. The procedure uses radiant testing of full-scale mockups with laboratory verification. He anticipates that lab scale methods will prove sufficient to certify performance. His tests of 28 different systems should be concluded this month; the results will be submitted to model-code bodies, ASTM, and NFPA by year-end.

PETER D. SLATIN

Reducing Refrigerant Emissions

There is more progress on the reduction of chlorofluorocarbon emissions, which have been implicated in the depletion of the earth's protective ozone layer [RECORD, October 1989, pages 134-135]. Centrifugal chillers and manufacturers such as Trane are encouraging users to consider one of several options for conserving energy and converting to systems that use safer hydrochlorofluorocarbons (HCFCs).

Improved maintenance, the first option, includes leak prevention—some 40 percent of CFC emissions occur through leaks—and leak purging, the removal of noncondensable air from the system.

The second option, converting existing CFC chillers to HCFC use is now a possibility, but it is a complex process that requires an engineered conversion.

The third option is to purchase

new equipment. Electric chillers that have been rehabilitated to run on HCFC are said to cost about 70 percent of the cost of new equipment. A new or reworked chiller is called for when a current system has capacity too marginal to permit re-engineering. Equipment is available in several generational modes, so the designer must thoroughly analyze the possibilities before making up his mind. □

Book Briefs

Seismic and Wind Loads in Architectural Design, 2nd Edition, by Stanley W. Crawley and Delbert B. Ward. Washington: American Institute of Architects, 1990, \$63.50 (\$53.50 for members). Revised to treat substantial changes in the seismic codes since the first edition's publication in 1987. To order: 800/242-4140.

Performance of Buildings and Serviceability of Materials, Gerald Davis, Francis T. Ventre, Eds. Philadelphia: ASTM Publications, 1990, \$44 (\$35.20 for members). Proposes standards for evaluating performance and offers a collection of papers for facilities managers and users. To order: 215/299-5585.

New Stone Technology: Design and Construction for Exterior Wall Systems, Barry Donaldson, Ed. Philadelphia: ASTM Publications, 1990, \$34 (\$27.20 for members). Greater use of thin stone has brought its share of technical complexities. The chapters include coverage of thin veneer stone, panel systems, and glass-fiber reinforced concrete systems. For information, 215/299-5585.

Robert Maillart and the Art of Reinforced Concrete, by David P. Billington. New York: The Architectural History Foundation, 1990, \$60. Accompanied by handsome photographs and analytical drawings, the text cleanly describes the great bridge builder's search for structural refinement.

Standard: TD-6, Standard Reference Symbols for Construction Documents, offered by the Construction Specifications Institute, is intended to reduce the proliferation of graphic symbols to as few as 248, organized by the CSI numbering system. For information: 703/684-0300. □

DETAILING THE DIFFICULT ROOF

We designed a hard-to-protect structure and asked roofing manufacturers for proposals. Here is how eight responded.

Designing a roof calls for a complex arrangement of several elements. What do you do when standard details don't apply? To tap into the expertise available at roofing companies, RECORD asked 20 manufacturers to come up with solutions for some atypical conditions. We designed a small but complicated structure, and asked each respondent to propose an appropriate product, draw details, and describe the selected system's advantages and disadvantages. In the following pages, we show parts of the eight replies we received.

We turned to two experienced hands to advise us on the design of the roof and look at the submissions. David Zaiser has considerable roofing and reroofing experience. He is an architect at Kehrt, Shatken, Sharon Architects, of Princeton, New Jersey. Carl G. Cash is a principal of Simpson Gumpertz & Heger, in Arlington, Massachusetts, a consulting engineering firm with wide experience in inspecting, testing, and specifying remedial work for roofs.

We had some preconceived notions about our roof. The structure has both a low-sloped barrel vault and a "flat" (1/4-in.-per-ft slope) area (details below). To be able to use the same product and installation on both would be an advantage. Color was also important, since the barrel roof

could be seen from a distance.

Runoff from the sloping roof is conveyed to a scuppered gutter, which presented hard-to-detail links from roof to gutter, and gutter to parapet. The roof was described as capable of deflecting 1/2 in. under load. The point at which this surface meets a through-wall scupper required detailing a joint that can move when water accumulates.

Prior to submitting, one manufacturer, Stevens, asked us for more information (we had left some areas vague for the sake of simplicity): the UL Class of the roof, application of Factory Mutual data 1-28 (steel deck) or 1-29 (single-ply roof), the ANSI Ground Roughness Exposure, pressure and humidity considerations within the

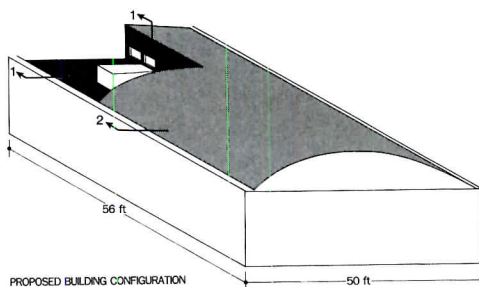
building, the nature of any chemicals vented onto the roof, the warranty period. Zaiser called this "an excellent check-off of design considerations."

How they responded

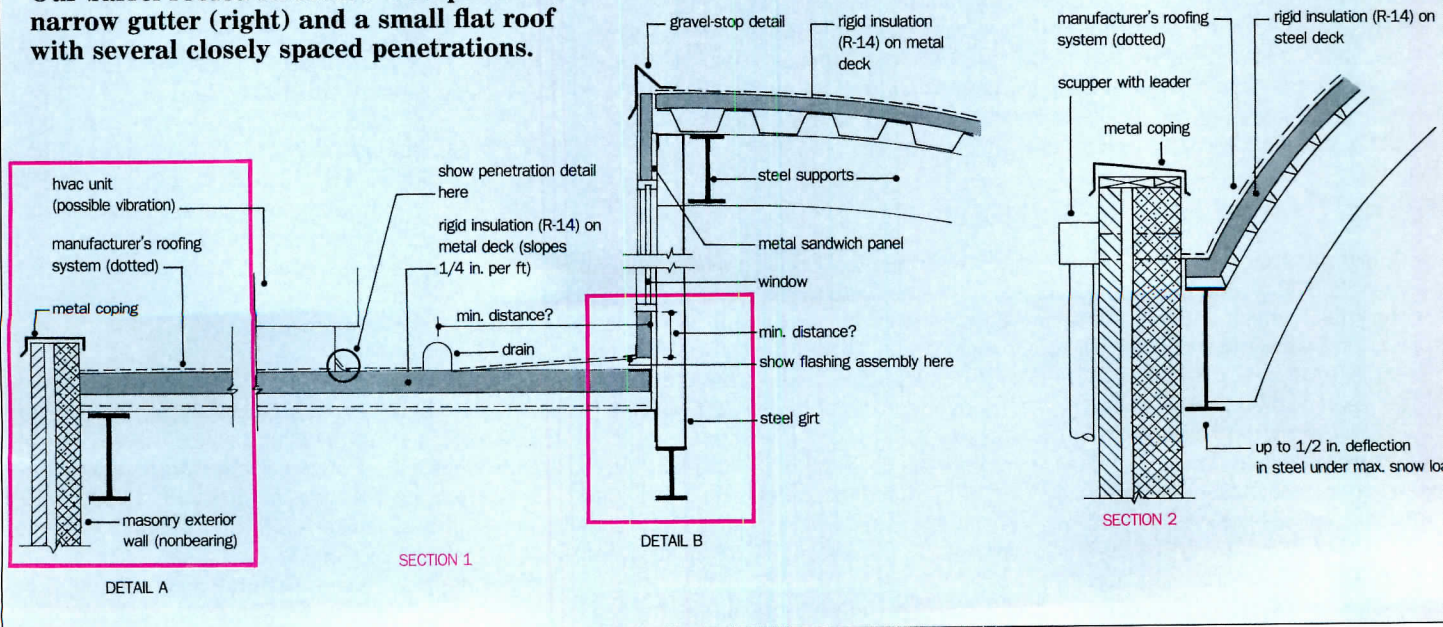
Most of the manufacturers tried to adapt the designs to their own typical details, which, in some cases, called for redesigning the roof-gutter condition. Most respondents submitted CAD-generated drawings. These are reproduced (rather than hand-drawn as is our usual practice) so the reader can evaluate their completeness and clarity. Some manufacturers gave us a combination of computer drawings and hand-drafted or sketched drawings (the latter have been redrawn). We have noted the availability of computer details and the applications with which they are compatible in the chart opposite.

Sarnafil. The company proposes a fully adhered, 72-mil polyester-reinforced membrane for the flat roof. On the barrel roof, a similar membrane, mechanically attached, is recommended for ease of installation. The system is said to be puncture resistant and tolerant of ponding water. Seams are hot-air welded. Metal accessories are PVC-coated for compatibility.

Stevens. Stevens offers two systems



Our barrel-roofed structure incorporated a narrow gutter (right) and a small flat roof with several closely spaced penetrations.



ed on its single-ply membrane of chlorophenated polyethylene (CSPE) synthetic fiber (trade-named Hypalon). Hi-Tuff includes the membrane and its related fasteners and adhesives; Hi-Tuff Plus includes a compatible insulation system and fasteners, metal fascia and termination accessories, and a longer warranty. The membrane reduces summer heat absorption. The mechanically attached method costs less than fully adhering the membrane to the substrate. Designers may find the batten system unattractive. The seams are hot-air welded, and the membrane is fire resistant.

Manville. A modified-bitumen SBS system is proposed. (For a review of the differences between the two types of modified-bitumen systems, see RECORD, February 19, page 128.) Two base plies of fiberglass-reinforced asphaltic felts are fastened over nailers on the barrel roof and topped in with hot asphalt. A cap sheet is mopped in. The company offers two types of protective granule coatings. The system on the flat roof is similar, but the fasteners are deleted and a different cap sheet offers fire-resistive qualities. Compared to a single-ply, the smaller sheets of modified bitumen are suited to the roof's small area and high number of penetrations.

Carlisle. An EPDM synthetic-rubber membrane is recommended, mechanically fastened to the barrel roof and fully adhered to the flat roof. The adhered system is preferred by Carlisle because it is less complex to install on the small area of the roof. The mechanically attached system is less labor-intensive and meets Factory Mutual 1-90 wind-uplift requirements on the barrel roof (although the maximum height of sheets for the FM-approved system is 7 ft). The membrane is offered in black only. Zaiser noted that a fully adhered system would have a cleaner appearance.

Cost. An advantage of the two-ply SBS modified-bitumen Paradiene 20/30 system (proposed for the flat roof), says Siplast, is that the bottom fiberglass-reinforced ply can be laid as a temporary waterproof barrier. Once work that might damage the membrane is completed (such as equipment installation), the top layer is mopped into place. With a fire-resistant cap sheet, the system meets UL Class A fire-resistance criteria; FM approvals were pending at press time. The roof may be applied with either hot asphalt or cold adhesive. For the barrel-roofed section, Siplast offers a foil-faced two-ply SBS with an "aluminum" appearance, which reduces heat gain. The cap sheet is mechanically fastened to the roof deck through the insulation. The top layer is torch-applied.

Eracorp. The company, which now incorporates products of Synergy Methods, proposes a fully adhered EPDM single-ply

for both roof conditions. The company sees the system as the most suitable for a small roof (arguing that 10,000 sq ft is generally the economic minimum for mechanically fastened methods). Zaiser agreed with this assessment. The membrane's 300-percent elongation is seen as useful at points of movement and where vibration may be a factor, such as at mechanical units.

Tamko. A three-ply SBS modified-bitumen system was chosen. It comprises two plies of fiberglass-reinforced felts installed in hot asphalt covered by a layer of poly-

combinations that would comply is limited. **Vapor barrier.** Insulation types and configurations are affected by provision of a vapor barrier. Several manufacturers noted that the National Roofing Contractors Association recommends that a vapor retarder be considered when the outside average January temperature is below 40 F and the expected interior winter relative humidity is 45 percent or more.

Cost. We didn't ask for costs, since there were too many variables to be useful. For example, the relatively small sheets of

Roofing Manufacturer	Features generic type	brand name	top layer	color	base layer	installation method	recommended insulation	CAD details	compatible with
TAMKO	flat and barrel roof	SBS modified bitumen	Awaplan Premium	Polyester reinforced bituminous	selection	2 plies asphalt sheet	hot asphalt	1-in. perlite 2-in. isocyanurate	Tam-CADD AutoCAD
SIPLAST	flat roof	SBS modified bitumen	Paradiene 20/30 FR	Paradiene 30 FR	selection	1-ply Paradiene 20	hot asphalt	1.8-in. isocyanurate	yes AutoCAD
	barrel roof	SBS modified bitumen	Veral/Irex	fiberglass reinforced bituminous	aluminum foil clad	fiberglass reinforced bituminous	torch applied	2-in. isocyanurate	
MANVILLE	flat roof	SBS modified bitumen	Spec #3GID	DynaKap FR	selection	2 ply GlasPly	hot asphalt	1.3-in. phenolic .75-in perlite	no
	barrel roof	SBS modified bitumen	Spec #3GID	DynaKap		2 ply GlasPly	hot asphalt	1.3-in. phenolic .75-in perlite	
ERACORP	flat and barrel roof	EPDM	Synergy	60-mil sheet	black	na	fully adhered	2-in. isocyanurate	yes AutoCAD
CARLISLE	flat roof	EPDM	Sure-Seal	45-mil EPDM	black	na	mechanically attached	2-in. isocyanurate	yes AutoCAD
	barrel roof	EPDM	Sure-Seal	60-mil EPDM	black	na	fully adhered	2-in. isocyanurate	
STEVENS	flat and barrel roof	CSPE (Hypalon)	Hi-Tuff Plus	single ply	white	na	mechanically attached	2-in. isocyanurate	CADalog AutoCAD Intergraph
SARNAFIL	flat roof	polyester reinforced PVC	G410L	single ply	selection	na	fully adhered	2-in. isocyanurate	yes AutoCAD
	barrel roof	polyester reinforced PVC	S327	single ply	selection	na	mechanically attached	2-in. isocyanurate	
COOLEY	flat and barrel roof	CPE/PVC/Elvaloy	C3	40-mil sheet	3 colors	na	mechanically attached		

The chart summarizes the characteristics of the roofs proposed by manufacturers for this project.

ter-reinforced modified-asphalt roll roofing (the latter is applied with hot asphalt or by torch). The company claims that the system combines the redundancy of multiple plies (an advantage of built-up roofs) with the strength and elasticity of single-ply membranes. The cap sheet's granular surface is offered in several colors.

Cooley. The company's latest product, called C3, is a "tri-polymer alloy" of CPE, PVC, and Elvaloy, a DuPont material. It is a mechanically attached single-ply system, although it is shown fully adhered in some details. Splices are hot-air welded. Three colors are available.

Recommendations

With the caveats noted, our consultants felt that all the systems offered straightforward, workable standard details. The lesson is that the roof should be designed to avoid hard-to-detail conditions. The responses show, Zaiser commented, that "no single manufacturer has all the answers." Some other factors that might influence a system decision:

Fire resistance. If a timed (say, UL-tested 1-hour) resistivity had been required, the number of insulation and roof membrane

modified-bitumen systems have an advantage for the small, complex roof of our structure. On a large, unencumbered roof, elastomeric sheets that come in long, wide rolls may be less expensive.

Maintenance: Most systems offer a walk-pad product to reduce damage from maintenance activities.

Insulation: Because insulation is now commonly placed on top of the roof deck, it can be critical to long-term membrane performance. Insulation must be properly supported by the deck and fastened to avoid blow-off, and it can't chemically react with any of the components of the membrane. Thus, specifying (or accepting) insulation not specifically approved by the membrane manufacturer is risky.

A final caution: Zaiser noted that manufacturers sometimes indicated insufficient edge-accessory fastening—a detail frequently overlooked by designers as well. Gravel stops and fascias must be attached, usually with wood nailers, "to structural elements—masonry, walls, metal roof deck." Sometimes the roof-deck edge is inadvertently left loose because the corrugation doesn't fall on its support.

JAMES S. RUSSELL

SECTION 1/Detail A

Detail for a flat roof where it meets a parapet

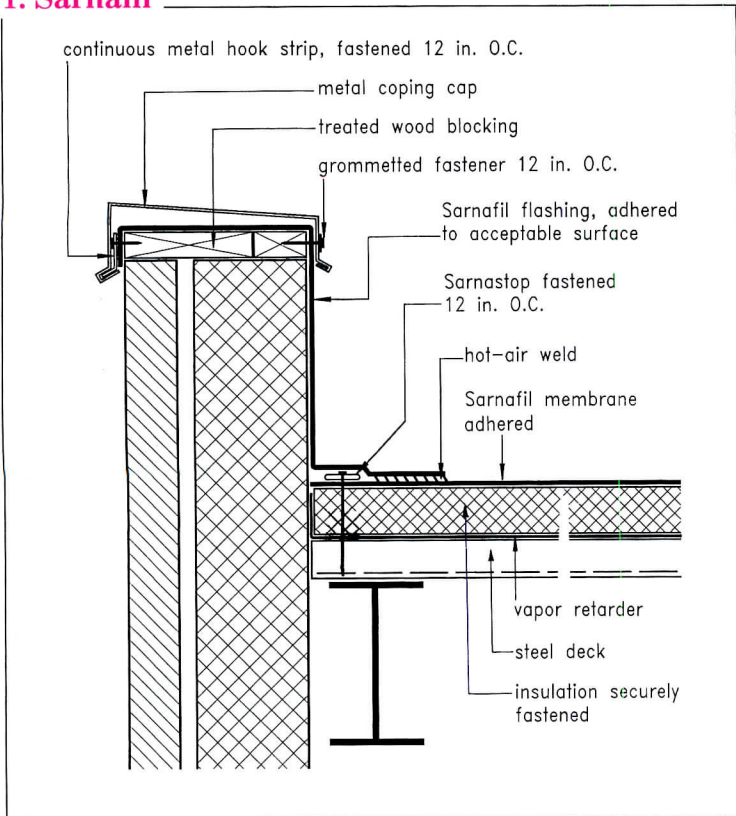
Detailing a parapet can be difficult because the roofing material meets flashing and coping, which may or may not be supplied by the manufacturer. In the case shown, the roof-wall joint may move because the roof is separately supported.

1. *Sarnafil*. The flashing is run up and over the parapet under the coping, which will shed any water that leaks through.

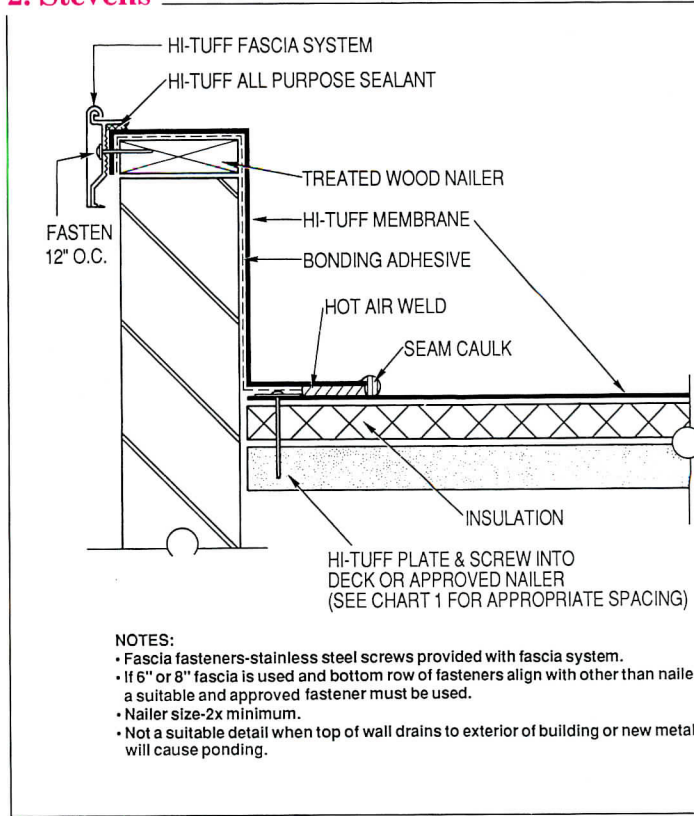
Carl Cash considered Sarnafil's dependence on the membrane's flexibility to take up roof-to-wall movement (similar to Carlisle and Cooley) to be "unrealistic."

2. *Stevens*. The company supplied detail with and without an expansion joint (the latter is shown). The exposed outer corner of the membrane in this detail is subject to puncture.

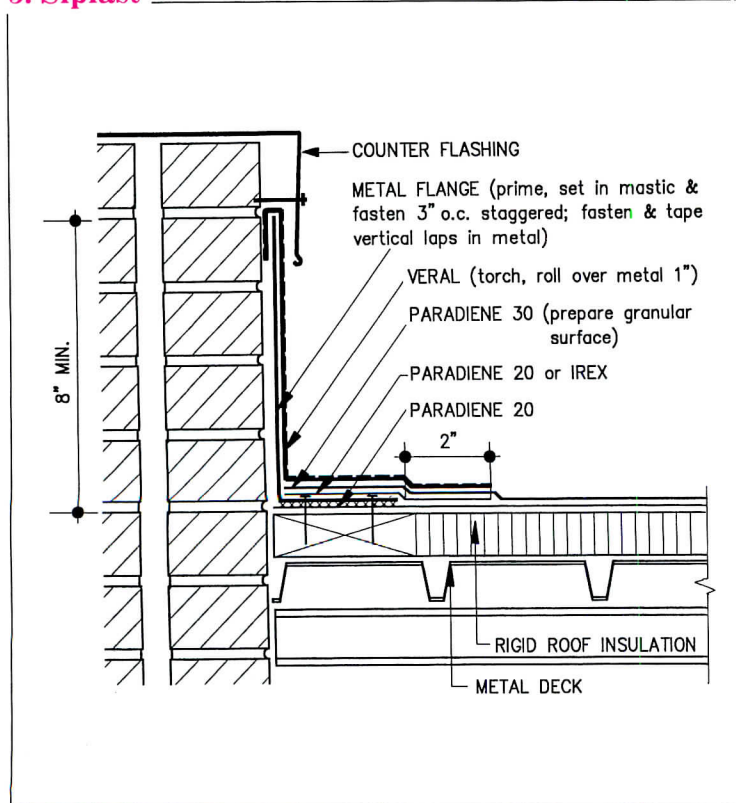
1. Sarnafil



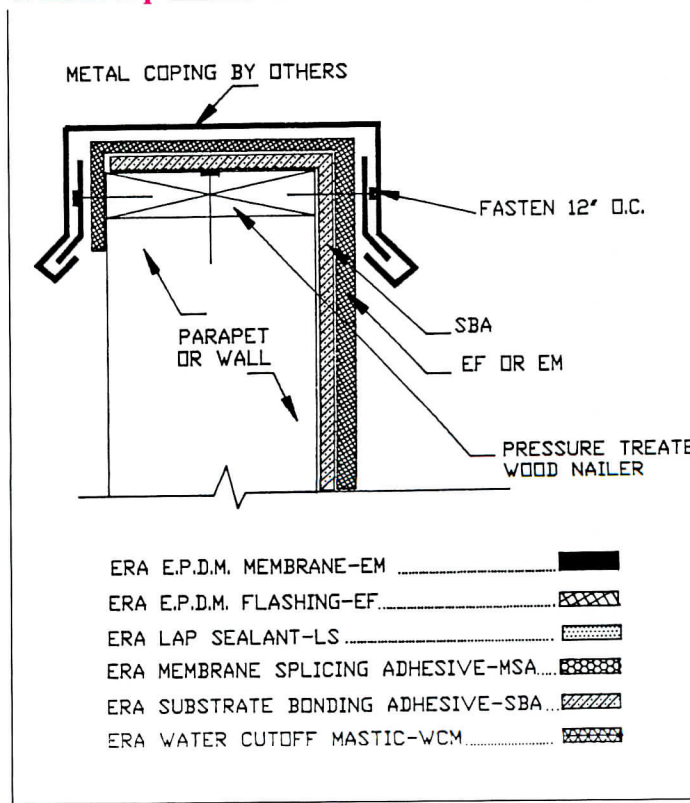
2. Stevens



5. Siplast



6. Eracorp



anville. The detail is the same as the proposed for the gutter at the barrel. Zaiser comments: "The only proposal showed that the blocking at the masonry wall must be of the countersunk and-bolt variety."

Carlisle. The roof-to-wall joint shown would depend on the membrane's high penetration, but the company also supplies

expansion-joint details. A variety of termination details (not shown) could be used at the coping.

5. Siplast. A flashing strip is wrapped around a metal flange, which can move independently of the wall under a metal coping. The Veral sheet is shown here without a cant strip, normally used.

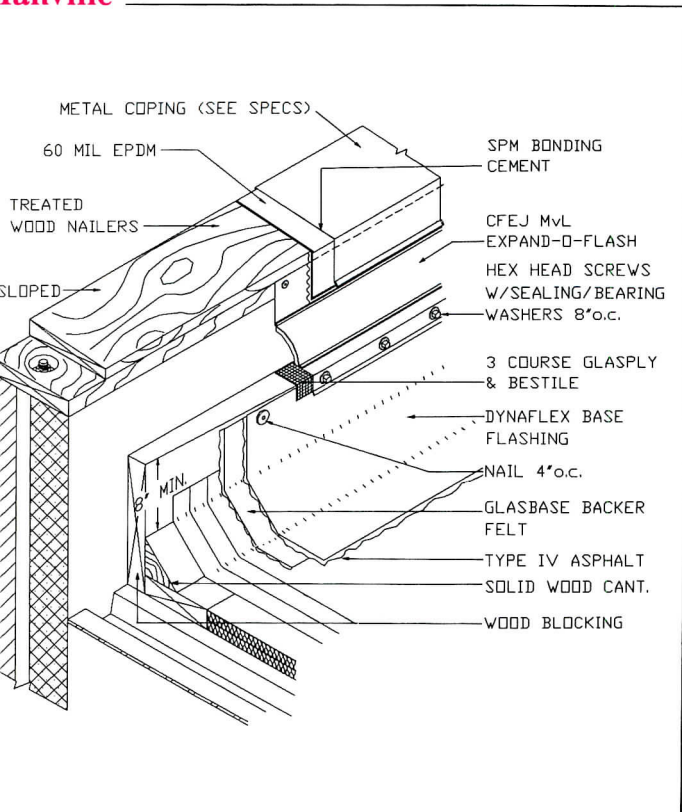
6. Eracorp. The detail shows EPDM flash-

ing wrapped completely over the parapet under a coping.

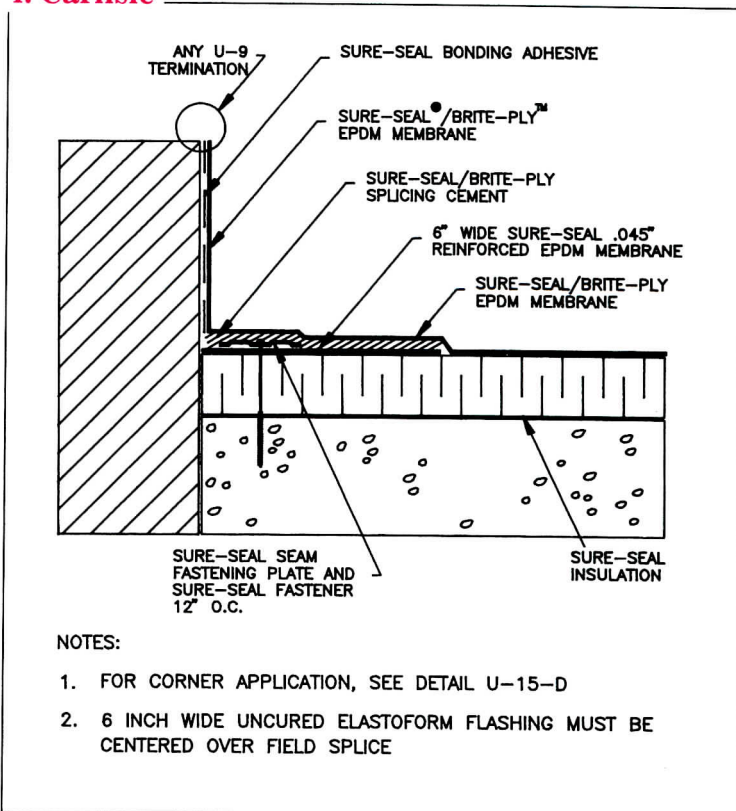
7. Tamko. The company drew a full expansion joint with a metal counterflashing over the turned-up roof edge.

8. Cooley. Cash comments: "Neither the type and thickness of insulation nor the distance between fasteners is specified, which is critical for wind resistance."

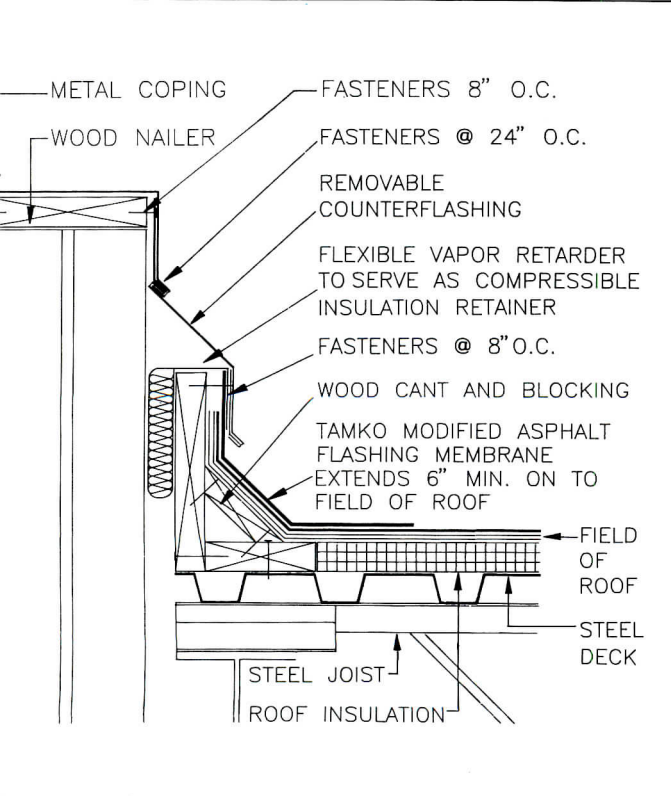
Tamko



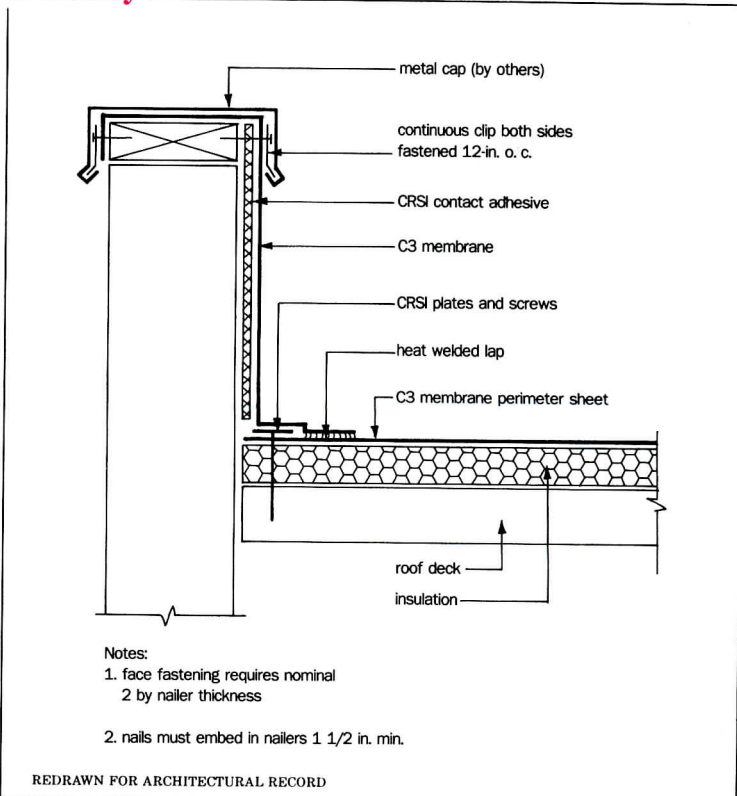
4. Carlisle



Tamko



8. Cooley



SECTION 2

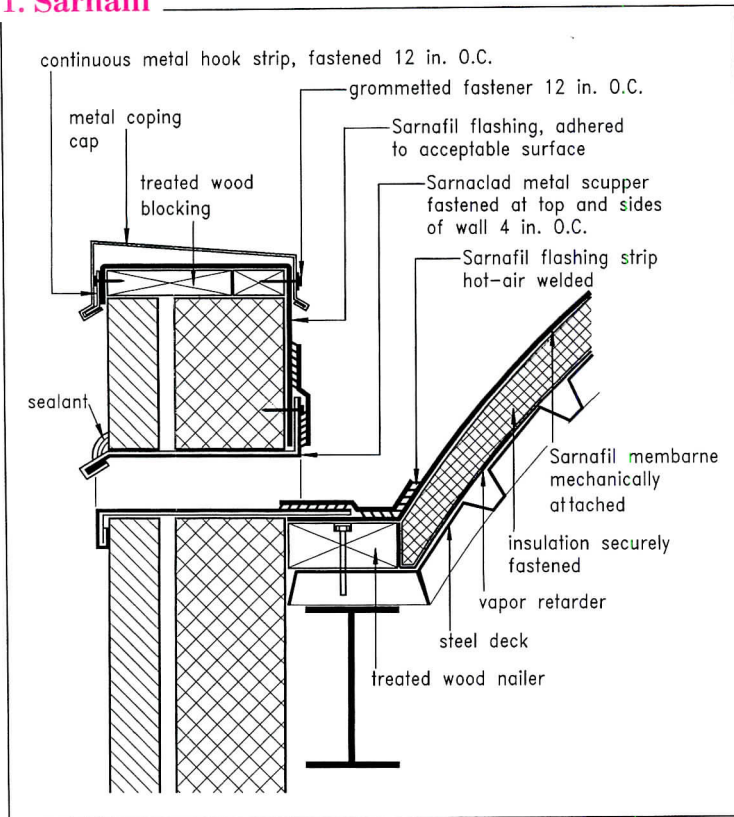
Detail of a gutter at the base of a sloping roof.

An internal gutter doesn't leave much room for flashing and requires maintenance. Some of the manufacturers suggested changes they felt were necessary to make our detail work.

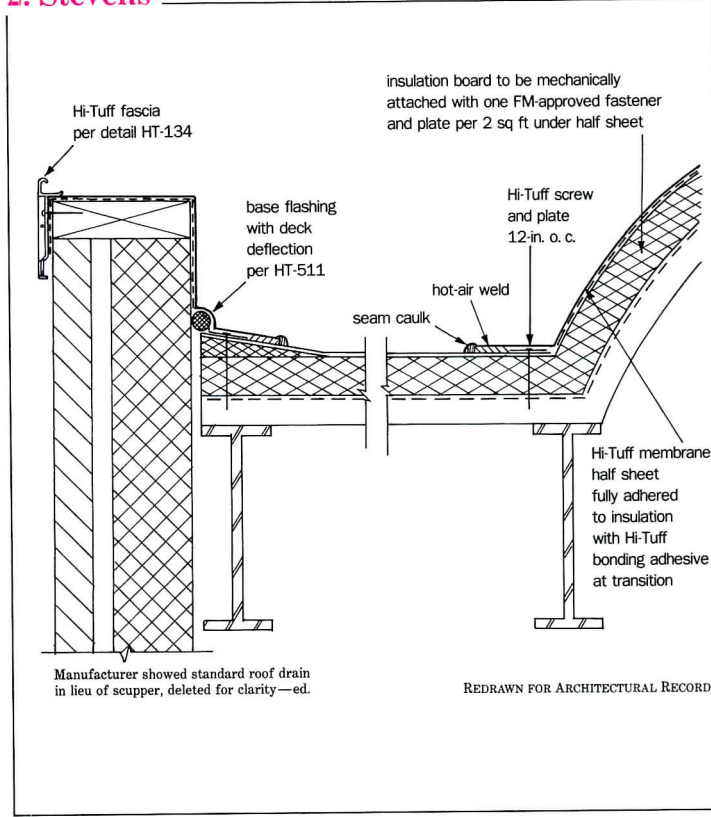
1. *Sarnafil*. The flashing can be hot-air welded to the PVC-coated metal scupper. Zaiser would prefer coping fasteners that "don't make water-entry holes."

2. *Stevens*. The company proposed that the gutter be widened to at least 3 ft (echoed by Carlisle, Eracorp, and Tamko) and the scupper replaced with a drain (not shown). The termination bar (a detail used by several manufacturers) shows "a misplaced reliance on a horizontal sealant bead for water tightness," says Cash.
3. *Manville*. Interior drains are reco-

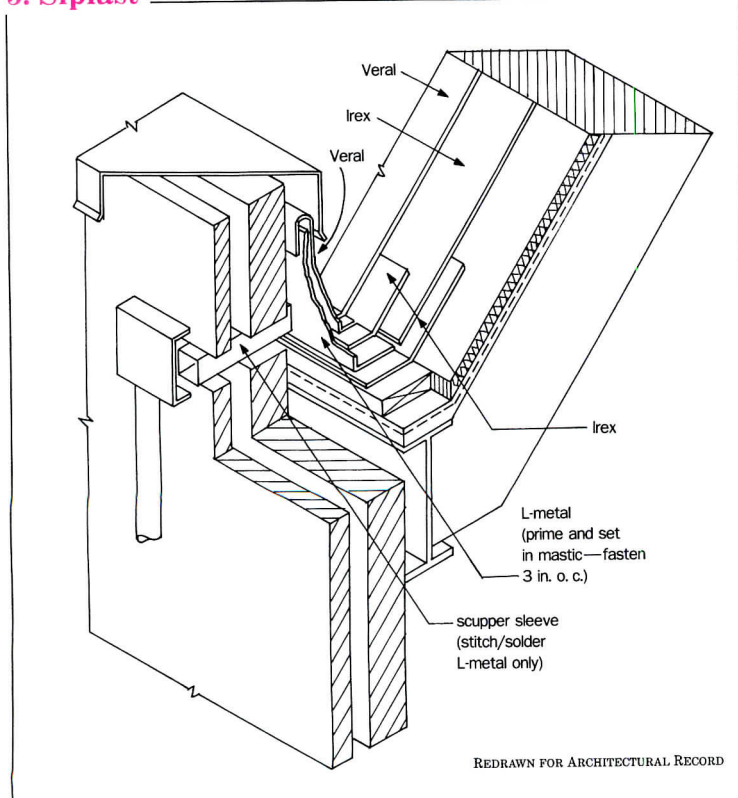
1. Sarnafil



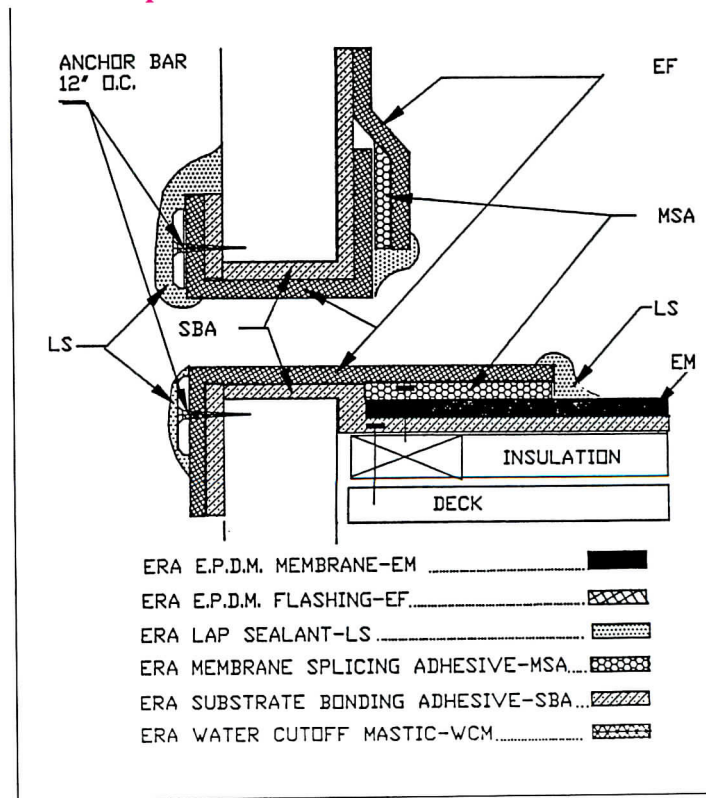
2. Stevens



5. Siplast



6. Eracorp



ended. A flexible bellows on the drain would allow movement relative to fixed piping.

Carlisle. In the detail shown (one of two provided), an expansion joint takes up movement between wall and gutter. To permit drainage by a scupper across an expansion joint is "wrong," in Cash's view.

Siplast. A metal scupper assembly is

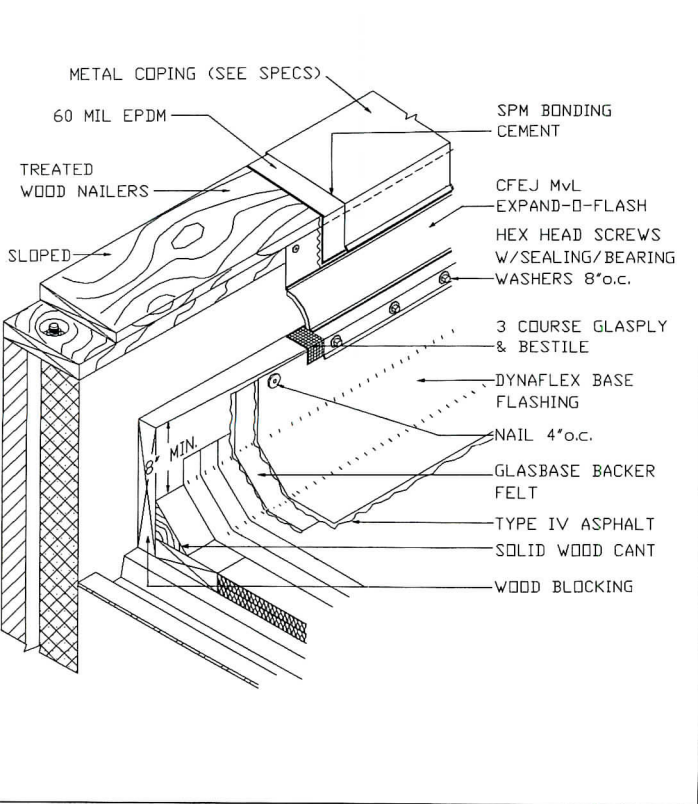
fastened to the blocking supporting the gutter, which allows it to move independently of the wall. Zaiser noted that a moving joint at the scupper-downspout interface would be needed.

6. Eracorp. The company recommended drains rather than scuppers, but did provide a scupper detail of EPDM flashing. A conductor and downspout are not shown.

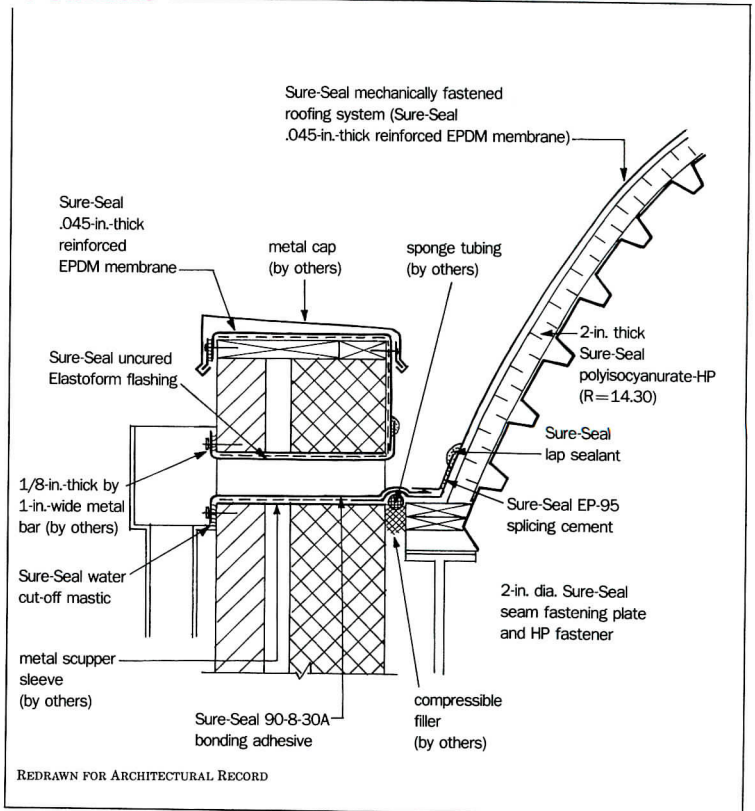
7. Tamko. To separate the gutter from the roof, the company shows an insulated, metal-counterflashed expansion joint. The scupper was deleted in favor of a drain.

8. Cooley. A membrane flashing sheet is extended up the parapet, where deflection is accommodated by a counterflashing. A seam at the bottom of the valley "is asking for trouble," warns Zaiser.

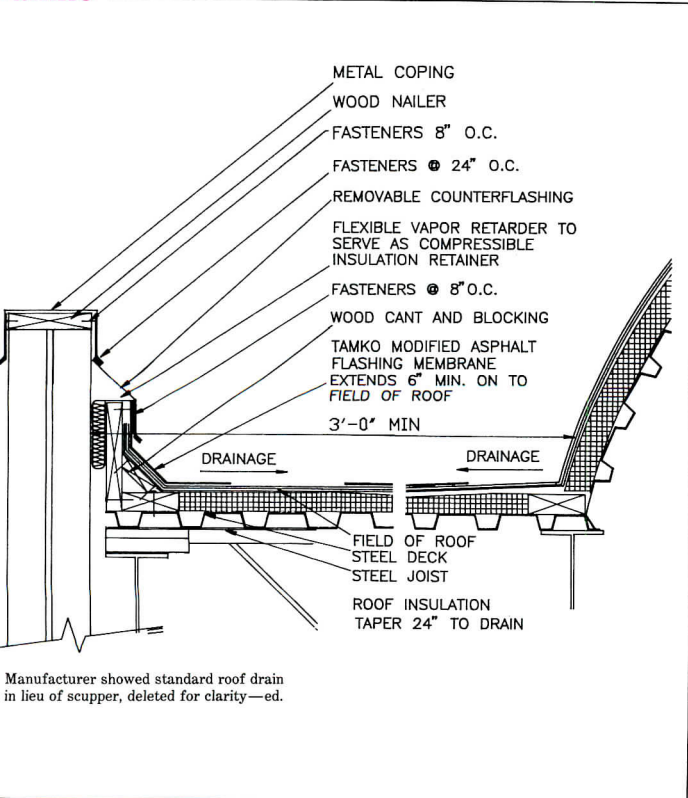
Manville



4. Carlisle

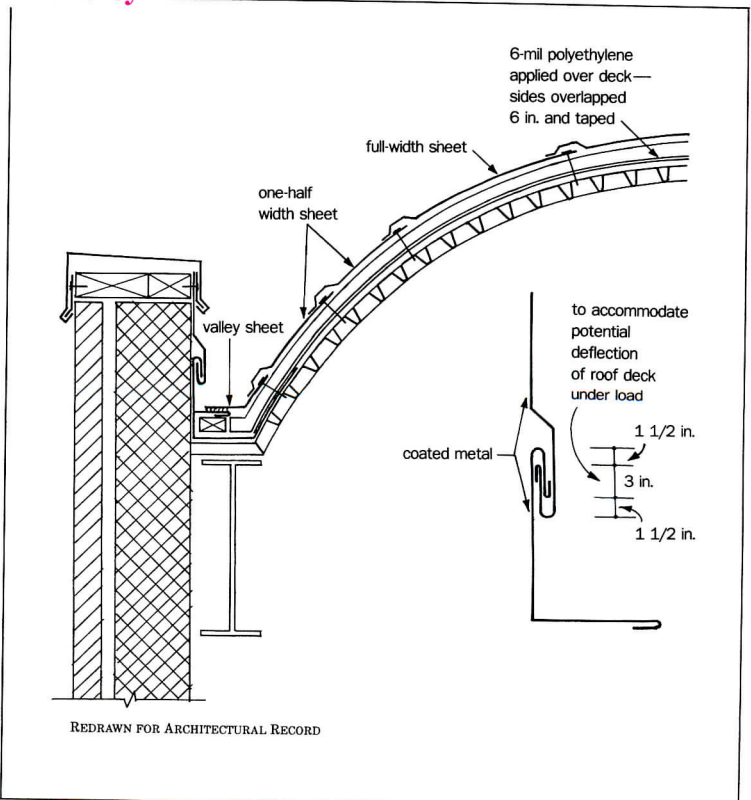


Tamko



Manufacturer showed standard roof drain in lieu of scupper, deleted for clarity—ed.

8. Cooley



SECTION 1/Detail B

A flat roof with penetrations meets a wall with a low-set opening.

A roof-to-wall detail is fairly straightforward except near penetrations. We asked how close to the wall a drain could be located, and how low a penetration (such as a window) could be placed.

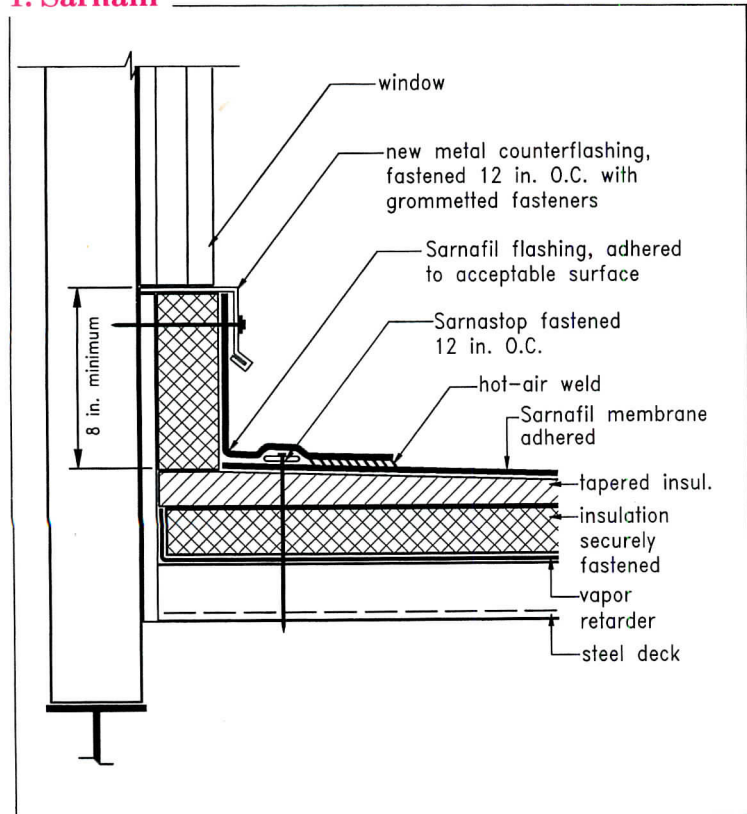
1. *Sarnafil*. The company used exposed fasteners to attach fully adhered flashing to the wall through a counterflashing. Sarnafil says there is no minimum horizontal

distance from a wall to a drain.

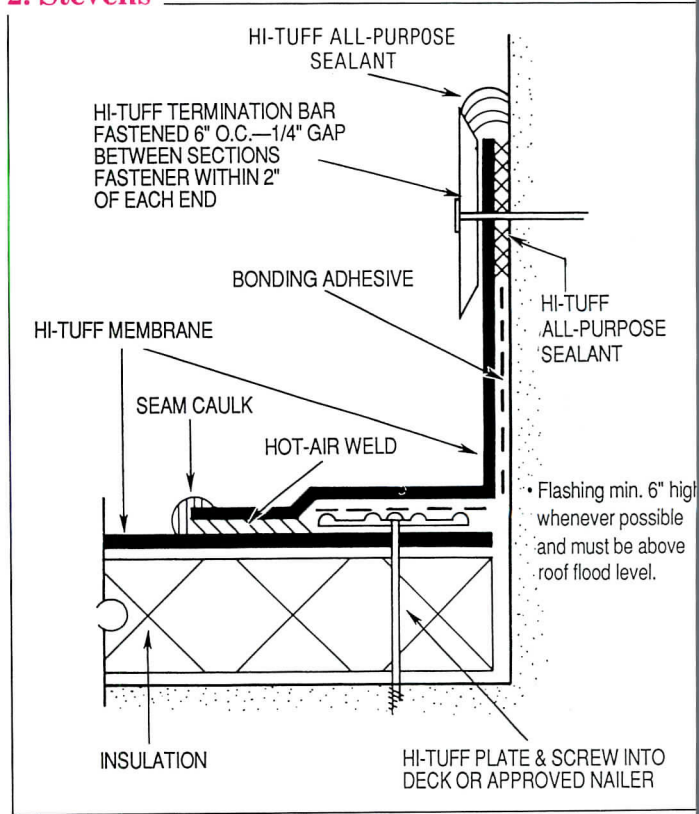
2. *Stevens*. The membrane flashing welded to the roof sheet and adhered to the wall. Flashing height is indicated minimum 6 in., and drains should be placed at least 1.5 ft from the wall.

3. *Manville*. Through-wall flashing using a counterflashing is recommended at window opening. To fasten the roof e

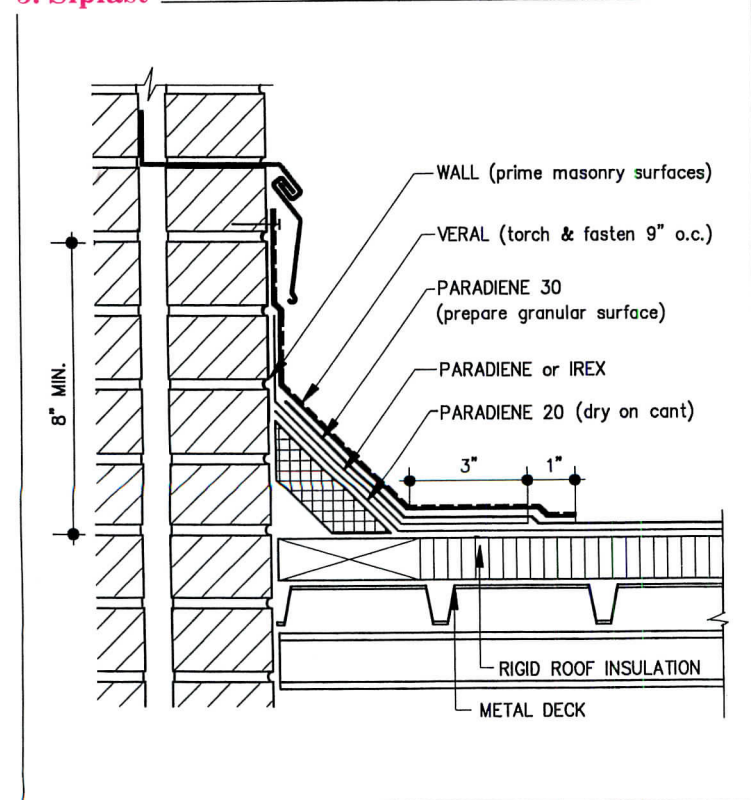
1. Sarnafil



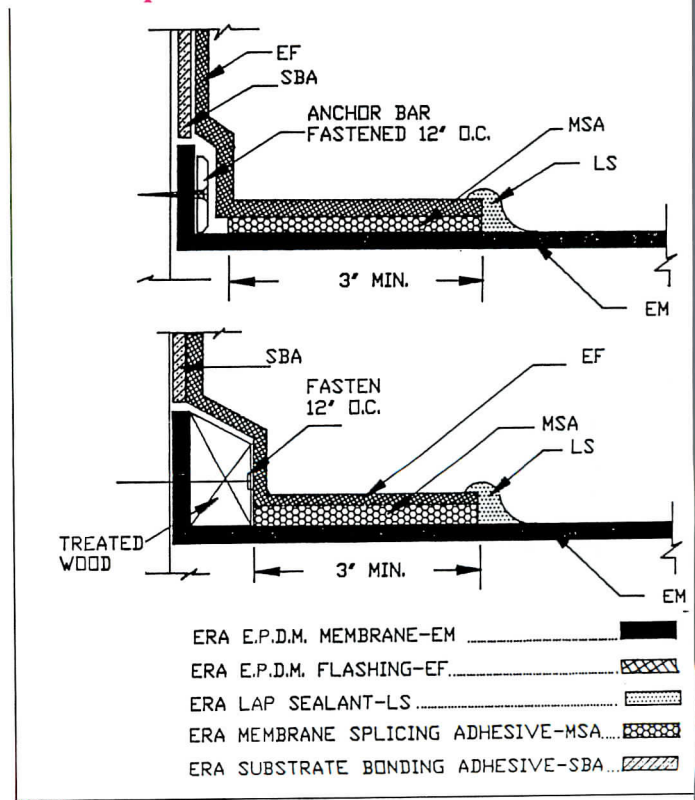
2. Stevens



5. Siplast



6. Eracorp



wood nailer is either mounted as a sill to window or recessed into the wall.

Carlisle. The detail shown indicates flashing insulation at intersections. The company provided a roof-wall detail in which a strip of flashing is fastened under the membrane, which is itself carried up the wall as the flashing.

Viplast. The Veral cap sheet is fastened

to the wall under two-piece counterflashing.

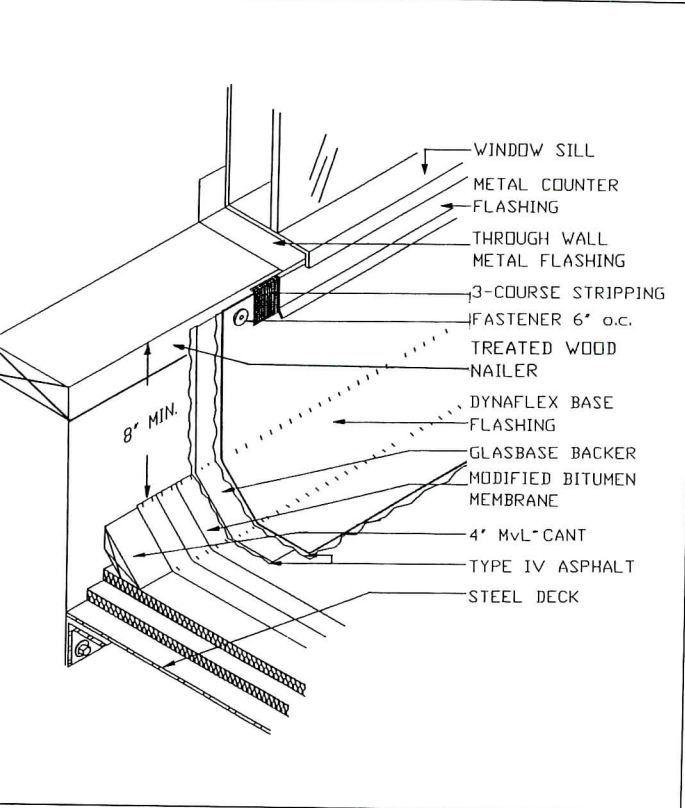
6. Eracorp. The roof membrane is attached to the wall through an anchor bar or blocking. Flashing must be carried vertically at least 8 in. and "monitored" drains can be placed as close as 12 in. from the wall.

7. Tamko. The company shows the roof

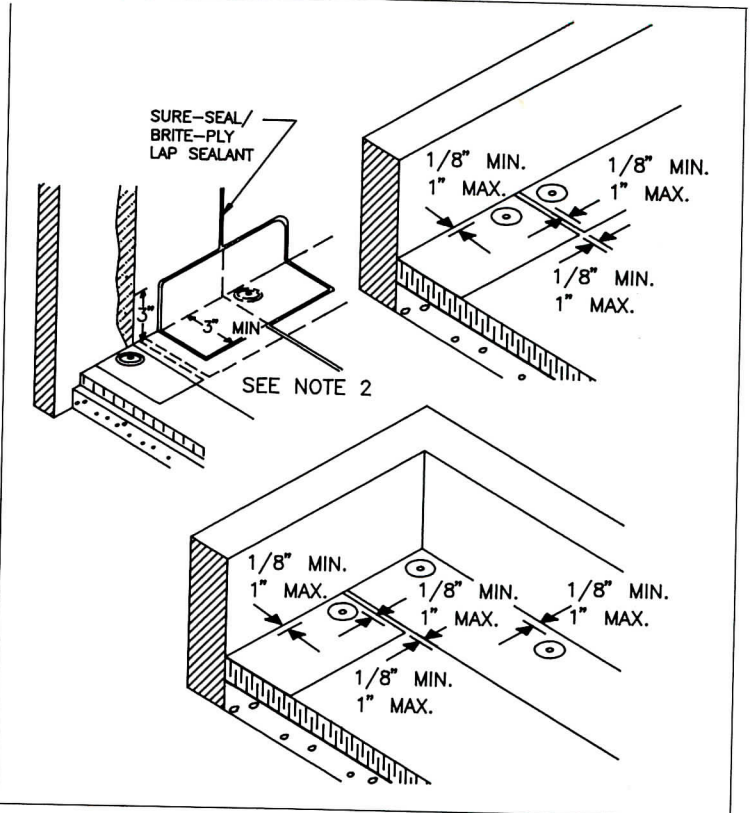
turned up at the wall and covered with two-ply flashing. Two-part metal counterflashing, fixed under the window, offers additional protection.

8. Cooley. The metal sandwich panel was interpreted as corrugated siding in the detail, which is used as counterflashing over the adhered membrane. The siding would have to be removed for reroofing.

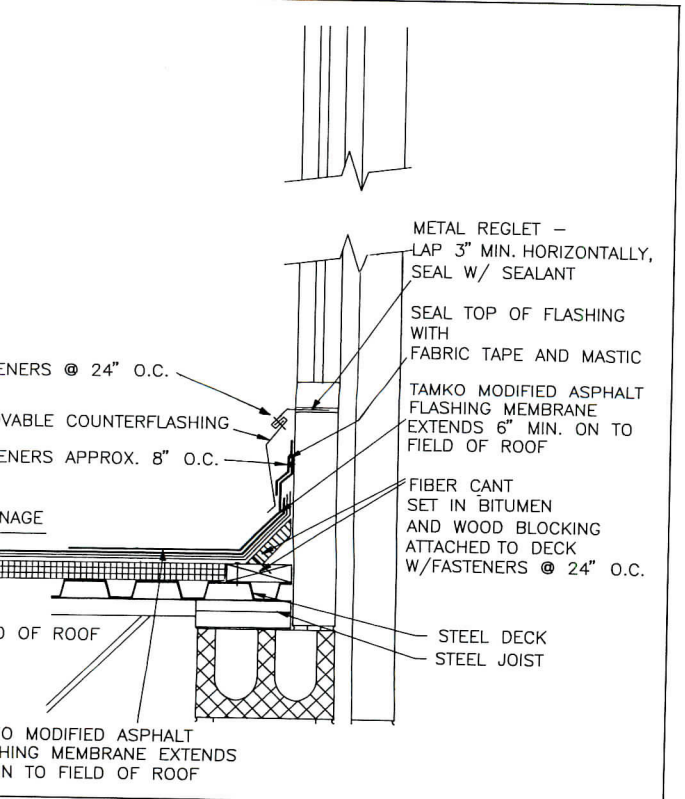
Manville



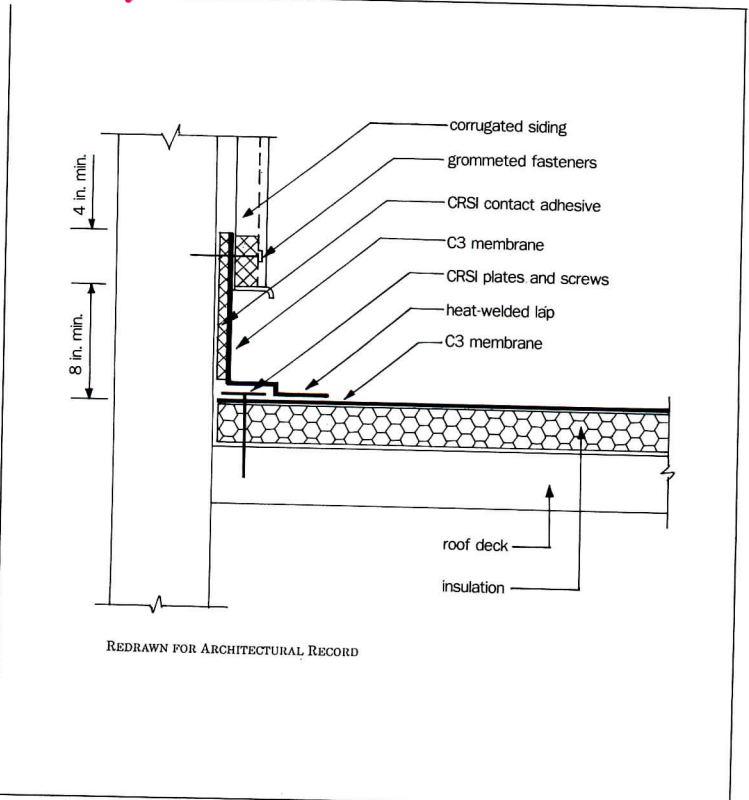
4. Carlisle



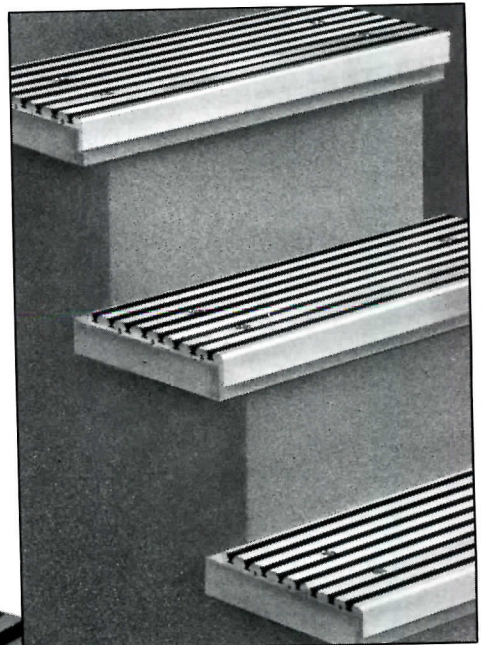
Tamko



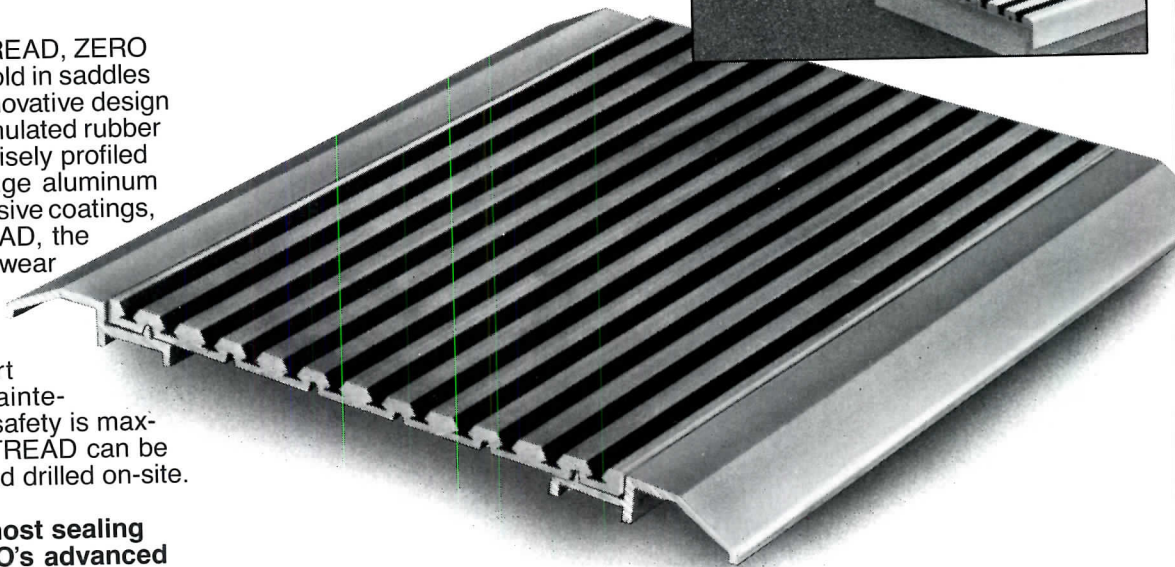
8. Cooley



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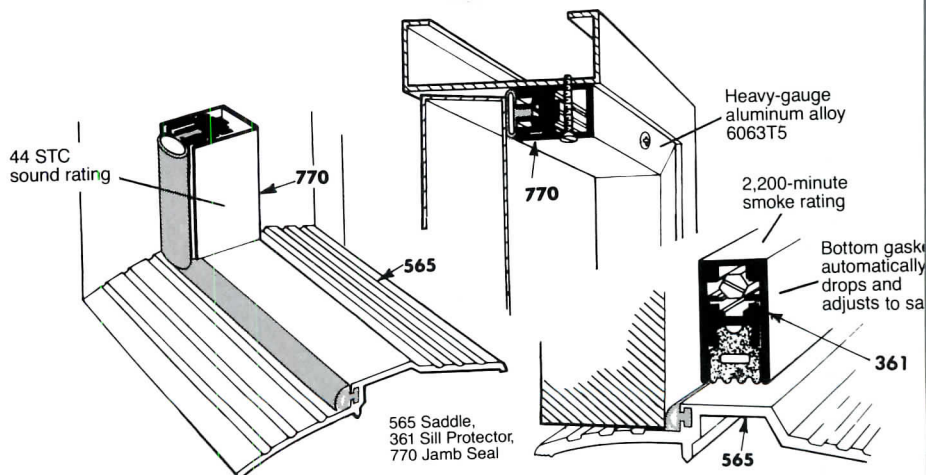
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WHEN NOTHING ELSE
IS GOOD ENOUGH
FOR LONG ENOUGH.

C H I C A G O

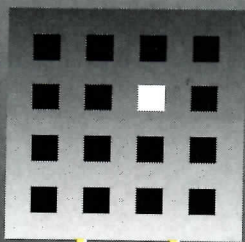
LIGHTFAIR

The only industry-sponsored lighting trade show and conference presenting lighting solutions for architects, facility managers, lighting designers and specifiers.

March 5 - 7, 1991
Expocenter at
The Merchandise Mart
in Chicago, Illinois

Presented by:
Illuminating Engineering
Society of
North America (IESNA)
and the International
Association of Lighting
Designers (IALD)

CHICAGO



LIGHTFAIR

**LIGHTFAIR
SHOW GUIDE**

WHAT IS LIGHTFAIR?

- LIGHTFAIR is the newest in lighting products.
- LIGHTFAIR is the latest in lighting technology.
- LIGHTFAIR is the best in lighting education.

And, LIGHTFAIR is the only lighting trade show and conference sponsored and presented by the Illuminating Engineering Society of North America (IESNA) and the International Association of Lighting Designers (IALD).

Members of every professional discipline that touches the lighting industry comprise the LIGHTFAIR Conference and Exhibitor Advisory Committees. These important groups represent your voice to the lighting industry and work together to develop LIGHTFAIR's world-class educational conference and high-quality product exposition.

Members of these advisory committees include:

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WHO SHOULD ATTEND LIGHTFAIR?:

If you are an:

- | | |
|-----------------------|------------------------------|
| ■ architect | ■ corporate facility manager |
| ■ electrical engineer | ■ contractor |
| ■ landscape architect | ■ electrical distributor |
| ■ interior designer | ■ developer |
| ■ lighting designer | ■ building owner/operator |

and want to discover the best in lighting solutions, then you can't afford to miss Chicago LIGHTFAIR, the most important lighting event of 1991.

WHY LIGHTFAIR?:

The industry's most comprehensive conference program LIGHTFAIR concentrates on 6 important lighting applications:

- | | |
|-------------------------|----------------|
| 1. energy and economics | 4. retail |
| 2. energy in design | 5. office |
| 3. outdoor | 6. residential |

At LIGHTFAIR, you explore each subject in-depth. You progress through a logical sequence of information on these 6 subjects. At each course, you learn a different aspect of an application plus have your specific questions answered. You'll leave each course with an action plan for success.

Don't miss the excitement of light at Chicago LIGHTFAIR.

**USE YOUR CREDIT CARD AND REGISTER
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SPECIAL LIGHTFAIR EVENTS

Participate in 8 prestigious industry-related events taking place in conjunction with LIGHTFAIR.

1. Product Showcase, Wednesday, March 6, 1991, 8:30-10 am

This is the ONE session that everyone demands — a look at outstanding products that have been introduced in the last year. Attending this overview, helps you better plan your time on the exhibit floor so you don't miss those products that could make a difference to you and your clients. A distinguished review committee has evaluated the submittals and new products will be announced in the following categories:

- Outdoor
- Commercial/Fluorescent
- Recessed Downlights
- Decorative Fixtures
- Industrial/Commercial
- Lamps/Ballasts
- Controls
- Custom Applications
- Lighting Design Software
- Other

Arrive early for this "standing room only" session. Cost: \$25. At the Expocenter Exhibit Hall. See registration form on page 15 for details.

2. National Association of Electrical Distributors Commercial/Industrial Lighting Conference, March 2 - 5, 1991

NAED holds its conference immediately preceding LIGHTFAIR. The event takes place in the Holiday Inn Mart Plaza. More than 250 electrical distributors, lighting manufacturers and their representatives attend this important technical event. For more information, call NAED direct at (203) 834-1908.

3. Prestigious Keynote Address, Tuesday, March 5, 1991, 8:30 - 10 am

The Environmental Protection Agency's Robert Kwartin and Jerry Lawson will present the EPA's newest program, which directly will benefit your bottom line, "Green Lights: Environmental Protection at a Profit." Free to all registrants. See page 4 for details.

4. Free Opening Night Reception, Tuesday, March 5, 1991, 5-7 pm

The Chicago Merchandise Mart and *Architectural Record/RECORD LIGHTING* magazine are co-sponsoring a complimentary opening reception in the Expocenter Exhibit Hall. Network with peers and enjoy cocktails while previewing innovative new products displayed by leading lighting manufacturers.

5. The Remodeling & Redecorating Professionals' Conference, March 5-6, 1991

This exciting FREE conference zeros in on the hottest area of interior design today: residential remodeling and decorating. See page 10 for complete details.

6. CEU Course: "Lighting for Residential Environments," Wednesday, March 6, 1991, 10 am - 6 pm

This core level course will help you develop an understanding of the impact lighting can have on residential environments. The course is accredited by ASID for .6 CEU credits. Cost: \$100. See page 8 for details.

7. Annual IALD Awards Dinner, Wednesday, March 6, 1991, 7:30 - 9:30 pm

The International Association of Lighting Designers (IALD) will present its annual lighting design awards at a gala celebration in the Art Institute of Chicago's Stock Exchange Trading Room. The special evening includes a cocktail reception, awards banquet and a spectacular laser light show. The event is being co-sponsored by *Architectural Lighting* magazine. Tickets are \$85/person and may be purchased today by marking the appropriate box on the registration form on page 15. The banquet is expected to be a sellout and seating is limited.

8. Chicago Illumination Design Awards Luncheon, Thursday, March 7, 1991, 11:30 am - 1:30 pm

The Chicago Section of the IES presents its annual awards luncheon to publicly recognize professionalism and originality in the lighting design field. See the Gallery exhibition of award winners' projects on display in The Chicago Merchandise Mart. Cost: \$25 For more information or to purchase tickets, call 1-800-677-MART.

CHOOSE FROM SIX LIGHTFAIR SEMINAR TRACKS

Select the programs of interest to you. Mark your choices on the registration form.

All seminar sessions are held on the 14th floor of the Holiday Inn Mart Plaza. The Keynote Address, all exhibits and the Product Showcase are on the 2nd Floor in the Exponenter exhibit area.

ENERGY AND ECONOMICS TRACK

TUESDAY, MARCH 5, 1991 8:30-10 AM

Keynote Address: "Green Lights - Environmental Protection at a Profit"

During this opening address, you will learn how the Environmental Protection Agency's (EPA) "Green Lights" program can significantly:

- Decrease your company's energy costs
- Maintain high aesthetic quality of lighting
- Reduce further pollution to the environment

"Green Lights" is a pledge by major corporations to install improved energy-efficient lighting in all facilities in the next three years.

Dozens of corporations have made commitments in principle to join this program. If you are involved in the selection, purchase or use of lamps, lighting fixtures, ballasts and controls, you MUST attend this important opening address.

SPEAKERS: Robert Kwartin, director, Energy Efficient Lighting Program and Jerry Lawson, chief, Energy Productivity & Pollution Prevention, Environmental Protection Agency (EPA), Washington, D.C.

10:30 AM - NOON

"Effective Packaging of Lighting Products: Learn How To Get What You Really Want"

Learn how "packaging" has dramati-

cally affected the lighting industry from the points of view of a designer, an electrical contractor, a manufacturer's rep and an electrical distributor. Hear how the "packaging" process is influencing the way projects are designed, specified, purchased, and constructed in this new business climate.

- How do you work within this system?
- How do you improve communications with the important players to avoid pitfalls?

PANELISTS: Randy Burkett, IES, IALD, president and design principal, Randy Burkett Lighting Design, St. Louis, Mo.; Larry Plunkett, NECA, AGC, PE., president, Sachs Electric Company, St. Louis, Mo.; Richard Dunlop, IES, president, Chesapeake Lighting Associates Inc., Laurel, Md.; and Cal Bertram, marketing manager/lighting, Eesco-United, Minneapolis, MN. **Session leader:** Mark Roush, IES, Lighting Center Manager, Philips Lighting, Somerset, N.J.

3:30 - 5 PM

"How Energy and the Economy Are Influencing Construction: Perspectives on Today's Environment and Forecasts for the Future"

Attend this session and learn how the '90s economy will affect the construction industry. Learn how today's economic/energy trends are affecting:

- the make-up of design teams
- design-build projects
- design-build firms
- quality and its survival
- changes in design priorities. Specifically learn:
 - how to capitalize on the architect/engineer/designer's roles as energy managers
 - how to anticipate changes in these roles in the '90s
 - how to reduce costs.

PANELISTS: Steven Kerch, Chicago Tribune's real estate reporter and Robert Murray, managing economist, McGraw-Hill Information Services Co, New York. **Session leader:** Charles Linn, AIA, former editor of Architectural Lighting magazine.

ENERGY IN DESIGN TRACK

**TUESDAY, MARCH 5, 1991
10:30 AM - NOON**

"The Design of Energy Efficient Lighting: Lamps, Ballasts, Fixtures & Controls"

Lighting energy issues are hot topics. Demand side management (DSM) and an emerging energy crisis make energy-efficient lighting necessary for new construction and remodeling.

Hear about California's Advanced Lighting Guidelines, the first independent technical and design guide concerning the latest in energy-efficient, high quality lighting products and design techniques. The Guidelines also include applications and specifications information for every day use by architects, designers, engineers and lighting specialists, regardless of the project's location. Learn how to use the Guidelines to achieve high quality, low energy lighting systems. The presentation will cover the Advanced Lighting Guidelines, including:

- Compact fluorescent lamps
- Full-size and U-bent fluorescent lamps
- Compact metal halide and white sodium lamps
- Conventional-shaped tungsten halogen lamps
- Energy-saving and electronic ballasts
- Energy-efficient luminaires
- Computer-aided lighting design
- Lighting design practice

SPEAKER: James R. Benya, PE, IALD, IES senior principal and chief executive officer, Luminae Souter Lighting Design, San Francisco

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(301) 662-9386
TO REGISTER TODAY.**



Jerry Lawson



Robert Kwartin



Randy Burkett



Larry Plunkett



Richard Dunlop



Mark Roush



Robert Murray



James R. Benya

2-3:30 PM

How to Remain Competitive in the Face of New and Pending Energy Legislation

Attend and learn how lawmakers and designers are responding to the oil/environmental crisis of the 1990s. Hear an update on current and proposed landmark regulations including...

- California Title 24: Performance/application-based compliance
- Massachusetts: Component (lamps, ballasts, luminaire) regulation
- New York State Energy Code: Prescriptive Regulations and equipment efficiencies.
- Federal government/Department of Energy Standards
- Industry and professional society response to energy legislation

Learn how new/pending legislation WILL affect your business and limit your design options. If you are involved in lighting at all, you must attend this seminar to learn exactly how you and your clients are going to be affected by new legislation.

SPEAKER: Helen Diemer, IALD, is an associate of the lighting design firm David A. Mintz, Inc., New York and the current president of the International Association of Lighting Designers (IALD). Diemer is well-versed on the subject of codes and standards, having served for three years as chairman of the IALD Energy Committee and as a member of IES Energy Management Committee. She was active in the development of ANSI/ASHRAE/IES Standard 90 and has appeared several times before the Department of Energy and the New York State

Energy Office to deliver petitions on federal and state regulations.

OUTDOOR TRACK

WED., MARCH 6, 1991
10:30 AM - NOON

"City Lights: A Better Approach to Our Urban Environment Featuring a Case Study of Battery Park"

Learn the role of electric lights in the night-time environments of North American cities. Better understand how to:

- learn important distinctions between highway lighting and street lighting; and avoid the confusion between these two applications. Learn how they have caused our cities to suffer;
- maximize the inter-relationship of lighting poles and fixtures in the daytime and the quality of light at night.

Leave this session with a better approach to urban environments. Learn how to use fixtures appropriate to urban settings.

SPEAKER: Robert Prouse, IES, IALD, a partner at H. M. Brandston & Partners, New York. Prouse has managed such projects as the Street and Esplanade Lighting at Battery Park City, New York; the San Antonio Museum of Art; and the Denver Transitway Mall. He has taught lighting design at Pratt Institute, Columbia University and The Parsons School of Design.

3:30 - 5 PM

"Practical Residential Landscape Lighting Can Be Alluring"

Safety, security and enjoyment of the landscape are three important reasons to provide landscape lighting. Attend this session and hear about key issues such as:

- how to select the right lamp
- what techniques to use to create specific effects
- how to identify the important issues in developing a design approach based on geographic location and the impact of weather
- decide the appropriateness of the 120-volt vs. 12-volt systems in the project

SPEAKER: Janet Lennox Moyer, ASID, Jan Moyer Design, Berkeley, Calif. Ms. Moyer has more than 14 years in lighting design. Her prestigious projects include the lighting of Levi Plaza, The Detroit Civic Center, Greenville Commons and Skywalker Ranch.

6 - 7 PM

"How to Create Drama in Light: Light Sculptures for Public Spaces and Visual Effects"

Learn how you can use lighting to bring life to "Town Square America." Lighting for...

- plazas/piazzas
- fountains and monuments

If you are involved with public space design, you won't want to miss this session.

SPEAKER: John David Mooney, Chicago artist and sculptor. Mooney is known for his large-scale light sculptures built in the United States, Europe and Australia. Mooney's work includes "American's Sky Sculpture," a sculpture barge and programmed searchlight piece on the Chicago River in May 1990, incorporating multiple lighting forms and lasers; "Lightscape '89," the transformation of Chicago's IBM Building into a 52-story high light sculpture in August 1989; and "Starsteps," a rooftop sculpture at the corner of the Hollywood Freeway and Sunset Boulevard, now a landmark piece in Los Angeles.



Helen Diemer



Robert Prouse



Janet L. Moyer



John D. Mooney

RETAIL LIGHTING TRACK

WED., MARCH 6, 1991
10:30 AM - NOON

"World View: A Comparison of Applications in Retail Lighting From the U.S. and Abroad"

Hear what three world-famous experts have to say as they review trends in retail lighting over the last five years. Then look ahead at the new light sources that are affecting current and future retail designs. Learn how European and U.S. retail designers address...

- aesthetics
- glare control
- maintenance
- accent lighting
- color rendition
- budgeting
- life cycle vs. first costs

PANELISTS: Derek Phillips, FRIBA, FCIBSE, IALD, M. arch. MIT, B.arch., MCD L'pool, owner, Derek Phillips Associates Lighting Consultants, United Kingdom, and Roberto Pamio, Architect, Venice, Italy. **Session Leader:**

David A. Mintz, IALD, IES, principal, David A. Mintz, Inc., New York.

Phillips was the first architect to become president of the Illuminating Engineering Society of Great Britain, now the Chartered Institute of Building Services Engineering (CIBSE). Pamio studied under Carlo Scarpa and other famous Italian architects, after receiving his architecture degree from the University of Venice. David A. Mintz, Inc., has lighted more than 40 million square feet of retail space. He is a founder of the IALD and has served on the board of directors of the U.S. Institute of Theater Technology.

3:30 - 5 PM

"Fundamental Value-Added Lighting Techniques For Retailers"

Good lighting offers a value-added benefit to help improve visibility, create atmosphere, reduce energy

costs and increase sales. You will receive information on the "how to's" of retail lighting. You will learn ■ how to use visibility, ■ how to achieve a desired effect, and ■ how to use new technology in construction and renovation projects. This is a non-technical presentation with useful information for retail designers and owners.

SPEAKER: Stephan Graf, IES, IALD, owner and founder of Fantasee Lighting, a design firm specializing in the lighting needs of video, theater and stage shows, and IlluminArt, a firm specializing in architectural lighting design services, both in Ypsilanti, MI.

6 - 7 PM

"How to Light a Retail Store to Sell Merchandise and Meet Budget"

It takes cooperation, communication and teamwork to put the merchandise in the right light. Learn how the following issues can make or break a job...

- Budget: Learn what are reasonable budgets for purchasing, installing, and operating a lighting system.
- Maintenance: Learn how to use design to keep maintenance costs to a minimum.
- Specs: Learn who should write specifications, and how to allow for an "or equal" provision?
- Construction Phase: How to keep the project on schedule, including the completion of the punch list.

PANELISTS: Dan Evans, ISP, Vice President of Visual Merchandising, Hartmarx Specialty Stores, Inc., Chicago; Don Bona, ISP, Schafer Associates, Oakbrook Terrace, Ill.; and David Kintz, consultant, Chicago. **Session leader:** Connie Whiteley, IALD, IES, lighting consultant, Lighting By Design, Chicago.

OFFICE TRACK

THURSDAY, MARCH 7, 1991
8:30 - 10 AM

"America's Office Lighting Future Can Be Found in Europe Today"

Hear the latest in European office lighting standards and the product technologies that have been developed to meet those standards. Learn how these standards compare to new U.S. office lighting standards and product developments. Learn how these European trends will directly impact the future of office design and the corporate bottom-line.

SPEAKERS: Dr. Richard Schnependahl, LITG, VDE, research and development director, Trilux, Arnsberg, Germany; Wolfgang Egger, IES, CIE, LTAG, vice president of marketing, Zumtobel, Lighting Inc. U.S.A. **Session leader:** Gary Steffy, IALD, president, Gary Steffy Lighting Design, Ann Arbor, Mich. Steffy is immediate-past president of IALD and author of the recently released book, *Architectural Lighting Design*.

10:30 AM - NOON

"Office Lighting: Fundamentally Speaking" Lighting is a critical part of office productivity. Learn how to establish the criteria and identify the major concerns in office lighting design...

- How to determine how much light is enough?
- When to use direct vs. indirect lighting?
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Examine systems and trends in sources and fixtures for both new and retrofit installations. In addition, learn how energy legislation is affecting design and user performance.

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SPEAKER: Sandra M. Stashik, IES, PE, IALD, principal-in-charge of the Philadelphia office of Grenald Associates



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- 3:30 PM

New Guidelines for Lighting Offices Maintaining VDTs: Practical Information Solutions that Work"

This practical/hands-on seminar will teach you in understandable language how to light an office maintaining VDTs. Review the new SNA recommended practice guidelines and discuss their applications, looking at how off-the-shelf equipment/luminaires meet or don't meet these guidelines. Learn to evaluate available solutions, including both direct and indirect solutions.

SPEAKER: Mitchell B. Kohn, IES, IALD, Mitchell B. Kohn Architectural Lighting Consultant, has offices in Highland Park, Ill. specializing in interior illumination design for commercial, institutional and industrial environments. He is on the board of directors of IALD. He is a member of the National Committee of the Commission Internationale De l'Eclairage (CIE) and a member of IES, for which he serves as chairman of its office lighting committee and is a past president of the Chicago section.

RESIDENTIAL TRACK

WEDNESDAY, MARCH 6, 1991
10 AM - 1 PM, 3 - 6 PM

Course: Lighting for Residential Environments"

CEU credit, core level, ASID accredited. During this six-hour course, you will develop an understanding of the impact lighting has on residential environments. Learn how to select lamps and equipment for the techniques required for a successful design.

Learn the pro's and con's of various light sources, including efficiencies, color characteristics, appropriateness to different applications, and a comparison of features.

■ Learn specifics about **a)** selection of equipment types, what they do and how to evaluate the choices; **b)** lighting specific interior spaces, such as kitchens, baths, living spaces and art; **c)** lighting exteriors for aesthetics and security.

SPEAKER: Carol Chaffee, IES, IALD, principal, Carol Chaffee Associates, Minneapolis, Minn. Prior to forming her own company, Carol Chaffee served as design principal with a Los Angeles firm specializing in lighting consultation for the performing arts. Ms. Chaffee serves on the editorial advisory board for *Architectural Lighting*.

RESIDENTIAL TRACK

THURSDAY, MARCH 7, 1991
8:30 - 10 AM

"Fundamentals of Residential Interior Lighting Design"

Attend this session and learn how to combine lamps, luminaires and fixture location to **a)** reinforce the architecture, **b)** enhance the finished interiors and, most importantly, **c)** address the needs of the end-user.

Receive practical advice on how to handle specific lighting problems, including:

- 2 and 3 dimensional artwork
- interior plantings
- task areas
- spaces with high or sloped ceilings

SPEAKER: Connie Jensen, IALD, IES, founder, Lighting Professionals, Inc., Montvale, N.J. Ms. Jensen's dynamic yet practical approach makes this complex subject easy to absorb. Architects, interior designers, showroom personnel — in fact, anyone who works with light, will find this an especially rewarding presentation.

10:30 AM - NOON

"Practical Applications of Colors: Real and Imaginary"

At this seminar see demonstrations on: **a)** the important factors that relate the color properties of light sources to the colors of objects seen in the surrounding environment; **b)** critical parameters for choosing light source colors; and **c)** the interpretation of the common color criteria, such as the color rendering index. Discover the limitations of the common color criteria.

SPEAKER: Dr. Robert E. Levin, IES, senior scientist, GTE Sylvania's general engineering research and development group, Salem, MA. Dr. Levin was an associate professor at California State University at San Jose prior to joining GTE Sylvania. He has 60 publications and 36 patents in the lighting field.

2 - 3:30 PM

"How To Choose A Dimming System That Is Right For the Home"

Learn how to choose a dimming system that is right for your project and your client. Hear about the newest technological options available for residential dimming in the '90s including:

- wall box dimmers
- wall box presets
- integrated network systems
- small stand-alone systems

In addition, learn how to design and specify a complete dimming system, including...

- circuits, zones, channels, presets, scenes and cues
- system configuration
- control station selection
- what to look for, and look out for, in vendors

SPEAKER: Craig A. Roeder, IALD, IES, Craig A. Roeder Associates, Inc., Dallas. Prior to starting his own firm in 1979, Roeder worked as an assistant to Jim Nuckolls and Jeffrey Milham at Design Decisions in New York. His designs have been published in more than 50 different national publications.



Mitchell Kohn



Carol Chaffee



Connie Jensen



Robert E. Levin



Craig A. Roeder



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"Beyond INTERIOR VISIONS: Show House Influences on Real-World Rooms." Chris Madden, author of the best selling book *Interior Visions*, looks at what show house rooms are really telling America about our living

spaces, metaphoric and actual. Plus, a special preview of her upcoming new book on the special challenges of showhouse kitchens and baths.

"Is Your Net Working?" With design business so dependent on word-of-mouth referrals, it pays, literally, to make the most of all your contacts, both business and social. Ann Boe, award-winning presenter and widely published expert on networking, offers helpful guidance on how you can build your business with the help of colleagues, clients, subcontractors, everyone!

"Breakthrough Solutions for Kitchens & Baths." Nationally published designer Florence Perchuk, Chicago's own sought-after Michael deGulio, *Kitchen & Bath Design News* columnist and designer Mort Block, and product designer/consultant Don Arnold share their ideas for barrier-free, multi-generational, and other special kitchen and bath design challenges.

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TUESDAY, MARCH 5, 1991

12:30-1:30 PM

"How To Achieve Maximum Results From Emergency Lighting in the Office Environment"

Emergency lighting is a concern that most corporate and institutional end-users think about only in times of crisis or natural disaster.

Learn the latest developments in quality emergency lighting fixtures and how it integrates with both good design practice and engineering.

PANELISTS: Representatives from Beghelli, Bodine, Lightalarms and Yorklite Electronics Inc.
Session Leader: Charles Linn, AIA, former editor, *Architectural Lighting* magazine

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WEDNESDAY, MARCH 6, 1991

12:30-1:30 PM

"How To Light Fine Art in a Residential Environment"

When properly lit, fine art can be the focal point of a room. Learn methods of illumination: wall washing, accenting, highlighting and framing projection.

SPEAKER: Gerry Zekowski, IES, Gerry Zekowski Lighting Consultants, Skokie, Ill.

12:30-1:30 PM

"Lighting and the New Energy Consciousness"

Energy codes in New York and Massachusetts differ from those in California and the Pacific Northwest. Learn how to cope with the rapidly changing codes and their effect on lighting energy in the U.S.

SPEAKERS: James Benya, senior principal and chief executive officer, Luminae Souter Lighting Design, San Francisco; Emma Price, president and chief financial officer, Edison Price Lighting, New York; and Peter Bleasby, manager, technical relations, Osram, Montgomery, N.Y.

THURSDAY, MARCH 7, 1991

12:30-1:30 PM

"Landscape Lighting: How to Effectively Light Outdoor Water Features"

Lighting water presents challenges and opportunities. See successful applications and learn techniques, for the lighting of pools, hot tubs, waterfalls, fountains and streams.

SPEAKER: Janet Lennox Moyer, ASID, Jan Moyer Design, Berkeley, CA

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Specialty linear incandescent and fluorescent lighting products and miniature low voltage lighting

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Omega, Division of Thomas Industries

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Osram Corporation

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Commercial and institutional fluorescent and HID fixtures

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Commercial and institutional fluorescent and HID fixtures

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Commercial and institutional fluorescent and HID fixtures

General Lighting Products
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(314) 997-2408
Commercial and institutional fluorescent and HID fixtures

General Lighting
Patrick Dr.
Raleigh, NC 28144
Booth 709
(919) 333-2100
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Booth 1139
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Office task and ambient lighting for all furniture systems, factory task lighting for workbench systems, portable task lights, portable power sources

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- Tuesday, March 5, 1991 10 am to 7 pm
- Wednesday, March 6, 1991 10 am to 7 pm
- Thursday, March 7, 1991 10 am to 5 pm

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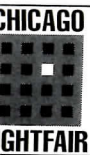
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EXPOCENTER AT THE MERCHANDISE MART

Chicago, Illinois March 5-7, 1991

Pre-Registration Deadline - Feb. 18: After this date, bring this form on-site.

Name _____
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 Firm/Org. _____
 Address _____
 City _____ State _____ Zip _____
 Telephone _____ Fax _____

Check all appropriate boxes - Note: Attendees who register for any session or CEU receive FREE entrance to exhibits, Green Lights, Breakout Sessions and opening night reception.

PLEASE CHECK ONE BOX IN EACH CATEGORY:

Firm Type:

- A Architect
- B Lighting Designer
- C Interior Designer
- D Landscape Architect
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- F Facility Manager/Owner
- G Contractor
- H Manufacturer/non-exhibitor
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- J Distributor
- K Student
- L Engineer
- M Press

Professional Affiliation:

- | | | |
|--|---------------------------------|---------------------------------|
| A <input type="checkbox"/> IESNA | E <input type="checkbox"/> IFMA | I <input type="checkbox"/> IBD |
| B <input type="checkbox"/> IALD | F <input type="checkbox"/> ASLA | J <input type="checkbox"/> NAED |
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| D <input type="checkbox"/> ASID | H <input type="checkbox"/> NECA | |
| L <input type="checkbox"/> Other _____ | | |

TUESDAY, MARCH 5, 1991

<input type="checkbox"/>	8:30 - 10 am	Keynote: Green Lights	\$25 _____	(free with other registrations)
<input type="checkbox"/>	10:30 am - noon	Lighting Systems	\$25 _____	
<input type="checkbox"/>	2 - 3:30 pm	Legislation	\$25 _____	
<input type="checkbox"/>	10:30 am - noon	Packaging	\$25 _____	
<input type="checkbox"/>	3:30 - 5 pm	Economic Forecast	\$25 _____	
<input type="checkbox"/>	Tuesday Pass	(Any Seminars)	\$25 _____	
<input type="checkbox"/>	Firm Discount	(5 or more pre-registrations mailed together)	\$60 _____	
<input type="checkbox"/>	Student Day Pass		\$50 _____	per person
<input type="checkbox"/>			\$25 _____	

WEDNESDAY, MARCH 6, 1991

<input type="checkbox"/>	8:30 - 10 am	Product Showcase	\$25 _____	
<input type="checkbox"/>	10:30 am - noon	Retail:Worldview	\$25 _____	
<input type="checkbox"/>	3:30 - 5 pm	Visual Merchandising	\$25 _____	
<input type="checkbox"/>	6 - 7 pm	Lighting Retail Stores	\$25 _____	
<input type="checkbox"/>	10:30 am - noon	Battery Park	\$25 _____	
<input type="checkbox"/>	3:30 - 5 pm	Landscape Lighting	\$25 _____	
<input type="checkbox"/>	6 - 7 pm	Light Sculpture	\$25 _____	
<input type="checkbox"/>	Wednesday Pass	(Does not include CEU)	\$80 _____	
<input type="checkbox"/>	Firm Discount		\$70 _____	per person
<input type="checkbox"/>	Student Day Pass		\$25 _____	
<input type="checkbox"/>	10 am - 6 pm	CEU course	\$100 _____	

THURSDAY, MARCH 7, 1991

<input type="checkbox"/>	8:30 - 10 am	Office: Worldview	\$25 _____	
<input type="checkbox"/>	10:30 am - noon	Fundamental: Office	\$25 _____	
<input type="checkbox"/>	2 - 3:30 pm	VDTs	\$25 _____	
<input type="checkbox"/>	8:30 - 10 am	Fundamentals: Residential	\$25 _____	
<input type="checkbox"/>	10:30 am - noon	Color and Light	\$25 _____	
<input type="checkbox"/>	2 - 3:30 pm	Dimming Systems	\$25 _____	
<input type="checkbox"/>	Thursday Pass		\$60 _____	
<input type="checkbox"/>	Firm Discount		\$50 _____	
<input type="checkbox"/>	Student Day Pass		\$25 _____	
<input type="checkbox"/>		(Includes CEU, excludes Special Events)	\$200 _____	
<input type="checkbox"/>			\$10 _____	
<input type="checkbox"/>	Wed. March 6	IALD Awards Dinner (not included in any package)	\$85 _____	

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PRODUCT SPOTLIGHTS



Walkover/Driveover Buried Surface Luminaires

New from BEGA are these ground illuminators. Efficient low voltage tungsten halogen light sources. Internal optical system spreads light across a ground surface in one or four directions. Integral or remote transformers. High tensile strength die cast aluminum. Also available in this group of luminaires are indicator luminaires and floodlights/uplights. 4-color brochure available. 805/684-0533.

Bega/FS

Circle 30 on the Reader Service card.



Electronic Light Capsules

These electronic light capsules offer 9,000 hours average rated life. They consume up to 75% less energy than conventional incandescent bulbs. No special ballasts are required... simply screw-in and turn on. They start instantly and are ideal for overhead recessed cans, table lamps and wall fixtures. For uses such as : corridors, downlighting, floodlighting, indoor walkways, staircases and more. In hospitals, hotels, stores, offices and restaurants.

Panasonic

Circle 31 on the Reader Service card.

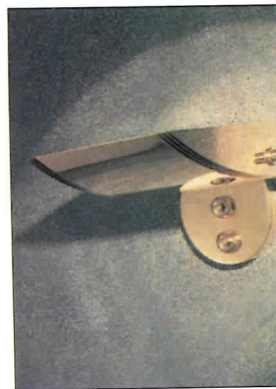


Wall-Mount Decora® Occupancy Sensor

Offers a 180-degree field of view that covers up to 2,700 sq. ft. Can be used with 120V or 277V lighting applications (incandescent or fluorescent) with no wiring modifications. Its elegant styling coordinates with Leviton's popular Decora line of wiring devices to complement any interior. The occupancy sensor is UL Listed, CSA certified and meets California Title 24 Energy Code requirements.

Leviton Mfg. Company

Circle 32 on the Reader Service card.



The Aero

Winona Lighting announces an addition to its standard product line...the Metro series of six wall sconces and brackets are available in polished brass, bronze and stainless steel. The Aero, in polished brass, is distinguished by its shallow lamp housing trimmed with 3 decorative "fins". The Aero is 8.5" wide with a 7 3/4" projection. Lamps in the series are quartz halogen and 120 volt.

Winona Lighting

Circle 33 on the Reader Service card.



Four Attractive Shapes Added to PrismGlo Line

Suited to a wide variety of commercial and retail applications, PrismGlo lighting systems feature state-of-the-art prismatic light control to create a highly efficient, quality oriented environment. The luminaires are available with three lighting distributions: 60% up, 40% down; 40% up, 60% down; and 50% up, 50% down. The fixtures may be used with 150 to 400W MH or HPS. UL Listed 1572 "Damp Location".

Holophane Co., Inc.

Circle 34 on the Reader Service card.



Perimeter-45

For the effect of a lighted cove without the expense of building a cove, Perimeter-45 is the answer. Perimeter-45 is a sleek 4" x 6" architectural shape. Its unique reflector system distributes light evenly on the walls, eliminating socket shadows, and concentrates output for maximum efficiency. Plus, the corner system is designed to function aesthetically, while eliminating the need for field-measured corners.

Litecontrol Corporation

Circle 35 on the Reader Service card.



Spotlighting Grid

Structurella lighting system consists of miniature extruded aluminum three-dimensional frames. Elegant Italian design combined with quality introduce a new dimension in low voltage lighting for window displays, boutiques, showrooms, galleries, restaurants, etc. UL listed as a complete system at 32A-12A. The maximum run from each electrical feed is approximately 20 ft. in each direction.

Targetti Inc.

Circle 36 on the Reader Service card.



The Most Efficient Family of Halogen Bulbs

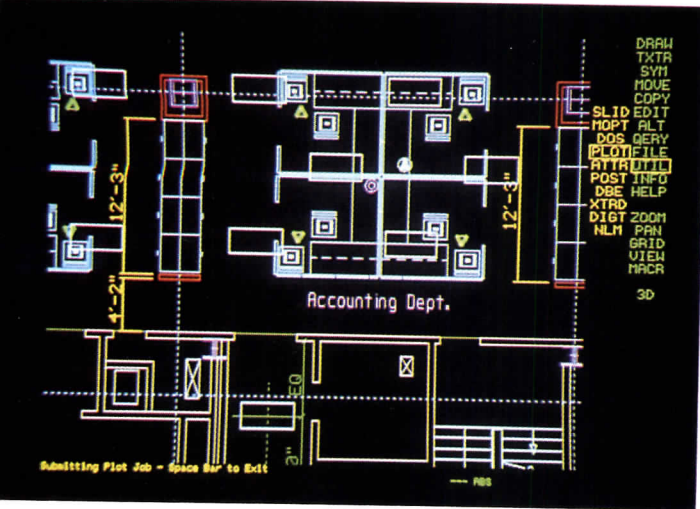
The MASTERline collection from Philips Lighting Company features low and line voltage halogen lamps. The MASTERline square and round MR16 and the MASTERline PAR30 and PAR38 (above) offer added value energy savings and increased light output than existing halogen products.

Philips Lighting Company

Circle 37 on the Reader Service card.

CADVANCE 4.0: A GATEWAY TO DATABASE CAD

Here's a clever way to extend the life of 286 machines by buying a 386 server and Novell Netware/386. By Steven S. Ross



The standard Cadvance menu system is only two levels deep—easy to use with a mouse.

high-end, full-featured 3-D CAD package with built-in database. The network version (Cadvance for Work-ups), especially when used with Novell NetWare/386, is fast and function-packed. Cadvance has always been one of the best CAD packages, especially for on-line redraws. It now can use network resources to speed regenerations as well, to control printing, plotting, and file priority. This package is for systems based on MS-DOS or PC-DOS.

VIEW

basics: All the standard tools are there: Support for expanded memory, symbol libraries, parallel lines (and offsets for arcs) for walls, automatic build-edges, 3-D editing (in perspective, axonometric, oblique as well as isometric or orthographic), walk-throughs, rendering, applied fonts, wide range of dimensioning options, 255 layers, macro-promising language, and so forth. Cadvance can read or write DXF files (including AutoCAD 10 "3-D" DXF) automatically, and output images in the standard PCX format used by advanced word processors and almost all desktop publishing packages.

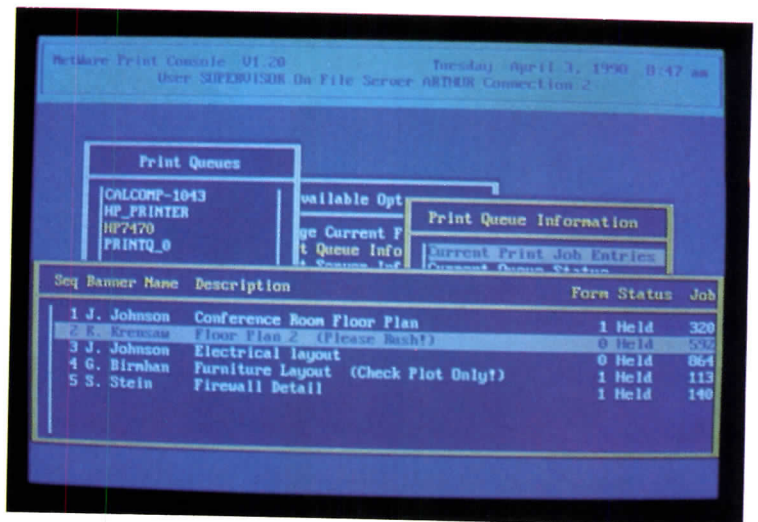
Cadvance is, at the moment, the high-end CAD software package that makes the best use of the new network tools built on the most widely used DOS network

software, Novell NetWare/386. It is also a powerful drawing and database tool in its own right.

Networks that work with MS-DOS or PC-DOS (such as Novell NetWare) do not allow more than one person to access a file at the same time. But Cadvance at least allows you to send a message to whomever is controlling the file—perhaps asking for release, or for an estimate of when the file will be ready. In fact, its electronic mail system can be invoked for any purpose, even during a drawing session.

Cadvance also makes good use of what Novell calls "NetWare Loadable Modules." Version 4.0 of Cadvance comes with two NLMs. One allows the file server to handle hidden-line removal. This can save quite a bit of money; the alternative is to use more powerful computers at each seat, or to sit and wait (sometimes a half hour for really huge drawings) for hidden lines to be identified and removed.

Underlying databases—for bills of materials, for example—can be queried from any terminal running Cadvance, even if the central file "server" computer holds the data, without moving the entire database to the terminal. The NLM that does this also provides the ability to use structured query language (SQL) for database searches. The SQL module is not full-featured, but more complex queries can be done outside Cadvance using the SQL built



The Novell NetWare/386 interface; here, a queue for output is being set up.

into dBase IV and other software that reads dBase files.

NLMs only work with NetWare/386, however. They will not work on older versions of Novell NetWare, or on other network software.

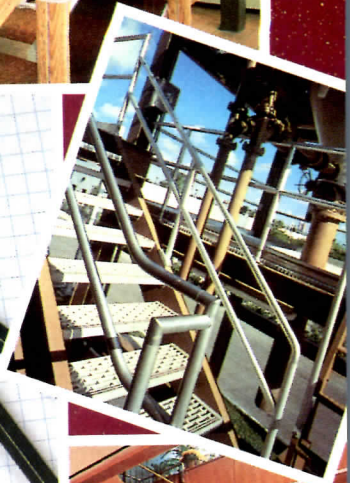
Likewise, Cadvance 4.0 supports new NetWare features such as naming a queue for printing. Earlier NetWare versions did not allow one user to print from another's printer unless that other user was at the file server itself. Now users can specify a printer or plotter anywhere on the network.

If a file is in use when a new user wants it, the new user can "wait" for the file—the new user's terminal simply keeps asking for it, and the network won't let anyone else ask for it. The user who is waiting will, however, lose control of any file he or she might have been editing, if another person is waiting for it. ISICAD says this is to prevent a daisy-chain of lockouts based on one user waiting for a file, another user waiting for the waiting user's file, etc.

Reference files—files a user can view, but not change during a session—are handled seamlessly. If the user has the right to see them, they are displayed. If one user is editing a file that another is using as a reference file, the new changes will not be displayed on the reference file until the person using the file as a reference requests an update (a screen regeneration). If the regen is called for as the newly up-

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Traditional Railings — Handrail, trellage, fittings, and decorative ornaments in aluminum, bronze, steel, and stainless steel.

Elevator Cab Components — Elevator sills, handrail and brackets suitable for vertical mounting in elevator cabs.

Handrail Brackets — Wall, post and vertical mounting brackets for all handrail types.

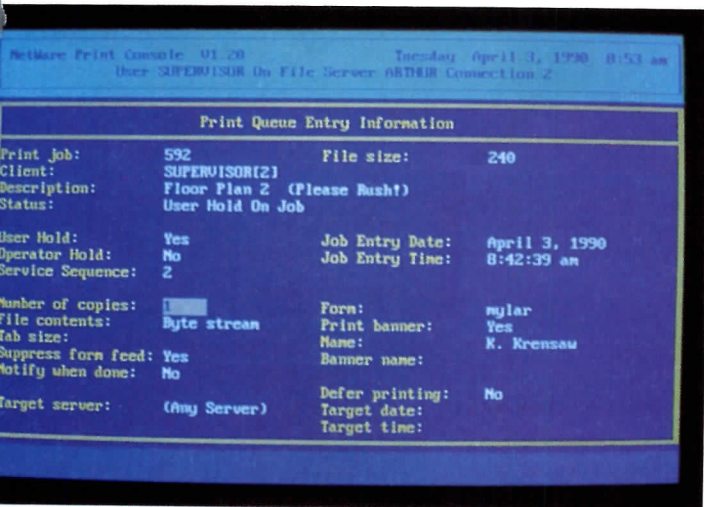
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Setting up a print queue so that information is sent easily to a printer or plotter from within Cadvance.

ID name	Type	Length	Total Area	Total Weight	Used Area	Used Weight
CMY1001	200MM	100.00	20000.00	150.00	0.00	0.10
ARC CMY1006	500MM	100.00	37500.00	250.00	*****	0.40
ARC CMY1015	200MM	100.00	20000.00	150.00	*****	0.10
CMY1017	200MM	100.00	20000.00	150.00	0.00	0.10
CMY1018	200MM	100.00	20000.00	150.00	0.00	0.10
CMY1019	200MM	100.00	20000.00	150.00	0.00	0.10
CMY1021	200MM	100.00	20000.00	150.00	0.00	0.10
ARC CMY1022	200MM	100.00	20000.00	150.00	*****	0.20
CMY1024	200MM	100.00	20000.00	150.00	0.00	0.10

The gateway to database access, for bills of materials, facilities management, and similar tasks.

ed files is being saved, the save is suspended until the regen is complete. As for database files, only individual records, not entire databases, are locked when using NetWare, so multiple users can access a single database without worrying about others.

The copy protection has the potential to do harm, but we could not cause a malfunction by misusing it. ISICAD used a security device attached to a parallel port on your computer. If your license allows for working, only one device is necessary for the entire network. But it cannot be attached to the file server itself; it must be attached to one of the terminals. If that terminal is shut down, it can be restarted without destroying work being done on other terminals.

This software allows quite a bit of flexibility for configuring networks. All files in the program as well as the files you create when you make a drawing) can reside on the server. If they do, terminals do not even need disk drives of their own. Or, more commonly, each terminal contains its own copy of Cadvance, and the server contains the drawing files.

We tested Cadvance by installing it on a small NetWare/386 system that had most available disk space taken up by other software. We were able to condense Cadvance quite a bit by setting up directories for common files, and allowing each user to have a small subdirectory with separate INS files. Each copy of CAD.INS contained specific information about each user's own terminal.

Cadvance drawing files can be quite large in memory, mainly because they are not deleted and changed elements until saved. Saving automatically packs the data but leaves unreferenced symbols and other odds and ends; use the FILEPACK command occasionally to assure files are as small as possible. □

e 300

Cadvance 4.0

Equipment required: While the stand-alone version will run on machines as old as the IBM XT and compatibles, the software's power is wasted on anything less than an IBM or compatible computer with 80386 or 80486 microprocessor as a server, and (at a minimum) an 80286 microprocessor for individual terminals. Supports most graphics accelerator boards, mice, digitizers, and plotters.

A coprocessor chip (an Intel 8087, 80287, 80387 or look-alike products from other vendors) is strongly recommended. Expanded memory (or at least the extra 64K available with Microsoft's HIMEM driver) is strongly recommended—and is usually mandatory when running on a network. Cadvance has been certified to run with Novell NetWare; the vendor says it runs on other networks as well.

Vendor: ISICAD, Inc., 1920 West Corporate Way, P.O. Box 61022, Anaheim, CA 92803-6122. 714-533-8910. Fax 714-533-8642. \$3,295 for single-user license in stand-alone system; \$3,495 for single user in a network. Each includes 90 days free telephone help line. Some representative network volume pricing: \$12,000 for five users, \$20,000 for 10, \$40,000 for 25. Network licenses allow any number of stations to be equipped with Cadvance, but only the specified number can be run concurrently.

Manuals: Good. There's a detailed installation and tutorial, along with a comprehensive reference. Much of what you will need for network installation is included, but Novell NetWare is complex. Hands-on dealer help is strongly recommended to get things installed the first time.

Ease-of-use: Cadvance has long been one of the easier full-featured CAD

packages to use. Version 4.0 is no exception. You can work well with a mouse, although some vendors of add-on products suggest a digitizing tablet for command input and you can configure a tablet for standard commands. Cadvance automatically writes a dBase III+ (or dBase IV) file; there's no extra conversion step needed at the database end. Error messages are cryptic and general—common with network-capable software that must run on many different network packages and configurations.

Error-trapping: This is particularly important on network software. A key issue is file-locking. That is, when one file is in use, you do not want someone else accessing it at the same time on a DOS-based network such as that provided by Novell. That's because each user of the file would make changes independent of the others. Only the last file saved would actually survive; other changes would be overwritten.

Cadvance handles these chores well. It locks drawing files, as all Novell-based software does. It also locks database files (as most do) and auxiliary files such as macros and add-on software (often left unprotected).

It is possible to install the security device backwards, on a serial port instead of a parallel port. If you do, Cadvance will not start up.

Cadvance 4.0 is rather stable on NetWare/386. If a user turns off his or her station before releasing a file, Cadvance senses this and frees up the file anyway. Even a simulated power failure (we pulled the plug) did not disturb things.

It is possible to load a DXF file while another drawing is already being edited. If you do, the two files will be (perhaps unintentionally) merged or overwritten.



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Circle 40 on inquiry card

GLAZED FIRE WALL

Life safety under active fire conditions depends on keeping people physically separate from flames, smoke, and extreme temperatures until all occupants can evacuate the building, or the fire is suppressed. Fire-rated walls, doors, and windows are designed to do this, with their ratings—from 20 minutes to several hours—indicating how long this process of flee or fight may be expected to take.

Fire-rated glass was what you used in a fire-rated assembly, and for years it was a simple spec: wire glass, in a size permitted under the applicable code.

Architects and end-users have objected to the severe esthetic of wire glass, which is not even, properly speaking, fire resistant. During fire conditions, the glass itself quickly cracks. The wire serves only to hold the pieces in position in the frame, holding back the flames for its rated time. Nor is it a safety glass. In fact, not only will the broken glass present a danger, but the wire itself can act as a sharp fishnet.

These concerns have encouraged the development of substitutes for wire glass in some fire-rated applications. Windows and door-lights can use FireLite, a clear glass ceramic from Japan, which can be exposed safely to very high temperatures [RECORD December 1989, page 89].

Another condition—the fire wall—can be met by the Eich Fire Protection Glass System, which has been accepted under the more stringent criteria of UL 263. This test limits the temperature rise on the unexposed surface of the assembly to 250 degrees above ambient, and governs the designation of fire separation walls between use groups. It just so happens you can see—clearly—through it.

The German-made system incorporates Contraflam glass, which has a configuration that resembles an IG unit, with two panes of clear tempered safety glass on either side of a space filled with a colorless polymer gel. Heat generated by a fire will cause the gel to form a layer of highly heat-resistant crust, which consumes and dissipates a large amount of the fire's heat energy. This sacrificial process continues for the full extent of the rating, providing effective heat insulation from the fire while maintaining an intact barrier to the spread of smoke and flame.

© PETER VANDERWARKER Photos



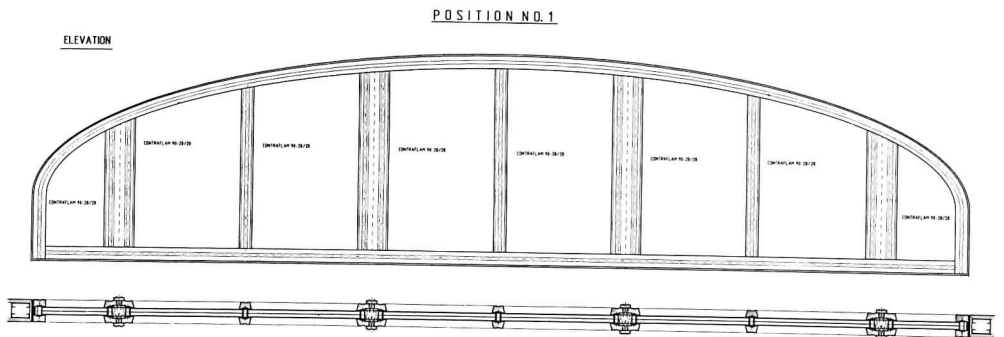
The fire-rated framing systems, made of metal or solid hardwood, maintain a relatively slim profile, given (in the 90-minute configuration) a glass thickness of 2 13/16 inches. While the installation may be very large (the new German Parliament building in Bonn will have a Chamber of Deputies surrounded with Eich fire-resistant glass walls up to 36 ft high), structural considerations normally impose a total nominal height limit of 12 ft. The modular framing is adjustable on 12-in. centers up to a maximum glass area of 4 by 7 ft. These individual lights can be erected in line to form a wall of any width. Eich Corporation, Los Angeles. *Circle 301*

Light and view in an adaptive reuse

The sensitive renovation of McKeen Memorial Hall at Phillips Academy in Andover, Massachusetts, by architect AIA incorporates several large areas of Eich/Contraflam glass. design firm submitted just-completed test data on the system to state Building Code examiners, who approved it for use in applications calling for a 90-minute firewall.

The long-vacant 35,000-sq-ft classroom building, originally designed by Hart and Richardson in 1903, is one of three historic buildings on the campus of the former Abbot Academy. Its major space, Davis Hall, a grand coffered-ceiling a

An innovative glass design permits the use of large clear-vision panels in fire separation walls between use groups.



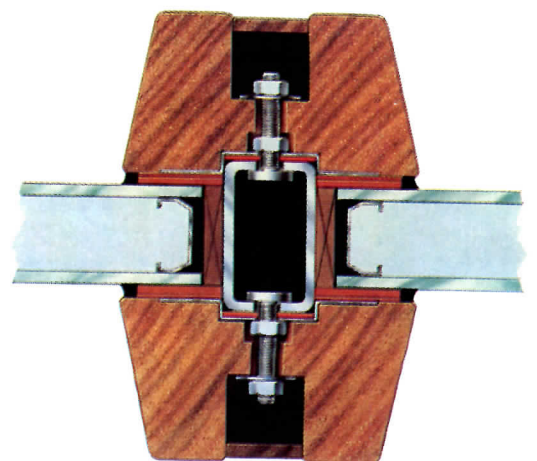
Plan views show the proportions of frame surround to glass of the Eich wall in the office mezzanine space. Total width of the glazed area is 29 ft 6 in.

m with a stage and fly galleries that
l a fire hazard and inhibited the
l's program in their current state (be-
view, 3). By removing the stage and
ng its wall 15 ft forward, space was
d for a two-level office mezzanine (4).
rosenium arch was reconstructed on
ew wall, and glazed along the top to
t the theatrical character of the origi-
age. Eight wood-framed Eich units
placed 36 inches above the new floor
giving the occupants a view into the
ished hall. A dramatic organ loft
g page, 1, and above, 2) became part
wo-level lobby space, and was glazed
six panels in an assembly 11 ft wide
most 11 ft high. Both of these applica-

tions required a 90-minute rating. The fire-resistant glass on the mezzanine level is carried on a steel frame. The cross-section, right, details the framing components of the glass fire-wall, which can incorporate one or two Contraflam panels as required.

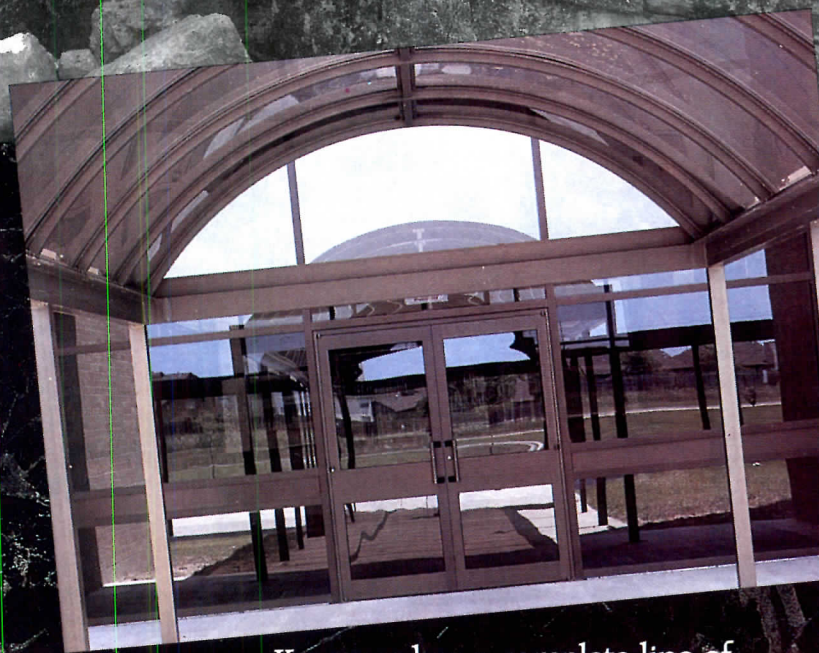
JOAN F. BLATTERMAN

*Renovation of McKean Hall,
Andover, Massachusetts*
OWNER: Phillips Academy.
Elaine B. Finbury, project manager.
ARCHITECT: Alan Schoenegge AIA—
Alan Schoenegge, Thomas MacLeod,
Jonathan Krueger, Franklin Liu,
project team.



Cross-section of wood frame.

Long after everything else has gone to ruins,
it's worth noting that the entrance still makes
a monumental impression.



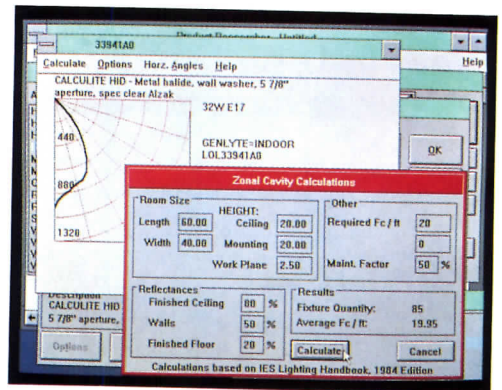
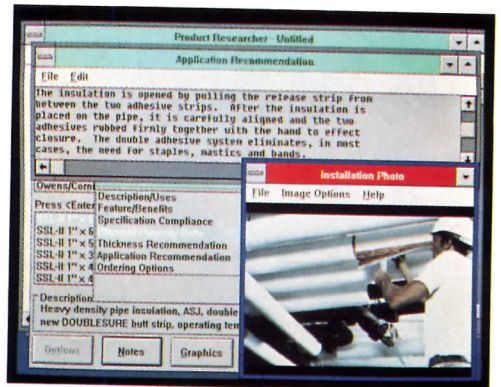
Kawneer has a complete line of
aluminum entrance systems,
each a timeless classic in its own right.

Kawneer
The designer's element.

Circle 41 on inquiry card

CATALOG ON A DISK

The Eclat CD ROM catalog offers quick access to voluminous amounts of manufacturers' literature, and a gateway to automated specifications.



After more than four years of experimentation and accommodation to aging technology, Eclat is poised to reintroduce its automated catalog system early in 1991. The catalog, supplied on a CD ROM disk, offers access to various manufacturers' products, and a whole lot more. To use it, though, you will need a CD ROM drive (about \$500) for an IBM-compatible computer using an 80286 or newer microprocessor, and Microsoft Windows 3.0. A monitor, SuperVGA- or 8514/A-compatible monitor, 80386 computer, and 2 MB of RAM are all strongly recommended.

To access the CD ROM containing Eclat, you use the firm's searching software, Product Researcher. It comes on the CD ROM and installs on your fixed disk.

The software works like most do with Windows. You move the mouse to a menu at the top of the screen and pull down the menu. Clicking the mouse button selects a menu choice. You get at products by clicking directly to the Catalog menu and clicking the "Select Proprietary Product" option on it if you know the product name, or click the manufacturer.

Select the "Define Generic Product" option if you want to search the entire CD ROM disk for products that meet your criteria. If a product is made by a manufacturer that does not participate in Eclat, you may get the manufacturer's name, but no product description. You only have to define criteria that are specific to a given product—number of drawers in a filing cabinet, for instance. Typically, you use CSI-based specs.

On-screen graphics can include color and black-and-white photos, line art, and even dynamic graphics (for lighting patterns, for instance). In the photo top left, a designer navigates through the Moen catalog, selecting products and attributes by clicking on the screen with a mouse. Screen top right displays windowed specifications, product data, and installation instructions from Owens-Corning Fiberglas. Unlike print catalogs, the computer provides interactive engineering information. Using zonal cavity calculations from Genlyte, for example, lower right, the system will instantly draw a photometric curve for a specified mounting angle, or calculate

the required number of fixtures for particular room geometry and reflectances. Images can be printed out, and text can be saved to a file for pickup by your own word processor. Some graphic images can also be saved using the Windows clipboard, and pasted into other documents—bidding documents, for instance.

The process is fairly easy and intuitive, but not too neat. That's because the manufacturers have supplied data in formats that vary somewhat. Some are crude color images, and some are high-quality line art.

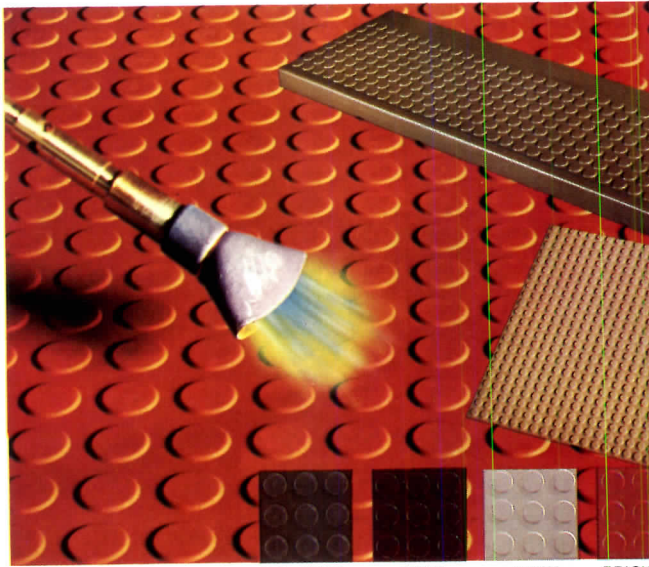
Windows 3.0 itself is intolerant of many of the expanded memory drivers that modern CAD packages depend upon. But the most advanced CAD packages, using the Phar Lap DOS extender or extended memory rather than expanded memory, will have no trouble coexisting with Windows.

Finally, there's an electronic gateway to the SuperSpec automated specification-writing system. Disks, updated quarterly, will be available to qualifying design offices without charge. Eclat, Pleasanton, Calif. Circle 302

STEVEN S. ROSS

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DISC-O-TRED™ Safety stair treads

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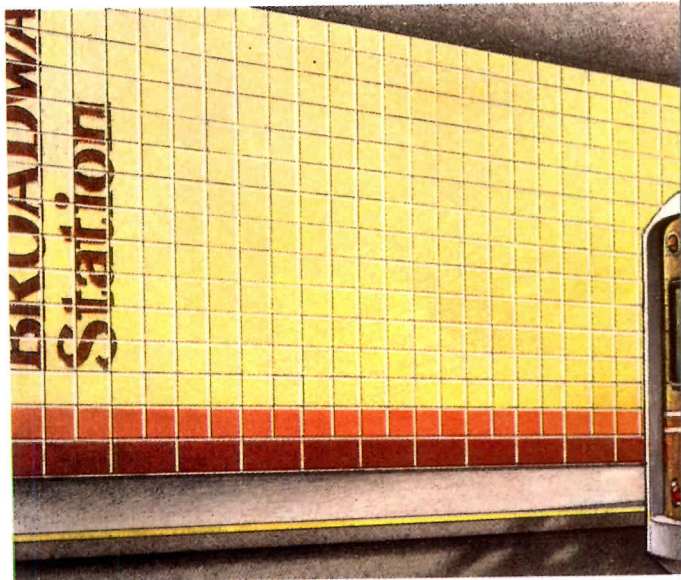
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Circle 44 on inquiry card

Here are some building products' catalogs, brochures and technical literature available in the architectural market today. To receive your copy of any of them, just fill out and return one of the special Reader Service Cards bound into this Product Literature Showcase.



Acrovyn Interiors

The new line of high impact wall coverings and wall panels are both beautiful and durable. The entire system can be used in both renovation and new construction. Prelaminated wall panels, wall coverings, column covers, door and frame protection and feature moldings are available in an exceptional range of textures and colors. The C/S Group 800-233-8493, Fax: 717-546-5169.

The C/S Group

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Mapes Industries

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Chadsworth Incorporated

Authentic Replication Columns follow the specs derived from the fifteenth century Renaissance master architect, Vignola. Architectural Stock Tuscan, Contemporary and Art Deco columns in pine, redwood and other wood species. Diameters-6"-36". Heights to 40'. CHADSWORTH - Expect the Best! Catalogs or information Box 53268, Dept. 9, Atlanta, GA 30355. Ph. 404-876-5410. Fax 404-876-4492.

Chadsworth Incorporated

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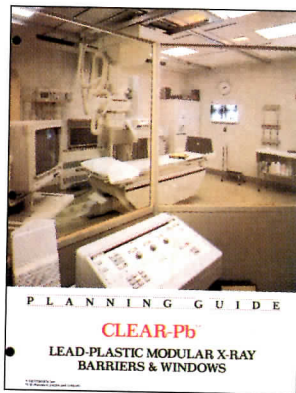


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Register & Grille Mfg., Co.

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Nuclear Associates

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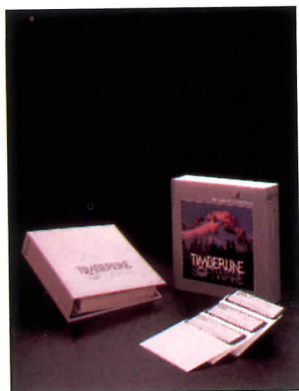
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Pemko's all new full-line catalog exhibits our complete line of residential and commercial products, including thresholds, gasketing, astragals, automatic door bottoms. Pemko's many new products and finishes are shown, including white and brite-dip gold anodized product line, adjustable thresholds and spring-bolt astragals. Pemko (805) 642-2600, fax (805) 642-4109.

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PRODUCT LITERATURE SHOWCASE



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Timberline Software Corp.

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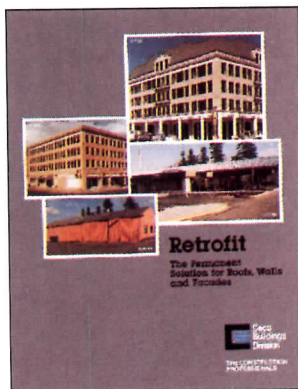


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Tulikivi Group

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Ways To Retrofit Shown In Brochure

Effective metal roof solutions to roof problems are featured in "RETROFIT—the permanent solution for roofs, walls and facades." Designed for the fast-growing building retrofit market, brochure shows how to eliminate leaky roofs, improve building energy efficiency, and enhance exterior appearance. Charts document cost-effectiveness of metal roof systems.

Ceco Buildings Division

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SONEX Ceilings offer renowned acoustics plus the ability to create hundreds of truly unique ceiling designs. SONEX Ceilings are available in five tile patterns and white, gray or beige color. Each 24" x 24" tile fits in standard ceiling grids and can easily be cut. Represented by Architectural Surfaces, Inc., 123 Columbus Court North, Chaska, MN 55318. (612) 448-5300.

Architectural Surfaces Inc.

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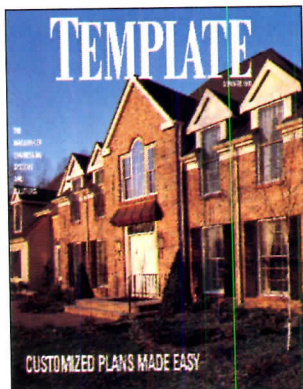


Supra-Slate II Slate-of-the-Art

Supradur is pleased to announce Supra-Slate II, an asbestos-free replica of Supra-Slate an established slate substitute for roof applications for shopping centers, hotels, historic restorations and luxury housing. It provides "Class A" security & freeze-thaw protection. Manufactured with beveled edges. Available in Bangor Black, Pennsylvania Gray, Vermont Green, Rutland Red. It offers "storm-anchor-free" installation.

Supradur Mfg. Corp.

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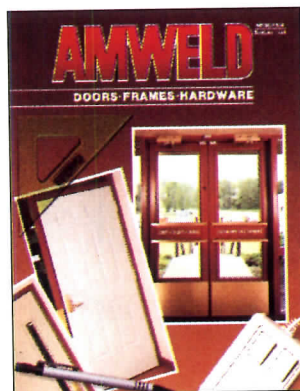


Customizing Plans Made Easy

Free reprint describes a quick, easy way to customize construction plans using simple cut and tape techniques and an engineering copier. Beneficial reading for the custom builder. Xerox Corporation, 300 Main Street, Suite 4-102, East Rochester, NY 14445. Call 1-800-448-3400, Ext. 558 or circle reader service number.

Xerox Corporation

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Libbey-Owens-Ford EverGreen™ Float Glass provides a soothing green tint that blocks 78% of the light, transmits 66% of visible light, yet offers nearly 20% less solar heat gain than conventional green tinted glasses.

Libbey-Owens-Ford

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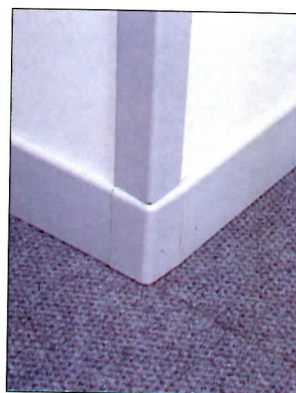
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Pawling Corporation
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Kemlite Introduces Colorful "Envision" Wall Panel

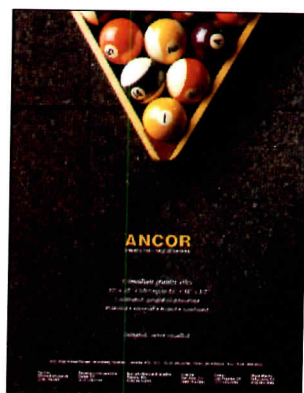
New type of smooth, matte finish fiberglass wall panel that has patterns imbedded into it. Available initially in a vertical ribbed look, square tile pattern and stone look. All come in a variety of colors and can be customized with your logo, pattern or design. Suitable for commercial offices, health care, schools and hotels. Moisture resistant, easy to clean, won't peel or chip. Class A fire rating. Contact Chris Farrell 800-435-0080.

Kemlite Corporation
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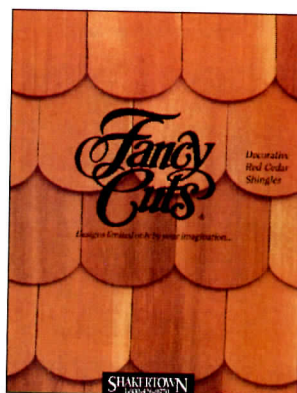
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Transwall combines these two basic wall requirements for today's high tech office with Sounddivider® open plan system and the full height corporate series. The two systems offer complete interchangeability of wall mount components, as well as compatibility in design and appearance. Modular furniture blends with panel mounted work surfaces. Electrical and electronic support is system integrated.

Transwall Corporation
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produces over a dozen granites in a variety of finishes for residential, commercial and institutional use. Standard format is 12 x 12 x 3/8"; other sizes up to 18 x 18 x 1/2" available. Polished and honed tiles are fully calibrated for economical thin-set installation. Ancor's honed finish tile is particularly suitable for high traffic commercial areas. Ancor Granite Tile, 435 Port Royal West, Montreal, Quebec H3L 2C3 Canada. Phone: (514) 385-9366, Fax: (514) 382-3533.

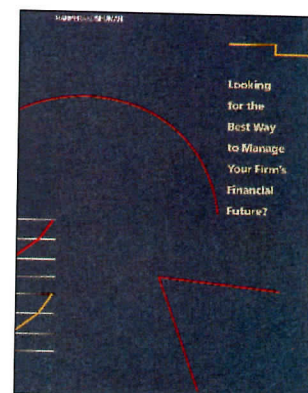
Ancor Granite Tile Inc.
Circle 519 on the PRODUCT LITERATURE SHOWCASE inquiry card.



Fancy Cuts Decorative Red Cedar Shingles

Nine precision cut patterns are available as individual shingles, or in eight foot panels with 5" or 7-1/2" exposures. This brochure shows many photos of product applications and design ideas. Shakertown Corporation, 1200 Kerron Street, Winlock, WA 98596. (800) 426-8970. (206) 785-3501 inside WA.

Shakertown Corporation
Circle 520 on the PRODUCT LITERATURE SHOWCASE inquiry card.

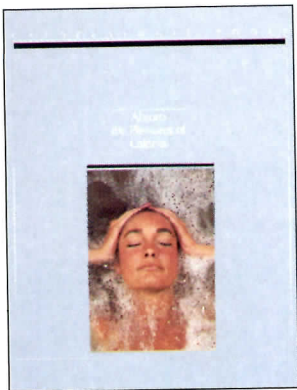


CFMS (Computer-based Financial Management System)

Harper and Shuman develops, sells and supports financial management software specifically for architects. The only system of its kind sponsored by the AIA, MICRO/CFMS runs on PCs and CFMS runs on the DEC VAX. A modular approach lets you buy only what you need. Call today (617)-492-4410 or (415)-543-5886. Harper and Shuman, Inc.

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PRODUCT LITERATURE SHOWCASE

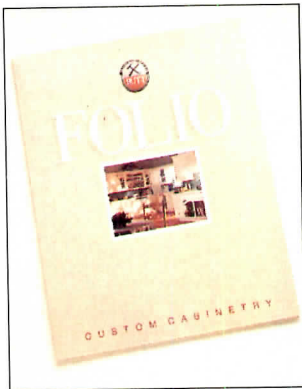


Caldera Spas

Since 1976 Caldera has been manufacturing whirlpool baths in 11 different sizes in 25 DuPont Lucite XL acrylic. Each system includes 6 or 8 jets and a 1 hp self draining pump which is activated by an air switch at tub side. An installation platform is attached to each unit. All models are also available as a tub only. For more information contact Caldera at 1080 West Bradley Avenue, El Cajon, CA 92020, 1-800-669-1881, FAX 619-562-5120.

Caldera Spas

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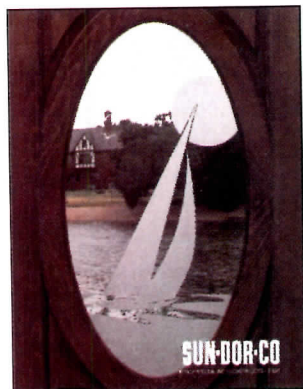


Rutt's 70-page "Folio of Custom Cabinetry"

RUTT CUSTOM CABINERY'S "Folio" demonstrates a wide selection of traditional, transitional, and contemporary styles, and the latest in custom design and decorating ideas for rooms throughout the home. Send request on company letterhead and also receive free our 270-page Specifications Guide. Enclose \$7.00 - Rutt, Dept. AR, P.O. Box 129, Goodville, PA 17528.

Rutt Custom Cabinetry

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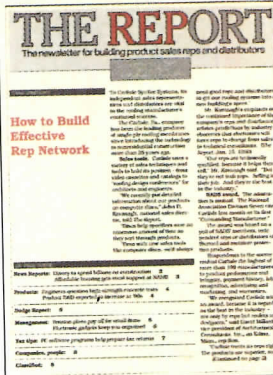


Etched Glass Doors

SUN-DOR-CO Etched Glass Art options complement the full line of SUN-DOR-CO wood doors. An extensive collection of Etched Glass Art options is shown in 8 pages, fully illustrated. A variety of door styles, standard sizes and odd sizes are available. SUN-DOR-CO, P.O. Box 13, Wichita, KS 67201. (800) 835-0190.

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The Report

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Specifier's Guide For Bent Temp™

Bent Tempered Glass

This Glasstemp brochure provides a ready reference on bent tempered architectural glass. Design information shows how you can now have the exciting look of curved glass with the strength and safety of fully tempered glass. Detailed specs describe use for building exteriors, handrails, elevators, partitions, bay windows, skylights & other applications. 1001 Foster Ave., Bensenville, IL 60106.

Glasstemp, Inc.

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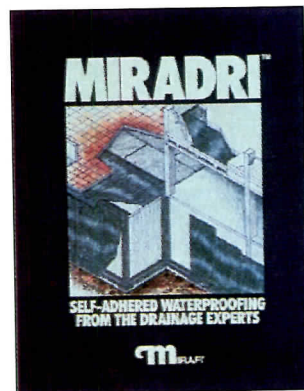


FRT Wood for Interior and Exterior Uses

PYRO-GUARD third generation interior fire retardant lumber and plywood is tested for plywood roof sheathing, roof framing and other interior structural applications. EXTERRIOR FIRE-X fire retardant treated lumber and plywood is used for exterior applications such as siding, decks, stairways, common entrances, scaffold plank and many other applications. Both products are UL-classified.

Hoover Treated Wood Products

Circle 527 on the PRODUCT LITERATURE SHOWCASE inquiry card.



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Miradri is a self-adhered sheet membrane that provides excellent waterproofing protection for below grade foundation walls, slabs, parking decks, plaza decks, tunnels, etc. Miradri is marketed as a complete waterproofing system in conjunction with a primer for wall preparation, a liquid membrane for hard-to-reach areas, and a mastic to seal termination points.

Miraf Inc.

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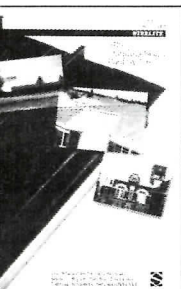
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Standing-seam roofing

Architectural applications of the SRS mechanically seamed roof are featured in a four-page design catalog. The system resists long-term weathering, extreme wind uplift forces, and thermally induced movement. Steelite, Inc., Pittsburgh. *Circle 400*



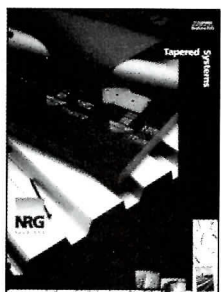
Glazed roof tiles

Natural-clay tiles come in two barrel shapes, an interlocking Oriental style, and a shingle-look. Natural, flashed, and ceramic-glaze colors range from white through reds to silver and two shades of black. Maruhachi Ceramics of America, Inc., Corona, Calif. *Circle 406*



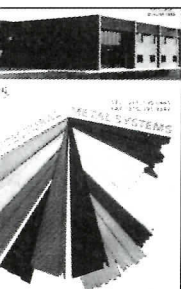
Commercial roofing products

A 48-page specification manual contains general design recommendations for all Tamko built-up and SBS-modified products, including new fire-retardant systems. Flashing and construction details are shown for all roof systems. Tamko Asphalt Products, Inc., Joplin, Mo. *Circle 401*



Tapered insulation

Brochure illustrates large roof projects, and explains how ENRGY 1 foam panels are compatible with virtually every type of roofing material and attachment method. High insulation value per inch. Facilitates slope-to-drain. NRG Barriers, Inc., Saco, Maine. *Circle 407*



Architectural metal systems

Roof, ceiling, and wall components made of aluminum, copper, or steel shown in both stock and custom profiles. A 20-page catalog features a structural Arc-Metafor panel custom-curved to either concave or convex shapes. ATAS Aluminum Corp., Allentown, Pa. *Circle 402*



Self-adhesive membrane

Flyer gives details on the Gray-sam roof, a fully adhered CPE-based membrane that is applied by removing the release paper and pressing the sheet onto the substrate. It remains flexible to -40F and has 15 percent elongation. Hyload, Inc., Pittsburgh. *Circle 408*



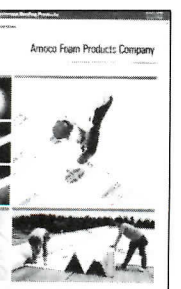
Vapor barriers

Reinforced with nylon cord to resist tears, Griffolyn polyethylene vapor barriers come in sizes up to 40 by 100 ft; custom sizes of up to 200 sq ft are available. Suggested for use under slabs and as a vapor retarder in roof-deck assemblies. Reef Industries, Houston. *Circle 403*



Coal tar pitch

A 12-page guide explains how the tight molecular structure of Black Armor coke-oven tar provides natural resistance to the effects of temperature, moisture, and corrosive elements. OSHA exposure standards included. Allied Signal, Inc., Morristown, N. J. *Circle 409*



Extruded-foam insulations

The features and benefits of Amofoam, Amocor-PB6, and Amocor Plygood roof recovery boards are discussed. The rigid boards offer a number of installation and facing options, including an easy-to-handle fan-fold. Amoco Foam Products Co., Atlanta. *Circle 404*



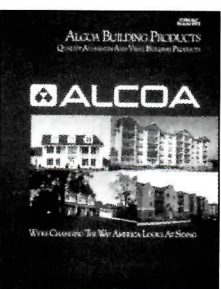
Sprayed-on roofing system

A 32-page guide explains the installation and specification of a Dow Corning seamless roof for various site conditions. The system consists of sprayed-on polyurethane foam insulation covered with two coats of silicone rubber. Polycoat Systems, Inc., Hudson Falls, N. Y. *Circle 410*



Shake-look roof panels

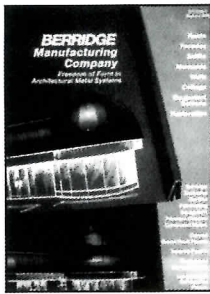
Lightweight, fire-resistant roofing made of steel formed in a mission tile or wood shake pattern is surfaced with a finish of colored stone granules. Panels interlock, and are installed with matching roof accessories. Gerard Roofing Technologies, Inc., Brea, Calif. *Circle 405*



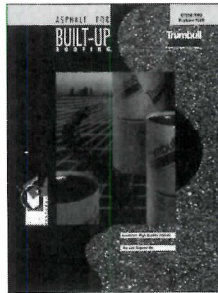
Roofing and siding accessories

Architectural catalog includes photos, performance data, details, and specifications for aluminum and vinyl siding, fascia, and soffits; rain-carrying systems; louver and raised-panel shutters; load-bearing columns; and trim. Alcoa Building Products, Sidney, Ohio. *Circle 411*

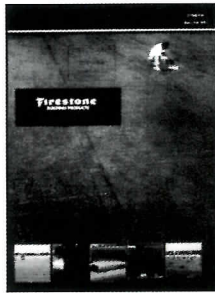
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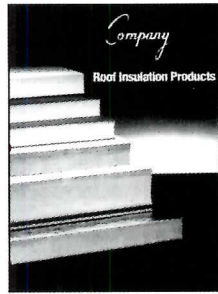
Architectural sheet metal
Innovative metal techniques include on-site roll-forming of continuous-length straight and curved standing-seam panels. A 40-page guide illustrates colors and applications ranging from sports stadiums to Victorian-era homes. Berridge Manufacturing Co., Houston. *Circle 412*



Roofing asphalt
Technical brochure highlights the performance characteristics of asphalts specifically formulated for dead level, flat, steep and special-steep roofing applications. Test data are listed. Trumbull Division of Owens Corning Fiberglas, Toledo, Ohio. *Circle 418*



Single-ply membrane systems
Catalog explains design and installation requirements of all Rubbergard EPDM and CPE membranes. Charts list accepted insulations and attachments for each roof type, including the new Saturn System. 16 pages. Firestone Building Products Co., Carmel, Ind. *Circle 413*



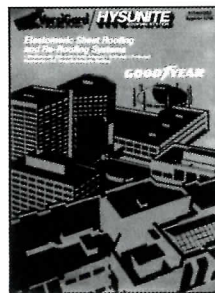
Commercial board insulation
Catalog discusses rigid polycyanurate panels, made in different facings to meet attachment, layout, and installation requirements of special roof systems. Stress-skin panels and nail-base insulations included. Homasote Co., Trenton, N. J. *Circle 419*



Roof edge
Brochure explains how Anchor-Tite roof edging meets various single-ply conditions. Design has a corrosion-resistant aluminum anchor bar concealed by a continuous, snap-on cover. Guaranteed for winds of up to 95 mph. Metal-Era Roof Edge Systems, Waukesha, Wis. *Circle 414*



Modified bitumen membrane
Capabilities brochure outlines a range of asphaltic roofing waterproofing products incorporating either APP or modifiers. Research and manufacturing facilities are described. U. S. Intec, Inc., Arthur, Tex. *Circle 420*



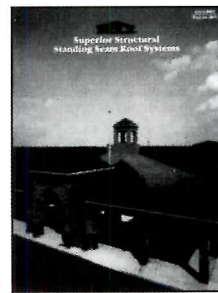
Sheet roofing systems
A 28-page catalog highlights VersiGard EPDM and Hysunite, a polyester-reinforced white Hypalon membrane. Test results are listed; diagrams demonstrate correct edge and flashing details. The Goodyear Tire & Rubber Co., Roofing Systems, Akron, Ohio. *Circle 415*



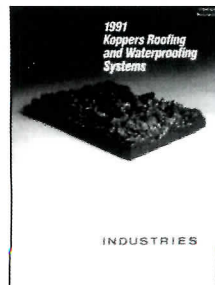
Hot-air-welded
Installation and long-term performance benefits of Nonthermo based roofing membrane covered. The material remains thermoplastic when installed and is said to be easy to handle even at cold temperatures. Bond Cote Roofing Systems, West Point, Ga. *Circle 421*



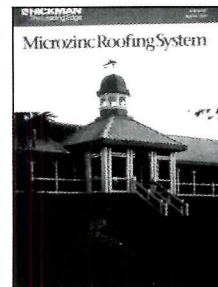
Metal components
Brochure introduces a line of metal panel systems for architectural, commercial, and industrial projects. Greater spans are possible with the heavier gauge metal used. Field-assembled insulated walls are featured. ECI Building Components, Inc., Stafford, Tex. *Circle 416*



Structural metal roof systems
Architectural brochure highlights the long-span potential of snap-together Ultra-dek field-seamed Double-Lok roofing systems. Diagrams show how the systems' alternating clip responds to thermal movement. MBCI, Houston. *Circle 422*



Built-up roofing systems
Technical guide discusses design considerations for both coal tar and asphaltic materials. The water-resistant properties of coal tar bitumen permit its use on dead-level roofs; new formulations reduce fume evolution. 28 pages. Koppers Industries, Pittsburgh. *Circle 417*



Weathering metal
An architectural sheet metal made of a zinc/copper/titanium alloy, Microzinc will weather in response to local conditions to a uniform gray color that will not bleed. Catalog describes special seam roofing and roof accessories. W. P. Hickman, Asheville, N. C. *Circle 423*

For your convenience in locating building materials and other products shown in this month's feature articles, ARCHITECTURAL RECORD has asked the architects to identify the products specified.

Pages 62-67
 Franklin Institute
 Charles Brecher Qualls Cunningham, Architect
 Marble: Wollery Stone Co., Inc. Brick: Belmont. Sandblasted anodized-aluminum exteriors: John W. McDougall Co. Paints on metal surfaces: Themec. Storefronts, windows, and doors: Hope's Architectural Products, Inc. Glass: Glass Group (Solex). Lead-coated copper roofing: James Heilstand, Inc. EPDM membrane: Manville. Skylights: Bohem; SuperSky West.
Pages 64-67—Atrium paving: Monile Terrazzo. Special lighting: custom by Klemm Reflector Co. Carpeting: Leonard Kunin Associates. Carpeting: Eastman-Bigelow. Rubber flooring: Freudenberg Building Systems, Inc. (Norament). Silk-screened melamine-on-steel panels: AllianceWall. Folding tables: Howe. Chairs: Flyline (Tuja). Illuminated signage: custom by architects, fabricated by Melius Architectural Products.

Pages 68-71
 University Research and Education Building
 Perkins & Will, Architect
 Marble cladding: Tristate Cut Stone. Aluminum curtain wall and windows: Marmet Corp. Glass: Glass Industries, Inc., Glass Group. Single-ply roofing: Firestone Building Products. Terne-coated stainless steel: Dessent Roofing Co. Entrances: Arsite Architectural Products. Door hardware and devices: Corbin Hardware. Paints: Benjamin Moore & Co. Custom panels: Barsanti Woodwork. Ceramic tile: Dal-Tile. Elevators: Westinghouse/Oldler.

Pages 72-75
 Mount Hotel
 High Space Architects
 Custom doors and woodwork: Progressive Millwork. Paneling and cabinetry: Maville. Laminate surfaces: Formica Corp. Perimeter lighting: Lightflex, Inc. Furnishings in lobby: Arflex (Marco Zanuso chairs); Ecart (Jean Michele Frank chairs); Maville (Philippe Starck tables and chairs on zinc; side chair and ottoman); Idee (Mark Carlson Lockhead aluminum lounge); Disenios Moricos (Antoni Gaudi carved settee); Muebles Cas (Carlos Riart sofas). Custom-color paint: Suede.

Pages 76-83
 Bank of China Tower
 Pei & Partners
 Marble: Lanhelin French granite. Curtain wall: Josef Gartner. Glass: Spectrum Glass Products. Penthouse solar screening: Tajima. Stainless-steel metalwork: Haukee; Josef Gartner. Elevators: Mitsubishi.

Pages 84-87
 Pines Health Center
 Mario Associates, Architect
 Roofing: ECI Building Components. Exterior stains: Empire Homecare. Composition flooring: Cross-Products Corp. (Dex-O-Tex). Entrance doors: custom by architects, fabricated by Contemporary American Furniture. Reception desk: custom by architects, fabricated by Laco Woodworking. Door hardware: Schlage Lock. Customized pendants: Lighting.

Pages 94-97
 Warsaw Community High School
 The Odle McGuire & Shook Corp. and Perkins & Will, Associated Architect
 Metal roof and siding: H. H. Robertson Co. Glass: Viracon, Inc. Aluminum-framed windows: Wausau Metal Corp. Entrance doors: Kawneer Co., Inc. Wood doors: Eggers. Door hardware: Corbin. Acoustical ceilings: Armstrong World Industries, Inc. Suspension grid: Chicago Metallic. Paints: Sherwin Williams. Wallcoverings: Genon. Carpeting: Lee's Commercial Carpets.

Pages 97-100
 Jane S. Roberts Elementary School
 Hervin Romney Architect, Inc.
 Corrugated metal roofing, canopy, and windows: H. H. Robertson Co. Glass block: Pittsburgh Corning, Inc. (reflective Decora). Library pendant fixtures: SPI Lighting. Other lighting: Lithonia.

Pages 101-104
 Hope Elementary School
 Taft Architects
 Ground-face CMU: Trenwyth Industries, Inc. Preformed metal roofing: ECI Building Components. Aluminum-framed windows: EFCO Corp. Glass: Guardian Industries. Exterior lighting: Bega/FS. Entrances: Kawneer Co., Inc. Hollow-metal doors: Fenestra. Wood doors: Weyerhaeuser Co. Locksets: Best Lock Co. Hinges: Hager. Closers: Rixon-Firemark, Inc. Exit devices: Von Duprin, Inc. Sprinklers: General Firematic. Vinyl wallcovering: Genon. Laminate surfaces: Wilsonart. Paints: Benjamin Moore & Co. Corridor lighting: Holophane. Resilient tile: Azrock Floor Products. Classroom desks: Irwin.

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February 24

al Rudolph, in the "Shape of the City" discussion series at the 92nd Street YWHA, 1395 Lexington Ave., New York City, at 8 p. m.; Charles Moore, on February 26; Allan Greenberg, on March 5; Paul Demberger, moderator. For information: 212/415-5455.

Through February 9

Josef Hoffmann: Drawings and Objects from Conception to Design," 281 sketches and objects, Goldie Paley Gallery, Moore College of Art & Design, 20th St. and the Parkway, Philadelphia; participants in a long symposium on Josef Hoffmann February 26 will include David Gebhard, Otto Graf, Michael Graves, others. For information: 215/568-4515.

February 28-March 8

Women: A Culture of Builders," an exhibit of photographs by Peggy Crawford of women building forms; sponsored by the American Architectural Foundation; at the College of Architecture, University of Arizona, Tucson. For information: R. Brooks Perry, 601/621-6751.

February 31

The Skin of the Earth," symposium conducted by London-based architect Raoul Schotzen; other evenings include Neal Schari, February 7, and Patricia Phillips, February 14; sponsored by the Architectural Dialogue Committee of the New York City chapter of the AIA; New York City Society for Ethical Culture, 2 West 64th St., 8:30 p. m.

February 6-May 21

The Grand Louvre: Entering a New Century" on the architecture of the Louvre, organized by the American Architectural Foundation, at The Octagon, 1799 New York Ave. N. W., Washington, D. C. For information: Lynne Lewicki, 202/262-7467.

February 10-April 14

Frank Lloyd Wright: Preserving Architectural Heritage," an exhibit of over 70 creative pieces by Wright, including furniture, art-glass windows, textiles, and paintings; at the museum of the Pennsylvania Academy of the Fine Arts, Broad and Cherry Streets, Philadelphia. For information: 215/972-7642.

February 11-15

Successful Construction Management Techniques and Procedures," a five-day course conducted by the College of Engineering, Department of Engineering Professional Development, the University of Wisconsin-Madison. For information: 800/441-376.

February 26-April 27

Design 1935-1965: What Modern Was," a 250 mass-produced and hand-crafted objects, a traveling exhibit organized by the Montreal Museum of Decorative Arts; opening at the IBM Gallery of Design and Art, 590 Madison Ave., New York City. For information: 212/745-3500.

March 2

"Social Responsibility and the Design Professions," 9 a. m. to 5 p. m., a forum organized by the New York chapter of Architects, Designers and Planners for Social Responsibility; Susanna Torre, program coordinator; at the New School for Social Research, 66 Fifth Ave., New York City. For information: 212/334-8104.

March 5-7

"Lightfair," lighting show and conference sponsored by the Illuminating Engineering Society of North America and the International Association of Lighting Designers; preceded by National Association of Elec-

trical Distributors' Commercial/Industrial Lighting Conference, March 2-5; both events to be held at the Merchandise Mart, Chicago. For information: Lynne Weller, 404/220-2115.

Through March 31

"Windows Through Time: American Windows from the 1630s to the 1930s," examining the evolution of American window design and technology and including 18 original windows; at the National Building Museum, Judiciary Square, Washington, D. C. For information: Donna Anderson, 202/272-3606.



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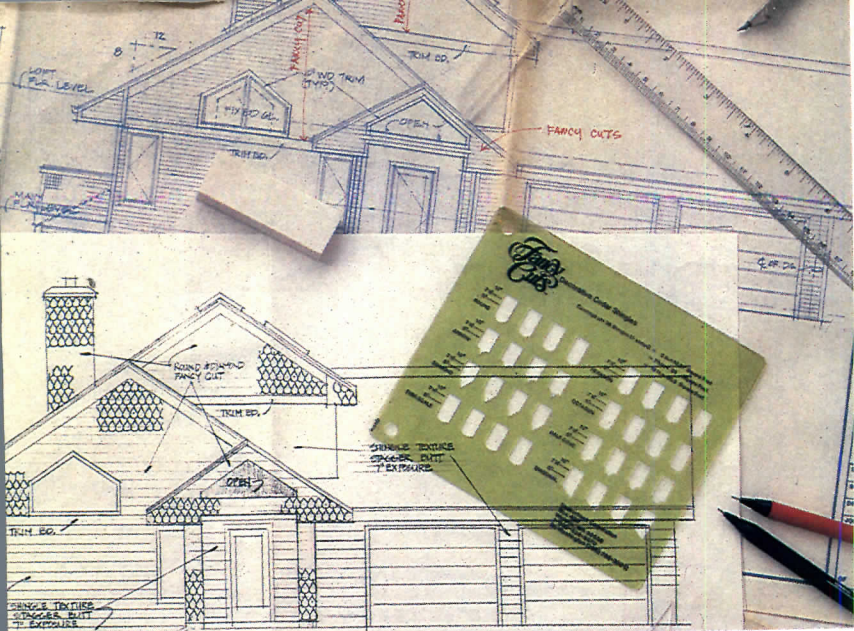
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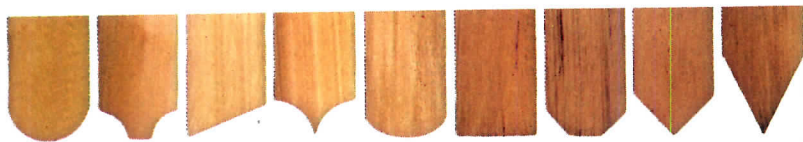
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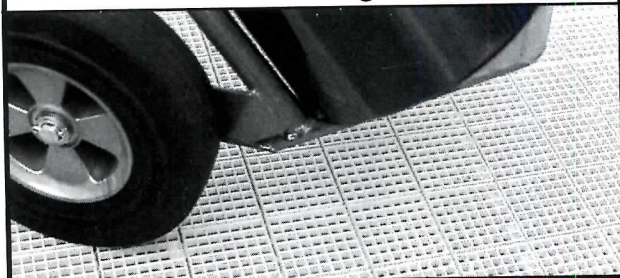
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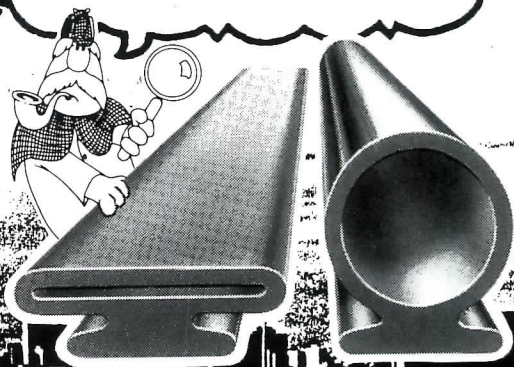


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