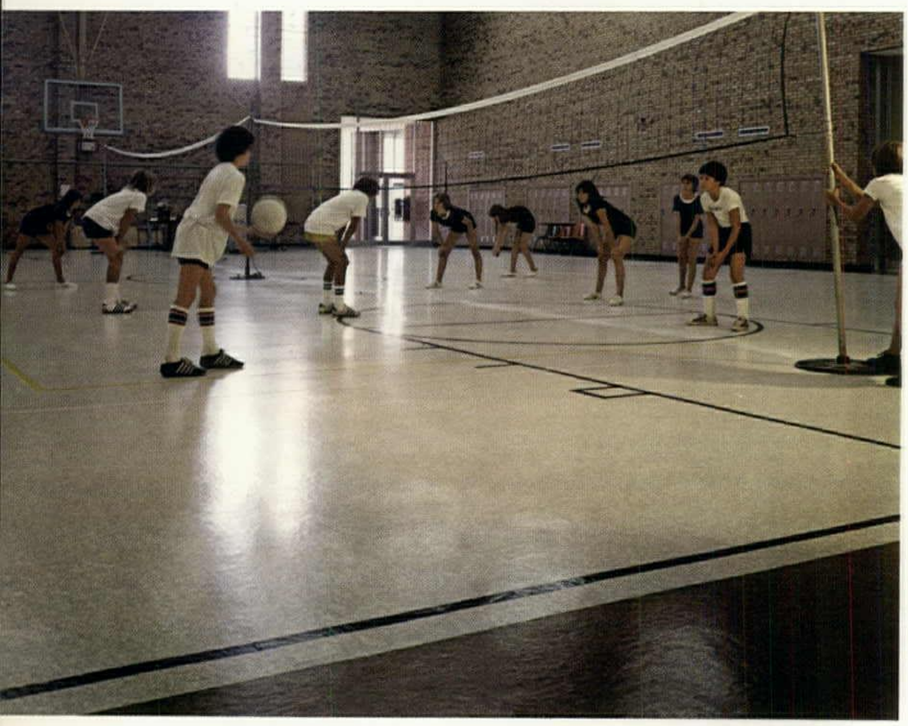
Progressive Architecture

June 1976 An IIRC Reinhold publication

The Brigantine® floor from Armstrong. At Liberty Junior High School, they've even put it in the gym. Because it's even tougher than the kids who try to beat it up.

If there's one word that describes most teenagers, that word is "active." So when you've got a junior high school with an enrollment of 600, you can easily imagine the kind of collective activity that takes place. Day in and day out.

With that many kids letting loose that much energy, you've got to be pretty particular about the covering you put on your floors. At Liberty Junior High School in the Richardson, Texas, Independent School District, they've found a particular way to cope with the continual tramping of all those busy feet. They've put down Brigantine Vinyl Corlon® from Armstrong.



In fact, school authorities are so confident of Brigantine's staying powers, they've even put it in the gym. Where the daily grind includes gym classes, basketball games, foot races, and volleyball — using tape for lane markings.

Introducing the Registron™ Series from Armstrong. Three beautifully sculptured ceilings designed to make the grid become part of the pattern.

The standard lay-in ceiling has two things going for it...economy and accessibility in a suspended grid system. However, because the grid is exposed, the ceiling's design is interrupted and its aesthetic appeal diminished. Now, with the new Registron Series, Armstrong has come up with an ingenious solution.

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Textured Squares employs a 12″ x 12″ tilelike module and features embossed radiused

June 1976

Progressive Architecture

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Cover: Chermayeff & Geismar's Tobacco Museum at Philip Morris cigarette factory, Richmond, Va., designed by SOM, N.Y. (p. 78). Photo: © ESTO.

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Show us the way

June 1976

Architects attending last month's AIA Convention in Philadelphia didn't know which way to turn—literally or figuratively. Out on street corners, they could be seen riffling fragmentary maps in the spring breeze. Indoors, delegates may have learned where to look for commissions, but they couldn't begin to agree on a course to follow in the crucial area of professional ethics. (See P/A News Report for particulars.)

The ethics questions boil down to these: Can the architect move in new directions (contracting, for instance) that may bring his own interests into conflict with his client's? Can a profession survive free-for-all competition among its members (on fees, free sketches, etc.)?

The AIA officers and board came to the convention advocating a bold move on ethics, but they had approved it only narrowly (20-15) and gave it only half-hearted support. Significantly, these people who had given the new ethics code the most study did favor it, if only narrowly. Objections from membership centered more on their unfamiliarity with the new provisions—and their implications—than on disagreements in principle. Now that the code has been sent back for a year of task force study, the charge to the AIA board is clear: any ethics changes proposed next year must be thoroughly explained and justified to the membership; any communication gaps remaining then will have to be closed by *leadership*.

Further indecision on this issue could cause more firms to flout the existing rules—to the extent that these rules survive court challenges. AIA's role would be seriously undermined, and all architects would suffer.

Another instance of uncertain direction was revealed by Vincent Scully's rejection of both his honorary AIA membership and his medal as historian. How could it be that Scully was being recognized (at long last) when architect Robert Venturi, whose work and theory Scully has championed, was judged deficient in his contributions to architecture to rank among the roughly 1100 members of the AIA College of Fellows?

The easy answer is that two entirely different juries ruled for Scully and against Venturi. But on a deeper level, an institution cannot passively tolerate such inconsistencies, and Scully served the AIA by exposing them. The situation is hardly unique: an organization establishes an elevated category of membership, admission to which is controlled by a jury of those who have already made it—though appointed in this case by the Institute board—who are almost inevitably more conservative in outlook than the general membership. (For a fascinating institutional history of the National Institute of Arts and Letters and the even more selective American Academy of Arts and Letters, see *New Yorker*, Feb. 23, 1976.)

Assuming no drastic change in the method of admitting new fellows—and there is probably no alternative that would justify such a change—the obligation falls on the present fellows (especially the recently elected ones) to make sure that future decisions truly represent the outlook of the Institute as a whole. As for Venturi, can anyone who has been involved in this profession over the past 15 years seriously contend that Venturi's contribution to the understanding of architecture has not been substantial? Some of his impact could be seen there in Philadelphia, in the fine museum exhibits designed by his firm and in their brilliant design of Franklin Court (April P/A, p. 69; for opposing opinions, see Views, p. 8). But Venturi's *ideas* were felt even more widely, in the meticulous restoration of Furness's century-old Pennsylvania Academy, for instance, which he helped us all to appreciate.

For architects with reasonable doubts about where the profession has been heading, Philadelphia itself showed something about the way to go. It showed that strong planning concepts, vigorously executed—even over some justifiable objections—can produce an urban environment almost universally beneficial; and that powerful, individualistic architecture can make a superb contribution in such a setting. In short, a few hours of wandering in downtown Philadelphia—purposefully or randomly—can do much to restore one's faith in the direction of planning and architecture in our lifetimes.

John Morris Dixon

Letters from readers

Views

Philadelphia revisited

The April issue (P/A 1976) was a monumental celebration of Philadelphia. It was not only a celebration of an American city, but a celebration of a design idea put forth by Edmund Bacon in his writings, "The City as an Act of Will."

It was a celebration of The Philadelphia School that Jan Rowan unveiled for us 15 years ago in *Progressive Architecture*. We had a school then and we have one now.

It was a celebration of an extraordinary series of creative forces: Furness, Cret, Howe, Lescaze, Kahn, Bacon, Larson, Stronorov, The Honorable Joseph S. Clark, Mayor Richardson Dilworth, Kling, Holmes Perkins, Venturi & Rauch, Scott Brown, Geddes, Brecher, Qualls, Cummingham, Mitchell/Giurgola, Sauer, Schlesinger, Baxter, Bower & Fradley, Murphy Levy Wurman, McHarg.

And looking over the entirety of their work, I am impressed by the boundless outpouring of talent. It was a great celebration!

John P. Sheehy, Architect
The Architects Collaborative
Cambridge, Mass.

The April issue of P/A was really fine. I think it offers an incisive reexamination of one of the most stimulating situations for architecture in America at this time. The essays by Robert Coombs and Walter Kidney combine real sympathy for the subject, a fine sense of the possibilities of the place and the architects who people it, and for the historical continuum which seems so very important not only to us looking at it from the outside but also, it would appear, to those working in it.

Equally fine, it seems to me, was the broad review of architecture in Philadelphia as it is at this time; even the so-called Bicentennial buildings were presented in an appropriately uninflated manner. And I think Lee Ryder made it pretty clear that D/R's incessant, and, by now, for me, overly cute Cambridgeization of everywhere was somehow less than what the doctor ordered.

Robert A.M. Stern, Architect
Robert A.M. Stern & John S. Hagmann Architects
New York, N.Y.

Your April 1976 issue containing the Philadelphia story as it relates to architecture is a very outstanding one. Its coverage of the city is very comprehensive and we enjoyed it very much.

We also appreciate the fact that we were included in the article by Robert Coombs regarding Philadelphia's Phantom School. He certainly covered the subject extremely well.

Charles E. Dagit, RA, AIA
Dagit/Saylor Architects
Philadelphia, Pa.

In looking over your April edition, two buildings caught my eye because of the problems they either tackle or create.

In the Graff house, the architects built a new concrete addition to a reconstructed colonial brick house. Very simply, I don't believe the new addition and the old house belong next to each other. The author of the article maintains that the addition highlights the original house. I disagree. The two structures conflict with each other. The new addition is almost a building in its own right and therefore creates tension. I maintain that if the architects wanted to highlight the building they should have built a black wall behind it. In all fairness though, I believe the wing should have been added in the same brick style as the original.

The other building I noticed was the Glass Palace. I liked it. However, I found one aspect of it that I would question. That aspect is the use of exposed pipes and heating ducts. I find normal exposed ducts somewhat nostalgic. Being nostalgic is not a criticism in itself. After all, the ducts do fit the interior decor of the building right now. But what will they look like in 50 years when the interior has been redesigned a dozen times over. The problem is very obvious: the ducts match the interior decor instead of the building itself. I have only one solution at the moment. That is that if architects like exposed ducts or water pipes, they ought to design their own to match their buildings.

Robert Rothblatt
Berkeley, Calif.

Kahn on film

Your review of "The Engineer Kahn" (April P/A, p. 97) was noted with interest since IMI, prior to Kahn's death, dispatched a motion picture crew to Exeter, N.H., Ahmedabad, India, and to Dacca, Bangladesh, to film Kahn's powerful designs. To our knowledge this is the only 16 mm color film footage in distribution featuring Kahn's work in India and Bangladesh.

The 17-minute IMI film titled *First Principles*, recently won an award from the U.S. Industrial Film Festival and a Chris Award from the 23rd Annual Columbus Film Festival. Any of your readers wanting to view a free-loan copy of the film, narrated by Vincent Scully, should contact IMI for a brochure and listing of distributors in the U.S. and Canada.

Neal English, Executive Director
International Masonry Institute
823 Fifteenth St., N.W.
Washington, D.C. 20005

Credit due

The article on the NewMarket development in Philadelphia (April P/A, p. 76) should have included credits to lighting consultants **Jules Fisher and Paul Marantz, Inc.**, who were incorrectly listed as building material suppliers.

George M. Ewing Co. should have been credited as joint venture architects, with Bower & Fradley, for Market Street East (April P/A, p. 50 and May P/A, p. 54).

Proper credits for the new portico of the First Church of Christ, Scientist, in Boston (Mar. P/A, p. 81) should include **Cossutta & Ponte**, along with I.M. Pei & Partners, as associated architects and planners.

Kitsch vs. quality

Re your articles "Home of the Century" (P/A 6:73 p. 126) and "From the folks who gave you 20-20 vision" (P/A 9:75 p. 64): there shall be no quarrel that those people who call themselves Ant Farm have the right to do what they want. So does the desert group in Arizona (P/A 9:74 p. 22), the British group who talked about "Lumps" (P/A 12:74 p. 21), the lady who dreamed up Liberace's dream house (P/A 8:74 p. 23) or the team who came up with the Pembroke Dormitories in Providence (P/A 2:76 p. 47). It is also your editorial privilege to consider these works worthy of an architectural magazine and publish them.

There shall be no quarrel either about your prerogative to invite the member of a firm which advocates the Las Vegas environment to be a juror of urban design in your 21st Awards Program. Even her right to demean architecture and the profession (P/A 1:74 p. 70) shall be recognized.

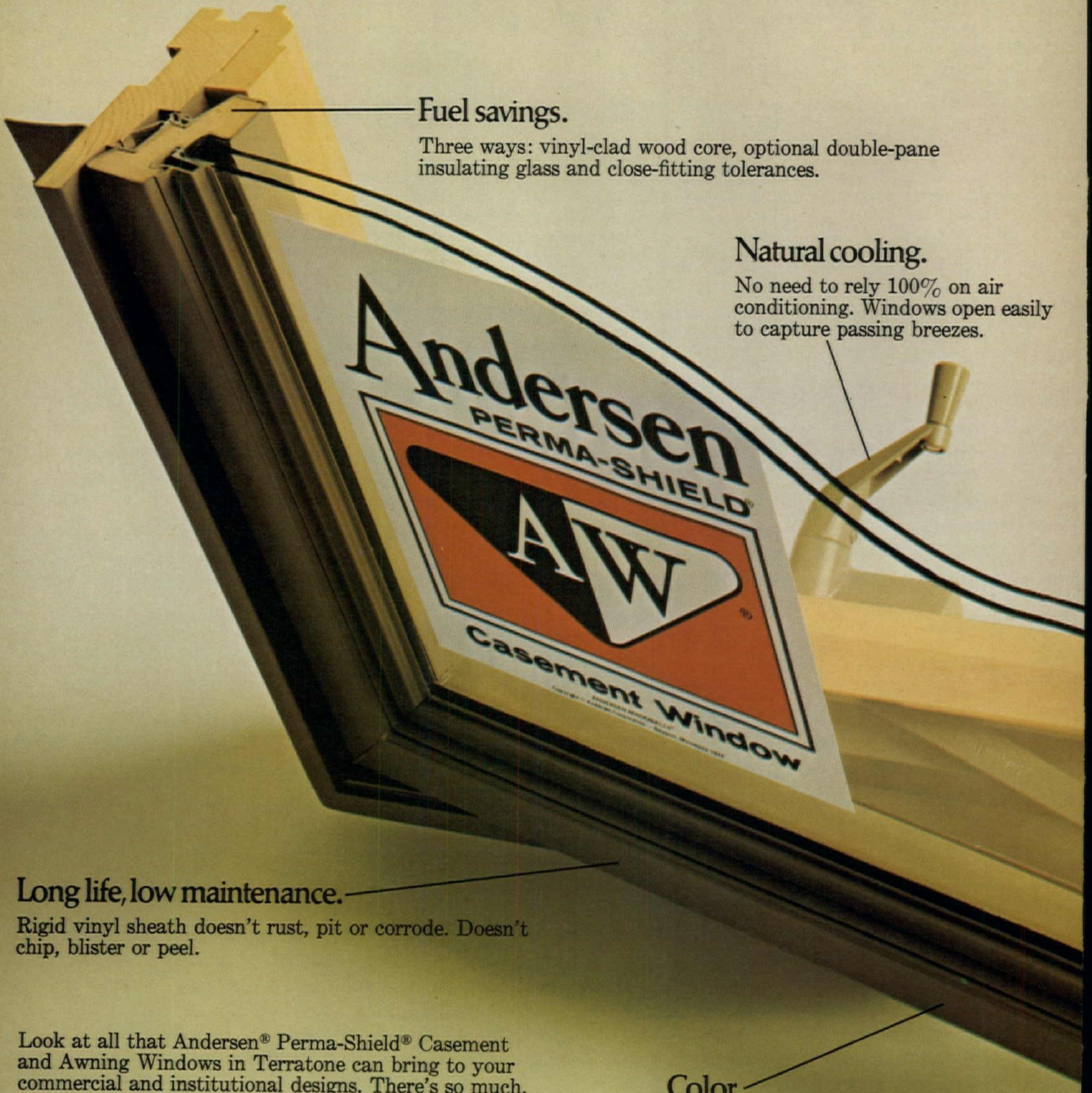
Furthermore, re P/A's 23rd Awards Program, it was definitely the jurors' right to accept the Grand Rapids Community Arts Center and the Fountain house as architecture and to honor them too. And it was perfectly within your right to explain the jurors' decisions in your reply to reader Sam Carson's letter of protest (P/A 3:76).

Nevertheless, recognizing these rights does not prevent me from feeling nauseated. I regret your trying to be controversial for controversy's sake, and to be different for difference's sake. This seems to be unexplicably inconsistent with the otherwise excellent quality of your magazine. Your perfectly rational article re the International Terminal at Logan Airport (P/A 2:76 p. 76) particularly shows that you are in full possession of your analytical senses.

I must, however, express my sadness and indignation concerning the total desecration of Benjamin Franklin's homesite (Franklin Court, P/A 4:76 p. 69) by the same Las Vegas-loving people mentioned above, who also proposed to pollute Philadelphia's roadside with billboards (P/A 4:76 pp. 31 and 45; luckily the proposal is being rightfully ignored). I protest as a citizen and regret as a design professional that such a significant site of our national history has been turned into a circus of kitsch. I can't help but want to blame the media (including you) and the academic/intellectual crowd for taking those people seriously and thus influencing the public agencies involved to make such a disastrous judgment in the design for Franklin Court.

Ted Wu, Architect/Industrial Designer
Los Angeles, Calif.

[Very simply, we believe that works of architecture such as Franklin Court and the Pembroke Dormitories are outstanding for their design quality, and no less responsible than the international terminal at Logan Airport. Our conversations with architects attending the AIA convention in Philadelphia in May indicate that Franklin Court was widely appreciated by architects who visited it. Your suggestion that these works or the Philadelphia billboard proposal "pollute" or "desecrate" their settings may stem in part from unfamiliarity with those settings. Beyond that there is obviously disagreement—a widespread disagreement to be sure—about the objectives of architectural design—Editors]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Architect: The Grad Partnership, Newark, N.J.

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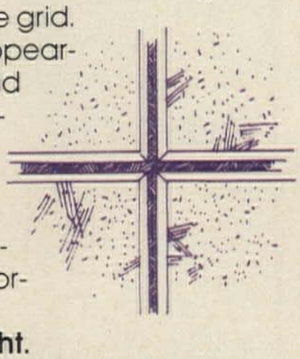

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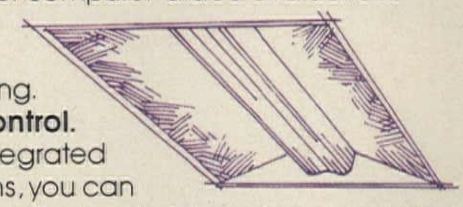

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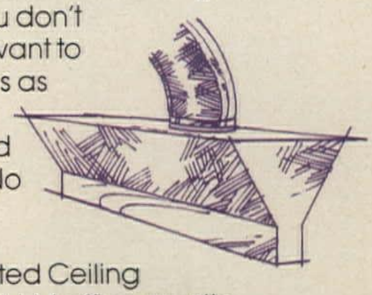

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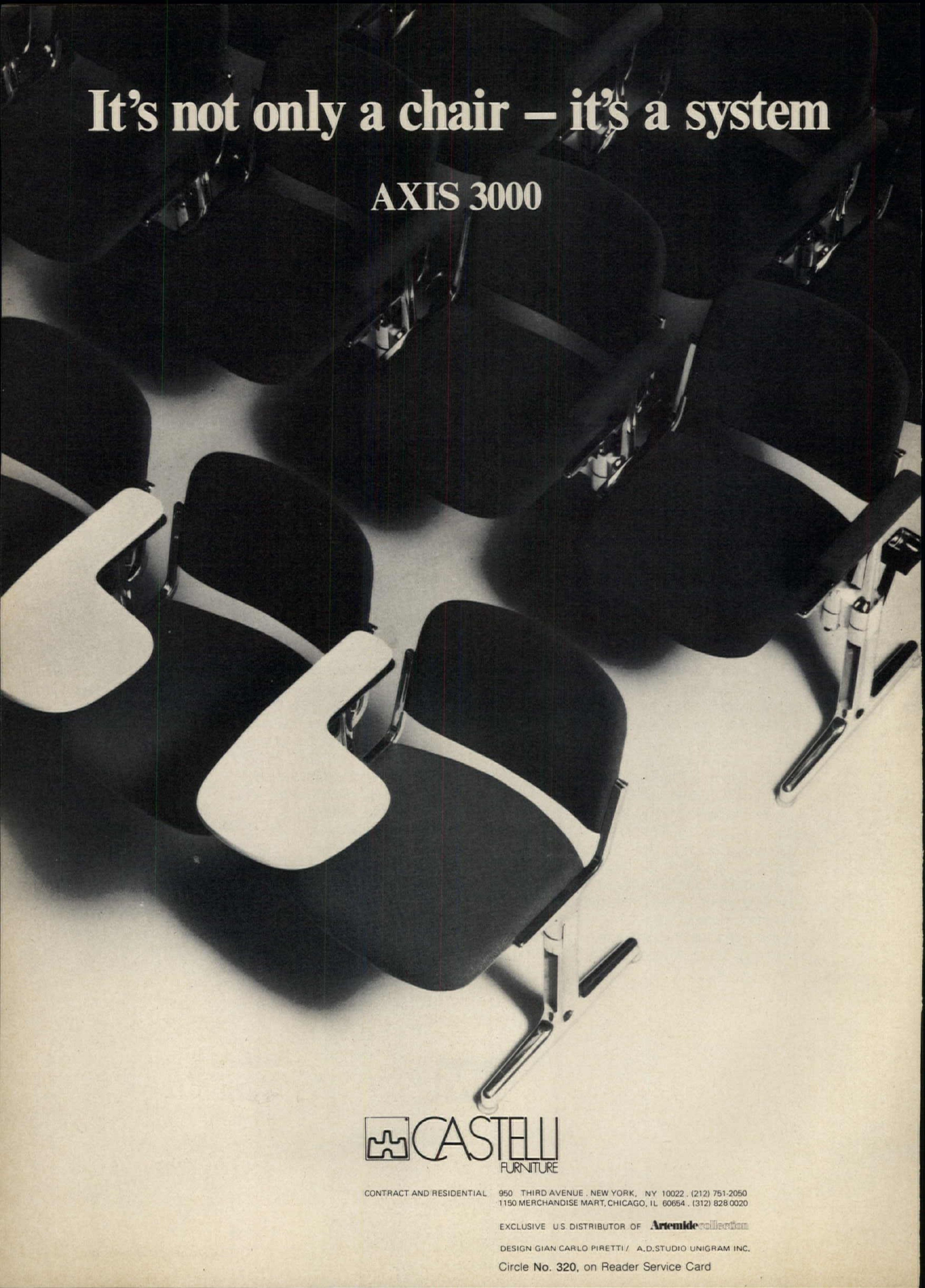
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P/A 24th Annual Awards Program

for projects not yet completed

in architecture planning and research

Progressive Architecture announces its Twenty-fourth Annual Awards Program. Awards will be made to U.S. and Canadian architects, designers, urban planners, other professionals and their clients for projects now in the design stage and scheduled to be under construction in 1977. Any building, group of buildings or urban planning project illustrating definite building proposals will be eligible. *In addition* entries in *applied research for a client* will be accepted from architects or others *if they are applicable to the design or realization of specific facilities or programs and are scheduled to be acted upon within the calendar year 1977.* Qualification of entries in any category depends on the fact that the work is commissioned by a specific client.

Purpose of the Awards Program is to recognize, at the critical early stages, outstanding examples of work being done in the fields that most directly affect the built environment. Recognition will be given to both the entrants and their clients.

First award, award, and citation designations may be given by the jury in any or all of the three broad categories: research; urban design and planning; architectural design. Entries will be reviewed for such factors as response to a client's program, site use and development, design excellence, conceptual advances, materials selection, and methods of implementation.

Judging will take place in Stamford, Conn. during September 1976. Winners of awards and citations will be notified (confidentially) immediately after the judgment. The jurors will be eight highly respected professionals, to be announced in the July and August issues of P/A.

Public announcement of the winning projects will be made at a presentation in January 1977 at a location to be selected. Winning projects will be featured in the January P/A. As in the past, P/A will arrange coverage of winning entries in news media, particularly in those localities of the award and citation winners. Winners must agree to provide illustrations reproducible in the press and to forward original material, including models, to P/A if requested.

[continued on next page]

Submission requirements

1 All submissions *must be firmly bound.* Original drawings, actual models, or mounted exhibit panels won't be accepted, and no material is to exceed 11″ x 17″ in size. Each project is to be submitted under separate cover; 8″ x 10″ binders are preferred.

2 Submissions must be accompanied by the *entry form,* to be found on the *left side of this page.* Each entry must have a separate form; reproductions of the form will be accepted. Please fill in (typewriter only, please) *all* appropriate spaces on the form, and sign statement of publication (part 2). Note that four parts are required for each entry.

3 No identification of the entrant may appear on any part of the submission, except concealed in an envelope attached inside back cover of binder; entries will be kept anonymous until judging is completed.

4 In addition to the form, please include the following: a one-page synopsis of the submission; attached to first page inside binder, summarizing program, your solution, description of and reasons for your selection of materials and construction methods, site considerations, and objectives of design (for research and planning, the intent and effect of the work). Synopsis must conclude with a statement on *why this submission should be considered for recognition.* (Entrant should realize that this synopsis, plus visual material, may be sole basis for retaining submission beyond first round of judging.) Any additional information necessary, or amplification of the one-page synopsis, is also encouraged, but should remain separate from the synopsis.

5 Graphic submissions should also include pertinent drawings such as site plans, representative floor plans, sections, details, perspectives and/or model photos.

6 For purposes of jury procedure only, projects are to be classified *by the entrant* in the appropriate space on the entry form. Awards and citations will not be given by categories, but submissions must be divided into comparable groups for judging. For this reason, you are asked to list your submission as one of the following: *Education (Higher), Education (Secondary), Education (Primary or Early Childhood), Housing (Single Family), Housing (Multiple Unit) Commercial (Large Scale), Commercial (Small Scale), Industrial, Religious, Recreation, Health Care, Planning and/or Urban Design, Applied Research.* If no category is listed for your submission, please write in MISC., and it will be placed with comparable entries. Mixed-use entries (part commercial and part housing, for instance) should be classified according to the larger function.

7 Submit fee of $10 for each entry, to cover processing and handling, in an envelope marked "fee" attached inside front cover of binder. Make check or money order payable to *Progressive Architecture.*

8 Any entry not conforming to the above requirements may be returned to the entrant without being judged.

P/A will take every reasonable precaution to return submissions intact; P/A will assume no liability for lost submissions. **Deadline for mailing** is August 31, 1976.
Address entries to Awards Editor,
Progressive Architecture
600 Summer Street, Stamford, Conn. 06904.

Entry form

Progressive Architecture 24th Annual Awards Program

Please fill out *all* parts of this form and submit with each entry. Copies of this complete form may be used when submitting multiple entries. (Typewriter only, please)

Entrant:
Address:

Project:
Location:
Client:
Category:

Entrant:
Address:

Statement of Publication Rights: P/A has first rights to publish both the design and the finished project if it wins an award or citation (in the case of research studies, first rights to publication of the results) in the architectural press. Construction of the project is not yet completed, construction (or action on research proposals) is scheduled to begin before the end of 1977.

SIGNATURE ______________________

Awards Editor
Progressive Architecture
600 Summer Street, Stamford, Conn. 06904

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FULTON

News report

Progressive Architecture

AIA ethics question postponed a year

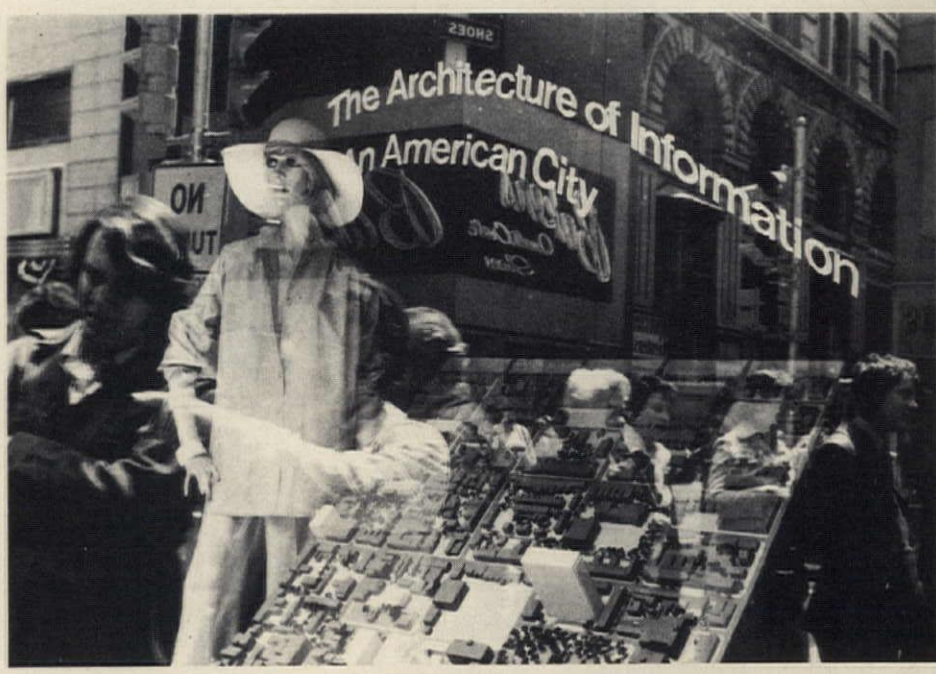
Action was deferred on the controversial changes in the American Institute of Architects' code of ethics by delegates to the 108th convention held in May in Philadelphia. After a witty speech in support of the liberalizing measures, John F. Hartray Jr. of Chicago nevertheless moved that the proposed changes be studied another year and voted upon at the 1977 convention in San Diego, Calif. The motion passed.

Attendance, for the second year in a row, was down: 1184 members compared to 1509 in 1975. Total convention attendance, including associates and guests, was 2704.

In approving Hartray's motion, the delegates voted to create a task force of members representing both sides of the issue which should submit reports on the majority and minority opinions to the chapters for study by January 1977, and produce a final report in time for the next convention to be held June 5-9, 1977.

At issue were advertising, free sketches, paying agents, and working as building contractors. The ethics question was introduced by First Vice President John M. McGinty, of Houston, Tex., chairman of the three-man committee that drafted the changes. Robert L. Wilson of Stamford, Conn., a vice president, and Hilliard T. Smith, of Lake Worth, Fla., secretary, also served.

Jerome M. Cooper, of Atlanta, was the first to speak against the changes.
[continued on page 33]



Photos: Ann Carter

Architectural display in Wanamaker's window with streetscape reflections during convention week.

Delegates hear ethics debate. William Marshall (below, left), and speakers in line to talk.

City of information: hit despite misses

Philadelphia was rediscovered as a city of beauty and surprise delights by the 2700 architects and guests attending the 1976 AIA convention last month but did so on its own with little or no help from the prepared brochures and guides. This is all the more ironic because the convention theme was "An American City: the Architecture of Information."

A definite handicap were the maps, which were incomplete and hard to read. Not one gave a total picture of what was happening—either for the scheduled talks, scattered in buildings throughout the city, or for sightseeing spots.

Perhaps the most conspicuous

Gerald Cope (left) reads Keynote Fable to tiers of spectators (above) at Centre Square. The event opened AIA convention week in Philadelphia.

Fuller speaking at Holy Trinity Church

Pied piper leads crowd to Rittenhouse Square.

Breakfast reception at Rittenhouse Square. Balloons, gingerbread men, mimes were part of the festive offerings. AIA events were well covered by the press and television.

T-shirts for sale and sidewalk show of architectural panels.

breakdown of communication occurred on the opening day at the keynote fable, which was billed as a media presentation in lieu of a keynote speaker. AIA national convention chairman Richard Wurman of Philadelphia wrote the fable. Crowds filled the atrium tiers of Centre Square making the building, designed by Vincent Kling of Philadelphia, come alive; music by Musica Orbis lent a festive air. When Gerald Cope with his brisk British accent launched into reading the fable, people started milling around as acoustics in some of the balconies made the speech inaudible. While crowds searched for better spots, they created a far more interesting spectacle of sights and sounds than the lone speaker reading a wordy tract from the bucket of a mechanical lift. It proved that the *architecture* of information *is* more interesting than informative words.

Highlights of the week were a concert by the Philadelphia Orchestra in the elegant Academy of Music, and the breakfast reception at Rittenhouse Square, where crowds were lured by a (bag-) piper, Rufus Harley, from Holy Trinity Church into the square following a talk by Buckminster Fuller. The much-heralded fireworks display and "Citylights" (buildings specially lit for the evening), while enchanting, made many wonder beforehand where they should be to view the events. The display made the newspaper's front page.

One of the most rewarding activities was the "Philadelphia: Three Centuries of American Art" exhibit at the Philadelphia Museum of Art. Although the exhibit was *not* mentioned in the convention brochures, it included a small but beautiful section on Philadelphia architecture. The main exhibit was installed by Venturi & Rauch in a space recently converted by Geddes Brecher Qualls Cunningham from storage to galleries. While the exhibit was rather subdued for Venturi & Rauch, it still makes dramatic use of background colors and spatial composition that are becoming their installation design trademark.

Botsai elected AIA first vice president

Elmer E. Botsai, partner in the San Francisco firm of Botsai, Overstreet &

Rosenberg, was elected first vice president of the American Institute of Architects at the Institute's convention in Philadelphia. He will serve in that office during 1977, and the following year will be president of the AIA. Botsai defeated Carl L. Bradley, of Fort Wayne, Ind., for the office. Bradley is currently serving as a vice president of the Institute as well as being president of Archonics Corporation.

Others elected were vice presidents Herbert Epstein, of Brooklyn, N.Y., president of Epstein/Greenfield Architects, PC; Ehrman B. Mitchell Jr., of Philadelphia, partner in the firm of Mitchell/Giurgola, architects; and Robert L. Wilson, who heads his own firm in Stamford, Conn. This will be Wilson's second term as vice president. Robert M. Lawrence, of Oklahoma City, Okla., of Noftsger, Lawrence, Lawrence & Flesher, was elected to a two-year term as secretary.

Botsai, a graduate of the University of California, Berkeley, is in his second term as a vice president of the AIA, and has served as treasurer of both the AIA and the National Architectual Accrediting Board. He has served as chairman of the Institute's Finance Committee and as a member on the Planning Committee and the Institute Restructuring Task Force.

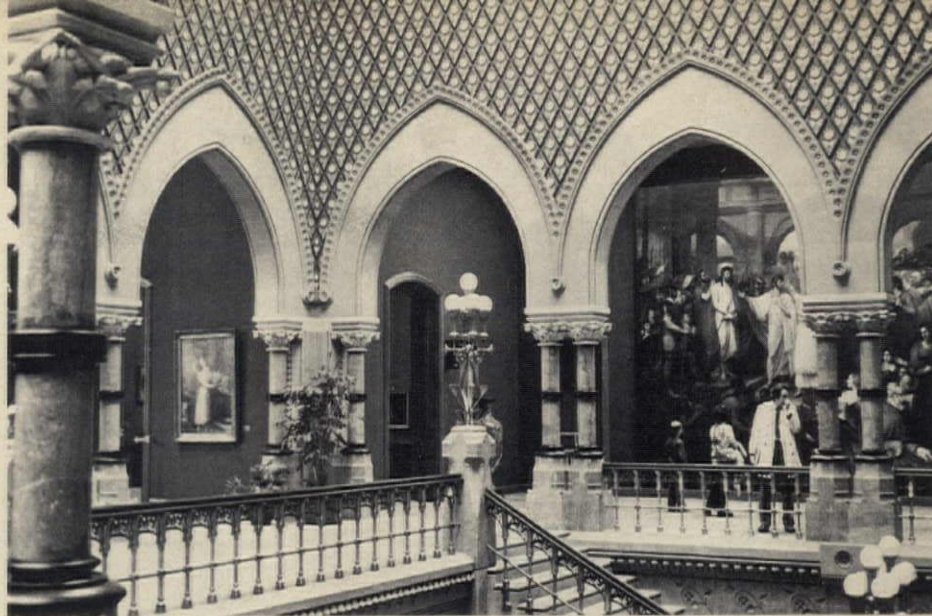
He ran on a platform to increase the effectiveness of the Institute in assisting members to expand their markets and improve existing markets and to help AIA components improve representation of architects to the public and to other architects.

Current AIA president is Louis de Moll, of Philadelphia, who will serve through December. President next year will be John M. McGinty of Houston, Tex.

Women delete 'women' from AIA resolutions

Women successfully argued at the AIA national convention to remove the word "women" from the Omnibus Resolution on Minority Affairs. By so doing, the women made the point that they don't want to be considered apart from the mainstream of architects, and that they want equal, not separate, treatment from the American Institute of Architects.

The resolution in question contained



Frank Furness' newly restored Pennsylvania Academy of the Fine Arts.

Robert Siegel shakes hands with John Burgee (left) after receiving Honor Award. Academy House (below) where gala ball was held.

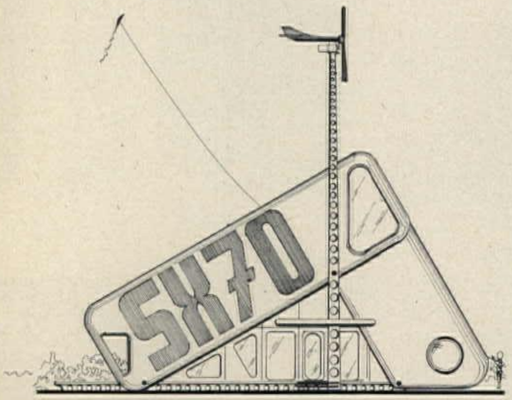
'Architects Holiday' at David Crane & Partners (below, left), AIA bookstore (below, right).

Students tour Mitchell/Giurgola's (below, left).

David Osler and Richard Meier (below, right).

Women's caucus heard report of AIA's Affirmative Action Plan. Exhibitors' tables (below, right).

Hugh Herrington of British Aluminum talks with London architect Norman Foster at Reynolds event.



Allen Koster's prize-winning mobile home design based on Polaroid camera action (above). Foster's headquarters for Willis, Faber & Dumas (below).

the phrasing "minorities and women" in three places where awareness of their needs and participation was recognized. As one woman commented later, the further distinction of women from minorities as well as from architects, generally, was unacceptable, although the women do not particularly want to be grouped under the term minorities, either.

Earlier during the convention at the women's caucus, a group of about 50—half Institute members, half students—heard, some for the first time, about the AIA's Affirmative Action Plan. Adopted in December and effective in January, the plan is designed to remove sex discrimination from Institute activities and strengthen the position of women. Copies of the plan were sent to AIA components for implementation, but copies were not readily available at the convention, and objections were raised.

In discussing the plan, AIA deputy vice president James A. Scheeler cited several instances where the plan is working: of this year's 71 Fellows, three—or 4.2 percent—were women, a percentage which exceeds the percentage of women in AIA. Also, 53 women—3.7 percent of the total—have been appointed to committees in 1976, again a greater percentage than that of their membership. Three of the four students this year in the Institute's Scholars Program are women, and 10 of the 114 are women in the Pilot Intern Development Program.

"I don't want anyone to get the impression we're out of the woods," said Maire Laleyan of San Francisco, one of the members on the AIA Task Force on Women in Architecture and chairman of the women's caucus. While commending the Institute on steps taken at the national level, she told her colleagues that the burden will rest on the components, which must develop their own programs based on the Affirmative Action Plan. Also important is channeling to AIA headquarters in Washington information concerning significant activities of individual women so that more women may be considered for appointments.

Open discussion at the caucus showed that women are sensitive to "tokenism" and are strongly in favor of appointments in line with their qualifications not their gender. They said the whole purpose of their movement is "integration" and that they don't want to be treated separately.

Many were annoyed that the only way to study the Affirmative Action Plan was to read the copy sent to their local chapter. Some felt this was a hardship on those living some distance from the chapter. They were told that budget problems accounted for so few copies being made available. A spokesman said later that copies may be obtained by writing AIA headquarters.

London/Philly win $25,000 prizes

Norman Foster of Foster & Associates, London and Oslo, has won the $25,000 prize in the R.S. Reynolds Memorial Award for Distinguished Architecture Using Aluminum. His design for the county head office in Ipswich, Suffolk, for the insurance company Willis, Faber & Dumas Ltd. was selected by a jury of William Marshall Jr., FAIA, chairman; Ehrman B. Mitchell Jr., FAIA; and James J. Foley, FAIA.

Another prize of $25,000 was awarded in Reynolds' fourth biennial Community Architecture program to the city of Philadelphia for its central city master plan, attributed primarily to Edmund N. Bacon, FAIA. This is the first time the award has been presented to a city in the United States.

Along with the cash award, Foster will receive "Continuum 2-76" by sculptor David Lee Brown, one of a number of outstanding artists commissioned by Reynolds over the years to create an original aluminum art work for the prize.

Top student winner from U. Minnesota

Allen Koster, a fifth-year student at the University of Minnesota School of Architecture, has won first place in the 1976 Reynolds Aluminum Prize for Architectural Students. Gregory Page, fifth-year student at the College of Architecture and Urban Planning, University of Michigan, and Raymond Nikel, senior at Texas Tech University, won honorable mentions.

Koster won with a design for an improved mobile housing unit which unfolds on the site into a three-level, A-
[continued on page 28]

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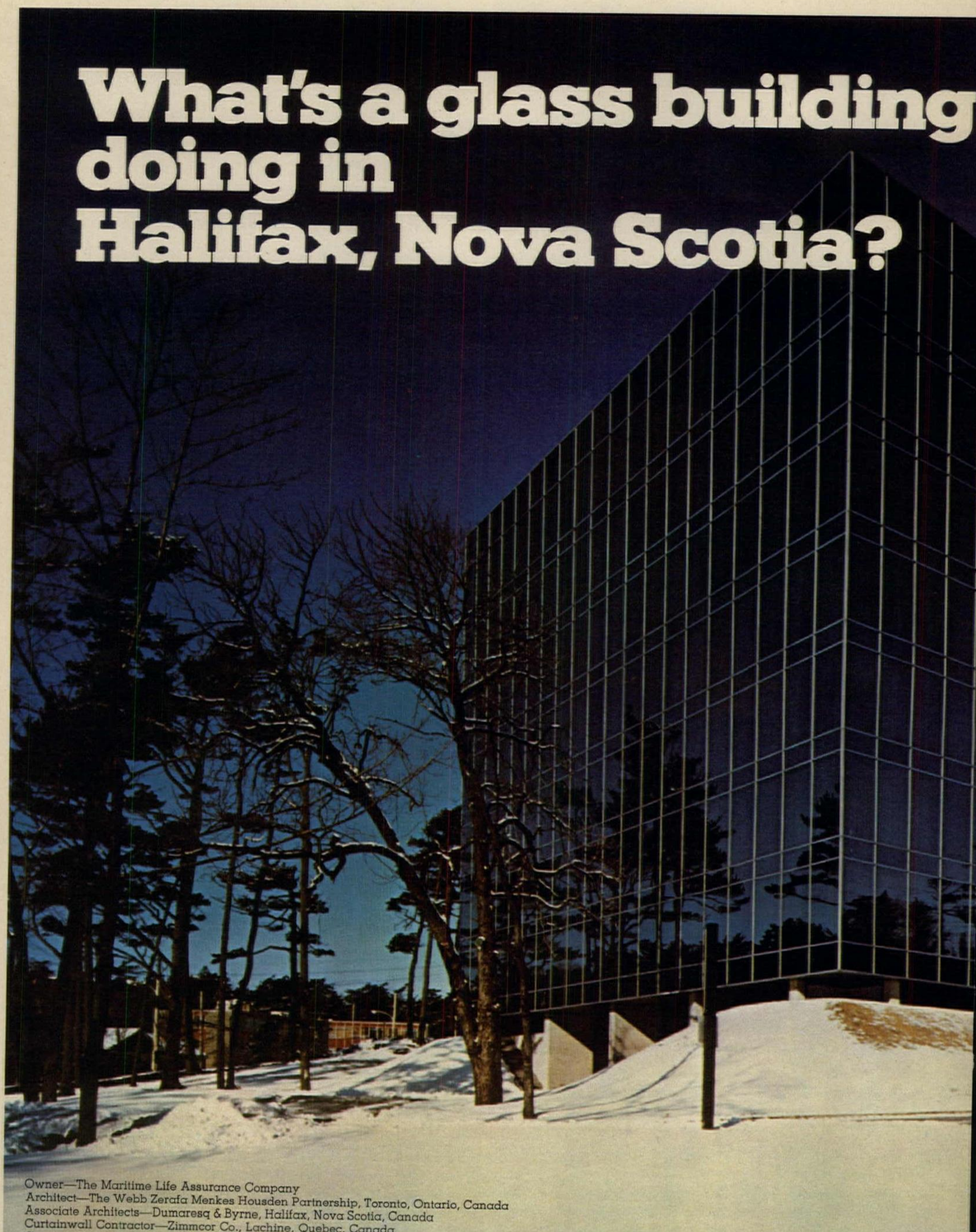
What's a glass building doing in Halifax, Nova Scotia?
Owner—The Maritime Life Assurance Company
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Associate Architects—Dumaresq & Byrne, Halifax, Nova Scotia, Canada
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General Contractor—Fraser-Brace Ltd., Halifax, Nova Scotia, Canada

News report continued from page 24

frame dwelling.

Page's entry was a prefabricated building capable of instant heating or cooling by use of a floating aluminum parabola that gathers the sun's rays, which are reflected onto a central collector. The heat is then transferred through an air medium into a brick storage tank.

Nikel's solution is an inflatable space shelter with an outer skin of silicon monoxide laminated to aluminum and an inner skin of Mylar laminated to aluminum. Between the two layers is a cavity which is inflated with a chemical compound that solidifies into an insulating material.

Jury members for the student entries—numbering 28—were architects Thomas Vreeland of Beverly Hills, Calif., chairman, Kermit Lee of Syracuse, N.Y., and Larry Dickie, 1975 prize winner from the University of Tennessee.

Prizes—$5000 first, and $1000 each, honorable mention—will be shared by the recipients with their schools.

'Tomorrow' theme for AIA in 1977

A totally new programming concept including videotaped replays of the day's sessions is being planned for the 1977 AIA convention, June 5–9, in San Diego, Calif. The three traditional aspects of the meeting—theme sessions, marketplace, and exhibits of products and materials—will be combined into one multimedia event to take place each day in the Convention Center of San Diego's Community Concourse. The room, named the Golden Hall, will be treated as a gigantic studio with 40-ft-high screens on all sides.

"Tomorrow" is the convention theme, and all topics will be addressed to the future. Exhibitors, too, will be asked to direct the message of their product to the future, and this message will be included in the media presentation. There will be no other exhibition room. The cost to producers of this type of presentation will be larger than in the past and will help defray, in part, convention costs, although much of the technical equipment required will be donated. Grants also are being sought for financing the event.

Designer for the major space is Joe Nicholson of San Diego. Convention co-chairmen are Richard Bundy, San Diego, Rex Lotery, Los Angeles, and George Hartman, Washington, D.C.

Each morning a business session will be held. Lunch will be served outdoors, and the afternoon will be devoted to media presentations in the Golden Hall.

Sightseeing tours, already a year and a half in the planning, will be of two sorts: major and mini—the mini tours being designed for six to eight people who will be driven by local AIA members to whatever sights they choose to view.

The main social event will not be a single large party but four small ones all held the same night. Each will have a theme: one will be Mexican, over the [continued on page 33]

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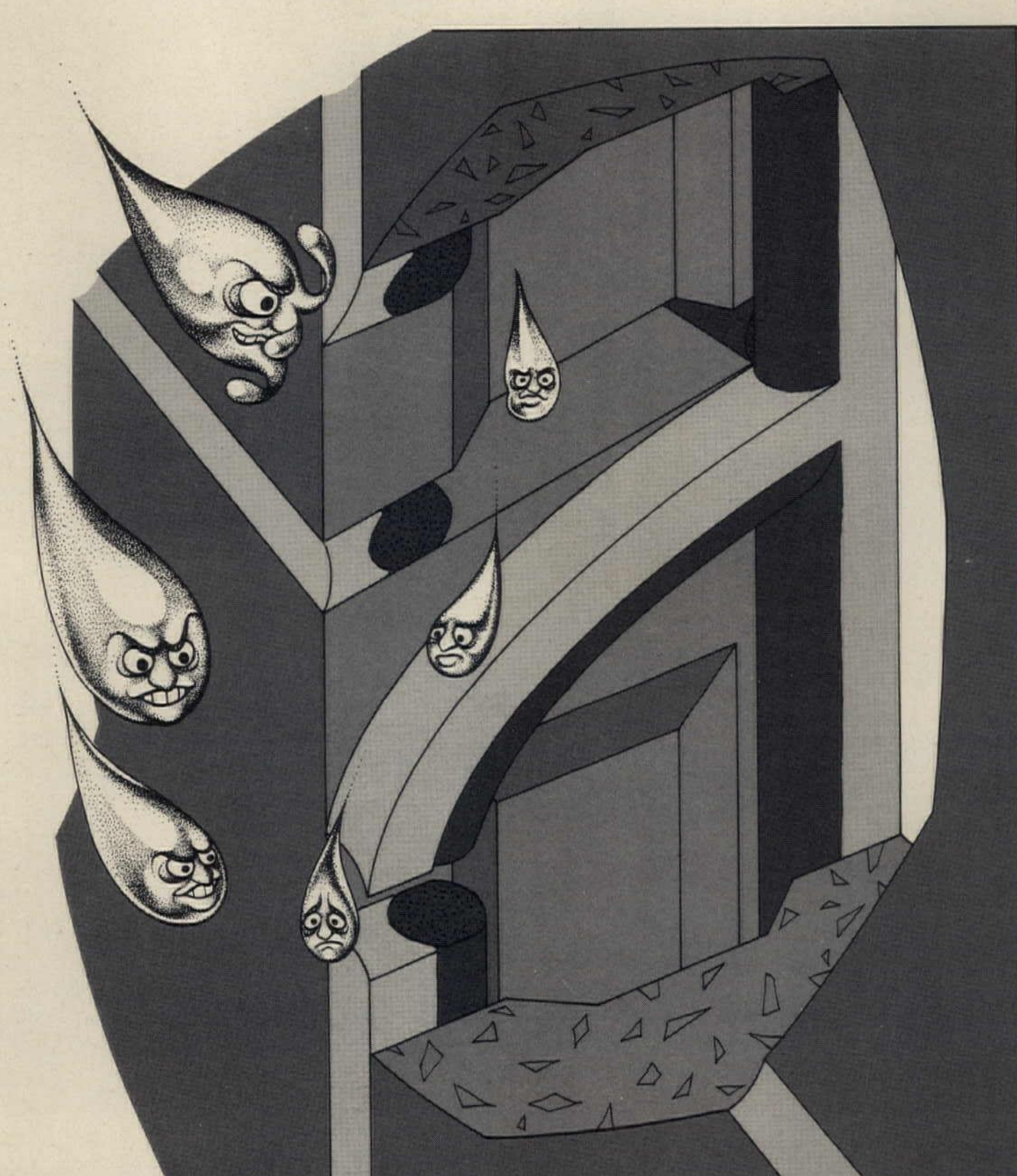

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What happens if there is a break in the interior seal? If the warm interior air is carrying moisture, as it usually does, the moisture condenses in the cooler wall cavity, drops down and drains to the exterior. (See diagram 2.)

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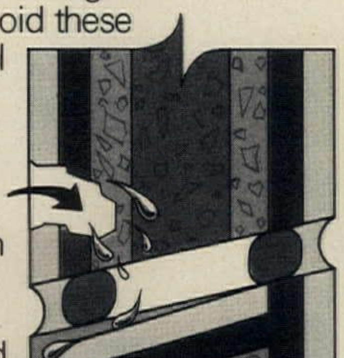

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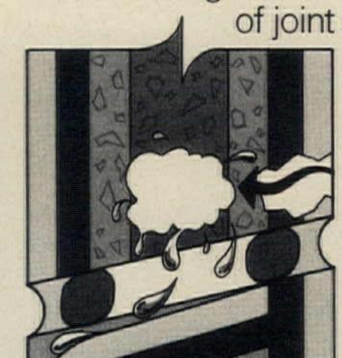

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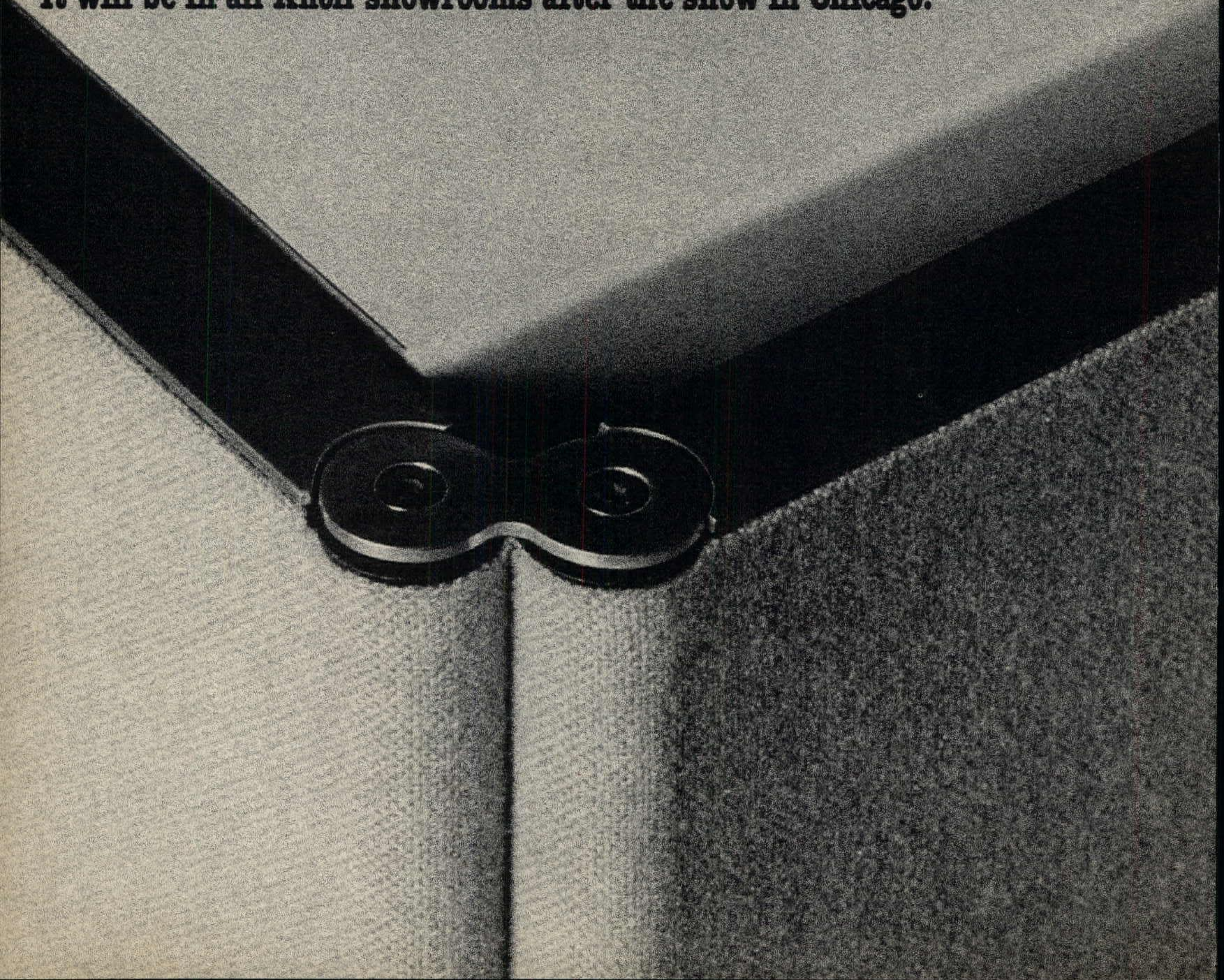

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border; another, a dinner on cruise ships in San Diego Bay; a third, festivities in the Fine Arts Museum where related exhibits will be on view. A fourth is in the planning stage. The opening night Dodge/Sweets party will be held on the pier.

Convention goers will be encouraged to bring the entire family, and special activities for pre-teen and teenagers are planned, such as a rock band party on a cruise ship. Recreation will be in abundance: golf and tennis tournaments and yachting.

Another important event of the convention will be the International Chair Design Competition, which the San Diego chapter is sponsoring, with $30,000 in prizes.

The media aspects of the gathering are staggering to contemplate. Selected events of the day will be replayed on videotape so that guests may view them at night on TV in the hotel rooms.

Ethics continued from page 21

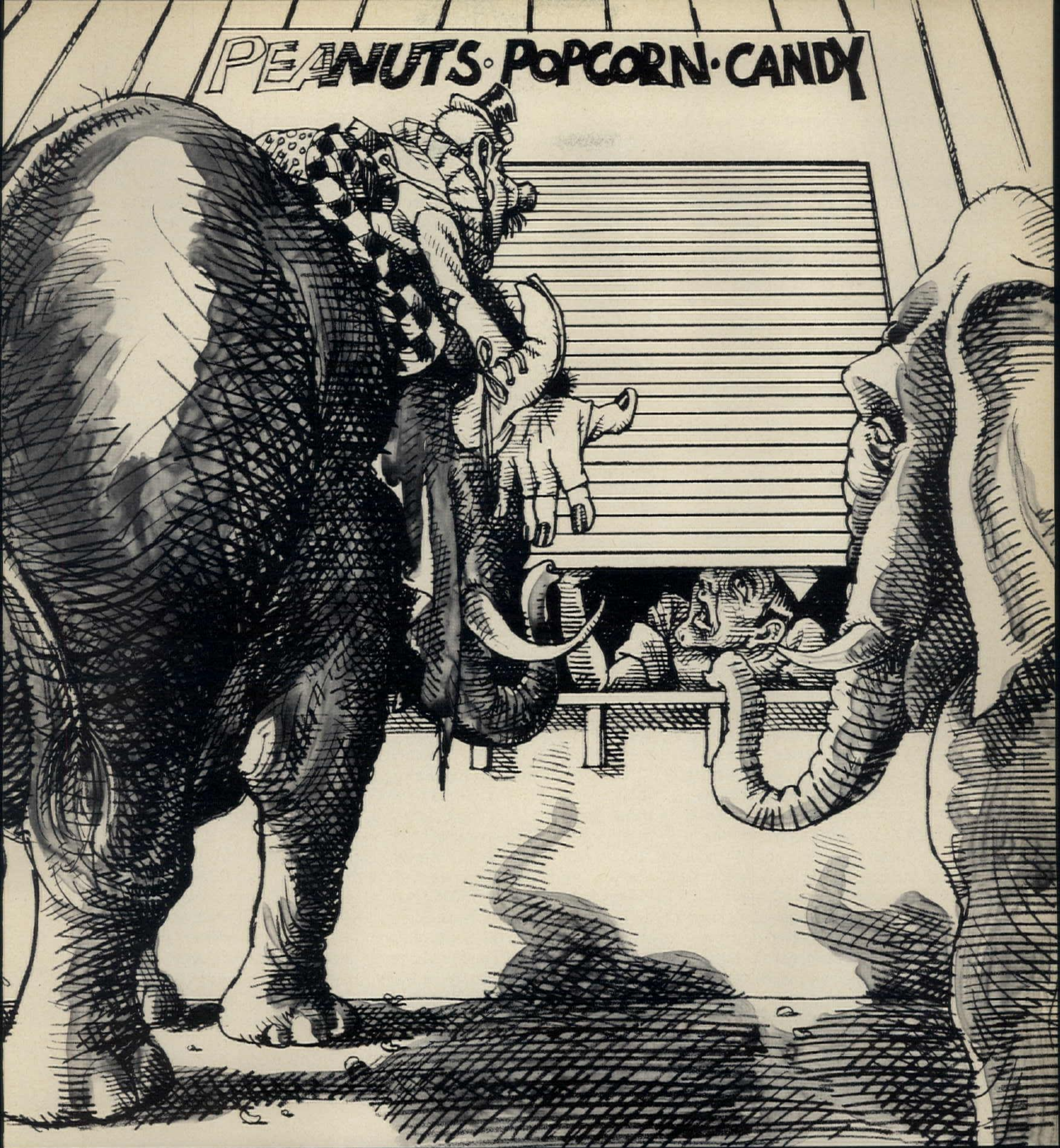
He received a standing ovation for what seemed to be the majority viewpoint—that of opposing the revisions, as proposed. Cooper said the changes would give unfair advantage to large firms who could afford to advertise and assign man-hours to the production of free drawings. There is nothing in the present code, he said, to prevent members from enjoying the benefits of what the new rules propose to provide and "the trade of what we gain by what we stand to lose doesn't balance out."

Hartray's defense of the proposed changes included the observation that large firms already have the wherewithal (time and money) to woo clients—primarily on the golf course—whereas all that small firms have are their time and ability to produce sketches when looking for work. As for advertising, he said, "If Caudill Rowlett Scott wants to give dishes away it's all right with me." He also noted that businessmen may trust an architect less as a professional than as a businessman.

Those who spoke against the changes included George T. Heery of Atlanta, who said advertising will benefit only advertising agencies. Hugh Johnson Jr. of Fredricksburg, Va. said, after much debate pro and con among the delegates, "We don't want to change ethics—only the ethical code."

Robert F. Gatje, president of the New York chapter, said the chapter voted overwhelmingly against advertising, free sketches, and agents, but was in favor of loosening the strictures against contracting. Robert F. Grove, president of the New Jersey Society, said it would take another Solomon to help the Institute enforce the ethical code if these changes were made.

Among those speaking in favor of the changes was Robert L. Wilson, who warned against emotional responses to the issue and commented, "I don't believe there will be a mad stampede to advertise, pay an agent, or become a contractor." He said much of the controversy stems from "confusing business with ethics." Ger-
[continued on page 36]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News report continued from page 33

ald S. Hammond of Hamilton, Ohio, warned that if the AIA doesn't take action voluntarily, it will be forced to do so by state attorney generals. Ohio components soon will be required to loosen their ban on advertising.

George M. Notter Jr. president of the Boston Society, said it's time ethical standards allowed architects to enter the marketplace, and Daniel Boone, of Abilene, Tex., said "I've been through a lot of doomsdays in our profession, but I don't think it (another doomsday, if the changes are approved) is going to happen."

After the session, William Marshall, of Norfolk, Va., immediate past president of the Institute, said "If there's going to be change it should be evolutionary—brought about by the members. I'm not in favor of this resolution, which was produced by three members of the executive committee, who all shared the same views."

Frank Whalen, the AIA's legal counsel, observed that the Institute has a 50-50 chance of definding its present position against legal attacks "if you want to spend the money." In addition to architects in Ohio, those in Arizona, Missouri, and Florida are facing possible action by the states to compel architects to advertise as proof of fair trade. Later, a resolution by delegates from Arizona seeking Institute financial aid for legal defense was defeated.

In other action, the delegates turned down a resolution spelling out more specific mutual obligations between employer and employee, and another that would have required an annual preference survey of the members, rating various institute programs (very costly, said past president F. Scott Ferebee).

There was the usual watering down, before approval, of well intentioned resolutions. Wording that would have placed AIA squarely behind "mandatory" energy codes and regulations—a strategy favored by the AIA Energy Committee—was amended into a piety about "reduced consumption of depletable resources." The weaker of two resolutions involving recertification was passed, calling on AIA only to take a "leadership role" in developing appropriate continuing education programs—not to make any proposals concerning recertification itself.

Among the resolutions that passed was one calling upon manufacturers, advertising agencies, and media to end "exploitive" practices, such as "using nude and scantily clad models in advertisements, product literature and information," though the wording drew embarrassed laughter from the debate-wearying members officiating.

NEOCON 8 June 23–25

NEOCON 8 will be held Wednesday, June 23 through Friday, June 25, in Chicago at the Merchandise Mart and will include a presentation by the Club of Rome on selected growth through international planning. In 1972, the Club released a "bombshell" called "Limits to Growth." A panel composed of architects and businessmen will respond to the Club's thesis.

Among the speakers will be Mihajlo Mesarovic, director, Systems Research Center, Case Western Reserve University; Bogdan Hawrylyfhyn, director, Center for Industrial Studies, Geneva; and Ervin Laszlo, fellow, United Nations Institute for Training Research.

John Dixon, editor of *Progressive Architecture,* will be moderator for a panel discussing "Lighting Challenge to the Architect." The panel will be held the morning of Friday, June 25. Speakers will be Albert Barnes, Federal Energy Administration; Sylvan Shemitz, of Sylvan R. Shemitz & Associates, West Haven, Conn.; Der Scutt, of Poor, Swanke, Hayden & Connell, New York; and Larry Spielvogel, lecturer at the University of Pennsylvania School of Architecture.

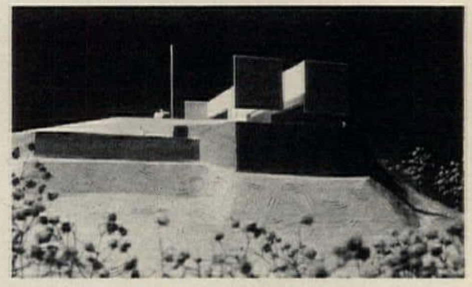
20th annual CSI convention/exhibit

The 20th Annual Convention and Exhibit sponsored by the Construction Specifications Institute will be held June 20–23 in Philadelphia. Larry Dean, president, will conduct the opening session, followed by the awards presentation, at the Philadelphia Civic Center the morning of June 21. Thomas Hollenbach, administrator of CSI technical programs, will preside over the June 21 afternoon session on construction communications (CONCOM).

Speakers June 22 will include David Rosoff of the Federal Energy Administration and William Cavanaugh of the American Society for Testing Materials. A panel on building codes will be held the afternoon of June 22.

Philadelphia firm wins Griffin contest

Cope & Lippincott Architects of Philadelphia has won the two-stage competition to design a memorial to American architect and planner Walter Burley Griffin, planner of the Australian capital of Canberra. The memorial will be built on Mount Ainslie in Canberra.



Griffin competition winning scheme.

Groundbreaking will take place July 4 to coincide with Independence Day in the United States, and completion of the project is scheduled in time for an unveiling ceremony on Nov. 24—the 100th anniversary of Griffin's birth.

Designer of the winning scheme is Robert T. Crane III, an associate of the firm. Jurors were Edmund Bacon, Philadelphia architect and city planner; Peter Harrison, fellow of the Australian National University; and Tony Powell, commissioner of the National Capital Development Commission, Canberra, which conducted the competition on behalf of both the Australian government's National Memorials Committee and the Administrator of the U.S. Bicentennial Activities, which will build the memorial.

Scully refuses AIA honors

Yale University professor Vincent Scully refused two honors that were to be bestowed on him by the American Institute of Architects because the AIA's College of Fellows refused to accept Robert Venturi into membership.
[continued on page 39]

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Scully had arrived in Philadelphia where the honors were to be presented at ceremonies May 5, but upon hearing of Venturi's rejection decided to turn down the honors.

Scully wrote AIA president, Louis de Moll of Philadelphia: "You will understand, I know, that as an historian of American architecture I cannot in good conscience accept an award, however welcome, in the same year that the most important architect of my generation is denied a fellowship."

Scully was to have been one of 13 new honorary members of the Institute and to have received a medal for his outstanding contribution to architecture as a historian.

Venturi, of the Philadelphia firm Venturi & Rauch, was nominated by the Philadelphia chapter of the AIA for membership in the College of Fellows but the Fellows jury did not include Venturi among the 71 inducted—three of whom were from Philadelphia. On the jury, composed of Fellows in the College, were Edward Killingsworth of Long Beach, Calif., chairman; Preston Bolton of Houston, Tex.; Herbert Duncan of Kansas City, Mo.; Robert Fehlberg of Billings, Mont.; Bernard Rothschild of Atlanta, Ga.; and Hugh Stubbins of Cambridge, Mass. Edward Miller of Terre Haute, Ind., was attending alternate.

Fellowship in the Institute is the highest honor the Institute may confer, apart from the Gold Medal. As recently as the 1974 convention, however, some have argued that membership is not selective enough and is subject to cronyism.

LA's Century City nearly completed

Dedication of the twin Century Plaza Towers completes the $200 million theme center of Alcoa's 180-acre Century City complex, itself 60 percent finished, in Los Angeles. The theme towers are supported by only three outside columns weighing four tons per lin ft at the base. They are clad in aluminum with a glass curtain wall. Architect was Minoru Yamasaki & Associates of Troy, Mich., with associated architects Albert C. Martin & Associates, Los Angeles.

The theme center includes a hotel, also by Yamasaki, the ABC Entertainment Center, and a 5600-car garage—the largest built underground in the world. Century City, in addition, includes a dozen major office buildings and five small ones, regional shopping center, hospital; four apartment buildings, and several dozen restaurants.

Century Plaza Towers: twin seen from the other.

The triangular towers offer 2 million sq ft of space, which is divided into a rectangular layout except for the corner offices. Construction also is underway on a fashion center of stores and parking for an additional 3000 cars.

Personalities

Albert A. Dorman, president of Daniel, Mann, Johnson & Mendenhall, Los Angeles, has received the 1976 Distinguished Civil Engineering Alumnus Award from the University of Southern California.

Robert J. Kleid, AIA of The Eggers Partnership, architects and planners of Bay Shore, N.Y., has been selected as a member of the Suffolk County Handicap Advisory Board.

Sir George Stephen Lewis, AIA, KT, GSMP of Boston has received the Certificate of Merit for distinguished work in art by the editors of *International Who's Who in Art & Antiques.*

Calendar

Through June 20. "One Hundred Years of Chicago Architecture" ex-
[continued on page 40]

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hibit, the Museum of Contemporary Art, Chicago.

Through June 27. "Art Nouveau Belgium/France" exhibit, Rice Museum, Houston, Tex.

Through Sept. 6. "The Eye of Thomas Jefferson," major Bicentennial exhibit of the National Gallery of Art.

Through Sept. 26. "Signs of Life: Symbols in the American City" exhibit, Renwick Gallery, Washington, D.C.

Through Oct. "Three Centuries of American Art" exhibit, Philadelphia Museum of Art.

June 23–25. "Design: For America's Future," national conference sponsored by the University of Delaware, Newark, and the Delaware American Revolution Bicentennial Committee.

June 23–25. NEOCON 8, National Exposition of Contract Interior Furnishings, Merchandise Mart, Chicago.

July 3–31. Seventh annual World Game Workshop sponsored by Earth Metabolic Design, Inc. in conjunction with R. Buckminster Fuller and the University City Science Center of Philadelphia and hosted by the University of Pennsylvania and its University Museum.

July 4–9. World Congress on Space Enclosures, Montreal, Canada, presented by the International Association of Shell and Spatial Structures, Concordia University.

July 11–15. Annual convention of the American Society of Landscape Architects, San Diego, Calif.

July 30–Aug. 2. Conference of the American Society of Interior Designers and the International Exposition of Designer Sources, Atlanta, Ga.

Aug. 29—Sept. 2. Annual technical conference and International Lighting Exposition sponsored by the Illuminating Engineering Society of North America, Cleveland, Ohio.

Aug. 31. Deadline for entries in the P/A Awards Program.

Oct. 5–7. Annual convention of The Producers' Council, Inc., Phoenix, Ariz.

Nov. 17–19. Building & Construction Exposition & Conference sponsored by the Producers' Council, Inc., McCormick Place, Chicago.

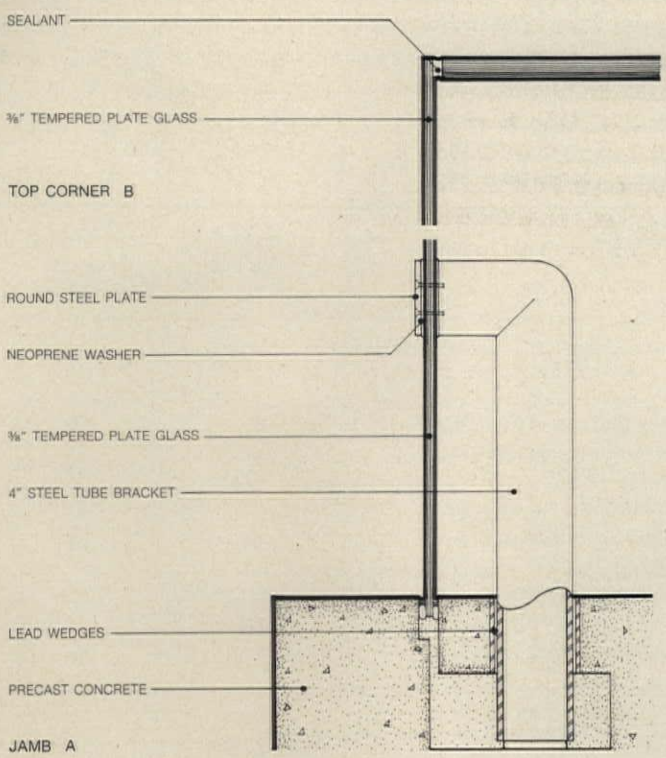
[continued on page 44]

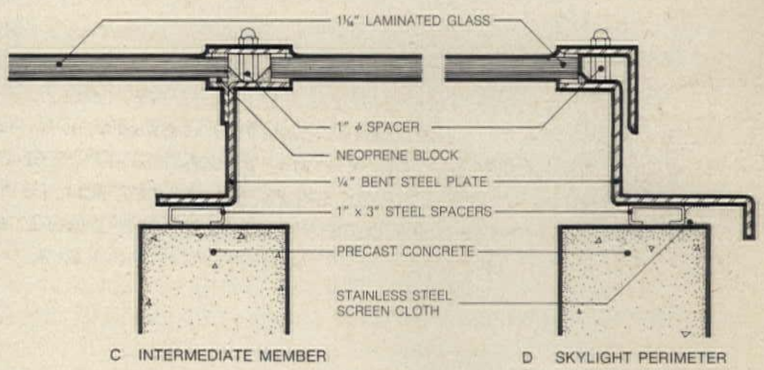
Through a glass

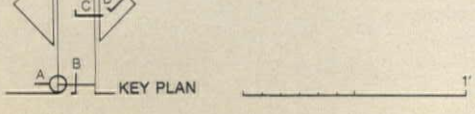
As architectural products go, few have had the allure or the trials of glass. Amid discussions of energy use and vision, first and life cycle cost, glass remains a favorite, if not thoroughly understood, wall material.

Le Corbusier said that the History of Architecture is a history of the struggle for light, the struggle for windows. Eero Saarinen & Associates (now Kevin Roche, John Dinkeloo & Associates) opened a new chapter of the History as they pioneered the use of reflective glass in Bell Telephone's Development Center, Holmdel, N.J., in 1962. Fellow architects were quick to write additional pages with striking designs, high-rise and low-rise, sheathed entirely—not just in vision areas—with gleaming panels of glass that mirrored their surroundings and the changing panorama of the sky.

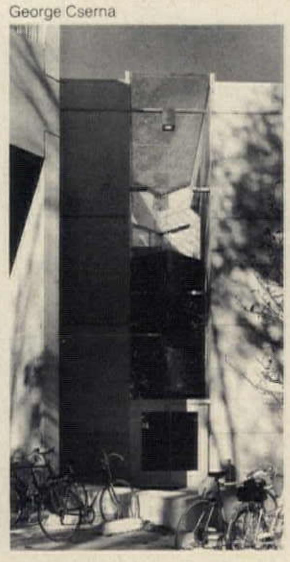
There's little need to belabor the point that freedom in the use of glass enables architects to design impressive structures, or that people prefer to live and work in buildings that have windows, or that building owners find it easier to rent space with windows. But the 1973 war in the Mideast, and the Oil Embargo that followed, started a new struggle that must be won if architects are to retain the aesthetic freedom to design with any materials that can perform as required. Fortunately, it's a battle for which suitable armament and ammunition are available. When America was shocked



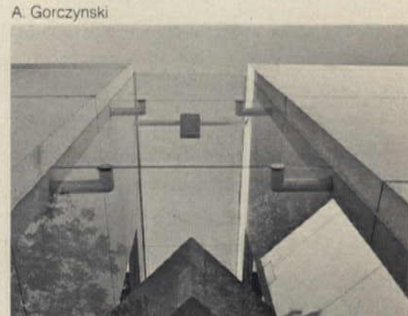




George Cserna



A. Gorczynski



Butted clear glass makes entry stairwells of Spelman Hall dorms, Princeton University, by I.M. Pei & Partners, read as voids in a concrete wall-bearing structure. Slots at base of skylight vent warm air in summer and draw tempered air up wells in winter, making entries comfortable. Massive doors contrast emphatically with the glass.

awake to the reality that somebody else controlled most of our fuel spigots and could raise prices almost at will, the big cry was for energy conservation. Typical of most crisis situations, the demand was, "Do something!" Typically, again, this was often translated as, "Do anything!"

An early and obvious target of the Btu-hunters was exterior glass. Forget about its beauty and utility. Forget that it's relatively inexpensive to erect. Everyone knows that glass is a poor insulator. Therefore, all those glass-walled towers must be energy sieves. They spill the output of heating plants in the winter and allow the sun to swell air conditioning loads in the summer. Of course, that's not necessarily true. Nevertheless, because the need for energy conservation is real, these objections must be answered.

In California, the demand for energy conservation has already produced a law that architects see as a strait jacket. It tries to define each building component, and applies a "reasonable" limiting energy value to it. With respect to clear glazing in new buildings, Title 25, Article 5 sets "basic glazing area" limits of no more than 20 percent of gross floor area in low-rise buildings (up to four stories) and 40 percent in high-rises (with adjustments for insulating glass). It applies to all new hotels, motels, apartment houses, dwellings, and other residential buildings which are heated or mechanically cooled. It would be reasonable to expect a push for a similar law covering office and commercial structures. A Mideast explosion that produced a new Oil Embargo could easily bring demands for further action in California and other states.

There's no question that until the Embargo, the thermal characteristics of glass were not a major concern of many architects or builders. If a building was a heat sieve, a bigger heating and air conditioning plant would handle it. Today it *is* a major concern, and it's good to know that glass isn't just glass. Architectural glass comes in many forms and combinations that offer a wide choice among a range of thermal, strength, glare control, sound insulating, safety, and security characteristics. Glass buildings do not need to be energy wasters. In some available architectural forms, glass is a better insulator than other conventional building materials. With judicious design, the sun's rays can be used to reduce heating and lighting loads. And in the not too distant future, some enterprising architect will find a practical way to use glass spandrels as solar collectors, using still more of the sun's energy.

Obviously, we must stop squandering what is largely an unrenewable and irreplaceable resource, certainly until the day that technology finally finds ways to produce energy economically from limitless resources like the sun, waves, wind, and fusion. Architects know that there is a better way to do it than by blindly applying limits on building components. They would prefer performance specifications or specifications based on a building's Total Annual Energy Budget, relating allowable energy use for all purposes to gross floor area and the building's intended use, as suggested by the General Services Administration and proposed in the U.S. Senate. In other words, they would prefer to tackle the energy problem in their own way, freely choosing among the many materials and techniques.

To the point is the comment by the Caudill Rowlett Scott design team in their book, *A Bucket of Oil:* "Architects, engineers, planners, and their clients must remember that buildings are for people . . . [A building] has a prime task. If that task is not done well, all the insulation in the world won't help." (Although it's a very necessary element.) Working within a budget is no new thing for architects; but working within an energy budget could well give rise to greater creativity and innovation.

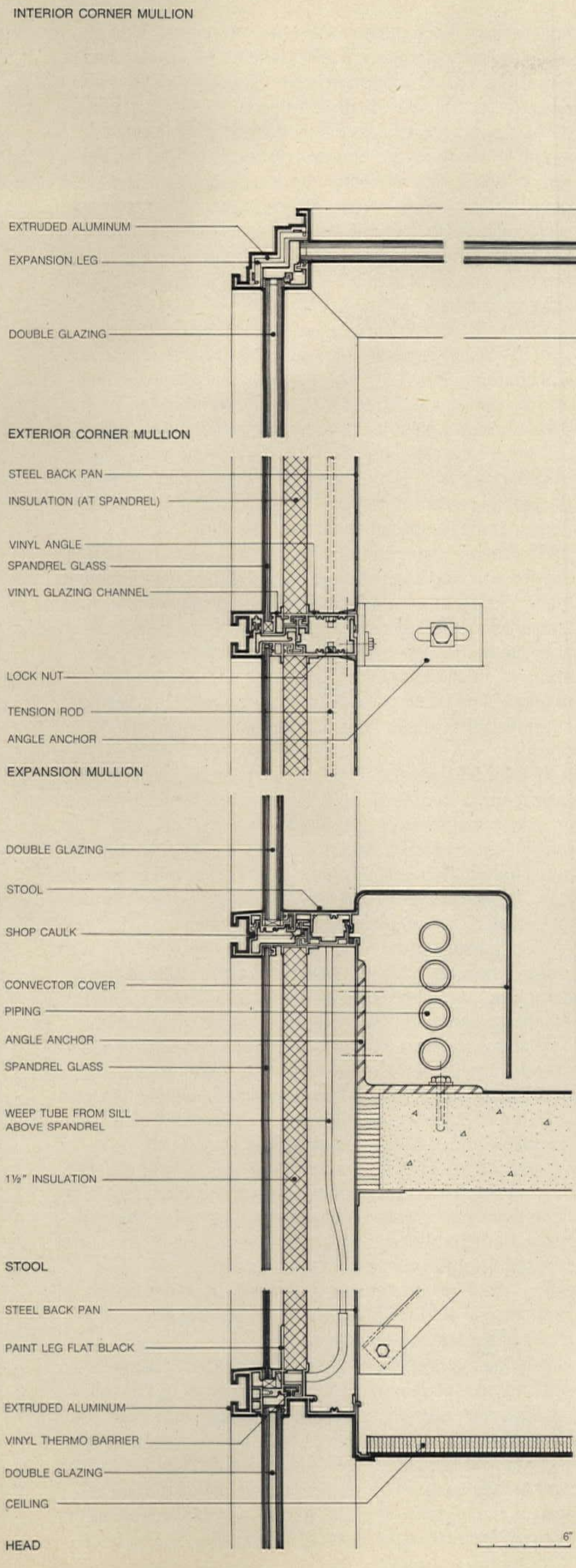
Conspicuous consumption?
Let's put into perspective the role of exterior glass in relation to total U.S. energy consumption. Based on a 1974 analysis by John Malarky of PPG Industries, energy use attributable to glass was only 4 percent of total consumption. Of this, new residential construction accounted for 0.13 percent, existing residential construction 2.47 percent, new commercial and office construction 0.14 percent, and existing commercial and office construction 1.26 percent. Glass in all new construction, therefore, influenced only 0.27 percent of total energy use. The figures would be somewhat different today, but are undoubtedly still in the same ballpark. Not to minimize the importance of glass's energy role in new construction, even the small share of 0.27 percent represented some 30 trillion Btus for the year. So, energy-conscious choices among available glass products can have a considerable impact on the nation's fuel bill and use.

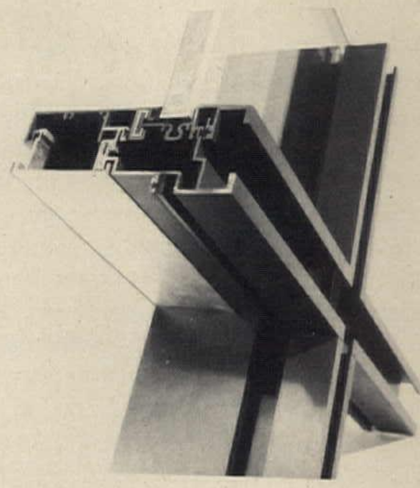
An example from an MIT study, "Architectural Problems," by Prof. Lawrence B. Anderson, has to do with a south-facing window in Boston. "A sealed double-glass unit with a "U" factor of .55 will lose during January about 380/Btu/sq ft/day more than a wall having a "U" of .10, but it will transmit from solar radiation an average of 520/Btu/sq ft/day, for a net improvement of 140/Btu/sq ft/day. During November the difference is greater, the index of superiority of the double window over the wall being

Some comparative U values

Material	Thickness, Inches	Comparative U value BTU/Sq Ft/F°
Single glass light — clear, tinted, laminated, or spandrel.	¼″	1.13
Concrete blocks, three oval core (sand and gravel aggregate).	8″	.90
Single light, heat reflective (emissivity 40).	¼″	.80
Double light, ¼″ air space.	¾″	.61
Double light, ½″ air space.	1″	.55
Concrete blocks, three oval core (cinder aggregate).	8″	.58
Triple light, ¼″ air spaces.	1¼″	.47
Triple light, ½″ air spaces.	1¾″	.36
Outside surface resistance + 1″ stucco (asbestos cement or wood siding or plaster) + 8″ H.S. concrete block + ¾″ plaster + inside air resistance.	9¾″	.40
Outside surface resistance + 4″ face brick (dense concrete) + 4″ L.W. concrete block + ¾″ plaster + inside air resistance.	8¾″	.33

Source: Guardian Industries





David Franzen

Nathaniel Lieberman

Glazing details for Minneapolis' IDS Center tower are designed to accommodate both lateral and vertical wall movements at special sliding joints. Detail photo gives close-up view of a typical horizontal member, with glass in place above, and spandrel slot below. The architects are Philip Johnson & John Burgee, with Edward F. Baker Associates, and the curtain wall design was worked out with Eugene O. Tofflemire Associates, consultants.

on the order of 270/Btu/sq ft/day."

James M. Ashley of Libbey-Owens-Ford Co. has made an energy analysis of an office in a hypothetical building in Toledo, Ohio, comparing the alternatives of an opaque wall and a reflective, twin-glazed insulating window. His conclusion: "In many, probably a majority, of cases a properly designed glass wall, and the use of natural daylight to eliminate some artificial light, is better than a well-insulated opaque wall, in terms of energy requirements." Another example from L-O-F cites a hypothetical building of 15 stories, with 164,000 sq ft of floor area and a vision area of 70 percent of the exterior wall glazed with clear glass. Reduce the vision area to 20 percent and save 2.2 billion Btu/year. Or, retain the 70 percent vision area and glaze with reflective insulating glass and save 2.4 billion Btu/year.

PPG points to the 56-story First International Building in Dallas. Its 66 percent vision area is glazed with neutral gray-toned reflective insulating units and its spandrels are reflective panels with a "U" value of .41. A computerized "equivalent energy benefit" study showed the following: Glazing the 66 percent vision area with high-performance reflective glass saved more Btus than reducing the vision area to 20 percent and using single clear glass in small windows—9.5 billion Btu/year vs. 9.0 billion Btu/year.

A completely opaque wall would have required about 5 percent less energy in this building than the high-performance glass wall but, PPG points out, if daylight were fully used and electric lighting were put on automatic control, the lower use of lighting energy, lower total cost of lighting fixtures, and reduced air conditioning needs could close the gap. On the basis of life-cycle cost, the higher first cost of more-expensive high-performance glass may well be offset by lower first cost of heating and air conditioning installations, additional rentable space gained by the reduction in equipment size, and lower operating costs.

Certainly these examples are only suggestive, but they indicate that architects can stop ducking when people throw stones indiscriminately at their glass houses. It's likely that the day is passing, if not past, when new, large structures may be fully covered or studded with monolithic (single-sheet) panels of clear glass. But the development (and refinement) of high-performance, energy-stingy glasses, and of detailed curves defining their properties and characteristics, has rescued the option of considering glass along with other materials for curtain wall construction. Architects can feel free again to enlarge vision areas with a clear conscience.

From pane to wall

The recent history of architectural glass may be divided into three generations. The first generation was clear glass, an extremely poor insulator, with a "U" value around 1. It is produced as sheet (mainly for residential windows), or thicker and stronger plate or float (for more demanding applications). Sheet glass, the least expensive, produces some optical distortion, since it is not perfectly flat. It is generally available in two thicknesses: SS (single strength) and DS (double strength, nominal ⅛ in.).

Float glass is taking the place of plate and will undoubtedly replace it completely in the next few years. Their finished properties are practically identical. However, plate is formed as a rough ribbon which must be ground and polished to produce flat, distortion-free surfaces. Float glass, as the name implies, is made by floating a continuous stream of molten glass onto a long bed of molten tin; the upper surface is fire-polished during production. This produces a wide ribbon of extremely flat glass that needs no surface finishing. It is available in thicknesses from ⅛ in. to ½ in. and more. Pilkington Glass of England developed the process, and most float glass in the U.S. is made under Pilkington license.

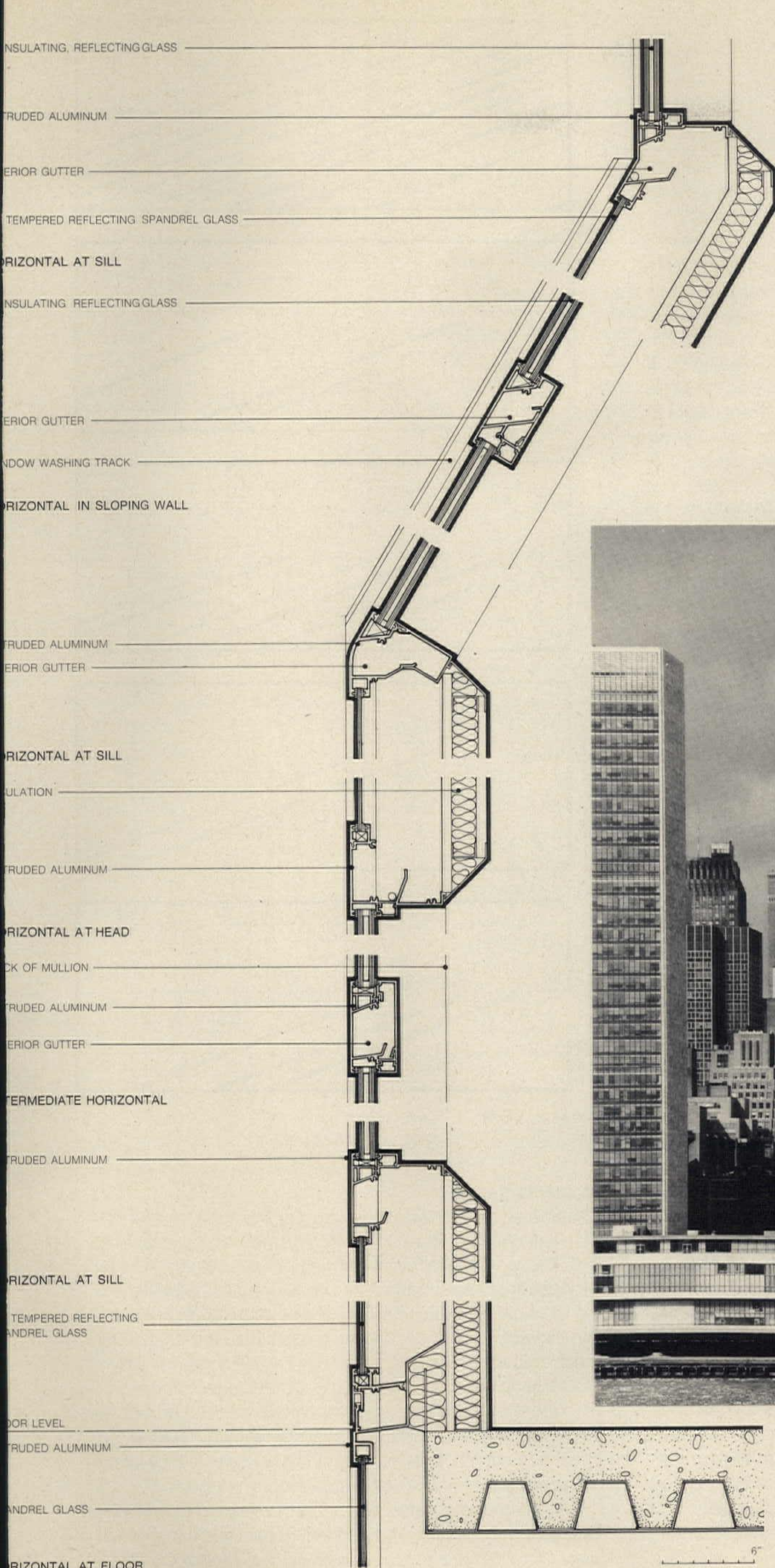
The basic glass comes out annealed—that is, slow cooled—which removes internal stresses. It has the proverbial characteristics of glass: relative weakness in tension and shattering into jagged fragments when broken. However, annealed glass is easy to cut and fabricate.

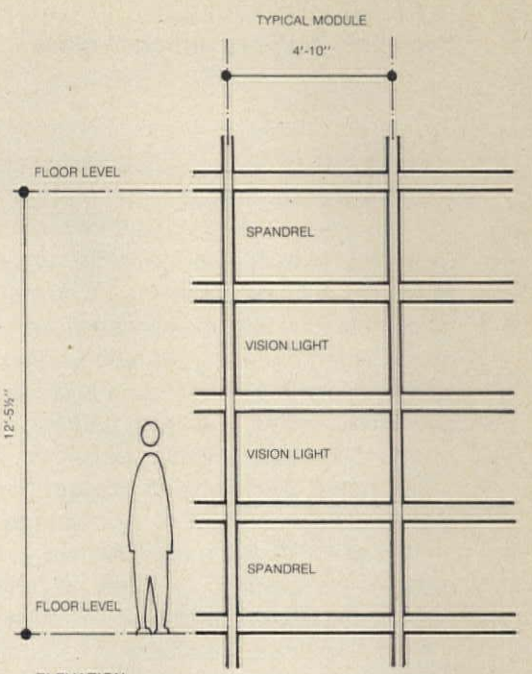
Tempering—rapid cooling—locks in the stresses and produces a glass that is four or five times as strong as annealed. It breaks into pebble-sized fragments with rounded edges. Once tempered, the glass cannot be cut; the sudden release of locked-in stresses causes catastrophic failure. The desired shape or size must first be cut in annealed glass and the finished pieces then tempered. Tempering also produces a waviness in glass which may be noticeable. Heat-strengthened glass has an intermediate strength. In all of the forms, greater thickness gives greater strength. The basic glass price increases with increasing strength or thickness, as is true of the later-generation products.

The second generation of glass was tinted, usually gray, bronze, or blue-green. The tint is obtained by adding metallic oxides to the mix. It is available in various degrees of intensity; tinted glass is heat-absorbing. It cuts down the sun's transmitted heat by filtering out part of the solar spectrum. It also cuts glare and may be used to control ultraviolet radiation. Although tinted glass has the same "U" value as clear glass, it has a lower Shading Coefficient. This is an index of how effectively a glass blocks solar heat radiation compared with a light of ⅛ in. clear glass. The lower the Shading Coefficient, the more effective the material (but note, if the architect wishes to take advantage of the sun on one elevation to reduce the load on the heating plant, he might specify glass with a high Shading Coefficient.) Monolithic tinted glass is available with Shading Coefficients as low as around .5 compared with clear glass's 1.0.

The third generation is reflective glass. A mirrorlike coating on the glass bounces back some of the sun's rays and heat, but is thin enough to see through from the inside (actually, from the darker side to the lighter; at night you can see into a lighted space from the outside, but can't see out). Reflective glass comes in a variety of color families, including silver, gold, blue, gray, and bronze, and in a range of light transmissions.

The coating is applied either by a wet chemical method, by firing on, or by vacuum deposition. Some, but not all, coatings are relatively soft and scratchable, and those are not recommended for exterior use. With both wet chemical and vacuum deposited materials, hardness depends on the type of metal used. The fired-on coat is claimed to be as hard as the underlying glass, so may be installed facing the exterior. Reflective glass, while close to the "U" value of





ELEVATION

New York's recently opened building for the United Nations Development Corporation features a wall system in which the deep dimension of the members is turned horizontally. Three such horizontal divisions occur between typical floors, thus reducing the overall façade scale. Architects: Kevin Roche, John Dinkeloo & Assoc.

clear (to .80, vs. 1.00 for clear) may achieve a Shading Coefficient of as low as .23.

All the glasses mentioned here may be used in their monolithic form and are available in a range of thicknesses. But that is only the beginning of the story. They may also be combined in almost any way that meets the architect's needs: tinted or clear glass with a reflective coating; insulating glass with one light clear and one tinted, one clear and one reflective, one tinted and one reflective, one plain and one laminated, wired or patterned, and on and on.

Laminated glass consists of a sandwich of two lights of glass and an inner layer of clear or tinted plastic (a number of different plastics are used, as well as different thicknesses). It is specified for safety, security, or sound control and may be had with tinted or reflective glass lights.

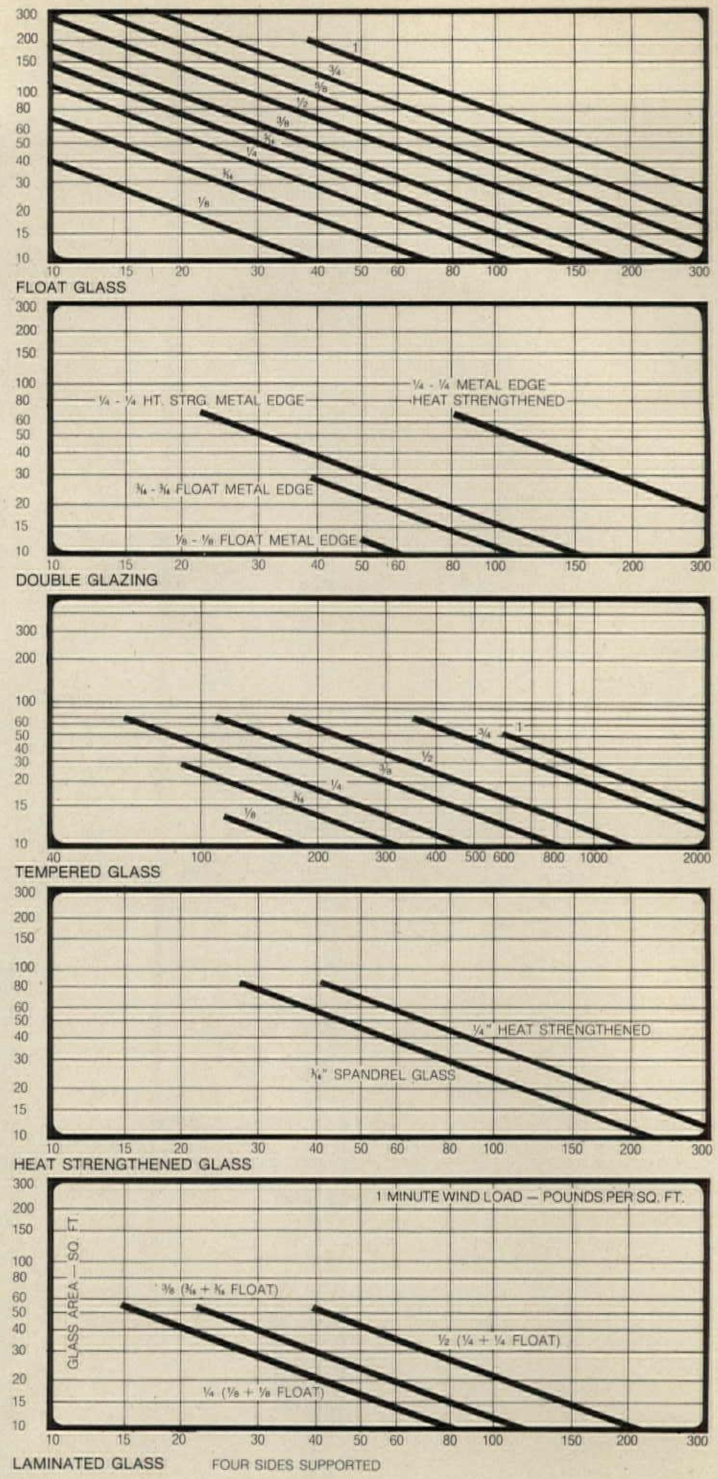
Insulating glass is available in various thicknesses. The usual is a two-light unit around 1-in. thick, including a hermetically sealed air gap of about ½ in., but 2-in. units with a wider air gap (for greater insulation) are common and three-light units with two air gaps are available. Two-light units may have "U" values as low as .28 and Shading Coefficients as low as .07, depending on components and construction. Manufacturers offer models with or without a metal edge band encircling the perimeter; conflicting claims are made about their respective benefits. Units are also made with a thermal break in the frame.

Spandrel glass, which makes possible the all-glass building, comes in single panels of clear or tinted glass with a colored ceramic frit fused to the back, in single panels of reflective glass that closely match the hues of the reflective vision glass, and in double-glazed insulating units with various combinations of clear, tinted, coated, and frit-backed lights. Single panels can be supplied with a factory-applied layer of insulation and backing. Otherwise, insulation may be field-applied behind the glass in angle clips or U-channels affixed to the inside of the mullions. Insulated spandrel panels may have a "U" value as low as .15 for a 1-in. unit and .11 for a 1½-in. unit. Glass spandrels, especially dark-colored ones, are usually installed with a low-reflectance backup material or against a dark background to keep their color appearance true and to mask pinholes and surface variations in the ceramic frit or reflective coating.

Other characteristics of glass that architects need to consider are the average daylight and solar transmittance and daylight reflectance, given as a percentage of total impinging light. These are tabulated in manufacturers' literature.

"U" values for each type of glass are fairly close from manufacturer to manufacturer, equivalent for monolithic clear glass. But they will vary for tinted and reflective glass, depending on methods of production, type and amount of metal, and for insulating glass, on types of construction and fabrication. Manufacturers' and fabricators' technical literature gives detailed performance characteristics.

Until the Energy Crisis, probably the main technical concern was strength—primarily, the ability of glass to resist wind loads. Building codes specify minimum wind loads, but glass manufacturers and fabricators recommend that detailed wind tunnel tests be run for tall or unusually shaped buildings and for buildings where the surroundings may create unusual wind patterns.



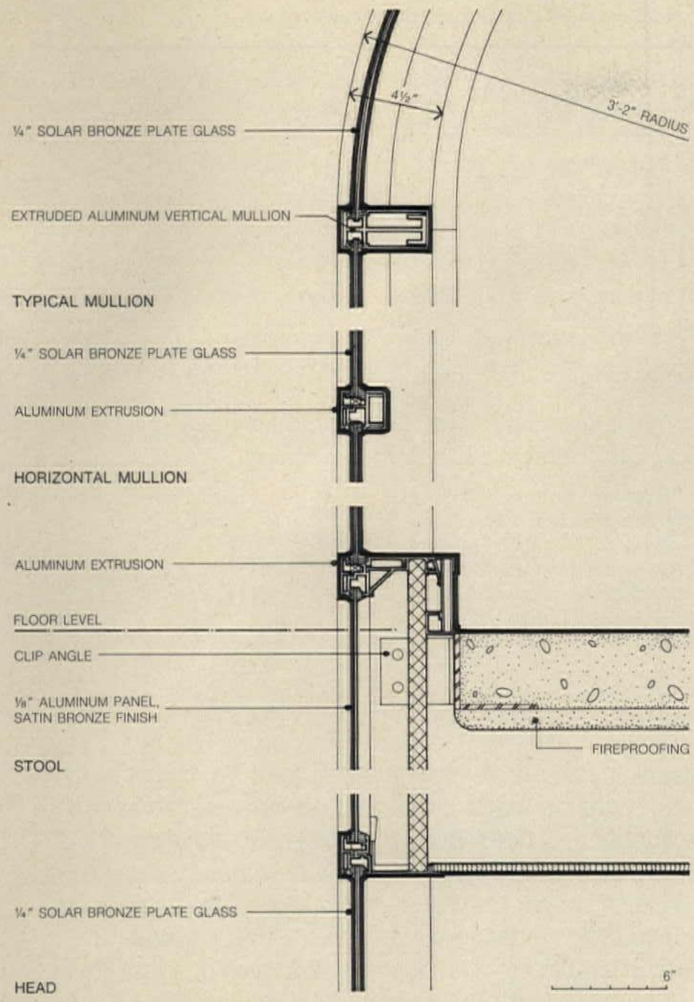
FOUR SIDES SUPPORTED

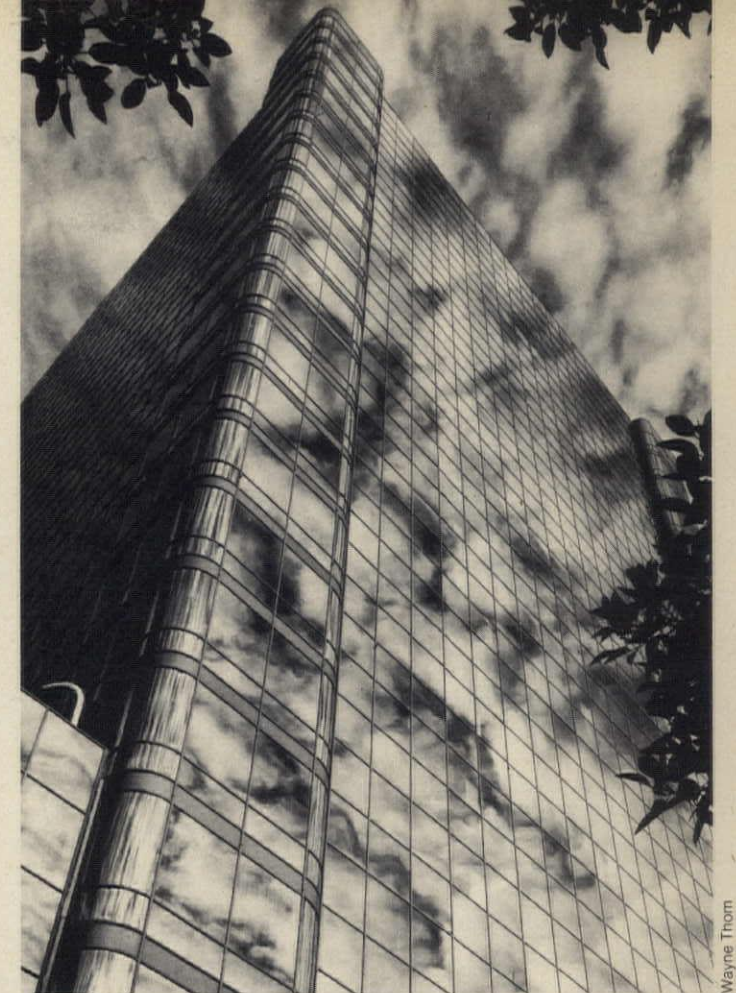
WIND LOAD DATA PROBABILITY OF FAILURE = 8 PER 1000 SOURCE: PPG INDUSTRIES

Safety factor

Glass is an engineering material, just like steel, and extensive tests have pretty well defined its mechanical properties. But where steel gives warning of impending failure by elongation and permanent deformation, glass gives little or no physical warning when it is about to break. In addition, because of its physical nature—basically a non-crystalline frozen liquid—there is a probability that strength will vary from the nominal, expressed as a Coefficient of Variation. Therefore, listed mechanical properties reflect a probability of confidence rather than a statistical certainty. Risk of breakage can be reduced to an insignificant level by using an appropriate safety factor; it cannot be eliminated.

The influence of safety factor on the statistical probability of failure may be judged by these figures from a manufacturer (for the firm's regular annealed glass with a Coeffi-





Corner offices of One Park Plaza, Los Angeles, occupy rounded-off square tower elements. Mullions have been reversed so that the section depth is inside the building, keeping outside expression to a minimum. The building is an early example of the architects' design concept, building enclosure as a membrane, or skin. Architects: Daniel, Mann, Johnson & Mendenhall.

cient of Variation of 25 percent). The figures apply to rectangular lights, adequately supported on four edges in a weathertight rabbet, and assuming statistically normal strength distribution. They give the probable number of lights which will break at the initial occurrence of the design load out of each 1000 lights loaded. At a specified safety factor of 1, probable failures number 500; safety factor 2, failures 22; safety factor 2.5, failures 8; safety factor 3, failures 4; safety factor 4, failures 1.3; safety factor 5, failures less than 1. Naturally, figures are different for other types of glazing. For the same manufacturer's heat-strengthened glass, it is necessary to go to a safety factor of only 2.75 to bring the probability of failure below 1. Safety factor implies thickness and degree of heat strengthening or tempering: the thicker the stronger (and the more expensive).

At any safety factor, there is an inverse straight-line relation between glass area and strength: a small light resists a higher wind load than a large light. Manufacturers' published curves for their products relate strength performance to glass area, usually at a safety factor of 2.5, and for specified limits in the ratio of short side/long side length. When architects specify glass within the published strength limits with an appropriate safety factor and with due attention to glazing details, the possibility of heat-induced stresses, and the effects of building movement on the glazing, glass may be used with a high degree of confidence. The architect usually first calculates wind loads, then selects glazing of the required strength. Nevertheless, on large jobs, whether or not the design falls within the published curves, it is wise for the architect to confirm his selection with the manufacturers' representatives. On unusual jobs, it's a good idea to consult during the very early stages. And as mentioned before, wind tunnel tests of mockups are desirable.

The as-yet unresolved mystery of the John Hancock tower in Boston points up the wisdom of getting as much input as possible as early as possible. Whether the glass problems were the result of unexpectedly high wind loads, excessive building movement, inadequate glazing design or installation, the too-optimistic application of performance curves to the large lights that were employed, other still-unknown factors, or a combination of any of these, remains to be discovered.

Because glass is not ductile, thermal stresses can be a serious enemy. This is especially true of heat-absorbing (tinted) and reflecting types and spandrels, which are also hungry heat absorbers. Design should be aimed at avoiding situations where there is a large temperature difference between the center and edge of the glass. It should not be glazed directly into a heat sink, such as a concrete reglet. Heating outlets should be designed to direct heat away from the wall; on cold mornings, when the heat comes up, the shock could overstress the glass. Interiors should be designed so that heat-trapping drapes and blinds cannot be installed too close to the glass, and with open space provided at the bottom and top or bottom and one side of the shading material to allow normal air convection over the face. Parallel surfaces such as pockets in suspended ceilings must be well back or should have vent slots to allow convection. Large tinted lights subject to diagonal or partial shading, so that they heat unevenly, especially under temperature extremes, should be heat-strengthened or tempered.

Spandrel glass is subject to greater thermal stress than vision glass. A recent walk down New York's Third Avenue after a particularly windy day showed a number of newly broken lights in several glass-walled buildings, all of the victims being spandrels. The combination of high wind loads and thermal stresses apparently was too much. The reason is simple. Dead air pockets formed by spandrel beams, fire stops, ducting, and backup insulation in spandrel areas may prevent rapid dissipation of heat on sunlit elevations. For this reason, spandrel glass usually should be heat-strengthened or tempered.

One manufacturer's literature cautions: The high internal temperatures reached in fused-frit spandrel glass generate stresses that can cause breakage-in-place of some glass spandrels with internal or external flaws. The literature concludes: "It is impossible for any manufacturer to completely eliminate all such glass. . . . No spandrel glass is warranted against breakage."

A comparison of acoustical properties of glass

Type & Overall Thickness	Inside Light	Construction Space	Outside Light	STC Value
¼" Plate or float	—	—	¼"	28
½" plate or float	—	—	½"	31
1" Insulated glass	¼"	½" Air space	¼"	32
¼" Laminated	⅛"	.030 Vinyl	⅛"	34
1½" Insulated glass	¼"	1" Air space	¼"	35
1" Insulated glass	¼"	½" Air space	¼" Laminated	36
1" Plate or float	—	—	1"	37
6¾" Insulated glass	¼"	6" Air space	¼" Laminated	42
½" Gypsum board nailed to studs, joints taped & sealed.				33
4" Hollow lightweight masonry block, plastered both sides.				40

Source: Guardian Industries

Silence, sealants, and stiffeners

The control of outside noise is vital in some installations and desirable in others, such as airport terminals and motels, hospitals, schools, libraries, laboratories, "think tanks," and the lower floors of offices and residences along busy highways. It might seem that large window areas and low noise are incompatible, but they're not. Ordinary insulating glass, although specified for thermal reasons, has some sound-insulating value as well. But it has a serious drawback. When both lights start resonating at the same frequency, the double-glazed unit lets through more noise than a single light. To avoid this, manufacturers of sound-control insulating glass make the two lights of different thicknesses. Each attenuates the resonant frequency of the other. A typical unit consists of two unequal panes, an air gap, a separator that houses desiccant, an acoustically absorbent liner, and a gasket that isolates the frame's vibration from the glass.

Acoustical properties are indicated by a Sound Transmission Class (STC) number. This is derived by fitting a theoretical curve over the actual Sound Transmission Loss (STL) curve according to ASTM procedure E413-70T. The STC number provides a preliminary estimate of acoustical properties. For actual design purposes, the performance of the material at all sound frequencies must be studied, especially those frequencies that the architect most wants to screen out. An STC rating of 35 to 40 is considered good and 40 to 45 very good. For ¼-in. float glass the STC number is 28 (poor) for ½-in. float it is 31 (fair). One manufacturer makes an acoustic insulating unit consisting of $\frac{3}{16}$-in. and ⅜-in. glass with a 2-in. air space, rated at STC 42.

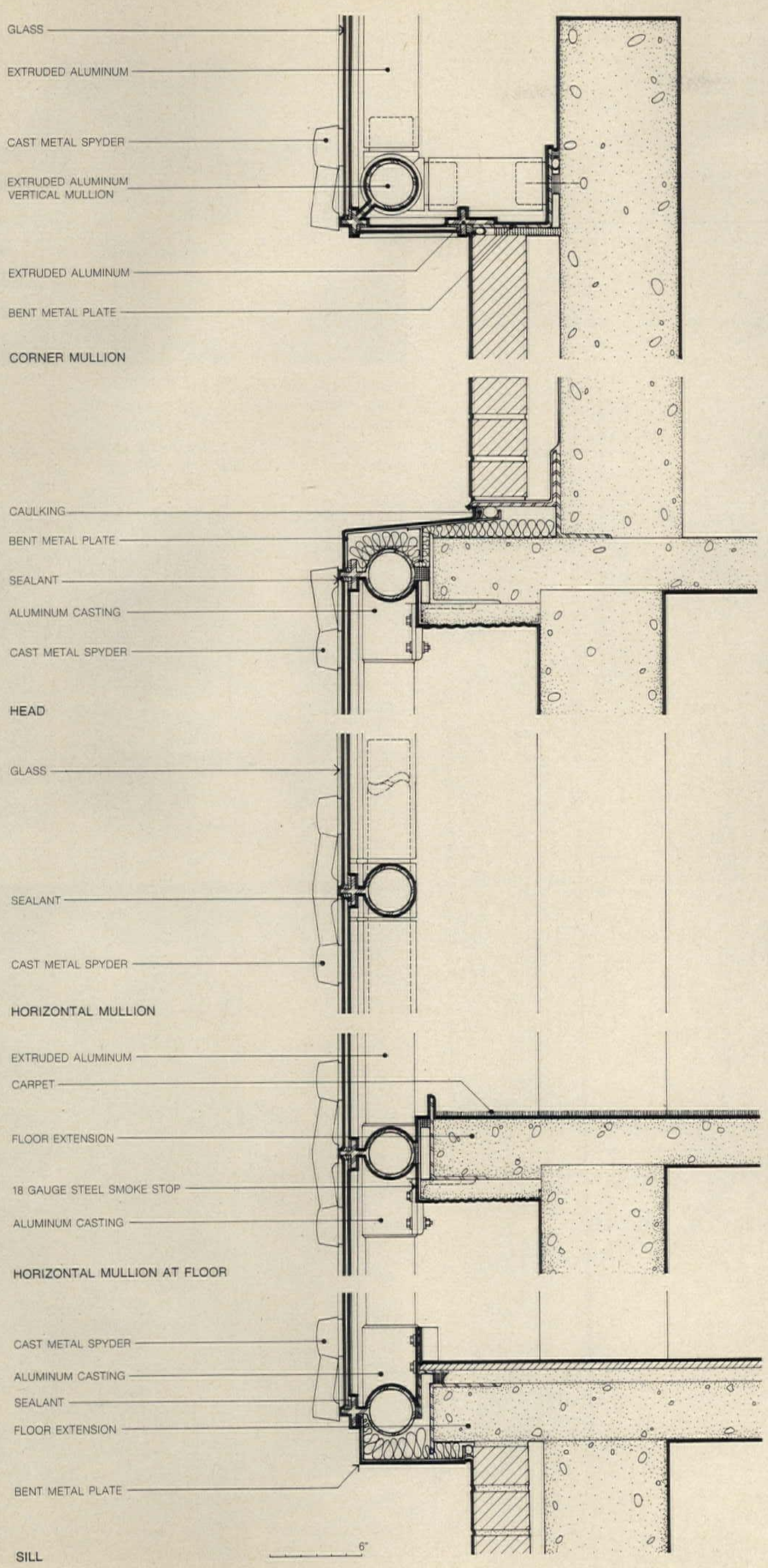
Laminated glass is also an aid to acoustic control. Usually it is incorporated in an insulating glass unit, but it may be used alone. It's used by another manufacturer to attain STC 42 with a 6¾-in. unit consisting of a ¼-in. light of float glass, a 6-in. air space and a ¼-in. laminated light, and STC 39 with a 1¼-in. unit consisting of ¼-in. float glass, ½-in. air space and ½-in. laminated glass. Manufacturers and fabricators can supply units with higher STCs or tailored to specific noise problems where required. It's important to realize, however, that a loose structure *provides an easy path for sound, as it does for heat. The best insulating unit will serve poorly if the system is poorly designed or installed.*

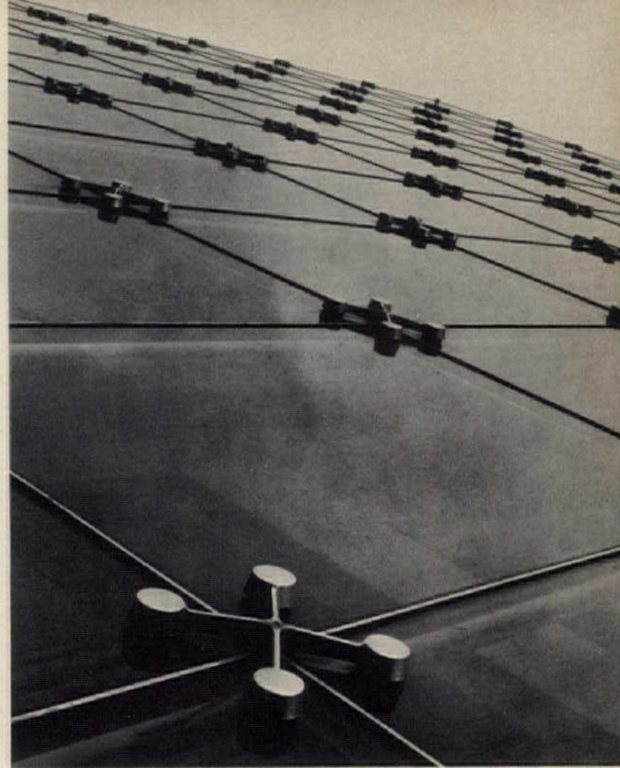
Indeed, proper glazing is vital to all aspects of glass performance. It's a dangerous mistake, in the pressure to close in a building, to accept framing openings that are not square or are out of plane. Not only will the glass not fulfill its energy or acoustic role, but it also may break prematurely.

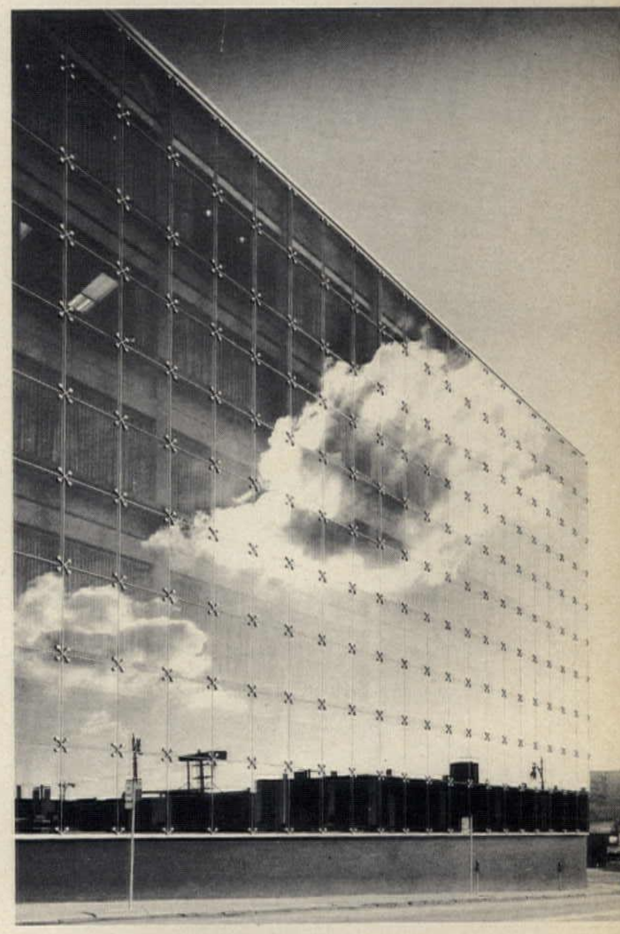
A short article allows little room to give much useful information about glazing details. Suffice it to say that attention must be paid to a number of factors, including edge preparation (straight cuts), glass protection, sash detail, sealant selection (see P/A, Dec. 1975, p. 74) and application, the location of setting blocks and shims, and provision of weep holes in the sill for insulating and laminated glass to prevent moisture from attacking the sealant or lamination.

Detailed glazing recommendations are published by glass manufacturers and fabricators and by industry groups such as the Flat Glass Marketing Assn., the Sealed Insulating Glass Manufacturers Assn., and the Architectural Aluminum Manufacturers Assn. Individual manufacturers will also provide guidance and recommendations for specific jobs. Indeed, over a certain size of glass or quantity of order, most manufacturers require a review by their technical departments.

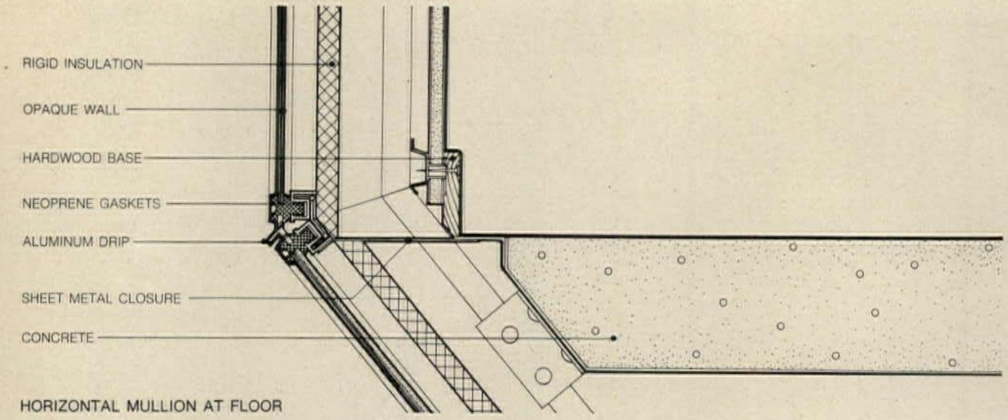
Le Corbusier's "struggle for light" has been accepted by many architects as a challenge to design longer expanses of glass, uninterrupted by mullions, and huge unobstructed windows rising two and more stories. These designs require special glazing systems—butt-joint glazing and suspended glazing. In butt-joint glazing, the glass is held at the head and sill by conventional glazing methods. The vertical edges are sealed with a silicone sealant (paradoxically, black sealant has been observed to be less obtrusive than clear). No vertical framing members are used. Some stiffening may be needed for large openings and wind loads. This is done with ¾-in.-thick, finlike glass stabilizers perpendicular to the main glazing. At each joint, either the two main



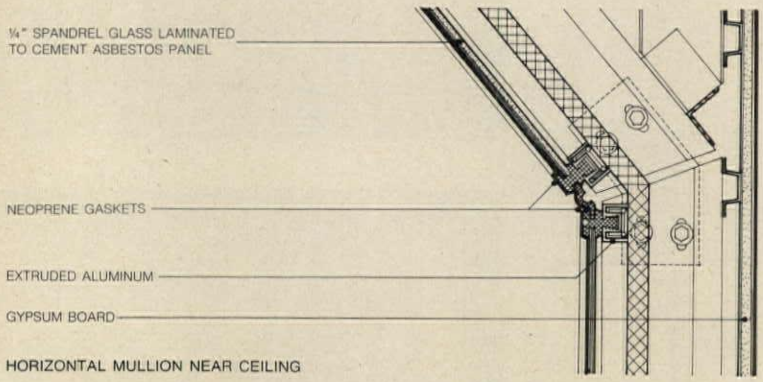




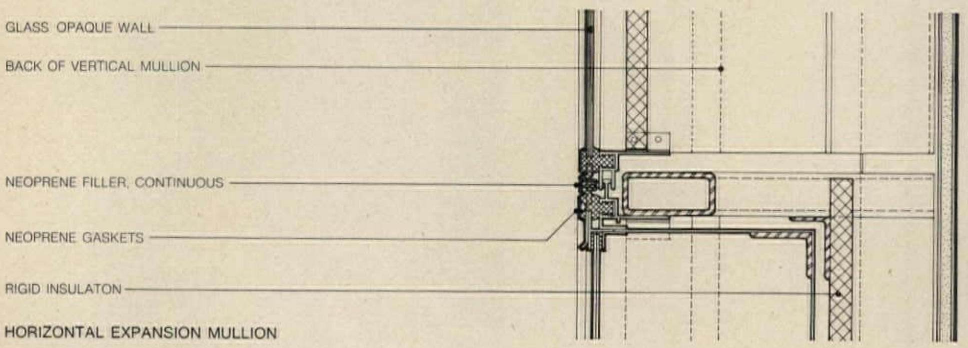
Playing a major role in the re-use of a 1910 Detroit building, the new glass façade is set nearly flush with minimal joint members. All restraint is supplied by the silicone sealant, not the x-shaped clamps (which were installed to hold lights while the sealant cured, and to satisfy code requirements for 4-point support). Architects: Smith, Hinchman & Grylls, Inc.



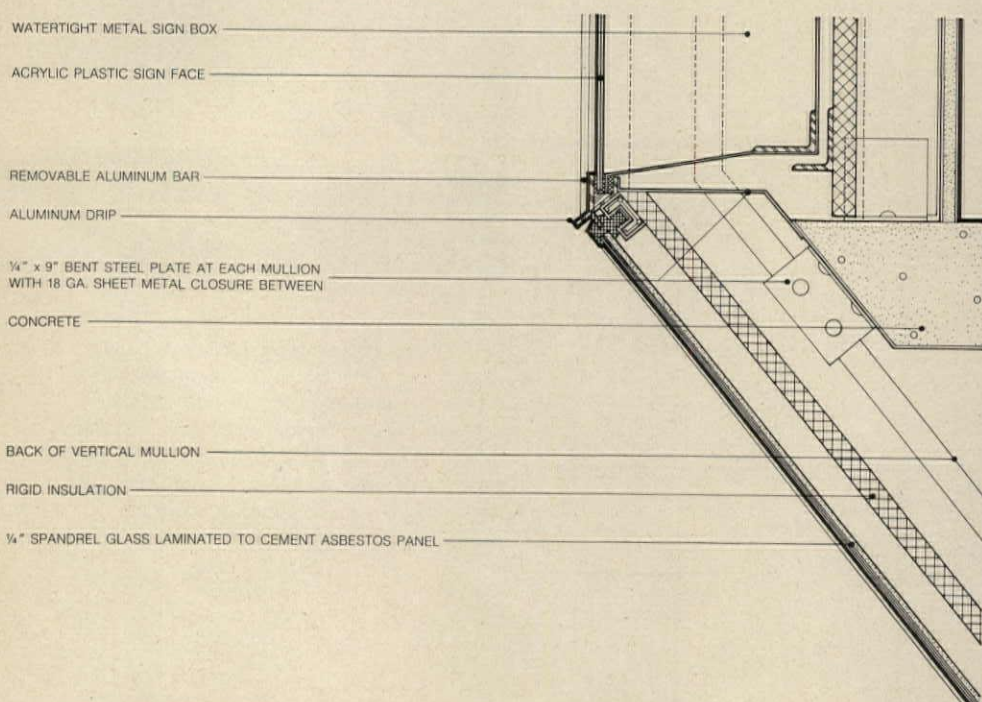
HORIZONTAL MULLION AT FLOOR



HORIZONTAL MULLION NEAR CEILING



HORIZONTAL EXPANSION MULLION



HORIZONTAL MULLION AT FLOOR

Sculptural facets of the Pacific Design Center in Los Angeles are backed with cement asbestos panels in non-vision glass areas, to prevent heat build-up behind spandrels of blue glass. Architects: Gruen Associates.

David Morton

David Morton

lights are butted to a single stabilizer or the lights are butted to each other and separate stabilizers are butted to the joint on both the interior and exterior. The head and sill of the stabilizers are fastened in the conventional manner, but with special head details to allow for excessive slab deflection over long unsupported areas.

In suspended glazing, each light is hung from the structural system above the ceiling by special clamps. The sill provides no structural support, but provides for sealing and vibration control, and restrains the lights from swinging. Stabilizers are used with this system too. Consultation with manufacturers and suppliers is recommended for these special glazing systems.

Notes on costs and procedures

☐ The trend of glass prices is up, in line with fuel costs, since oil, natural gas, and propane are a major raw material. But competition may keep the slope shallow since manufacturers need to keep their massive float lines running 24 hours a day.

☐ Offering pricing guidelines for the various glass systems is difficult, since the basic glass accounts for only part of the cost of a fabricated unit or assembly. Overall, higher performance costs more in first-cost calculations: thick is dearer than thin; tempered is dearer than annealed; reflective is dearer than tinted; tinted is dearer than clear. Aesthetic considerations aside, the trade-off is between performance (with possible long-term savings) and price.

Estimated cost per sq ft (Installed)*

¼″ Clear float	$2.25/Sq Ft
¼″ Bronze float	2.50
¼″ Reflective coated monolithic	4.70
1″ Clear insulating	5.00
1″ Bronze insulating	6.00
1″ Reflective coated insulating	7.50

*Because of the many variables including, but not limited to, quantity discounts, bracket size differences, unknown factors in labor costs, these costs are *estimates* only, based on conditions at press time. Source: Libbey-Owens-Ford Company.

☐ Energy costs will follow a steady rise, so err within reason on the high side of performance in specifying glass.

☐ Since higher performance costs more, consider using different glasses on different elevations to match energy requirements.

☐ Hold costs down by sizing all or most lights the same.

☐ Order extra lights for breakage replacement on special glass and store them in the basement. One manufacturer includes the right to ship and invoice a specified percentage of extras as a condition of sale for its insulating units. Lead times for some high-performance units run into months. (Another reason to simplify size/shape variety.)

☐ Keep a sample of the installed reflective or tinted glass along with production data to get a better color match on replacements.

☐ Break the traditional habit of ordering glass late in the game, to cope with long lead times for special glass and assemblies. Nearly every big job is a custom job, so the manufacturer must fit it into his production schedule.

☐ Ordering pre-glazed assemblies—the glass is factory-installed in frames—can cut costs and speed construction.

☐ Speculative builders will have to end their romance with lowest first-cost. They will need buildings they can sell on the basis of lowest operating costs.

☐ The *primary* mechanisms of glass failure in curtain walls are building and wall movements, thermal stress, impact, and inherent defects, not wind loads.

☐ Make sure of systems compatibility; i.e., the glass, glazing system, sealants, and metals must have compatible physical and chemical tolerances.

☐ Architects need more information on local weather phenomena; detailed wind loads, wind channeling effects.

☐ Longer and longer spans in structures, with resulting larger deflections, pose a danger to glass curtain wall installations. Present glazing systems cannot adequately handle excessive deflections. Structural engineers will have to find a way to control the deflections and transmit the information rapidly to architects.

☐ Architects will have to help bring mechanical engineers into plans earlier. Instead of meeting air conditioning requirements with brute force, the architect and engineer should work together in analyzing the effect of glass on overall operation and costs.

☐ In ordering hermetically sealed insulating glass that must be shipped to or through a markedly different altitude than the unit's manufacturing site, avoid damage caused by bowing in or out of glass due to marked difference between atmospheric and internal pressure. Suggested solutions: Installation of temporary breathing tube or drilling temporary relief holes and later plugging them.

☐ Looking at energy from a universal point of view, not only is the performance of a material important, but its total energy content as well. This means the total energy required to bring it to market, including energy calculations for raw materials, prime manufacturing facilities, fabricating facilities, and transportation. From this point of view, glass compares very favorably with other structural cladding materials. It is better than most.

With the fire-eating energy dragon laid low, architects may resume adding their glass statements to the History of Architecture. [Henry Lefer]

Credits

P/A received valuable assistance from glass industry and government sources in preparing this Technics report. Our special thanks to: ASG Industries, C-E Glass, Dearborn Glass, Ford Glass, Fourco Glass, Globe-Amerada, Guardian Industries, Libbey-Owens-Ford Co., Pilkington Glass Ltd., PPG Industries, Safelite Industries, Shatterproof Glass Co., Twin Pane Corp.; Flat Glass Marketing Ass'n., Sealed Insulating Glass Manufacturers Ass'n.; Federal Energy Administration, National Bureau of Standards.

People under glass

Marlys Hann

A horizontal glazing system breaks with the tradition for sloping glass roofs and postulates several new solutions to problems plaguing glass architecture.

With the spread of colonialization in the 17th Century came the knowledge of exotic plants. The desire to nurture them in urban countries of northern Europe was to have an interesting architectural impact. Ingenious building techniques and environmental control devices were developed for plant environments that were even more advanced than those for people. Boilers, steam, and radiant hot water systems, in fact, were first invented for hothouses and then adapted for homes. Those exotic glass gardens created for plants were subsequently taken over by people weary of the cold, dark confinement of masonry structures. The romantic botanist's hot house, the summer supper houses, and garden orangeries of the 18th Century developed into a culture of environmental fantasy at the beginning of the 19th Century, made possible by the new construction materials, iron and glass.

Early days

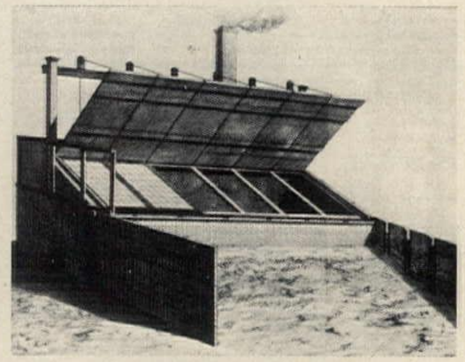
The 17th-Century Dutch slope-front forcing frames set the precedent for pitching greenhouse roofs to catch the rays of the sun and carry away water. Much later experimentation took place to handle the glass so it could receive the sun's rays directly while avoiding condensation. In the early 1800s, J.C. Loudon's analysis of the optimum angles that forcing frames should take resulted in such sophisticated conceptions as his design for a pointed glass dome with a spread base. Loudon's designs had louver systems to open the glass, connected to an automatic thermostat, canvas blinds for retaining heat, and tempered air that could be drawn from a heated back shed in cold weather. By inventing the wrought iron curved sash bar, Loudon paved the way for curvalinear glass construction. The small curved pieces of blown glass were overlapped like shingles or the scales of a fish.

Loudon is also credited with the design of the first "ridge and furrow" glazing—long bands of peaked glass roofing that could catch the "two daily meridians" of the sun. The configuration of the skin allowed condensation to run easily down to the glazing bars which were designed to collect the water. As John Hix points out in *The Glass House* (The MIT Press, Cambridge, 1974), the capability of the ridge and furrow to cover vast areas later influenced Joseph Paxton, who placed it over a vaulted section of the Great Conservatory at Chatsworth (1841) and later the Crystal Palace (1851). It is still used extensively by today's architects, and for intensive farming under glass.

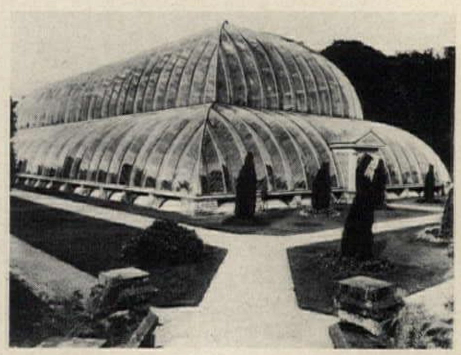
Paxton's Crystal Palace represents the sophistication that the mid-century engineers and builders had attained in ways other than the well-known standardization of all the elements. For example, his wood and iron rainwater gutter, with its condensation grooves, was structural and spanned 24 ft to rest on main gutters carried by the cast iron girders. These in turn were keyed to jointed columns allowing the flow of water. In 1858, Joseph Paxton developed and patented folding frames of hinged wood and glass panels, a prefabricated A-shaped hothouse produced for the suburban middle-class household. All of these structures, down to the present-day standard greenhouses, however, took for granted the fact that water would enter through imperfect seals, or would develop inside from condensation, and thus was to be carried away down sloping gutters to the ground.

20th-Century advances

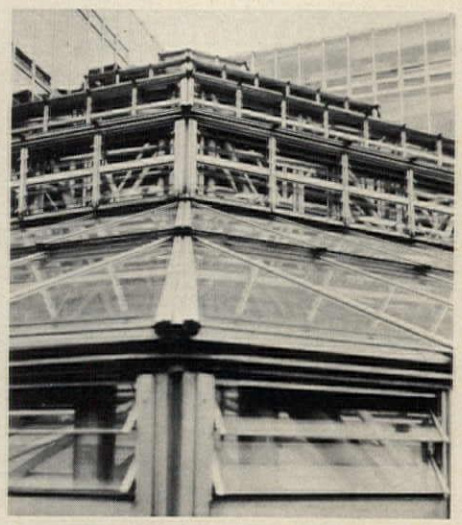
The technical knowledge gained in curtain wall construction about sealants, pressure equalization, drainage, and insulated glass no doubt will further the trend toward the



Dutch forcing-frame

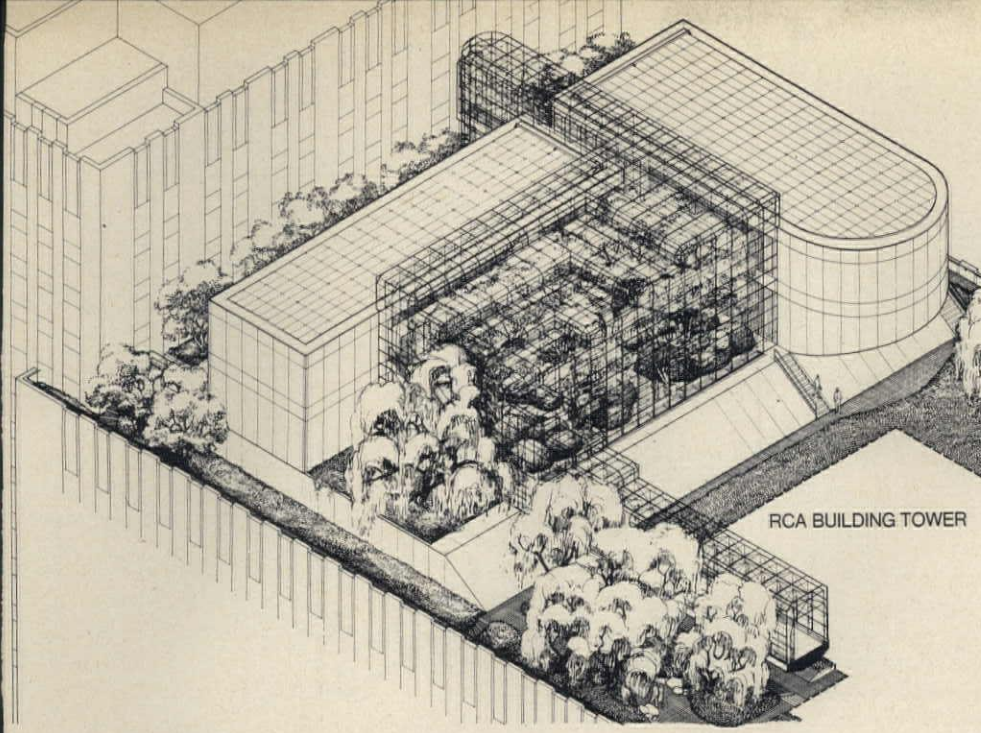


The Great Conservatory at Chatsworth, England by Joseph Paxton, 1820.

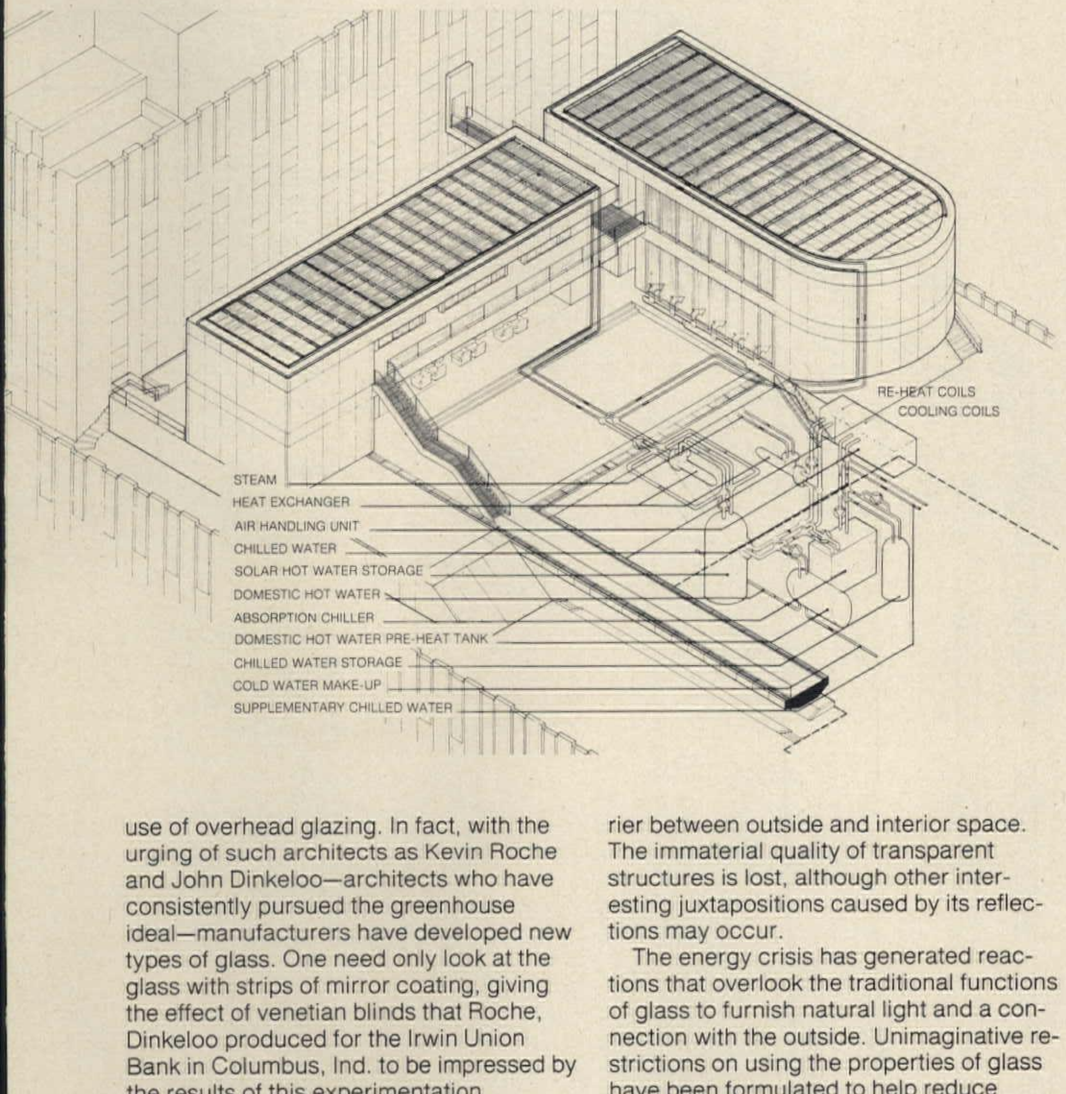


Cambridge University History Faculty Building by James Stirling, 1968.

Author: Marlys Hann, formerly an associate of Ford & Earl, was in charge of the design for the RCA Conference Center. She currently heads her own design firm in New York.



Isometric of RCA Conference Center project.



use of overhead glazing. In fact, with the urging of such architects as Kevin Roche and John Dinkeloo—architects who have consistently pursued the greenhouse ideal—manufacturers have developed new types of glass. One need only look at the glass with strips of mirror coating, giving the effect of venetian blinds that Roche, Dinkeloo produced for the Irwin Union Bank in Columbus, Ind. to be impressed by the results of this experimentation.

The transparent glass enclosure could only have developed in the diffuse light of cloudy northern skies. Even so, sun control and heat loss have continued to plague greenhouse design. While reflective glass solved problems of heat buildup, standard reflective glass cuts out up to 93 percent of the light: too high a percentage for successful plant growth. Also, reflective glass (and tinted, heat absorbing glass), viewed from outside creates a barrier between outside and interior space. The immaterial quality of transparent structures is lost, although other interesting juxtapositions caused by its reflections may occur.

The energy crisis has generated reactions that overlook the traditional functions of glass to furnish natural light and a connection with the outside. Unimaginative restrictions on using the properties of glass have been formulated to help reduce energy needs. Yet as the RCA Conference Center project shown on these pages illustrates, a glassed-in area can still respond successfully to requirements of energy conservation. The greenhouse is a "passive" solar collector, relying on direct insolation or radiation for thermal control. Direct insolation systems tend to be more efficient than more complex solar collector systems since the heat transport path is shorter with fewer heat exchanges.

Designed by Ford and Earl Design Associates in association with architect Justin Lamb, the Center integrated both a flat plate solar collector system and a transparent greenhouse structure with the other activities of the building. A dramatic aspect of the project was its site—the 12th-floor level of the RCA Building in Rockefeller Center. The need to fit the new building to the 1930s architecture and its pyramiding terraces gave rise to a solution of horizontal glass planes in stepped-up form.

Form and technics

Greenhouse and skylight glazing systems traditionally have 20 degree or more slopes so that the moisture developing on single-glazed structures could be carried to condensation gutters without dropping off. More recently, double-glazing has cut down condensation and helped in thermal control. But the 20 degree slope lingers on. Manufacturers of insulated glass do not have a method of assembly for units that can be used on near-horizontal planes. Most spacers and sealants presently employed would not stand up under continuous loading. With the Conference Center however, for the first time a special system was designed with an insulated glass unit on horizontal overhead glass as well as angled and perpendicular surfaces. Curtainwall consultant for the RCA project, Eugene Tofflemire, helped design a self-draining roof by eliminating the exterior stops. The glazed surface would be smooth except for 3-in.-square retainer plates. This special insulated glass unit is designed with an exposed glass edge to allow a smooth sealant joint between glass panels. Because the perimeter of the insulated glass panel resting against the glazing bar exposes the sealant and spacer edge, another problem needed solving. Guardian Industries, a glass manufacturer, fired a ceramic frit border about ⅝-in. wide onto the exposed glass edge to protect the insulated glass seal from ultra-violet radiation and provide an even line covering sealant and spacer.

What developed was essentially a flush butt-glazed system using insulated glass units. It was made possible by the capabilities of modern sealants such as silicone, which can accommodate many times the projected movement of the wall system. Silicone adheres well to glass and prepared metal, has excellent resistance to weathering, ozone, and U.V. exposure, and is unaffected by temperatures up to 250F. A backup drainage system would respond to possible sealant failures that might occur: any penetrating moisture would be carried in the mullion and drained out at approximately 9'-4" intervals. All exterior seals would be taped and tooled to ensure a flat uniform bead necessary for proper water runoff. The reduced heat transfer properties of the thermal glazing and the thermal insulation characteristics of the aluminum framing, would make the traditional slope and condensation gutters unnecessary.

The complete seal glazing system is

Glass architecture

considered almost totally impenetrable to water. The glass units would be set flush into the aluminum framing system and butt-glazed flush with ½-in. aluminum glazing bars. To counteract thermal movement, the Conference Center framing system was designed with expansion joints at a maximum of 4′-8″ on center. In addition, the major quantity of metal is contained within the structure to further reduce the temperature range.

From the beginning stages of design, energy conservation and shading was a major concern. The insulated glass unit would reduce heat loss by one-half. As for heat gain, solar studies performed at the University of Florida determined that the double layer of ½-in. clear glass forming the special glazing unit provided shading coefficients equivalent to standard heat-absorbing insulated units. In addition, a larger portion of the visible light spectrum could be obtained for plant growth.

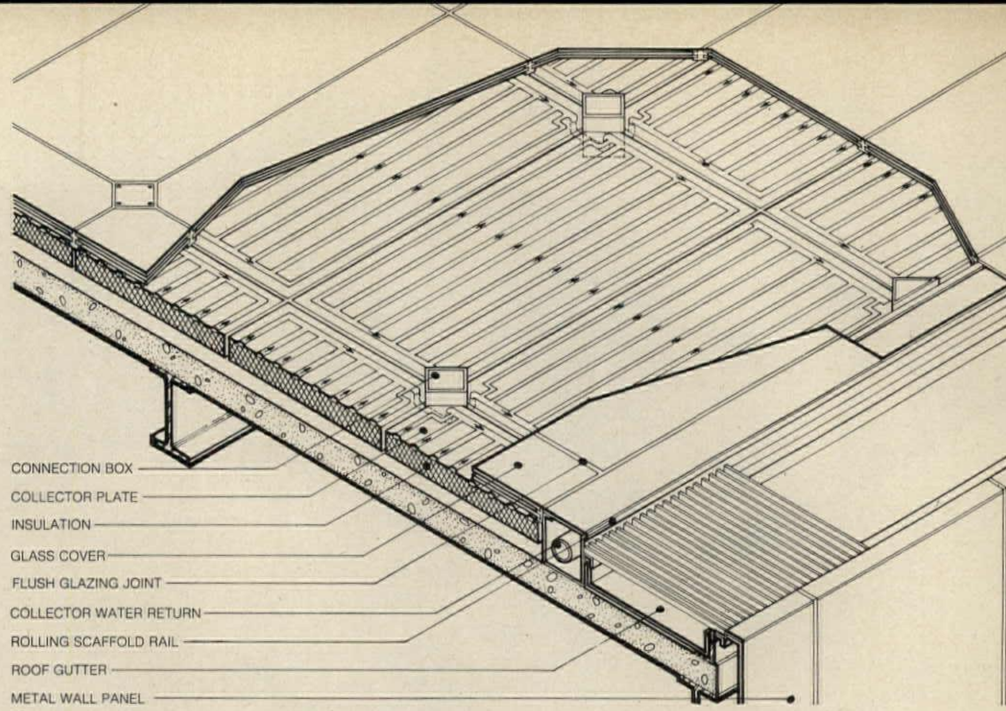
Cost studies indicate energy expenditures would be surprisingly low for heating and cooling of the greenhouse. During the winter season, the roof of the enclosed garden acts as a solar collector and saves energy by furnishing heat to the remainder of the building. The air conditioning and ventilating loads in the summer would increase energy costs for the building, but the greenhouse would not consume any more raw energy per sq ft of area than the rest of the building. Furthermore, operable windows on the upper portion could be used for emergency ventilation; large deciduous trees outside the south glass wall would shade the greenhouse space in the summer and let in needed sunlight in the winter months.

The roof's insulated glass unit is made up of ½-in. tempered glass on the exterior and double ¼-in. annealed laminated glass on the interior. The exterior glass has great strength, and resistance to impact and thermal breakage. The ½-in. thickness allows a surface for an optimum silicone weathering joint, and would be flatter than thinner lights. The laminated glass inside would retain any broken glass intact, just in case. A custom spacer protects the edges of all the laminated glass. As far as maintenance is concerned, only the exterior silicone seal would be a possible area of concern. But since it is exposed, inspection and repair should be easy. Because this was a new system, the glass was intentionally overdesigned for safety factors: It could even support limited traffic for maintenance.

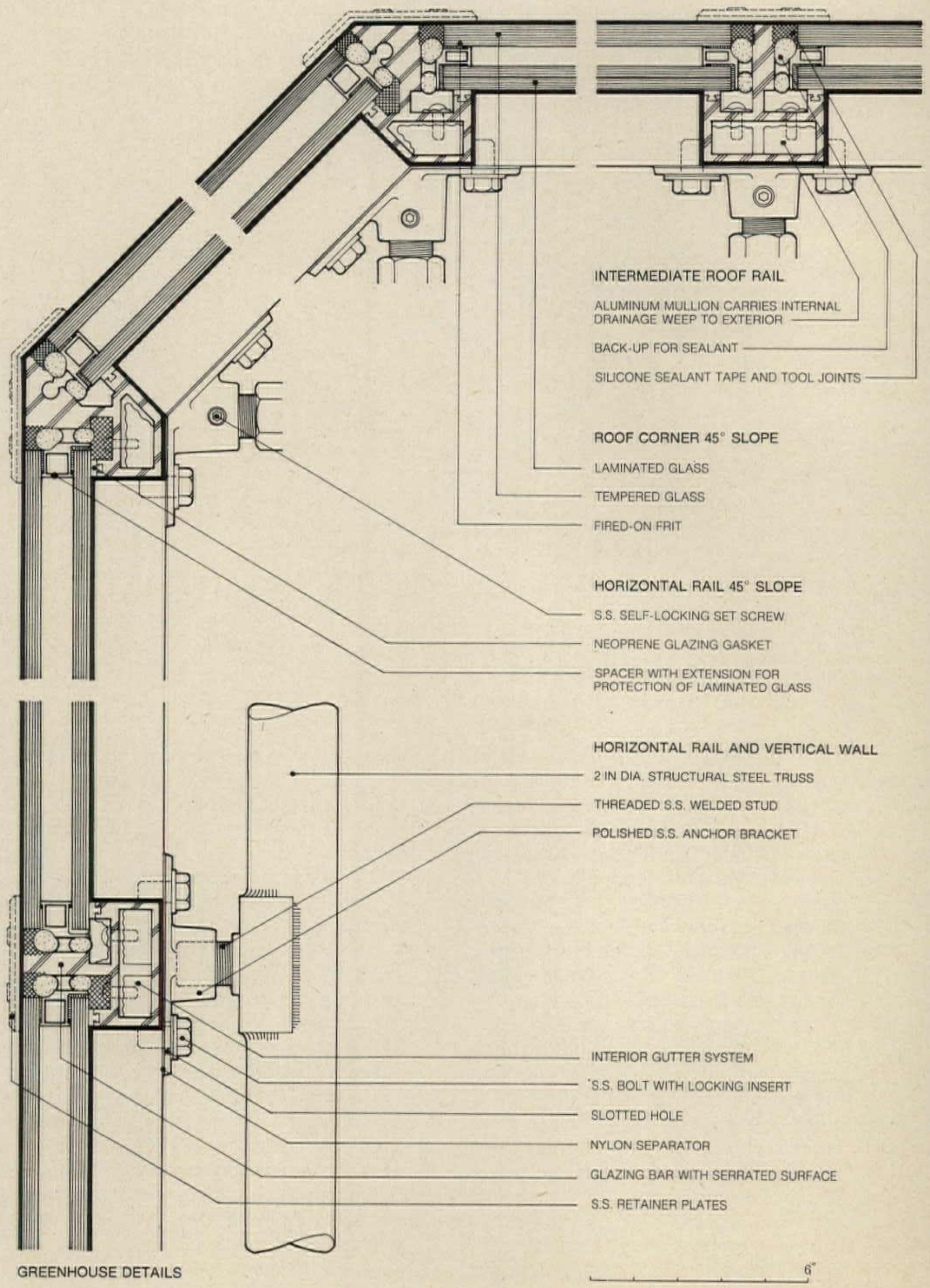
Other applications

Developed for a glazed roof, the system would also work for a vertical wall enclosure. The horizontal glazing bar and standoffs from the wall truss would support the units. Although twin lights of ⅜-in. annealed glass could be used here, detailing is essentially the same.

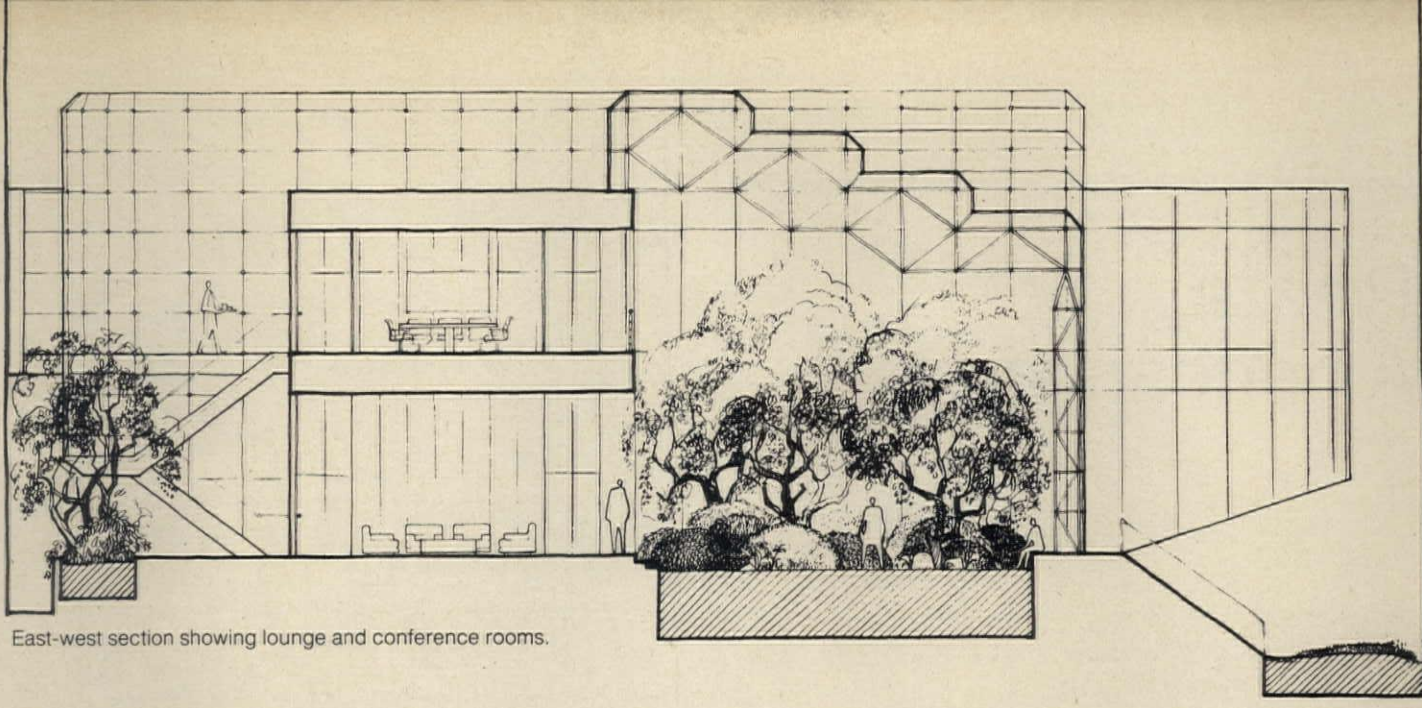
This glazing system could also be



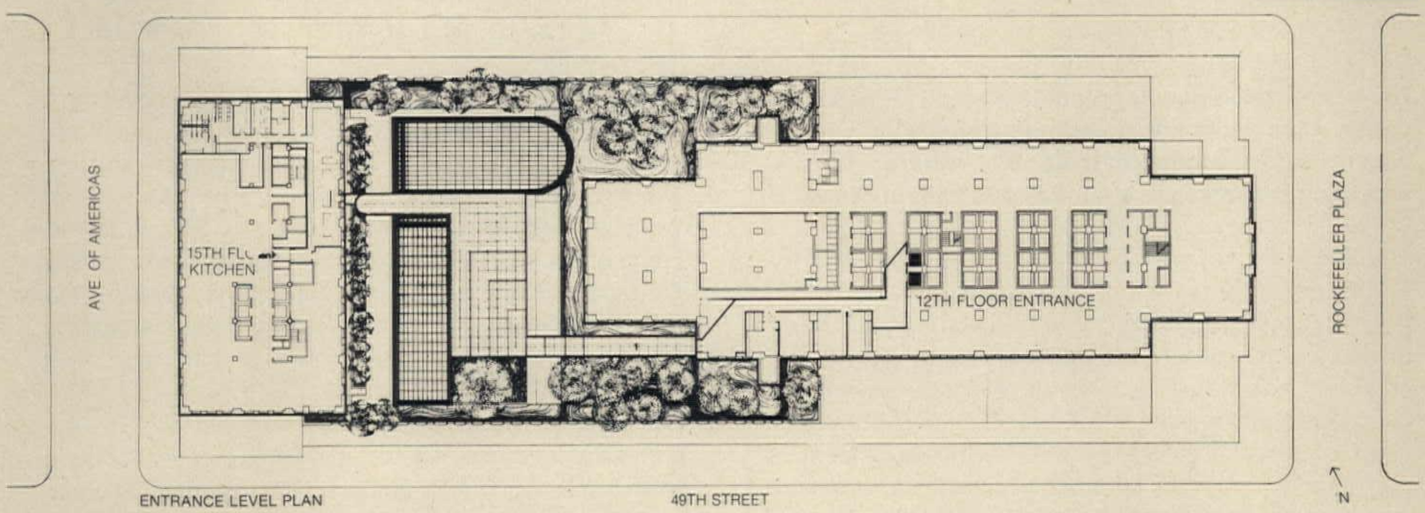
Solar collector



GREENHOUSE DETAILS



East-west section showing lounge and conference rooms.



12th floor level plan of Conference Center on RCA's Building.

adapted to the design of solar collectors, with greater efficiency than current schemes. As the Conference Center demonstrates, where large roof slopes are not feasible, spatially or economically, the horizontal orientation of collectors allows ample collection per sq ft of roof area. Tilted collectors require spacing of the saw-tooth configuration to prevent self-shading at the low sun angles. As the tilt angle is increased from the horizontal, the collector area on a limited roof space decreases.

Though a maximum yearly solar energy collection per sq ft of collector occurs at a tilt angle of 40 degrees facing south for this location, best results *for a defined area of roof* is maximum for winter and summer when collectors are mounted horizontally. The continuous plane of horizontal collectors eliminates the inherent flashing and drainage problems arising from a saw-tooth configuration, not to mention more complicated support structures. The horizontal collector could become an integral part of the roof, providing both the exterior skin and the insulation for the roof construction. Heat loss is reduced since the underside of the collector is not exposed to the weather and collectors are butted, eliminating intermediate edge losses. Flush joints help too, since no metal is exposed to the outside. However, the thinner glass necessary for the collector would require a special spacer to allow greater adhesion of the high-temperature silicone sealant. Square boxes at diagonal corners of the panels could house the connections and allow maintenance without requiring deglazing.

Used as roof, walls, or solar collectors, this glazing system provides a smooth skin enclosure and allows great flexibility in form. No longer would the prescribed degree of slope be needed. The smooth surface eliminates the exterior glazing bars and gutters that dam water, cause cleaning difficulties, and increase chances of corrosion. Less complex support structures than the traditional ridge and furrow or sloped roofs could be employed, simplifying detailing problems at changes in plane.

Although the RCA project will not be built owing to changes within RCA's organization, current economic conditions may stimulate such technological advances in glazing and the storage and use of solar energy. Insulated glass will become the norm. Currently, work is progressing on new insulated glazing systems that combine the functions of the glazing bar and separator so that on-site installation can be as simple as it is with building panels.

The best possible mission today for architecture lies in the creation of humane environments. Greenhouse and conservatory structures historically were created as rich in form as they were in scientific control. Visions of such gardens are as strong as ever. The controlled environment, under development for thousands of years, is not going to stop short of total realization, contend those who are working on such possibilities. Today, it is more important than ever to use glass and energy technology, and the elements of nature to create pleasant environments for both plants and people. □

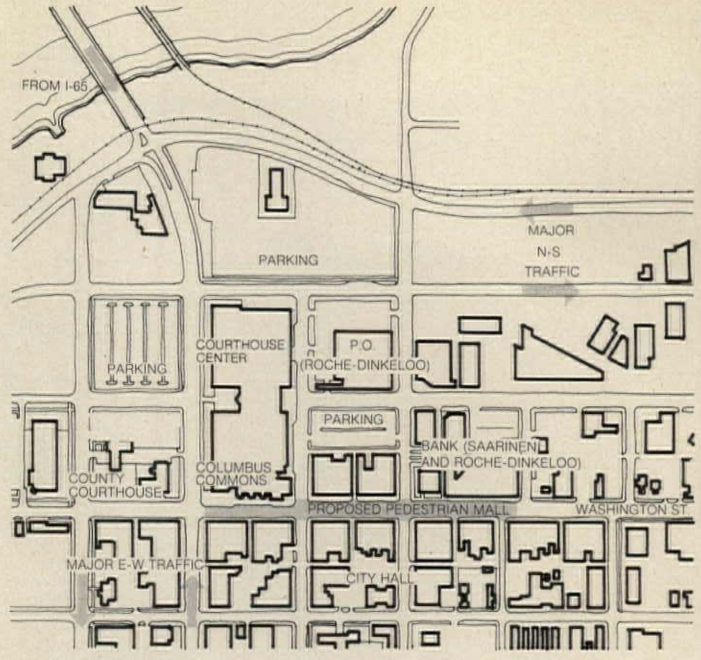
Credits

Design and planning for RCA Conference Center: Ford & Earl Design Associates.
Architect: Justin Lamb.
Consultants: Eugene Tofflemire, curtain wall design; Syska & Hennessey, mechanical engineers; Lev Zetlin, structural engineer.
Special credit should be given to Guardian Industries who carried out preliminary testing on the glass; and Trio Industries who advised the team about curtain-wall detailing.

Background information regarding the history of greenhouses was provided by John Hix's *The Glass House* (The MIT Press, 1974) and discussions with Ludwig Glaeser, director of the Mies van der Rohe archive at the Museum of Modern Art.

Courthouse Center and The Commons, Columbus, Ind.

Piazza, American style



DOWNTOWN COLUMBUS 200 N⟶

For a downtown development in a small Midwest city, Gruen Associates has combined a shopping center with an indoor version of the public square, wrapping the whole in a continuous skin of glass.

Columbus, Indiana, has been known for decades as Middle America's testing ground for modern architecture. Its remarkable series of schools, public buildings, banks, churches, and industrial buildings reflect the patronage and influence of J. Irwin Miller, president of Cummins Engine Co. But architectural pilgrims have always been disappointed to find these landmarks in an all too commonplace setting. From its seedy downtown to its highway commercial strips, Columbus looked all too much like any Midwestern town of about 30,000.

Today, however, downtown Columbus is beginning to coalesce into a distinctly out-of-the-ordinary townscape. And a critical part of this transformation is the unique public-private development known as Courthouse Center and The Commons. Joined together in this 240,000-sq-ft structure are a conventional shopping center and an unconventional two-acre city park under roof. Unifying it all is a sleek glass envelope designed to the exacting standards of Cesar Pelli, design partner of Gruen Associates.

Large as this new structure looms in Columbus—both in sheer bulk and in capital investment—it is but one interdependent element of a larger urban plan that takes careful account of the area's other assets.

The need for downtown renewal had been recognized by the mid-1960s, as population growth strained older facilities and fed out-lying sprawl. Alexander Girard's 1965 repainting and resigning of model blocks along Washington Street demonstrated the visual potential of Victorian fronts, but could hardly revive the street's economy. The downtown redevelopment plan of 1968, by Skidmore Owings & Merrill (Chicago) attacked the area's serious traffic and parking problems: realignment of a railroad allowed north-south auto traffic to be shifted to streets west of Washington and freed several blocks along the old rail line for convenient parking. The site of Courthouse Center and The Commons was earmarked for a one-story shopping center, with a small plaza at the southeast corner to set off the flamboyant tower of the 19th-Century county courthouse.

Actual development of this new center was sparked by an immediate need: Sears, the largest retailer remaining downtown, was known to be seeking larger quarters, with ample parking, when its lease expired in 1973. Irwin Management Co. (headed by J. Irwin Miller) won sponsorship of the project, with a proposal that included Sears as major tenant and Gruen Associates—known for both shopping center expertise and bold design—as architects.

Inventing an indoor public park

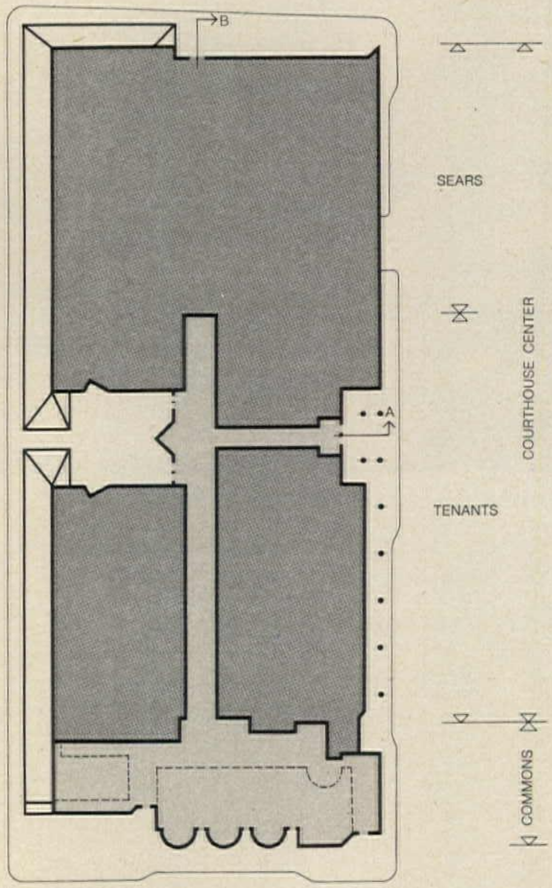
The design of the center had to meet two critical goals: give Sears suitable quarters, adjoining the new parking areas for one-stop shopping; link Sears to Washington Street in a way that would reinforce both. The usual introverted shopping center would not do. Out of these needs emerged the concept of an indoor public space fronting Washington Street—"the modern American equivalent of the Italian piazza," Pelli called it. The city agreed to accept The Commons (named by public competition) as a gift from Miller, his wife, and his sister, Mrs. Robert Tangeman. With The Commons serving as a pivot, further activity was envisioned running north along a pedestrian mall to a future department store "anchor" (plan above).

Courthouse Center and The Commons was planned around the circulation pattern so crucial to the whole enterprise. Linking Sears to The Commons is a skylighted concourse, intersected by a cross-axis tracing the former street right-of-way through the building. At the Commons end, circulation splits and eddies around calculated obstacles; its principal outlet to Washington Street is meant to be the 15-ft-wide air door at the northeast corner, but there are several other casually placed, understated openings.

Activities in The Commons range from a busy, noisy playground at the south end to quiet seating under the magnolias at the north. The focal element of the space—of the whole complex, for that matter—is the 30-ft-high kinetic sculpture "Chaos," by Swiss artist Jean Tinguely. The sculpture has quickly become a community reference point. ("Meet me at noon at Chaos.") From almost any point in The Commons, Chaos can be observed going through its routine—turning on its axis, running a little cart up and down one arm, dropping metal spheres down a

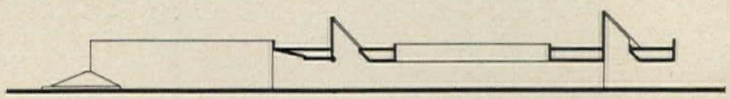
Bronze-tinted glass of new structure reflects surrounding storefronts until dusk, when light-spangled trusses of Commons interior become visible.

Courthouse Center and The Commons



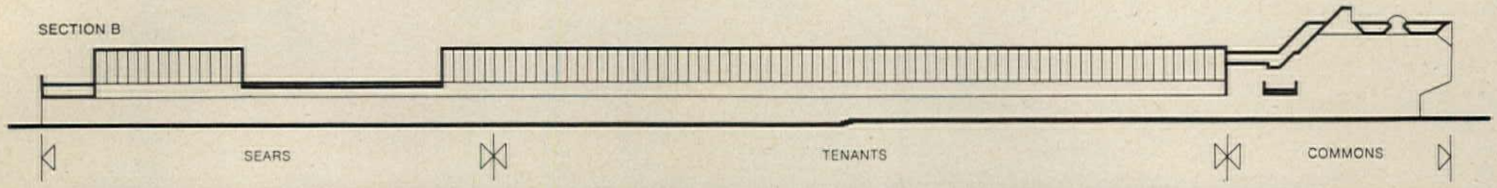
STREET LEVEL PLAN

Courthouse Center meets The Commons along an invisible line dividing the 685-ft-long structure (plan, left). The circulation spine of the retail portion (above) has a north-sloping skylight, ingeniously doubled by a vertical mirror under its apparent peak. The largely one-story structure rises at the east end to a height that fits the scale of Washington Street, allowing for mezzanine spaces (dashed outlines on plan) extending The Commons vertically. Gruen Associates' verbal plan of The Commons main floor (bottom) is worth a thousand pictures.



SECTION A

SECTION B



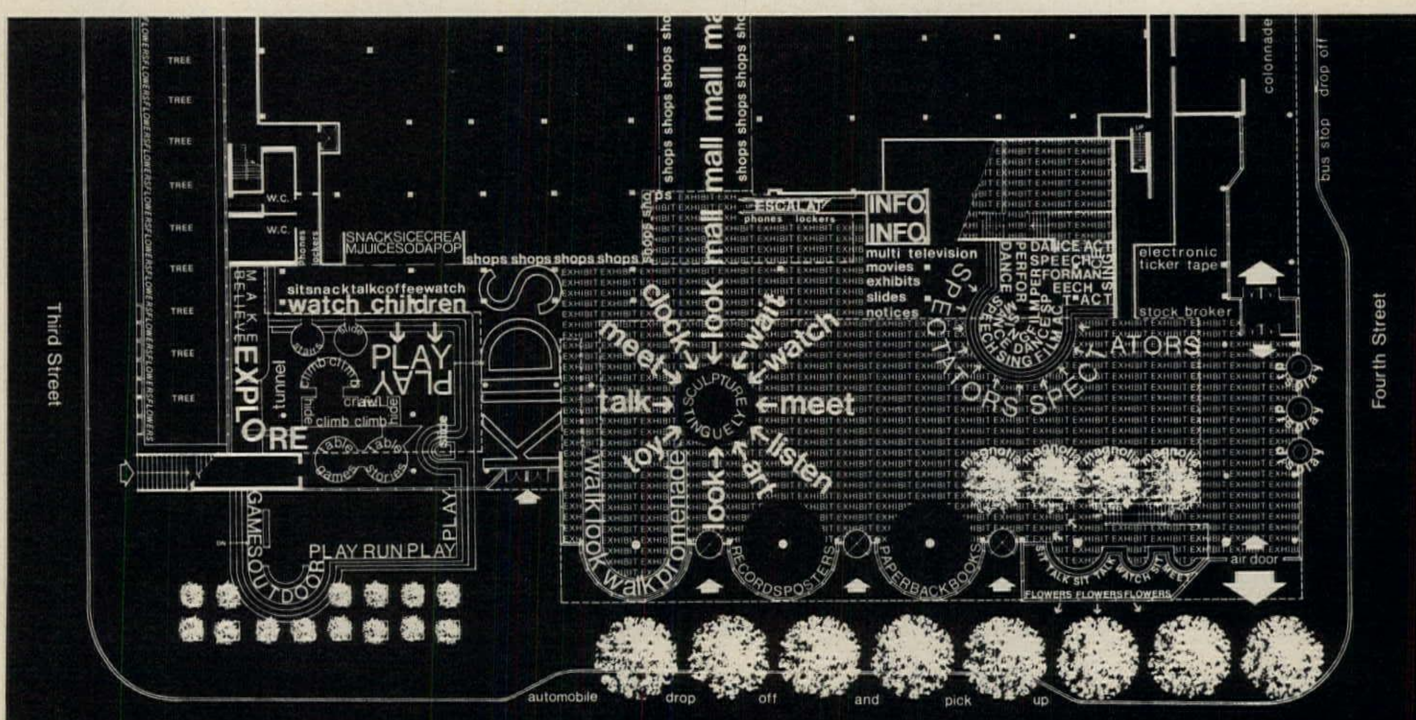
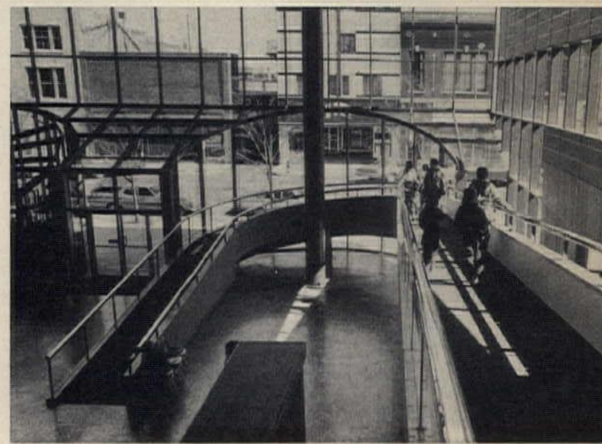


Photo: Lance Bird

Quiet corner of The Commons (far left) is under magnolia trees at northeast entrance. Exhibit galleries (near left) are on terraces leading up to mezzanine. Curving ramp (below) fits into projection along Washington Street front.



Mezzanine cafeteria (above) overlooks Commons activity from north end. Focus of space is kinetic sculpture Chaos (right) by Jean Tinguely.

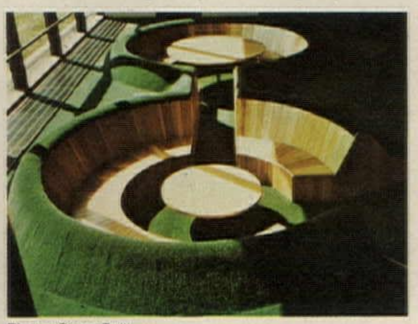
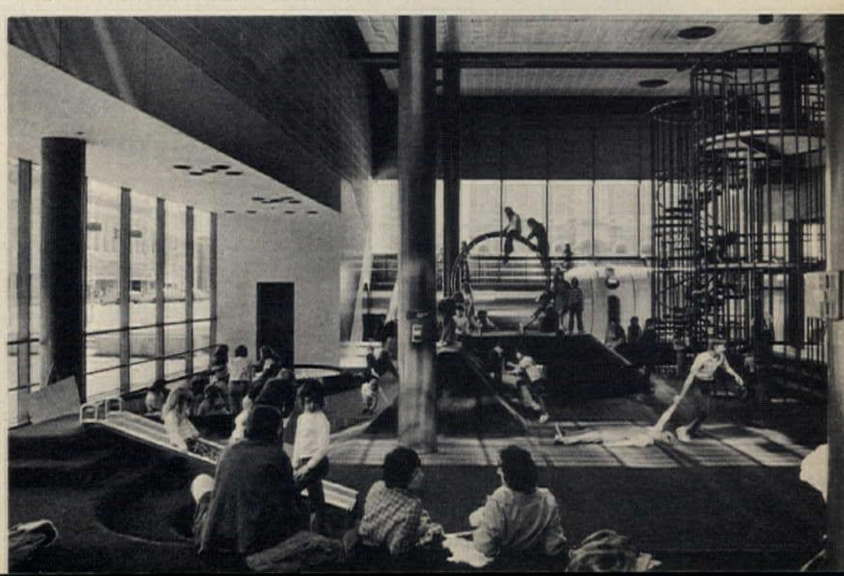


Photo: Cesar Pelli

Playground at south end of Commons (left and below) has red fiberglass "playtank" and other adventures, all on an artificial-turf landscape.



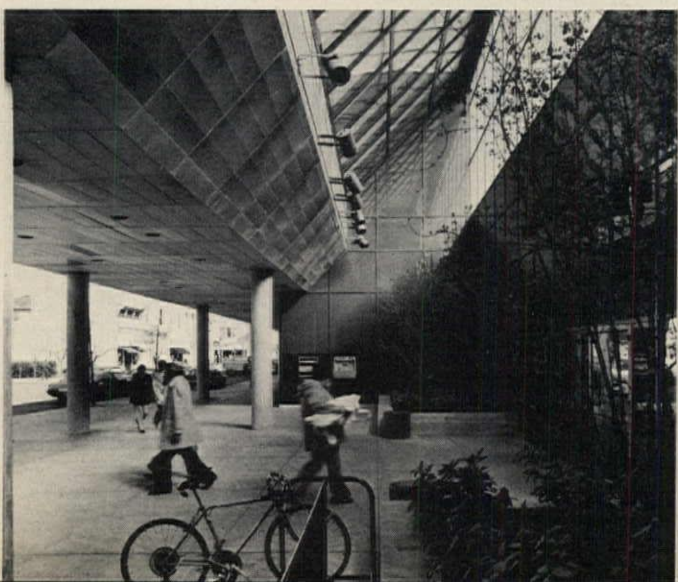
Courthouse Center and The Commons

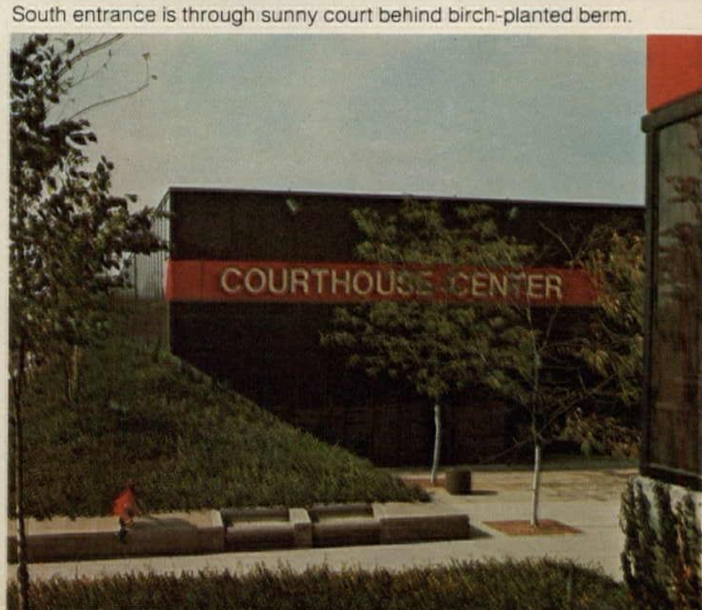
Bronze-tinted glass walls and continuous red sign strip identify complex in views from west (above). Small outdoor plaza at southeast corner (left) makes gesture to tower of 1870s courthouse (below left) and accommodates ceremonial stair to mezzanine cinemas. Complex form of east wall stiffens 50-ft-high frame (below) mainly of 2½″ x 5″ steel tube.

Photo: Doug Hatch

Skylight brightens entrance (below) on colonnaded north side.

South entrance is through sunny court behind birch-planted berm.





chute—going through a climax of activity every five minutes to meet the schedules of tour buses. As Pelli has said, nobody can feel alone in The Commons as long as Chaos is there; the sculpture is a lively host.

Commissioned by the donors of The Commons, Tinguely spent most of two years in Columbus, poring over the town's scrap yards, working with engineers and craftsmen at local industrial plants. He was delighted with the town's resources and with the sculpture's indoor setting.

Operating an indoor plaza

The Commons has its own director and staff, with maintenance currently handled by Courthouse Center under contract. Income from concessions, performers, fund-raising events, etc. ($63,409 in 1975) falls far short of expenses ($204,242 in 1975), the deficit being made up—through 1977, at least—by the donors of the space. Eventually, the city will have to shoulder a deficit that promises to swell with rising fuel and power costs.

The Commons functions remarkably well, considering the lack of precedent. The playground attracts hordes of children, surviving them well, and relates easily to snack bar and seating for parents and baby-sitters. The mezzanine cafeteria appeals to everyone from shopping teenagers to executives of local industries. Terraced exhibition spaces along the west side are a bit too remote, and the mezzanine cinema entrances are bleak at off hours. Kiosks envisioned for the glassy alcoves along Washington Street have turned into screened-off shops, with no great damage to the space.

The greatest discrepancy between The Commons concept and the reality lies in the area of scheduled performances. The space was expected to house no more than a couple of programmed events per week, informal occasions with no particular acoustic or lighting demands, for audiences that might drift in and out. In fact, the setting has generated an average of one scheduled event per day, by either local or touring groups, welcomed by a management that feels an obligation to draw audiences downtown. Each one requires Chaos to be switched off, some calling for the playground to be closed. The lighting system, programmed for long-term modulations or virtuoso light shows (ideal for a high school prom), reportedly "defy human intervention" to meet momentary needs of performers. Lack of catwalks (a late budget cut) compounds the problem, and the cost of replacing lamps of almost 100 varieties discourages the more ambitious programs. Little use is made of other Commons hardware: a large suspended projection screen and an electronic information wall.

Externally, there was no thoroughly graceful way to fit a low, five-acre building into an old retail district. The long roof lines and streamlined sign strip of Courthouse Center fit into the world of parking and highway to the west. At the east end, The Commons matches the prevailing height of storefronts, its parapet and soffit lining up nicely with cornice lines on the courthouse. At first floor level, The Commons picks up the recessed entrance rhythm of the old store fronts, but the door recesses have lost their original purpose, and the "show windows" between are of a bronze-tinted glass that frustrates window-shopping.

Pelli wanted transparency here, along the shopping street, but the rationale of the bronze-tinted glass stood in the way. Tinted glass made it possible to have an envelope that is transparent—from the inside—without intolerable glare and heat gain. And a shift to clear glass at street level would have destroyed the interior effect with glaring contrast. The effect from inside The Commons is, in fact, superb: the wall framing looks like an elegant open cage, enhancing details of the fronts across the street that wall the space in visually. Pelli has succeeded in his intention to "incorporate all their details and irony without having to repeat them."

But from outside, we see only tantalizing reflections of these same fronts. The architects had hoped that backlighting from skylights and wall convolutions would yield some transparency, but only a few objects can be discerned through the glass.

Pelli has made a special art of shaping glass-clad volumes, faceted above and below to appear weightless. He is fascinated by the shifting, layered images attainable with tinted (not mirrored) glass, defined by a grid of narrow mullions (typically 2½ in. here) of minimal projection (½ in.). Yet all this elegance masks his real achievement here. Inside is a lively prototype for urban public space; outside, a forbidding membrane enlivened by some rather misleading convolutions. Only at dusk does the frustrating film dissolve, bringing the indoor plaza visibly into the life of Columbus. [John Morris Dixon]

Data

Project: Courthouse Center and The Commons, Columbus, Ind.
Architects: Gruen Associates, Los Angeles, architects, planners, engineers; Cesar Pelli, partner in charge; Antal Borsa, project coordinator; Lance Bird, project designer; Victor Schumacher, designer.
Client: Irwin Management Co., Columbus, Ind.
Site: 11.9 acres downtown, essentially flat, including building site assembled from two city blocks, plus three blocks of parking adjacent.
Program: structure divided into two distinct parts. Courthouse Center, privately operated shopping center, includes Sears department store (68,233 sq ft gross) and other retail, service, and mechanical plant space (88,376 sq ft, ground floor, plus 24,536 sq ft, mezzanine); mezzanine includes twin cinemas (13,626 sq ft). The Commons (29,158 sq ft, ground floor; 17,642 sq ft, mezzanine), owned by the city, includes public sitting areas, performing stage, exhibition gallery, and playground (16,000 sq ft), plus revenue-producing snack bar (ground floor) and cafeteria (mezzanine). Total gross sq ft: 240,000.
Structural system: Commons has exposed steel trusses, which support curtain wall framed in light steel tubing; longitudinal skylight aluminum-framed; otherwise light steel frame with metal roof deck.
Mechanical system: central hot and chilled water plants (gas-fueled); medium velocity, dual-duct, multizone and draw-through distribution systems.
Major materials: exterior skin of bronze-toned glass, red-bronze spandrel glass, flush dark bronze-toned aluminum mullions; chat-sawn limestone for special exterior walls, planters, seats; continuous illuminated sign band of red acrylic sheet; interior walls and ceilings gypsum board, with areas of wood and mirror, and major part of Commons interior clad in perforated metal; skylights of tinted insulating glass, with some double-walled acrylic domes and vaults; floors in public areas of acrylic-impregnated oak; playground surfaces of artificial turf over foam rubber backing (see Building materials, p. 122).
Consultants: Bolt, Beranek & Newman, Inc., acoustics; Sylvan R. Shemitz & Associates, lighting; L.M.I., Inc., landscape (Wayne Doede, horticulture).
Construction: Irwin Management Co., project management; Cummins Engine Co., construction management; F.A. Wilhelm Construction Co., general construction.
Costs: total not available, acknowledged to be $26–31 per sq ft.
Photography: Balthazar Korab, except as noted.

Stern dimensions

Given the confines of the standard New York City building plot and the limitations of the typical row house model, architects Stern and Hagmann have dealt successfully with the issues of privacy, light, and orientation in this row house renovation.

New York City row houses have become one of the most adaptable building types, lending themselves to renovation or restoration; from single-family occupancy to multiple dwellings and, sometimes, back again. The house which architects Robert A.M. Stern and John S. Hagmann recently completed for their clients had already undergone two renovations within the last 25 years, the last of which left the house with a copper mansard roof. After all the stylistic applique and this latest renovation, the house probably has little in common with the original, except that it occupies the same plot of ground.

The façade of the new house has, in some ways, changed totally, while in others, not at all. The two entries, one to the doctor's office existing on the ground floor which the owners decided to keep, the other to their own dwelling, are virtually as they were originally designed. The large window of the formal living room and the balcony on the second level is the same except for new glazing and a new rail. Above that, the façade is totally new, replacing the former mansard with something a little more *au courant*. The new bay window of the master bedroom cuts through the entire width of the façade, disengaging the top, cut-out portion through which one sees the sky, and clearly making the façade read as non-structural. One interesting and deliberate aspect of the façade design is a lack of the traditional articulation of various floor levels. There is thus no indication of the immense volume which it encloses. It all seems far too modest and almost apologetic, the poor cousin to the 20-story apartment buildings on either side.

To ensure light and privacy in such circumstances, where one literally feels a thousand eyes peering down, is no easy task in a house which abuts one building on the north side, is built up to the street in front, extends virtually the entire length of the lot, and is separated from a tall building by a narrow alley on its south wall. Although the typical row house had exposures only along the front and rear façades, most were not nearly as deep, so that the problem of bringing light into the interior was not as difficult. Stairways were often located in the interior, lit by skylights. Often, too, the hallway adjoining the stair was ample enough to be a room, with large openings to the rooms at the front and rear for available light. Some of these same notions are carried over in this renovation, and reinterpreted. While access to the main level of the house was fixed, both systems of vertical circulation to the private quarters above the main living spaces are skylit. More important, however, is the reinterpretation of the central hall into an atrium space which rises from the dining area, through two levels of living spaces and the master bedroom

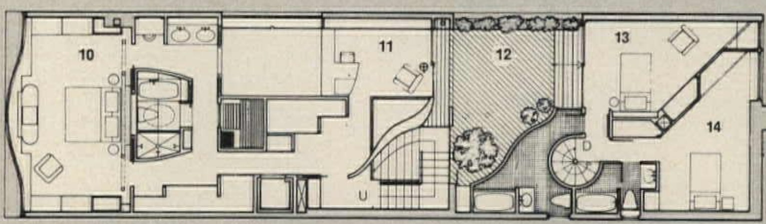
The surfaces, volumes and colors of the interior lend themselves to considerable photographic abstraction which the eye might not otherwise perceive given the usual visual distraction of the furnishings. The curved wall (top) separates the dining area from circulation to the kitchen located behind the yellow-stripped wall. A view (left) from a short flight of steps leading from the living room down to the dining room. The living room (above) as seen from the top of the main entry stairs.

Stern dimensions

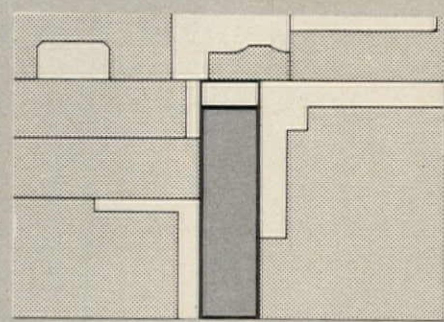
to end in a clerestory one level above the existing roof line.

Since the south wall was separated from its neighbor, it afforded the possibilities of light, but not of a particularly pleasant view. The architects inserted two large glass block windows into the south wall to catch available light and to imply openings, without sacrificing privacy for a view of a brick wall: New York City is a place where implications often have to suffice. Since the atrium space is the only source of interior light, the spatial organization of this house reverses the tradition of the central hall borrowing light from the exterior rooms, using the available light for a secondary set of rooms organized around the atrium.

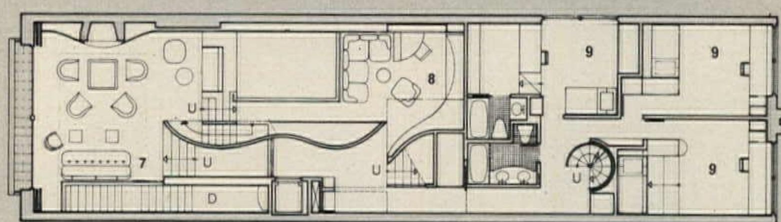
The house was planned around multi-leveled living spaces, a formal living room, a dining room, and a den/study, which are all visually connected, but physically separated by a few steps up or down. Two clear devices are used to modulate these spaces at the same time that



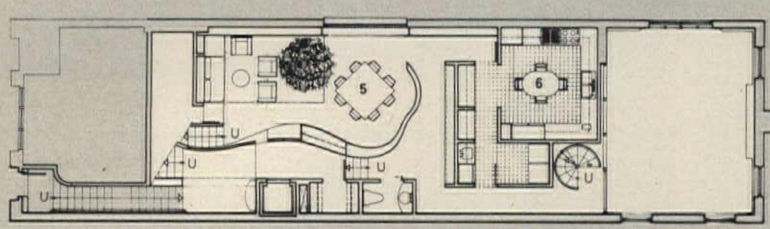
FOURTH FLOOR



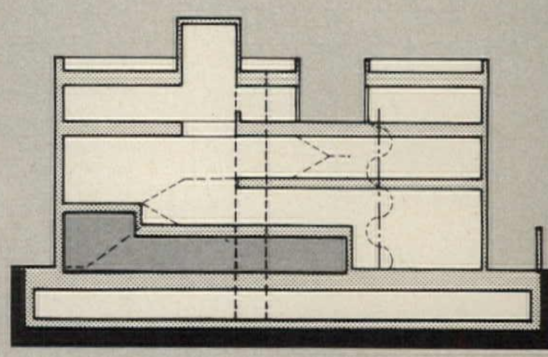
SITE PLAN N⟶



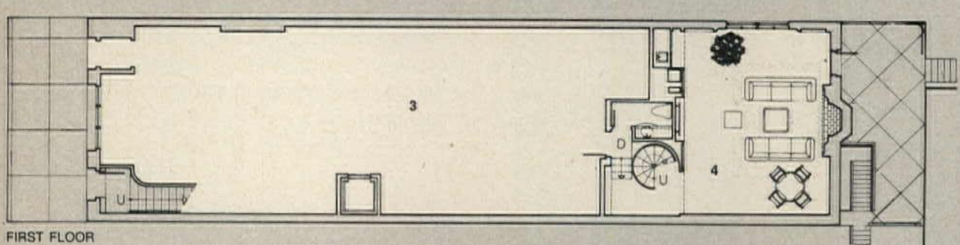
THIRD FLOOR



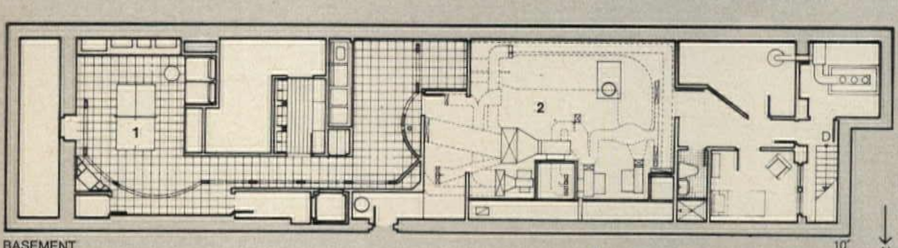
SECOND FLOOR



DIAGRAMMATIC SECTION



FIRST FLOOR

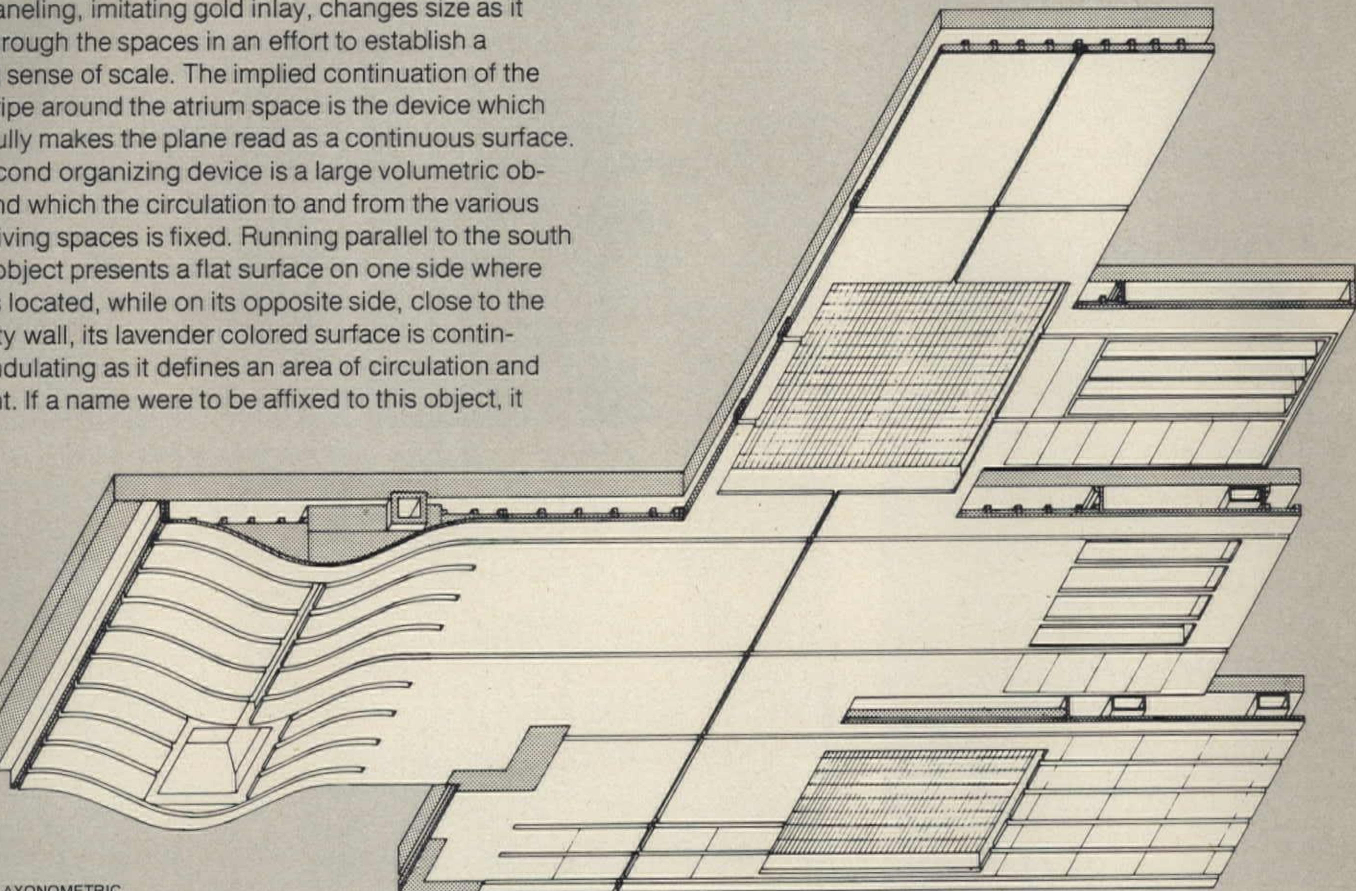


BASEMENT

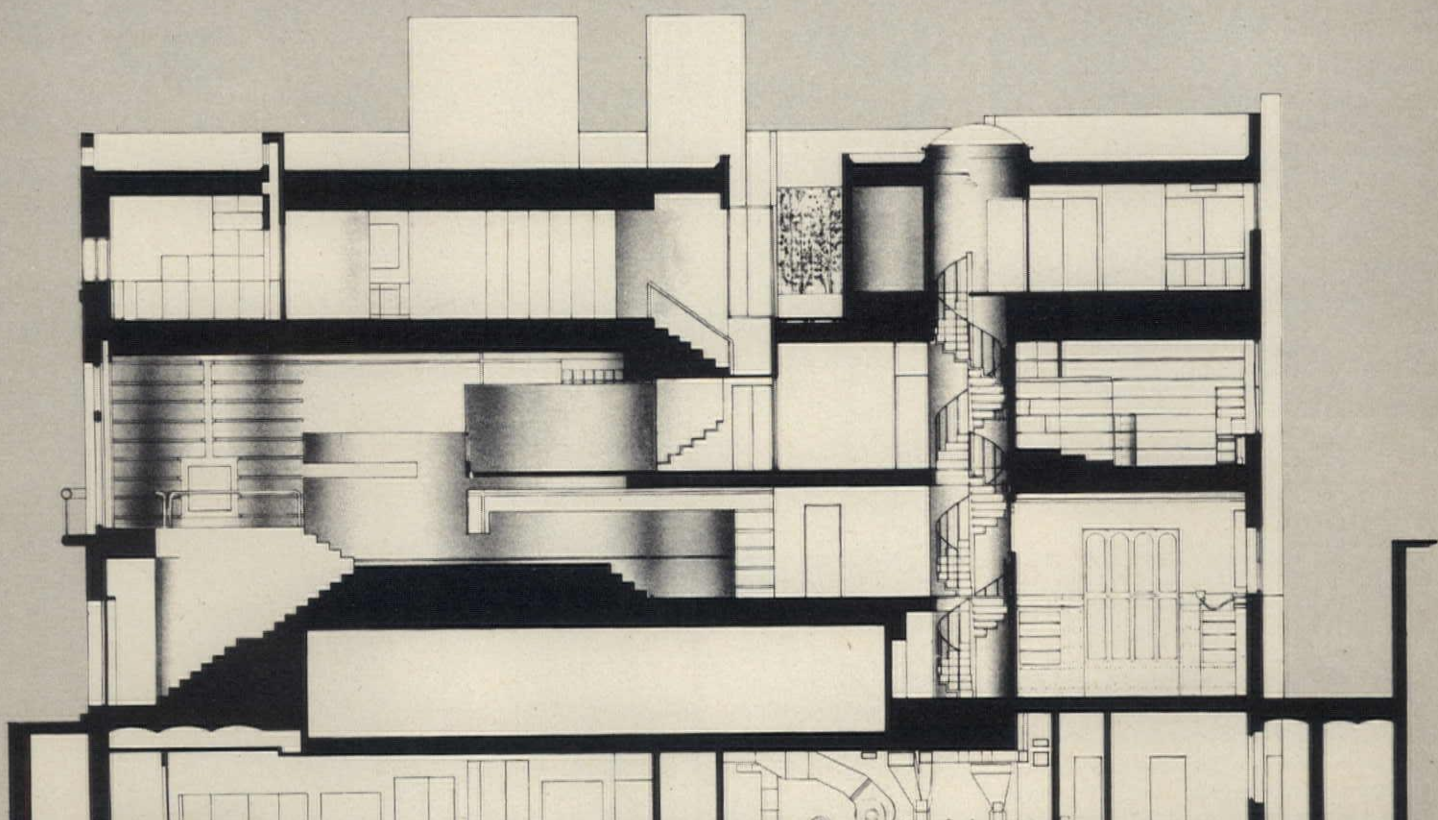
Legend
1 Playroom
2 Mechanical
3 Doctor's office
4 Family room
5 Dining room
6 Kitchen
7 Living
8 Study
9 Children
10 Master bedroom
11 Study
12 Study
13 Terrace
14 Guest
15 Maid

they act to unify the multi-leveled volume. The first is the reading of the south wall plane as a continuous surface passing through the space against which volumes are pushed up, or from which they are pulled away. The yellow striped paneling, imitating gold inlay, changes size as it passes through the spaces in an effort to establish a changing sense of scale. The implied continuation of the yellow stripe around the atrium space is the device which successfully makes the plane read as a continuous surface.

The second organizing device is a large volumetric object around which the circulation to and from the various levels of living spaces is fixed. Running parallel to the south wall, the object presents a flat surface on one side where storage is located, while on its opposite side, close to the north party wall, its lavender colored surface is continuously undulating as it defines an area of circulation and movement. If a name were to be affixed to this object, it



SOUTH WALL AXONOMETRIC



Stern dimensions

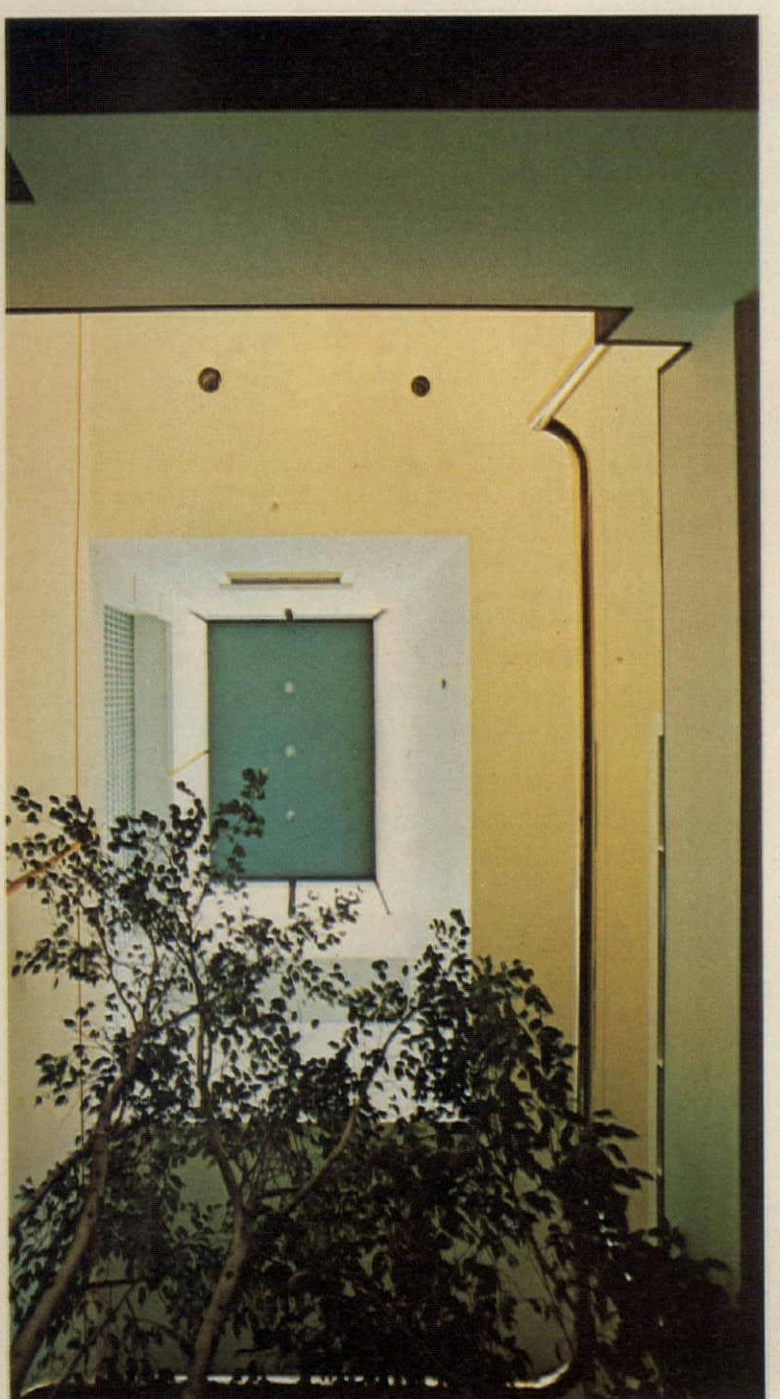
Dining room with small secondary seating area.

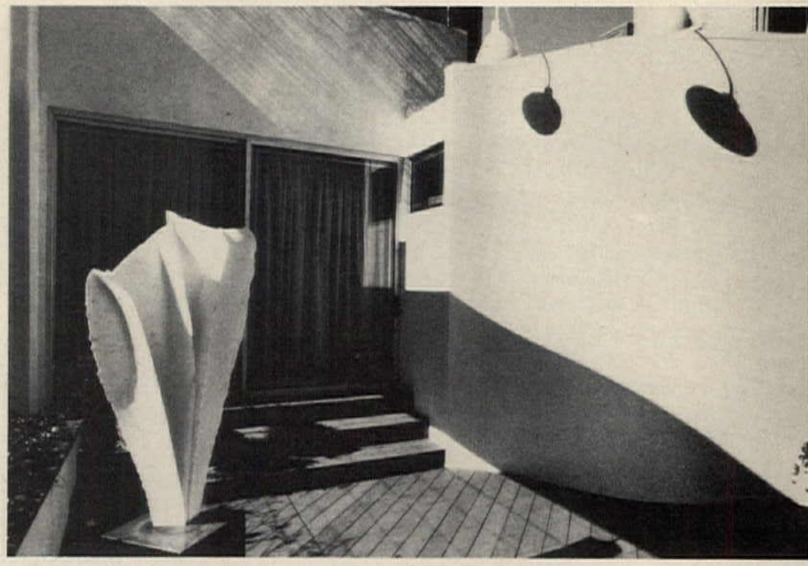
Living room seen from study.

Main stair and living spaces.

Dining room (above) with a small seating area is grouped around trees which reach up into the atrium. The main living room is beyond on the next level. A view through the atrium space (right) from the living room down to the dining room and up to the study. The curving neon strip in the ceiling suggests the completion of the cabinet and implies a "wall."

Looking up into the atrium space (below) the source of light is not apparent as the space is lit by a clerestory rather than a skylight, somewhat in imitation of the Baroque notion of celestial realms. The main circulation axis (at right) also uses Baroque notions of light from an unseen source above the stair leading to the master bedroom. The bowed front of the fireplace in the living room (below, right) begins the place of the South wall which continues, with its yellow stripping, through the atrium space and into the rest of the living areas.





would, on a pragmatic level, be considered a piece of large-scale cabinetry. Yet, because of its volumetric qualities, and the fact that the entire volume is never completely seen from any one point as it breaks under one level while rising above another, the spatial ambiguities it renders permit it to exist as much more than a simple piece of cabinetry.

Above the main living spaces, the more pragmatic considerations of private bedrooms for parents, children, live-in help and guests, a study, dressing areas, and baths take over. Here the house is split into two distinct domains, one for the adults, one for the children: a spatial notion reinforced by two separate circulation systems, connected only at the top by a roof terrace and on the lower living levels. The front portion of the house includes the master bedroom, bath, dressing areas, and the wife's study overlooking the atrium and opening onto the roof terrace. At the rear are two levels: the first has three children's bedrooms and bath, the second (and top) has a guest bedroom, opening onto the terrace, and bath as well as quarters for the live-in help.

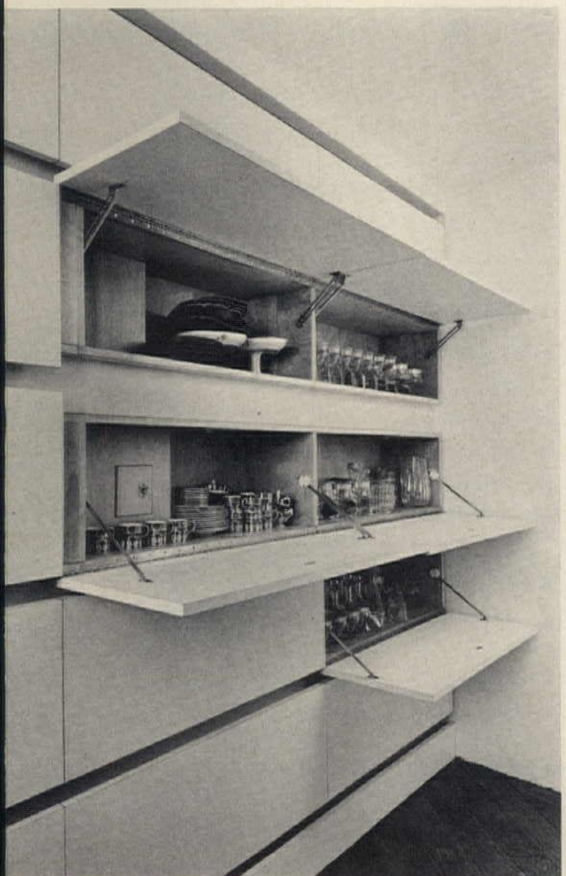
The program given the architects by their clients was rather undemanding and consisted mainly of things they did not want. But one requirement they did insist on was a finished interior, which accounts in great measure for the use of the spatial organizing devices, the inflections of the volumes, and the articulation of the surfaces. "Finished" to the client was a house that was not a neutral backdrop waiting as a repository for works of art. "Finished" for the architects was an interior rich in its spatial dimensions as well as its architectural details, an interior which was visually complete at all scales and requiring only the addition of the standard pieces of furniture. The necessity of completeness, in this situation, raises an interesting question about the nature of ornament or detail. Stern contends that a history of architecture is really a history of ornament and, while this is a simplistic statement on one level, it does make the role of ornament in our reading of architectural style or space an issue. Although this particular house does not employ the same obvious devices of the Lang house (P/A, April 1975, p. 78), it does use such devices as small-scale details, which play the role traditionally served by ornament in earlier styles of building. Stern further justifies his argument for ornament by citing the paradox of the modern movement which disdains the decorative, while, at the same time, developing its own set of devices—the integral joint or the application of painting or sculpture—to ornament and complete a space. While many of these devices read as "direct" or "clean," consistent with the dogma, oftentimes elaborate and complicated methods are employed to achieve these ends.

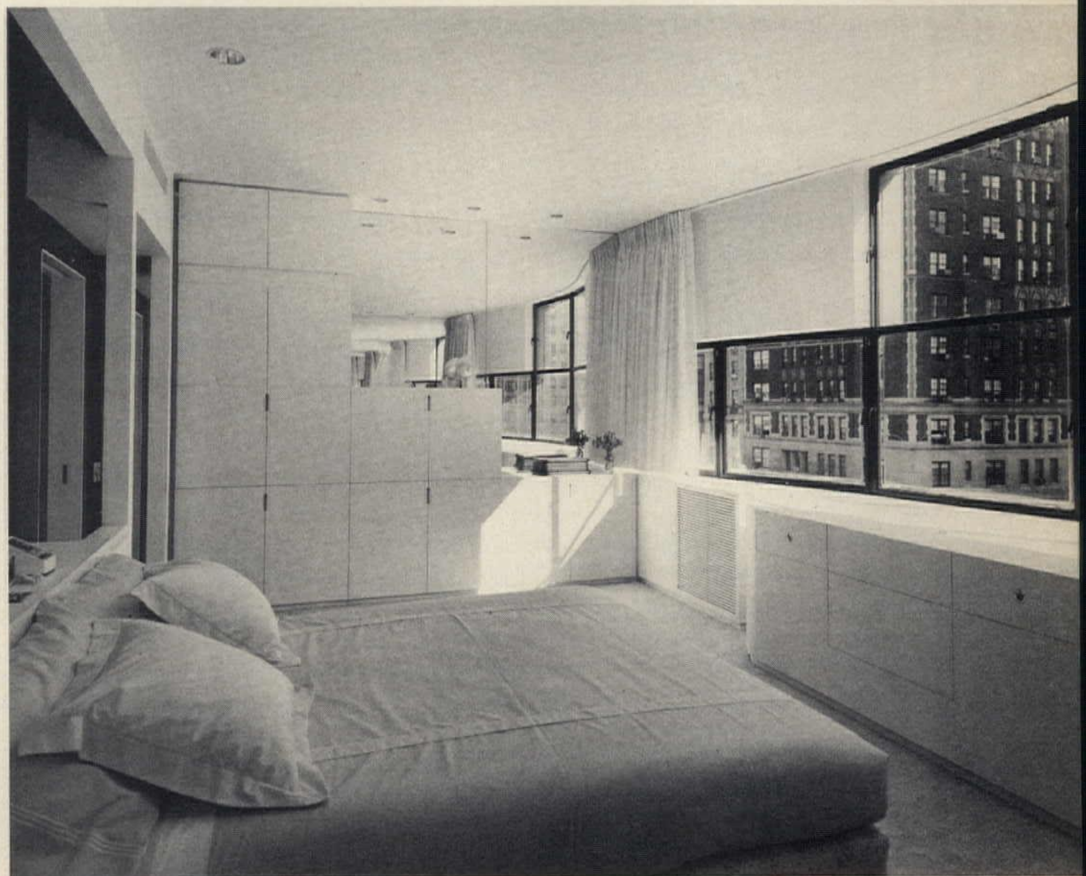
Yet, ultimately, all these issues, while interesting, remain academic. Whether or not the color is seen as applied or integral, the ornament as decorative or architectural, whether there is a precedent in Hejduk's Bye house (P/A, June 1974, p. 98) for the exploration of shape against plane or an inspiration for the spatial organization in Loos' Tsara house, is a peripheral, intellectual issue. It may enrich the visual experience of a place, but will not make up for what might be lacking. If one can imagine, for a moment, the house without the furnishings, a clear intent and richness of experience would still exist, complete in the architectural design. The finished house must stand visually and functionally with no need for apology or lengthy explanations of intent in words. This is one case where it does.
[Sharon Lee Ryder]

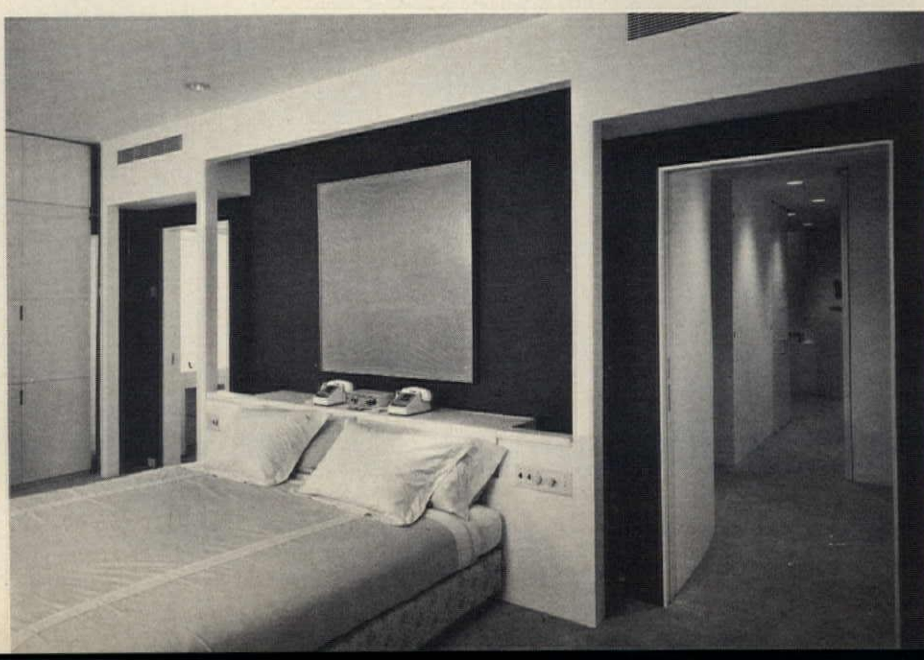
Data

Project: residence, New York City.
Architects: Robert A.M. Stern and John S. Hagmann; project team: Jeremy P. Lang, associate; Wayne Berg, Laurence Marner, assistants. Ronne W. Fisher, assistant in charge of interior design.
General contractor: Herbert Construction Co., Inc.
Program: renovation of an existing townhouse for a family with three children and live-in help. The ground floor doctor's office was to be kept.
Structural system: existing load-bearing masonry walls spanned by wood joists. New floor levels were established as necessary.
Major materials: exterior, brick with stucco; interior, plaster, gypsum board, paint, wood flooring, and carpet.
Consultants: Robert Silman Associates, PC, structural; Atmos Engineering Co., Inc., mechanical; Carroll Cline, lighting.
Photography: Edmund H. Stocklein.

The panels of the South wall open in the dining area to reveal storage behind. The master bedroom (below, right) with its bay window overlooking the street, has a mirrored wall to infinitely extend the view. One wall of the bedroom is pulled away to permit a clerestory to be inserted above the recess for the bed. One of the children's rooms (below, left) with built-in furniture and venetian blinds to match. The clerestory (right) occurs in the study at the junction of the curving walls. A view of the roof terrace (left, opposite) towards the guest bedroom and bath.







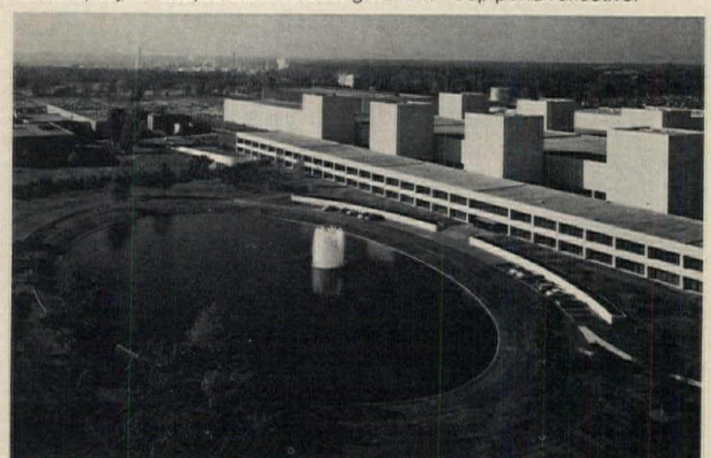
Making it on Tobacco Road

Gordon Bunshaft's white concrete factory for Philip Morris may be icy on the outside, but inside the huge plant is revolutionary, in more ways than one.

Regardless of your attitude toward smoking, the plain fact is that the vice is on the increase, showing a blissful ignorance of The Warning, and a seeming unawareness of the ban on TV advertising. So, as long as more people take up the habit, cigarette companies will continue to build new factories to satisfy the public craving. One of the newest—and the largest of its kind in the world—is now in operation for Philip Morris USA in Richmond, Va. Another, even newer plant, for Wills Tobacco Co. has recently opened in Bristol, England (p. 84). Both were designed by Skidmore, Owings & Merrill—the Richmond plant by Gordon Bunshaft of SOM, New York, the Bristol one by SOM, Chicago and Yorke Rosenberg Mardall of London.

Although the plants are similar in purpose and function, the Bristol facility also includes a seven-story corporate headquarters building (Philip Morris' headquarters is in New York). The two plants differ considerably, however, in size and in production capability. For instance, the machines at Bristol produce about 2500 cigarettes a minute, giving a factory total of about 20 billion cigarettes a year. At Richmond, the (British) machines can make 4000 cigarettes a minute, which will produce 140 billion cigarettes a year when all the machines are installed and the plant reaches full capacity next year. At Bristol, the making and packing section—the major, actual factory part—is 300′ x 550′; at Richmond, the same section is 210′ x 1000′. At each plant, these spaces are column-free.

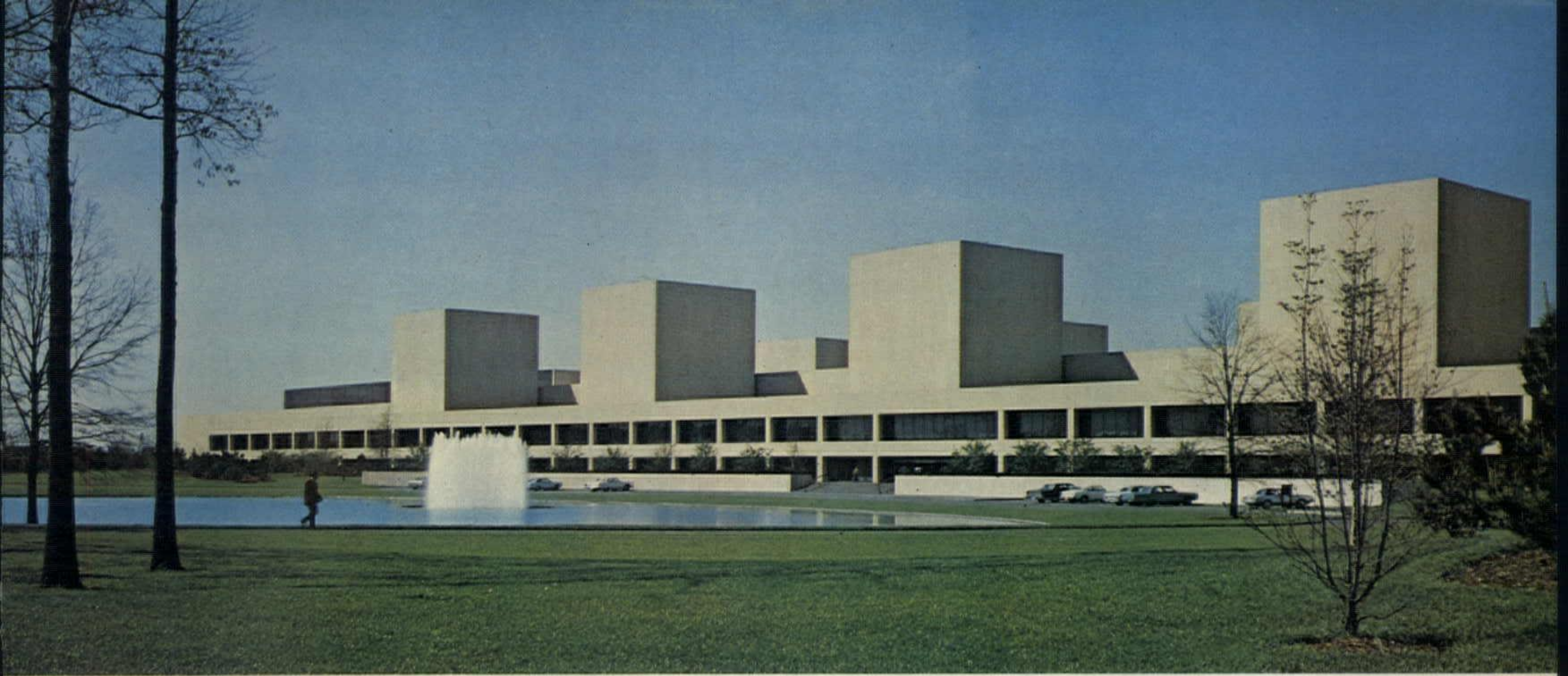
Water spray is recaptured in retaining walls to keep pond reflective.



Statistics of the Richmond facility are staggering. Its six clustered buildings total 34.4 acres of floor space, and a walk around them would be a little short of two miles. The making and packing building would almost hold three football fields. Enough concrete was used to build an 8-in.-thick highway 29 miles long, and this does not include the 30,000 tons of precast panels. Enough air conditioning to cool 3500 average homes is used.

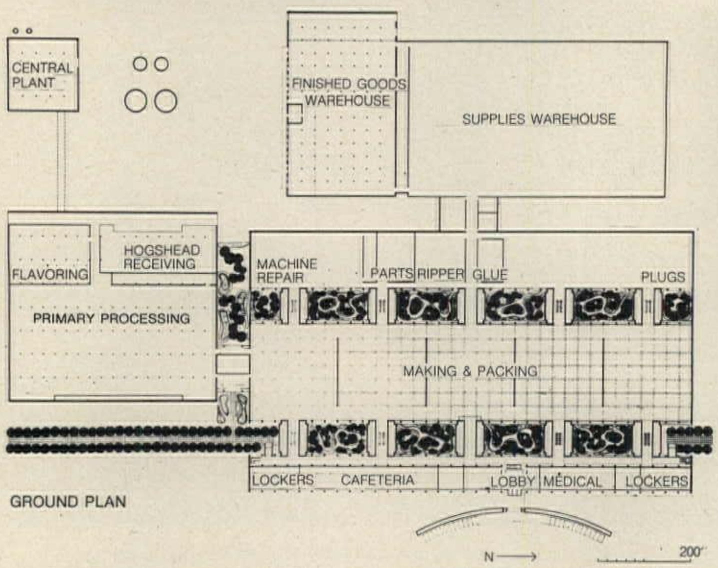
While the statistics may be impressive, what is important, however, as in any building, is how well it works and how satisfied the people are who work there. "Factories are facilities to house machinery, in the most efficient way," Gordon Bunshaft announces. But unlike many designers of factories, he doesn't stop there. "The other thing," he adds, "is people, who are usually neglected and only considered as they need to be by law." Does this mean Bunshaft and SOM are concerned with users' psychological needs? The cool, structural clarity and exquisite precision of detailing for which the firm is renown have done little to enhance its reputation in that respect; its buildings have usually appealed more to cautious reason rather than to the heart. And in continuing this tradition, there is no question that the Richmond factory, at least from the exterior, presents an austere, almost glacial face to the public.

The seemingly unending row of evenly spaced columns marching 1000 ft across the white concrete structure is broken only at the lobby entrance, which is placed exactly at the point where the façade is divided into a relationship of 3/5ths (everything from the entrance to the south) to 2/5ths (everything toward the north). To the rear, the long, two-story administration building is modulated, however, by two rows of five evenly placed, 94-ft-high, mechanical towers that have lounges and offices in their lower levels. A perfectly oval entrance drive surrounds a perfectly oval man-made pond directly in front of the entrance. Spray from a water jet, which is placed on the short axis of the pond in line with the entrance gate and main lobby, is recaptured in a retaining wall so it will not cause ripples on

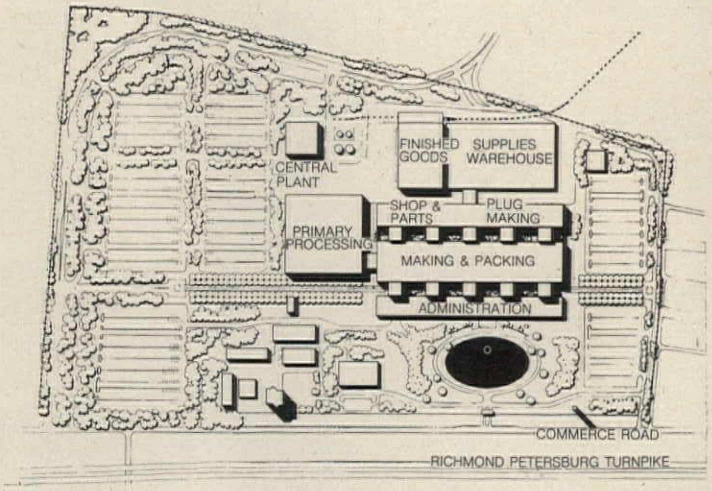


Interior gardens (view from factory floor, below) are in open pockets between mechanical towers (above) and divisions of main factory building.

Philip Morris Cigarette Manufacturing Plant



GROUND PLAN



SITE PLAN

the reflecting pond.

The building's austere formality is not mentioned to suggest that there is necessarily anything wrong with its being that way. In fact, exactly the opposite may be true. The facility is surrounded by mile upon unending flat mile of chaotic, light-industrial blight, where the conservative, ordered precision of the Philip Morris facility is a welcome relief. In fact, if it weren't for its location, one might not even know this building actually is a factory.

The surprises

Nor is it obvious upon entering the front door either, for here is where the surprises begin. The white, two-story-high administrative building lobby, surrounded by a mezzanine, is more like a garden courtyard than a factory lobby. The glazed front wall looks to the handsomely landscaped lawn and reflecting pool; the glass rear wall looks directly into one of four interior gardens that separate the administrative wing from the making and packing wing. On the other side of the making and packing wing, four more garden courtyards separate it from the shop and plug (filter) making wing. The lobby floors are either charcoal-colored flagstone or carpeted in a rich, grassy-green color, and furniture is black or white. The side walls are covered with large, boldly colored wool tapestries designed by Ivan Chermayeff and woven at the Aubusson mills. Across the back of the administration building, a 25-ft-wide, 1000-ft-long corridor runs the length of the building. This is the main circulation spine of the entire complex, and it is also carpeted in the same green. Lockers, cafeteria, personnel offices, an exquisite tobacco museum designed by Chermayeff & Geismar, and the medical suite are aligned on its east side along with the lobby.

On its glazed west side, the corridor looks into the interior gardens or gives entry to the first row of towers, which separate the gardens and form entrances to the making and packing building. The towers also house offices and lounges that look into the gardens, hold mechanical equipment in their top levels, and contain stairwells to the second level of administrative offices. At this level, the green carpeting is repeated in the open-plan offices, which also look into the gardens. The enclosed executive offices are aligned along the front, or east side of the building, facing the lawn and highway. Most of the upholstered furniture on this level is black; filing cabinets and desks are light beige metal, and executive desks are light wood. Walls are white except for brightly colored partitions that divide main areas.

This interior is surprising, because it is not what one has learned to expect from SOM. While there is the finesse of detailing and careful arrangement of objects, whether chairs or paintings, so characteristic of SOM, there is also an unusual—by any standard—vibrancy and freshness to these spaces. In areas where the black, green, and white motif is not used, such as in the cafeteria and auditorium, other vivid combinations are employed to the same effect. Rather than provoking the image of highly restrained, rich, extreme good taste associated with past SOM works, this interior speaks of a sharp, dynamic liveliness that is not interested in screaming Corporate Money at every opportunity. It seems to speak of a fresh new departure for SOM, which is especially welcome in this context.

If the concern for people working in the building were expressed only through the design of the interiors, the facility would remain attractive, but it would be of little significance otherwise. The truth of the matter is, though, that Philip Morris and the architects went to unusual lengths to find out just what it was the employees might want in the new factory. One result is that there is virtually no separation between workers and executives. Everyone parks in the same lot, uses the same entrance, walks down the same corridor to get to work, and eats in the same cafeteria (although there is an executive dining room reserved for special executive functions). And everyone, except the executives, has a view of the gardens. Those—the majority—in the making and packing wing make out particularly well in this regard, as theirs is the only section of the facility that looks in two directions through high glass walls to the eight gardens. To give employees a sense of identity in the vast space, the room is broken into five smaller areas by color-keyed partitions that stop about 25 ft short of the glazed garden walls, where big colored awnings hang into the room to shade the sun. From the inside, the huge, exhilarating room almost looks like some kind of vast, space-age greenhouse standing in the midst of a natural forest where the vegetation, mysteriously, was never brought inside.

But there *is* vegetation inside. It is all of the delicate genus *Nicotiana* of the Nightshade family, and it is the sole reason this facility exists. The factory cannot be appreciated as a cigarette factory, however, unless something is known about the manufacturing of cigarettes. When aged tobacco comes from the warehouse, the tightly packed leaves are carefully removed from their wooden storage barrel (called a hogshead). The leaves are then sterilized under high-pressure steam, the additives are added (such as honey, cocoa syrup, menthol from mint—it's all 100 percent natural), the tobacco is shredded, and then certain varieties are blended according to secret formulas to give the raw material for a Marlboro, a Virginia Slim, or any other number of brands the factory may be producing that day. After this "Primary Processing" phase the tobacco goes to the machines in the making and packing area where it is put together with wrapping paper, and filter if called for. The cigarettes are then trimmed, packaged in aluminum foil, paper or box, and cellophane. The packages are put into cartons, and the cartons into boxes of 12,000 cigarettes each before they go to shipping.

The uniqueness

Exactly the same process takes place today as it did 100 years ago, but at the Philip Morris facility it all happens on one floor, except for the two-level primary processing operation, rather than in a multi-level building. And this change in itself amounts to a revolution in the cigarette-making industry. Until now, cigarettes have always been made, for very good reasons, in multi-story buildings. One problem with tobacco is that it *is* very delicate, and consequently it must be moved as little and as gently as possible. The difficulty, however, is that it has to be moved a lot before it finally ends up as a cigarette. In the common multi-storied factory, the tobacco is lifted to the highest level, and is then "filtered" down through the building with different steps in the manufacturing process taking place at each level. Gravity alone moves the delicate material, but this method has always had its problems. To begin with, a multi-story building requires columns, which not only get in the way of people but also prohibit machinery from being changed or moved around. This is a particular problem in an industry where manufacturing equipment is in a constant state of evolution, where "It becomes very frustrating that we can't update our factories because there is always a column in the way," as one Philip Morris executive said. Another problem was "spaghetti"—the multitude of tubes, conveyor belts, shoots, and other paraphernalia hanging from the ceiling and dropping down through the floor. Not only are these things constantly in the way, but because many of them are always in movement they pose safety problems.

None of these problems exist in the new factory. Since the making and packing area is a clear-span space there are no columns to get in the way, and since there are no columns, machinery can be moved or changed as necessary. With this kind of flexibility it is doubtful that this factory will ever be "out of date." But there is another big advantage to the single-level space—no spaghetti. Tobacco is conveyed underground to the new, self-contained making machines. Only filters are brought by overhead pneumatic tubes, and these will be put underground when the factory reaches full capacity. Except for the delivery of paper and glue supplies, which are brought by electric cart down wide

Lobby (above) and 1000-ft-long main circulation corridor (below) in administration building look to inner gardens, as does factory space.

Staff entrance (below) is at southwest corner of administration building.

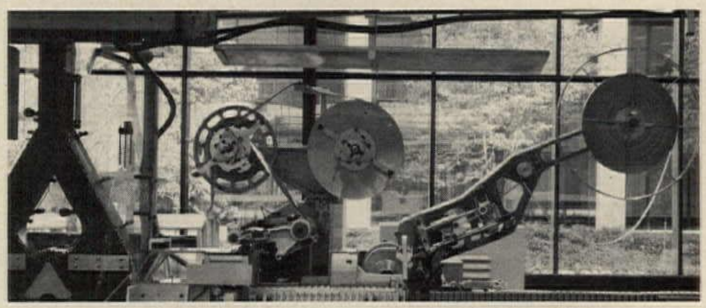
Mechanical towers house offices and restrooms on the lowest level, staff lounges in the middle level (above), and mechanical equipment is on top.

aisles, most of the operations of the factory are completely automatic and controlled by computer. Employees essentially watch the machines and carry out spot-checking.

A cigarette factory, or any other factory of this magnitude, poses extraordinary design problems. But a cigarette factory also has a laboratory aspect about it; it must be extremely hygienic, and precise humidity conditions must prevail at all times (190 fans exchange 7,500,000 cu ft of purified and humidified air per minute). In simple terms the real problem then becomes a question of whether a 34½-acre building, which combines the functions of both a factory and a laboratory, can in any sense be humane.

The answer is that it can, although many employees at Philip Morris had their doubts about this in the beginning. The truth is that they were not anxious to come to the new factory at first, reasoning that its size alone would make it too noisy and impersonal. But as the building neared completion, attitudes began to change, not only because of Philip Morris' extensive education program, but also because of what people could see for themselves—a facility that in many respects is more like a greenhouse than a factory, one that is cleaner and quieter than the older ones (the huge truss-supported sound-absorbing coffered ceiling and quieter machines are responsible for the decible decrease), and most important, one that is as geared to the people in it as it is to the manufacturing process it is designed to accommodate. It is now considered a privilege to work here, and employees are chosen on a merit basis.

None of this came cheap, though. The glazed making and packing building alone is a functional absurdity and an economic extravagance; solid walls would have been more sensible on both counts. But at what cost? At a cost that could only be calculated in human terms. At this scale, humaneness costs, and it is a credit to Philip Morris that they were willing to pay for it. But what is truly extraordinary, and of no little credit to Bunshaft and SOM, is that they were able to deliver this vast, complicated facility at a normal cost for buildings of its type. In the final analysis, Philip Morris made out. They and their employees, who will number 5000 at the new facility next year, are having their cake, and eating it too. [David Morton]



In the factory (above), machines and plants are often in close proximity.

Data

Project: Philip Morris Cigarette Manufacturing Plant, Richmond, Va.
Architects: Skidmore, Owings & Merrill, N.Y.; partners: Gordon Bunshaft, design; Loen Moed, administration; associate partners: Frederick C. Gans, administration, Sherwood A. Smith, design, Davis B. Allen, interiors; participating associates: Carl A. Zarello, job captain; John Gibson, field supervisor.
Contractor: Daniel International Corp.
Program: to combine cigarette manufacturing equipment into an efficient operation while creating a model working environment; building arrangement of complex related to flow of manufacturing process.
Site: 150-acre site in flat, light-industrial area within city limits.
Structural system: poured-in-place concrete; precast concrete exterior wall panels; long-span steel trusses on conventional steel frame.
Mechanical system: central chilled water; each module with air washer and fan system; 190 fans move 7,500,000 cfm of chilled/humidified air. Heating is minimal; fin-tube radiation unit at window wall base is primarily to compensate for condensation.
Major materials: other than those described under Structural system, interior partitions are CMU and gypsum board; maple wood parquet and carpeting; suspended acoustical tile; aluminum mullion windows with lock strip gaskets; and a combination gypsum board and acoustic tile coffered ceiling suspended between trusses 23 ft above manufacturing wall
Consultants: Zion & Breen, landscape; Syska & Hennessy, mechanical; Weidlinger Associates, structural; Chermayeff & Geismar Associates, graphic design and exhibits.
Client: Philip Morris U.S.A.
Costs: $86 million about $54 per sq ft, building only.
Photography: ESTO©; except p. 51 top, p. 53 top, David Franzen; p. 53 bottom, Norman McGrath.

Coffered ceiling in factory (above) absorbs sound and gives diagonal light for good vision.

Staff dining (above), executive dining (below).

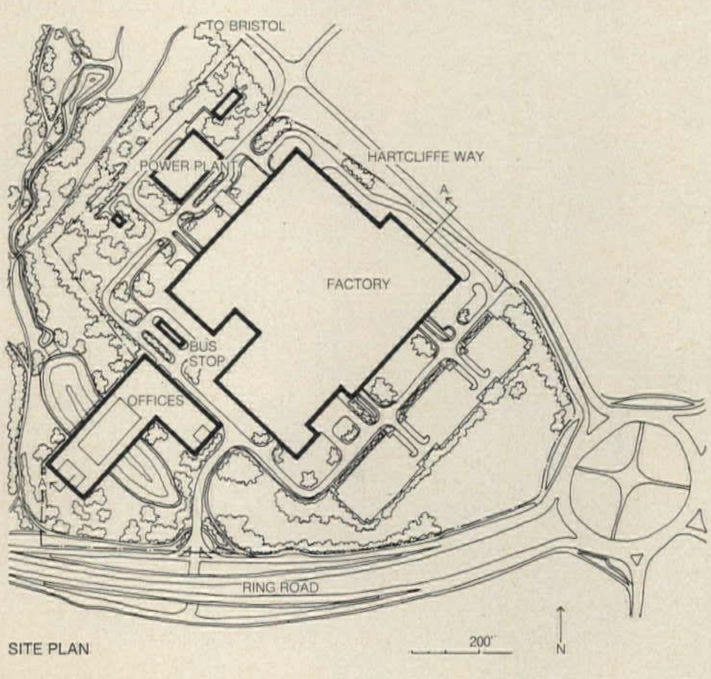
Chermayeff & Geismar's Tobacco Museum (below).

Wills Tobacco office and factory, Bristol, England

Making it on Hartcliffe Way

In Bristol, England, SOM Chicago and YRM London have collaborated on a cigarette manufacturing plant that is warm and relaxed in its parklike setting.

The British Wills and the American Philip Morris (p. 78) cigarette factories are similar in that they were designed for the same purpose and essentially accomplish that purpose in the same way. In both factories the secondary processing section—the place where the cigarettes are actually put together—takes place in a vast, truss-supported column-free space. In England, SOM Chicago collaborated on the Wills facility with the London firm of Yorke Rosenberg Mardall, with whom they had worked earlier on the Boots Building in Nottingham. Other than the fact that the British factory is smaller than the Richmond facility (secondary processing areas are 165,000 sq ft vs. 210,000 sq ft), its entire manufacturing operation takes place on one level, and the factory also includes facilities for making hand-rolled tobacco products. The main difference between the two facilities, at least programmatically, is that the English one also includes a separate corporate headquarters building at the same site. In terms of building materials there is no similarity between the two; the Bristol complex is constructed of weathering steel frame, the Richmond factory is built of poured-in-place concrete and concrete panels.

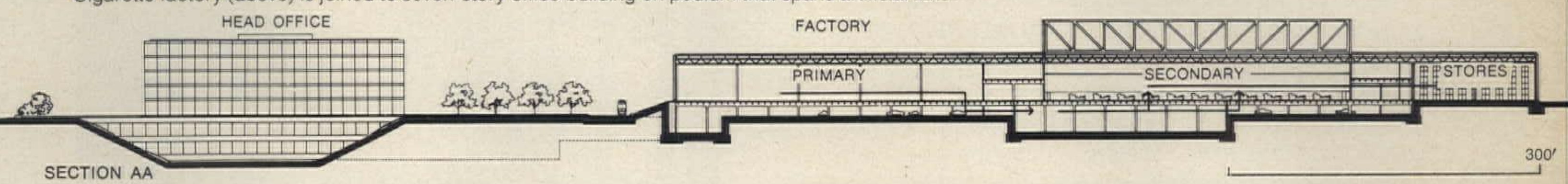


SITE PLAN

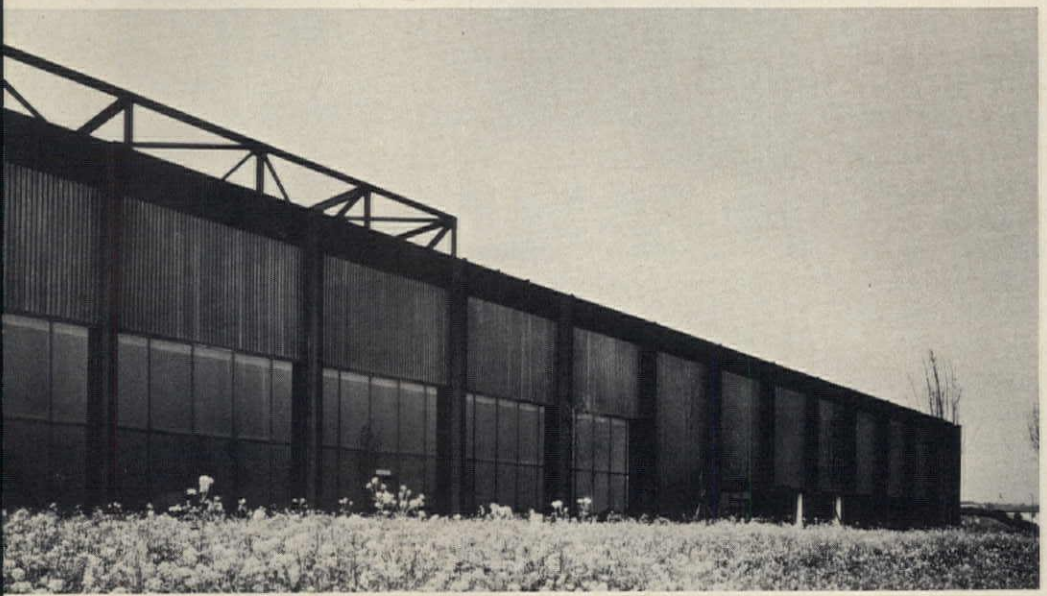
Like the Richmond factory, however, Bristol's also includes interior gardens, but in Bristol they are designed more for looking at and for bringing natural light into the factory and factory office spaces. Their ground cover is gravel, and trees and shrubs are contained in geometrically arranged planters. There is no place to sit. It was not as important, however, for these gardens to assume the same importance as those at Richmond. The Bristol facility is not sited in an exclusively industrial area; it is located in a mixed light industrial and housing area where its 56-acre site has been designed as an extension of an existing valley and park. Because of its surroundings, though, landscaping became extremely important. There is little above-grade parking (a 1000-car lot is under the factory), and an artificial oval lake has been created as a setting for the office building, which bridges the lake.

In this naturalistic setting, the complex has been designed and detailed in a much more relaxed manner than the factory at Richmond. At Bristol there is no grand, formal entrance; a simple curved drive leads past the lake to a service road that separates the office building and factory and leads to the bus stop and to underground parking. But the setting is not the only explanation for the relaxed feeling; materials and detailing also contribute significantly to a generally easy air at Bristol. The warm, weathering steel structure of the buildings and the bronze-tinted glass impart a sense of softness to the facility that the hard-edge white concrete forms at Richmond do not have. At the Bristol factory all exposed steel, including the nine huge trusses that span almost 300 ft of the making and packing area, is weathered steel; the infill panels are ribbed, gray factory-finished metal. In the seven-story office building the bronze-tinted glazing system is set back almost 6 ft from the weathering steel frame; in between, weathering steel grilles form sun screen/window-washing platforms at the perimeter of each of the five upper levels of the office block. The two lower levels, which form a podium the other five sit upon, are made of poured-in-place concrete to relate these levels more to the ground.

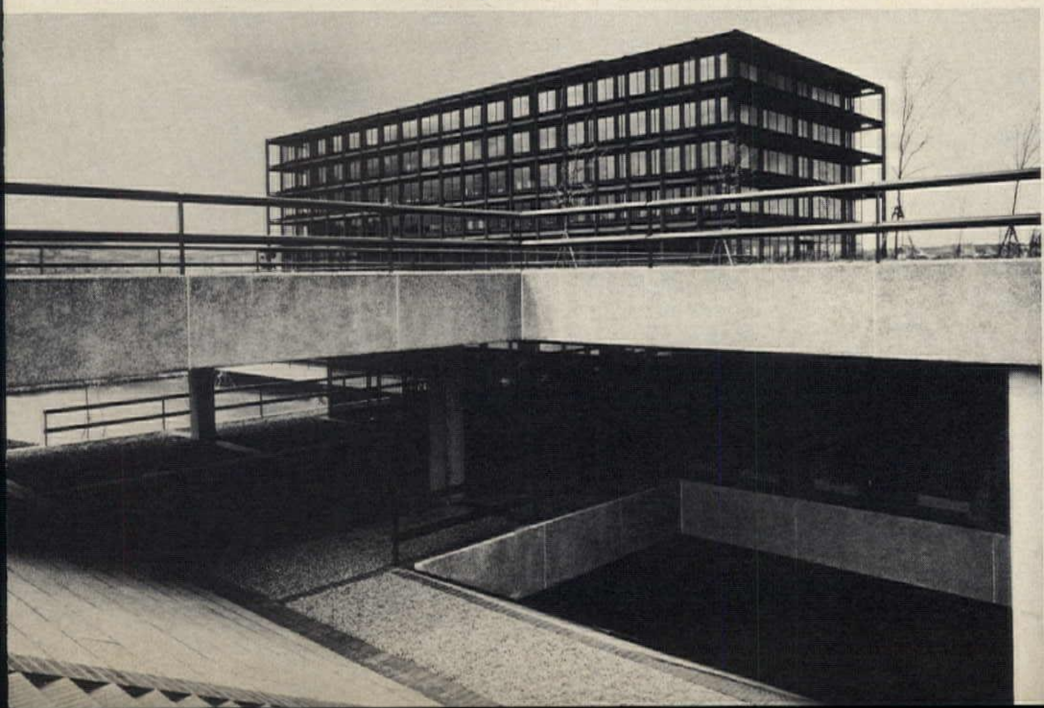
Cigarette factory (above) is joined to seven-story office building on podium that spans artificial lake.



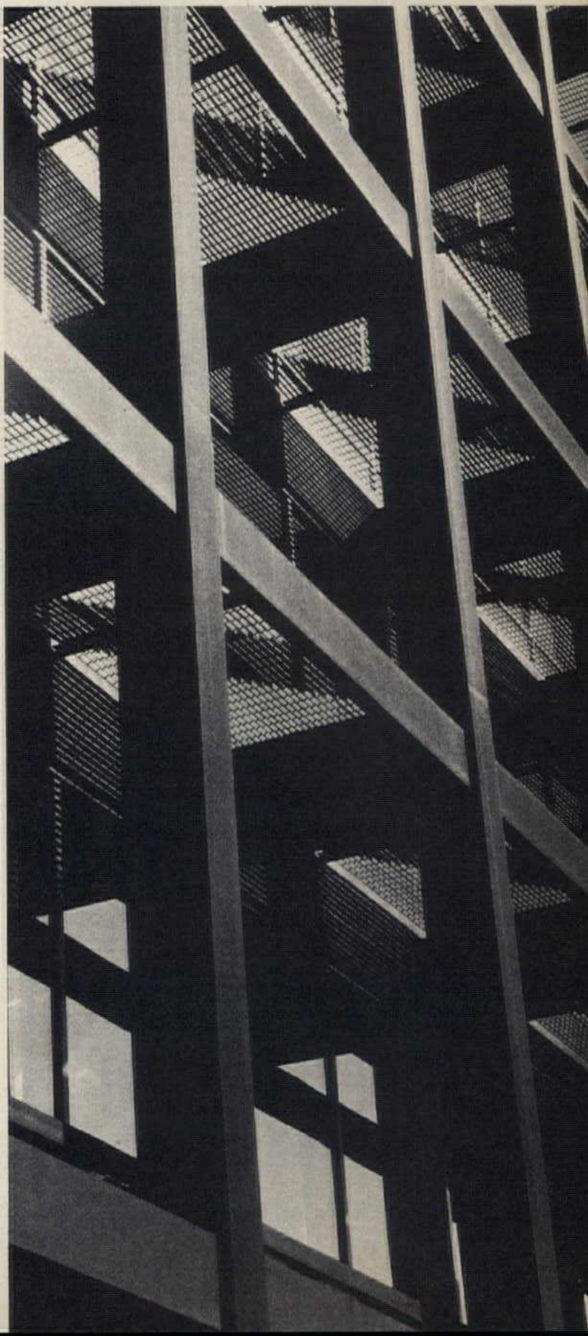
Northeast façade of factory (below) is easily movable, and gives views to flowering fields.



Stairs at southwest end of office building (below) lead to the two lower podium levels.



Office building structure extends away from wall.



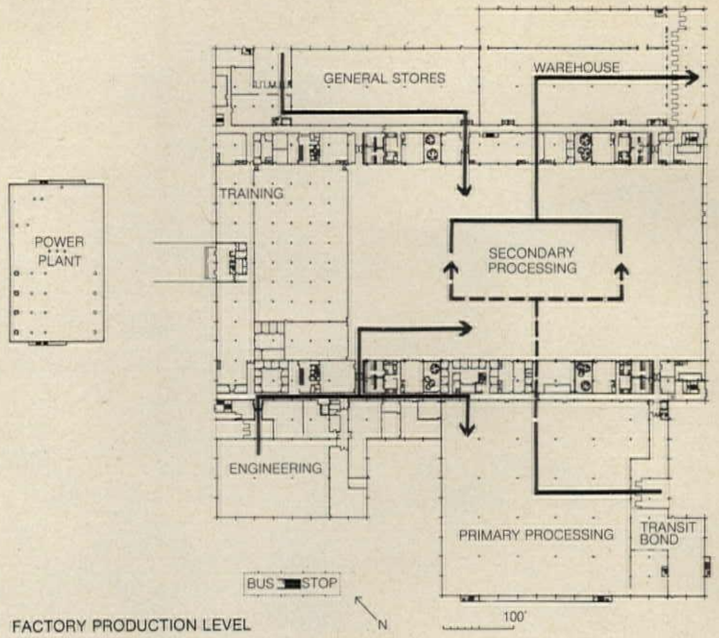
Wills cigarette manufacturing plant.

Within the factory, the functional requirements of manufacturing were, as at Richmond, the main determinants of design. At Bristol—in relatively the same position where in Richmond, gardens, mechanical towers and lounges form spines on each side of the making and packing area—there also are spines. Here, though, the spines are unbroken two-story spaces that house offices and other facilities on the lowest levels, and mechanical equipment in the mezzanine levels. Because none of the space within the roof trusses is used (at Richmond, deeply coffered ceilings extend into the trusses), the ceiling in the factory at Bristol is much lower than at Richmond, and consequently the space appears more like that of a standard factory. The machine operators, however, can look into the inner gardens and, through one large end wall (which is easily removable for future expansion), to the outside. In its parklike setting, this is no little compensation. The factory is linked to the office building by an underground tunnel which surfaces between the two buildings at the bus stop.

In the tower-and-podium office building, the two L-shaped concrete lower levels spanning the lake contain the public spaces for the entire complex, including a supermarket, post office, bank, and film theater, as well as the research and development laboratories, computer suite, and offices. In the five-story steel-frame structure above are administrative offices, with the director's office on the top floor. Wherever possible, spaces have been arranged for views to the lake.

Throughout the entire complex, a warm color scheme is used. Walls are white or beige, most furnishings are in the white, brown, and red families. Large banners commissioned by contemporary artists now hang in the factory. The general feeling, when compared to Richmond, and in consideration of the SOM idiom, is almost cozy; and this in itself is a keynote to a major difference between the two manufacturing complexes.

It may seem unusual that two facilities designed essentially for the same purpose could be so dissimilar, especially since they are of a building type that rarely receives much attention of any sort. But the reasons for the disparity illustrate one of the main differences between thoughtful and indifferent architecture. In Bristol, where it is damp and rains a good part of the time, a warm, relaxed group of buildings has been gracefully set into a naturalistic, parklike setting. By contrast, in sunny Richmond a formal and austere building stands almost in defiance of its unkempt surroundings, while it creates its own naturalistic landscape inside. In these terms the two complexes are almost completely opposite to each other; one is essentially an outward-facing building, while the other is inward-turning. But they are the way they are for the same reason, which tells of the architects' unusually high degree of awareness of the local conditions, which include not only characteristics of the site, but consideration of the surroundings, and of the climate. These are usually the last things thought of for a factory building, if they are thought of at all. The fact that SOM and YRM thought of these things, and of people too, is rare indeed when building manufacturing facilities. [David Morton]

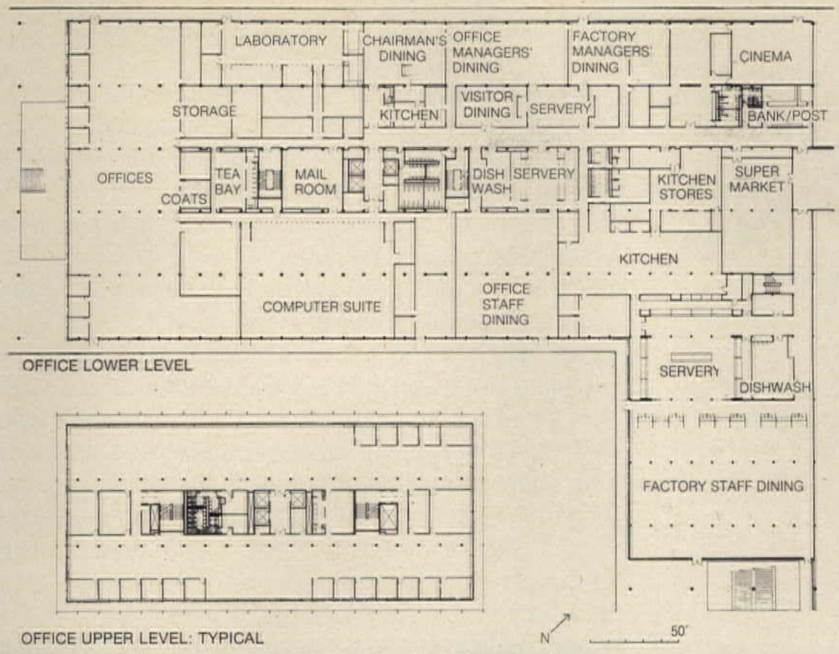


FACTORY PRODUCTION LEVEL

Executive dining room in podium level of office building (above).

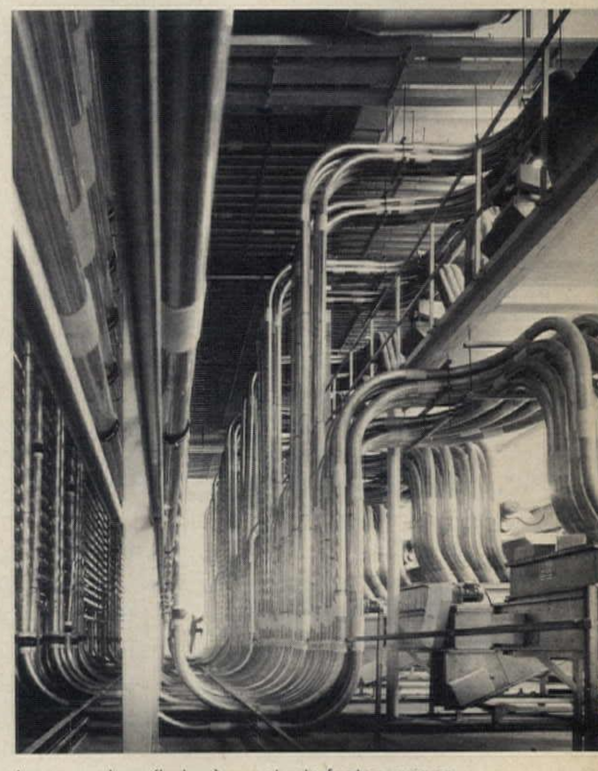
Data

Project: Western Division (factory) and Headquarters Office, Wills Tobacco Company, Bristol, England.
Architects: Skidmore, Owings & Merrill, Chicago; Yorke, Rosenberg, Mardall, London.
Contractor: John Laing Construction, Ltd.
Program: a major cigarette making, packing, and distribution factory and separate headquarters office building for tobacco company.
Site: 56-acre parklike setting in mixed light industrial and housing area.
Structural system: factory floor supporting constantly shifting, heavy equipment is supported by closely spaced concrete columns and spanned by 300 ft weathering steel trusses that support roof. Headquarters building is exposed weathering steel rigid frame with floors of composite concrete slab on steel beam; lower two podium floors are poured-in-place reinforced concrete beam, slab, and columns.
Mechanical system: entire complex air conditioned; served with steam and chilled water from power house; four boilers are gas-fired. Air conditioning is provided by 40 packaged units housed in two parallel mechanical spines in factory. Total air volume is 2,160,000 cfm.
Major materials: weathering steel, bronze-tinted glass and factory-finished steel panels on exterior. This is one of the first major applications of weathering steel in Britain. Walls are concrete block or gypsum board; metal pan false ceiling; carpeting and vinyl asbestos tile floor covering.
Consultants: Kenneth Booth, landscape; SOM Chicago and YRM London, interiors; Steensen, Varming, Mulcahy & Partners, mechanical; Felix J. Samuely & Partners, structural; Claude R. Engle III, lighting.
Client: Imperial Group Ltd., W.D. & H.O. Wills.
Costs: $40 million.
Photography: Brecht-Einzig; except top and left, p.59, John Roaf.

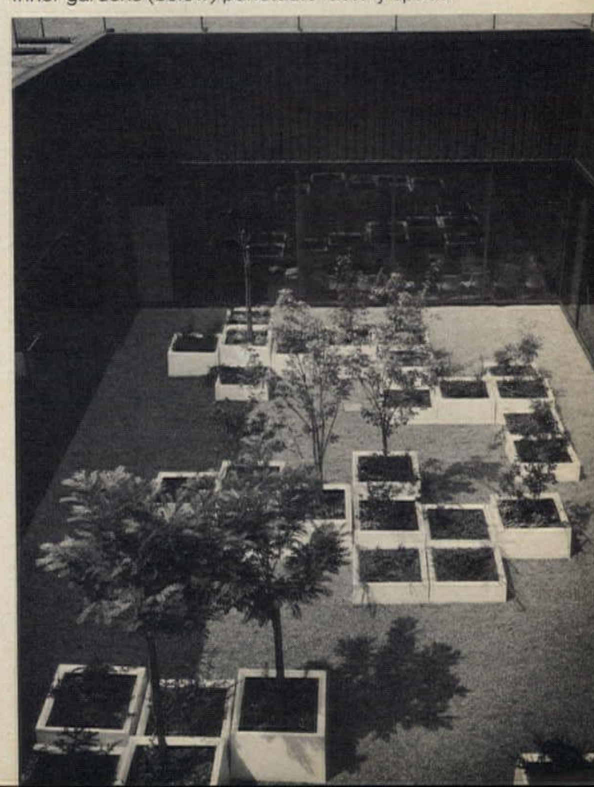


Making and packing area (above) is column free; tobacco arrives there by pneumatic tube (below).

Director's office (below) on top floor of office building looks out over factory.



Inner gardens (below) punctuate factory space.



Offices on upper podium level (below) extend full depth of office building and look to lake.

Technics: Specifications clinic

Paying for testing and inspection

Josephine H. Drummond

The author tells how to handle payments for tests and inspections in a way that is unobjectionable to turnkey project owners but maintains necessary control.

Testing and inspecting structural materials and fabricated assemblies are required by all model building codes for all but the simplest structures. Most codes further prescribe that the testing and inspection be under the direction of the architect or engineer of record and not under the contractor's control. The reasons are obvious.

At the same time, the architect probably does not want to get involved in paying testing lab invoices and then billing his client. Were he to do this, he would assume unnecessary responsibility for the laboratory's actions. His cash flow position may not allow it in any event.

The owner may object to numerous billings from miscellaneous sources, especially when he expected a "lump sum" or "turnkey" contract to include all construction-related costs. As he may not even understand what the reinforcing steel is used for, it is perhaps understandable that he would balk at paying a separate bill from an unknown (to him) entity for testing it. Altogether, it would seem preferable to include testing costs within the payments for construction if possible.

How can we do this and still comply with code requirements, as well as maintain a desired degree of control over the testing laboratories? A cash allowance arrangement seems to fill the bill. A specific sum is set aside to pay testing laboratory fees in the same manner as is sometimes done for finish hardware, lighting fixtures, artwork, or tenant improvements. Specifications should be very clear as to what is included in the allowance, who authorizes expenditures from it, and how it is paid. For engineered projects using high-strength steels and concrete, 1 percent of the building cost is a fair rule of thumb for setting the amount of the cash allowance.

The scope of the allowance must be carefully defined. We do not want air conditioning balancing, roofing inspection, load testing of elevators, and similar work to get mixed up with the structural tests. Neither do the same firms provide these services, except in rare instances.

One easy way to distinguish what is and is not included in the allowance is to state that all testing and inspecting required by Divisions 2 through 6 of the specifications are included and all other tests and inspections are not. It works out very neatly, inasmuch as soils, concrete, steel, and wood will thus get paid under the allowance. A refinement of the scope would be to exclude inspection of finish woodwork and miscellaneous and ornamental metals.

We have developed a specification section called simply "Testing and Inspection," which we include under Division 1. We make no attempt in this section to describe what to test, how often to do it, or what constitutes success or failure. These requirements are left to the technical sections. The section defines how the testing agency is selected, requires all tests to be performed by one laboratory as much as possible, how the test reports are distributed, who is authorized to order tests, and how the tests are paid. The allowance pays for one set of all tests required by codes and by the specifications. Costs of retesting replacements of defective material, and additional testing to check doubtful results are paid by the contractor. Of course, all remedial work is also paid by the contractor. If the contractor should elect to use unidentified reinforcing steel, or other material which requires additional testing because of the uncertainty of the source or of the material, then he is responsible for payment of tests to establish its quality. The contractor is responsible for payment of costs of the concrete mix designs. The allowance pays for all continuous inspection which is required by building codes, but not for resident inspectors or clerk-of-the-works.

The testing laboratory must submit for review a detailed schedule of inspection charges, hourly rates, per diem and travel, and test costs before it is approved for employment on the project. The architect's approval of laboratory invoices is limited to ascertaining compliance with the rate schedule and does not imply certifying the number of hours or total charges unless a clerk-of-the-works is retained full time on the site.

We specify that the contractor is to show laboratory fees as a separate item on his monthly application for payment. Paid invoices are to be included with the application, and the contractor is instructed to segregate allowance items from those he is required to pay. In this way the contractor writes the checks to the testing laboratory, but the architect and engineer maintain direct control over the expenditures.

Payment for testing by the allowance method is probably neither necessary nor acceptable for public projects. Most government agencies either can do the testing themselves or have provisions for getting it done. Private owners and developers of large scale or continuous construction work may, similarly, be accustomed to handling payment of testing fees. The method is most suitable for the individual owner who is building for himself and who does not have a staff of construction-oriented people to advise him. By including the testing costs within the lump sum price, we spare him the need for paying bills he doesn't understand for services he can't construe as beneficial to him. □

Author: Josephine H. Drummond, CSI is Specifications Writer/ Construction Administrator, Gruen Associates, Los Angeles.

The Winners:
1976 Plywood Design Awards

JURY: John D. Bloodgood | William Turnbull, Jr., Chairman | Remmert W. Huygens

1976 Plywood Design Awards

Residential/Single Family

CITATION: Daniel Solomon, AIA. LOCATION: Berkeley, California. JURY: "This is a very competent, straightforward residential project. It uses a builder's technique to provide a low-cost solution on a difficult site. The plywood detailing is crisp and well-executed."

Citation

JURY: William Turnbull, Jr., Chairman, AIA, San Francisco, California; John D. Bloodgood, AIA, Des Moines, Iowa; Remmert W. Huygens, AIA, Boston, Massachusetts.

Residential/Multifamily

CITATION: Donald Sandy, Jr., AIA, and James A. Babcock, Architects and Planners. LOCATION: Sacramento, California. JURY: "Through the use of architectural form, Sunrise attempts to create a sense of place on a relatively characterless site."

CITATION: Childs Bertman Tseckares Associates, Incorporated. LOCATION: Mashpee, Massachusetts (Cape Cod). JURY: "Competently but conventionally done. Reflects nicely handled massing and offers a pleasant place to live."

CITATION: Donald MacDonald, AIA, and Robert Dahlstrom, AIA. LOCATION: San Francisco, California. JURY: "A multifamily urban building done in the San Francisco idiom. It relates in scale to its older neighbors."

Citation

Citation

Citation

Commercial/Institutional

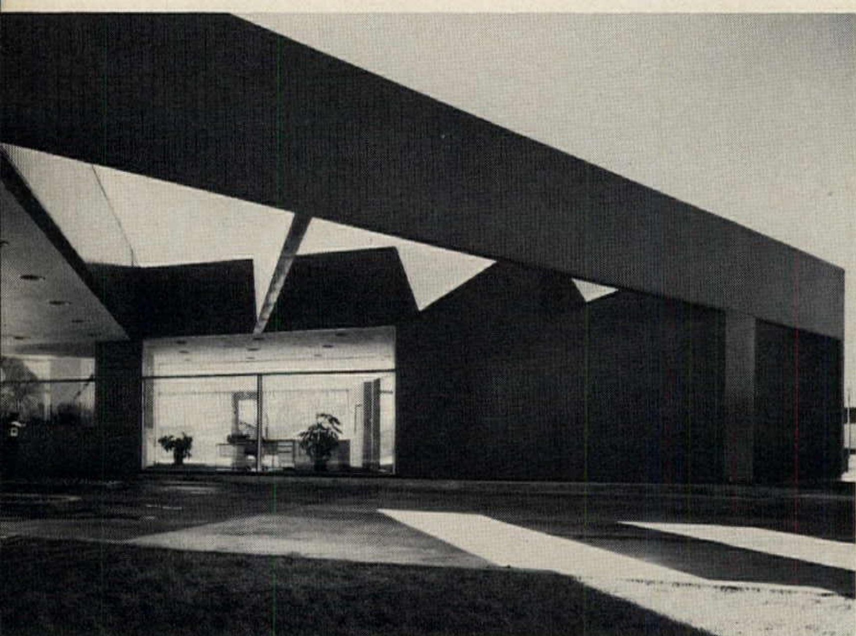
FIRST AWARD: Charles Herbert & Associates, Incorporated. PROJECT: Home State Bank Drive-up office, Jefferson, Iowa. JURY: "Clarity of concept precludes the necessity of identifying graphics. The building is a sign."

CITATION: Carlton S. Abbott, AIA, Abbott Assoc. PROJECT: Temporary Sales Center, Williamsburg, Virginia. JURY: "An integration of fabricated simplicity and the craftsmanship of field construction."

CITATION: Rolly Pulaski & Associates. PROJECT: Moulton Niguel Water District office, Laguna Niguel, California. JURY: "Elegant use of plywood. Nice four-sided quality. Inviting residential character."

CITATION: Charles Herbert & Associates, Inc. PROJECT: American Federal Savings and Loan Association, S.W. 9th St. office, Des Moines, Iowa. JURY: "Talented rehabilitation of existing structure. Shows potential of plywood in other than a foursquare manner."

First Award



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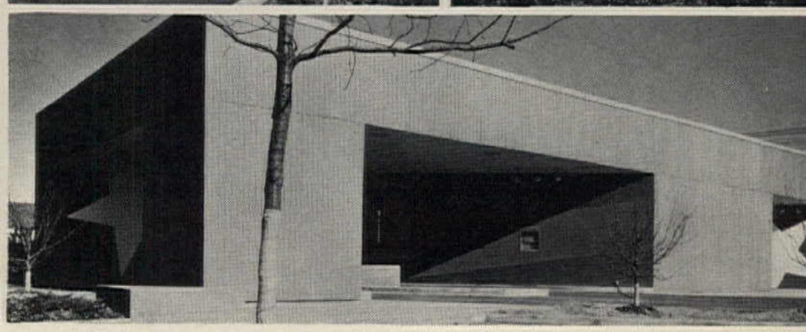


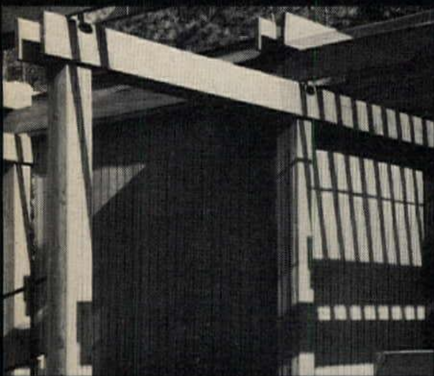
Vacation Homes

CITATION: Kirby Ward Fitzpatrick, AIA. LOCATION: Saint Helena, California. JURY: "Handsome vacation pavilion respectful to its site. The architect used plywood in a traditional manner with the exception of the roof where he turns a plywood structural solution into a visual complement to the other materials."

Citation

The Plywood Design Awards Program is sponsored by the American Plywood Association and Professional Builder & Apartment Business Magazine.

More ideas: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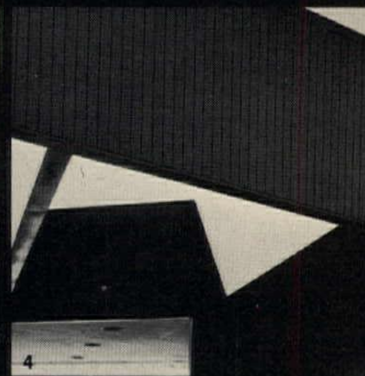
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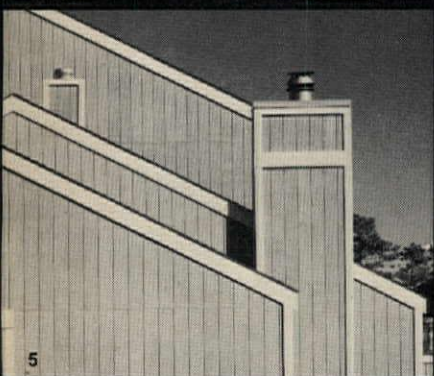
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1. Carlton S. Abbott, Temporary Sales Center, Williamsburg, VA. 2. Rolly Pulaski, Moulton Niguel Water District, Laguna Niguel, CA. 3. Donald MacDonald and Robert Dahlstrom, Lombard Street Condominiums, San Francisco, CA. 4. Tom Clause, Home State Bank, Jefferson, IA. 5. Childs Bertman Tseckares Associates, Massasoit Crossing, Mashpee, MA. 6. Alfredo De Vido, Horel residence, Montauk, Long Island, NY. 7. Richard E. Watson, Vantage House Restaurant, Houston, TX.


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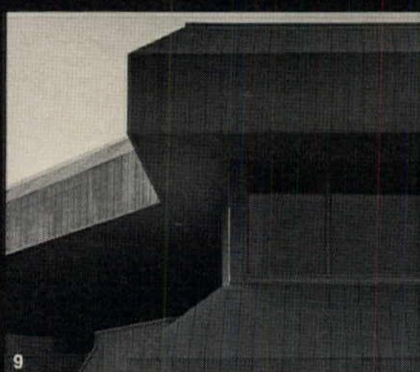
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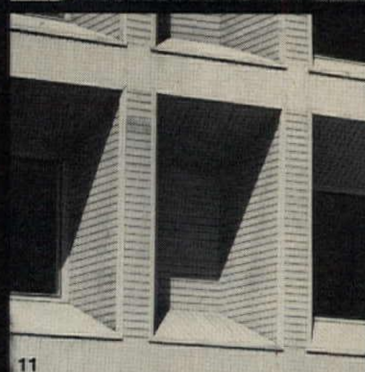
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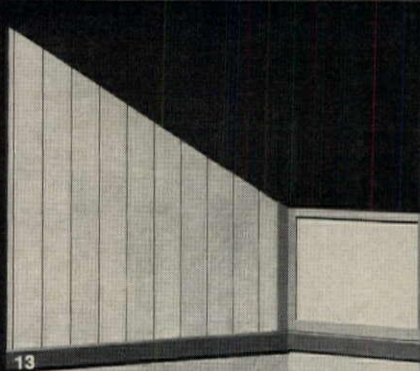
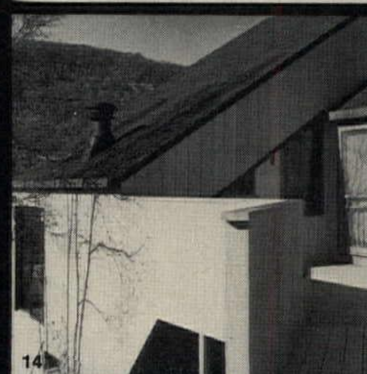

13

8. George Cody, vacation house, Monterey, CA. 9. Donald Sandy, Jr., and James A. Babcock, Portobello Office Center, Oakland, CA. 10. Dean F. Unger, Gibraltar Savings & Loan Assoc., Sacramento, CA. 11. Brian Paul, Mission Park Office Building, San Diego, CA. 12. Alan E. Smith, Harbor Day School, Corona del Mar, CA. 13. Hall and Visioni, Autistic Classroom Building, Santa Barbara, CA. 14. Markisz and Magnani, vacation house, Kent, CT.

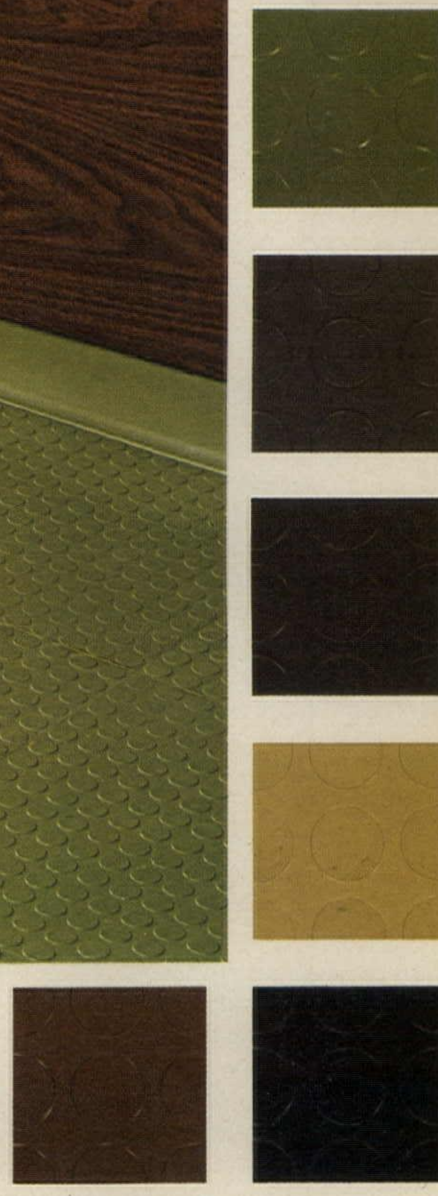

14

"There have been so many changes in wood. Our brain makes more and more new things out of it."—Walter Gropius.

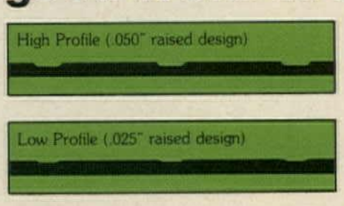
If you have any questions about plywood or plywood systems, please write American Plywood Association, Dept. **PA-067,** Tacoma, Washington 98401.

AMERICAN PLYWOOD ASSOCIATION

Radial Rubber Tile



For safe footing and good looks in high traffic interiors...



This unique new rubber floor tile is designed especially for interior floors where safe footing is required and handsome, easy to maintain appearance is desired. 1" diameter raised studs molded onto a special compound of tough, extra resilient rubber provides greater traction by allowing dirt and spilled liquids to drain off the walking surface. Extra resilience contributes substantially to safe footing.

Radial rubber tile is recommended especially for high traffic areas such as air terminals, shopping centers, ramps, elevator lobbies and stair landings. It is made in two profile designs and in overall thicknesses of 1/8" and 3/16". The high profile (.050" raised design) is ideal for areas where exceptionally safe footing is desired. The low profile (.025" raised design) is recommended for areas where light vehicular traffic such as shopping carts are used.

For samples and complete technical information write to Flexco, P.O. Box 553, Tuscumbia, Alabama 35674, or call (toll free) 1-800-633-3151.

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Circle No. 364, on Reader Service Card

Chicken or egg?

Bernard Tomson and Norman Coplan

Although the expected order is to obtain a building permit first and State certification, if necessary, later, a careful reading discloses differing statutes.

Failure to comply with technical or procedural matters under building or zoning laws often engenders disputes which must be dealt with by the courts. In some jurisdictions (i.e., in New Jersey, *Schultze* v. *Wilson*, 54 N.J. Super. 309) the courts' approach is to treat such failure to comply as a curable irregularity. In other jurisdictions, literal compliance will be required. In a recent decision in New York (*Bayswater Health Related Facility* v. *Karagheuzoff*, 37 N.Y. 2d 408) the highest court of that state was divided in its approach to this issue.

As reflected in the Bayswater case, an owner of real property in the city of New York (the petitioner) sought to alter and convert it for use as an adult care facility under the N. Y. State Hospital Code. The law required that in order to use such a facility, it was necessary to secure a certificate from the appropriate state agency. The statute provided that the certificate was to be obtained before a building permit be issued by the city agency having jurisdiction. However, the property owner secured a building permit prior to the issuance of the certificate, but with the assurance of the Building Department that no other approval was required as a condition to obtaining a valid city building permit.

After the owner had incurred substantial obligations for the necessary work, the Department of Buildings, on the basis of a so-called "stop-gap" resolution adopted by the city's Board of Estimate (which directed the suspension of all such permits), suspended the petitioner's permit. This stop-gap resolution was, in another case, ruled invalid, and the petitioner sought to compel the city to reinstate its building permit. The Trial Court directed that the permit be reinstated and granted 28 days of construction time to the petitioner in which to vest its rights. On appeal, this decision was affirmed and was further appealed to the highest court of New York which, also by a divided court, affirmed the Trial Court's decision. The majority opinion in the Court of Appeals states:

"At the time (the building permit) was issued, and earlier when it had been applied for, the city knew that certifications by the appropriate State agency . . . had not yet been secured. . . . A number of factors gives strong support to our view that failure to receive prior certification was a mere irregularity subsequently cured as to this permittee.

"Initially it is clear from its legislative history that the reference to certification . . . was not of great moment. . . . The incorporation of the language referring to State certification appears to have been purely incidental to draftsmanship . . .

"The State certification was for the use rather than the construction of the facility. Permission for the latter would not necessarily mandate the former. Normally a building permit precedes the start of an alteration; the issuance of a local certificate of occupancy, attesting to its satisfactory completion, would ordinarily come after the work was done. Only then would the health care facility be in condition to meet the requirements for State certification. Also, a builder who applied for an alteration permit did not necessarily have to be the operator of the contemplated domiciliary facility. So it was possible, in fact made sense, for a builder to withhold closing his contemplated purchase of the property and the leasing thereof to a contemplated operator until a permit had been issued. That is not hypothetical; it is what (the petitioner) actually did without any State problem. The proposed operator, not the owner, would then be the one to file an application with the appropriate agency for the State certification. Under these circumstances, it is not surprising that in actual practice the expected order of things had been to obtain a building permit first and State certification thereafter. A close reading of the statutes and rules regulating the State board supports the pragmatism of such an order of things."

The Court pointed out that the city's belated emphasis on State certification was not because it was concerned about the existing practice, but that rather "it was a response to political pressure by neighborhood groups who wished the zoning law changed." Because a change in the zoning law would take time, which, stated the Court, "the impatience of the sponsors of the proposed change would not countenance," the unlawful "stop-gap" resolution was adopted which, incidentally, made no reference to any problem over lack of State certification.

A minority of the Court would have dismissed the petition on the ground that there had not been compliance with the statute as of the time the building permit had been issued and that important public policy considerations would otherwise be subverted. The dissenting opinion stated:

"Persons may not contend that they were misled or deceived into acting in reliance upon unlawfully issued permits since they are presumed to know the extent of the issuing officer's authority. . . .

"Behind this rule is an important public policy, and that is to prevent corruption. . . . 'There can be no vested rights under a void permit. To hold otherwise would be to put a premium of dishonesty of city officials charged with the duty of issuing such permits and would open the way for connivance and fraud. The will of the official would then be substituted for the mandate or restriction of the legislative enactment, and thus the limitations of zoning acts and ordinances held for naught.' " □

Der Führer as client

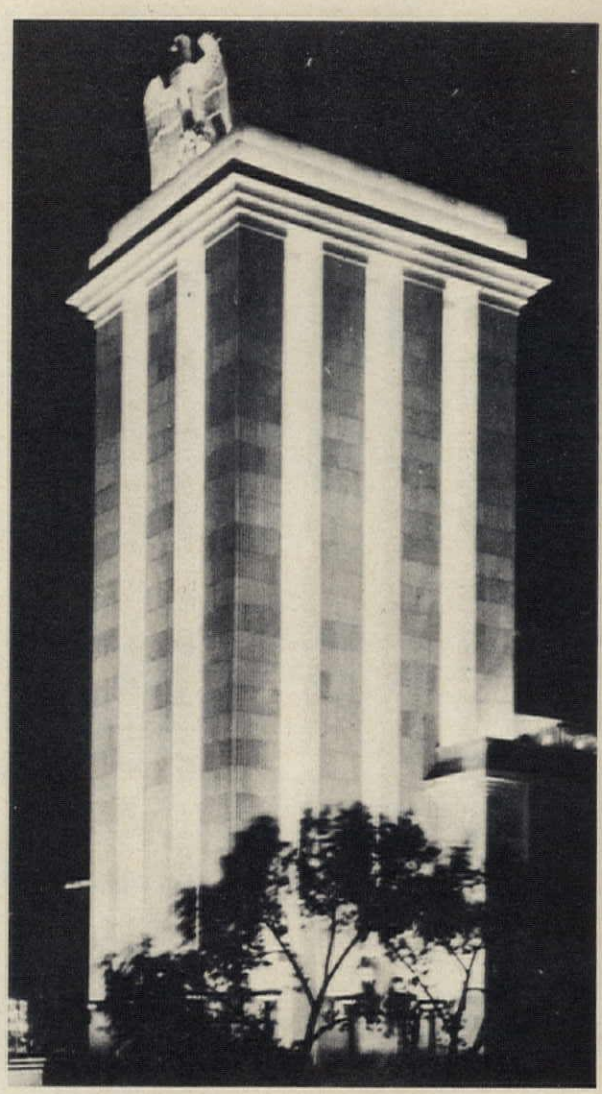
Spandau: The Secret Diaries *by Albert Speer. New York, Macmillan, 1976, 463 pp., illus., $13.95.*

Reviewed by Jim Mayo, asst. prof. architecture and planning, University of Kansas, Lawrence.

With the publication of *Inside the Third Reich* in 1970 and more recently the release of *Spandau,* Albert Speer has recorded his experiences as Hitler's architect along with his other experiences during the reign of Nazi Germany. Speer considers his main contribution to architecture to be the integration of exterior lighting with building design. However, his greater contribution may be in relation to the social-psychology of the architect. While Speer does not claim to have expertise in sociology or psychology, his observations offer enormous insight to an architect in a power position. We can criticize his deeds as one of Hitler's war ministers, but we can also learn from his behavior as an architect.

Having been removed from power and convicted of war crimes, Speer, during his imprisonment at Spandau, reflected on his architectural practice. His first book focused partially on the social conditions experienced as an architect, while *Spandau* contains more self-reflections on his architectural beliefs and past practice. Even though these books were written under adverse conditions, Speer strived to establish an understanding of his previous behavior. Most architects do not have an opportunity to evaluate their past actions; moreover, they are not accustomed to exposing their shortcomings.

The relationship between the authority to design and the desire to design places a burden on the architect to maintain a clear assessment of his social processes. When added authority is matched with increasing power to control a situation, the architect must be more careful in making design decisions. It is difficult to change the course of action once a committed direction has been made, and this problem increases with power. Speer emphasizes that the seductive desire for more power to design can lead the architect to an irrelevant design process. The architect must maintain a proper perspective to allocated power so that worthwhile design solutions can be developed. Robert Burnham, noted American city planner, once said: "Make no little plans . . . they have no magic to stir men's blood." This phrase has often been interpreted to mean "the bigger, the better." Size, however, does not constitute quality; in fact, in *After the Planners* Robert Goodman criticized this "bigness" notion as leading into a fascist, monumental architecture. While his comments are direct, Goodman lacks first-hand experience in making such errors. Speer, on the other hand, offers the advantage of having made them and of being in a position to evaluate the architect's role in such a situation. In reviewing his various design projects, Speer emphasizes the obscenity of monumentality in his work. The reasons for this development appear to be twofold: his captivation by Hitler's charismatic influence and his eventual design requirements; and the desire to design important works of architecture to become a great architect.



German pavilion, World's Fair, Paris, 1937 (above).
The Chancellery, Berlin, in 1941 (left).

Spandau is not intended to be an integrated commentary strictly directed to architecture. Instead, it is a personal chronicle of prison life, reflecting on the struggle to be creative in confinement. While Speer has some interesting insights into the nature of his past actions, the reader should also be aware of his search for moral behavior. In this regard, the questions he asks are as important as his observations of the past. The issues he addresses on ambition and loyalty are crucial to professional ethics. Speer leads us into a designer's world no architect has recorded before. We should not forget these accounts, because, based on his views and experiences, the relationship between the authority and the desire to design is crucial in the interpretation of ethical practice.

Literature and products

Master Hosts, Inn, Texarkana, Tex.

"Glas-wich Architectural Laminated Glass" catalog describes product which consists of two or more sheets of glass permanently bonded together under heat and pressure with an inner layer of vinyl butyral. It can be produced to control heat, light, sound, or breakthrough and has broad application. Dearborn Glass Co.
Circle 201 on reader service card

"Twin Pane Insulating Glass" brochure describes product, includes suggested specification, gives glazing instructions, and has chart showing relative heat gain, shading coefficient, U-Value, dimensional tolerances. Twin Pane Corp.
Circle 202 on reader service card

"Float Glass for Construction" brochure covers flat glass products for residential and nonresidential use. Clear, tinted, and tempered safety glass is described and characteristics given in chart form. Ford Glass Division.
Circle 203 on reader service card

"Glass for Construction." A four-color brochure describes the products that are available, including insulating and coated reflective glass. Technical data in chart and diagram form, glazing information, and specifications are given. Architect's design and glass load calculator slide rule is a give-away. Libbey-Owens-Ford Co.
Circle 204 on reader service card

"Glass & Glazing." Catalog describes wire and patterned glass, in addition to tempered, insulating, and reflective, that used for sound control, ceramic enameled spandrels, and spandrel insulated panels; color chart, and technical data are included. C-E Glass.
Circle 205 on reader service card

"Specification for sealed insulating glass units" covers performance properties of preassembled, permanently sealed insulating glass units. Request SIGMA No. 65-7-2. Sealed Insulating Glass Manufacturers Association.
Circle 206 on reader service card

Clearlite and Cleartemp glass. Brochure contains technical data in chart form for the architectural glass products by Fourco Glass Co.
Circle 207 on reader service card

Regency office building, Des Plaines, Ill.

"Environmental Glass Products," four-color brochure contains information about reflective insulating, and laminated glass, gives technical data, suggested specifications, and glazing instructions. Shatterproof Glass Corp.
Circle 208 on reader service card

"Glazing Recommendations for Sealed Insulating Glass Units." A manual which lists glazing instructions has been compiled from years of experience and observations by insulating glass manufacturers. Illustrations of specific examples of good glazing systems are shown. Sealed Insulating Glass Manufacturers Association.
Circle 209 on reader service card

"Arcadia sliding glass doors and windows." Catalog describes seven series of aluminum units which feature Step-Sill design, high water barriers, perimeter pressure seals, jam-proof latches, choice of finishes. Tracks are roll-formed stainless steel; weatherstripping is silicone-treated woven polypropylene pile, thin fin seal type. Glazing channel is extruded black vinyl. Northrop Architectural Systems.
Circle 210 on reader service card

"Design Oriented Glazed Structures" brochure illustrates in full color examples of basic domesystems, barrelvault systems, skylyte system, walkway enclosures, and rigid frame structural system. Roper IBG.
Circle 211 on reader service card

"Glass Recommendations—Building Cost Analysis" is Technical Service Report No. 105-B. It gives sample analysis form, sample computer printout sheet of cost analysis results, summary of cost analysis, discussion of results, and instructions for completing data input sheets. PPG Industries.
Circle 212 on reader service card

Architectural glass products color catalog describes single clear and tinted glass, single reflective glass, insulating clear, tinted, and reflective glass, tempered and laminated glass, and total vision systems services together with giving technical data in chart and table form. PPG Industries.
Circle 213 on reader service card

Glass catalog includes clear float, clear sheet, tinted plate, insulating, wired, laminated, and tempered glass, spandrels, transparent mirrors, and patterned glass. Technical data, descriptions, suggested usage, and suggested specifications are also given. ASG Industries Inc.
Circle 214 on reader service card

Architectural products brochure in color illustrates and describes vision and opaque glass, gives glazing details, wind load data, properties. Guardian Industries Corp.
Circle 215 on reader service card

Thermal windows. Literature discusses lower unit costs and higher heating efficiencies of aluminum horizontal rolling windows with closed vinyl foam insulating agent. Maker states that frame condensation is reduced to almost zero. Capital Products Corporation.
Circle 216 on reader service card

Glazing. A 15-page technical brochure on the use of Tuffak Polycarbonate sheet in glazing applications also reports the results of laboratory tests on break resistance, abrasion resistance, [continued on page 104]

Reinforced Concrete Design Idea Book covers such structures as office buildings, hospitals, hotels, motels, condominiums, churches, stadiums, medical facilities, and others, and contains articles from engineering, architectural, and construction publications. These reprints cover innovative structures in reinforced concrete as well as solutions to special problems such as site restrictions and large open interior spaces. It also includes a report on high strength concrete and its benefits in reduced column sizes and increased usable floor area. Concrete Reinforcing Steel Institute.
Circle 222 on reader service card


Blood bank


Vienna Cafe Chair


Liberty Pole

Products

Blood bank refrigerator. A digital display constantly shows solution temperatures in Celsius. Same display, when push button is activated, instantly shows upper or lower cabinet temperatures. Temperature monitor lights indicate too low, safe, or too high conditions of stored blood. Audible signal warns of unsafe solutions temperature and door-ajar condition. In case of power failure, batteries instantly activate audible/visual signal. Recording thermometer is an optional accessory. Units have vertically adjustable and removable drawers that will accommodate from 240 to 720 blood bags. The Jewett Refrigerator Co., Inc.
Circle 101 on reader service card

Liberty Pole. Updated version of the historic pole carved and erected in 1767, this one is carved and painted with words and symbols representing truth, eternal vigilance, liberty, union, equal justice and duty. It is 25-ft long and is suitable for parks, municipal buildings, industrial plants, club facilities, and large lawns. Wood is pressure-impregnated with chemical preservatives as protection against termites and decay. Koppers Company, Inc.
Circle 102 on reader service card

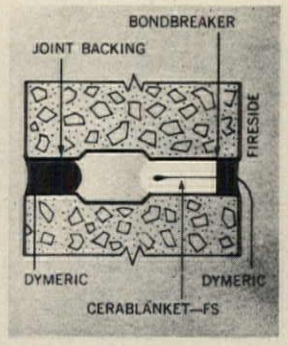
Vienna Cafe Chair, designed in 1876, has been revamped with a '76 back. Bentwood chair comes in choice of wood, cane, or upholstered seat. Thonet Industries, Inc.
Circle 103 on reader service card

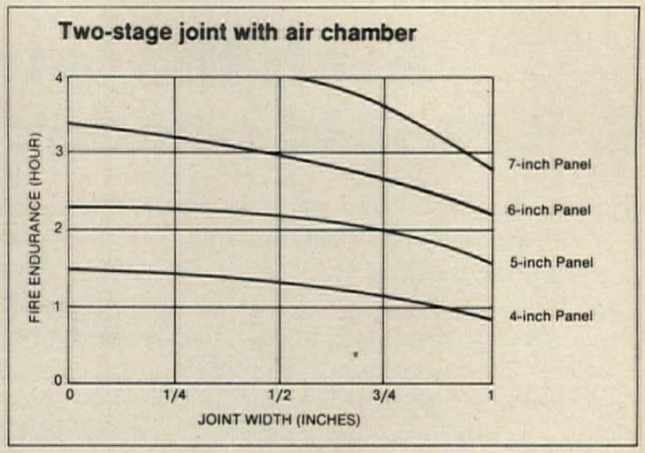
Nylon locking plugs and connectors. Devices feature safety color coding for identification of amperage and prevention of improper mating of differently rated plugs and connectors. Single-screw wiring assembly requires only one screw to completely wire device. Other features include clamptite automatic gripping action, self-sealing cord enclosure, individual wire pockets and true dead front construction. Leviton Manufacturing Co., Inc.
Circle 104 on reader service card

Wood treatment. Said to prevent water damage to wood, Wood Dry is a clear, colorless treatment designed for above-grade application. The product, according to the manufacturer, through a [continued on page 108]

Products continued from page 105

chemical reaction at the cellulosic sites within the wood, reduces water absorption rates and subsequent physical distortion and deterioration. It is neither a coating nor a sealant and treated wood continues to breathe, retaining its strength and natural beauty while reducing splintering, checking, warping, and cracking. Non-toxic, it can be applied at the site by spraying or brushing, or by dipping and pressure impregnation. Coverage extends up to 600 sq ft per gal. Treatment does not interfere with stains, varnish, or oil base paints. Cyclo Sciences, Inc.
Circle 105 on reader service card



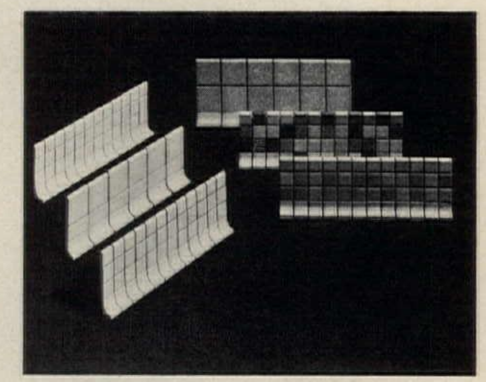


Childrens wate cooler is 33 in. high and floor mounted. Cabinet is made of heavy-gauge, welded steel with a gray hammertone finish and charcoal vinyl removable front panel. A choice of five vinyl finishes is available. Unit may be bolted to the floor to prevent vandalism. Haws Drinking Faucet Co.
Circle 106 on reader service card

Architectural trim for doors, windows, and cabinets for contract use is manufactured in England and warehoused in the United States. Products have received a design award from the Council of Industrial Design in London. Many finishes are available. National Builders Hardware Company.
Circle 107 on reader service card

Fire-resistive joint sealing system consists of a two-part, high-performance sealant and ceramic fiber blanket insulation. According to manufacturer the fire endurance ranged from 19 min. to over four hours during extensive tests sponsored by the Prestressed Concrete Institute. Tremco.
Circle 108 on reader service card

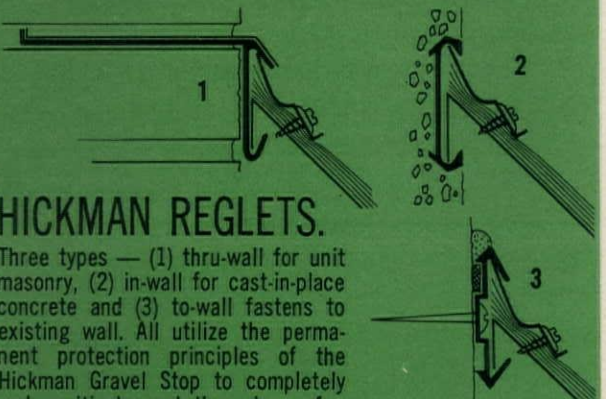
Built-up base features a basic cove base trim piece for finishing off a ceramic mosaic floor or wall installation at the juncture of the floor and the wall. On top of this trim piece are ceramic mosaic field tiles mounted in strips in heights from 4 in. to 10 in. capped off with surface bull nose. United States Ceramic Tile Company.
Circle 109 on reader service card



Built-up base

[continued on page 112]

How to flash roof to wall:



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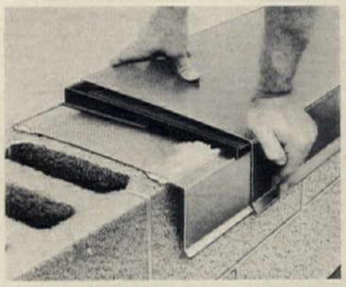

Permasnap Coping Covers are also simple to install. (It has to do with the "snap" in the name, but it's simpler if you see it for yourself.)

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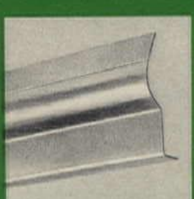

Perfect clamping? Sure. Hickman's patented compression clamp locks down felts, locks out water. Perfect fasteners? Of course. Neoprene-washered screws hold down the clamp, hold out the water. Perfect system? You bet. Nobody's ever found a failure in a Hickman Gravel Stop. And the cost? It's actually less, installed, than gravel stops that don't work as well or last as long. Then you'll specify Hickman for your next roof — new or old? Perfect.

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Marvin Windows

Notices

Appointments

Perry B. Johanson has been elected chairman of the board of Naramore Bain Brady & Johanson, Seattle, Wash. **David C. Hoedemaker** has been elected president and managing partner. Additional promotions are: **Donald L. Berg,** managing associate; **Anna Nissen,** senior associate; **Seth H. Seablom** and **John R. Pangrazio,** associates.

John R. Haaf has been named a full partner of David Wisdom & Associates, Architects, Philadelphia, Pa.

B.B. Michael has been elected president of Kirkham, Michael, Inc., Omaha, Neb. **Thomas A. Terry** has been named a design architect with the firm.

Wm. Eugene Maher has been appointed vice president of Walker/Grad Inc., New York City.

Team Four inc., St. Louis, Mo., has named the following associates: **Mary Breuer, Gary H. Feder,** and **Larry Marks.**

Francis T. Koo has been named vice president of The Spink Corporation, Sacramento, Calif.

Sheldon Joe Bell has joined Kenneth Parker Associates, Philadelphia, Pa.

Seymour Remen, AIA has joined Albert Kahn Associates, Inc., Architects and Engineers, Detroit, as manager of Health Facilities Planning.

The following have been named to serve on the newly formed Management Committee of Gensler & Associates/Architects, San Francisco and Houston, Tex.: **Edward C. Friedrichs, Margo Grant, Antony Harbour, Rodger N. Voorhees,** and **M. Arthur Gensler, Jr.**

Kenneth L. Wuest has been appointed an officer of Daniel, Mann, Johnson & Mendenhall and has joined the firm as manager of the San Francisco Division, headquartered in Redwood City.

John M. Cole, Jr. has joined TLA-Lighting Consultants, Inc., Salem, Mass., as director of design.

Bradley G. Field, AIA has been named corporate director of architecture for Smith, Hinchman & Grylls Associates Inc., Detroit.

New addresses

Koch Hazard Associates, Ltd., 630 S. Minnesota Ave., Sioux Falls, S.D. 57104.

George, Miles & Buhr, 724 E. Main St., Salisbury, Md. 21801.

Jensen & Halstead, Ltd. Architects Engineers Consultants, 55 E. Jackson Blvd., Chicago, Ill. 60604.

Haines Lundberg Waehler has opened an office at Gateway One, Raymond Plaza West and Market St., Newark, N.J.

Richardson Nagy Martin, 4000 Westerly Pl., Suite 200, Newport Beach, Calif. 92660.

Robert Larsen Architect has opened a branch office at Letchworth Village, Thiels, N.Y.

Blass, Riddick, Chilcote, 300 Fabco Bldg., Main at Fourth, Little Rock, Ark. 72201.

Geren Associates, Architects Engineers Planners (formerly Preston M. Geren, Architect & Engineer and Associates) has moved its Fort Worth, Tex. offices to 2100 Fort Worth National Bank Bldg.

Cole Associates Inc., Engineers Architects has opened an office at 9000 Keystone Crossing, Indianapolis, Ind. 46240.

New firms

James Schuemann Architecture and Construction Management, 335 W. Territorial Rd., Battle Creek, Mich.

Perry B. Goldstein, AIA has opened an architecture/planning/interiors practice at 600 Old Country Rd., Garden City, N.Y. with **Michael A. Mosher, AIA** as associate.

Thomas W. McHugh Architect/Designer, 30 E. 54 St., New York City 10022.

Bernard Rothzeid & Partners, P.C. Architects and Planners, AIA, 4 W. 62 St., New York City 10023. **Carl Kaiserman, Peter Thomson, Carmi Bee,** and **Bernard Rothzeid** are officers of the firm.

William L. Fletcher, FAIA, H. Curtis Finch, AIA, and Dale A. Farr, AIA have formed **Fletcher/Finch/Farr & Associates,** Portland, Ore.

Richard E. Adasiak has established **Adasiak Associates Architects,** Pittsburgh, Pa.

[continued on page 122]

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Notices continued from page 116

Haver, Nunn & Collamer is the new name for **Haver, Nunn & Nelson**, Phoenix, Ariz.

Organizational changes

The firms of Richard Dorman, FAIA and Theodore Barry & Associates, management consultants, have merged, with Dorman as chairman of **TBA/Dorman FAIA**, Los Angeles.

R.S. Scott Engineering Co., Inc. of Alpena, Mich. is now **R.S. Scott Associates, Inc. Architects Engineers Surveyors.**

The Office of Bahr Hanna Vermeer & Haecker will be known as **Bahr Vermeer & Haecker Architects, Ltd.**, Omaha, Neb., with the resignation of Robert L. Hanna.

Macomber, Dohr & Van Houten, Architects is the new name of Faragher & Macomber, Architects, Rochester, N.Y.

Pitts Phelps & White of Houston and Beaumont, Tex. will be known as **The White Budd Van Ness Partnership.** Principals are **Robert White, James Budd,** and **John Van Ness.**

Building materials

Major materials suppliers for buildings that are featured this month, as they were furnished to P/A by the architect.

The Commons of Columbus and Courthouse Center, Columbus, Ind. (p. 64). *Architects: Gruen Associates, Inc., Los Angeles, Calif.* Glass: PPG (ASG, skylights). Metal deck: Ceco Corp. Stone: Indiana Limestone. Metal siding: H.H. Robertson. Perforated metal ceiling and wall panels: Soundlock. Flooring: Permagrain wood (Arco Chemical). Carpet: Magee Carpets. Built-up coal tar roof: Philip Carey Co. Aluminum/glass skylights: Roper (Ickes-Braun Glasshouses). Glass fiber insulation: Owens-Corning Fiberglas. Wood and hollow metal doors: Emenco Architectural Metal Products. Rolling overhead doors: J.G. Wilson Co. Air entrance: Air Door, Inc. Typical aluminum and glass doors: Amarlite. Door hardware: Sargent. Hinges: Stanley Works. Complete sound system: Electrical Systems Co. Winch: Beebe Bros. Moving stair and hydraulic freight elevator: Montgomery Elevator Co. Electric distribution: Square D Co. Water closets, wall-hung: American Standard. Lavatories: American Standard & Universal Rundle. Flush valves: Sloan. Hot water boiler: Cleaver-Brooks. Radiators: Vulcan. Unit heaters: McQuay. Chillers: Carrier. Air handlers: Pace. Air diffusers: Barber-Colman.

Job mart

Situations open

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Corrections Architect: Permanent position available for an experienced Corrections Architect. Position available requires registration and 5 or more years correctional facilities experience. Should be knowledgeable in programming, design and overall project management. Background should also include ability to represent the firm in the development of potential projects. We are a well established firm offering career growth and an excellent benefit program. Please send your detailed resume including salary history to: Box 1361-946, *Progressive Architecture.* An Equal Opportunity Employer.

Department Head: The Department of Architecture at Tuskegee Institute is seeking a department head. Appointment to begin Fall 1976. Responsibilities include administration of educational program, teaching and program development. Tuskegee Institute is committed to continuing development of and innovative architectural educational program. Applicants should have prior teaching and professional practice experience. Prior administrative experience is desirable. Rank and salary commensurate with qualifications. Interested persons should send vitae, letter of recommendations & other supporting information to Dean, School of Applied Sciences, Tuskegee Insti. Tuskegee Insti. AL 36088. Applications should be received by 6/15. Tuskegee Insti. is an equal opportunity employer.

Director: Of the School of Environmental Design and simultaneously Chairman of the Department of Architecture in a newly forming Middle Eastern Arab university. Requires masters degree in architecture or equivalent and practical experience in architecture, planning or landscape architecture. Teaching experience and mastery of English essential. Must be interested in and sympathetic to Islamic culture. Send letter and brief résumé to P.O. Box 443, Arlington, Massachusetts 02174, [USA].

Executive Director: The Washington State Council of Architects/AIA is searching for an Executive Director. This is a newly funded position and the person selected will therefore be "breaking new ground". The Council represents the interests of about 600 architects in the State of Washington. Duties will include legislative/governmental agency relations, public relations, internal communications and office and financial management. The initial salary is proposed to be $20,000 per year. Position starts July 1, 1976. If interested, please submit your resume to: Washington State Council of Architects/AIA, South 311½ Occidental Avenue South, Seattle, Washington 98104. ATTENTION: Fred L. Creager AIA, Chairman of Search Committee.

Faculty: Positions are available starting Fall 1976 in architectural design and related subjects on one-year appointment or visiting lectureship. For information write or call Chairman, Dept. of Architecture, Iowa State University, Ames, Iowa 50011: (515) 294-4718.

Faculty Position: Assistant Professor for advanced architectural design studio teaching in combination with lecture course and research work in relevant field of expertise. Qualifications: Master's degree in architecture plus experience combining prior teaching with either practice or contract research. Supply vita, three references, design portfolio and sample publication. Nine month salary of $13,000; level of academic time commitment negotiable according to qualification. Contact: Ms. Patsy Kleypas, Office of the Dean, School of Architecture, Rice University, P.O. Box 1892, Houston, Texas 77001. Equal Opportunity Employer.

Faculty Position: "The Architecture Program at the University of Colorado anticipates a full-time faculty position to begin August 23, 1976. The position involves teaching courses of Mechanical Systems for buildings. Also required will be the ability to teach in one or more of the following areas: 1) Illumination and Acoustics; 2) Life Safety Systems and Life Cycle Costing; 3) The Design Studio. Masters required, registration, teaching and practical experience desired. Send resume to Robert C. Utzinger, College of Environmental Design, University of Colorado, Denver, Colorado 80202. The University of Colorado at Denver is an Equal Opportunity/Affirmative Action Employer."

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Volunteer Peace Corps/VISTA: Architects/ planners needed for Peace Corps projects in

[continued on page 126]

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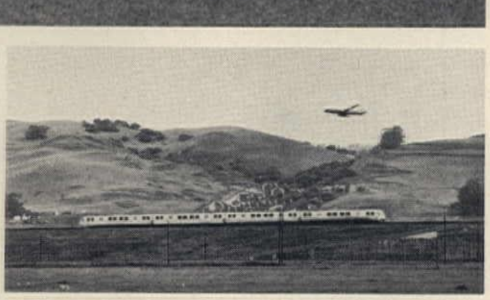

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Job mart continued from page 124

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Architect/Designer: 29, married. B. Arch., Cooper Union. Varied experience: urban and rural living, architects' and consulting engineers' offices, fine arts, grass roots rural community planning and development. Seeking responsible, permanent position leading to registration. Resume, references upon request. Will relocate. Reply: Alan Chack, Box 28 RD 2, Mifflintown, Pa. 17059.

Architect/Project Designer: Registered, four years diversified experience in medium and large scale projects. Most recent projects include a high-rise condominium and the studio/office facilities for a state television network. Two additional years teaching experience. Seeking position with design-oriented firm. Willing to relocate. Box 1361-948, *Progressive Architecture.*

Faculty Position: Registered architect seeking full time permanent teaching position beginning fall 1976. Four years professional experience and two years teaching experience including one in Europe. Previous teaching responsibilities include undergraduate basic design, computer graphics, construction. Will also consider one year sabbatical leave vacancy or similar position. Box 1361-949, *Progressive Architecture.*

Registered Architect/Designer: B. Arch., M.C.P. in U.D. (Harvard), 35, family. 5 years architectural, 3 years planning agency experience, including full architectural services, planning, urban design, public speaking and media. Interested in design position, U.S. or overseas. Reply Box 1361-950, *Progressive Architecture.*

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It is not necessary to send payment with order — use the Reader Service Cards in the back of this issue. Simply circle the appropriate number or numbers on the card, add your name and address and mail. Your order will be forwarded immediately to the publishers for shipment to you.

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2 New Uses for Old Buildings

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illus., 2nd edition, 1972 . . . $26.50

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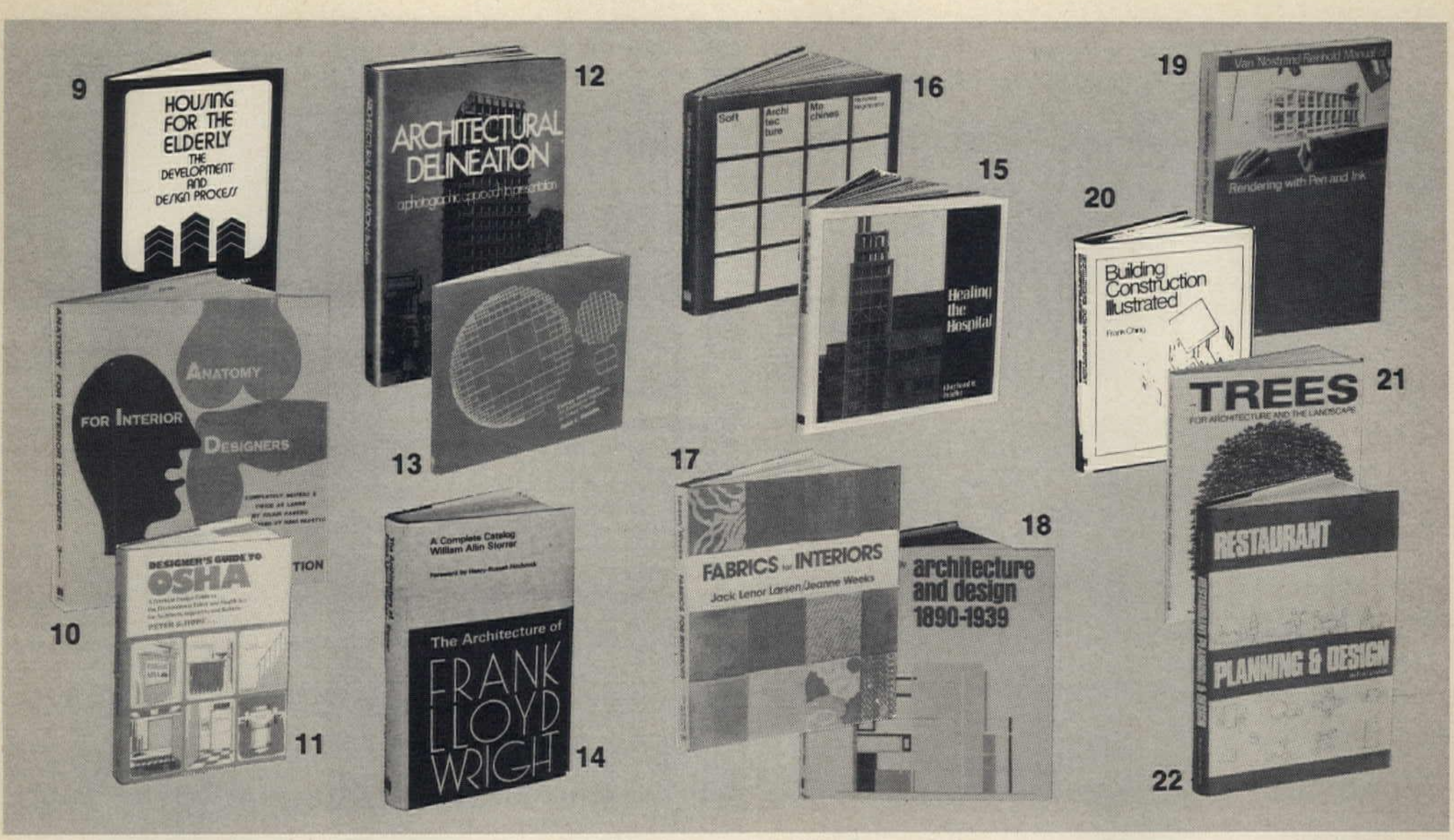

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This book provides ready-to-use guidelines for producing high quality housing for older Americans. It shows the kinds of housing that meets the physical, social and perceptual needs of senior citizens. Emphasized are types of shelter, environments and services required by independent elderly tenants as well as those who need limited health and social services.

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Edited by Timothy Benton and Charlotte Benton; with Dennis Sharp, 264 pp., illus., . . . $12.50

This concentrated study of the rise of the Modern Movement in architecture and design covers the half century during which attitudes toward these practical arts were changing dramatically. Based solely on original source material, this book contains extracts from the writings of such influential men as: Adolf Loos, Henry Van De Velde, Hermann Muthesius, Walter Gropius, Le Corbusier, Mies van der Rohe, Bruno Taut, Louis Sullivan, and Frank Lloyd Wright.

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19 Rendering With Pen And Ink

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