PROGRESSIVE ARCHITECTURE

A Reinhold Publication/November 1970

Designing for Children

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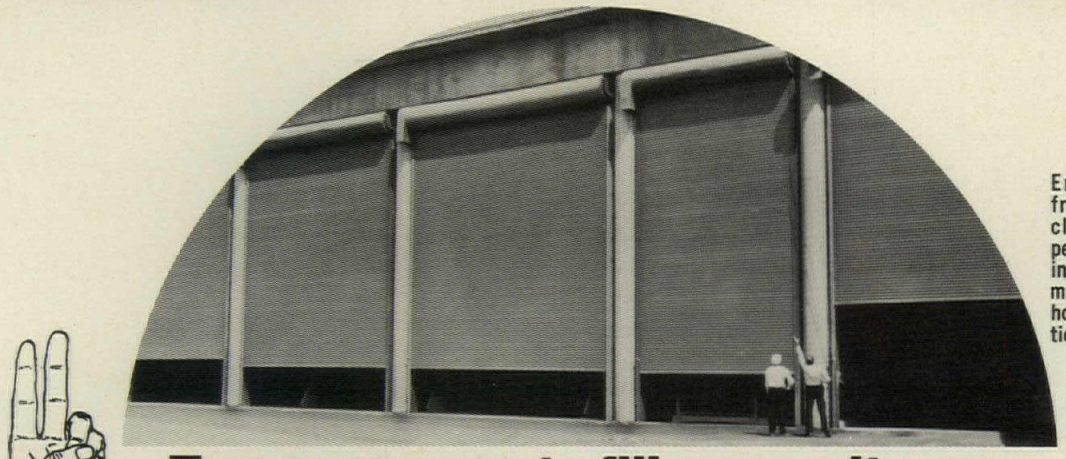
KINNEAR
ROLLING DOORS & GRILLES



Entryways or store fronts can be tightly closed with solid, dependable Kinnear Rolling Doors. Available for manual, chain or crank hoist, or motor operation.

Two sure ways to fill a security gap

Stores opening on an enclosed shopping mall are ideally protected by Kinnear Grilles where "see through" protection is often a plus for display and climate control.

Weather, fire, debris and unauthorized people all offer a real challenge to building security. Kinnear recognized these challenges years ago and designed doors and grilles to effectively answer the protection needs of buildings for retail business, industry, entertainment, education, public service and many other enterprises.

The compact coiling capabilities of the interlocking slat curtain developed by Kinnear remains the most all around reliable system for highly efficient metal doors — and it's never been excelled! The combination of positive, quick operation and compact "above the opening," out-of-the-way storage has proven the effective solution for service, space economy and ready protection.

Where a doorway or store front needs "solid" coverage, Kinnear Rolling Doors form the ideal barrier. Here is where the rugged quality of Kinnear pays off with construction features that defy wear and weather. They are adaptable to a wide range of big or small openings. But they also present a neat, clean appearance that harmonizes with modern building architecture.

If vision or ventilation are to be maintained, Kinnear Rolling Grilles will discourage trespassers while still keeping displays in view of the passer-by and after-hour shopper. Upward acting Grilles are completely hidden when open. No floor track to collect dirt or offer a stumbling hazard is required. And, there's a choice of Grille designs to fill various needs!

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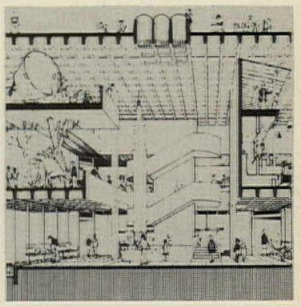
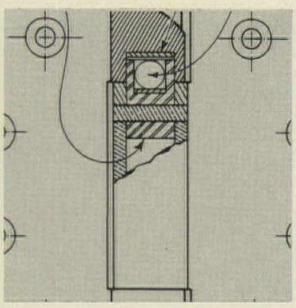
Fortress walls of Jacksonville Children's Museum enclosed "please touch" exhibits. Photo: Judith Gefter.

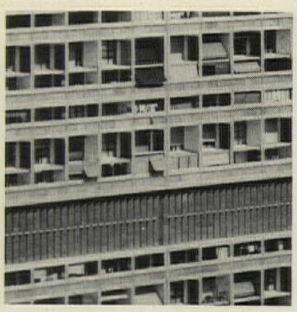
FEATURES

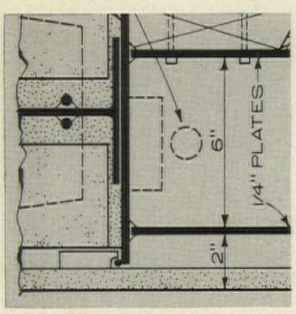


INTERIOR DESIGN DATA

MATERIALS AND METHODS







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YOUR POINT OF VIEW

More Modest Design Awards

Dear Editor: Notification of this year's P/A Design Awards program prompted our review of 1969's five awards and thirteen citations. Only one premiated submittal was less than a major, multimillion dollar project.

If the program's purpose is "to encourage the designers and owners of the projects so honored . . . ," then we submit that it's the modest projects that need encouragement and recognition.

Besides, our submittal this year is a small job.

William Corlett, FAIA
San Francisco

(Please watch for the Design Awards Issue Jan. 1971. The majority of the winners were small jobs. Ed.)

Trip to Washington Correction

Dear Editor: Thanks for the nice article on HUD meeting (P/A, Aug. 1970, p. 39). There was one item that was not quite accurate but I think I understand how it came up. This had to do with the junket to Washington during the Convention. Actually the New York Chapter did not organize it. People in Boston and some of the members of the Architectural League were really responsible.

David F.M. Todd
President, New York Chapter AIA

Systems Confusion Confusing

Dear Editor: In 1959 the Canadian Standards Association published *Modular Co-ordination in Building* which assigned the following hierarchy to building systems: 1. system, 2. subsystem, 3. component, 4. assembly. This classification was made an integral part in Toronto's significant school building systems project, the Study of Educational Facilities (SEF). For no apparent reason Guy Rothenstein chooses to reverse the last two elements in his "Systems Definitions" (P/A, Sept. 1970, p. 100). As you probably know, there is already an over-abundance of confusion in the area of systems building, and Rothenstein's evidence of further inconsistency does little to help this problem.

As a midwesterner I find it strange that my first letter to you be partially on behalf of Canadian colleagues, but I do sense both an academic and practical issue at stake. And fall is the season in which the maple leaf displays its finest colors.

Don Rezab
Western Illinois University
Macomb, Ill.

Index for P/A

Dear Editor: I have a few years of Progressive Architecture magazines in my bookcase. Locating a particular project or an article was often a time consuming task until I "cataloged" the projects by cutting out the monthly tables of contents and filing them in a folder. Now it is fast and easy to find what I want.

I want to thank you for the work you put into publishing such an interesting magazine.

Girish Ghatalia
Toronto, Ontario

(E.S.P. at work. We plan to publish a bi-annual index within the next month or two, which should relieve you of the troublesome task of clipping out the contents page. Ed.)

Premiated Defined

Dear Editor: Thank you very much for advising us that our project did not get premiated.

Apparently, we understand that our project did not win any awards, but the meaning of the word "premiated" has aroused a debate in our office. Would you be so kind as to advise us of the meaning of the word, since we have looked in our office dictionary and cannot find such a word.

William N. Bodouva, AIA
New York, N.Y.

("Not premiated" is an archaic phrase meaning you lost, otherwise we send a telegram. Seriously, the derivation is from premium, also premia: a reward or recompense for a particular act. Please forgive our use of language. What we really meant to say was that we very much appreciate your entering the competition and regret that you did not receive a telegram. Judging is done by five outside experts who, after premiating, leave us with the task of returning the projects. Ed.)

Engineering Mentality

Dear Editor: Once again your "engineering mentality" is showing. You talk so proudly of your recognition of human needs and the need for closer interdisciplinary actions to help this poor Mother Earth that we inhabit. Then you actually recognize and honor an aluminum and glass breadbox located on a "rolling, wooded 210 acres located 20 miles northwest of Washington, D.C."

I am of course, referring to the Comsat Laboratories (P/A, August 1970, p. 70). Stated is the fact that the landscape retains the look of the local countryside. Possible that remains to be seen, but what type of countryside is left with that metal, gleaming giant perched on the land like a vulture waiting to pick the bones of the remainder of the 210 acres and the surrounding lands.

Please, in the future, remember that this is the only place humans have to live and it is rapidly disappearing, thanks to the accepted thinking of our leaders today.

Roy H. Pender
Nashville, Tenn.

Yale Unfair?

Dear Editor: It is now almost a year since the results of your Annual Design Awards were published (P/A, Jan. 1970). At that time I wrote you, expressing my righteous indignation at the choice of some of the winning entries.

My concern was with the ugliness and incompetence in planning and design, and in the nihilistic trend that the jury was evincing a predilection for.

Since my serious concern then was, among others, with the relation of a juror and a couple of winners of the 1969 contest, I am even more seriously concerned now with the same three individuals, who in somewhat different roles have shown an ethically questionable interrelation in the case of the Yale Mathematics Building Competition.

I have most carefully examined all the program conditions of said contest and observed in the winning design at least 38 malfunctioning items or deviations from the program, some of which are so fundamental, that it would be well nigh impossible to proceed with construction of the building without major changes.

I feel very strongly that the professional media should have something to say about it, because the welfare of the entire architectural milieu is at stake.

Joshua D. Lowenfish, AIA
Bronxville, N.Y.

Giving Credit

The correct credit for the Marshall Field Project (P/A Sept. 70, p. 46) is: Loebl Schlossman Bennett & Dart and C.F. Murphy Associates, Architects.

Ben Schnall was the photographer for the Caudill, Rowlett, Scott office building (P/A, Sept. 1970, p. 104).

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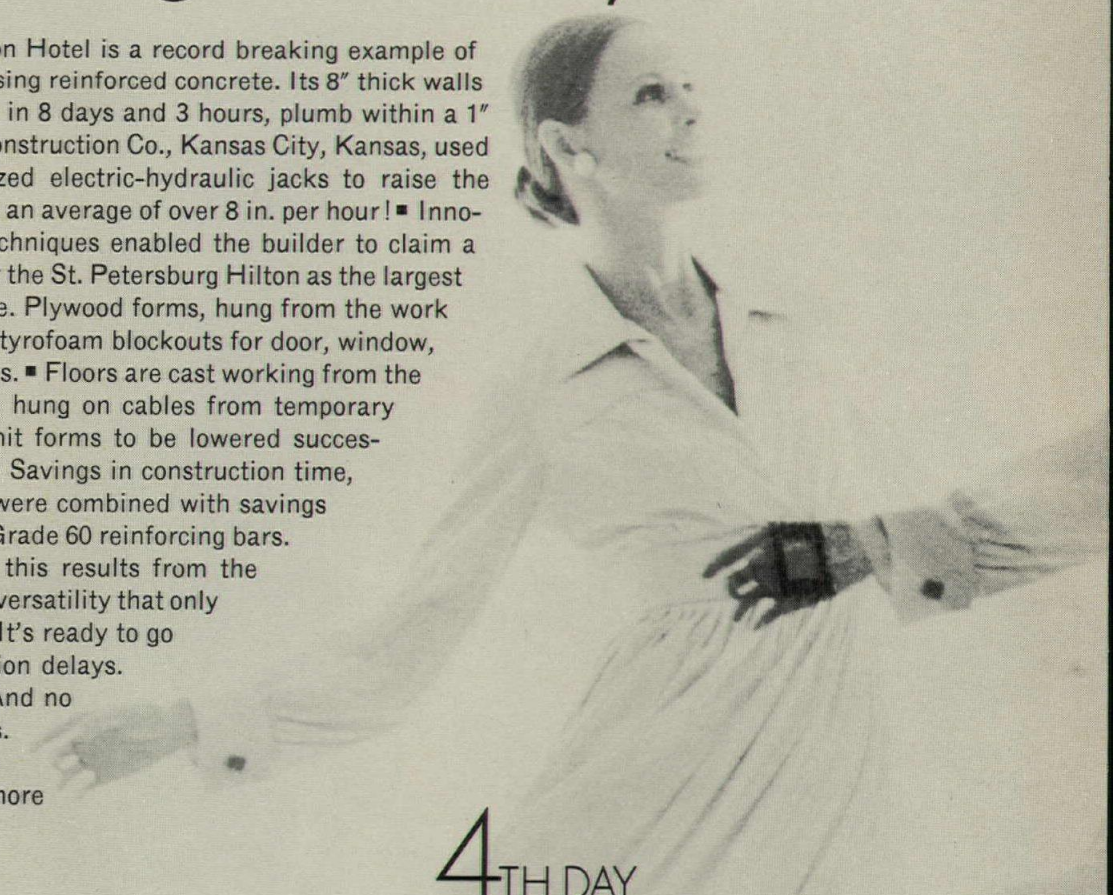
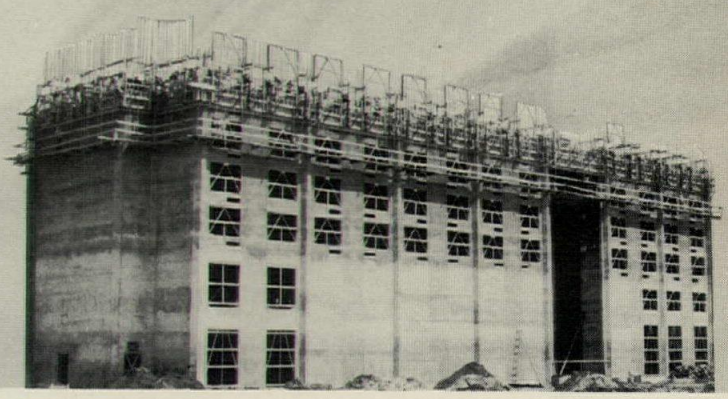
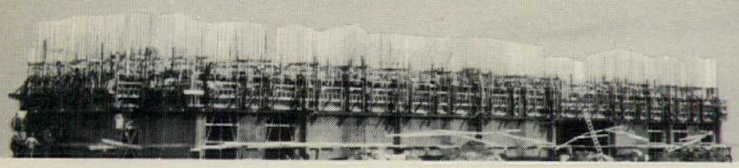


4TH DAY



2ND DAY



Owner: Associated Developments, Akron Ohio. Architect: Curtis & Rasmussen, A.I.A., Akron, Ohio. Structural Engineer: Hale & Kullgren, Akron, Ohio. General Contractor: Associated Biscayne, Miami, Florida. Sub-Contractor: R. D. Monroe Construction Co., Kansas City, Kansas.

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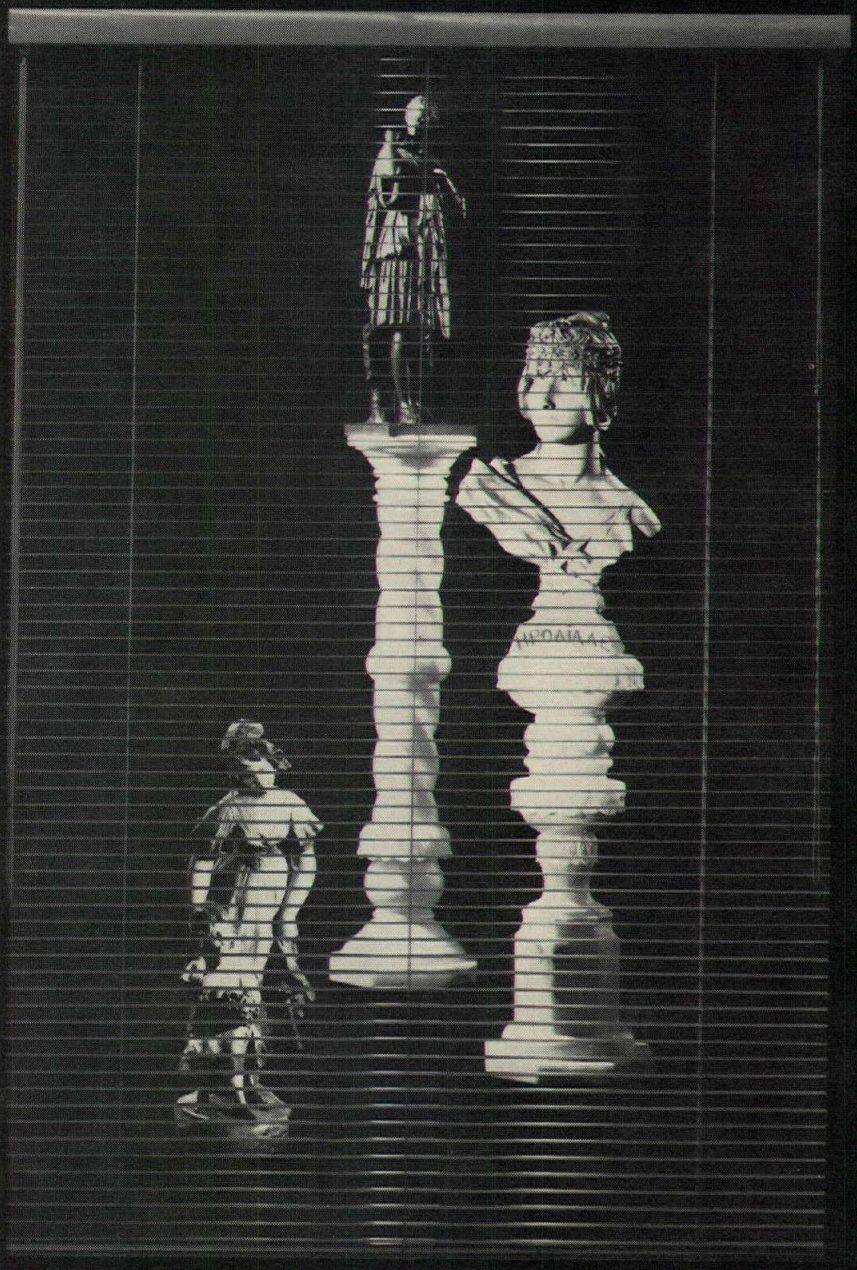

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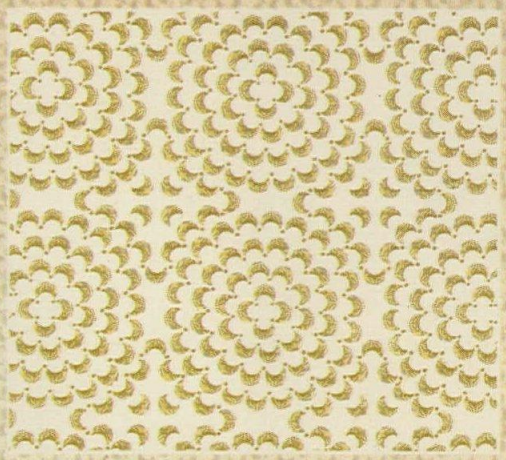

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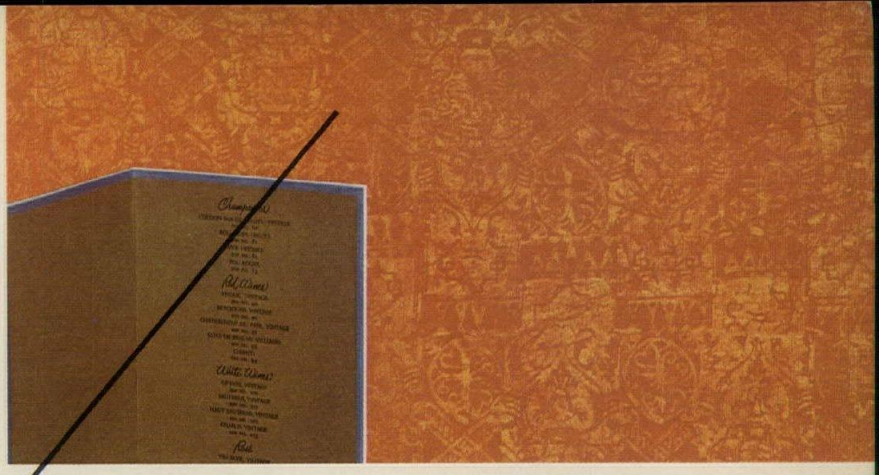

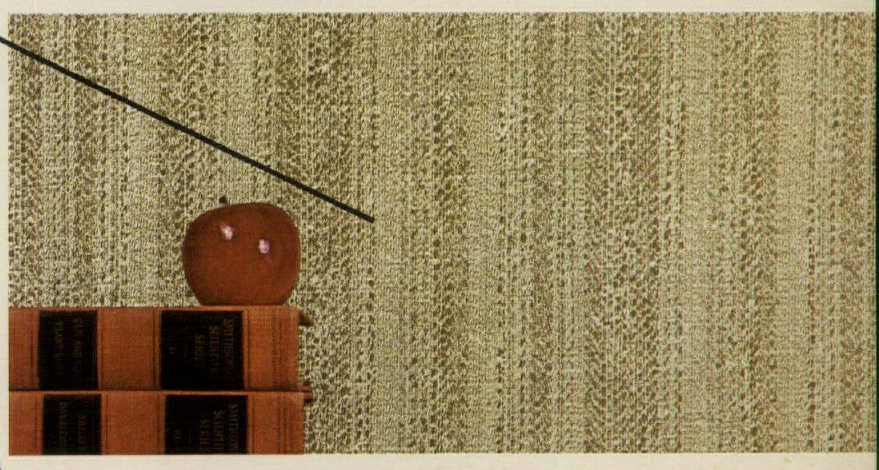

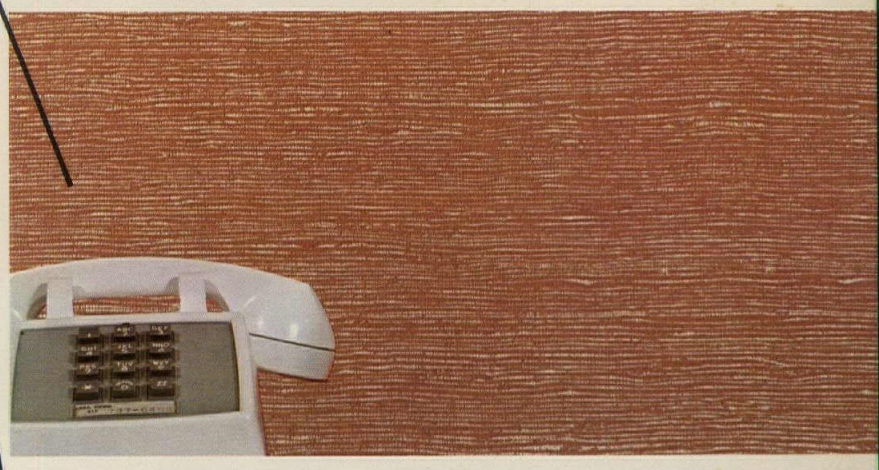

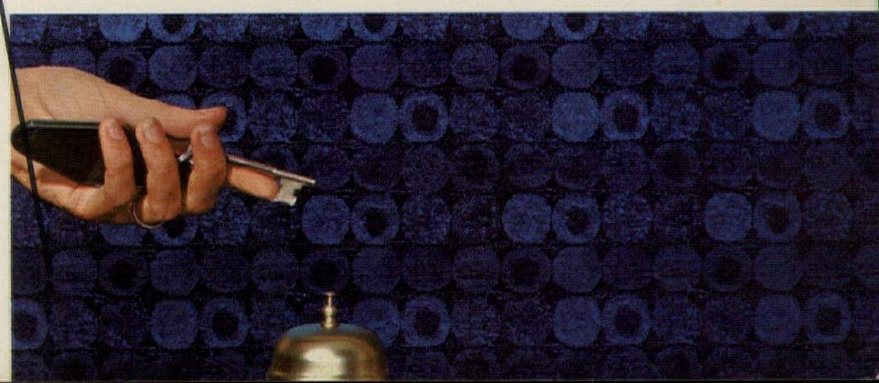

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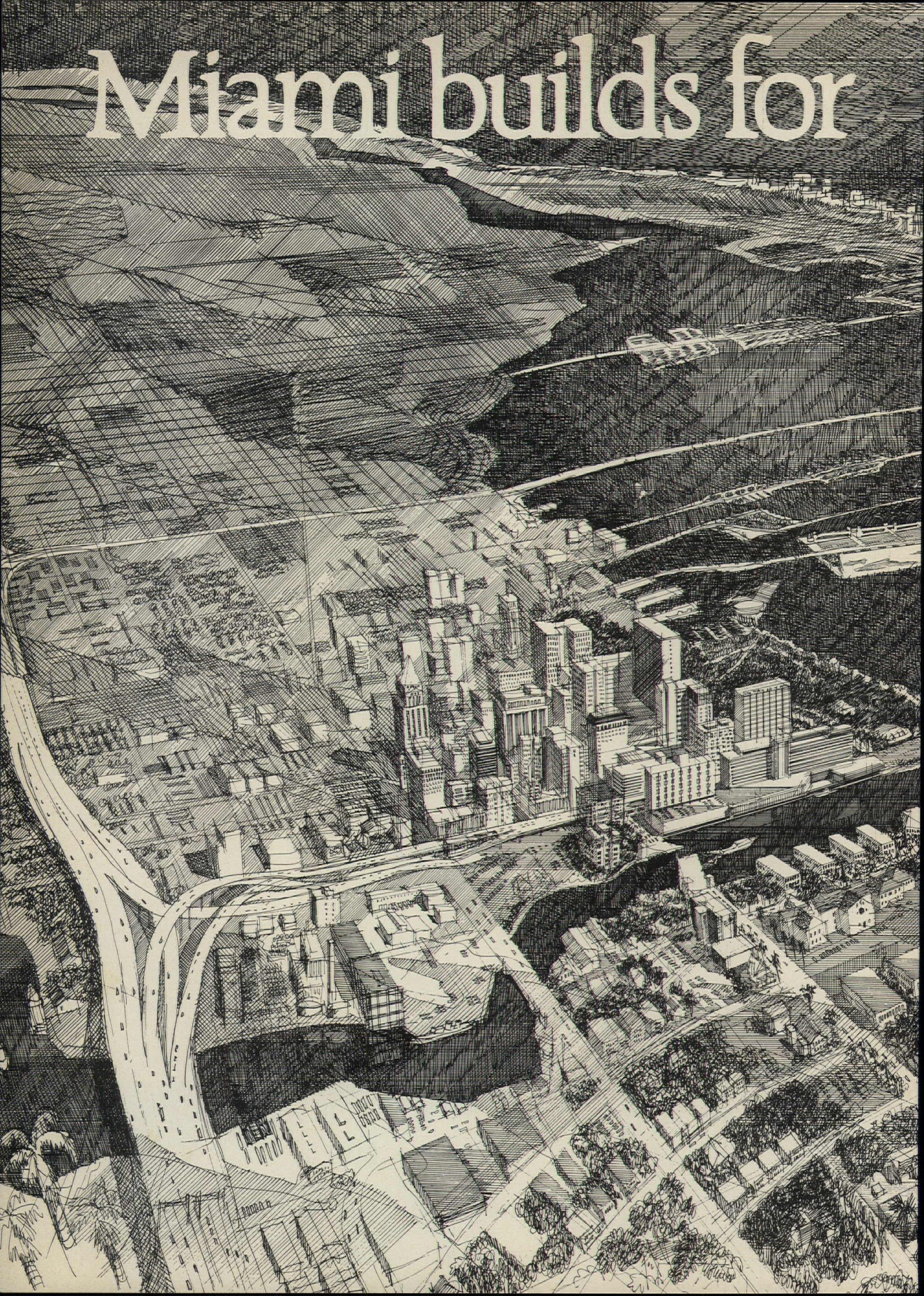

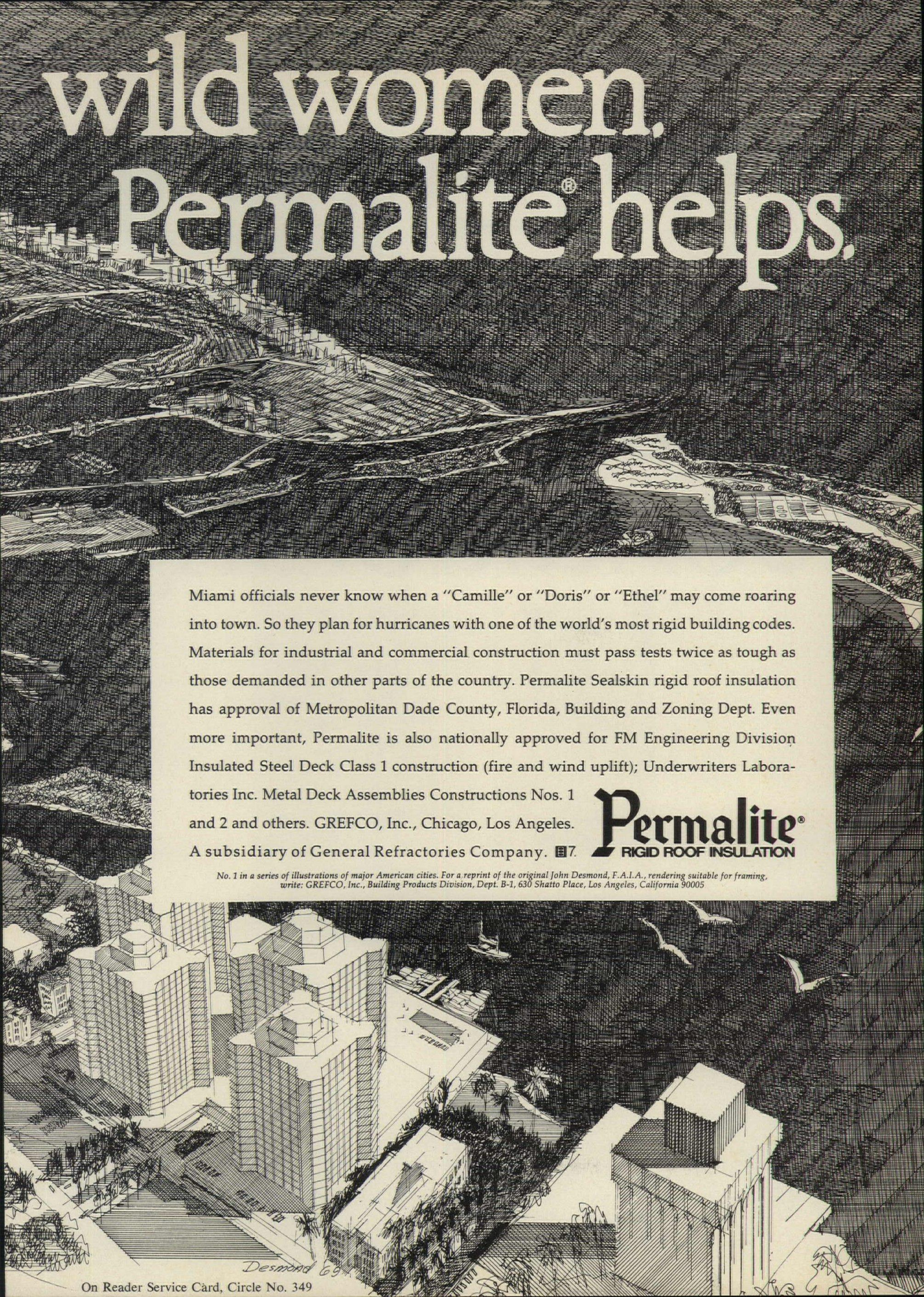

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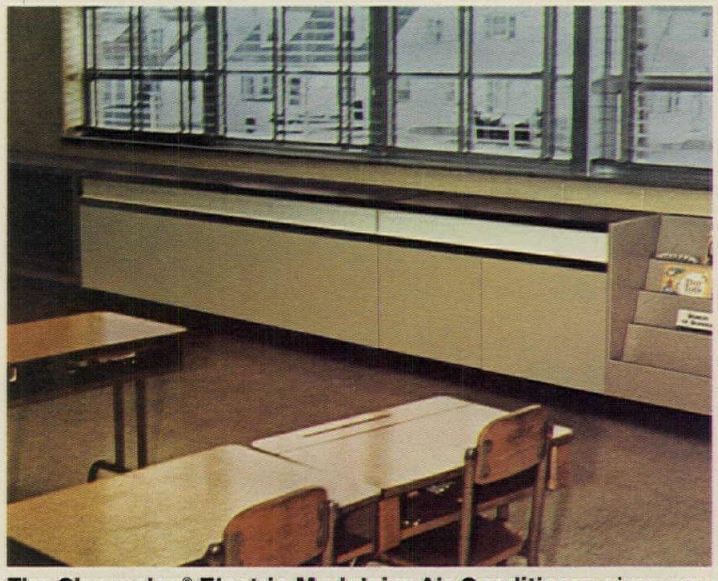

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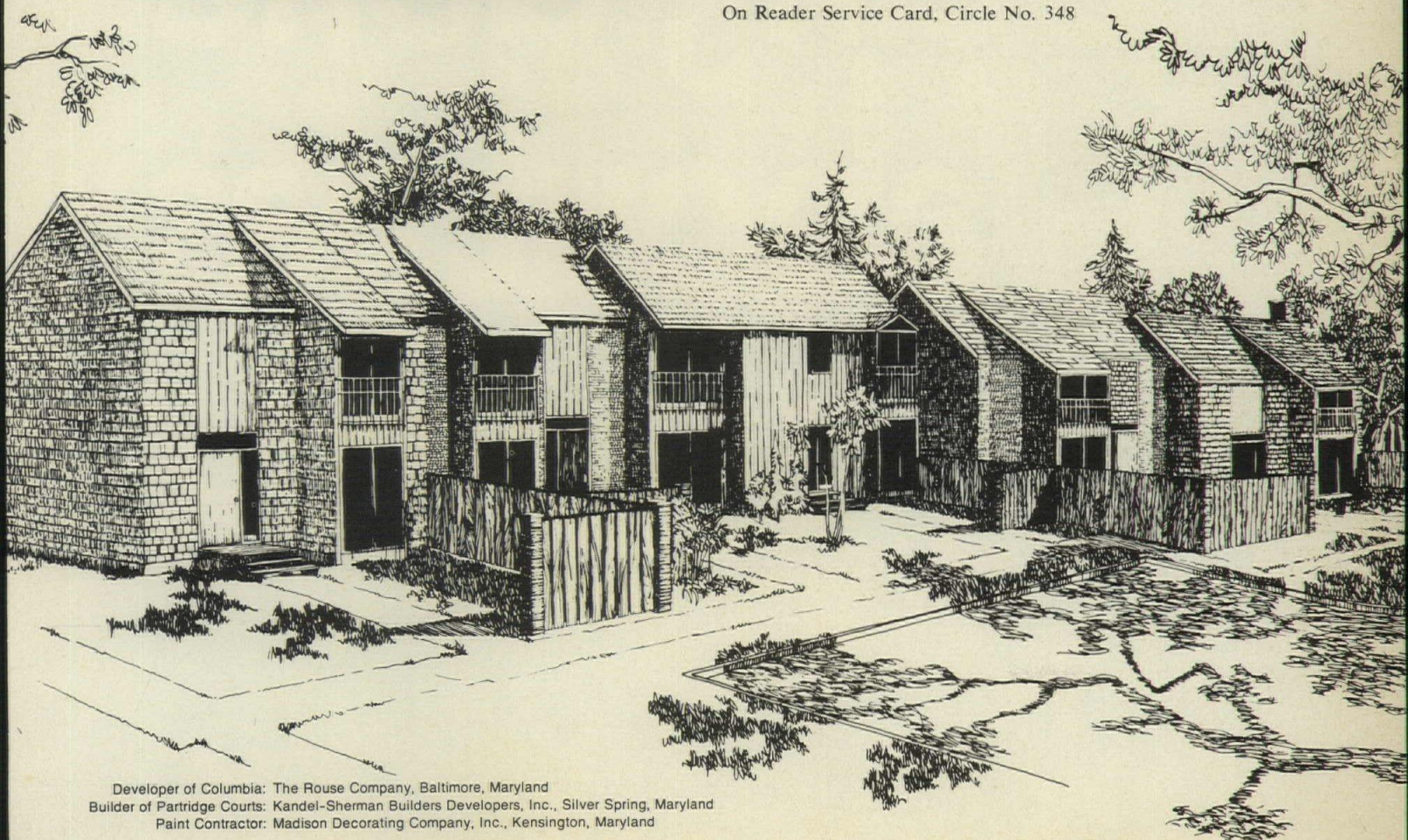

Developer of Columbia: The Rouse Company, Baltimore, Maryland
Builder of Partridge Courts: Kandel-Sherman Builders Developers, Inc., Silver Spring, Maryland
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What's being done about gas supply.

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What's happening is this: In certain areas, the demand for additional natural gas has outrun the *present* ability to supply. Consequently, a number of utilities which have received requests for new large industrial loads have had to turn them down. These shortages are due partly to increased demands for natural gas—such as in the effort to fight air pollution—and partly to the fact that gas is now being consumed faster than new reserves are being developed.

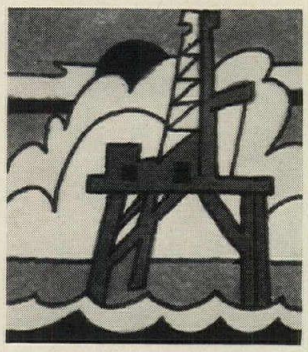
This does *not* mean the country is running out of gas. (In fact, geologists estimate that proved and potential supplies are over 70 times our present annual consumption rate.)

It does mean both the industry and the regulatory authorities must work together to stimulate exploration, to reverse the present imbalance between supply and demand.

It means regulatory authorities must ensure a realistic approach to field prices that will provide the necessary incentive to an expanded exploratory effort in the continental United States—onshore and offshore. It means a huge investment by producers and pipeline companies to bring gas to market from fields as far away as Alaska.

And it means the gas distribution industry must work to accelerate these exploration efforts, and search for other ways to supplement our present gas supply, as well as use it more efficiently. Described on the following pages are six of the ways we are trying to do just that.

1. The gas is there. The problem is getting it.



Right now the estimated proved reserves in this country come to 275 trillion cubic feet. Potential supplies should add another 260 trillion cubic feet, for a total of 535 trillion cubic feet. These reserves alone are over 25 times the present consumption rate of 21 trillion cubic feet per year. Furthermore, comprehensive geophysical estimates indicate an *additional* domestic potential of 967 trillion cubic feet.

Nevertheless, the rate of consumption has been rising sharply. Also, gas is harder and more expensive to reach than it was years ago.

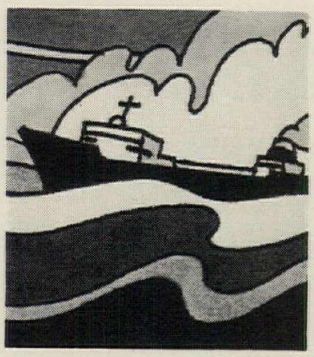
For example, offshore, where average discoveries have been much more substantial than onshore in recent years, drilling has been hampered by high costs, the need to drill deeper and deeper, and delays in the sales of new leases by the federal government. This only underscores the fact that the gas supply problem is one of incentive and technology rather than resources.

2. A billion dollar pipeline from Canada.

While expanding the search for new and greater domestic gas reserves, the gas industry also needs to make every effort to tap the potential elsewhere. Projects now in the planning stage envision a $1 billion pipeline to tap the gas reserves in Canada's Northwest Territories. Already under way is a $400 million pipeline to bring in gas from recent discoveries in Alberta.

While huge investments are needed, such new pipelines could provide our customers with 1.5 billion cubic feet of gas per day from Canada within a few years. By constructing an even costlier pipeline system from Alaska, we can deliver several hundred trillion cubic feet of gas where it's needed. Finally, there is now an active exploration program off Nova Scotia where exploratory permits have been granted for more than 260 million acres. During the next few years, $100 million will be spent in this program.

3. The promise of packaged gas.



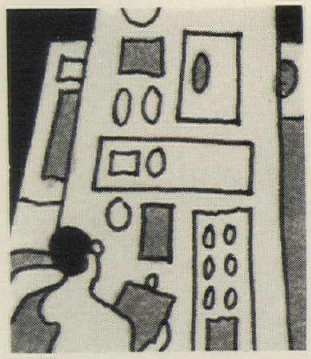
Just as pipeline technology ended dependence on local gas, LNG, liquefied natural gas, makes this form of energy an international commodity. Because LNG is only 1/600th the volume of natural gas, it can be transported easily across the oceans in cryogenic supertankers.

This means we shall be able to draw upon reserves in South America, Africa and other parts of the world. The reserves in Algeria alone range from one-fourth to one-third those of the United States. While international contracts for importing LNG involve high risk and cost factors, a number of long-term agreements have been signed to bring significant volumes of gas to East Coast ports.

This supplemental supply from overseas can be stored conveniently, so that LNG is being used more and more often for "peak shaving."

THE GAS SITUATION

4. Natural gas that isn't natural.



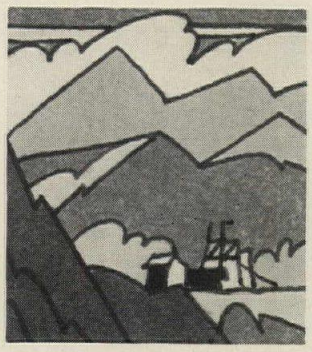
What makes natural gas desirable is not the fact that it is "natural," but its particular chemistry. As part of its long-range research program, the gas industry has been looking into the possibility of producing a pipeline-quality gas, methane, from coal or oil. Although synthetic, the methane would be fully interchangeable with natural gas.

This "unnatural" gas, made from coal, is already being produced by a pilot plant financed jointly by the American Gas Association and the federal government. With a major investment for research at this and larger-scale facilities, we shall have a practical, economically viable conversion process—using any type of coal.

Once this is done, it will open up a major new source of supply for natural gas users. Because coal is abundant and widely scattered geographically, the importance of our research effort in meeting future needs is inestimable.

THE GAS SITUATION

5. New technology to boost gas supply.



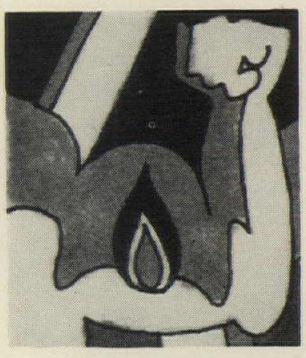
Much of the natural gas reservoir in this country has been unavailable because we couldn't get at it without deep drilling. In West Virginia, for example, only 15% of its roughly 100,000 cubic miles of sediments has been tested. Now two ultra-deep wells are being drilled in the Appalachian basin. These and other deep wells—over four miles deep in the Southwest—will increase the supply of gas for delivery by major pipelines.

Offshore drilling has also benefited from new technology. Less than ten years ago, drilling in the Gulf of Mexico was limited to water depths of 300 feet or less. In the past four years, depths of 600 feet have been explored. And today, drilling in water depths up to 1500 feet seems entirely feasible.

In another research development, nuclear detonation deep underground has been designed to fracture rock which holds large supplies of natural gas. The Atomic Energy Commission and the Gas Industry are cooperating in these experiments.

THE GAS SITUATION

6. Getting more energy out of gas.



Despite all these efforts to increase the supply of natural gas, it is sound economy as well as conservation not to waste it.

In some industrial direct-heating applications, for example, modern gas-fired infrared equipment has demonstrated dramatic savings in gas. Recycling exhaust systems, improved insulation, submerged combustion, continuous-fire kilns, modular boilers, industrial preheating, and oxygen-enriched gas-fired systems are other methods of conserving natural gas.

Overall, new technology which makes more efficient use of energy must offset the increasing demand for clean-burning natural gas.

This makes sense in purely dollar terms as well. The cost of all forms of energy is increasing. The cost of supplementing our gas supply—of getting at the gas and making it available—is increasing, too. As a result, the final cost of natural gas to the user will obviously depend not only on price but on how efficiently it is used.

AMERICAN GAS ASSOCIATION, INC.

Levolor Rivieras give the Westinghouse headquarters building a new outlook.

They're the new Riviera design by Levolor. The Alcoa® aluminum slats are much narrower than conventional blinds. And you can control the daylight and view to a degree never possible before, simply by rotating the "Magic Wand." This fingertip control is demonstrated (above) in an executive office in the new Pittsburgh headquarters of the Westinghouse Electric Corporation.

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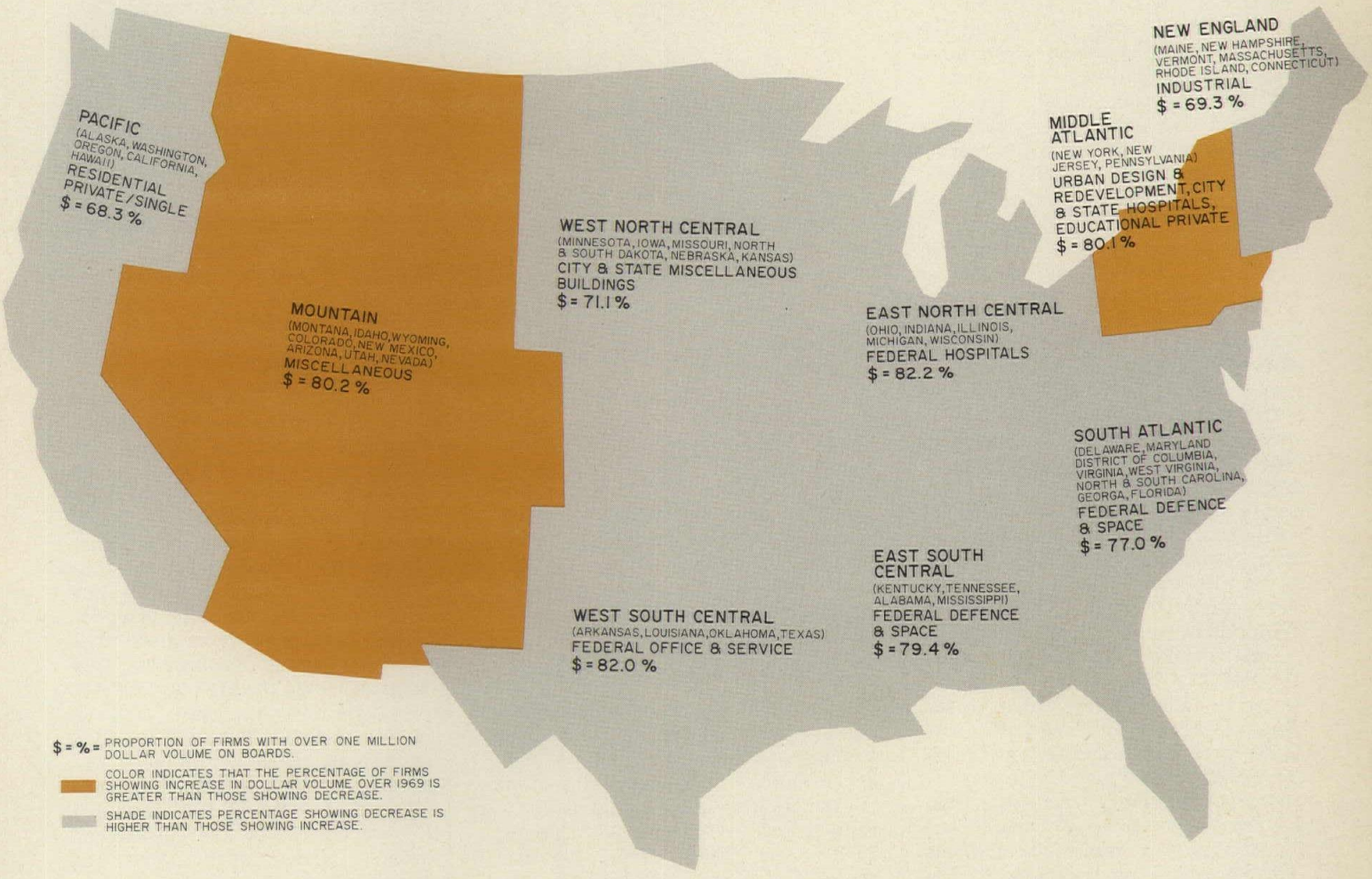
Change for the better with Alcoa Aluminum

ALCOA



Economic Forecast

The Year of Reckoning

No architect will need to be told much about the current economic picture. This is the year when President Nixon's 1969 economic "game plan" to cut inflation was undoubtedly felt by all sectors of the economy, including architectural firms. The plan called for Federal spending curbs, tight budgets and a stringent monetary policy. Although construction industry was severely affected a year ago, architecturally designed construction still in the project phase had not shown the bite yet. Even now, respondents to P/A's 1971 survey report a 5.8% lead as of September 1 on their total dollar volume for 1969, with total anticipated 61% higher dollar volume by year end than last year. Nevertheless, figures indicate that firms — usually in small and medium sized range — showing a decrease in dollar volume are in the majority. Yet large as well as small offices have been hit by the unique compound effect of Nixon's game plan that for six months caused corporate profits to go down, employment and inflation to go up. In an interview reported in the New York Times, Richard Roth Jr. of Emery Roth & Sons (reputed to have done $1.5 billion volume last year) stated about the current volume of work: "It's a disaster, to be perfectly honest." But the problems felt by large offices are more serious for small firms. As Charles Moore stated, the difficulty is "that people don't pay their bills," so that the little office has outstanding bills, with consultants demanding their payments in turn.

P/A's Survey for 1971

In compiling its annual business survey, the only one in the country that forecasts architecturally designed construction for the coming year, P/A sent a questionnaire to 5000 readers. By the deadline responses from 1002 firms had been received, a broader base than last year's response (618). The largest percentages of response — in ranges of 17.7% to 19.6% — were from the Middle Atlantic, East North Central,

South Atlantic and Pacific regions. The smallest percentages (ranging from 3.9% to 6.3%) were from New England, West North Central, East South Central and the Mountain regions. The majority (55.8%) of the offices responding seems to comprise one to four persons, who control 19.7% of the total dollar volume of business. The large firms (25 plus) represent only 4.6% of firms reporting, but control 27% of the business.

Dollar Volume Trends

The inflationary cutback measures have had an effect nationwide on firms, but actually may not be as crucial as some might think (Table 1). While 43.2% of the respondents reported a decrease in business last year, close to a third (34.8%) reported an increase and about 22.5% stayed the same. Of those reporting a decrease, 64.3% had a decrease of less than 50% and 35.7% had a decrease of over 50%. Of the third reporting an increase, 57.4% increased their work less than 50%, while 42.6% increased their work over 50% (of this group 9% increased their dollar volume by 100%). This is less than last year's results when 57% of the firms reported an increase in dollar volume of work over the previous year, and of those firms, over half reported work increases of 50–100%.

Comparing small firms (less than five employees) to large firms, it was found that the majority of firms (60.7%) reporting a decrese of 50–100% in volume were small firms. Yet small firms (64.4%) were in the lead of the firms who reported an increase of 50–100%.

In asking architects their dollar volume for 1971 construction, P/A found that 55% of the firms have a dollar volume in the $1–$10 million range (a drop from last year when almost two-thirds of the firms fell in the $1–$11 million volume range); 14.3% of the firms have a total dollar volume in the $10 – $25 million range and 7.1% top that (Table 2).

Table 1

Work on Boards, September 1970

Change from 1969	Firms Reporting Change Increase	Decrease
LESS THAN 50%	57.4%	64.3%
Fewer than 5 employees	47.7%	50.4%
5 or more employees	52.3	49.6
50 to 100%	33.6%	32.8%
Fewer than 5 employees	64.4%	60.7%
5 or more employees	35.6	39.3
Over 100%	9.0%	2.9%
Fewer than 5 employees	48.1%	63.6%
5 or more employees	51.9	36.4

Geographical Distribution of Work

Over 82% of the firms in the East North Central and West South Central regions have more than $1 million volume. The Mountain, East South Central, and Middle Atlantic regions are close seconds having 79–80% of their firms in that range. The West North Central have 11.9% of the firms doing over $25 million of business, while New England has the greatest percentage (19.4%) of the firms in the under $500,000 range.

Regarding proportionate increases and decreases in work over the last year, (Table 3) the Mountain region leads in increase in volume (50% of the firms have more work). The Middle Atlantic states come next with 41.2% of the firms reporting more work. The greatest percentage of firms showing a decrease in work are in New England (52.6% with only 29.8% of the firms showing an increase) and the East North Central region (49.2%). All regions except Mountain and Middle Atlantic have a higher percentage (36.7–52.6%) of firms showing a decrease in volume over last year than firms showing an increase.

Types of Buildings Presented

According to the P/A survey (Table 4) the greatest number of architectural firms responding (47.4%) are involved in commercial low-rise buildings, with residential private/single buildings next, followed by government sponsored educational buildings and private residential low-rise. These results are similar to last year's findings including the category with the *least* number of firms involved — defense and space. The building type expected to yield the highest total dollar volume for this year is educational construction for state and local governments, with a billing of $1,282,300,000. (One out of five firms is involved in this type.) Also near that billion dollar mark are commercial low-rise, commercial high-rise and residential low-rise (not including public housing) all in the $800 million range. City and town planning is not to be ignored: together community planning and design (non-governmental) and urban design and

Table 2

Distribution of the Work for 1971 Construction Among Architectural Firms

Total Amount of Work Being Done for 1971 Construction	TOTAL U.S. FIRMS	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
Under $500,000	11.7%	19.4%	9.2%	10.0%	5.1%	14.3%	10.3%	7.0%	5.1%	17.2%
$500,000-999,999	11.9	11.3	10.7	7.8	23.8	8.7	10.3	11.0	13.7	14.5
$1,000,000-9,999,999	55.0	53.3	54.2	62.4	47.3	56.3	61.3	61.0	59.0	47.1
$10,000,000-24,999,999	14.3	9.6	15.7	16.3	11.9	9.9	18.1	14.0	18.8	15.0
Over $25,000,000	7.1	6.4	10.2	3.5	11.9	10.8	*	7.0	3.4	6.2

*Amount insignificant; less than 0.1%

Table 3

1970 Volume of Design Work Compared to 1969 Volume

Geographic Region			About the Same
New England	29.8%	52.6%	17.5%
Middle Atlantic	41.2	40.0	19.4
East North Central	30.2	49.2	20.6
West North Central	30.2	47.2	22.6
South Atlantic	36.1	43.7	21.0
East South Central	23.5	44.1	32.4
West South Central	32.2	36.7	31.1
Mountain	50.0	34.6	15.4
Pacific	33.3	43.0	23.6

redevelopment (including public housing) bring in a dollar volume of $1,168,500,000.

Who is Getting What?

Commercial high-rise structures are expected to yield almost $900 million this year yet only a relatively small proportion of the respondents (a little over 10%) were involved in this type.

As Table 5 shows, commercial low-rise architecture is being done by firms having a total business volume of $5–$19.9 million. State and local government offices and service building and residential low-rise are also the common types of buildings done by these firms. The great majority of Federal government office and service building (82%) is done by the real biggies — firms with an annual volume of $20 million and over. They also handle most of the Federal hospital/health buildings design work (73.1%) as well as over half of the other Federal construction. Residential high-rise building is yet another category dominated by the $20 million-and-over offices.

And Where

The Middle Atlantic states have a fairly equal share, 25–35%, of dollar volume in most building types, (Table 6) while the East North Central states have the largest share of volume (69.4%) in Federal Government hospital and health buildings. The South Atlantic region has the largest dollar volume in defense and space construction (68.2%). The West South Central states have garnered the largest volume in Federal office and service building construction (49.3%) while the Pacific region's largest dollar volume is in residential private construction (38.0%).

Breaking it down another way, the numbers of firms in each region involved in various building types show similarities. About half or more (48.7–62.6%) in every geographic region of the U.S. are working on commercial low-rise building, and at least two out of five firms in every region and sometimes half the firms (in New England, Mountain and Pacific states) are involved in residential private single houses. In the East South Central states 56.4% of the firms are involved in education construction on the state and local government level.

1969 Designs Actually Built

A strong index of the amplitude of future commissions is reflected in figures showing how much of last

Table 4

Work Being Done by 1,002 Architectural Firms for 1971 Construction

Type of Work	Total Firms	Volume of Work on Boards September 1	Additional Work Anticipated Before the End of this Year	Total in 1970
Commercial low-rise (1-3 stories)	475	$ 540,800,000	$ 287,400,000	$ 828,200,000
Commercial high-rise (4 stories, up)	111	614,800,000	261,500,000	876,300,000
Industrial	196	193,100,000	116,100,000	309,200,000
Community planning and design, **non**-government	79	273,600,000	210,100,000	483,700,000
Urban design and redevelopment, **including** public housing	121	406,400,000	278,400,000	684,800,000
Federal government				
Office and service	28	85,100,000	24,700,000	109,800,000
Hospitals/health	23	75,400,000	66,800,000	142,200,000
Defense and space	13	39,700,000	5,300,000	45,000,000
Other (**not** including housing)	20	36,100,000	6,900,000	43,000,000
State and local government				
Office and service	88	150,600,000	84,300,000	234,900,000
Educational	259	913,200,000	369,100,000	1,282,300,000
Hospitals/health	59	237,700,000	135,400,000	373,100,000
Other (**not** including housing)	73	247,600,000	57,900,000	305,500,000
Educational, private (**not** including government)	109	187,700,000	95,000,000	282,700,000
Hospitals/health, private (**not** including government)	143	468,500,000	230,000,000	698,500,000
Residential, private, single	373	73,080,000	49,250,000	122,330,000
Residential, low-rise (1-3 stories) **not** including public housing	222	504,900,000	353,100,000	859,000,000
Residential, high-rise (4 stories, up) **not** including public housing	78	408,500,000	229,500,000	638,000,000
Other	226	241,700,000	114,400,000	356,100,000
TOTAL	1,002	$5,698,480,000	$2,976,150,000	$8,674,630,000

Table 5

Share of Business for Various Types of Building Among Architectural Firms According to Their Total Dollar Volume

Type of Building	Under $1-Million	$1-Million to $4.9-Million	$5-Million to $19.9-Million	$20-Million and over
Commercial low-rise	7.7%	31.0%	48.2%	13.1%
Commercial high-rise	1.6	12.3	32.6	53.5
Industrial	8.2	28.7	35.7	27.4
Community planning/design	1.9	25.3	28.1	44.7
Urban design/redevelopment	4.0	7.5	38.7	49.8
Federal government				
Office and service	0.1	3.9	13.7	82.3
Hospitals/health	6.1	9.8	11.0	73.1
Defense and space	3.0	11.8	29.8	55.4
Other	3.5	28.5	10.8	57.2
State and local government				
Office and service	5.4	13.5	44.3	36.8
Educational	3.3	16.5	39.1	41.1
Hospitals/health	6.3	27.6	46.0	20.1
Other	21.1	38.0	31.7	9.2
Educational, private	7.0	25.3	34.7	33.0
Hospitals/health, private	3.9	19.1	29.5	47.5
Residential, private, single	17.3	33.7	29.6	19.4
Residential, low-rise	2.6	21.8	46.1	29.5
Residential, high-rise	3.3	12.0	17.8	66.9
Other	7.4	33.2	20.5	38.9
Proportion of Total Business	4.9%	20.2%	34.6%	40.3%

From its unique structural system to its outside walls, the 38-story Ala Moana Hotel in Honolulu is an assembly of precast concrete components.

The building's structural system is an arrangement of precast concrete H-frames stacked and grouted one atop the other to support prestressed concrete planks of the floor system.

The H-frames are joined midway between stories using a unique method developed by Alfred A. Yee, structural engineer for the project. Formed sockets were cast into the upper sections of each H-frame and reinforcing dowels were cast into the lower sections. On erection, the sockets were filled with a special Master Builders flowable *EMBECO* non-shrink grout to provide high strength bond to the dowels of the H-frame member seated on it . . . thus forming continuous columns with structural integrity.

POZZOLITH admixture was used in all the precast concrete. It improved placeability and workability, promoted optimum density, and improved uniformity from batch to batch. Especially significant, *POZZOLITH* helped obtain high early and high ultimate strengths.

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Nova

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Constructed of a molded polypropylene shell and ⅝″ dia. chrome plated steel frame, Nova has successfully withstood tests in excess of 250,000 sittings, loaded to 220 lbs.
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Atelier International, Ltd., 139 East 57th Street
New York, N.Y. 10022.

ai

Table 6

Distribution of 1970 Volume Across U.S. for Construction in 1971

Type of Construction	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Mountain	Pacific
Commercial low-rise	4.2%	24.1%	11.8%	5.3%	16.5%	2.0%	10.6%	4.7%	20.8%
Commercial high-rise	1.8	29.7	9.6	4.1	16.5	1.2	10.5	6.3	20.3
Industrial	10.6	30.2	20.6	5.7	13.1	5.0	2.6	2.0	10.2
Community planning/design	1.9	17.9	3.3	18.2	13.3	0.6	16.2	1.8	26.8
Urban design/redevelopment	4.5	34.0	6.8	6.3	9.7	6.1	17.0	1.8	13.8
Federal government									
Office and service	*	9.5	9.7	1.2	20.6	0.4	49.3	0.5	8.8
Hospitals/health	9.8	1.2	69.4	3.9	4.9	2.4	4.6	*	3.8
Defense and space	*	*	0.2	13.8	68.2	6.0	0.4	2.7	8.7
Other	9.1	24.9	4.2	35.1	13.7	2.8	1.4	*	8.8
State and local government									
Office and service	0.5	26.3	13.7	15.3	21.0	1.1	6.0	5.5	10.6
Educational	9.3	30.8	15.1	8.1	13.4	3.5	6.2	5.0	8.6
Hospitals/health	2.0	34.2	18.6	22.9	6.8	1.9	6.4	1.5	5.7
Other	0.9	30.7	8.5	25.2	8.8	1.1	5.3	1.1	18.4
Educational, private	3.9	33.1	7.3	21.1	16.2	2.1	7.4	3.2	5.7
Hospitals/health, private	2.4	25.3	16.6	13.4	6.0	1.8	6.8	4.5	23.2
Residential, private, single	5.8	16.2	6.7	2.7	15.5	1.2	6.8	7.1	38.0
Residential, low-rise	4.1	17.6	10.8	1.9	16.1	1.7	12.7	5.1	20.0
Residential, high-rise	3.6	33.8	5.9	2.4	25.3	0.7	3.3	4.4	20.6
Other	1.4	23.4	24.4	8.5	15.2	2.0	6.0	7.6	11.5

*Amount insignificant; less than 0.1%

Table 7

Total Construction from Work Designed in 1969

Type of Construction	Total Volume of Work Designed in 1969	Amount Constructed in 1970 $	Amount Constructed in 1970 %
Commercial low-rise (1-3 stories)	$ 529,200,000	$ 380,900,000	72
Commercial high-rise (4 stories, up)	625,100,000	337,800,000	54
Industrial	307,900,000	242,100,000	79
Community planning and design, **non**-government	208,900,000	58,300,000	28
Urban design and redevelopment, including public housing	361,700,000	240,500,000	66
Federal government			
Office and service	69,700,000	11,100,000	16
Hospitals/health	121,100,000	24,600,000	20
Defense and space	54,100,000	4,500,000	8
Other (**not** including housing)	29,200,000	19,400,000	66
State and local government			
Office and service	179,600,000	107,900,000	60
Educational	873,600,000	576,500,000	66
Hospitals/health	102,500,000	69,100,000	67
Other **not** including housing	65,400,000	33,500,000	51
Educational, private (**not** including government)	176,200,000	144,100,000	82
Hospitals/health, private (**not** including government)	280,900,000	169,500,000	60
Residential, private, single	108,450,000	74,580,000	69
Residential low-rise (1-3 stories) **not** including public housing	518,800,000	292,300,000	56
Residential high-rise (4 stories, up) **not** including public housing	342,300,000	184,200,000	54
Other	433,600,000	190,200,000	44
Total	$5,388,250,000	$3,161,080,000	59

year's work on the boards actually was constructed in 1970 (Table 7). Of all the work done by architectural firms in 1969, only 59% was constructed. The survey showed that the percentages were highest for educational, private with 82%; industrial 79%; and commercial low-rise 72%. Those categories with the lowest percentage of volume actually built were in the Federal Government programs for offices and service (16% of the volume was built); hospitals/health (20% of the volume built); and defense and space (only 8% constructed). State and local governments did much better than Federal, building over half of their projects.

Architects' Views

Because of economic fluctuations, architects are often not in the best frame of mind about the profession. As one respondent described his present attitudes toward the practice of architecture, they are characterized by "depression and panic, tempered by brief periods of hysteria." Another, speaking more generally about architecture as a profession said, "Architecture, diminishing as a profession, is becoming more of a job." Others feel this frustration by being in a "middle man role" squeezed between "client and spiraling costs of construction, decreasing quality of construction, materials and building equipment." The result of some of these pressures is viewed more positively by some architects. The architect is now learning businesslike attitudes to use in his practice. As one architect expressed it, they are being forced to "loosen prejudices and learn how to make money in order to survive." Services, fees and production are all watched very closely. (As a result of the scarcity of commissions, some are reducing fees, but others insist the fee structure must go up.) There is more of a willingness for the architect to participate in jobs as entrepreneur and many firms are trying to offer the complete run of services in the package. Architectural-engineering mergers seem to be most common, partly because as one architect put it "consultants are too slow to produce work by date of delivery." But the combined efforts of developer, contractor and architect are gaining way. Turn-key operations in which the contractor employs architects and engineers are cited by a number of respondents as being more and more frequent. Also cited of course is the tendency for big firms to get larger and small firms to go by the wayside. Some optimists feel however that the good small architect

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But even these architects realize the need for making work procedures more efficient by use of computers in specification writing and production of architectural drawings. Some foresee not only computerized specifications, but also computerized structural design and feasibility services to be in wide practice in the near future.

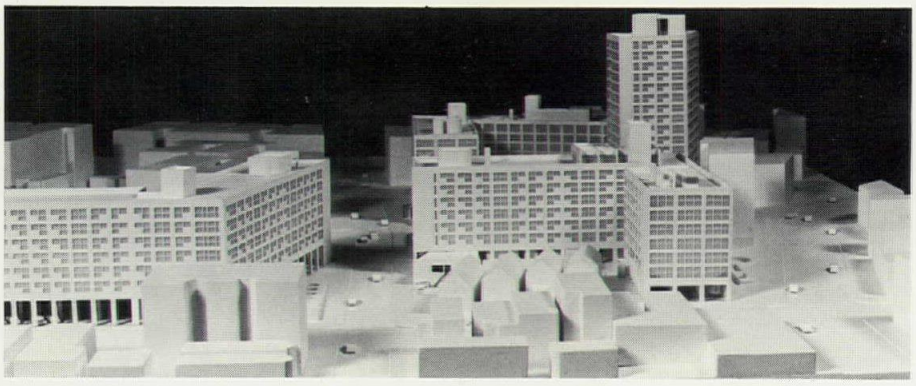
Regarding broader concerns of architects, many respondents cited an increased involvement in community needs and environmental problems due to a mounting social awareness on the part of architects. As one stated, "There appears to be an increasing desire for greater responsibility in the realm of community planning accompanied by a decreasing interest in performance of the small details which form day-to-day practice." Hence the need for computerization.

Outlook for the Coming Year

Recently, economic forecasters have agreed that the worst is over. They generally predict an upturn in the economy, then a period of moderate growth. With the recent falling price rise rate, the loosening of money by the Federal Reserve Board, and the apparently precedent-setting reduction of prime interest rates by First Pennsylvania Banking & Trust from 8% to 7½, relief is in order. Unemployment, however, is up to 5.5% and is expected to rise before it goes down. There is speculation that the rate of price rise is likely to move higher again soon, (although not back to previous inflationary levels) and that money will tighten after elections. If money doesn't tighten, though, the improved situation will undoubtedly affect construction and, of course, architectural design.

Mortgages are unlikely to drop their 8½% interest rate for some time, since demand for construction money is strong. Yet the drop in prime rate interest means that money is more plentiful, with the result that down payments on houses may lower. While housing starts have decreased 11% from 1969, they are predicted to jump 15% next year. And as far as commercial construction is concerned, it is expected to drop in New York in 1971 but pick up in cities such as Houston, Boise, Tucson and Tampa. Construction should soon be on the upswing. The effect on architecturally designed construction next year is hard to gage. Most likely firms will be slowly getting back on their feet but at a cost of many small practices.

Photo: Ezra Stoller



Twin Parks Residential Development, New York City. Richard Meier and Associates, Architects.

Realpolitik and Architecture

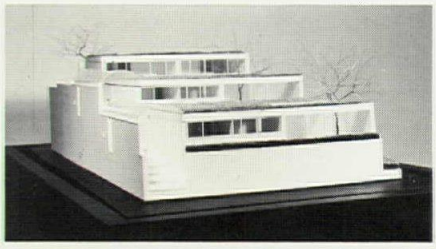
The New York State Urban Development Corporation has recently been treating New Yorkers to a view of many of its urban development projects. With extraordinary timing evidently inspired by gubernatorial elections, two museums, the Whitney and the Metropolitan Museum of Art, opened exhibitions of projects commissioned by the public benefit corporation.

"Cities" Show at Whitney

Eighteen projects (including ten in New York City) were on display for three weeks presenting work of architects Paul Rudolph; Ulrich Franzen; Sert, Jackson & Associates; Davis, Brody; James Stewart Polshek; Gruzen & Partners, among others. The installation, designed by Robert A.M. Stern and John F. Hagmann, included a full-size house in the museum's sculpture court. The 41′ x 24′ house composed of four modular units is a prototype dwelling unit for a system designed by Jerry Wells and Fred Koetter for General Shelters. It proved to be the hit of the show.

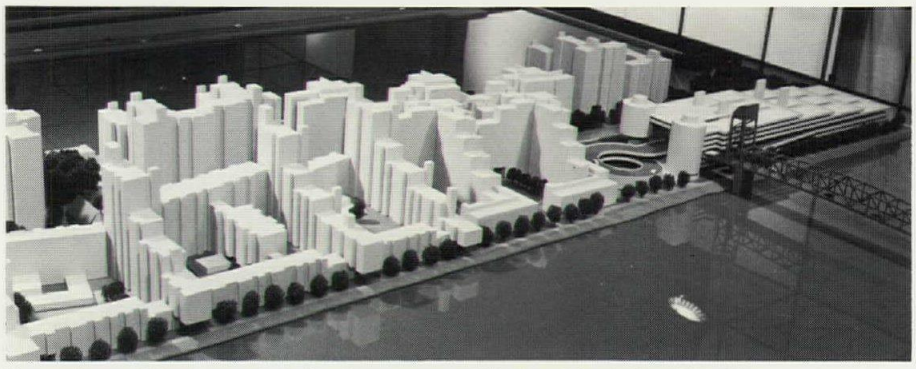
Welfare Island in First Stage

Meanwhile at the Met, a small exhibition illustrated interim design for UDC's Welfare Island. After Philip Johnson and John Burgee submitted a master plan last year (P/A Dec. 1969, p. 42) they were retained for



Scattered site housing, Ithaca, New York. Werner Seligman and Associates, Architects.

the design of the Town Center, including 250 unsubsidized dwelling units. Meanwhile seven other architects were brought in for the design of the rest of the project. These include Giorgio Cavaglieri (landmark restoration); Conklin & Rossant; Gruzen & Partners (systems analysis); John M. Johansen; Kallmann & McKinnell (Motor Gate Garage and Plaza for the carless island); Mitchell/Giurgola Associates; Sert, Jackson & Associates. Also involved are landscape architects Dan Kiley & Partners, and Zion & Breen, plus engineers Gibbs & Hill to do the transportation (electric mini-bus), and a pneumatic refuse system. Although original plan calls for the tallest buildings to be twelve stories at the central portion of the island dwindling to four at the water's edge, new schemes increase heights at the central portion by six stories. This might create a narrow canyon of towers lined up on either side of the main street, broken only by Sert's design which uses varying heights along this street.



Composite models of current design for one part of Welfare Island, New York City.

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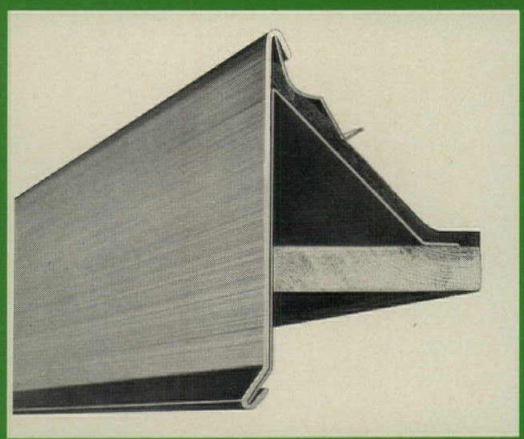

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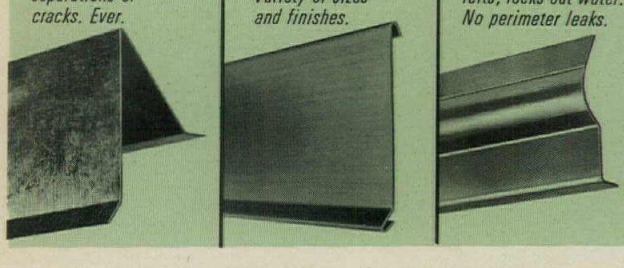

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A new warehouse in St. Louis for Lever Brothers uses prestressed concrete double "T" slabs for flooring and roofing in order to save on-site labor and cut overall costs. The two-story structure has floor panels 5 feet 8 inches by 30 inches by 34 feet; roof panels are 8 feet by 2 feet by 68 feet. Armco's TUFWIRE® Strand provides the uniform physical properties that give these slabs their strength.

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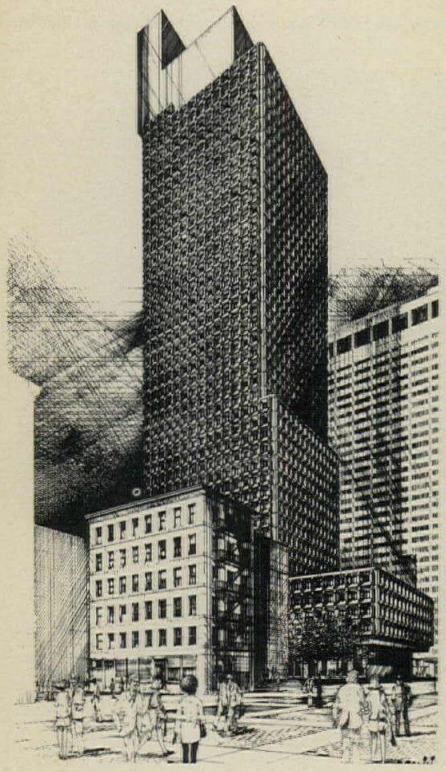


Office Building

Boston, Massachusetts
Marcel Breuer and Herbert Beckhard, Architects

At the rear of Boston's new City Hall and the New England Merchants National Bank building will rise a 44-story office tower and pedestrian arcade. The building, the highest in this waterfront redevelopment area, has a stepped back configuration to "blend" with both adjoining office towers and Faneuil Hall and Faneuil Hall markets. The tower rests on a five-story base (with 33,000 sq ft per floor) housing mechanical equipment and two floors of offices. Contained within the overhang of the five-story base is a pedestrian arcade that runs along the back of the building from State Street to Faneuil Hall Square. The steel-frame structure is clad with precast concrete panels which project from windows to provide a screen from the sun and to contain mechanical services. Total gross area of the building is 900,000 sq ft.

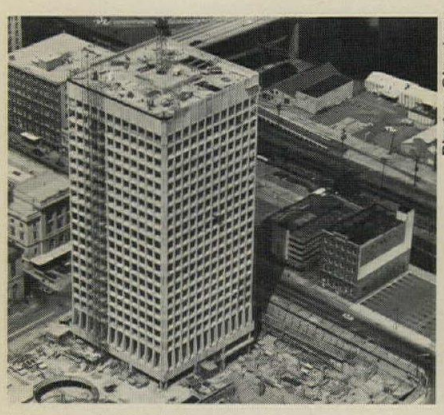
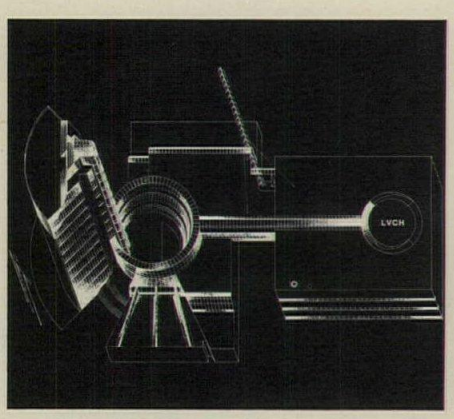


Photo: Skyview

Bank of Washington Plaza

Tacoma, Washington
Skidmore, Owings, Merrill, of Portland, Oregon, Architects
Lea Pearson & Richards, Associated Architects

The first high-rise office building to be built in downtown Tacoma in 40 years is soon to be completed. The building, which at 24 stories could qualify as a Chicago low-rise, will offer a landing facility for helicopters on the roof, and a grade level plaza and below-grade courtyard and restaurant. The reinforced concrete structure provides 432,115 gross sq ft. Because of the building's load-bearing walls and inner structural core housing elevators, utilities and mechanical equipment, the column-free interior allows more than 85 per cent of the 15,210 sq ft per floor to be used. Additional space for mechanical equipment is provided at the roof.



Las Vegas City Hall Complex

Las Vegas, Nevada
Daniel Mann Johnson & Mendenhall

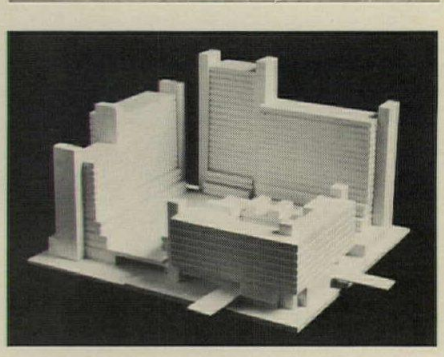
Projected for a transitional site between the main downtown gambling area and a decaying residential section, this city hall complex may offer some competition to all of that Vegas *electrographic architecture*. The complex will replace an existing 30-year-old facility on the same site: it comprises an office building (left), a police building (top), council chambers (bottom), all connected by a three-story circulation ring and horizontal tube to a public parking garage and heliport.

The 240,000 sq ft building has a poured-in-place concrete frame and is clad with precast concrete panels, travertine marble, bronze anodized aluminum and bronze plate glass. The office tower elevator core is slip formed.

Herbert F. Johnson Art Center

Cornell University, Ithaca, N.Y.
I.M. Pei and Associates, Architects

Now under construction on the Cornell campus is a 60,000 sq ft art exhibition, storage and teaching facility. Sited for a slope overlooking nearby Cayuga Lake, the Center comprises a series of levels, six above grade, two half-levels and a service level below. A tower incised by elevator and stairway slot contains exhibition galleries on lower floors, then administration offices, print galleries, and finally, meeting rooms on the top floor. Additional exhibition space (galleries total one-fourth of the building's square footage) occupies the open side. The open portion in fact includes a mid-air sculpture terrace. Cantilevered over this terrace is a lounge area and behind it a study and storage center. The $3.575 million structure is board-formed concrete with welsh quarry tile in lobby and terrace floors; other floors will have wood strip surfaces.



Multi-Use Complex

Denver, Colorado
RTKL, Inc. Architects

A design competition sponsored by the Denver Urban Renewal Authority in the Skyline Renewal area has resulted in the selection of RTKL, Inc. as architects for the $20 million project. The one and a half block area will include 387 high-rise apartments, a 400-unit motel, shops, restaurants and recreation facilities, an office tower that uses air-rights over the street and an 800-car parking garage. A second-level pedestrian walkway will link this complex to adjoining developments and will connect second level plazas. Structure and materials are yet to be decided.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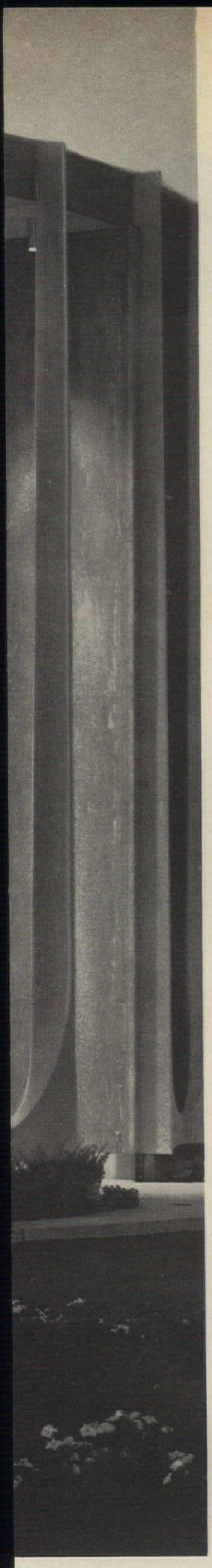
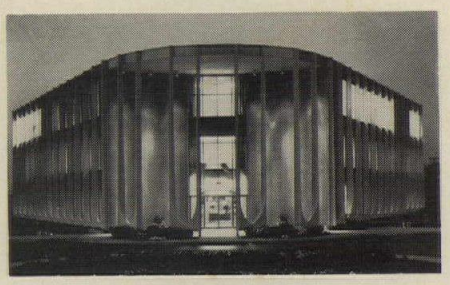


Architect John A. Benya must love All-Electric design. It gave him the freedom to design a heart-shaped bank.



John A. Benya won't build anything unless it's All-Electric—the most flexible approach to total environmental control.

The people at the Creve Coeur Bank in Creve Coeur, Missouri, bought this concept when they asked him to design a new bank. Now the town of Creve Coeur (French for broken heart) has an All-Electric bank in the shape of a heart. Two years ago Mr. Benya used the freedom of All-Electric design to build a football-shaped bank.

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Ficker Was Quicker

It's not often an architect makes front page news for almost two weeks running. William P. Ficker did. The 42-year-old architect from Newport Beach, California, with his own firm made headlines as skipper of the "Intrepid," America's Cup winner. With a young crew of 11, the 12-meter sloop beat the contender Gretel II of Australia, in a suspenseful meet that wasn't decided until the fifth race when the Intrepid had its fourth victory over Gretel II. Ficker, known for his attention to detail in his architectural work as well as his sailing, has frequently compared his avocation to his profession: "In architecture, the goal is seeing all the parts come together in an esthetically pleasing building. In sailing, all parts come together in a fast winning boat." Nevertheless the Americans have to admit this year that the attempt to take away the cup was formidable. Although Americans are known to employ the most technical advances in their sailboats, this one, an Olin Stephens' design with modifications by Britton Chance, Jr., defeated the wild and woolly Aussies by narrow margins in all except the last race. Ficker apparently remained calm throughout.

Photos: Stanley Rosenfeld

Ford Funds Back Construction Study

The Ford Foundation has awarded a grant to Harvard University for a continuing study of construction industry problems. To be carried out in cooperation with the Construction Industry Foundation, the study will cover the bid-pricing system, manpower planning, collective bargaining methods and proposals for their reform and factors affecting productivity in construction. John T. Dunlop, a David A. Wells professor of Political Economy at Harvard and Dean of the Faculty of Arts and Sciences will be in charge of the research project.

News in Capitol on Pennsylvania Avenue Plan, DOD Bidding, Construction, HUD Funding

BY E. E. HALMOS

Pennsylvania Avenue Plan Gets Backing

Architects have again taken a strong hand in plans to redevelop (or rather rehabilitate) Washington's Pennsylvania Avenue between the Capitol and the White House. AIA witnesses strongly supported House bills (also backed by the Nixon Administration) which would set up a "Federal City Bi-Centennial Development Corporation" for restoration of "the avenue."

The proposed corporation could plan and execute private and public development in an 18-block area, could borrow from the Treasury to help finance its schemes, could assemble blocks of land for development by private investors to introduce business and residential uses of the now rundown areas interspersed with huge blocks of federal buildings. The legislation itself, however, seemed to have little chance of action at this session of Congress.

DOD Pre-Bid Deemed Unethical

The Defense Department's "experiment" in obtaining architect-engineer services (P/A Oct. 1970) came a quick cropper on its first start. Four of five architectural firms invited by Navy's Southern Division to a "pre-bid" conference on a relatively small building at a Navy base near New Orleans politely found reasons to submit nothing more than their professional qualifications. The fifth said it was too busy to handle the job.

Pentagon's Installations and Logistics office, which had ordered the "test" in Navy's engineering service and for the Corps of Engineers' Sacramento district, was reportedly in a state of shock at the idea's immediate failure. It hadn't decided what to do about the situation in early October; lower commands didn't say.

The idea is that architects and engineers submit both technical proposals and sealed-envelope price estimates to selection boards, be then ranked by boards for further negotiation. All major professional societies, led by AIA, protested the idea, and advised their members that such activities are not in accord with best professional practice.

In fact, at the end of September, the AIA with Board approval reinforced its objections of new Standards of Ethical Practice, which include the following significant paragraph:

"No. 6 — An architect shall represent truthfully and clearly to his prospective client or employer his qualifications and capabilities to perform services. After being selected for his professional qualifications, an architect shall reach an agreement . . . as to the nature and extent of the services he will provide, and his compensations. . ." That's a far cry from what the Pentagon has decreed.

(As of press date, the AIA has reported Congress' approval of a bill halting new A/E procurement procedures by the DOD. If Nixon signs, existing practices will be kept.)

HUD Funding Has Some Changes

Struggling toward adjournment in early October, Congress concentrated on the belated passage of annual money bills. It admitted that it had dawdled so long it couldn't get around to legislative breakthroughs of any kind — in fact, it could reach no bold new programs at all.

One example was the $4 billion authorization for the Housing and Urban Development Department and various associated agencies. In general, the bill simply continues all existing HUD programs, ignoring Secretary Romney's attempts to reshuffle the many arms of his sprawling agency that pertain to housing. But it does contain some changes of significance: (1) it permula for regular middle-income panies to invest in federally aided low- and middle-income housing; (2) it changes the down payment formula for regular middle-income FHA homes to make more housing available to families above the poverty level; (3) it authorizes subsidies to help meet operating deficits of public housing authorities; (4) it provides some subsidies for city transit systems to help meet recurring debts; (5) it provides federal guarantees to private builders who set up complete "new towns" and federal payments of up to 80 percent

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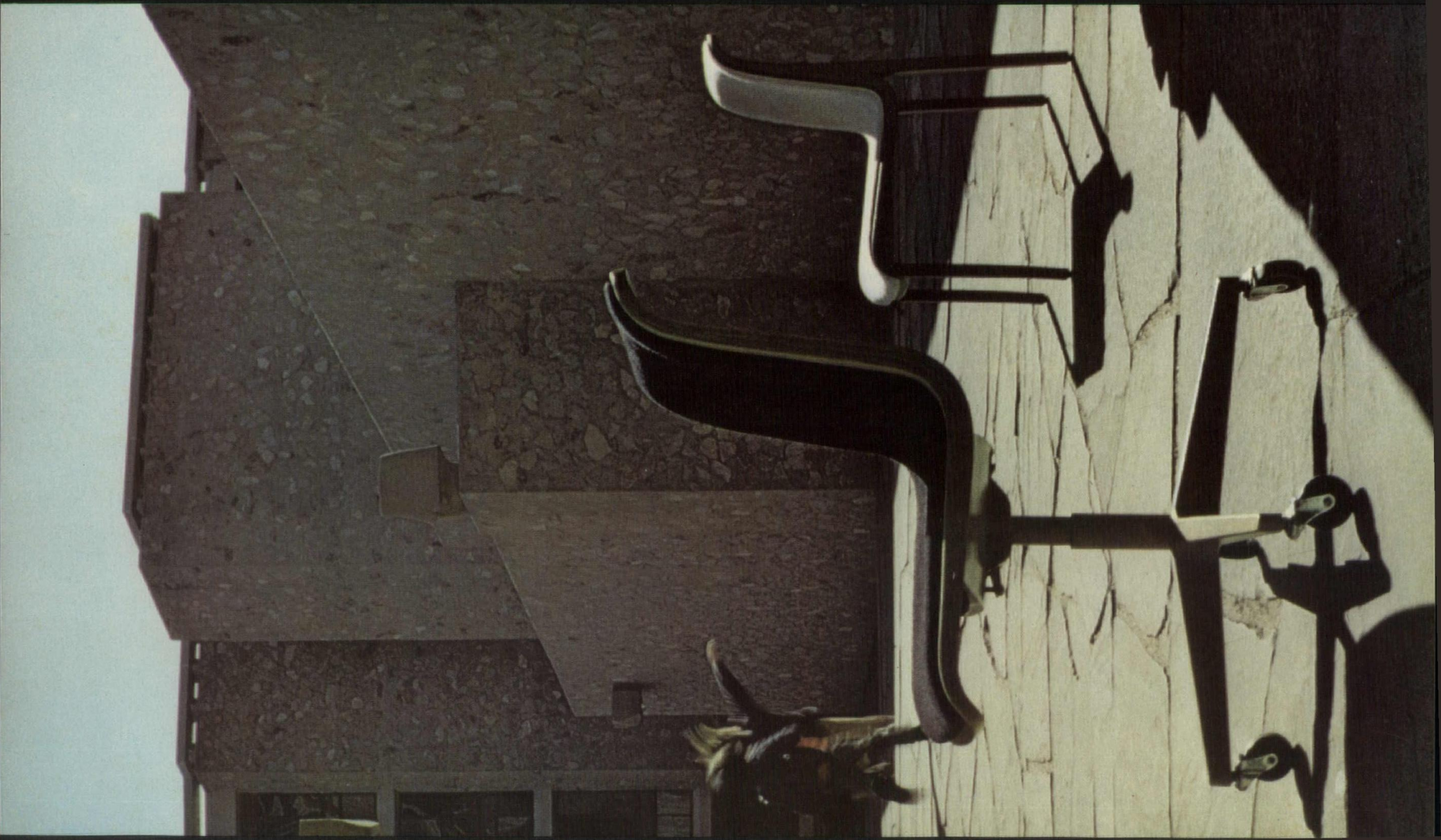

Southside High School — Greenville, South Carolina
Owner: School District of Greenville County
Architect: Liles, Clarke and Associates, Greenville
Engineers: Liles, Clarke and Associates, Greenville
Prestressed Concrete Fabricator: Greenville Concrete Company
Contractor: Triangle Construction Company, Greenville
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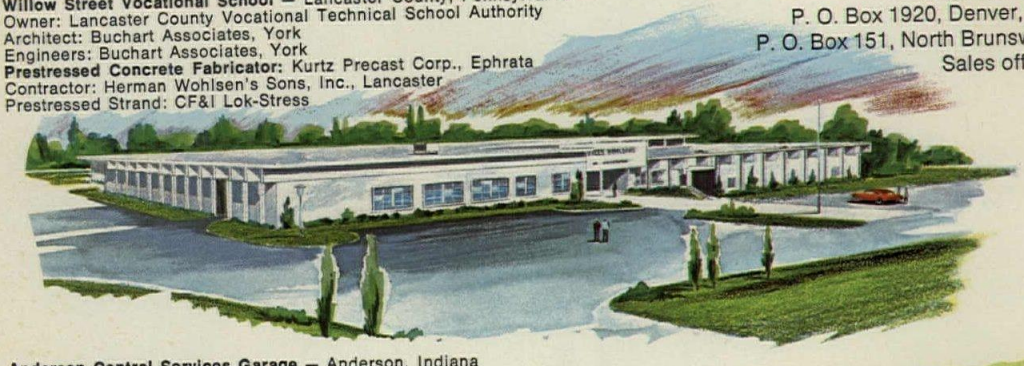
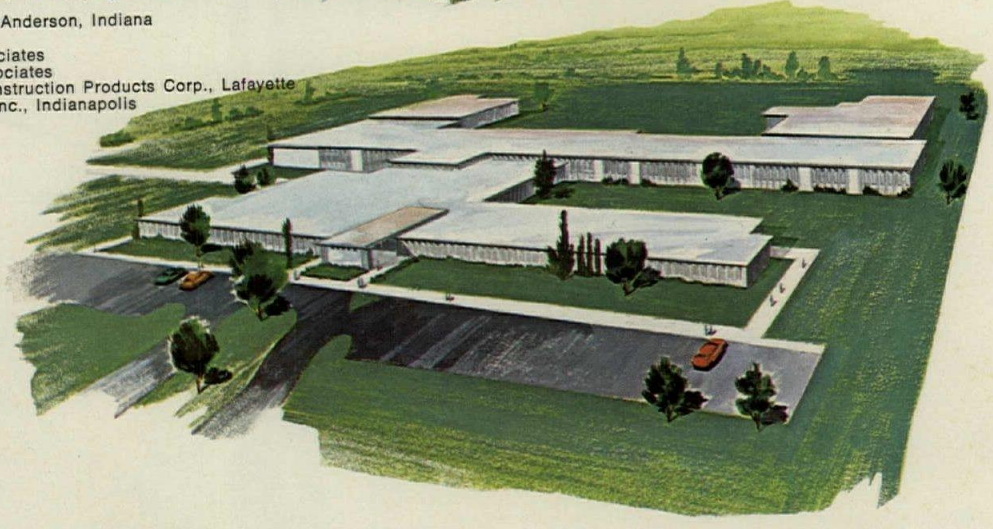
Willow Street Vocational School — Lancaster County, Pennsylvania
Owner: Lancaster County Vocational Technical School Authority
Architect: Buchart Associates, York
Engineers: Buchart Associates, York
Prestressed Concrete Fabricator: Kurtz Precast Corp., Ephrata
Contractor: Herman Wohlsen's Sons, Inc., Lancaster
Prestressed Strand: CF&I Lok-Stress



Anderson Central Services Garage — Anderson, Indiana
Owner: City of Anderson
Architect: Johnson Ritchart and Associates
Engineers: Johnson Ritchart and Associates
Prestressed Concrete Fabricator: Construction Products Corp., Lafayette
Contractor: A.B. Cochran and Sons, Inc., Indianapolis
Prestressed Strand: CF&I Lok-Stress



CF-145

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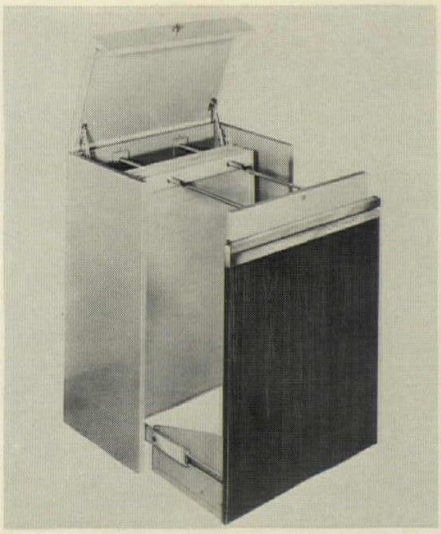

File for Original Drawings

Indexed for quick filing and retrieval, original drawings are also protected from handling and filing abuse in Masterfile. Drawings are attached to self-adhesive hangers which act as file supports and carrying handles. Plan Hold Corp.
Circle 101 on Reader Service Card

Plastic Plumbing Wall

Vinyl and fiberglass reinforced plastic wall surfaces, vinyl piping and a foam core comprise plumbing wall assembly for bathrooms and kitchens in new or older buildings. Alternate piping materials can be substituted where necessary; walls available in any size, varied textures and colors. B.F. Goodrich Chemical Co.
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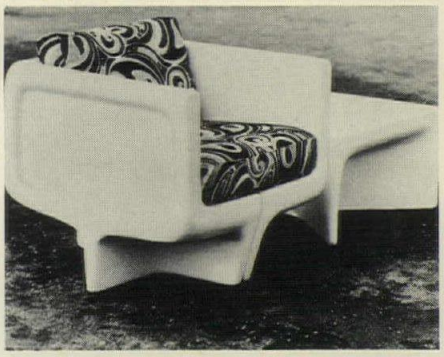


Chemistry at Work

Right out of the mold, with its own hard, mar-resistant self-skin comes plastic furniture created by the Rubicast process. One-step chemical process makes a lightweight and strong rigid urethane foam sandwich structure. Uniroyal.
Circle 103 on Reader Service Card

Lexan Light Globe

Seamless globe made of General Electric high-strength, unbreakable Lexan is locked to its globe holder with a special device to make the fixture vandalproof, according to manufacturer. Packaged with pole, or globe and holder may be mounted to existing standards. Trimplex Products.
Circle 104 on Reader Service Card

Clean Fire Protection

Fire extinguishing agent quickly snuffs out fire without leaving any residue. By chemically interfering with the chain reaction that causes combustion, the new "clean agents" protect valuable objects, records or delicate electronic equipment. Manufacturer recommends its use in museums, libraries and computer centers as well as standard applications. The Ansul Co.
Circle 105 on Reader Service Card

Wash Center

Compact stainless steel wash center is designed specifically to provide clearance for wheel chair users; installed height from floor to bowl bottom is 29⅝", depth front to rear, 17¾". Bradley Washfountain Co.
Circle 106 on Reader Service Card

New Colors for Flooring

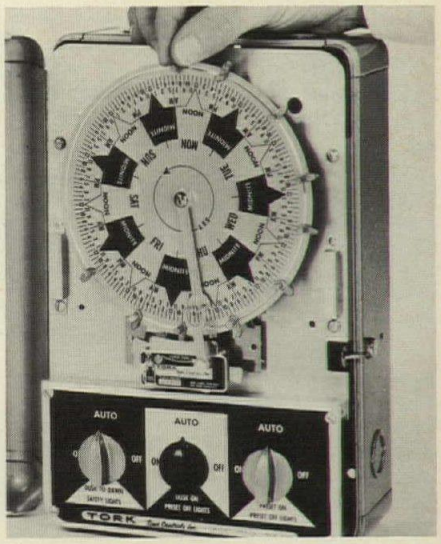
Vivid bay leaf, paprika, nutmeg and curry colors have been added to Azrock's vinyl asbestos Custom Cortina floor tile series for heavy traffic use. Flecks of color-chips pattern the tile, which comes 12" x 12" in two gauges — ⅛" and 3/32". Azrock Floor Products.
Circle 107 on Reader Service Card

Folding Shower Seat

Tucked into a corner, this stainless steel shower seat folds up when not in use. For hospital, and nursing home use; measures 15¾" x 15¾". Bobrick Architectural Service Dept.
Circle 108 on Reader Service Card

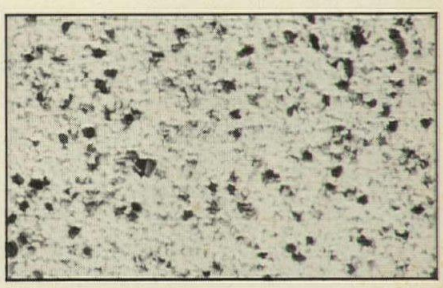
Cushioned by Chemistry

Fresh out of the lab comes Omalon carpet cushion — tough, resilient and lightweight — the result of a polymer chemical development. Guaranteed by the company not to break or pack down, it is available in flame retardant grades which pass government flame spread tests. Olin Corp.
Circle 109 on Reader Service Card



On Again, Off Again

Automatic on/off lighting, combining photoelectric and time control, is available with reserve power for a 7-day unit (daily programming which can skip operation on weekends and any preselected days). Should power fail, a built-in precision spring mechanism takes over to keep the time control operating up to 36 hours. Tork Time Controls.
Circle 110 on Reader Service Card



Stone/Plywood Siding

Colorful aggregate stone is laminated to exterior grade plywood and coated with a solvent-free epoxy to make Sanspray, a lightweight, low maintenance panel suitable for application as spandrels, fascias and cantilevered walls. Aggregate comes in two sizes with wide color and size range. U.S. Plywood.
Circle 111 on Reader Service Card

Glare-Check Glass

Glare and light are controlled by polarized window glass, both in interior and exterior areas. Can be installed with neutral tinted windows for cost savings. Maximum size panel 48" x 96". Polacoat Inc.
Circle 112 on Reader Service Card

(Continued on page 60)

PRODUCTS & LITERATURE

(Continued from page 59)

Study Aids

Examination Handbook 1-2-3 contains all three examination handbooks previously published by Architectural License Seminars. All subjects on the architectural licensing examination are covered, including over 900 simulated questions and answers, plus complete solutions to the problems of the last three Architectural Design and Site Planning examinations. Also just published is "Problems and Solutions," a comprehensive collection of problems based on past examinations in site planning and architectural design given by NCARB. Architectural License Seminars.
Circle 113 on Reader Service Card

Getting a Fair Shake

Looks like wood shake siding — yet offers all the advantages of solid vinyl siding — excellent insulating properties, low maintenance, weather- and fade-resistant colors. Shake siding in white, avocado green, and charcoal gray; clapboard-styled sidings in yellow too. Bird & Son.
Circle 114 on Reader Service Card

Glazed Concrete Block

A 16-page color brochure covers the color, texture, scale, and pattern of Spectra-Glaze glazed masonry including scored, design, and standard series. The Burns & Russell Co.
Circle 115 on Reader Service Card

Mail Lock Box

Vertical mail boxes, which can be keyed to apartment door locks, have solid ¼" extruded aluminum doors and concealed hinge and frame. Available in clear, satin or gold anodized, or painted bronze finish. American Device Mfg. Co.
Circle 116 on Reader Service Card

Activated Carbon Filter

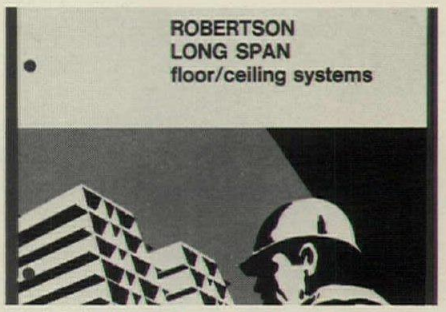
Activated carbon filters for odor control of gases and vapors is described in a six-page bulletin. Due to its high affinity for a wide variety of odorants — human, animal, and chemical — these filters effectively eliminate contaminants from outside air for airports, hopsitals, and other facilities. American Air Filter Co., Inc.
Circle 117 on Reader Service Card

On the Beam

Structural, insulating roof decking is also a finished exposed-beam ceiling whose rafters span up to 6 ft. The whole story in color catalog from The Homasote Co.
Circle 118 on Reader Service Card

Plumbing Noise Control

Sound conditioning compound, designed to muffle the sound of water flowing through plumbing and heating lines, is described in a catalog available from Kopper Kote, Inc.
Circle 119 on Reader Service Card



Multiple Use Floor/Ceiling System

A long span composite floor/ceiling system which permits floor spans to 32′, and incorporates various mechanical services is described in this 32-page catalog. Optional services include air and electrical distribution, air diffusion and acoustical control, recessed lighting. H.H. Robertson Co.
Circle 120 on Reader Service Card

Single Width Partition

Series "4" drywall partitions offer one constant 4" out-to-out dimension for nonload bearing interior wall use. Use of any standard door frame with a 4" throat simplifies design; brochure describes three basic assemblies. United States Gypsum.
Circle 121 on Reader Service Card

Site Light

Uniformity of illumination, minimum glare is promised for landscape fixtures with clear or bronze tint acrylic enclosures. Two sizes: 28′ overall, 400W mercury vapor series for large areas; 100 to 175W up to 16′ overall. Color booklet from Moldcast Manufacturing Co.
Circle 122 on Reader Service Card

Steel for Schools

Brochure shows how sheet steel siding, roofing and other construction materials can be used to build a school environment conducive to learning and capable of being altered and expanded. SG-133 Steel Products News Bureau.
Circle 123 on Reader Service Card

Picture the Computer

Digital data is converted into graphic presentation by incremental plotter which cuts drafting, checking and rework time, offers many possible solutions to a problem. Color brochure. University Computing Co.
Circle 124 on Reader Service Card

Fluorescent Lamp Ballasts

Basic data for ballasts for fluorescent lamps is offered in a 32-page catalog. Operation and care of ballasts, wiring diagrams, and new ballast listings are included. A new cross-reference guide also is available. Universal Manufacturing Corp.
Circle 125 on Reader Service Card

Floored by Nuclear Research

Hardwood parquet impregnated with plastic then exposed to gamma rays results in Gammapar, a solid wood-plastic composite. Looks like wood, is suitable for heavy duty commercial and residential flooring. Tests indicate Gammapar LB Flooring has bactericide qualities. Brochure: The American Novawood Corp.
Circle 126 on Reader Service Card


SARGENT®
New Haven, Connecticut • Ontario, Canada
A complete line of advanced architectural hardware, including the Sargent Maximum Security System
On Reader Service Card, Circle No. 369

Ponding causes a whole deluge of problems. Zonolite roof deck systems turn them off.

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Just talk to your local Zonolite representative. He'll be pleased to consult with you and come up with a recommendation that will satisfy all your design requirements.

Want to correct a roof deck problem. Or better yet, prevent one in the first place?

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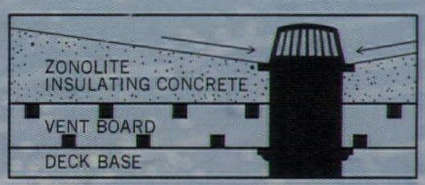

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GRACE

Just say Grace.

On Reader Service Card, Circle No. 387

PROGRESSIVE ARCHITECTURE
NOVEMBER 1970

EDITORIAL

"The most stimulating important thing about tomorrow is not technology and automation but the new relations that will arise among human beings. I imagine that people will gradually come to be able to live their daily lives without losing childish innocence and ideals, which will indeed become recognized in all our activities and cease to fall victim to disparagement. Therefore, if we want to know what tomorrow will be like, let us look at our children." This glimpse of the future was given to us by the oldest youngster in the design professions, Buckminster Fuller.

The theme that runs through this issue of P/A is children, who are the true measure of architecture, for they experience the language of architectural space, texture, color and sound through all of their sensibilities. We begin with a children's museum where learning about the structured official world of knowledge is the building's function. We show children's shops designed to vend toys for siblings who as adults will be the future clients of architecture. There is also an almost antiarchitectural learning structure which is a therapeutic environment for children who are so physically handicapped that they cannot play and are therefore incapable of using their bodies as learning devices.

In the shops, learning has been formalized into what adults feel is training for a totally man-made environment. However, the assumption holds true for only a small percentage of today's children. It is not the case with the disadvantaged child. His toys are the accidents of our productivity, the broken discards of an affluent society; abandoned automobiles in the streets, the refuse of vacant lots, or the vandalized structures of abandoned buildings. Yet such undesigned "toys" make up an environment closer to that sought by modern architecture than the controlled environment of total design.

Toys and play are not innocent. A society can be gaged by the way it teaches its children to play and the toys it gives them to play with, as a cat playfully teaches its kittens to hunt and kill. Play shows each child the place that society has chosen for him. The architecture here for children tells us a good deal more about ourselves than perhaps we care to perceive.

The affluent city child in the toy store is instilled with the idea that everything in the world is and can be man made. Even his most intimate possessions, his toys, are man-made directives.

In the past stimulations associated with childhood had not been designed into our environment. They were considered childish and it was taken for granted that the older we become, the less joyful, the more disciplined and structured our environment must become. This is no longer true. A conscious effort is now made to bring some of the direct joyful experience of the child into the adult world of modern architecture; supergraphics, mannerist structure, playful space and color are becoming commonplace.

The theme that runs through the words of men of such divergent formal convictions as Frei Otto, Buckminster Fuller, John Andrews, Christopher Alexander, the architects of the third generation of modern architecture, is that the importance of architecture is in its meaning to the building's user.

"In this age of so-called objectivity, we close our eyes before the limits of the 'objective' and damn the nonobjective even when it is needed. If we want to define more precisely the task of all those involved in building — the architects, engineers and artisans — it is not to build an apartment house, a schoolhouse, a coffee shop or a theater, but to make a good place to live, to learn, to eat or to have some other specific experience," are the words of Frei Otto.

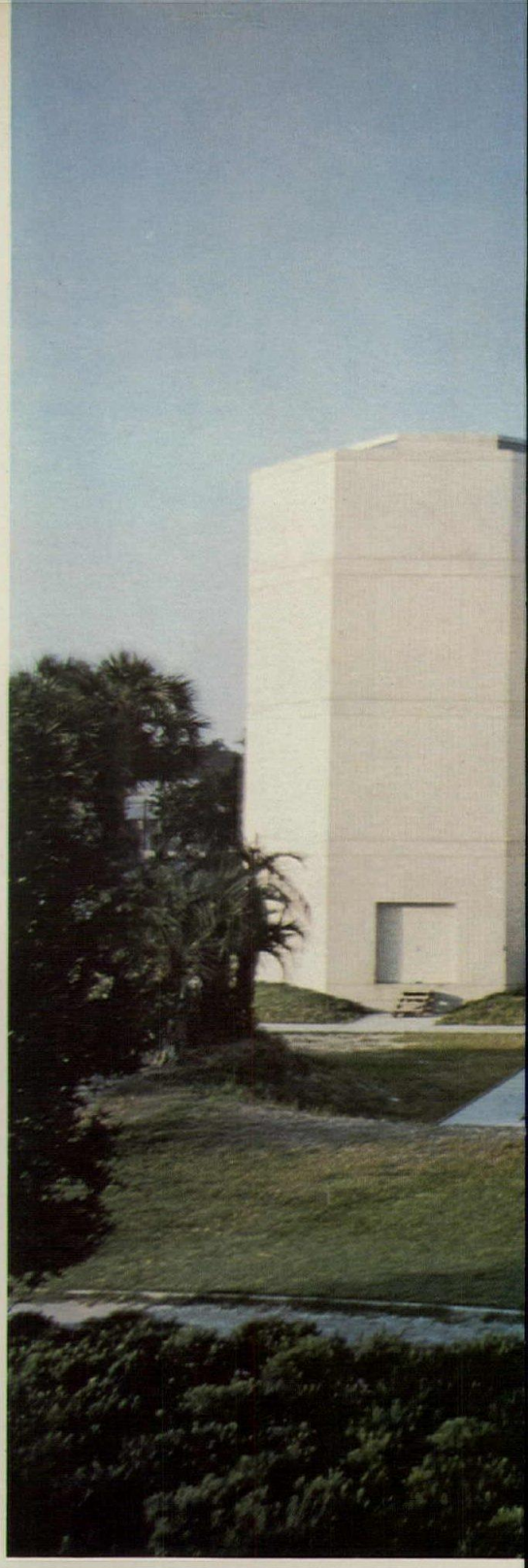
Christopher Alexander put it the most succinctly of all, "If you want to make a living flower, you do not build it physically with tweezers, cell by cell; you grow it from seed. If you want to design a new flower you will design the seed and let it grow."

It can undoubtedly be proven that people's learning capacity decreases as they grow older, but it is also true that less consideration is given to the architectural devices that excite, stimulate, communicate and teach them.

If we are to "seed" an environment as Alexander says, we must, to realize Fuller's future, to create Otto's "good place to live," begin with an awareness that satisfying the preceptual needs of childhood is a sign of emerging architectrual maturity. The children shown in these buildings in this issue of P/A tell us more about the meaning of our architecture than façade, plan or section.

Forrest Wilson

MUSEUM PLAY-IN



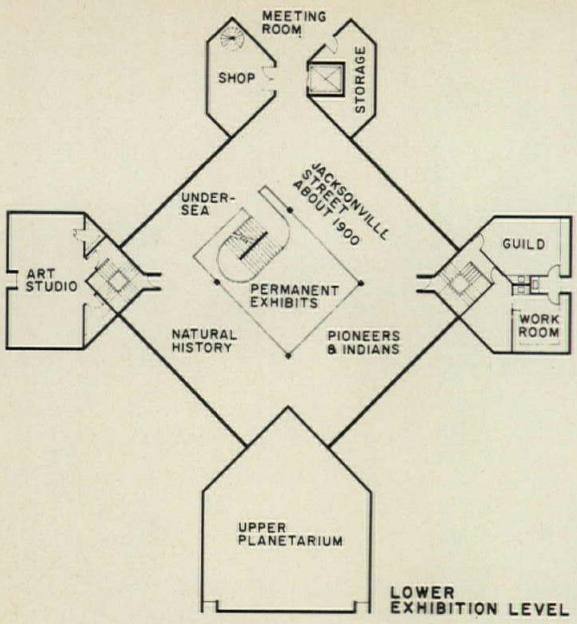
Architect William Morgan designs a geometric module to house the ever-growing Jacksonville Children's Museum.

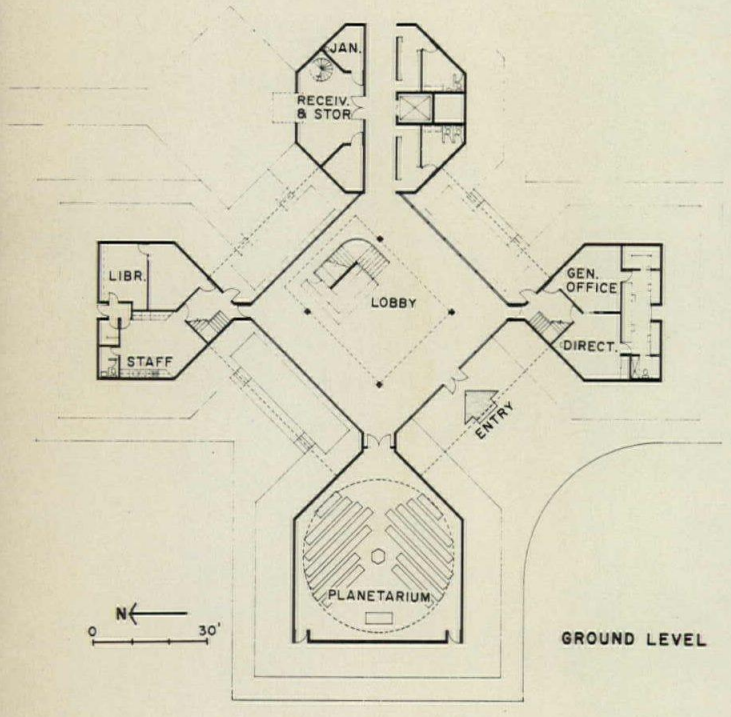
The Jacksonville Children's Museum, a gleaming fortresslike structure designed by architect William Morgan, provides efficient new space for an innovative institution. The museum had long outgrown its former quarters and, anticipating that expanded facilities will again be required within a few years, was designed to double its size with a modular addition.

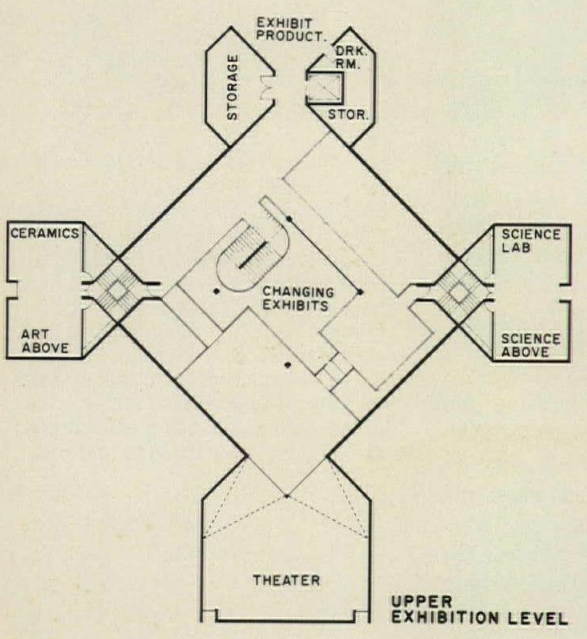
Originally organized by three school teachers who prepared youth displays in the windows of a local bank, the museum had been housed in an old wood-frame residence since it was chartered 22 years ago. From the beginning it has served to supplement both elementary and high school curricula. An instruction program coordinated with the county's school system offers Saturday and after-school classes in arts and sciences, while exhibits acquaint visitors with regional history, culture and natural sciences of northeast Florida. The museum's multisensory exhibition techniques encourage visitors' active participation.

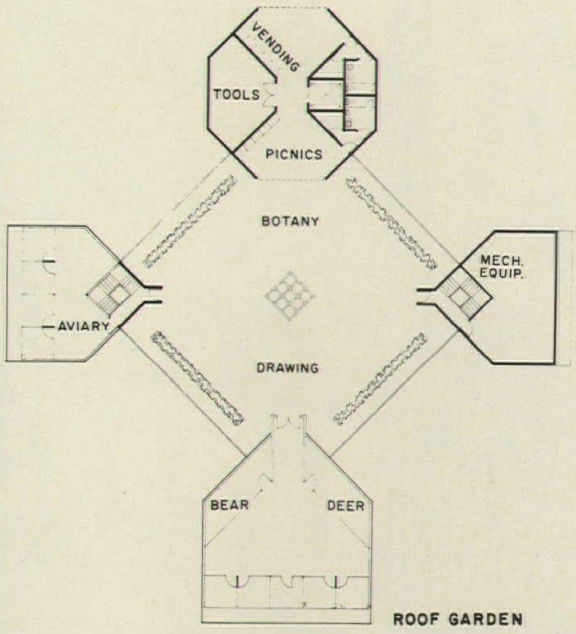
In recent years, Jacksonville's tremendous growth has swelled museum attendance to over eighty thousand

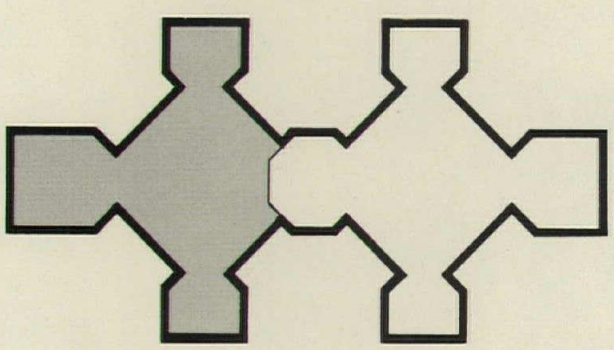
St. John's River Park and Marina designed by Edward D. Stone, Jr. & Associates, provides the basic landscape setting for the museum (aerial photo). Since the site is subject to occasional flooding, the entire structure is placed on a 3-ft-high berm. The berm also covers footing tops that are held near final grade to reduce excavation and ease compaction. According to architect Morgan, this procedure cost about $6000 less than wood or precast piling. Cast-in-place concrete is the principal construction material.



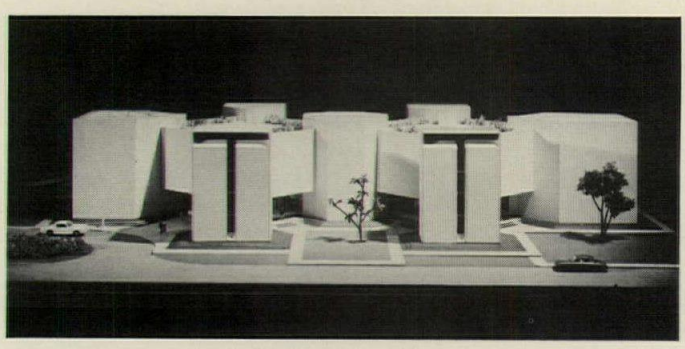




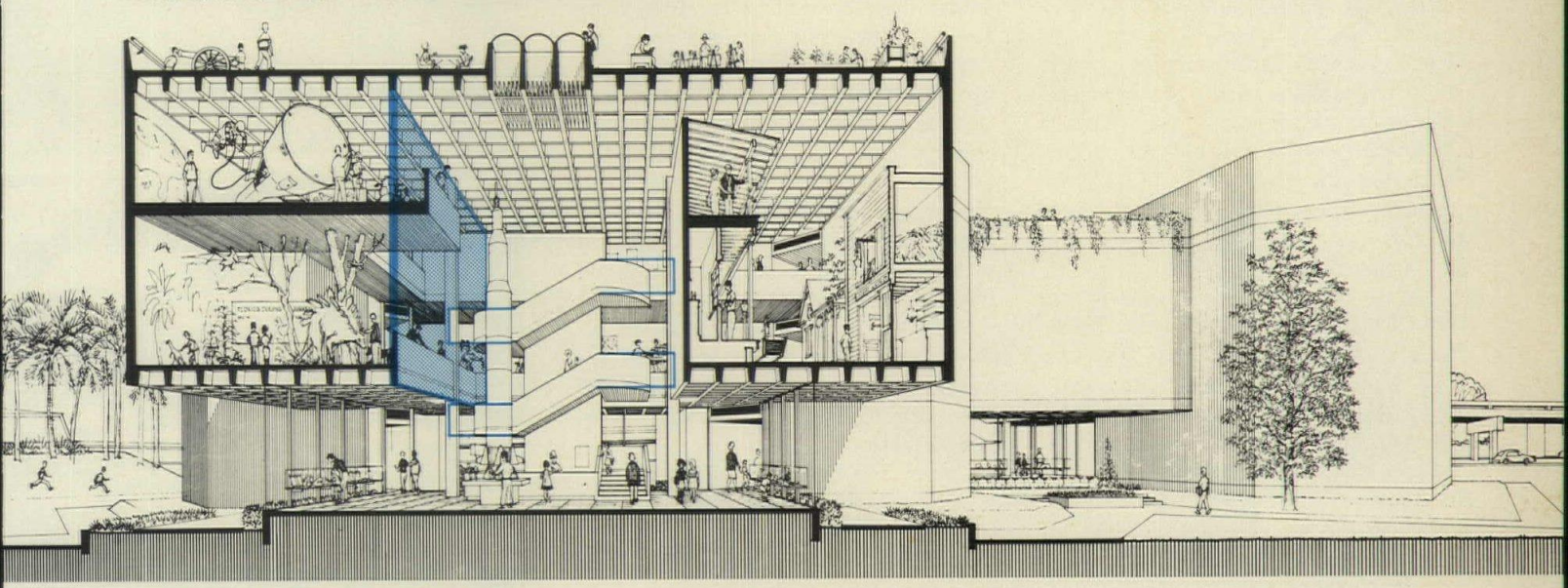




The museum is designed as a module to facilitate easy expansion. The second stage (shaded area) will include more art and science classrooms, a 250-seat lecture hall and more than double exhibition space.



The main stairs, originally designed to float freely from stairwell walls (below), were modified because of fire codes which required closed spaces; the result is a dark and less dramatic area.



annually, and the old frame building had become completely inadequate to meet the needs of the community. Moreover, the toll of millions of footsteps and rising maintenance costs had threatened its very existence.

The City of Jacksonville came to the museum's aid with a donation of land, hoping also to revitalize cultural interests in the downtown area. The site is located on the southwest corner of a heavily used public park and marina, along a curvature of the St. John's River. It is adjacent to the park's Friendship Fountain and a major expressway. At ground level the museum is clearly visible from all sides, while the nearby Gulf Life complex, Prudential tower, Sheraton Hotel and other tall buildings across the river provide a view from above.

In designing ample space for the museum's two-fold program, architect Morgan has provided a structure with separate yet interrelated areas for teaching, exhibition, administration and service. The plan consists of a central core containing an entrance lobby, two exhibition levels, and a roofgarden, surrounded by four towers that accommodate classrooms, offices and service space. While circulation on exhibition levels

is planned so that visitors can view all displays in sequence without retracing steps, secondary stairwells within the towers permit students to enter classrooms directly from the lobby without passing through other areas. These also permit horizontal access from classrooms to exhibit and roof levels via alternating stair landings.

The museum's main entrance is approached from a gentle ramp partially sheltered by projecting upper floors, which help protect school bus loading from inclement weather. Once inside, visitors are greeted by an 11-ft-high allosaur skeleton along the southwest wall. Portals at the lobby's four corners provide access to the four tower areas. The planetarium is specifically located off the lobby so that it can be used for public shows and lectures when the rest of the museum is closed. Visually dominating the space is a skylighted central stairwell that rises 40 ft and controls access to exhibition levels and the roofgarden. The stairs were originally designed to float freely from stairwell walls, but fire codes regulated that they meet the walls to close the space; what could have been a light, open area is now darker and less dramatic.

The second level of the central core contains permanent exhibits in the form of "environmental chambers" — three-dimensional reconstructions which, for example, enable the child to stroll down an old Jacksonville street as it appeared at the turn of the century, to walk into a pioneer block house of the 1830s, to enter a Timucuan Indian hut, to visit a general store (photo, above) and a typical residence as it was before Jacksonville's historic fire of 1901. Children can sit on the furniture, try on the clothes and hear sounds typical of each historic era. Transitional zones between building replicas display plants and animals of a pine forest, cypress swamp, seashore and life under the sea.

The third level contains temporary exhibits on topics of current interest, and are accommodated by variations in floor level, and movable walls and cases. Children can view a light show, touch a replica spacecraft, operate a scientific instrument board to see how it really works. Multimedia audiovisual systems explain relevent aspects of transportation, commerce, agriculture, industry and similar subjects.

The roof level makes maximum use of the building: a roofgarden (not yet completed) will accommodate botany experiments, small observatory, art classes and sculpture exhibits, while a small zoo and an aviary will house animals and birds native to the region. A picnic pavilion on the east tower will serve the many visiting school classes.

While the new museum contains 29,810 sq ft of enclosed space (the roofgarden provides another 9275 sq ft), a twin module will eventually double on-site capacity (a rural farm several miles from the downtown site further expands the museum's program). It will include more art and science classrooms, a 250-seat lecture hall and will more than double the exhibition space.

The project fulfills the highest hopes of architect, client and the public. No longer will a dedicated museum staff be expected to produce imaginative exhibitions and instructional programs with inadequate means. According to museum director, Mrs. Doris Whitmore, "It functions most efficiently in terms of the visiting public and has adopted itself quite flexibly to our complex operational needs." For the public, children and adults alike can be drawn into exciting learning experiences never before available in the city. Indeed, the public is taking full advantage of the new opportunities offered: "We expected about 200,000 visitors during our first year," suggests Mrs. Whitmore, "but by current attendance figures we may have as many as 320,000." For the city, the new building provides a bold focal point — a new jewel in Jacksonville's growing cityscape.

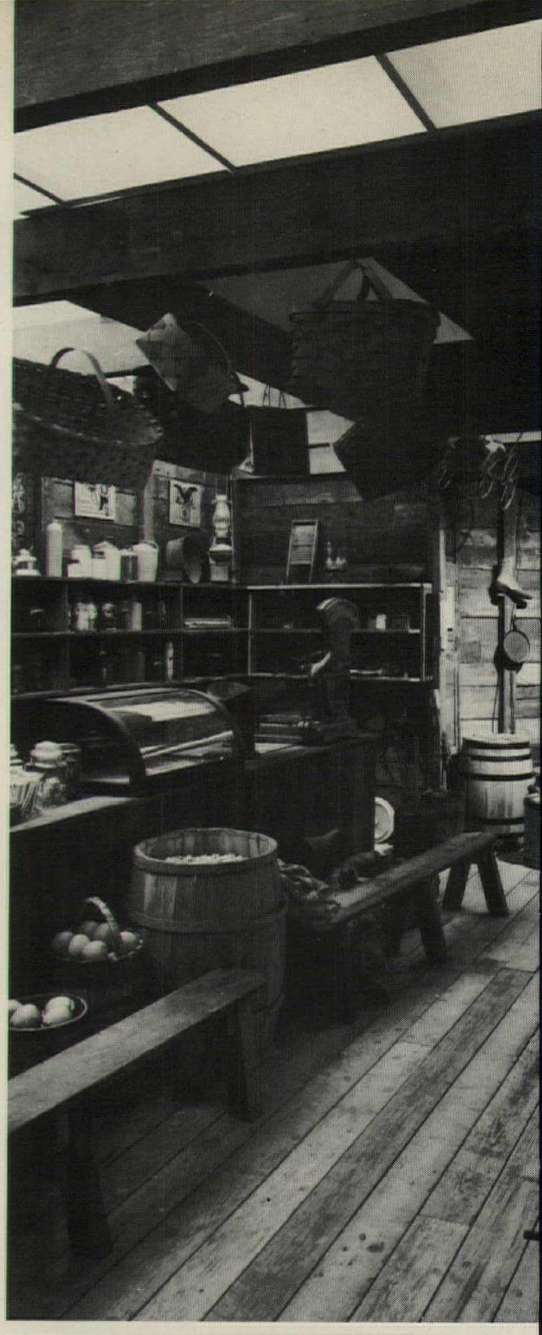
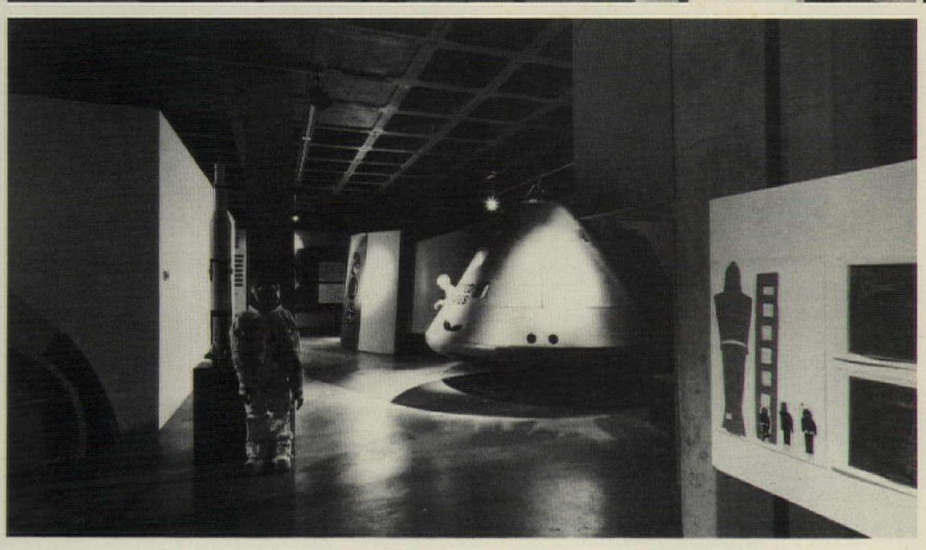
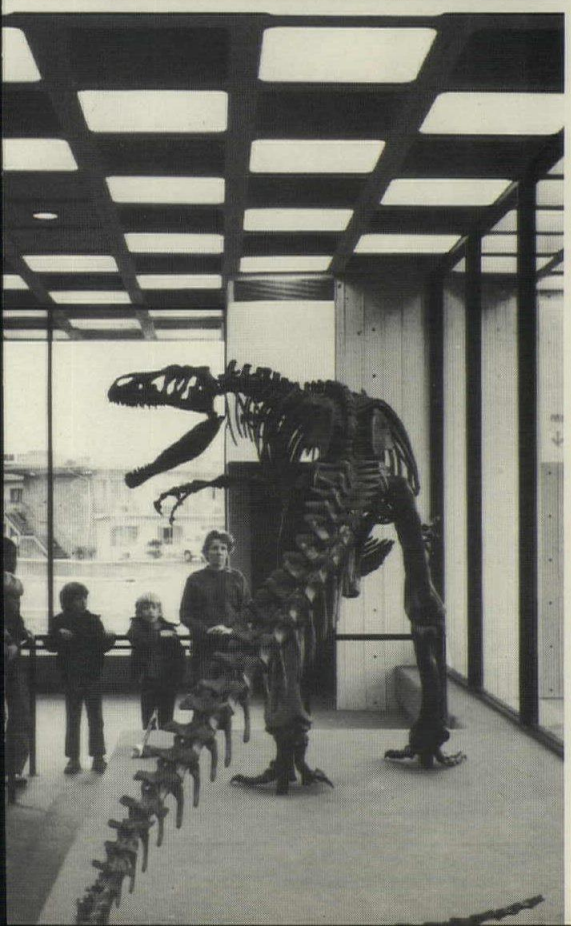


Photo: Kurt Waldermann



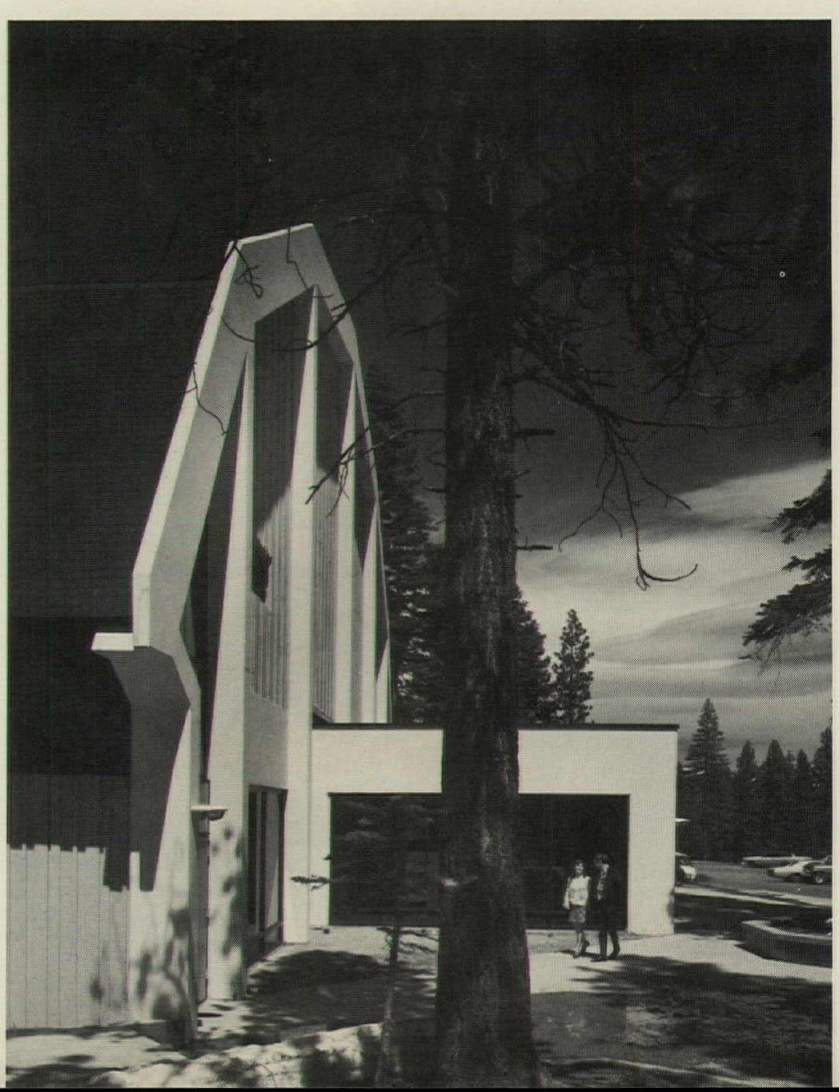


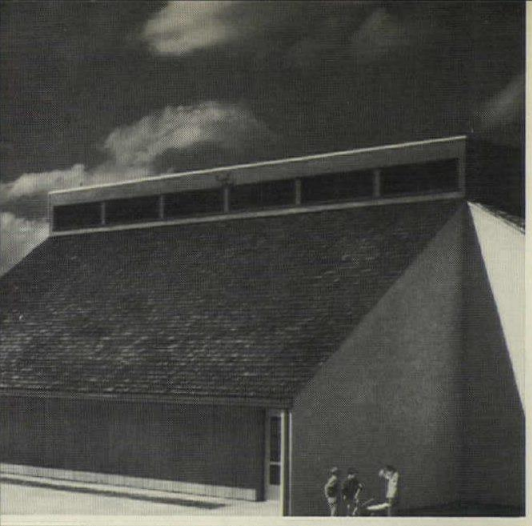
JACKSONVILLE CHILDREN'S MUSEUM, Jacksonville, Fla. **Architect:** William Morgan, AIA. **Program:** Provide facilities for permanent and changing exhibits, to teach arts and sciences to children from kindergarten through high school and easy future expansion. **Site:** Urban public park. **Structural System:** Cast-in-place concrete, load-bearing walls and columns, waffle and flat-slab floors. **Mechanical Systems:** Conventional split-system air conditioning, roof-top chilled, fan coil units in zones, electrical strip heating. Incandescent movable lighting in exhibit areas, fluorescent ceiling fixtures in classrooms and service areas, and exposed spherical incandescent lights in alternate waffle slab coffers used in lobby. **Major Materials:** Exterior is exposed cast-in-place concrete with limited areas of glass in aluminum frames. Interior is exposed concrete with nonbearing partitions of gypsum wallboard on steel studs, and concrete block. **Costs:** $465,000, or 29,-810 sq ft at $15.60 per sq ft. **Consultants:** Freedman, Clements, Rumple, permanent exhibits designers; Exhibits Laboratory of Austin, Tex., wildlife exhibits designer; Evans & Hammond, Inc., mechanical; Haley W. Keister, P.E., structural; Ed Heist, Jr., color consultant. **General Contractor:** Daniel Construction Co. **Photography** (except as noted): Alexandre Georges.

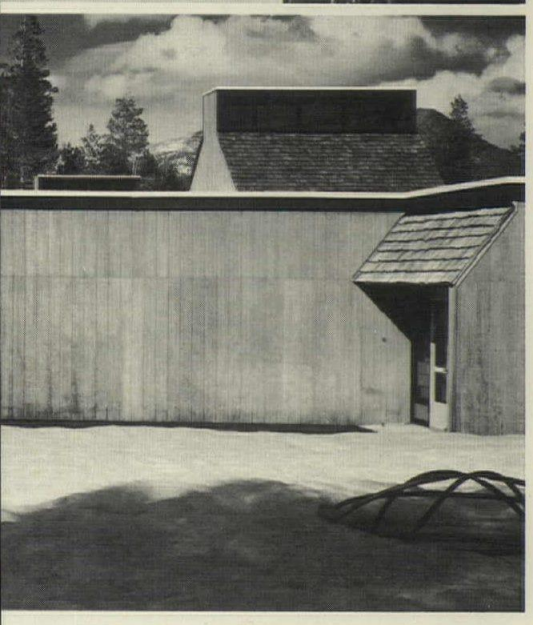
While exterior glass is minimal to avoid sunlight distraction in gallery and class areas, the first floor lobby (photos, upper right and lower left) is almost entirely glass enclosed. After museum hours, casual strollers can peer inside from viewing platforms to see an 11-ft high allosaur skeleton, sample displays of new exhibits and announcements of current museum activities. Permanent exhibits in the form of 3-dimensional reconstructions invite visitors to actively participate (photo, upper left). Temporary exhibits, such as the Apollo Space Project (photo, above), include flashing lights, multislide projections and individual telephone messages.

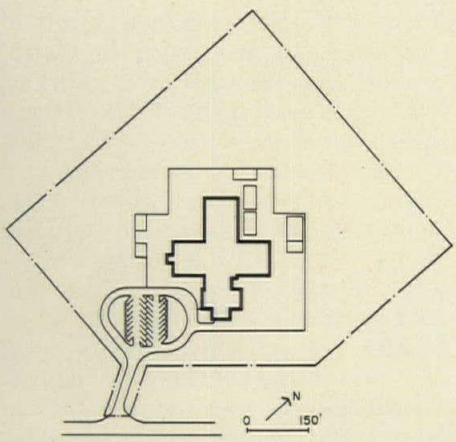
Ski Lodge Schools

As theory and experiment sweep the nation's schools, the architecture follows suit. Two schools in the California Sierras, designed several years ago under new guidelines, are reviewed here after several years of use. Programs for both included open classes, team teaching, nongrade groupings — all demanding highly flexible physical plants. The curriculum and theories under which they operate are aimed at the individual developing at his own rate in areas of his own interest. Architects for both schools are Van Bourg-Nakamura.









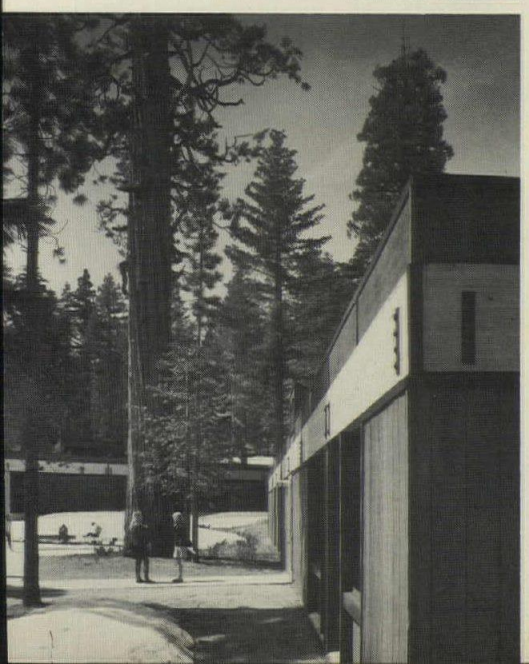
In harmony with the landscape, a rough textured cedar plywood, painted in bright colors, was used for exterior finish.

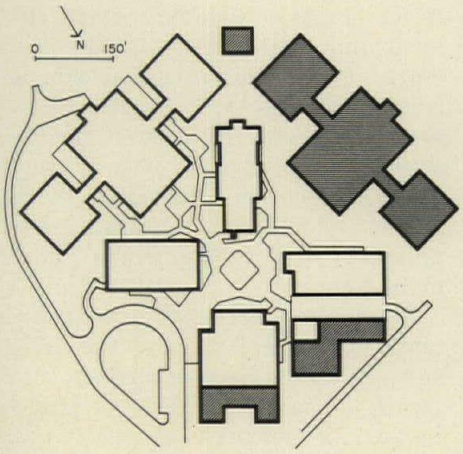
For the Meyers Elementary School (completed 1967), the superintendent and school board had specified an open building for nongraded primary grouping and team teaching. The architects responded with a concept virtually devoid of corridors. Instead, three instructional units are grouped around a central project area. Each includes a four-teacher open space and two self-contained classrooms, one of which is large enough to seat two full classes for special instruction. Of the latter type, one, used for kindergartens, has a folding partition and an annex for separate entrance and toilets.

The core that forms the center of the instructional units themselves consists of a large resource center-cum-library, an arts and crafts room, pupil personnel services, a teachers' preparation room and a radiant-heated open courtyard. An administration and multi-use unit with stage and kitchen abuts the core's fourth side and completes the Greek-cross plan.

Since similar site and weather conditions prevailed, design data from the earlier South Tahoe High School was useful in defining a structural system. Concrete bearing and lateral

Photo: James Hildinger



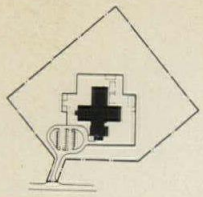


Horizontal roof planes resulted from studies of snow loading, and yield a relaxed Alpine architecture (far left). Institutional images are absent from this crisp, informal wooded setting (above left).

Covered walkways were avoided through use of heated paths (left).

A belief in integration and open-endedness is embodied in architects Van Bourg-Nakamura's design for South Tahoe High School (completed 1966). Stanford University provided a computerized "flexible scheduling" program that emphasizes differences in student, teacher and subject area within a total quantity of time. Conventional classrooms are relatively few, yielding to larger spaces, often sloped or stepped, that permit such varied activities as lectures, independent studies, seminars and simultaneous small classes.

Institutional images and attitudes are absent from this crisp wooded setting. Buildings of different size and function are clustered to create an intimate campus — avoiding urban density, formality and anonymity — while preserving much of the naturally landscaped site. An open atmosphere is furthered by avoiding covered walks, and the problem of snow accumulation is solved instead by heated paths that use excess steam from the central heating system. The positive values of the area's snowfall are exploited in a unique ski



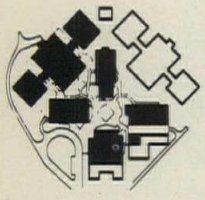
support columns were again used with a roof and girder system designed for 100 lb per sq ft snow loads. For maximum flexibility, all interior and exterior walls are nonbearing and nonshear. Here, as at the high school, concrete columns were erected first, ready to receive roof structures and snow loads within two or three months of ground breaking. In this way all interior work, including installation of mechanical systems, pouring concrete floors and erecting partitions, could proceed throughout the winter.

In harmony with the forested mountain landscape, a rough textured cedar plywood was used for exterior finish, treated in bright colors for contrast against the severe whites of winter. Inside, too, bright colors serve to identify individual areas in the open, structurally undefined classrooms.

Reaction to the school, particularly on the part of teachers, has been as much a reaction to new techniques and approaches as to the buildings themselves. The architects involved themselves to an unusual degree in ironing out difficulties of adjustment with the teaching staff. Seminars, which might more properly be called "gripe sessions," were arranged to discuss the uses of this new tool for education, and many of the negative feelings inevitably associated with the unfamiliar were worked through and exchanged for positive attitudes.

Although problems with noise levels have been felt in some double classrooms, teachers appreciate the opportunity to constantly create new activity centers through rearrangement of tables, desks and movable cabinets maintained and shared by the entire group. The variety of activities offered the children, who may move on to a new one only after the one they are engaged in has been successfully completed, provides a new impetus for achievement as well as a sense of individuality in terms of pacing and interest.

MEYERS ELEMENTARY SCHOOL, South Lake Tahoe, Calif. **Architects:** Van Bourg-Nakamura & Associates. **Site:** A flat, heavily forested area, with mountains in background. **Program:** Open, flexible building for nongraded primary grouping and team teaching that could be converted to conventional classrooms if necessary. **Structural System:** Concrete bearing and lateral support columns, supporting glu-lam girders, roof joists and plywood roof diaphragm, with buildings raised on five-foot pad of engineered fill due to swampy site. **Major Materials:** Exterior finish of rough-textured cedar plywood; carpeting throughout academic and library areas. **Cost:** $835,208; $18.80 per sq ft (buildings only). **Consultants:** O'Kelly & Schoenplank, Mechanical; Butzbach/Bar-Din, Structural. **Photography:** Julius Shulman.



instruction program that is part of the regular physical education curriculum. This required inclusion of ski-tow and related facilities in the architect's program.

Site and seasonal conditions peculiar to the area determined the construction procedure. Due to the short warm season, it was necessary to roof over as much floor space as possible so that construction could continue under cover throughout the winter. Consequently, the bearing system, free-standing concrete columns arranged in a grid pattern, was erected first. It supports laminated timber beams and wood joists as well as plywood sheathing and insulated roofing covering large spaces whose functions can be easily reprogrammed. Only the walls of the gymnasium and theater are load-bearing, since these units will remain stable in function.

The horizontal roof planes that are typical of the school resulted from studies of snow loading (structures had to be designed for more than five times the roof loading required in the San Francisco Bay Area), melting and run-off characteristics. These horizontal planes are broken here and there where a special interior function demands expression.

The demand for flexibility in interior spaces is reflected on the exterior in a relaxed aesthetic that employs natural finishes suitable to a rustic environment. Formal or sentimental values were eschewed, for example, in the omission of roof overhangs, so often associated with Alpine architecture. Roof drainage is provided internally, where heat maintains flow.

Budget considerations and unpretentious design influenced the decision to expose roof structural elements. This allows easy repartitioning and wiring — essential to a program dominated by flexibility.

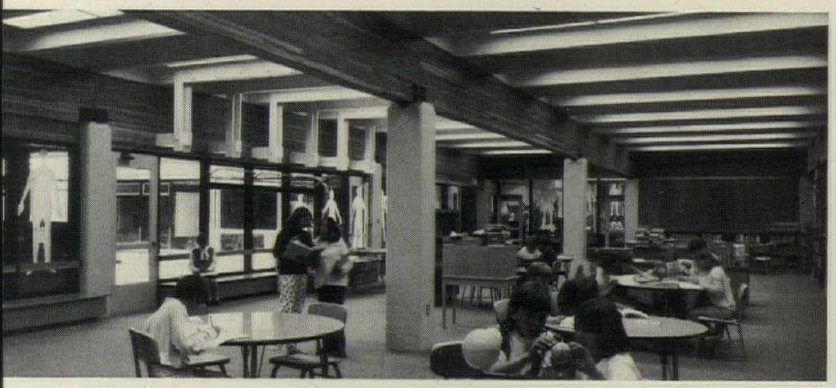
Four years later Anthony J. Magliari, superintendent of schools, reports that the potential for flexibility is unlimited. The open space carpeted area has housed a seminar, small group conferences, centers for individual study spaces and two satellite libraries which are used extensively. The departmental office space has promoted communication among staff members as well as production of teaching materials. He also notes that the cluster arrangement allows for good circulation. Because the auditorium building and the gymnasium are so accessible to the public, the school is developing into a community center.

"There are some inadequacies in the plant," he adds, "but these will be corrected when the second phase of the building program gets underway. We need more physical education facilities, special education classes, cafeteria space, a student lounge and a production center."

The students, meanwhile, remain enthusiastic. One reports, "I love the whole school. It builds morale and makes the kids want to study harder. It's just like a college campus."

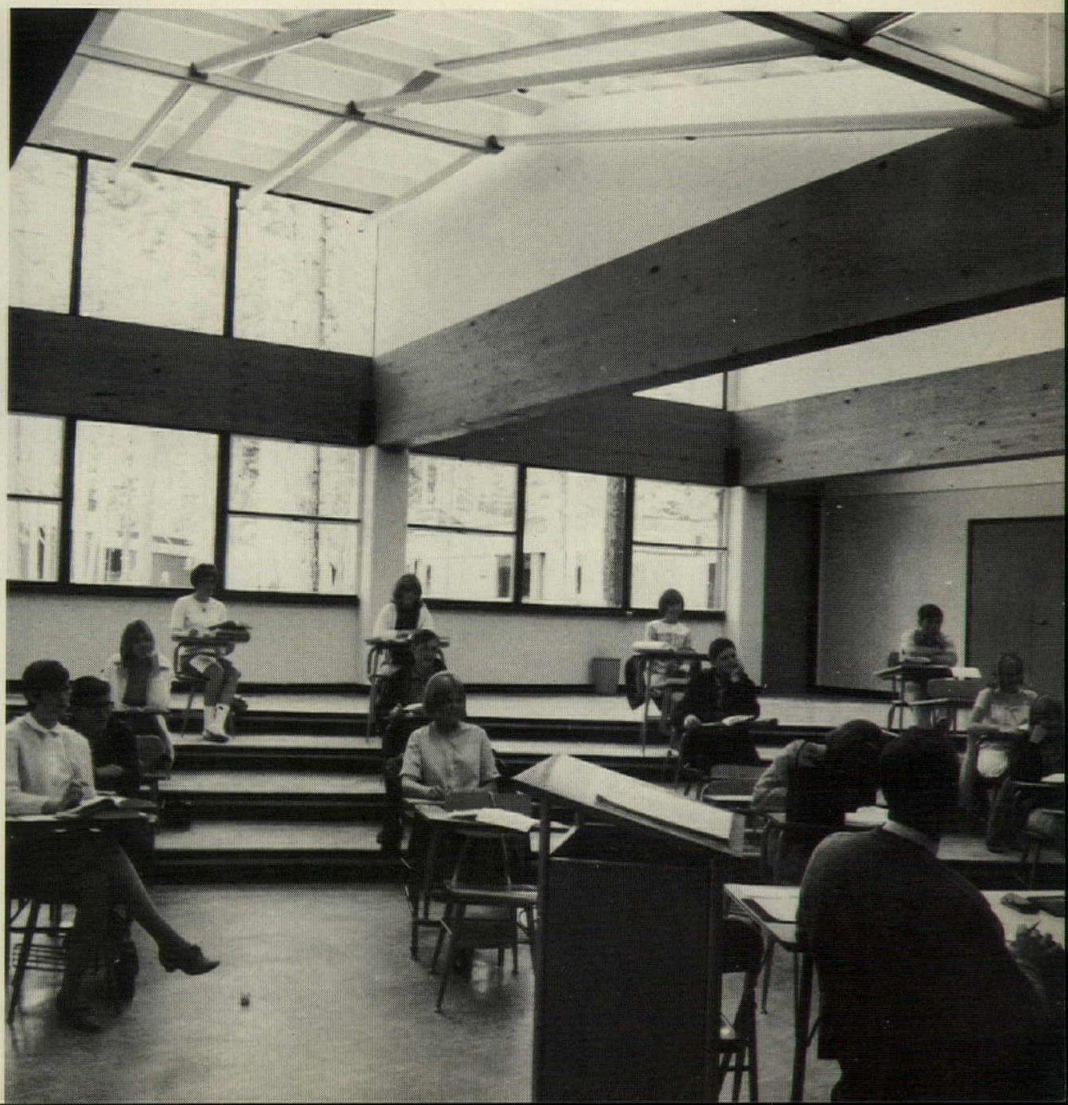
SOUTH TAHOE HIGH SCHOOL, South Lake Tahoe, Calif. **Architects:** Van Bourg-Nakamura & Associates. **Site:** Evergreen forest adjacent to U.S. Forest Service reserve. **Program:** High School for rural area where terrain and heavy snowfall provides opportunity for skiing. **Structural System:** Grid system of square concrete columns; horizontal, plate height glu-lam beam and wood joist roof system. **Major Materials:** Industrial grade glu-lams, carpeting and factory-finished steel sash and doors. **Cost:** $2,103,567 (buildings only); $19.58 per sq ft. **Consultants:** Massetti & Parish, Electrical; O'Kelly & Schoenplank, Mechanical; Butzbach/Bar-Din, Structural; Carl Kirker & Associates, Civil; George Wilson, Acoustical. **Photography:** Julius Shulman except as noted.

Clerestory windows of the multi-purpose room above are of gray plastic.



The library-resource-study center right is a space gleaned from savings of "corridors" within the state-aid square footage formula.

Teachers appreciate the chance to create new activity centers through rearrangement of tables, desks and cabinets.

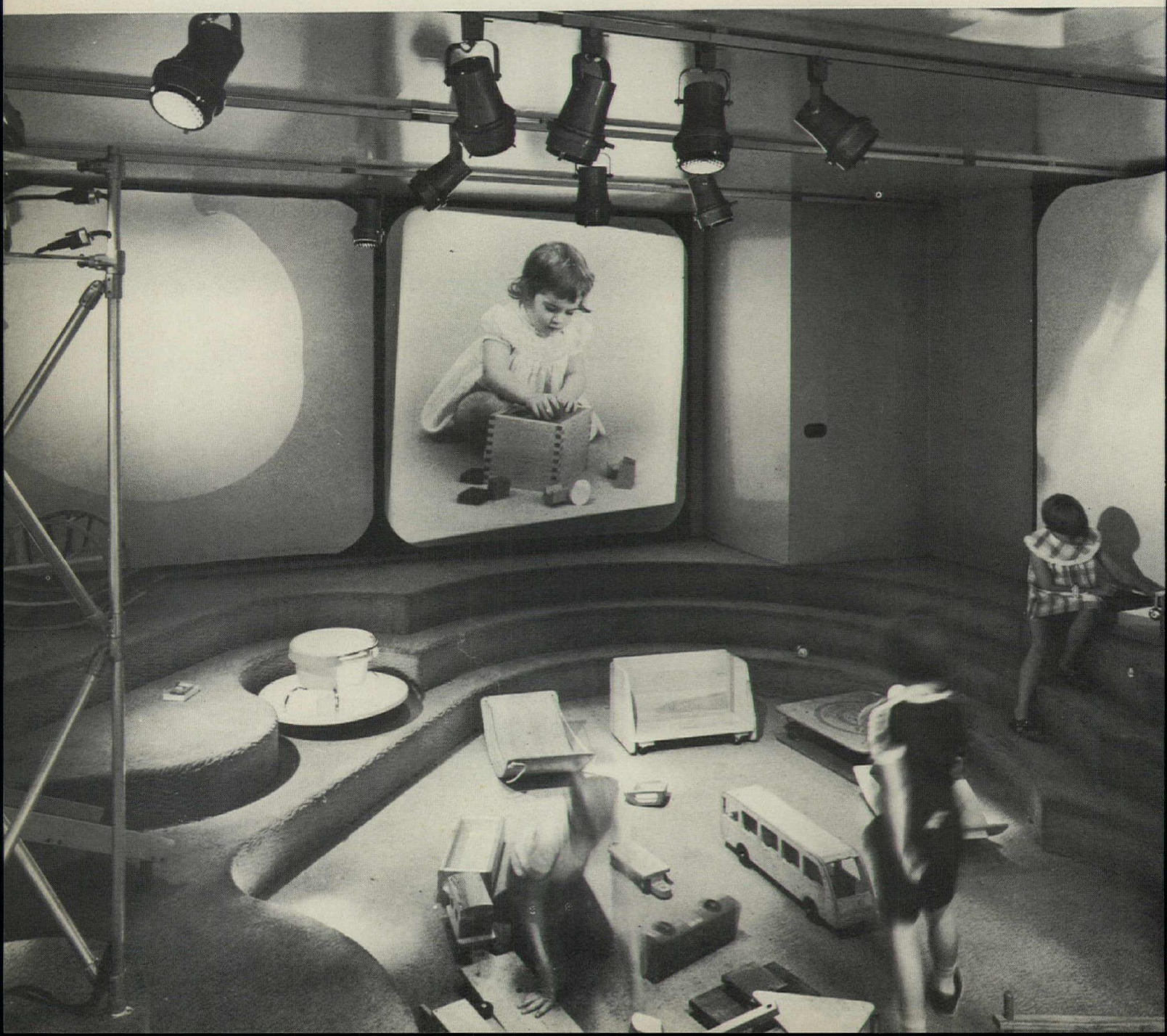


The gymnasium and theater alone have load-bearing walls, since their functions are stable (above). Conventional classrooms are few, yielding to larger stepped spaces for varied teaching situations (right).
Photos: Mitchell Van Bourg

Designing for the Real Customer

Most children's stores, from both a physical and a mental viewpoint, are designed for adult shoppers rather than for the real customers — the children themselves. The three shops presented here have adopted a new approach — providing a playful, educational and aesthetic child-oriented environment — to encourage his involvement in shopping.

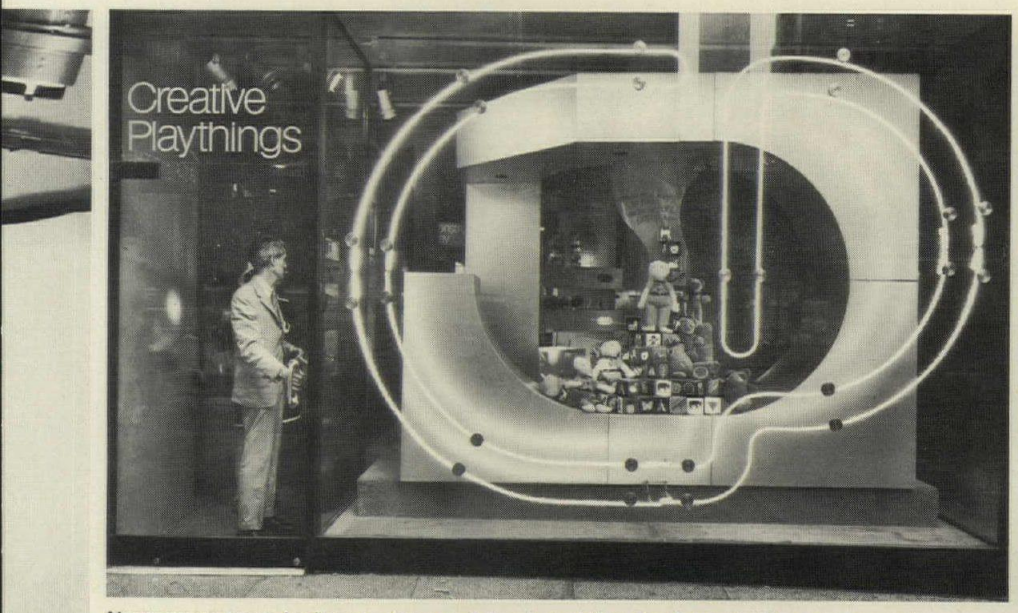
To achieve this marketing goal, each shop is designed to accommodate the child's size, comprehension level and physical capabilities, while bright colors, bold forms and graphics stimulate his awakening aesthetic sense. Each contains features other than merchandise to engage the child's interest in an activity suitable to his age, with little distinction made between merchandise displays and play equipment. A



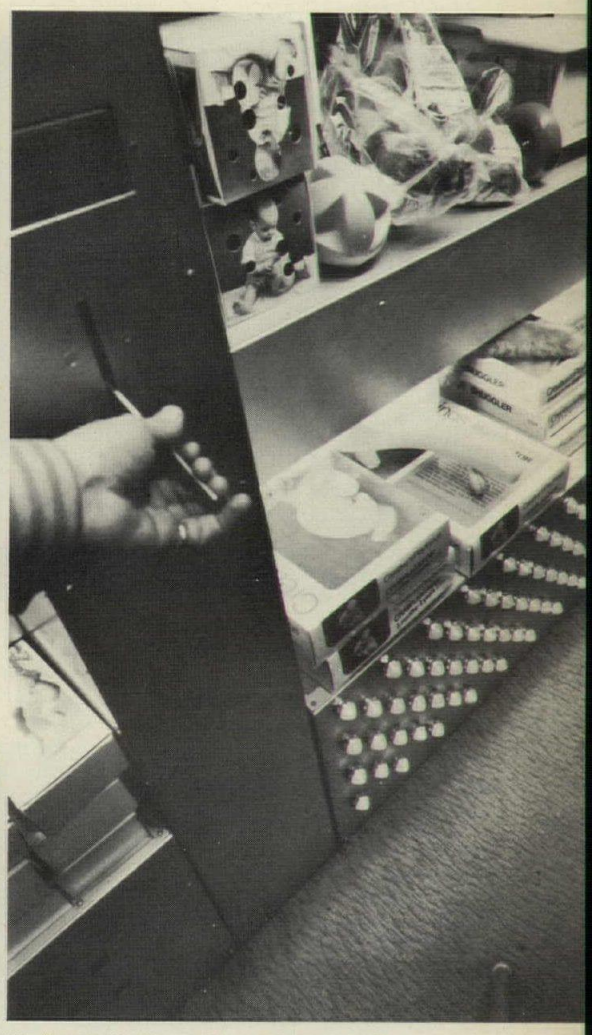
selling table, for instance, is also a playhouse: children can literally poke their heads up through the table to see merchandise. By physically participating in the environment, the child discovers merchandise to suit his needs and desires. Even though he may not control the actual purchasing transaction, his reactions to his surroundings influence the child's selections.

For the child, shopping thus becomes a positive experience, rather than the usual bore of the adult environment and frustration of "do not touch." The success of these shops emphasizes that children, as intelligent and responsive market prospects, can be approached through advanced marketing methods, and suggest that retailing for the child sector is due for major changes.

Creative Playthings

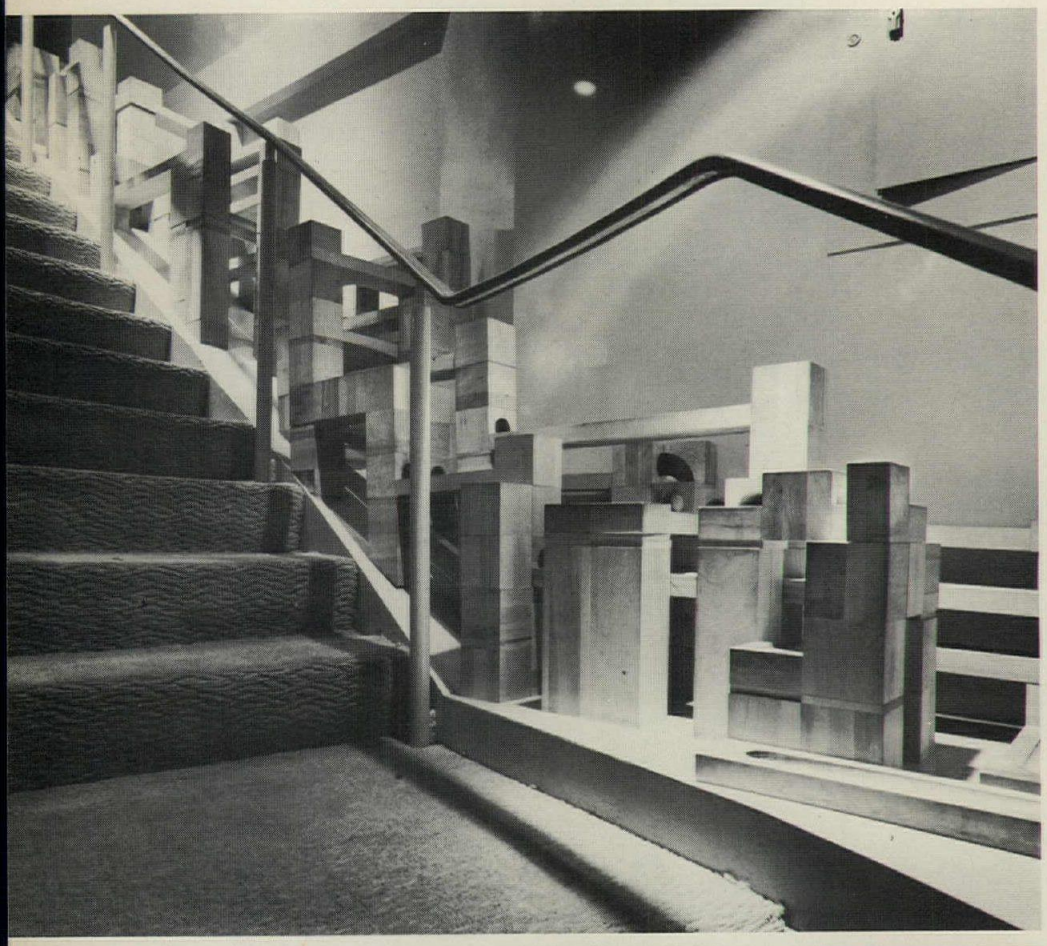


Neon monogram invites customers into store (above) where children can sample the merchandise in a carpeted, free-form playroom (left). Overhead slide projectors provide a continuous show. Below, thick aluminum display shelves isolate groups of toys for easy viewing and selection. Bold graphics and a color-coded system identify the age group for which each toy is suitable.

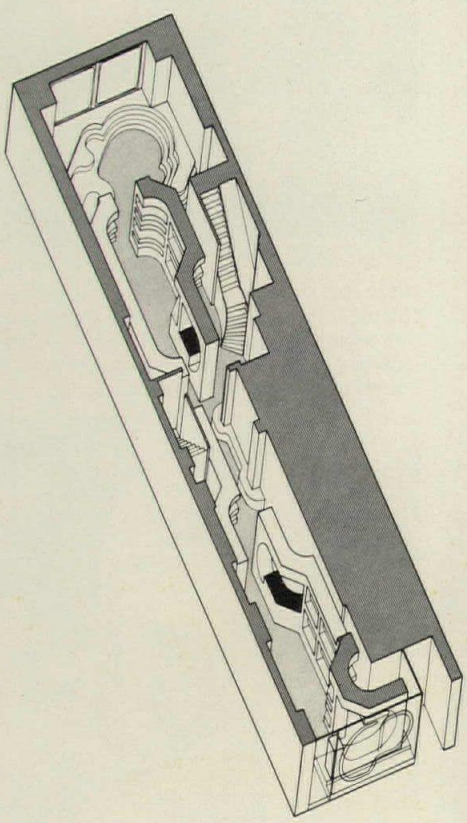


Built into display units are levers and buttons which children push to activate blinking lights and create their own electronic music (above).

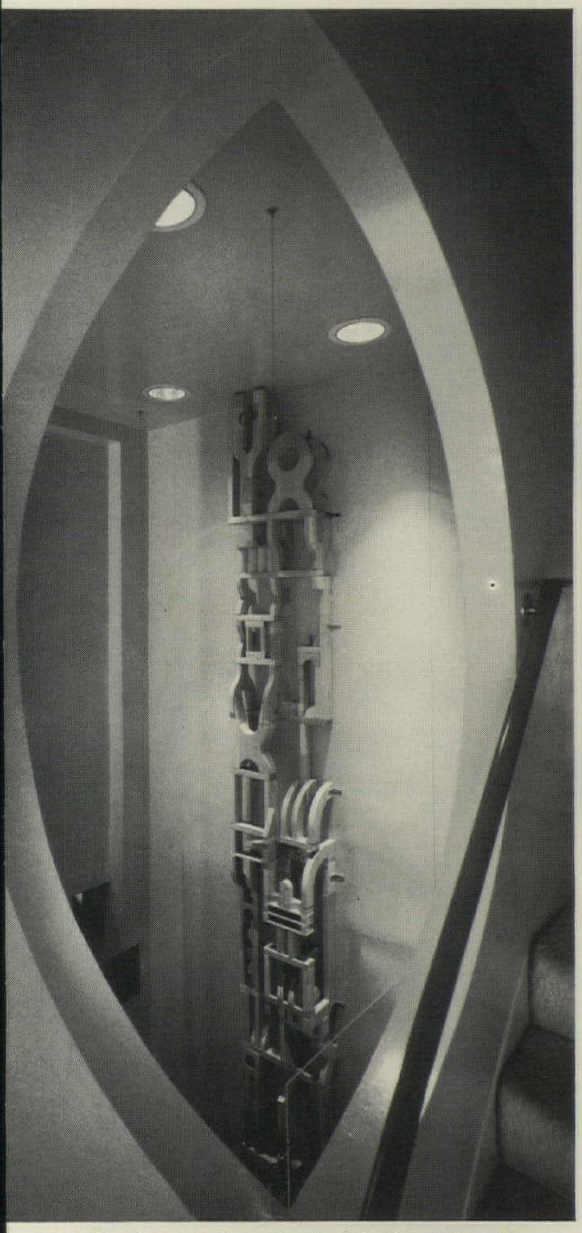
An ambiguous demarcation between merchandise and playthings is an essential factor of participatory shops.



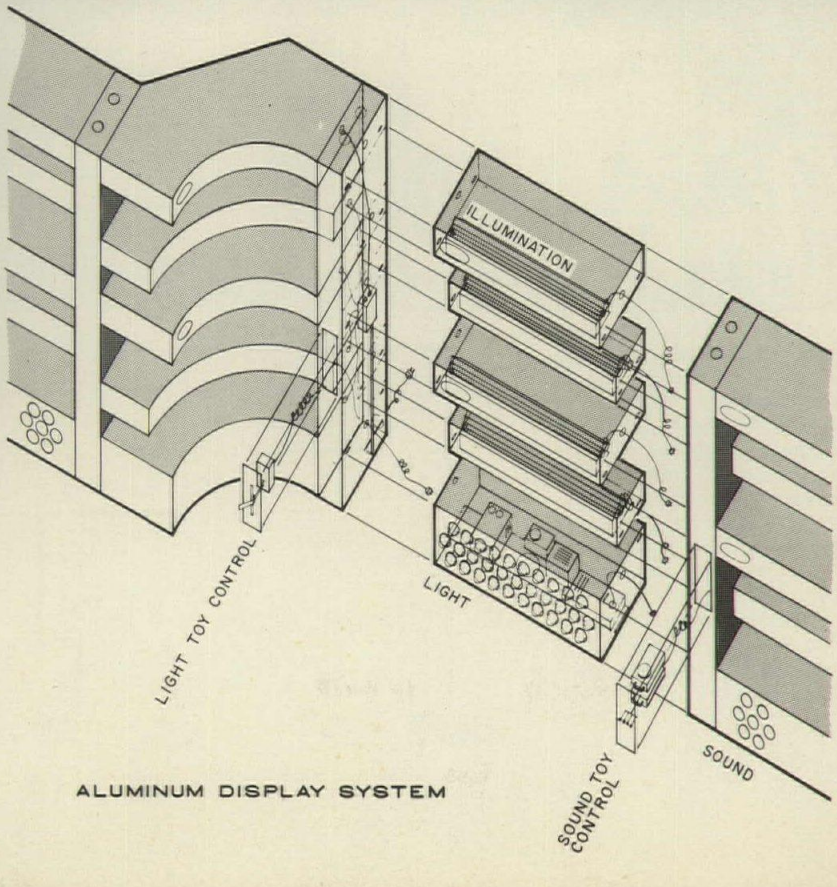
CREATIVE PLAYTHINGS, 1 East 53rd St., New York, N.Y. **Architects:** Godard/Hodgetts/Mangurian/Walker. **Client:** Creative Playthings (subsidiary of CBS). **Program:** Design an exciting space with facilities to sell Creative Playthings toys. Architect's aim was to provide a single system to configure space as well as house display, light, sound toys, etc. **Site:** Interior of 100′ x 15′ (average) shop, adjacent to Paley Park. **Design Concept and Solution:** Large scale parts which fit together to shape traffic flow, display, etc. Conceptually, an aluminum set of parts within an orange tube; the parts are stress-skin type, pop-riveted air-conditioning ducts. Floors surfaced with bright orange carpet custom made by Bigelow. **Mechanical System:** HVAC. **Costs:** $59,000 or $24 per sq ft. **Consultants:** Jules Fisher, lighting; Morton Subotnick, sound; Edward Bernstein, aluminum fabricator. **Photography:** Norman McGrath.



A wood marble run (above), an oversized version of one of Creative's products, is an invitation for children to enjoy themselves. Right, the display system throughout the store directs traffic flow and provides cashier counters in the shape of the store's logo.

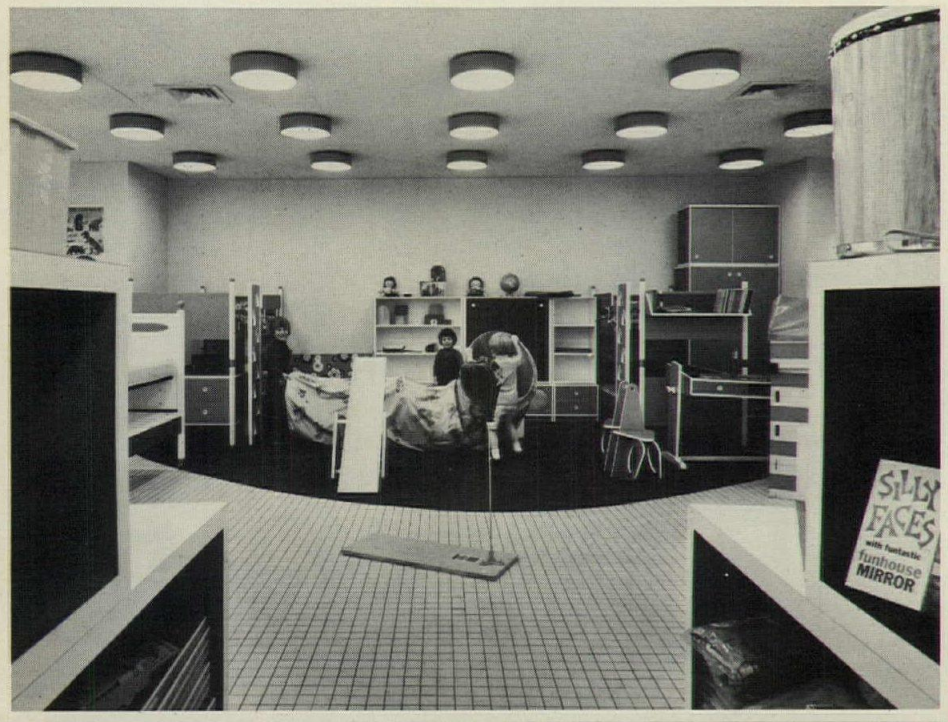


An almond-shaped cutout in the stairwell wall reveals a two-story high wood-block castle (above). Right, the display system consists of 105 interlocking, interchangeable parts for quick and easy rearrangement of the store's interior. It also houses visual, sound and lighting systems, as well as clip-on panels for supplementary graphics.

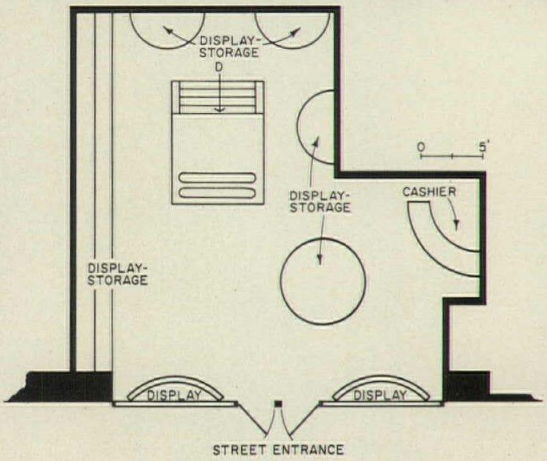


ALUMINUM DISPLAY SYSTEM

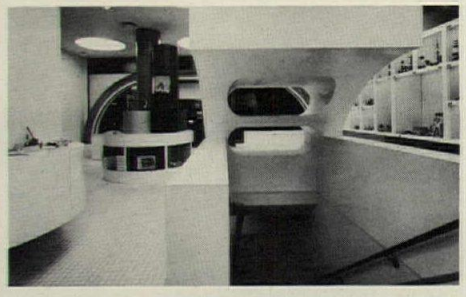
Childcraft

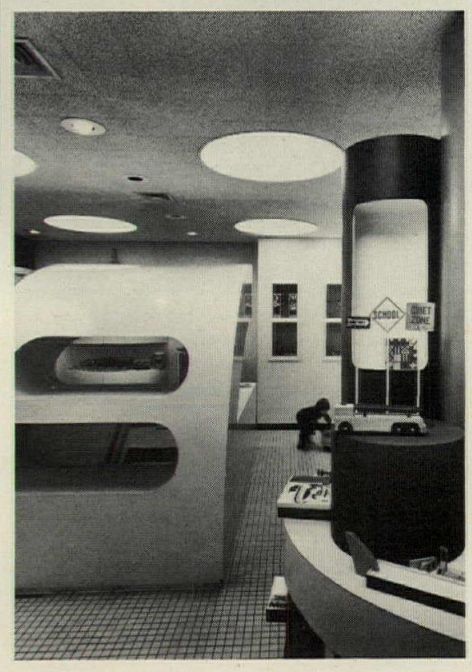


Neon-lighted rainbow introduces the Childcraft toystore. Two entrances are provided — one for adults and one 4-ft high for children. A half arch with lozenge-shaped openings (far right) leads to the lower sales level, which includes an artificial-grass play area with game tables and toys (above). A sound track of trains, planes, crickets and thunderstorms reverberates throughout.

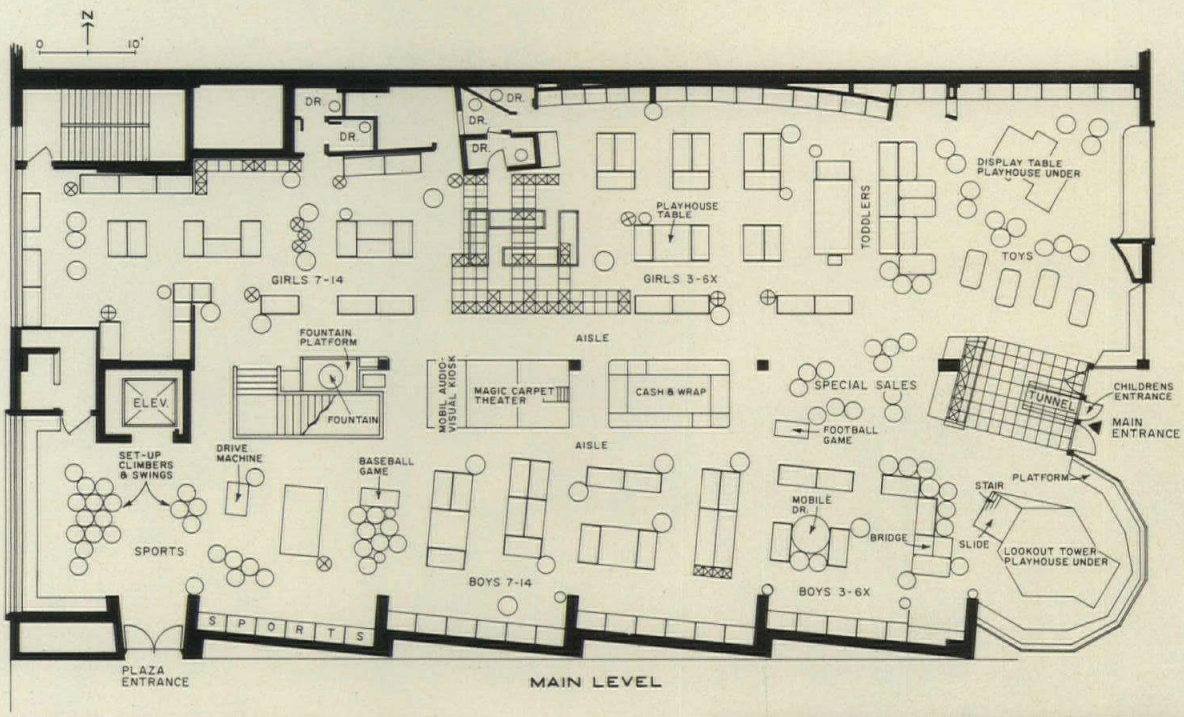


CHILDCRAFT CENTER, 150 East 58th St., New York, N.Y. **Designer:** Milton Glaser. **Client:** Childcraft Centers Inc. **Program:** Develop an unusual and promotable environment in which to sell toys. The client hired a graphic designer rather than an architect because the problem heavily involved graphics. **Site:** Approximately 4000 sq ft of ground and below-ground floor space in new office building. **Design Concept and Solution:** Beginning with a neon light "rainbow" facade, a circular idiom was maintained throughout. In order to organize the space clearly and to simplify the general visual chaos common to most toy stores, display bins are provided to isolate groups of toys into an understandable unit, and all areas are color coded by age for easier shopping. Materials are tough and easy to maintain (display units are plastic laminate and floors are vinyl tile). **Costs:** $75,000, or approx. $18.75 per sq ft. **Photography:** Norman McGrath.





The Children's Place



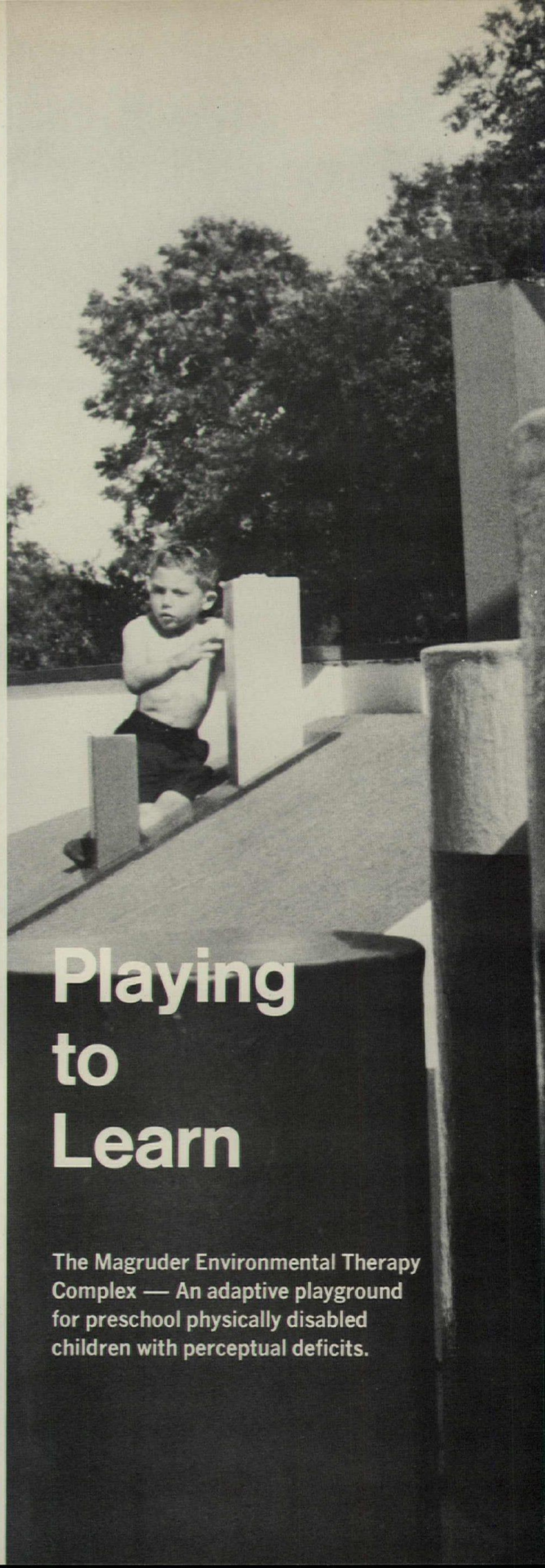
THE CHILDREN'S PLACE, Bishops Corner, West Hartford, Conn. **Designer/Architect:** George Nelson & Co., Inc. **Client:** Clinton Clark and David Pulver. **Program:** Design a children's department store that will provide a profitable base for business, and serve as a facility for testing new marketing theories about children's behavior and tastes. **Site:** Existing two-level space (12,000 sq ft) in a major shopping center. **Concept and Solution:** To provide an environment that would encourage the child's involvement in shopping, features other than mechandise (wishing well, playhouse, etc.) were placed in each department, with little distinction made between display fixtures and play equipment. All elements were determined by children's tastes, comprehension, physical capabilities and psychological adjustments. **Major Materials:** Ceiling is white acoustical tile, walls are dry-wall painted with brightly colored enamel, and floor is red brown wool carpet (special areas overlaid with Astro-Turf). **Photography:** Edward Saxe Studio, Inc.

Children enter the store through a bright yellow plywood tunnel. Each department has a different play element, the principal one being a 2-level, plywood castle (above) which includes telescopes, a slide (left), fountain and wishing well and a furnished playhouse. "Endless" and funhouse mirrors occur frequently, while a strong graphic mood and vivid colors dominate the store. Even the elevator is adjusted to the child's capacity for a new experience: low windows inside reveal a rainbow painted on the elevator shaft.

Tactile Awareness — the feel of things.

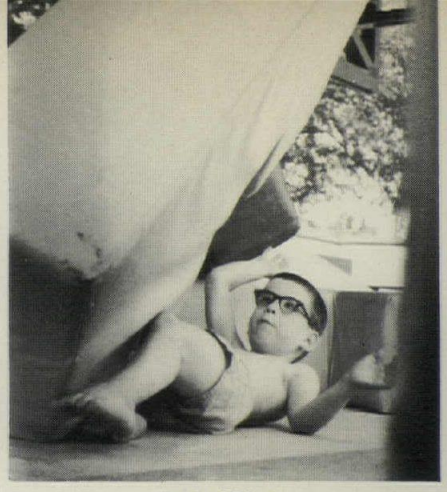
Motor Planning — a consolidation of knowledge of how to move effectively in space.

Body Balance — dynamic and static.

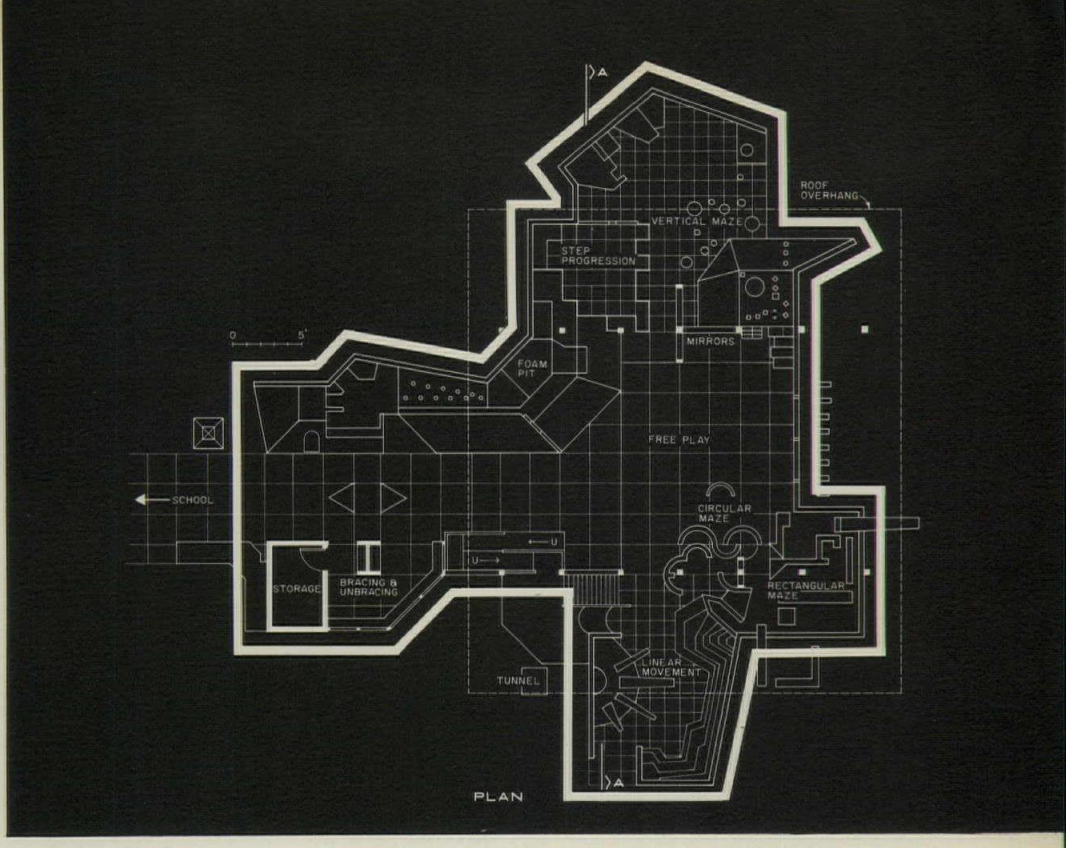


Playing to Learn

The Magruder Environmental Therapy Complex — An adaptive playground for preschool physically disabled children with perceptual deficits.



Integration of Body Sides — understanding of back and front, up and down, left and right, externally in relation to the body.



Temporal Awareness — time required to get from one place to another.

Children play. This is such an accepted fact that it has rarely been questioned or seriously studied. But it is being investigated now because there are countless children who are denied this activity because of physical disabilities and their associated perceptual deficiencies. A question of great urgency is whether or not, and to what extent, play is important to future learning.

Normally, a child's knowledge of himself and his surroundings begins with the exploration of his own body. From the very beginning, however, a handicapped child encounters barriers to his exploration that impair his perception of his body and his surroundings. If he cannot control the movement of his hands and feet, he will be unable to discover their functions; he may even remain unaware that they are his. Thus he may fail to reach the common levels of motor development and his motor perception may show deficiencies due to lack of experience.

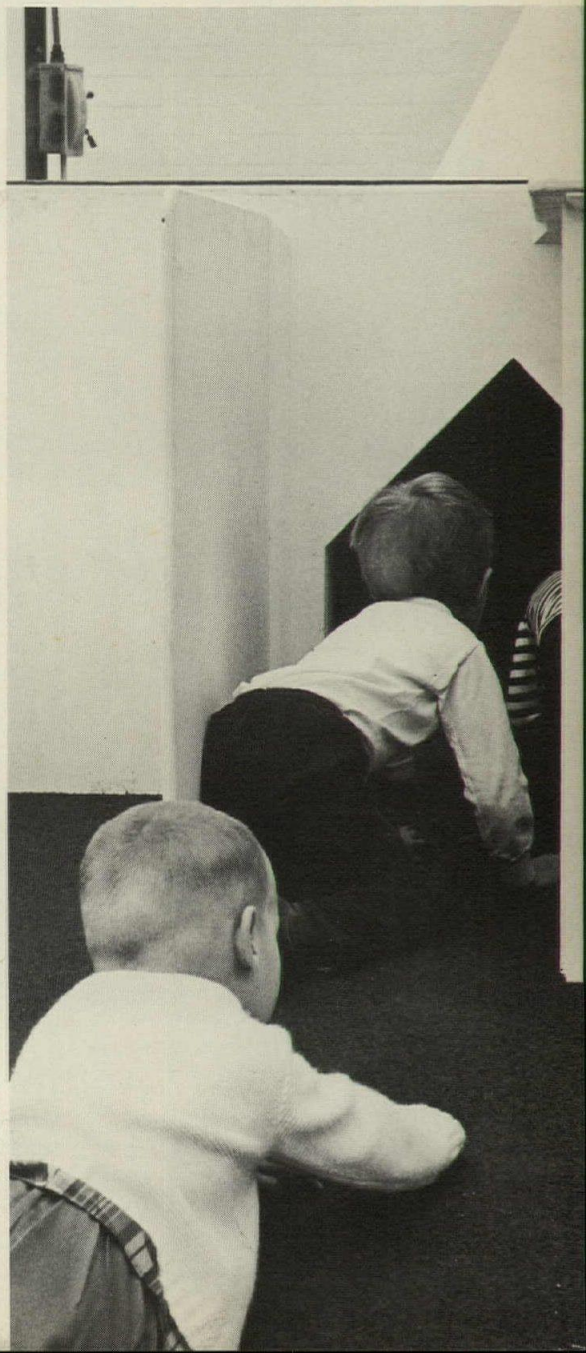
But recently some startling things have been happening at Forrest Park School in Florida. A child who was thought to be physically unable to walk reached out and pulled himself up onto his unsteady, wobbly legs, without crutches; another even dared to take a few halting steps for the first time in his life. A child who could only crawl on his stomach tried so hard to reach his friends that his knees flexed and suddenly he was crawling on all fours. Another frightened, nonambulant boy, seeing his friends excitedly flopping into a falling pit, finally threw himself in and came out laughing.

Forrest Park's playground is an environment that motivates play, where children can function freely, regardless of the extent of their disabilities, where they are simply told to "go play," with no attempt to structure their activities, and where they can have the important motor experiences that form the necessary basis for future learning.

The school's principal, along with a physical therapist, a physical education expert, and the designer worked together with special educators, a kinesiologist, and a psychologist to develop a set of desirable perceptual goals essential to the full development of motor perception. The playground, with equipment unlike the usual therapeutic equipment, is intended to develop 15 basic skills and was designed to allow the children free, spontaneous and unstructured play. Unhindered by their braces, yet protected by yielding surfaces, they are given breadth of experience as similar as possible to that of normal children.

The ten principal parts of the environment consist of balance beams, step progression, shelters, tunnels or caves, free-standing walls, foam pits, slides, overhead pull-ups, rolling hills, up and down ramps, and mirrors. These expose the child to the 15 perceptual goals essential to the full development of motor perception. (Although an activity may encourage the development of more than one perceptual goal, photo captions list only one important benefit of each activity.)

Learning depends on perception; if the flow of sensory experience is blocked or slowed because of an impaired motor system, then mental development cannot proceed at the nor-



Judgment and Decision — ability to avoid or use objects as one moves.

mal rate. In school a disabled child may have difficulty grasping abstractions basic to academic progress. Such difficulty is often assumed to be due to low I.Q. or even to retardation. Actually, these learning problems may be the result of a lack of perceptual experience due to physical deficiencies.

The study of children who have been denied normal access to play because of their handicaps, although in its early stages, seems to suggest that play is, indeed, perhaps the first and most important step to further learning. The problem is that if it is important, how can children who seem to be unable to play be encouraged to do so?

In the past it was felt that handicapped children could not play, and no attempt was made to make it available to them. What was provided was physical therapy in clinical, fluorescent-lighted, sterile rooms with a maze of objects and contraptions where the child was forced to go through hours of discomfort, happy to get back into his wheelchair or braces until the next dreaded session. He would usually spend years doing this, with little or no results, leading to frustration or stifling of the child's normal enthusiasm for play.

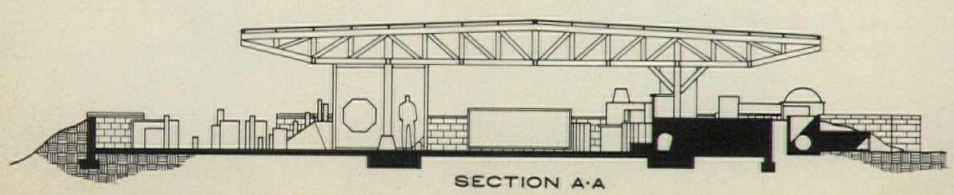
At Forrest Park the playground is an attractive, colorful, exciting atmosphere that stimulates the child's imagination and makes him want to use his muscles. It is a continually flowing series of events and experiences that appear to the child as a fantasy world of brightly colored shapes scaled to his size, pleasant to his touch, and tolerant of his limitations. It is a place where handicapped children, who have traditionally been thought to be unimaginative, show immense creativity and invention that was not evident prior to their exposure to the environment. But most important, it is a series of potential explorations and adventures — and therapeutic exercises.

The playground is designed to allow change and experimentation by the staff, and the children themselves can manipulate many of its flexible features. The process of modification and change that was set in the early stages of design is continuing, for it is felt that no area should be thought of as permanent. The playground is being constantly tested, and it will be modified if there is any indication of improper muscle balance. One important aspect of the testing involves the analysis of motion pictures of the children's activities to determine the nature and degree of muscle strengthening. Films of the children at play reveal startling occurrences that might otherwise go undetected. In one instance the film shows a child using a hand previously considered by the therapists to be unusable. Another child is seen extending an arm usually held rigidly against his body.

These tests are only a beginning; the ETC offers many possibilities for research. One proposal is to evaluate the effects of color, light, form and shape on perceptual development. But the most important test will come as the children who have used it enter the first grade. If they have fewer learning problems than similarly disabled children, it will be preliminary proof of the positive effects of the experience. The earliest observations indicate that the playground activities are yielding positive results.

DAM

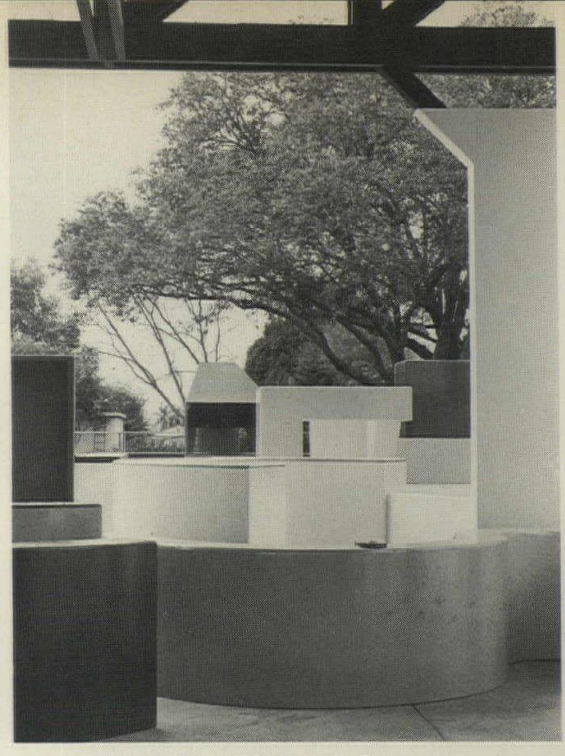
MAGRUDER ENVIRONMENTAL THERAPY COMPLEX (ETC), Forrest Park School, Orlando, Fla. **Architects:** Leland G. Shaw, Designer; Dan Williams, David Smith, Dwayne Crawmer, Michael Weinstein, Student Design Assistants; W.G. Wagner, Research Consultant. **Site:** Existing 100′ x 100′ playground. **Program:** To create an environment with motivation through play in which physically handicapped children could function freely and acquire experience similar to that of other children, based on the precept that such motor perception experience is basic to future academic learning. **Structural System/ Major Materials:** Wood roof-truss system; limits of interior area delineated by concrete block retaining walls capped by 2″ x 4″ planks. Marine plywood shapes, some covered with exterior carpeting and some painted, formed up to wall on interior, are principal elements. **General Contractor:** Creed J. Clifton.



SECTION A-A

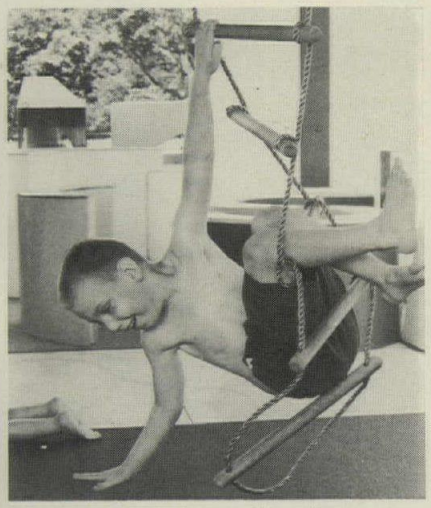
Body Awareness — self awareness and body parts awareness, weight of body, awareness of right and left hands to climb.

Directionality — movement in many directions from various planes of the body.



Relationships of Objects in Space — going around, over, under, through different objects.

Spatial Relationships — where one is in space, how much space he occupies.

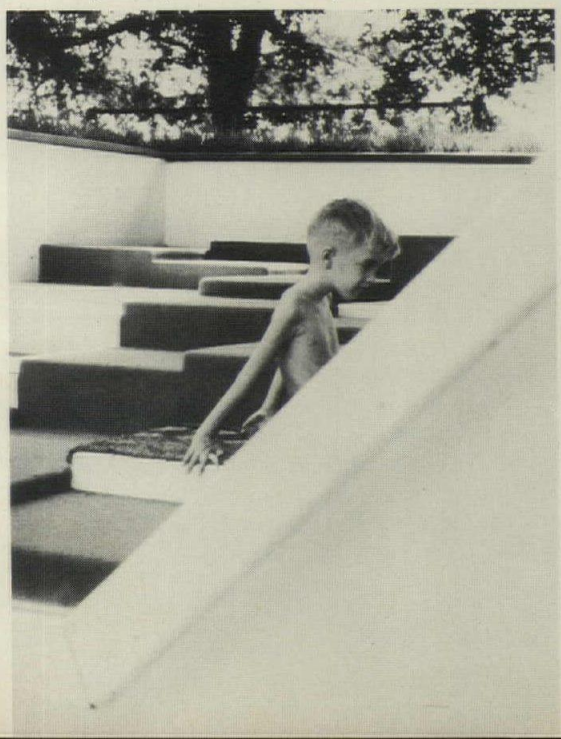


Laterality — understanding of body halves, left and right.

Kinesthetic Awareness — the feel of joints and muscle movement.

Linearity — following lines out in space, knowledge of remote spaces.

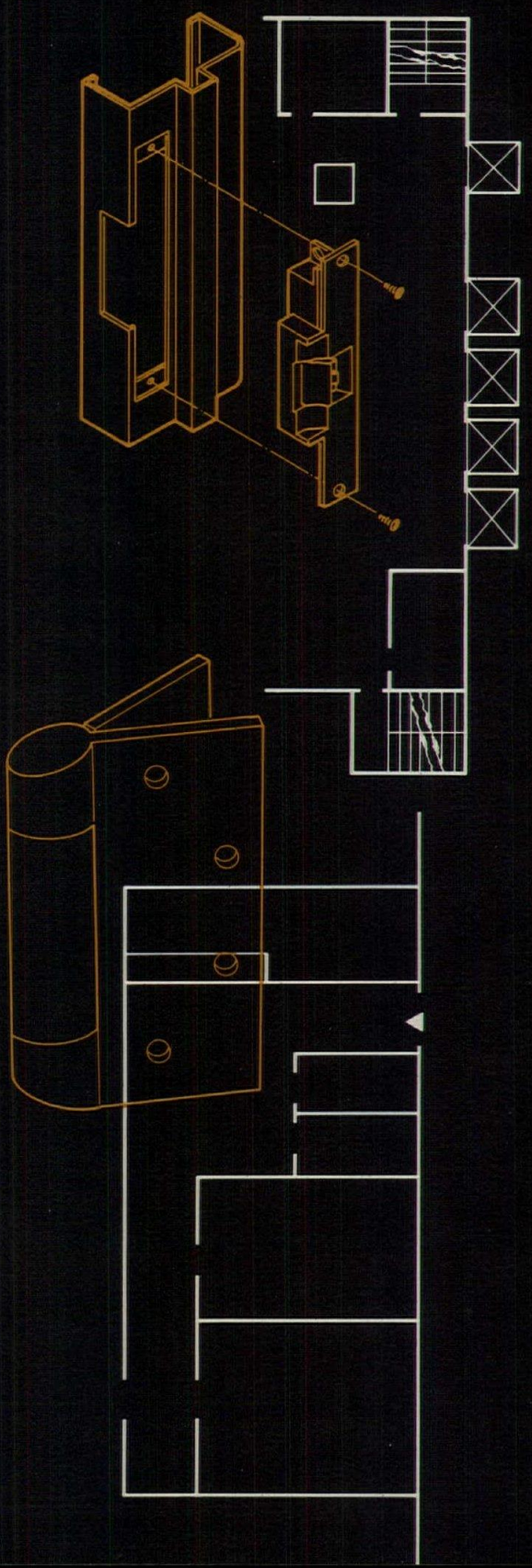
Depth Perception — assessability of objects up and down in space.



Concepts about Space — the experience and knowledge gained should bring about increased understanding of the abstracts of formal learning.

Designing for Security

By **Richard B. Cole,** President of Loss Prevention Diagnostics, Inc.



Misfortunes one can endure — they come from outside, they are accidents. But to suffer for one's own fault — ah! — there is the sting . . .
Oscar Wilde

It is true that if we could predict impending disaster, inefficiency or apathy, we would do our very best to avoid them. Why is it true, then, that American business sustains large losses each year from internal pilferage and overt criminal attack. Indeed, if dollars that are irretrievably lost through theft had been invested in facility design and construction, the losses might not have occurred and the retained profits could have been fruitfully used.

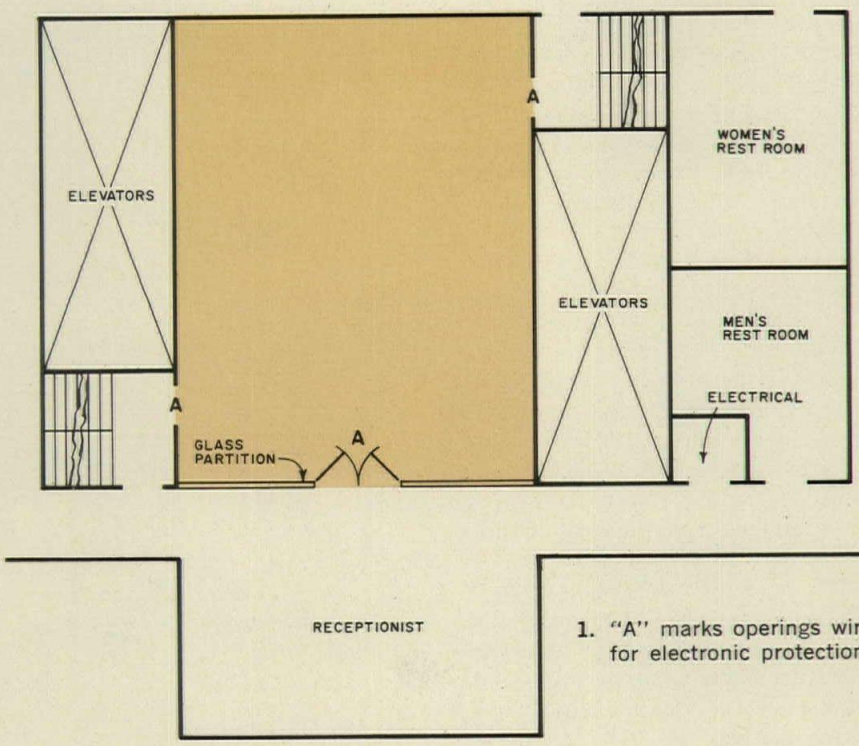
There are consulting firms that bring to architectural planners the opportunity to improve their design by permitting it to reflect the client's ability to control his losses, his people and his continuing operating expense. These firms elaborate upon the architect's analytical abilities by creating opportunities to reduce the potential for the criminal confrontation. This leads to additional benefits. Having reduced the opportunity for crime to occur, it becomes possible to predict reduced protection requirements to maintain an adequate level of security that can result in dollar savings to the client that could equal or surpass the original architectural fees.

By determining a client's past history of criminal confrontations, the existence of and his ability to operate internal control programs, it is possible to design a building that provides the best atmosphere for a successful security program, once aware of the client's product and its system of production.

Even with burglar alarms, it is possible to design systems to assure that alarm hardware does not destroy the aesthetic intent of the architectural plan. When considered in the very early stages, the architect can suggest cost savings for the client by recommending that alarm

hardware be purchased rather than leased, and that it be installed under the general contract, thus allowing fixture expense tax advantages and lower annual maintenance fees (tables 1 and 2).

The early design of alarm systems has advantages. For example, in high-rise buildings the opportunity to use common raceways and electrical closets could result in substantial savings. The opportunity to determine the need for precut door bucks where electrical door controls are used can save many dollars if done by the manufacturer rather than at the job site. The design of the building core to assure that receptionist activities are confined to a public area within the core can save money in several ways: if alarm technology is appropriate, confining the distance of wire runs in installations to the building core area will result in cheaper installation,



1. "A" marks openings wired for electronic protection.

Table 1

Leased vs. Purchased Alarm System

Leased Systems:	1st Year	2nd Year	3rd Year	4th Year	5th Year	5 Year Cost
Installation	$1,700.00					
Annual Lease	270.00	$270.00	$270.00	$270.00	$270.00	
Annual Maintenance & Monitoring	630.00	630.00	630.00	630.00	630.00	
	$2,600.00	$900.00	$900.00	$900.00	$900.00	$6,200.00
Purchased Systems:						
Installation & Purchase	$3,050.00					
Annual Maintenance	400.00	400.00	400.00	400.00	400.00	
Annual Leased Telephone Costs	96.00	96.00	96.00	96.00	96.00	
	$3,546.00	$496.00	$496.00	$496.00	$496.00	$5,530.00

Table 2

Leased Systems:		1st Year	2nd Year	3rd Year	4th Year	5th Year	Direct Profit Related Costs
Operating Costs Directly Related to Profit Reduction	Installation	$1,700.00					
	Annual Lease	270.00	$ 270.00	$ 270.00	$ 270.00	$ 270.00	
	Annual Maintenance & Monitoring	630.00	630.00	630.00	630.00	630.00	
		$2,600.00	$ 900.00	$ 900.00	$ 900.00	$ 900.00	$6,200.00
Capital Expenditure Depreciable Fixture Type Expense		—0—	—0—	—0—	—0—	—0—	—0—
Purchased Systems:							**Direct Profit Related Costs**
Operating Costs Directly Related to Profit Reduction	Annual Maintenance	400.00	400.00	400.00	400.00	400.00	
	Annual Leased Telephone Costs	96.00	96.00	96.00	96.00	96.00	
		$ 496.00	$ 496.00	$ 496.00	$ 496.00	$ 496.00	$2,480.00
Capital Expenditure Depreciable Fixture Type Expense	Installation & Purchase	$3,050.00	—610.00	—610.00	—610.00	—610.00	—610.00
			$2,440.00	$1,830.00	$1,220.00	$ 610.00	$ 0

and in a better maintained alarm system, since fewer protected points are exposed to misuse or abuse. Continuing operating expenses can be reduced because it would require less staff to supervise these public areas than if they were scattered throughout the building.

If electronic alarm protection were desired, the building core plan (illustration 1) calls for wire to only three openings, marked "A." The opportunity to reduce the distance of wire runs is substantial; the distance from the electrical closet, where raceways are available, is minimal compared to what it could be.

Quick fire exit is provided from inside the secured premises as well as from the public area. The public area is well defined, permitting individual tenants to control their own space during the day while permitting building management to secure each tenant's space at night. Restrooms within secured space reduce the opportunity for criminal confrontation there, and provide better surveillance

of visitors near those areas. Another advantage, particularly in today's bomb-threatened, high-rise environment is that the receptionist's full view of the public area reduces the opportunity to plant a bomb successfully. Indeed, burglary-resistant glass, while more expensive, may substantially reduce the client's insurance premiums as well as reduce the cost of glass replacement.

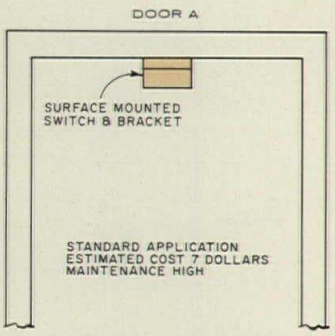
The merging of security systems with the design can save the client unnecessary maintenance costs if the systems are recessed, covered, or applied in such a way as to reduce exposure to tampering or breakage.

Door "A" (illustration 2) represents a surface-mounted switch that hangs down from the door frame about 2 in. Door "B" represents a recessed application where the switch is not observable, reducing opportunity for tampering and breakage, while maintaining aesthetic standards.

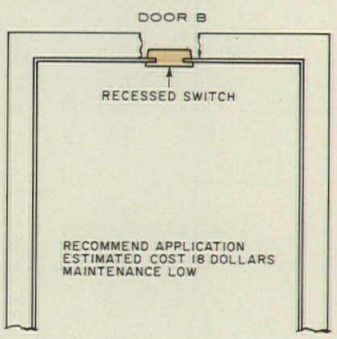
A digital entrance lock is another way to control access; such devices are frequently used in industry and government. Illustration 3 is a typical industrial application which, until recently, was the only available device. Recently manufacturers have provided devices that are recessed and available in several finishes to blend with decor. The installation costs are greater in the recessed device than in the surface mounted unit (illustration 4), but the recessed device blends with the wall, making it less imposing.

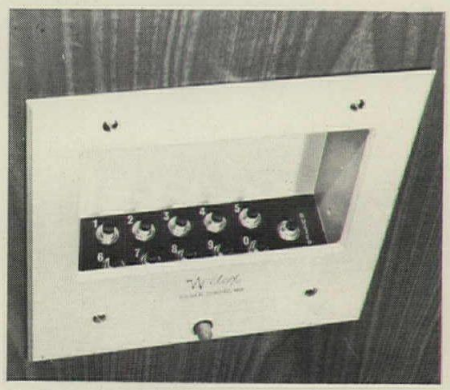
Possibly as important to the decor of the digital lock is the required use of an electric strike. If proper planning is done early in the design stage, door buck manufacturers can precut door bucks, permitting easy installation, a more uniform appearing door frame and a lesser opportunity to jam the electric strike.

Illustration 5 represents several examples that retain a high level of design while imposing restrictions on the use of the premises. In view of the fact that each of us prefers to think we are not controlled in our actions, there is an obvious benefit to establishing an acceptable level of security by merging the devices with the design.



2. Standard and recessed switches.





3. Recessed digital lock.

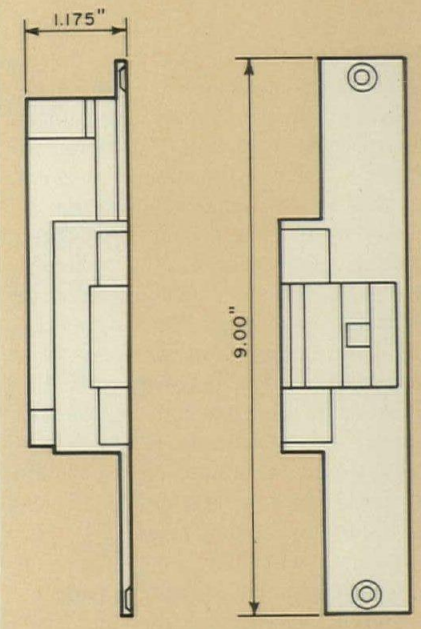
Preplanning security in design can assume new dimensions when it is considered in site selection. Such things as terrain, highway access, population, the use of a building, capabilities of law enforcement and fire service, and trash removal service affect design. Because these factors are as predictable as those formerly mentioned, the design of a facility can compensate for shortcomings in community services while providing the client with a predictable level of security and reduced security overhead.

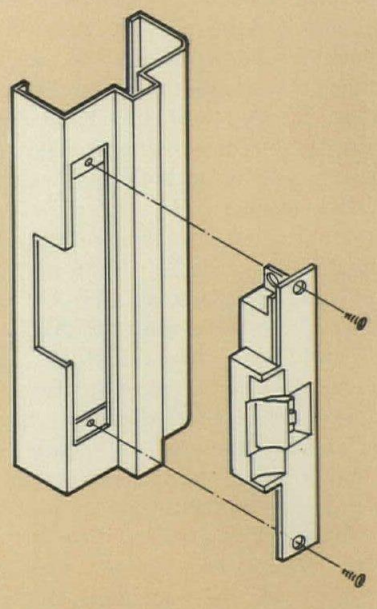
4. Surface mounted digital lock.

For example, if only one police patrol car covers 40 square miles on the midnight shift, then reducing building perimeter openings or adding alarm protection is a relevant initial design consideration. If the best available fire equipment can only evacuate personnel from a height of 60 ft, is it wise to construct the building to a height of 85 ft? If trash removal is only available from 6:00 P.M. to 6:00 A.M., one should consider designing a burglar-resistant trash hold area that does not permit access to the interior of the building (illustration 6).

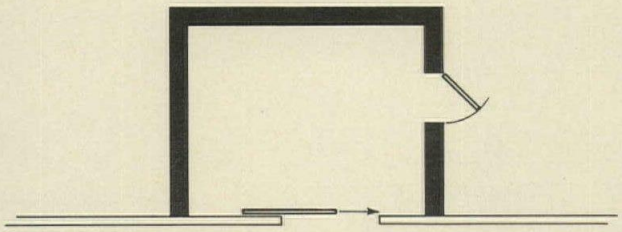
The alternative to this, of course, is a potential breach in the desired level of security, or increased supervisory payroll.

Illustration 7 is an employee en-





5. Electric strike.



6. Trash area needs protection.

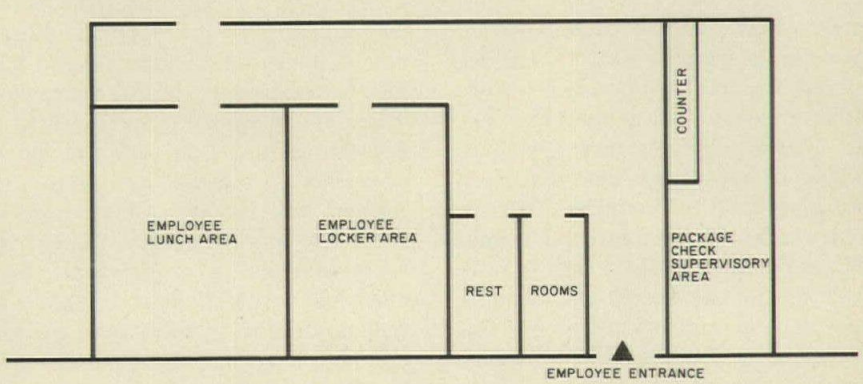
trance to a retail store separate from the one for customers. This reduces their opportunity to enter the store while wearing outer garments or carrying containers for concealment. Because their locker area, restrooms and lunch areas are within the confines of a supervised area, they have no opportunity to enter the retail selling floor to conceal merchandise on their person. Because of the restrictions on the employee's actions, the burden of proof is transferred from management to the employee should a confrontation occur.

Many simple opportunities to improve design are available. For example, it is wise to use substantial locking hardware when hinge pins are exposed to the public side of the door; or, one could spot weld the hinge pins or use institutional hinge pins to maintain the integrity of the level of security as well as provide substantial locking hardware (illustration 8).

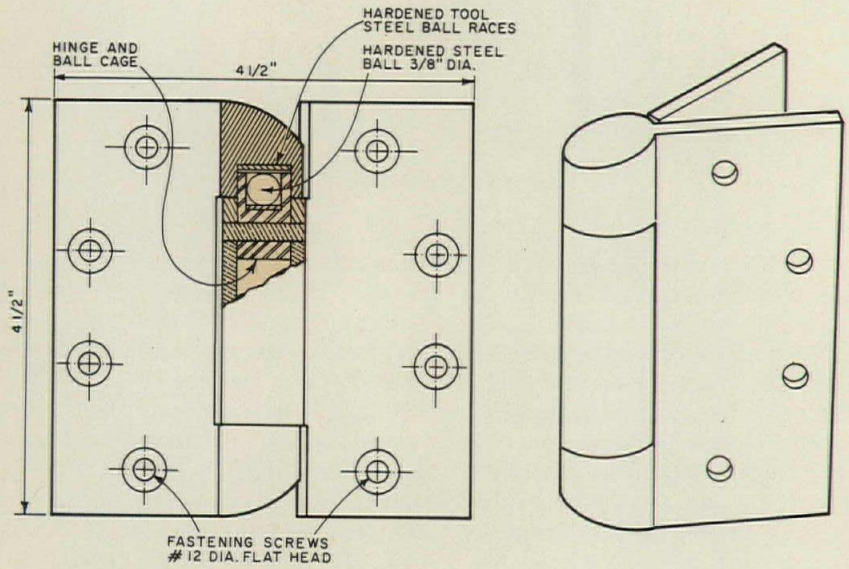
Another example of value to the client may be the use of removable core or cylinder locking devices that provide greater flexibility in making lock changes at reduced cost when needed (illustration 9).

Equipping doors with automatic self-closers and automatic deadbolts is sometimes helpful to reduce human error. In some cases the hand of a door, left or right, will be important regarding the visual security opportunity available for persons on the secured side of the perimeter area. The design can be basic or sophisticated, depending on need.

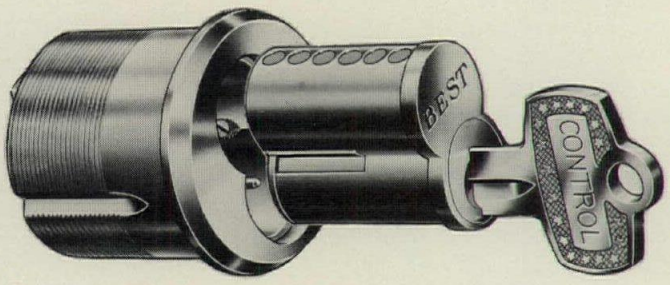
Examples of a before and after situation in high-rise office building construction are shown in illustrations 10 and 11. The first represents a building core area as originally designed. It has several frequently recurring security vulnerabilities of high-rise offices. Washrooms in the public area expose tenants to a confined and sometimes unobserved criminal confrontation; public access to private office areas is possible from the elevator area. Because of the usual requirement for extended elevator operating hours beyond normal business hours, the space continues to be exposed beyond supervisory capabilities. Another problem is the



7. Separate employee entrance helps protect store.



8. Hinge pins should be concealed.



9. Lock with removable cylinder.

ability to use the fire towers either for convenience or theft. Locking devices could reduce this vulnerability, but these are only as good as the individuals responsible for control.

It is in the tenants' and building owner's best interest that another perimeter barrier be available to reduce the opportunity to use fire towers from elevator areas on a free access basis. There are various methods of reducing access while remaining within the confines of existing fire codes. If the degree of criminal incidents rises and falls according to the sociological conditions of the community, then the building core area should be designed to reduce the opportunity for criminals to leave the street.

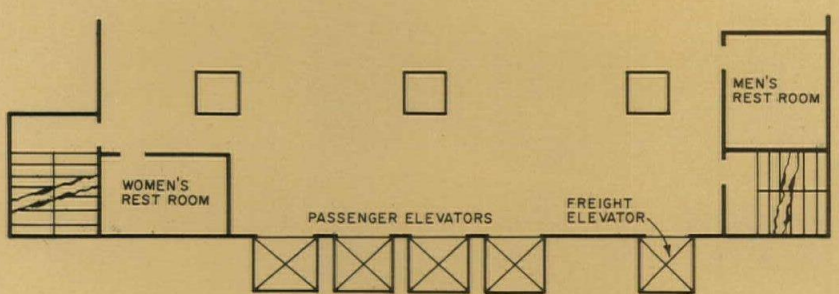
Illustration 11 is an example of reducing the criminal opportunity while maintaining high standards of building usage. A perimeter barrier has been established that defines the public area and increases the potential square foot area for office occupancy. This design interposes a barrier to the free use of the fire towers. The freight elevator continues to be vulnerable, but this problem can be overcome by a locked hold area with limited key issuance. The shape of the lobby is a significant factor; the triangular shape of the lobby is a motivational technique intended to induce visitors to leave the elevators and move to the widest portion of the lobby where they may be served by a "live receptionist system."

The entrance doors are electrically monitored so the remote receptionist will know if the doors are opened or closed and locked. Under the remote system, closed circuit television is utilized with two-way communication so that the visitor can be identified, and the person visited notified of his presence. The entrance doors can be remotely released or controlled by a digital locking device that admits only authorized code holders. In the lobby design, soft illumination of a higher foot candle was used at the electronic console as a motivational technique as well as to improve lighting standards in the television monitoring area.

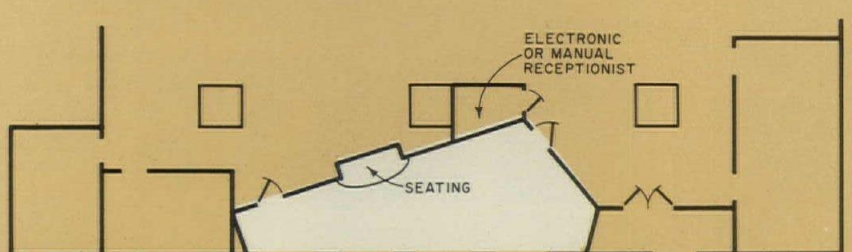
To add flexibility to the use of space, the electronic unit containing television camera, monitor and two-way communications is modular so that it can be easily removed and replaced with a desk unit designed to fit in the same space. This permits changes in traffic volume to play a part in a decision to use electronics for control of people. The flexibility feature validates the cost of design and construction because space usage can be changed with minimum cost, giving the building owner a range of security to offer to potential tenants (illustration 12).

As indicated in illustration, 13 right, the designation "A" is an ambient light detector that serves to advise a remote receptionist that a person has left the elevator. The presence of a person passing through the detection path changes the light level and annunciates on a panel at the remote monitoring location. This serves redundantly as alarm protection during the evening. The designation "B" represents the visual opportunity of the television camera that identifies daytime customers and night-time intruders. The designation "C" represents the monitored doors. "D" represents the digital entrance control device.

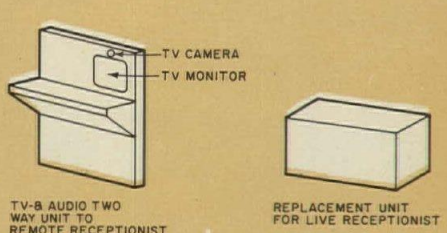
What has been defined in the foregoing is simply a type of premises



10. Risk is high in open core.

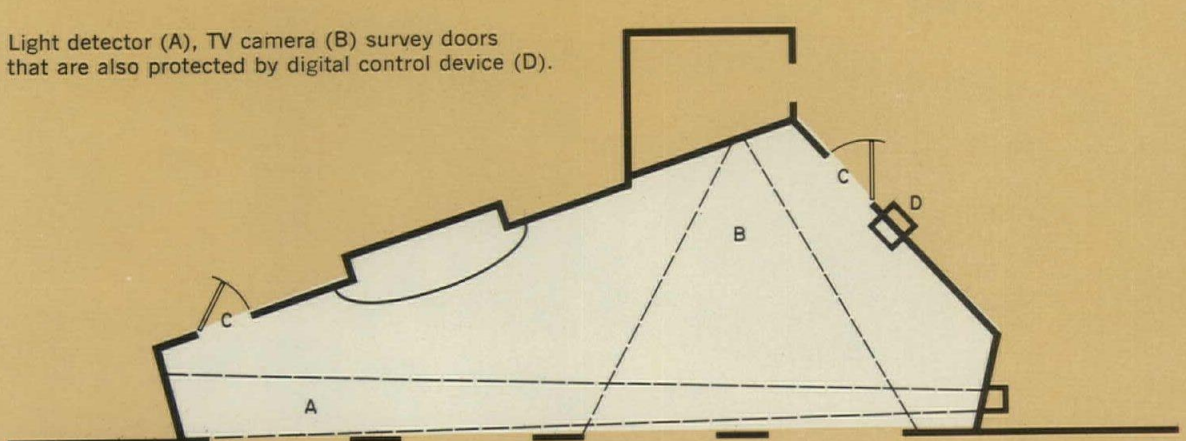


11. Public access is restricted after remodeling.



12. Electronic unit can replace live receptionist.

13. Light detector (A), TV camera (B) survey doors that are also protected by digital control device (D).



protection equation. For the architect, the equation offers the potential of saving the client's projected operating overhead in amounts comparable to the architectural fees. For the client it provides the opportunity to improve the level of security and greatly reduce the chance of criminal confrontation. All of this can be accomplished while maintaining a satisfactory level of aesthetic design. These concepts are consistent with the philosophy of the Small Business Administration's study "Crime Against Small Business." They are also consistent with reducing the opportunity for the unplanned criminal confrontation.

Living with Corbu

By SEYMOUR HOWARD, AIA

The author is Professor of Architecture, **Ecole d'Art et d'Architecture** in Marseilles, France.

Marseilles has been living with the *Unité d'Habitation* for 20 years now. This building, once a battle cry of modern architecture, has become an element of the city and the theories of its architect tested by the everyday life of 1600 inhabitants (men, women, and children). The best tribute I can bring to Le Corbusier's memory is to check his intentions against the results. He once wrote, "No one is more eager than I am to correct my ideas if they are wrong." It would be an insult, to treat him as a god whose work should not be questioned, just as it was an insult to treat him as a visionary with impractical ideas.

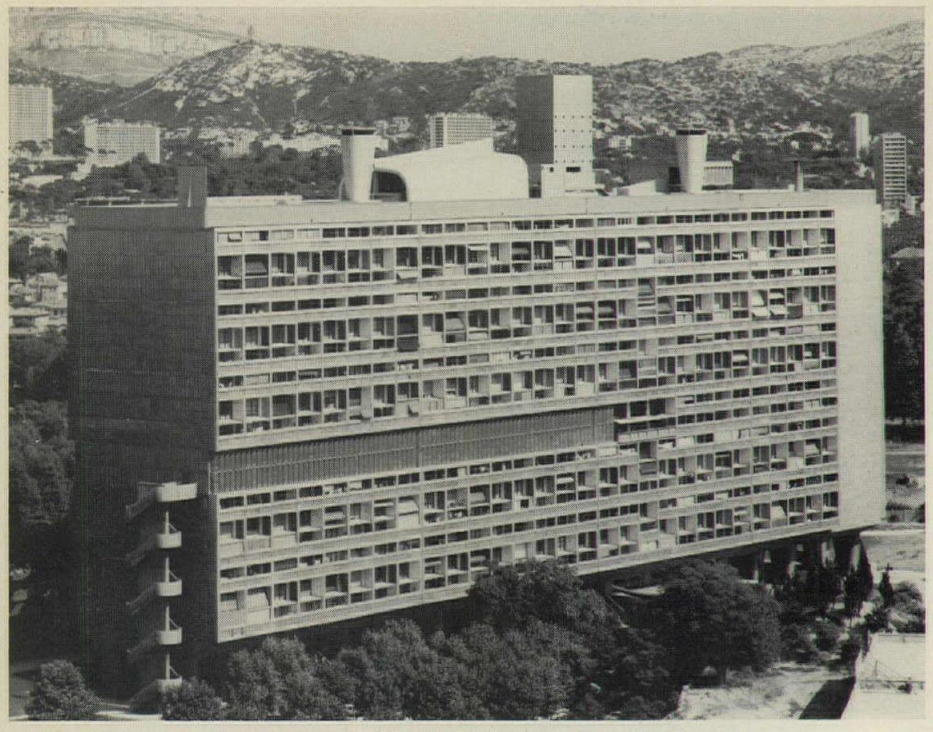
I Functional Intentions.

The *Unité d'Habitation* was started in 1947 and finished in 1952. It was the first full-scale realization of Le Corbusier's 25-year-old dream of a Radiant City: clear prisms to rise above the landscape on their pilotis, freeing the ground for pedestrian and automobile circulation, for trees, gardens, schools, sports fields. "The materials of city planning are: the sun, the sky, the trees, steel and concrete" to which he added: "hotel service," the "corridor street," the "absolutely private dwelling."

I would like to examine his points as they refer to the *Unité d'Habitation* one by one:

A. The Pilotis.

The masonry prism is there, a powerful commanding presence like a great ocean liner in drydock. Philosophically and materially, the build-



Unité d'Habitation rises from a grove of plane trees off the Boulevard Michelet in Marseilles. Photo: L. Sciarli

ing is detached. There are no extensions into its surroundings, except the main entrance hall and the fire stairs which dramatically reach the out-of-doors some 15 feet in the air. What is more, they are an invitation for use, because they are the quickest exit from the two lower "street-corridors".

The pilotis are used without formal compromise; the area below the building is completely open (above). In spite of their plastic value, however, they are calamitous from a practical point of view. The mistral, that famous wind which roars down the Rhône valley, strikes Marseilles from the northwest. It may blow for nine days at a stretch, often at high velocities, and by a Bernoulli effect, it accelerates through the relatively narrow slit between the building and the ground. This wind is so strong that children have been knocked against the rough concrete pillars, and the glass doors jerked open and banged shut.

These practical difficulties could be overcome by installing handrails like life lines on a boat and by fitting mechanical operators on the doors, assuming the pilotis were really necessary. But the fact is they are not. The area under the building is used for nothing. Cars are parked in a too-limited area to the west, away from the street, and you pick your way through a typical herd of cars to the main entrance. Children play in an undefined and hilly field, happily digging their own slides on the slopes or bicycling on the driveways; since they are more or less uninhibited in their activities, they would not hesitate to use the space under the building if they felt attracted to it and if Le Corbusier had subdivided and furnished it as well as he did the roof. But the main contradiction remains. In the absence of large scale pedestrian circulation, the open ground floor is an error.

Of course the building would not have looked the same if the pilotis were not there. But no one can doubt that an architect of Le Corbusier's genius could have found another solution to the problem of massing if his client had refused the pilotis for practical reasons. Such buildings at the *Cité de Refuge* for the Salvation Army in Paris (1932) or the *Immeuble Clarté* in Geneva (1933) are evidence.

B. Trees and Greenery.

Very little landscaping has been done except for the excellent grove of plane trees in the parking lot and a rather weak pedestrian walk to the Boulevard Michelet, where the bus shelter is marked "Le Corbusier." The naturalistic meadow in which the building sits absorbs some of the noise and fumes of the street. With its boundary rows of plane trees, it also plays the role of "ground" in the site plan, permitting the "figure" of the building to be set true north-south, far from parallel to the street.

Apparently the condominium owners feel no need of anything more elaborate or differentiated. Their intimate contact with nature still occurs at the beach or in the country, where most own or rent vacation houses, an ingrained French habit. Even Le Corbusier had his little cabana at Cape Martin. (France stands first among nations in the number of "second homes," the only way, the French feel, to combine privacy and a change of scene.)

C. The Sun.

Sometimes described as the greatest sun worshipper since Ikhnaton, Le Corbusier insisted on its biological and psychic importance. Although the apartments in the Marseilles block are not all equally favored, everyone gets plenty of sun and simple means to control it, except for the public spaces on the third and fourth floors (levels 7 and 8), where the concrete fins hardly cut off the west sun at all, being set SW-NE instead of NW-SE (probably an oversight during construction). In addition to the vertical and horizontal surfaces of the balconies, the apartments are equipped with awnings which can block the sun completely. Their colors join the painted concrete to give a semblance of personal expression to each apartment. It is only a semblance, however, because the colors can never be changed, only repainted. "Le Corbusier" is classified as an historical monument and no alterations of the façades are permitted.

The group of apartments at the south end are by far the most desirable, as would be expected, for they get maximum sun in winter and very little in summer. However, their view is undistinguished and they have no cross-ventilation. The majority of

"The materials of city planning are the sun, the sky, the trees, steel and concrete," said Le Corbusier, adding "hotel service," the "corridor street" and the "absolutely private dwelling."

the apartments, along the long east and west façades, benefit from cross-ventilation and views, but do not have the best insolation. This is a good example of the principle that it is impossible to optimize all of a group of variables each of which has different criteria.

D. The Sky.

All apartments in the building see the sky, but in this respect they are not superior to the majority of apartments built in France (and elsewhere) during the past 20 years, i.e., since Corbo showed the way. Like sunshine, a view of the sky is now accepted as a legal right for all dwellings, a not insignificant achievement of the rationalism of "modern architecture."

The superior use Le Corbusier made of the roof is shown in the Marseilles block. Not only are the ventilation and mechanical requirements combined into interesting forms which make other roofs look like cemeteries, but all group activities involving the outdoors — nursery school, swimming pool, gymnasium, stage, running track — are placed here under the sky (photo). A six-foot-high parapet forces the eye to look upward, a device he repeated at *La Tourette*. A sociologist could say again that the isolation of the group from the city is only reinforced by this location. However, the gym club has members from other parts of the city and the nursery school a few children who are "outsiders."

E. Hotel Service.

In *"The Radiant City"* (published 1935) Le Corbusier wrote: "The keystone of the whole organization (of each *unité*) is the assignment of an entire floor to services." In this way he hoped to free the individual, especially the housewife, from the multitude of time-wasting chores. He indicated the service floor at the first level above the ground, a preferable location because the stores could also attract buyers from outside the building. But at Marseilles he moved the service floor to mid-height, a more logical place for the convenience of the inhabitants, but a near disaster for the store owners. It is a mistake to link stores too tightly

By assigning an entire floor to services, Corbu hoped to free the housewife from a multitude of time-wasting chores.

to a single group of consumers. Even if the group or neighborhood initially chosen is large enough to correspond economically with a group of specific services, systems of distribution change, in turn establishing new ratios of people to stores. Stores should be located and planned to adapt to such developments, in accordance with the principle that a constant cannot correspond to a variable. As things are in the *Unité* at Marseilles, a small chainstore supermarket manages to survive (photo), as do a butcher, hairdresser, dry cleaner, and hardware store. The hotel has about ten rooms, a bar, and a restaurant, which does a good business, including take-out meals. Many of the spaces originally assigned to shops are rented as professional offices. Although the two-story-high shopping street on the west façade is sadly empty (photo), the interior corridors next to the market and the hotel have their lively moments with gossiping men and women padding about in slippers and housecoats. The atmosphere is that of a big family, re-creating some of the spirit of the old, established quarters of the city.

If he had removed the shopping center from its central position (as he did in some of his four later *unités*) Le Corbusier would have deprived himself of an important plastic and sculptural element. The long horizontal bands of double height louvers are very important in subdividing both east and west façades. But this aesthetic consideration should not have outweighed the practical shortcomings. As with the pilotis, a different solution could have been found. The reproach must be made that the economic problems were not realistically studied during the planning stages.

F. The Corridor-Street.

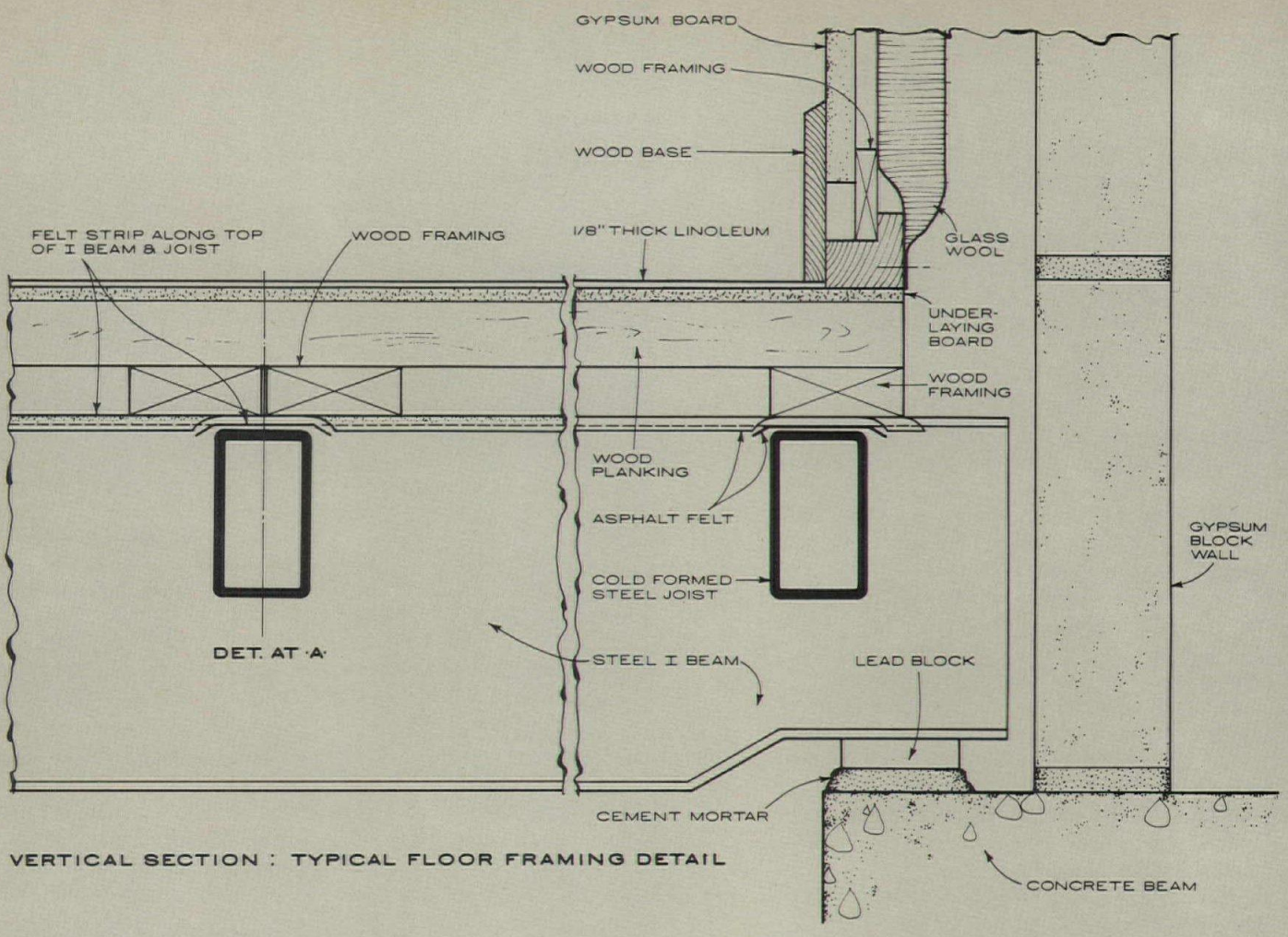
Le Corbusier did not anticipate the current preoccupation with promoting social contacts in public spaces. An elevator is a peculiar device for crowding people together and as yet its architectural possibilities have not been explored. The elevators in the Marseilles block are no exception. They are convenient in being wider than deep, but offer no other amenities. They work more or less well. The "expert elevator operators" predicted by Le Corbusier are often electronic though there is always one human one in the daytime. Because of the interlocking duplex apartments, the elevators stop at only every third level, which makes you feel it is a short trip and not such a high building.

From the elevator you walk down the dark corridor. The lights at each of the painted doorways — green, yellow, red, blue — complete the intended effect of row houses lining a Mediterranean village street on a moonless night. While some people do not like it, I find it sympathetic. At least it is not bland. Except for possible muggings, which so far have not occurred, there is no functional reason against the relative darkness. The contrast is all the more dramatic when an apartment door is opened and you enter a space vibrating with light and sunshine.

G. The Private Dwelling.

The acoustical barrier is almost as strong as the luminous contrast. As you walk alone down the corridor-street, you hear only the echo of your own footsteps. Once inside the apartment, children can scream, loudspeakers can blast, dogs can bark — yet no one outside will hear. Le Corbusier wanted the "silence of a tomb" in his apartments and he achieved it. The technical clue is the famous "cage and box" structure, which has been shown so often in model form. In reality the apartments were not prefabricated boxes. They were constructed in place of cold-formed steel elements supported on lead pads set on an open framework of reinforced concrete beams and columns. As a system for acoustical privacy, it works perfectly, yet nobody copies it. The excuse is that it is too costly, that it was possible only because the government paid the bill (now repaid many times over by the sale of the apartments and by subsequent inflation). However, industry has shown great ability to reduce the cost of a system if there is a real demand. What is important is to agree on the objective.

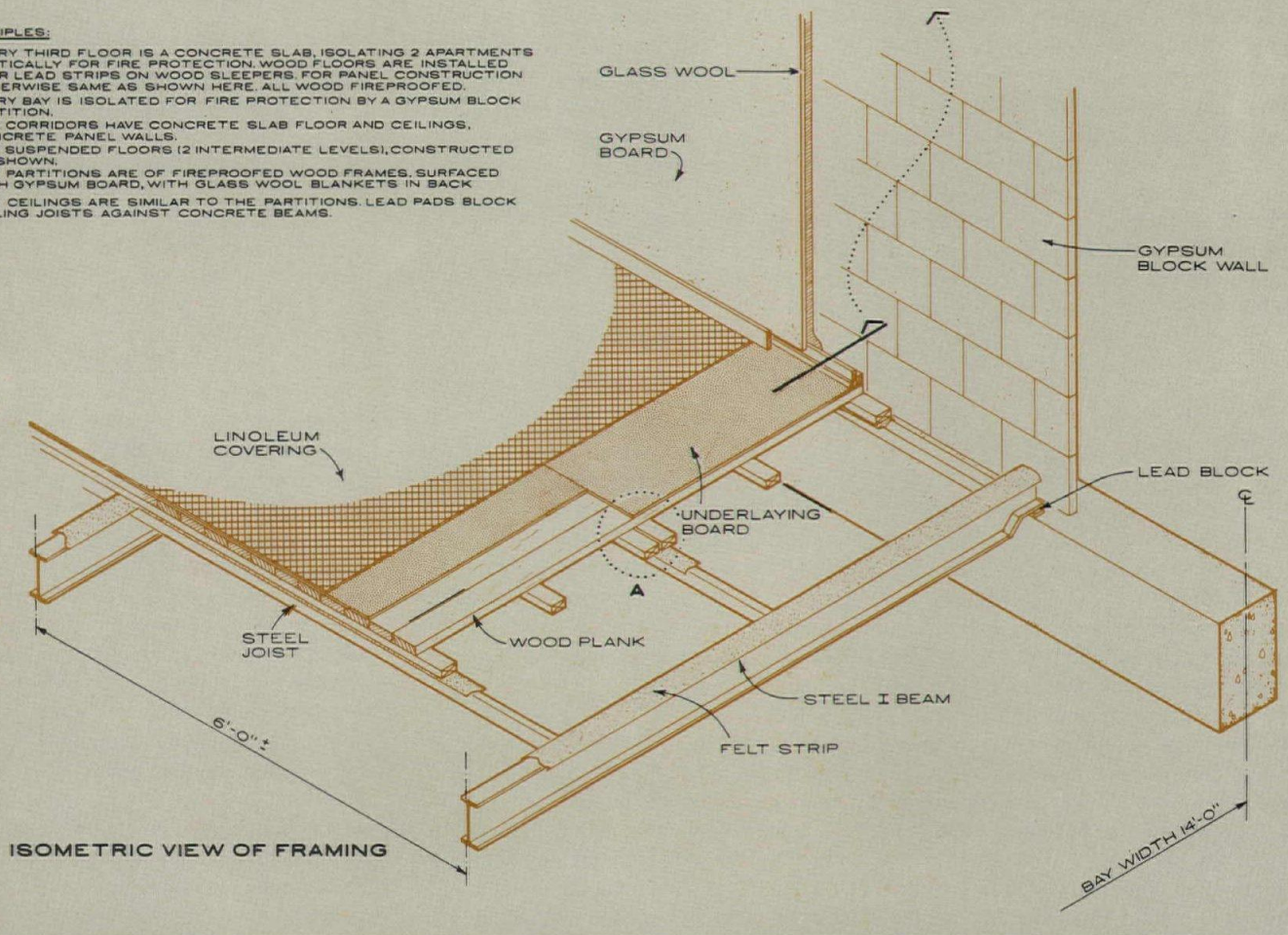
It is impossible to over-emphasize



VERTICAL SECTION : TYPICAL FLOOR FRAMING DETAIL

PRINCIPLES:

1. EVERY THIRD FLOOR IS A CONCRETE SLAB, ISOLATING 2 APARTMENTS VERTICALLY FOR FIRE PROTECTION. WOOD FLOORS ARE INSTALLED OVER LEAD STRIPS ON WOOD SLEEPERS. FOR PANEL CONSTRUCTION OTHERWISE SAME AS SHOWN HERE. ALL WOOD FIREPROOFED.
2. EVERY BAY IS ISOLATED FOR FIRE PROTECTION BY A GYPSUM BLOCK PARTITION.
3. THE CORRIDORS HAVE CONCRETE SLAB FLOOR AND CEILINGS, CONCRETE PANEL WALLS.
4. THE SUSPENDED FLOORS (2 INTERMEDIATE LEVELS), CONSTRUCTED AS SHOWN.
5. THE PARTITIONS ARE OF FIREPROOFED WOOD FRAMES, SURFACED WITH GYPSUM BOARD, WITH GLASS WOOL BLANKETS IN BACK
6. THE CEILINGS ARE SIMILAR TO THE PARTITIONS. LEAD PADS BLOCK CEILING JOISTS AGAINST CONCRETE BEAMS.



ISOMETRIC VIEW OF FRAMING

Unite d'Habitation
Marseilles, France
Le Corbusier, Architect

Selected Details
Typical Framing of Apartment

the importance of acoustical privacy. After studying Nantes-Rezé, the second *Unité* built by Le Corbusier after Marseilles, Chombart de Lauwe, the sociologist, stated "The entire social life of the apartment house was transformed as a result of the perfect acoustical privacy." Most of the apartments are designed on two levels, providing the potential for rich spatial effects within. It remains largely potential, however, because there are only two main variations. In one, you enter at the kitchen-dining-living room level and go up to the bedrooms, in the other you enter at a kitchen-dining balcony and go down to the living room and bedrooms.

It is surprising to learn that a number of architect-owners have extended their balcony floors out to the exterior wall, drastically cramping the third dimension to which you would think them particularly sensitive. Since the façades cannot be touched, however, there can be no massive destruction of Le Corbusier's architecture such as occurred in the Frugès project at Pessac-Bordeaux (1925), a destruction Le Corbusier shrugged off by saying "Life always has the last word."[1]

On the other hand, in spite of Charlotte Perriand's pioneering built-in furniture and the carefully determined minimum room sizes, I wonder if the apartments could not have been designed to permit their rebuilding according to the whims and desires of their owners. One of the irrefutable arguments in favor of single family houses is that they can so easily be enlarged or remodeled. In France the major housing efforts since the war have been directed toward apartment projects. Not only are they often bleak and isolated from older sections of the city, but the tenants can do nothing to make their apartments their own.

French sociologists have made a significant contribution to environmental studies by their analyses of mass housing. Although they have not specifically studied the Marseilles block, whose inhabitants generally have the means to express themselves with their furniture, the conclusions of the sociologists are equally valid here and can be a guide for all architects. Paul Chombart de Lauwe (*Famille et Habitation*, C.N.R.S., Paris, 1960) states: "Modern architecture has been explained as anticipating human needs. Tomorrow's needs can be partly provided for by studying today's desires . . . The most profound desires of man are those which help liberate him."

Corbu: "All my commentators talk about my city of the future. It is useless to answer that I know only the present; I cannot make any claims about the future."

And H. Lefebvre writes (preface to *L'habitat pavillonnaire*, C.R.U. 1966): "Let nobody claim the right to determine the destiny of society by fixing the housing standards and the way of living for all its members. Invention and discovery must remain possible. The dwelling is a free area. In the home, which is preferable above all others, a man should be able to assert himself and act out successive roles: craftsman, thinker, creator, lover, comedian, etc."

The next step in apartment house design should be an empty space, say 12,000 cu ft, which the owner could subdivide according to his own plans, somewhat as a business can subdivide an office floor. The idea is widespread, but so far no one has made it a reality. If only Le Corbusier had been able to profit from imaginative sociological studies instead of depending so much on his own intuition!

II Le Corbusier the "visionary"; a double tragedy.

The tragedy of Le Corbusier was public misunderstanding, a situation his own character encouraged. What he might have accepted as objective criticism he often interpreted as an attack on his personal integrity. Like de Gaulle, whom he resembled in his fanatical devotion to an ideal, he never forgot a grudge.

Unfortunately his critics were often not objective, and he saw through their shortsightedness as in his famous blast: "All my commentators talk about my 'city of the future'. It is useless to answer that I only know the present; I cannot make any claims about the future. Their reply is a cowardly trick: 'You are busy with the future', implying that they and everybody else are taking care of the present. What a lie! With all the modesty of a researcher, I am devoted to the present, today; as for them, they live yesterday, in yesterday's terms" *(The Radiant City)*. In this he was right.

Where he was wrong was in thinking that he could almost single-handedly establish a complete architecture program for the present. Here, in the program stage, is the moment when sociologists, historians, geographers, economists, ecologists and the public must intervene. The public, society as a whole, is now the client and must be trained, from school days on, to criticize, to judge, to define the environment it wants.

Le Corbusier let his prejudices override evidence in insisting on the absolute superiority of high-density multistory housing over the single family house and garden. His drawing comparing a graph-paper suburban layout with his *Unité d'Habitation* was grossly unfair. Most multistory apartment houses are nothing more than the same graph-paper set vertically. The formal chaos everyone deplores in suburbia has merely been repeated on a colossal scale. He himself did not believe in an automatic and unthinking application of the Radiant City principle. He anticipated some of its defects when he wrote: "The vast spaces which I created in this imaginary city, dominated by an ever-present sky, tortured my mind; I was afraid that they might be 'dead' and that the people who lived there might be bored or even frightened." But every time he was given the chance to work with a real site, his proposals were richer and more varied than any formula, as can be seen by studying the plans he made for a much larger area of Marseilles (Le-Corbusier, Oeuvre complete, 1946–52, Boesiger, Zurich 1953).

The tragedy of Marseilles is that the city did not take advantage of the architectural talent which Le Corbusier offered. It is only by imagining its growth as architecture — in terms of three-dimensional form — that a city plan can become great. For 2600 years Marseilles has planned from day to day, with only

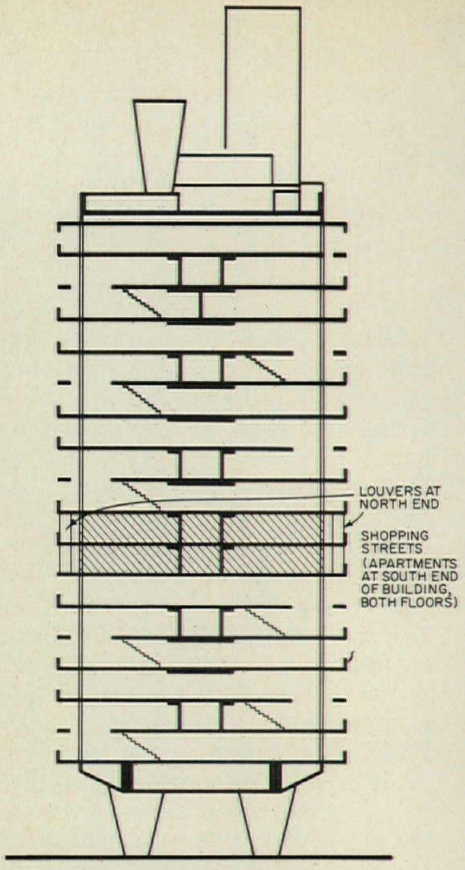
[1]Thoroughly analyzed in the book **Pessac de Le Corbusier** by Philippe Boudon, Dunod (Paris) 1969. The "last word" in this case may hopefully be their classification as a historical monument and their complete restoration.

occasional architectural successes. Le Corbusier offered it much more.

III The Real Contribution.

Le Corbusier succeeded as an architect, not only because he understood the necessity of analyzing his program thoroughly, but because he knew how to create a building which does much more than answer a problem. "The house is a machine to live in," he wrote in 1923, but also in the same text: "My house is practical. I say, thanks a lot, the way I'd say thanks to the railroad engineers or the telephone company. You haven't touched my heart. But, if its walls stand silhouetted against the sky in a form which excites me, I feel your intentions. You were gentle, brutal, charming or dignified. The stones say so. My eyes see something which tells of a thought — a thought which is explained not by words or by sounds, but only by pure forms which are interrelated. . . . With crude materials, with a more or less practical program which you have transcended, you have established relationships which excite me. That is architecture!"

How did he do this in Marseilles? Perhaps the durable aesthetic concept of "unity in diversity" will help us to understand. The unity of the Marseilles block is obvious, but the richness of its diversity is limitless. Its mass is almost classical in its tripartite division, but the treatment is unexpected. Le Corbusier had "a horror of conventionality." The base is a void, an unbase. The cornice is the parapet and the group of forms on the roof. The wall is often ambiguous. Like contrast and dissonance, ambiguity is an aspect of diversity as characteristic of our time as it was of the Baroque. Although Le Corbusier's paintings show his preoccupation with ambiguous shapes as he assimilated the plastic lessons of Ozenfant, Braque, Léger and Picasso, it is in architectural form that he made an original contribution. One of the ways this is shown in the Marseilles block, for example, is by the division of the façade (see p. 92) into two triplets below and three triplets above the two shopping streets. The apparent height is reduced to perhaps 7 stories, at the most 12, instead of the 17 which are actually there and which can, of course, be found by careful counting. How this is felt as you

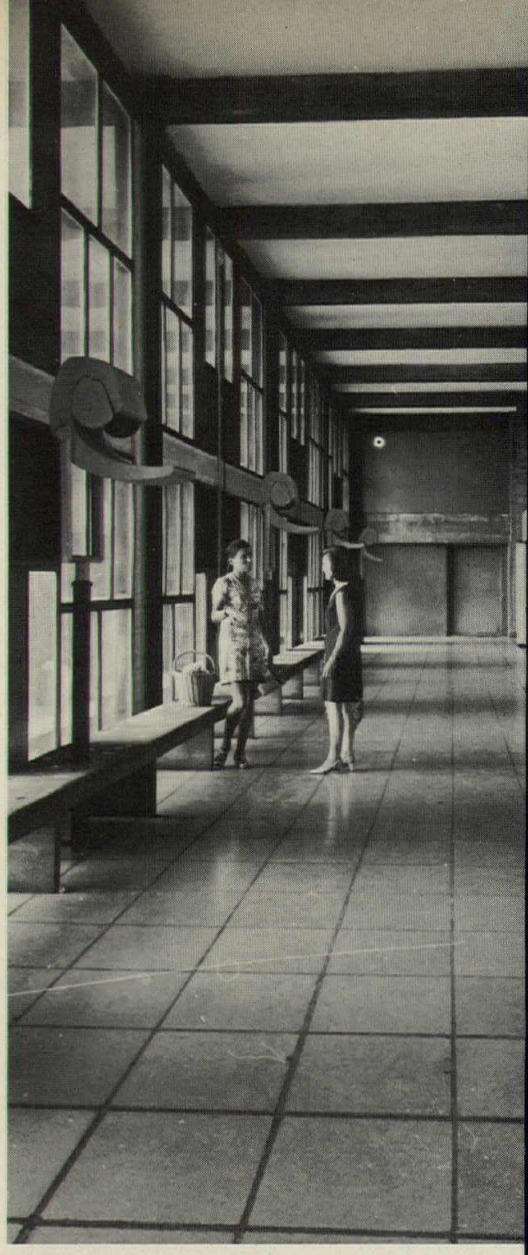


TYPICAL SECTION

move through the building I have already mentioned in the section on the "Corridor-Street."

You are also very conscious of another optical illusion looking up from the parking lot toward the northwest corner. Above the pilotis, the wall is divided into two unequal parts by the horizontal band of louvers which mask the two shopping floors. The balconies of the apartments above and below the division are actually in one plane, but it is impossible to "read" them so. The lower block appears out in front of the upper. I do not suggest that these ambiguities are major aspects of the richness of Le Corbusier's design, nor that they were all intended, but merely that they are characteristic of his handling of forms.

A careful study of the façades, even in photographs, reveals many types of nonambiguous variety. The grid, a planning and structural necessity, gives unity, but every functional difference is taken advantage of to break it: balcony parapets, horizontal sunshades, the shopping street, and an occasional apartment which is out of step with the others. The east and west façades differ not only by the elevator tower but also in their horizontal patterns because the east apartments overlap those on the west. Everywhere Le Corbusier expresses functional as well as plastic



The two-story shopping street on the west façade is usually quite empty (left) but the supermarket branch (left, below) survives. Space under the building does not seem to appeal to children as the roof playground does (below) Photos: L. Sciarli.

relationships, in accordance with his principle "A building is like a soap bubble. The exterior is the result of the interior." But he does so without the boredom of typical one-to-one relationships. The only important functions he failed to express are two interior stair towers on the east façade; they were given windows like apartments and you'd never notice them except at night.

The coherence of the design is partly due to the Modulor. All dimensions are interrelated, like notes on a well tuned piano. More than any architect since the Renaissance, Le Corbusier was preoccupied with geometrical proportions. Obviously the Modulor does not correspond exactly to the human figure, but the attitude which invented it is nothing if not architectural.

Like any other work of art, a great building is an inexhaustible source of psychic energy. It cannot be created by machines and a machine is not art. Le Corbusier succeeded because he knew that "There are no rules in art, there is only success or failure measured by the solution proposed to a conflict of ideas, emotions, practical requirements. . . . A work of art is the ultimate result of an incredible, inconceivable, indescribable mental struggle." And the result is human. After almost 20 years, those who live in the building — many since the beginning — feel toward it the way a long-married partner would, who has accepted another's defects and idiosyncracies but whose love and admiration are strengthened by the day-to-day experience of living together.

For a bright backdrop to a Brooklyn playground at the end of dreary row houses, artist Tania painted in a sunny yellow and a crisp sky blue around a focal metal sculpture.

URBAN RENEWAL WITH PAINT

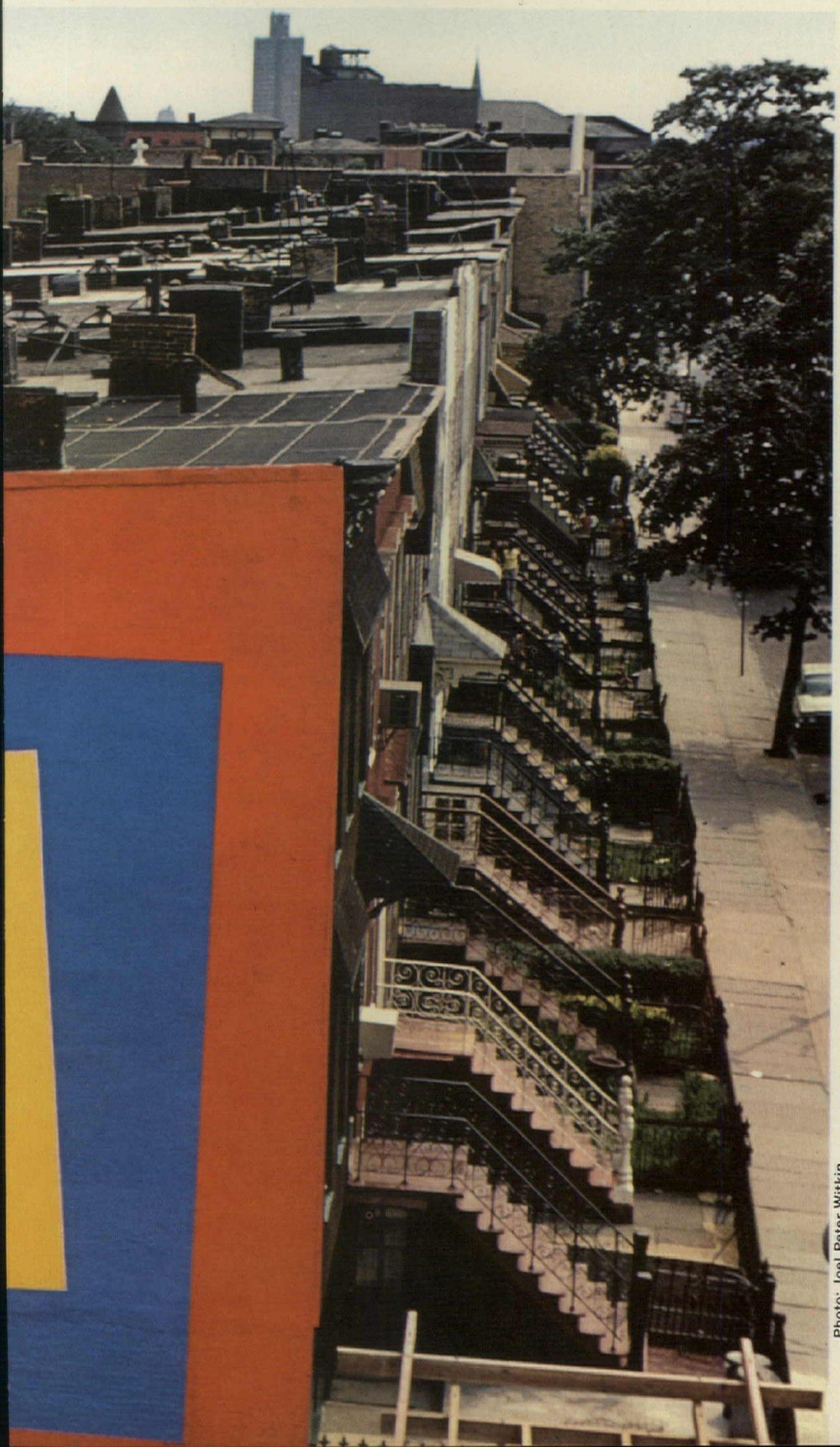


Photo: Joel Peter Witkin

Billboard techniques fostered by city agencies are producing superscale urban frescoes — both abstract and social.

Journalistically, regular readers may be able to stand only one more word on the subject of Supergraphics — its epitaph. Especially so since one of the major paint companies last year published its knell as a how-to-paint-stripes-and-circles brochure that apparently presented the device as an interiors fad for plasticamerica.

Urbanistically, however, the potential of paint for quick, economical, and community-involved urban renewal is only just being proclaimed to a meaningful degree. Two forces are making this proclamation: first, the architects and designers whose interests in Supergraphics seem still to be expanding, and second, the outdoor mural-painting programs of municipal governments in depressed areas of New York City, Detroit, Chicago, Boston and elsewhere. Television stations from West Germany and Italy recently visited Boston to produce films on this ghetto mural activity because they reportedly consider it one of the most stimulating social and artistic phenomena in our country today.

As a fast and cheap means of enlivening our ghettos, our industrial areas and our too often drab city environments, paint can make an immediate contribution. Today's cities can be bright, cheerful and sprightly without being completely rebuilt.

The reasons for using paint for this purpose are several: economics, remedial improvement, involvement of both users and designers, and finally, aesthetic possibilities. Several architects and designers who have employed these devices (and whose works have been previously pub-

lished in P/A) provide detailed reasoning on these points and give tips on the technology of Supergraphics:

Economics

"The beauty of it is that it is a very low-cost answer," says architect Cesar Pelli. "Architects who used to be concerned only with so-called important projects are concerned today with low-cost problems as well — problems where there is little money. And paint is a terribly important answer."

Architect Hugh Hardy adds a note of caution. "Talking about the device as being cheap for the ghetto sounds second best — like cleaning up the natives. It sounds condescending. Why should ghetto solutions be low cost? This sounds less appealing than that the technique is good because it is a good idea."

Cesar Pelli replies, "Sometimes you have to do things with little money because the money has to go far and there is just so much to go around. And maybe you should stretch it and do more with that money. Besides, the technique is not only good for ghettos; as our Jewelry Mart shows (P/A, Dec. 1968), it can enliven a commercial problem."

In addition, the low cost of a paint-design solution engenders rapport between clients and their architects. As architect Barry Feiss explains, "Clients are less hesitant about trusting you with paint because it does not take a lot of bread out of their pockets."

But are Supergraphic exteriors really inexpensive? One contractor answers, "Why should it be expensive? Painting is painting." Obviously the costs of execution are inextricably bound up with the labor force engaged. "Many sign painters get $125 per day," Barbara Stauffacher Solomon observes. Student-designer-architects who execute their own designs are clearly less expensive than union painters. Designer Peter Harrison of Robert Miles Runyon & Associates admits that the two sunbursts for the S.S. Independence (P/A Dec. 1968) cost $38,000, but they were 400′ x 150′ crossing over many levels.

The Supergraphic design that architects Hardy Holzmann Pfeiffer had painted on the exterior of the Brooklyn Children's Museum "Muse" (P/A Dec. 1968) cost $300 including the spider scaffolding. "And I cannot think of anything that would have been as inexpensive," Hardy adds.

In New York City the Department of Cultural Affairs' City Walls program sponsors murals that cost between $1500 and $5000. The total cost of one project, according to Albany, New York, architect Harris A. Sanders, was "about one-third more expensive as compared to merely painting the project without any graphics, or 18 cents per sq ft compared to 12 cents per sq ft."

"If you design something complicated it takes a long time," Barbara Stauffacher Solomon explains, "and if you design something easy it is quick as hell."

Painters

So far, exterior and interior Supergraphics have been painted by students, designers, architects, sign-billboard painters, union and nonunion house painters and special category painters.

Toronto's Barrie Briscoe (P/A Sept. 1969) and California's Barbara Solomon each keep one sign painter busy. Hardy Holzmann Pfeiffer worked with a billboard painter on Muse. "He grumbled because of the diagonal lettering that runs across glass, stone and metal," Hardy remembers. "He was not used to it. Sign painters spend their whole trade lining things up horizontally."

"Yet billboard painting has been going out of fashion for the last 10

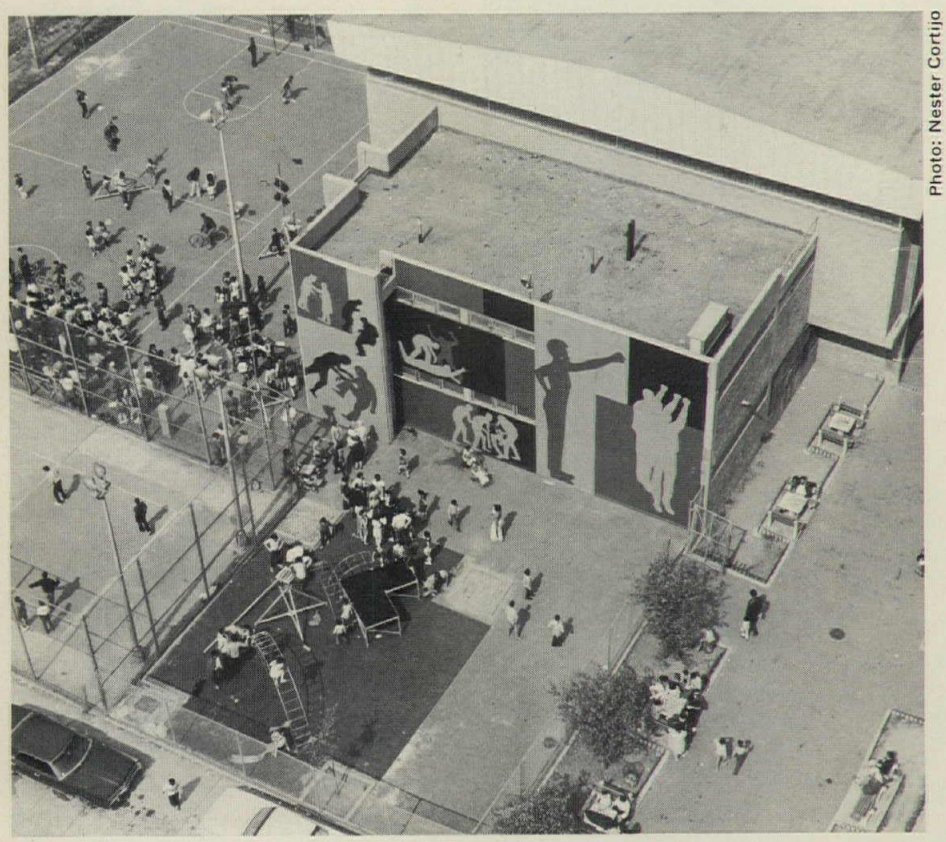


Photo: Nester Cortijo

New York City's Department of Cultural Affairs, under former Director Doris Freedman, has sponsored nearly two dozen murals throughout the boroughs of the city. With the NYC Community Arts Workshop directed by Susan Shapiro, the Department recently sponsored a mural painted by black teenagers from the Al Smith Housing project on the Lower East Side. The blue and red mural of silhouettes expresses the stages of drug life as the young artists see it: on the right a teenager turns his back on former drug use and gives the black power salute while looking toward the future. Doris Freedman feels that this direction "of helping the artist to move into society and also of responding to the needs of the community" is the direction that city and government art programs should be going.

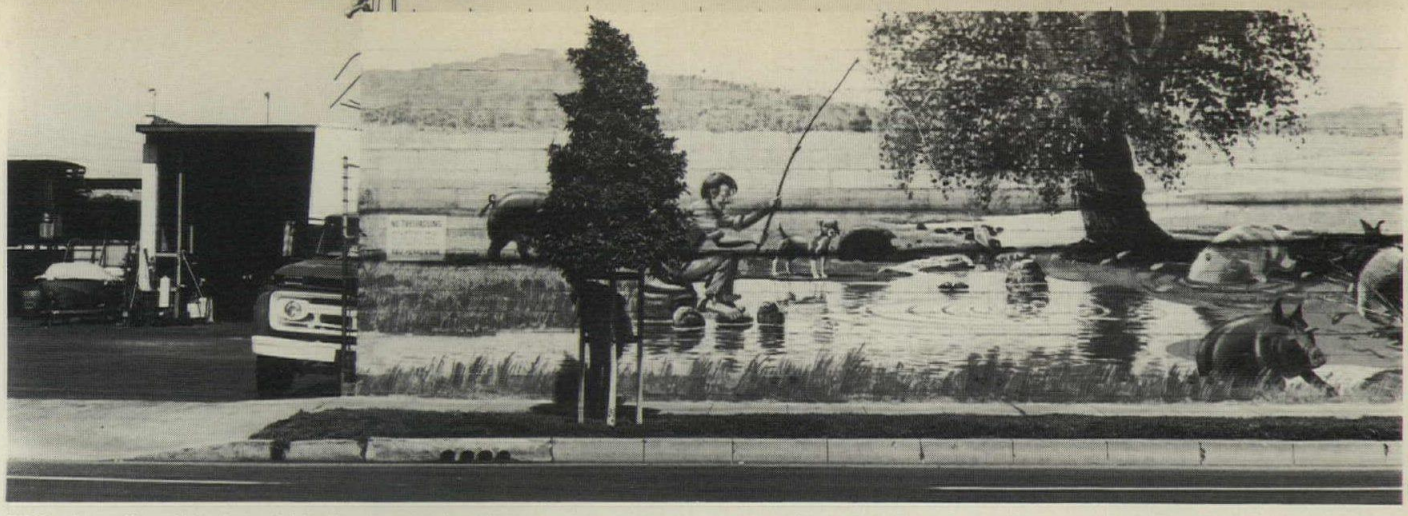


Photo: courtesy David Gebhard

Of the bucolic painted roadside fence, which shields the truck lot and building at Farmer John meat packing plant in Vernon, California, David Gebhard, director of The Art Galleries at the University of California, Santa Barbara, writes observantly: "The uniqueness of the approach to design (and public relations) is so way out and flamboyant that there are many lessons we can learn from it. Here is a real application of the idea of Supergraphics or whathaveyou — combining a 19th century view of the farm with the billboard; with illusionism tempered by an understanding of community relations. Here behind these nostalgic reminiscences of the farm, slaughter takes place and stench permeates the air."

Photo: Gray Plosser Jr.

A red stripe oozes from under a sidewalk manhole cover, crosses the sidewalk and winds over the entry to direct circulation to the door handle of the Birmingham, Ala., shop "Fraction." The shop was designed by Tulane architecture graduate Gray Plosser Jr., now a 1st Lt in the Army Engineers in Germany.

Circulation graphics and entry door become the eye-catching commercial signage of the building as well as a bright spot in the urban shopping environment — for under $150. Freehand painting "and a lot of touching up" over the rough old building included one sealer coat and two coats of gloss enamel. Though the regular enamel has lasted on the sidewalk, a more durable paint should be investigated, the designer urges.

Photo: Robert Kearney Jr.

Involved students of urban design at St. Louis' Washington University initiated a playground mural in University City, Mo., by approaching the Land Clearance for Redevelopment Authority over two and a half years ago. The mural is still intact. City authorities saw the mural as an effort to dress up redevelopment areas between the time of demolition and new construction.

While designers William Albinson and Robert Kearney Jr. projected slides of their design model on the walls at night and freehanded outlines in crayon, University City Police tried several times to arrest them. The two nights of cartooning included incorporating projected shadows of the designers. With the help of neighborhood children ("literally a cast of hundreds — children, dogs, etc.") the designers finished the scheme in a week. The Redevelopment Authority provided brushes, 17 gallons of paint, and turpentine along with pizzas and hamburgers for labor. Total cost was about $300 for about 2000 sq ft, or 15 cents per sq ft. "I would classify this as inexpensive," says architect Kearney, "but if you had to pay the labor it would be another question."

years," Barrie Briscoe observes, "and big outdoor sign painters have decreased in number. But it is good to work with sign painters," he says, "because they are accustomed to blowing designs up in scale."

"A problem with union painters," according to Austin architect Richard Oliver, "is that some of them want to know the whole lay of the land before they start. With non-union painters we just say do this today and then do that tomorrow."

Other Reasons

"It is a remedial operation," says architect Lee Harris Pomeroy, "in that it corrects bad spaces." In answer to the question of whether architects could become content with being exterior decorators, Barry Feiss, now an associate of Pomeroy's adds, "If he takes care of a bad situation he is doing a good job. We are in a situation where a lot of things have got to get done and this is a quick, simple way of doing them. You can improve the quality of the environment with graphics. America is packaging oriented, and if you give people that, they think it is done completely anyway. People have to be happy again before they will do anything about our environment."

"A primary value," Lee Pomeroy continues, "is that overworked word 'involvement.' With paint, the community itself can get into it. They can't build buildings and lay bricks, but they can paint. That has a real social value." In Puerto Rico a year or so ago, church members painted their own Supergraphic exterior; architect Barry Feiss numbered the building design in chalk and gave each church member-painter a number and a paint pail, explaining, "You are color number one and you are color number four." The action melded the congregation.

This same spirit has spurred the painting of murals in black ghettos in Detroit, Chicago, and Boston, where the Institute for Contemporary Art has been a leading force. In New York this spring, a mural sponsored by the City's Department of Cultural Affairs was painted by black teenage artists from the Al Smith Housing project. They painted the saga of a black power figure turning his back on drugs.

"If Government is going to get into the arts," says former NYC Director of Cultural Affairs Doris Freedman, "it has a dual responsibility: one to the artist, the other to all the people."

Aesthetic considerations in Supergraphics, of course, continue to interest designers and architects. Doris Freedman observes, "Artists are now working in a scale that cannot be contained in an institution and so art has to come outdoors."

Architect Hugh Hardy adds, "Most of these murals are still frame oriented, however, and there is no reason they could not take that at a bigger scale and spread the idea across lots of buildings. In a sense Times Square is that because it all goes around corners in neon. If you can take a three-dimensional solid and dematerialize its corner, that is a pretty potent vocabulary. The fact that it costs very little is only one part. You could do it all with chrome and lapis lazuli and it would be vastly expensive. But it would still do the same job and be the same powerful core thought."

Cesar Pelli sums up the aesthetic considerations. "Supergraphics is a minor thing, but it is a new possibility that has been incorporated into architecture. It is a widening of the range of what architecture is. Paint used to be something outside the pale. And this is a breaking away from that — that colors in themselves can become architecture. It is one more tool. It is not the answer to everything but in many cases it is the best answer."

Technology: Designs

The working drawings that are provided for Supergraphic designs are of several types: scale elevations, axiomatic plans, color-coded elevations by numbered paint chips and colored-in scale drawings. Barrie Briscoe makes ½ in. scale drawings for "wherever there are special areas."

Scale models have also been prepared — sometimes of exterior designs but primarily of interior projects. In the main, residential interior designs have been executed from no drawings or quick sketches at most.

Preparation of Surfaces

Ordinary cleaning of outdoor surfaces is the rule, but one renewal project was executed without cleaning. Another engaged the community for a whole week of scrubbing down and brushing its building.

Primer coats commonly used include oil for concrete block, latex for wood shingles. Brick, "which soaks up gallons of paint" one designer reminds us, should be coated with a sealer before the prime coat. Toronto architect A.J. Diamond adds that new brick should be allowed time to lose its salts before being painted. The standard four-step process for masonry walls outlined by paint companies is recommended by architect Robert Kearney Jr. That process is: one primer coat, two finish coats of enamel, and a top coat of glazing to prevent efflorescence.

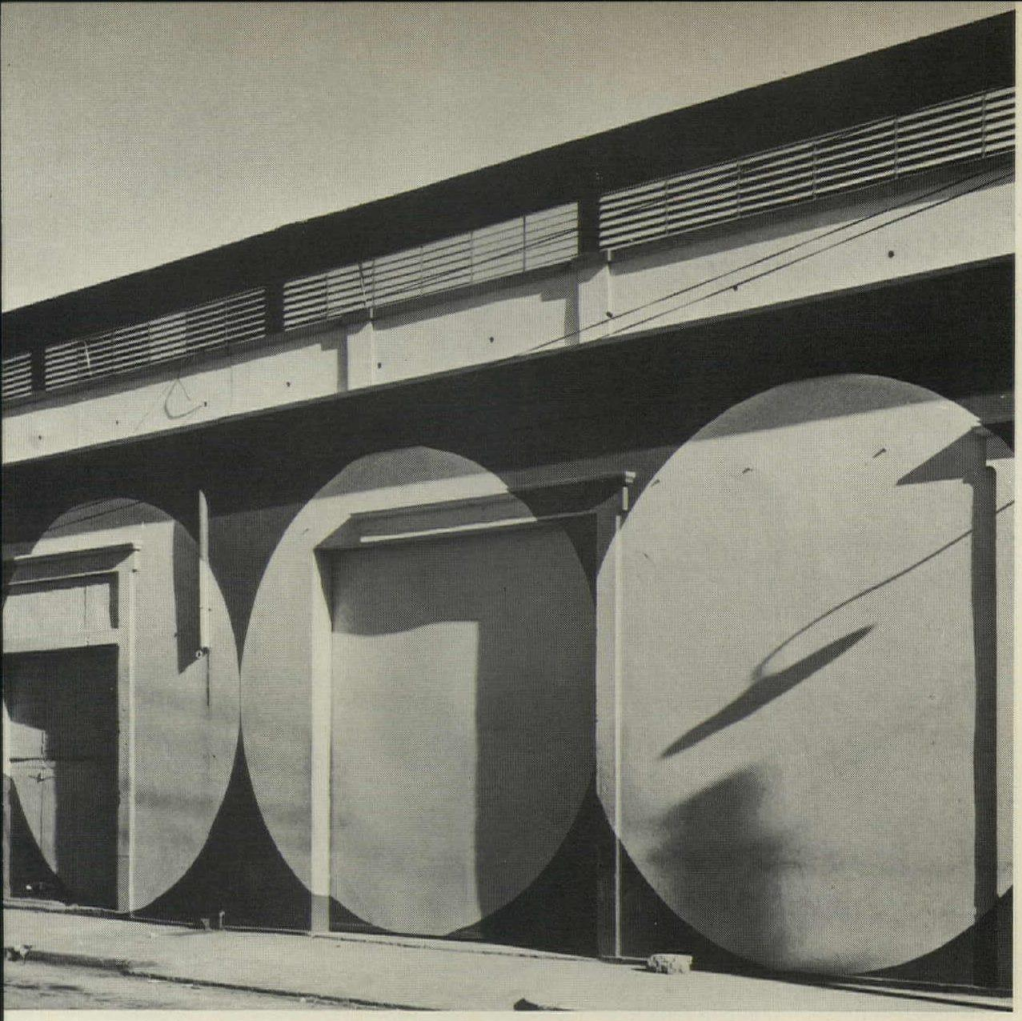
Photo: Francisco Vando

Transferring Designs

The methods of transferring the design to the prepared surface have ranged from the simplest freehand drawing measured by eye in interior work to the most elaborate combination worked out for the S.S. Independence. There one man on a dock with a surveyor's transit communicated by walkie-talkie with a crane-supported painter who made guide point marks on the ship.

"So that you will not have to go through a whole number measuring up a building," Barry Feiss points out, "you can design the job to use features of the building such as doors and windows as guide points."

Stripes are most commonly laid



In Areicibo, Puerto Rico, New York architect Barry Feiss, who was then with the architectural firm of Schimmelpfennig, Ruiz & Gonzales Inc., designed a paint-renovation scheme for an old lumber warehouse that was to be refurbished as a bottling plant for Ron Llave rum. The design was a real happening: at the site, in one hour architect Feiss conceived and drew a sketch, which he showed to the painting contractors. "Draw circles the height of the building," he instructed, "then repeat them around the building until you get back to the start." It was done a week later at the cost of $2000.

Architect Feiss conceived the scheme as a direct expression of the interior function of the bottling plant — its repetitive barrels and bottles. He also saw the scheme as relating to the cityscape of Areicibo — the white-beige tint matching sidewalks and house trim, the reddish tint matching rooftops — yet as also creating a new scale with a simple geometric form.

The design, aesthetically, does have a Supergraphic dimension (architect Feiss calls them "Metagraphics" for their metaphorical allusiveness) in that it has a literary meaning beyond large size. The circles in Feiss's mind are like Batman's spotlight being projected on the building. Its powerful beam blots out the red and makes beige circles; in the process the beam catches hanging lamp fixtures in its shadow. This two-level allusion is the heart of Supergraphics.

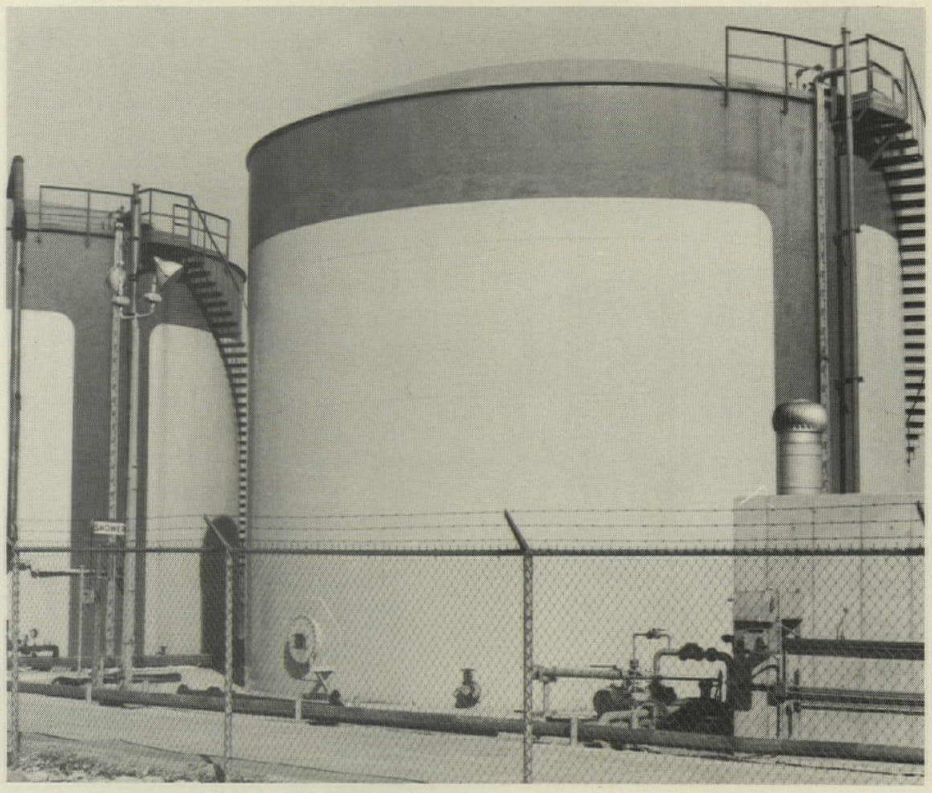
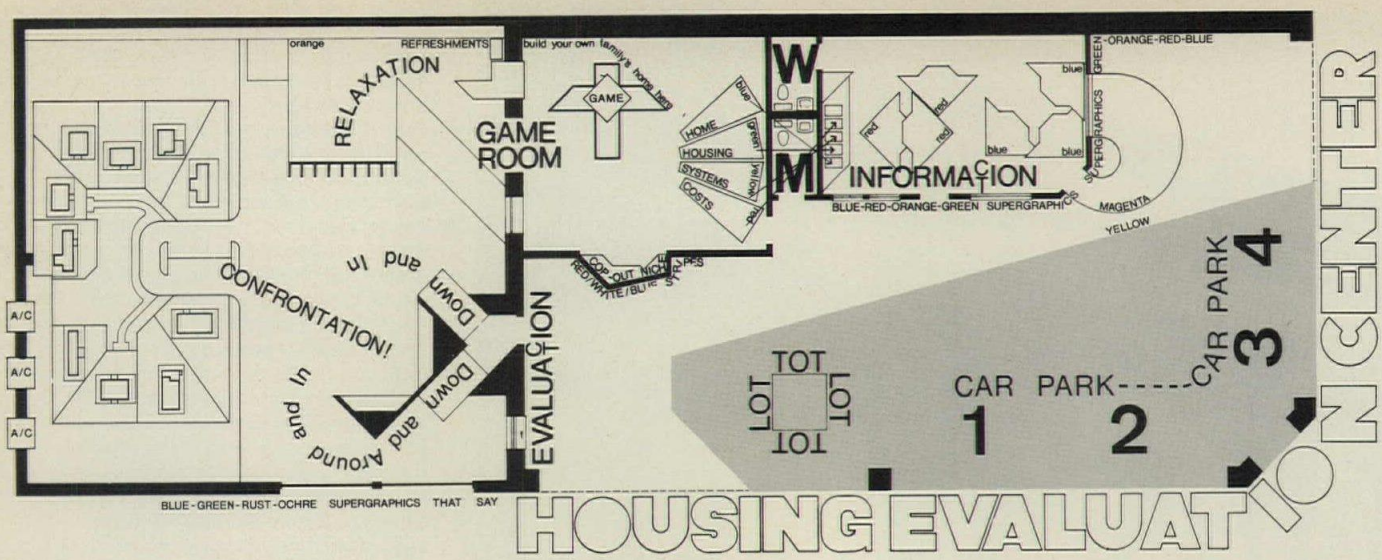


Photo: Courtesy of Hohmann & Meyer

For the Slay Bulk Terminal on the west bank of the Mississippi River at St. Louis, architects Hohmann & Meyer designed and executed a paint-stripe scheme as a "low-cost beautification and aesthetic improvement" in addition to their master-plan for the Terminal. Scale elevations were prepared, as well as larger scale details of radii. First the two 30-ft diameter, 40-ft high tanks were sprayed yellow all over with an amine-cured epoxy primer and a chemically cured epoxy enamel finish. Transfer of the design's horizontal lines onto the tanks was accomplished, according to architect George H. Hohmann, "by using a storey pole, transit, and chalk line; vertical lines were plumbed and chalked on; curves were freehanded onto the tanks." Then, 12-in. masking tape was used to outline the stripes that were subsequently sprayed a second color.

The job took six union man-days per 46,000 sq ft tank. The bid price per tank was a normal $3000; it cost $400 more per tank to paint the stripes. The owners of Slay Bulk Terminal agree with the architects that the project has become a favorable public relations effort and "an artform as well as a tank farm." They therefore plan to paint four more tanks this year.



The Housing Evaluation Center at Austin, Tex., was a five-month data-gathering project of HUD and the University of Texas at Austin. In the Center, the ten preselected system houses used in the low-income development "Austin Oaks" were evaluated for acceptability by the occupants, whose preferences and needs by ethnic group were also determined. The Center was housed in a vacant tire sales and service building, which was carefully selected to be within the overlapping territory of the Black, Chicano, and Anglo populations. Trained interviewers from each group held three-hour sessions with families at the Center — in the conference area, in the children's domain, and in a "game room."

"The graphic handling of the building," according to architect Richard Oliver who designed the graphics, "made a temporary landmark of a forgotten building in an unmemorable section of town. Street façades were treated in polite regional colors but at outrageous size. Back under the canopy, colors boomed out bright and hard. A giant red and blue nonflag gave a vaguely Federal air, while certain composite Spanish-English words provided evidence that the place was prepared by locals for locals.

It was equally off-balancing to everybody — both a pleasant surprise to interviewed families and to curious and approving middle-class drop-in visitors. As intended, it was impossible for anybody to find a stereotype by which to peg the Center." Nonunion Mexican housepainters working with full-size templates taped to the walls painted the exterior signs and the interior work, aided by three union sign painters who did the small graphics. Total cost for painting including the two exterior sides (70 ft long and 150 ft long) was $1500.

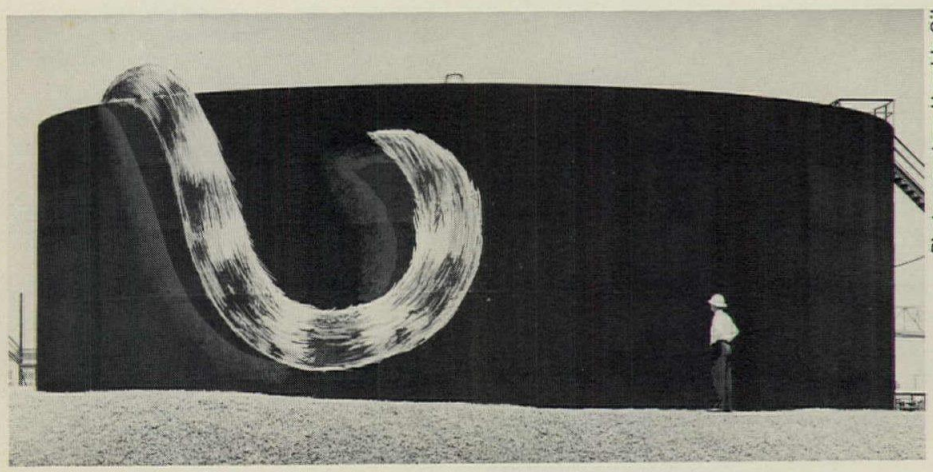


Photo: courtesy Humble Oil

The world's largest representational Supergraphics may well be the abstractions that have slyly amused motorists for the past three years near New York and Chicago: A three-dimensional, sculptural, 50-ft long tiger tail constructed of painted steel wags out of the Humble Oil Terminal in Chicago. A painted, two-dimensional version is visible at Humble's Bayway Refinery going North on the New Jersey Turnpike between exits 12 and 13. This example of the merger of commercial art and literary amusement is pioneering in our culture.

out by chalk snaplines. Circles are outlined by string, pushpin, and pencil, chalk or crayon. Where concentric circles are to be outlined, Barrie Briscoe ties the same string with knots to indicate each different radius.

Full-size templates of numerals and letters, which have been enlarged photographically, are used by Briscoe, Oliver, Jane Needham of Harrell & Hamilton and by Barbara Solomon, who adds, "and you make optical corrections like mad."

Photographic projections provide a quick means of transferring designs to surfaces as well as providing new aesthetic possibilities. Photos can be projected on walls, and outlines made as the projections are turned on and off while the painters work. Projecting slides of a model revealed to architect Robert Kearney Jr. "that it required a long distance to throw the image, and if space is cramped, it becomes difficult. Also, projection makes for some distortion in the images."

Finally on the subject of transferring designs, Jane Needham has found that written verbal descriptions are easier for painters to understand than customary working drawings. "Since the design should be related to the finished space as you see it," she explains, "I am telling the painters to start, for example, on the third stair and make this figure cascade down the stair. This is an effect spec rather than a measured spec." It also makes the placement of the designs an action-involvement activity for the painter, whose skills and crafts, even whose artistry, can become engaged.

Guidelines

How to ensure a hard edge for the painted design is an important ques-

Photos: E. M. Weil

The "1–2–2 Club," a neighborhood youth center at 122 Franklin Street in an economically depressed area of Albany, N.Y., has revitalized several abandoned buildings with a large scale exterior paint scheme based on the address. Designed by Steven L. Einhorn, Merrill H. Diamond, and Eric C. Yaffee of the architectural firm Einhorn-Sanders Associates, the building was refurbished with no effort to repair the broken shingles or cracked blocks. Instead, circles and segments were laid out on the old surfaces by using varying lengths of wood poles with one end drilled to hold a marker and the other end nailed to the wall. Then sign painters and house painters completed the finish free hand.

The project has survived the longest and most severe winter in Albany's history. It cost about a third more than painting the surface without graphics, but at 18 cents per sq ft as compared with 12 cents per sq ft that is still urban revitalization at low cost.

tion. Masking tape versus freehand seems to be the basic choice. "For close scale where the edge counts," Richard Oliver observes, "we use masking tape; at a bigger scale, freehand is adequate."

Freehand and care seem to go together. "The guy I use makes straight lines as he goes," says Barbara Solomon. "A good sign painter can do that."

"Sign painters use big brushes that hold more paint," Barrie Briscoe elaborates, "since the freer the stroke the more even the stripe."

Paint Materials

Most designers seem to specify just good outdoor enamel — regular house paint over a primer. "I leave that up to the paint company," says Barbara Solomon. Others have preferences about specific brands.

"Sign painters use a very high quality paint and do it in one coat so they will not have to do it over," Barrie Briscoe notes.

At Houston's Project HOPE, gloss paint was applied over flat black backgrounds. The Austin Housing Evaluation Center had latex flat paint outside; inside, high and semigloss enamel were used over an enamel undercoat because they were washable. Hardy Holzmann Pfeiffer are also intrigued by the use of shiny and matte surfaces together. For floors and some vertical exterior work, epoxy paints seem to be the recommended area of investigation.

Problems and Hints

Architects Murphy Levy Wurman point out that painted designs "take more supervision from critical point to critical point." Richard Oliver agrees, "You have to keep checking because the workmen are unfamiliar with the idea. You have to keep breaking the information down into pieces they can understand and go back every day and snap out a new bunch of lines." Admittedly Oliver is speaking of a project done with unskilled house painters rather than sign painters.

"Most mistakes are judgment about scale," Barbara Solomon advises. "That is all about the eye of the creator — where you do it and where you don't do it. That is the design."

Lee Pomeroy has one hint about the masking tape procedure in a multiple color stripe scheme. "To prevent laying out the tape twice for each side of a hard edge," he explains, "lay out ¼ in. masking tape to create a narrow white stripe between two colors. Our painters put a coat of clear nail polish over the single surface opaque black vinyl masking tape, then painted a different color on each side. When the single piece of tape was removed, the paints had not run under the tape because of the clear lacquer and that lacquer left a hard edge. The white stripe between the two colors also gives them additional brightness."

Duration of painted designs is variable, but the consensus is that a multicolor exterior paint scheme lasts as long as a whole house surface or any other outdoor paint. Interior stripes last no less well than a whole wall of one-color paint. Most outdoor murals have lasted intact for at least two and a half years.

Some Admonitions

Final words on the subject are admonitions from two designers. Barbara Solomon warns, "Supergraphics has been used very faddishly by many people so far. It is better when there is a reason for it — when it can be used directionally or even when it is subliminally decorative — rather than being purely decorative."

Lee Harris Pomeroy concludes, "Our streets mean nothing to people as a place. They are conduits for garbage, as they were for the Romans. To make people care about the streets they have to have symbolism and sex appeal — like tail fins. Supergraphics exteriors are a short-term strategy to give sex appeal to our environment."

Let us make no mistake about the intentions of this report. Paint is not a panacea. It is only icing on a dessert. It will not feed the poor or nourish them, but it can make them feel better temporarily. Paint may not make squalor *be* better, but it can make it *look* better. It can give some visual relief. Admittedly, in this kind of environmental renewal we are dealing with symptoms rather than causes, with "bandaids rather than surgery" as one spokesman said of another activity at this year's AIA convention. But let us not make a mistake in the direction of real priorities either: we must deal with interim measures until a vaccine is discovered. There is a valid place for surface renewal as well as fundamental renewal. May we use paint wisely for urban revitalization.— CRS

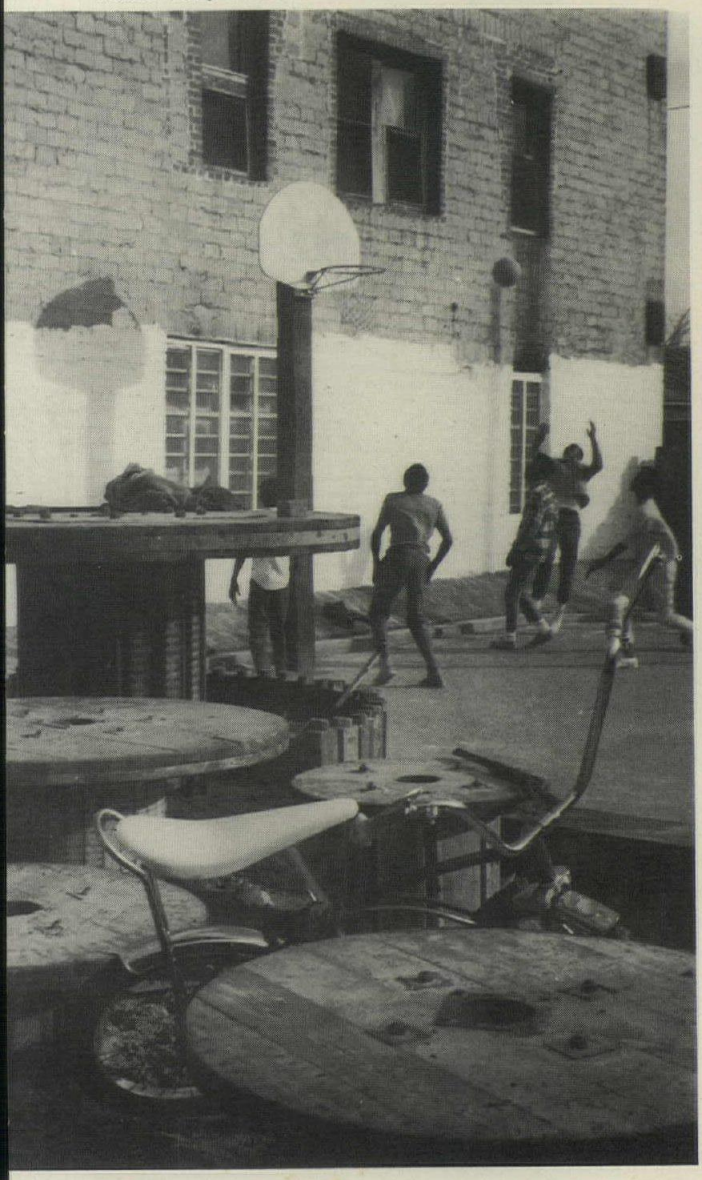
Project HOPE, a youth recreation center in Houston's Black "Pearl Harbor" area, is one of those achievements that the world of architecture can be proud of. It was designed and built by fourth year architecture students at the University of Houston as a class project. The tyro-architects not only devoted themselves to a problem that was relevant to today's society, they also went beyond that dedication to produce a real accomplishment — beyond the lip service of protest that so many students exercise without further results. In addition, the Houston students gained on-the-job training about client relations, about persuasiveness in obtaining contributed materials from local suppliers, and about actual construction — instead of the elaborate yet detached paperwork of too many architecture students.

In setting up their own course program at the direction of associate professor John Zemanek, the fourth year students contacted HOPE — Human Organization for Political and Economic Development — which had selected a site for a youth center in Houston's most depressed ghetto. The site was a dilapidated wedge-shaped one-story building that HOPE had painted black and named the Black Building; it had an adjoining open area which was asphalted.

According to architect Zemanek, "The meeting with HOPE brought out how times have changed — HOPE was not impressed with advice and promises with strings attached, with problem solutions that created new problems. Unless HOPE could help **us**," professor Zemanek continues, "they were not interested in our intentions to help them. We needed help; we knew we had come to the right place. With the understanding that HOPE was providing an opportunity to design and build a useful community facility, not only for the ghetto but also useful as a learning experience in the urban environment, we embarked on what was an experiment in architectural education. The students learned about sociology, economics, psychology and all those environmental studies as well as about frustration, patience, fear, work and each other."

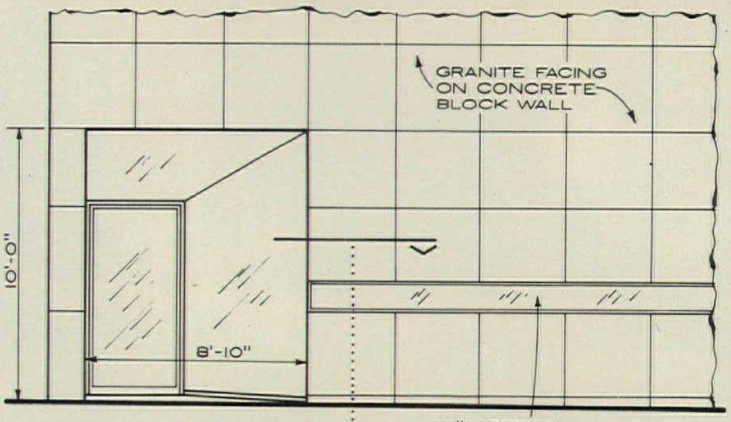
Materials for construction were donated by business establishments; except for small purchases, no cash funds were required throughout the project. Painting included exterior logos and signs (the lightning pattern on the front was freehanded by Charles Coffman from a comic book) as well as interior designs (some were photos of neighborhood kids projected then painted on the walls). The total involvement of architecture students with the neighborhood was a project in which all architects should see great hope — and the potential contribution of paint to our urban environments.

Photo: Hickey & Robertson

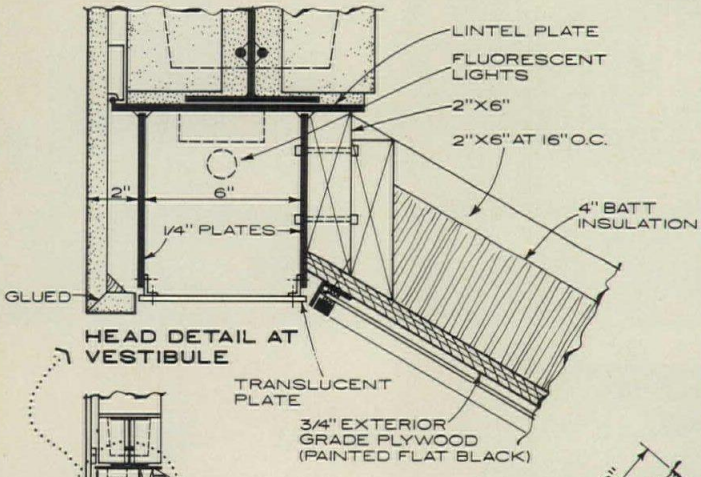


Photos: except as noted: John Zemanek

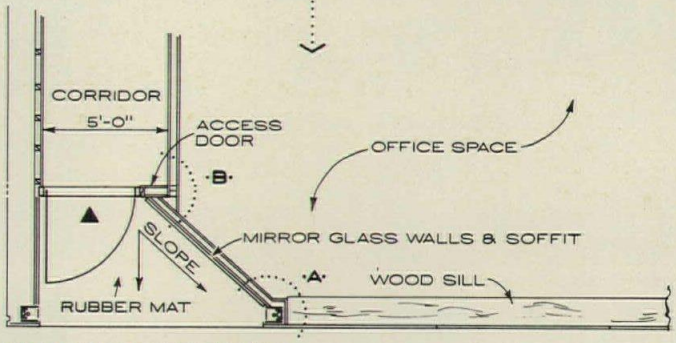
Mirrored Store Entry



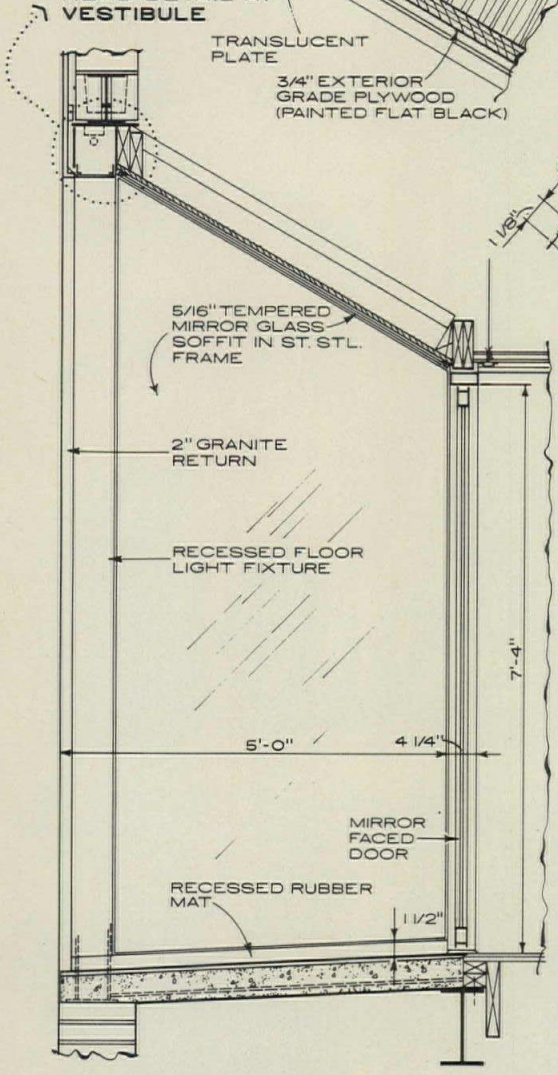
PARTIAL ELEVATION



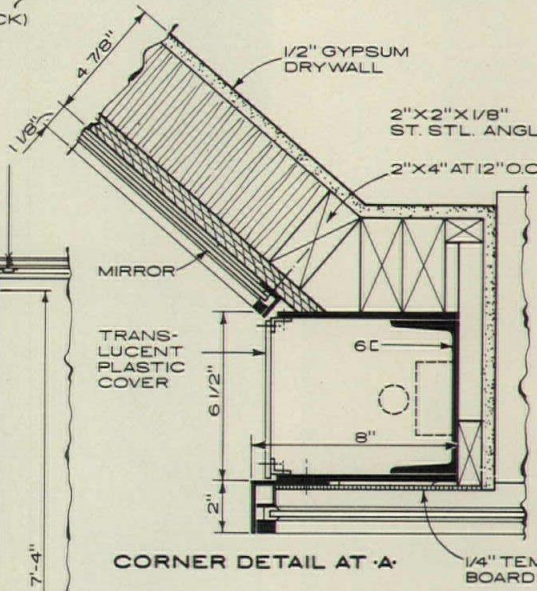
HEAD DETAIL AT VESTIBULE



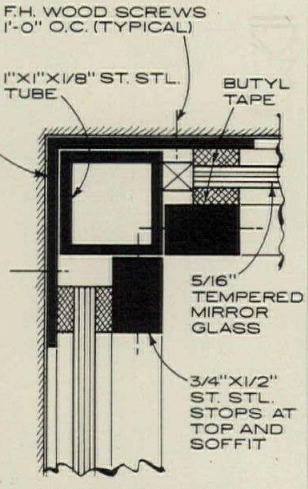
PLAN VIEW AT ENTRY



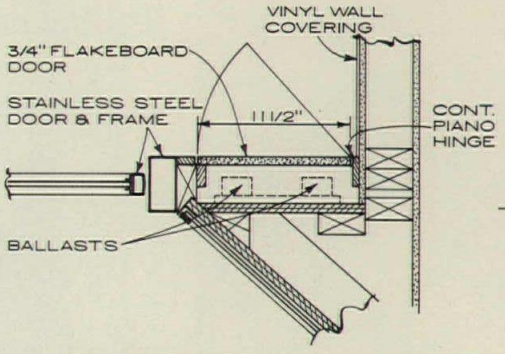
VERTICAL SECTION THRU VESTIBULE



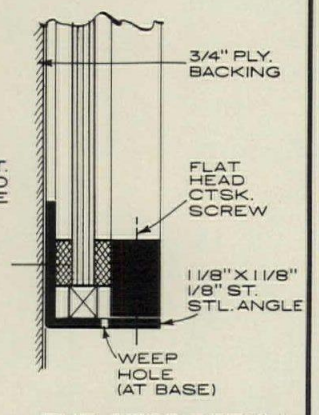
CORNER DETAIL AT ·A·



TYP. STOP DETAIL: SIDES TO SOFFIT



DETAIL OF ACCESS DOOR AT ·B·

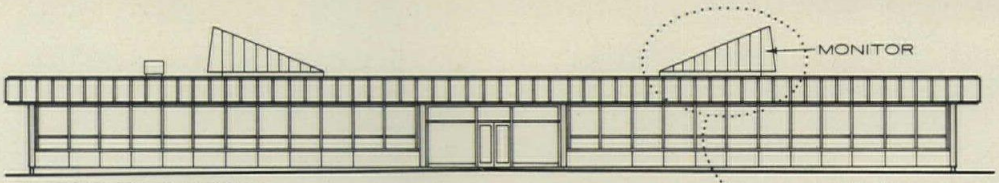


TYP. STOP DETAIL: BASE & SIDES

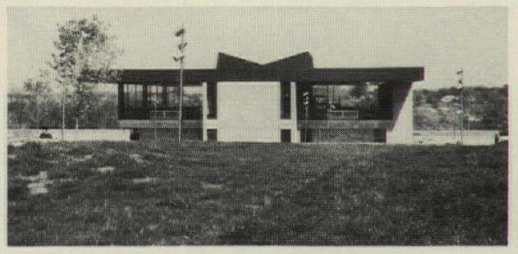
Manchester Lease International, Inc., Clayton, Missouri
Gruen Associates, Architects,
Cesar Pelli, Designer

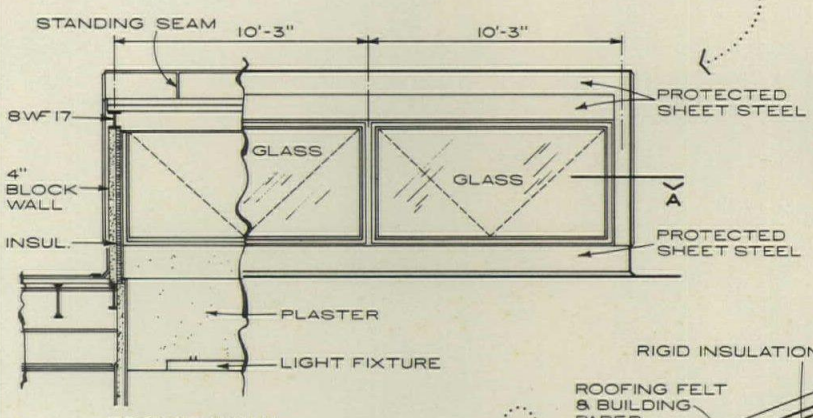
Selected Detail
Mirrored Store Entry

Monitor

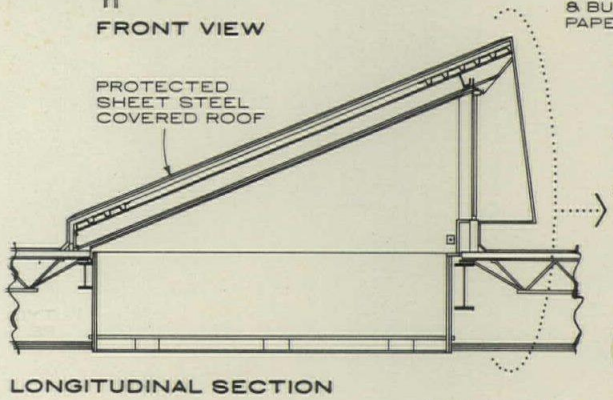


WEST ELEVATION

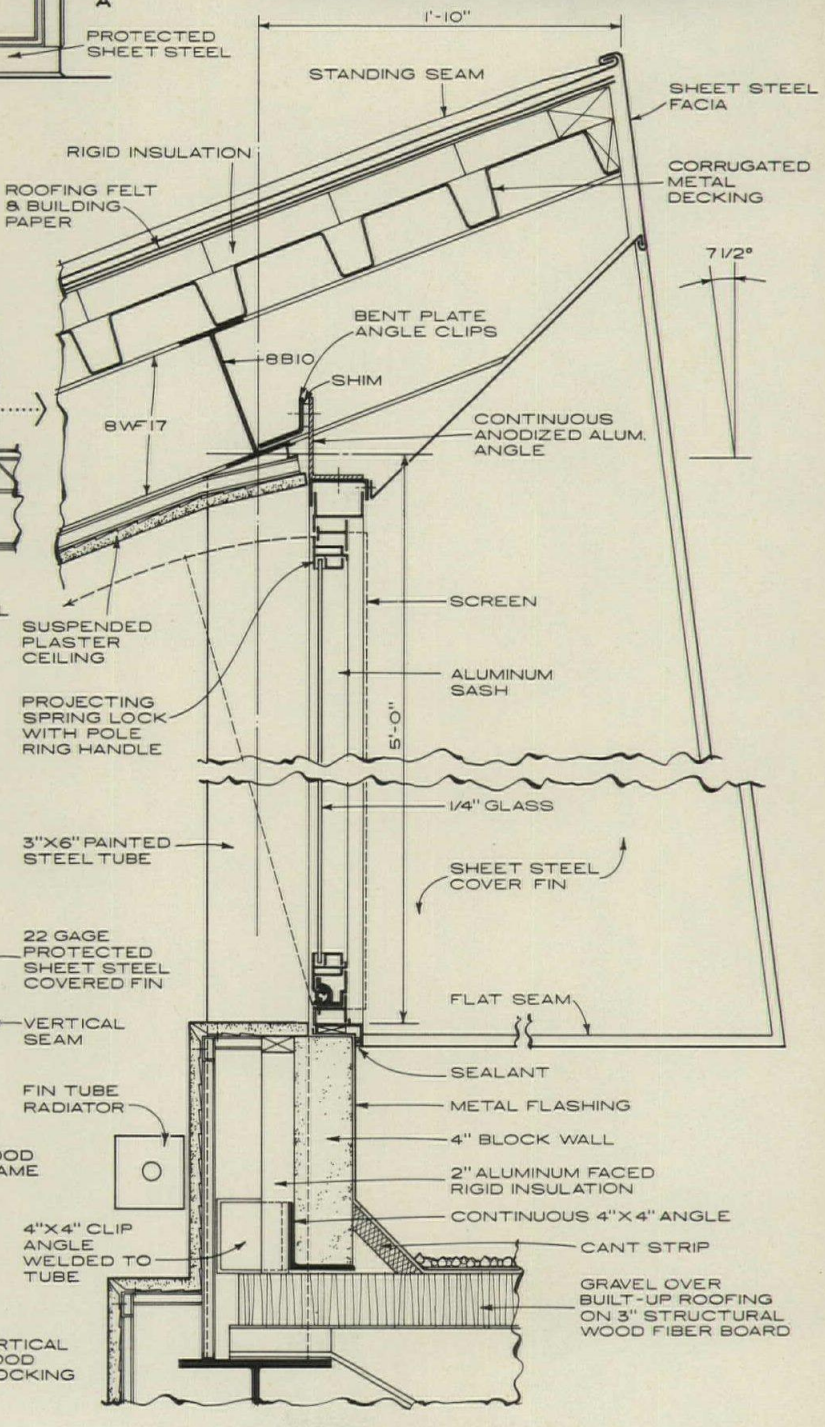


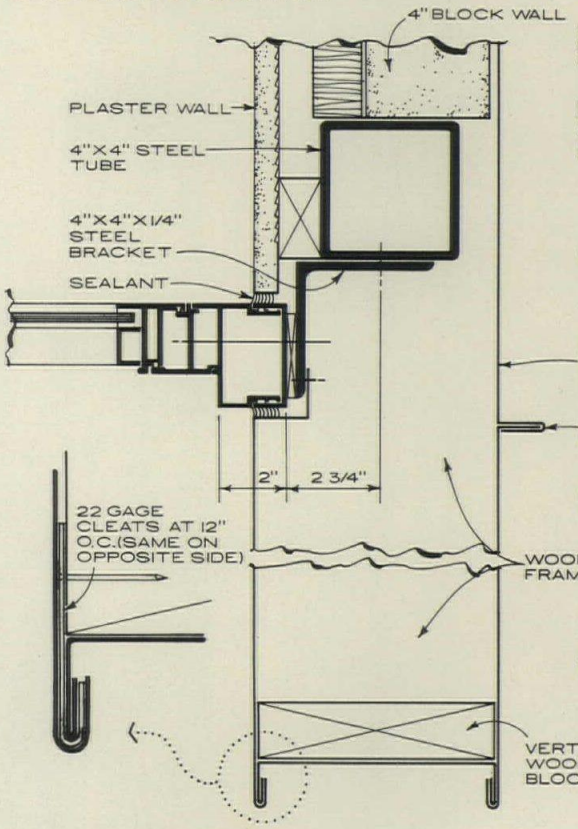


FRONT VIEW



LONGITUDINAL SECTION



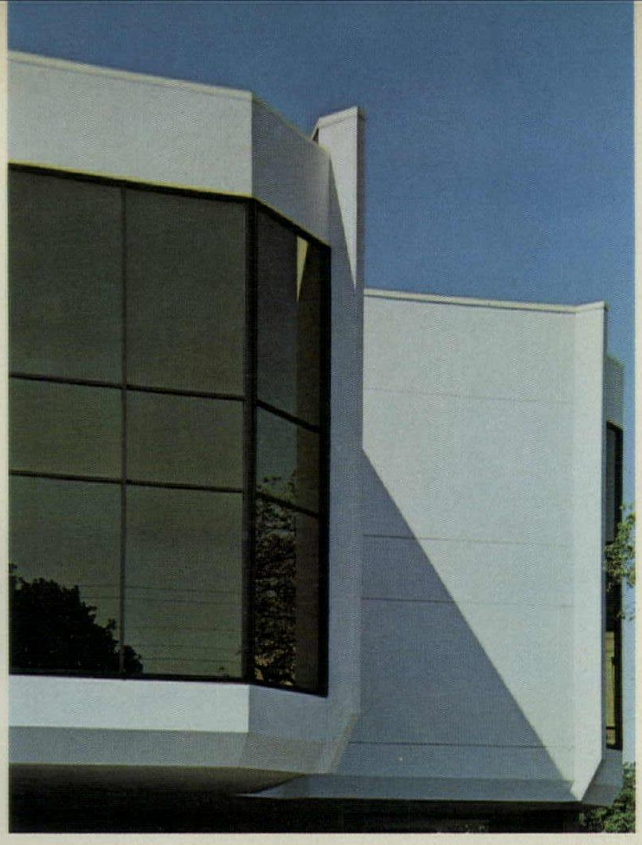


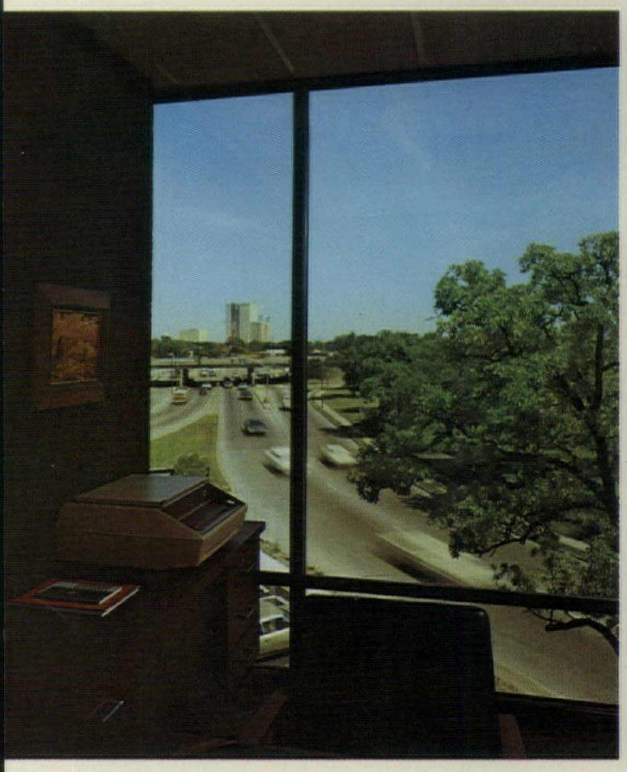
PLAN SECTION AT ·A·

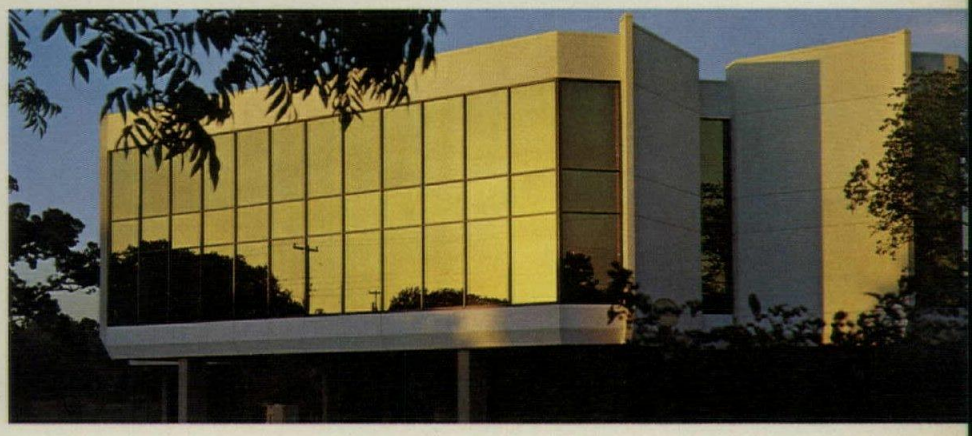
VERTICAL SECTION AT WINDOW

State University of New York,
Agricultural and Technical College, Canton, N.Y.
Carson, Lundin & Shaw, Architects

Selected Detail
Monitor







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Materials Handling for Hospitals

This is the first of a series of articles discussing the problem of materials distribution in hospitals and related facilities. Available systems and equipment are outlined by an associate of Syska & Hennessy, Inc., Consulting Engineers, New York City.

Simply stated, planners and administrators of hospitals and medical teaching facilities are faced with the supply and return of hundreds, and in many cases thousands, of items each day. These materials run the gamut in size, shape and durability. The trick is to distribute them to and from the user as cheaply as possible by dependable means.

Unfortunately, there is no pat answer, no one system that meets all conditions. Outlined here, on a broad basis, are the available systems and equipment. There are three major categories of materials distribution. The first is manual transportation. Although it may not sound glamorous by today's standards, there are many cases where manual transportation is necessarily the answer. The second category, when automation applies, includes equipment for handling large items and accumulations of smaller items having the same destinations. These systems are planned to move carts. The third major category is equipment for the movement of small individual items, sometimes point to point, sometimes to local distribution areas.

Types of Materials

A list of the types of materials to be moved would be too extensive to include here. But the major large and accumulated items that can be moved by carts are food, clean and soiled linens, patient treatment equipment, solutions, lab samples, housekeeping supplies, solid wastes, flowers, pharmaceuticals and bulk supplies of medical records, X-rays and paper forms.

Some of the small items that require individual handling range from a sample for testing sent between the operating room and the lab to such items as requisition forms, mail, a medical record, an X-ray, a completed pharmacy prescription.

Quantities

Although quantities of movable materials vary widely between institutions, the scope of materials traffic can be visualized by using a 600-bed hospital as an example. This facility might generate 600 cart trips per day, or 300 each way, of which close to 200 may be for food service. Thirty to 40 trips may be required during a one-hour food serving period. If the hospital has adjacent teaching and research facilities, these quantities increase.

Transportation of small items in the same hospital can account for 2000 carrier trips per day. Clean and soiled linens will run from 10 to 16 lbs per bed each day, or an average of 8000 lbs each way. Solid wastes, even without a complete disposable program and teaching facilities, can run 10,000 to 15,000 lbs per day.

Types of Equipment

In addition to service elevators and hand carts for manual movement, there are numerous systems available to move carts automatically, both vertically and horizontally. All of them load and unload carts onto carriers automatically for vertical use.

Automatic cart lifts are available for vertical movement only. These are really small elevators or dumbwaiters with equipment built in the floors that injects or ejects carts.

Automatic cart systems for vertical and horizontal travel move carts by means of transporters traveling on monorails or overhead chain conveyors, by chain drives in the floor, or by self-propulsion guided by electric impulse wiring in the floor.

For transportation of small individual items there are pneumatic tube systems, automatic ejection dumbwaiters equipped with trays and tote boxes, horizontal and vertical conveyors that also use tote boxes, and an automated self-propelled container system that travels on a small track.

For departmental materials handling there is an extensive amount of conveyor equipment for automated food service and dishwashing, automated central sterile supply operations, automatic cart washing and X-ray handling.

Gravity chutes, commonly used for soiled linen and solid waste return, in many cases can be converted to a system which pneumatically transports the materials back to central collection areas.

Costs

Cart systems can cost $1000 to $5000 per bed. Systems for small items can cost $7000 to $20,000 per station. Whichever systems are selected, careful study must first be done to insure that they can do the job, and then economic comparisons should be made. Most systems will have to be justified economically in terms of manpower savings. In such a study, costs of space for separate tunnels or corridors and shafts must be included. Costs of maintenance and replacement must not be overlooked. Each case must be evaluated individually since building orientation (i.e. extensive horizontal, minimum vertical travel vs. high vertical, minimum horizontal travel) and outlying facilities have an important bearing on costs.

Planning

It is important that materials handling be examined in the very early stages of planning new hospitals and related facilities. This can save extensive redesign and rebudgeting as plans develop. What exists and is to remain or is to be converted should be included to make the analysis complete. The rising cost of manpower and the growing difficulty of obtaining needed manpower in many geographical areas makes the study of a good materials handling system more important every year. This, then, is one of the challenges that every owner, architect, and engineer encounters in his quest to design not only an attractive facility but an efficient and functional one.

Earthwork Specifications: Part II

This month, the Chief Specifications Writer of Skidmore, Owings & Merrill, New York City, continues his recommendations for earthwork specifications, suggesting provisions to protect the interests of the architect and his client.

When rock is likely to be encountered during excavation, the specifications may provide for an equitable pay arrangement. An estimated quantity of rock may be noted in the specifications with a stipulation that if a greater or lesser amount is encountered, the contract sum would be adjusted accordingly. This provides for firm bidding without any contingencies on the part of the contractor. Use of the following language is recommended:

"The contract price shall include allowances of_____cubic yards of general rock excavation and_____cubic yards of trench and pit excavation. The actual total amount of rock to be excavated shall be determined by cross sectioning and measuring the rock to be removed. Should a greater or lesser amount of rock be encountered than the total estimated amounts hereinbefore noted, payment for any such greater amount or credit for any such lesser amount shall be made in accordance with the unit prices agreed upon."

The specifications may also be written to provide that all excavation be considered as earth, and that if rock is encountered, it would be measured and paid for at a stipulated unit price. Rock should be defined so that there is no dispute and the following language may be used:

"Rock Classification: Only solid rock in ledges, bedded deposits or conglomerate deposits so firmly cemented as to present all the characteristics of solid rock, and which cannot be removed with a ¾ cu yd capacity power shovel without drilling and blasting, and boulders having a volume of more than ½ cu yd, shall be classified as rock."

If rock is known to be present or if it is anticipated, payment lines should be specified so that any additional rock excavation is paid for within prescribed limits. A specification to cover rock payment lines is suggested as follows:

"Rock Payment Lines: In making rock excavation, no payment will be allowed for additional rock actually excavated beyond the following limits:

1. Two feet outside of concrete work for which forms are required, except footings.
2. One foot outside of the perimeter of footings."
3. In all pipe trenches, 6 in. below invert elevation of pipe and 2 ft wider than the inside diameter of the pipe, but not less than 3-ft minimum trench width.
4. Neat outside dimensions of concrete work where no forms are required."

The architect is not responsible for the methods used by the contractor for earthwork operations, nor should he specify how the contractor should perform his work on temporary bracing, shoring, underpinning, sheeting, etc. However to protect the owner's interest, the architect should include the following provisions in his specifications:

"The contractor shall retain, at his own expense, the services of a qualified soils consultant to advise the contractor on all construction techniques involved in the work, including the design, checking and approval of temporary bracing, shoring, underpinning and other items pertinent to the work, and on construction methods for solution of problems which may be encountered during the prosecution of the work. The soils consultant shall be primarily concerned with construction methods which will prevent settlement and/or damage to such surrounding structures as sidewalks, roads, utilities and embankments on the owner's property and on property adjoining the site of the work."

Fills and backfills should be specified to be compacted to achieve the following generally accepted percentages of maximum density at optimum moisture:

Location	% Max. Density
Under slabs on grade	95
Under paved areas	95
Under structural members	90
General grading	85

For each type of soil encountered or for borrow material delivered to the site, one optimum moisture-maximum density curve should be established by an accepted laboratory. These densities should be determined by ASTM D1557. Fill and backfill should be placed in horizontal loose layers in such manner as to produce a thickness after compaction of about 10 in.

To assure compliance with the filling and backfilling compaction requirements, a soil testing laboratory should be engaged to check the compaction specified. Field density tests to determine compliance may be referenced to ASTM D1556, Density in Place by Sand Cone Method, or ASTM D2167, Density of Soil in Place by Rubber Balloon Method. Test requirements can include a test at each layer, providing for one test for every 2500 sq ft of filled area, for general fills, fill under paved areas and under building slabs.

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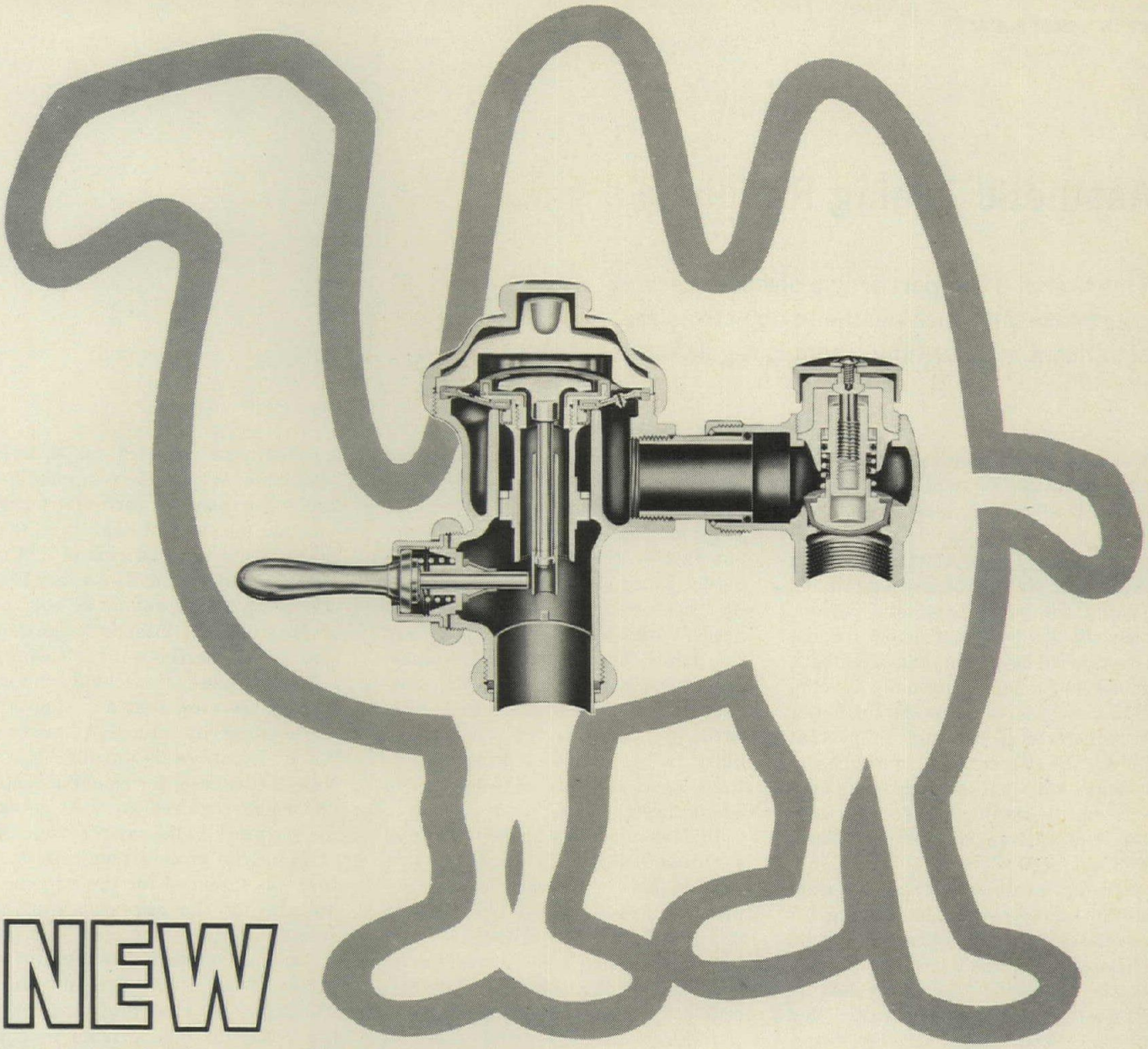

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IT'S THE LAW / By BERNARD TOMSON, District Court Judge, Nassau County, N.Y., Hon. AIA
and NORMAN COPLAN, Attorney, Counsel to New York State Chapter AIA

Aesthetic Zoning Rationale

This first of a two-part article discusses several court cases in which aesthetic objectives are significant in determining zoning regulations.

The legality of zoning restrictions and limitations is traditionally based upon the inherent power of a municipality (sometimes referred to as the police power) to protect the health, safety and welfare of its inhabitants. Zoning for purely aesthetic reasons has not been looked upon by the courts with favor and has often been found to be constitutionally invalid. In recent years, however, aesthetics have become increasingly important in the development of zoning regulations, and the constitutional base for zoning ordinances seeking aesthetic objectives has been broadened by the courts.

The rationale underlying the position of many courts that zoning for purely aesthetic objectives is invalid is based upon the premise that aesthetic standards (as contrasted to standards for public health and safety) vary widely and are determined by individual preferences and subjective judgments. Typical of this viewpoint is an Iowa case (*Stoner McCray System* v. *Des Moines*, 78 N.W. 2d 843). Involved was a zoning ordinance of the city of Des Moines which required certain billboards owned by the plaintiff to be removed or which required special permission by the city to maintain. The court held that a city may not prohibit billboards because they are unsightly and that aesthetic considerations, since they were a matter of luxury and indulgence rather than of necessity, could not support this exercise of municipal police power.

A similar case in Ohio presenting the traditional point of view is *Youngstown* v. *Con Bros. Bldg. Co.*, 148 N.E. 842, which held a city zoning ordinance invalid on the ground that it was based purely on aesthetic considerations. This ordinance limited a particular area to single- or two-family homes. The court argued that mere aesthetic considerations could not justify the exercise of the inherent police power of the municipality because there was no essential need for the regulation involved and the public view as to what is necessary for aesthetic progress varies between communities and people. This variability, thought the court, would make it impractical to base restrictions upon the use of property on aesthetic standards.

In Massachusetts there have been contradictory decisions on this subject. In 1936 the Massachusetts Supreme Court upheld a town zoning law prohibiting the erection of certain professional signs in residential districts despite the fact that this regulation was based upon aesthetic considerations. The court came to the conclusion that the appearance of a residential neighborhood relates to the value of the property in that neighborhood and that the value of property is a matter of general welfare which justifies the zoning ordinance. However, in 1949 the same court found a zoning law invalid which placed a particular plot of land in a residential district for the purpose of increasing the attractiveness of the town as a residential community to those approaching it. The court ruled that aesthetic considerations will not alone justify restrictions upon private property for the purpose of preserving the appearance of the town.

The Pennsylvania courts have generally upheld the principle that a zoning ordinance based only on aesthetic factors is invalid. For example, a zoning law which divided a town into districts and provided for different requirements as to the minimum habitable floor area for each district was declared unconstitutional by a Pennsylvania court on the ground that the home owner's right to use his property as he desires cannot be abridged because what he intends to construct may not be aesthetically pleasing.

In New Jersey the courts generally support the view that a zoning ordinance primarily directed toward aesthetic objectives is invalid. In one New Jersey case, for example, a statute which required an 80-ft setback for one-story buildings was found invalid on the ground that this provision was intended for the purpose of beautifying the appearance of the streets. The court stated that aesthetic factors are not matters of necessity "and it is necessity alone which justifies the exercise of the police power to take private property without compensation."

Contrary to a substantial volume of precedent many decisions, particularly in recent years, have upheld zoning ordinances even though they are based solely or predominantly on aesthetic considerations. In Florida, for example, regulations limiting the size of commercial signs and prohibiting the storing of junk within 75 ft of the boundary of any residential district have been upheld on purely aesthetic grounds. In Oregon a zoning ordinance excluding automobile wrecking yards from the city was found valid even though based upon aesthetic objectives.

The trend toward accepting aesthetic standards as justifying zoning limitations is particularly accented in Wisconsin and New York. In next month's column we will continue our discussion of this subject.

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Toward a Management of the Environment

Reviewed by Charles N. Ehler

The reviewer is an Assistant Professor of Urban Design and Urban Planning in the new School of Architecture and Urban Planning at UCLA, where he is developing a program option in Environmental Systems Planning and Management.

Population, Resources, Environment. Issues in human ecology. By Paul R. Ehrlich and **Anne H. Ehrlich.** *W.H. Freeman, San Francisco, Calif., 1970, 383 pp. $8.95.*

Resources and Man. A study and recommendations. By the Committee on Resources and Man, National Academy of Sciences/National Research Council. *W.H. Freeman, San Francisco, Calif., 1969, 259 pp. $5.95 (paper).*

1976. Agenda for tomorrow. By Stewart L. Udall with an introduction by John W. Gardner. *Harcourt, Brace & World, New York, N.Y., 1968, 173 pp. $5.75.*

Hopeful signs are beginning to appear that a concern for the deteriorating quality of our environment is gradually permeating the general consciousness of society and its institutions. This new "environmental awareness" has quite naturally brought a rush of new publications — a few good, most bad, or at best, superficial. While the half-life of the concern for the environment is difficult to predict, the architect and urban planner, who, at least for the present, are direct participants in shaping the environment for better or worse, should welcome the information and knowledge that can be gained from this new literature.

Several similar themes run through the pages of these three books; their conclusions are basically the same. The authors agree that: (1) the overall quality of the environment of our cities, our nation, and our world is rapidly deteriorating, and, in fact, we are on a collision course with eco-catastrophe; more specifically, (2) we are staring down the throat of the Dismal Theorem (1798) of English economist Thomas Malthus, which briefly stated says that since resources, particularly food, are finite, as population increases, the ratio of resources to man must eventually fall to an unacceptable level; and finally, (3) the scope of our environmental problems is global, calling for united, international action.

Population, Resources, Environment is a timely, comprehensive introduction to the worldwide crisis of overpopulation and its resulting demands on the limiting factors of the earth environment: nonrenewable resources, space, energy, water, food, and heat. It is by Stanford population biologist Paul Ehrlich, father of *The Population Bomb* (1968).

The book sums up the present world situation as follows: (1) the planet is grossly overpopulated considering present behavior patterns and technology; (2) major hindrances to solving human problems are the absolute number of people and the rate of population growth; (3) the limits of human capability to produce food by conventional means have nearly been reached; (4) attempts to increase food production further will tend to accelerate the destruction of our environment, which in turn will eventually reduce the capacity of the earth to produce food; (5) population growth increases the probability of a lethal worldwide plague or thermonuclear war or both; (6) the solutions to environmental problems involve dramatic and rapid changes in human attitudes.

Ehrlich believes that one of the major pollutants of the earth system is man himself. He states: ". . . The absolute size of the human race is now so large that it is perhaps the single most important factor we have to consider in discussing man's future, and its present unprecedented rate of growth adds to the urgency of the problem. . . " Ehrlich's conclusion is based on science fact not fiction. He does see an end in sight to the population explosion, however, not due to the impact of birth control, but rather to a rise in the death rate, largely due to famine.

The destruction that Ehrlich discusses is most apparent in our cities. Demographer Kingsley Davis has extrapolated world urbanization trends and has produced the following amazing statistics: if the urban growth rate that has prevailed since 1950 continues, half of the world will be living in cities by 1984; carrying that same trend forward to the year 2020, half of the world's human population would be in cities of over one million; and by 2044, the largest city would have a population of 1.4 billion people of a projected world population of 15 billion.

Ehrlich recommends a de-development of the United States, i.e., bringing our economic system, particularly our patterns of consumption, into line with the realities of ecology and world resurces.

Resources and Man, a report by the Committee on Resources and Man of the National Academy of Sciences/National Research Council, updates a similar study by Brown, Bonner, and Weir (*The Next Hundred Years*, 1957) and a series of 1962 reports to the Committee on Natural Resources of the NAS/NRC. The Committee on Resources and Man was established "to evaluate national and world resources in the light of current and expected stresses and to identify problems in need of study as well as opportunities for progress." The book reviews the critical aspects of the resource situation in an ecological context. Its underlying assumptions are explicit, its scope is broad, its view is long-range, and it is brief.

In an introductory, philosophical paper, titled "Man and his ecosystem," ecologist Marston Bates sees man's major form of environmental destruction as his attempt to simplify the biological relationships within the ecosystem to his own advantage. ". . . The danger in the simplified ecosystem is in its liability to catastrophe. . . . From diversity comes the possibility of change, of adaptive response to new conditions, of development and evolution."

Canadian geographer John Chap-

(Continued on page 126)

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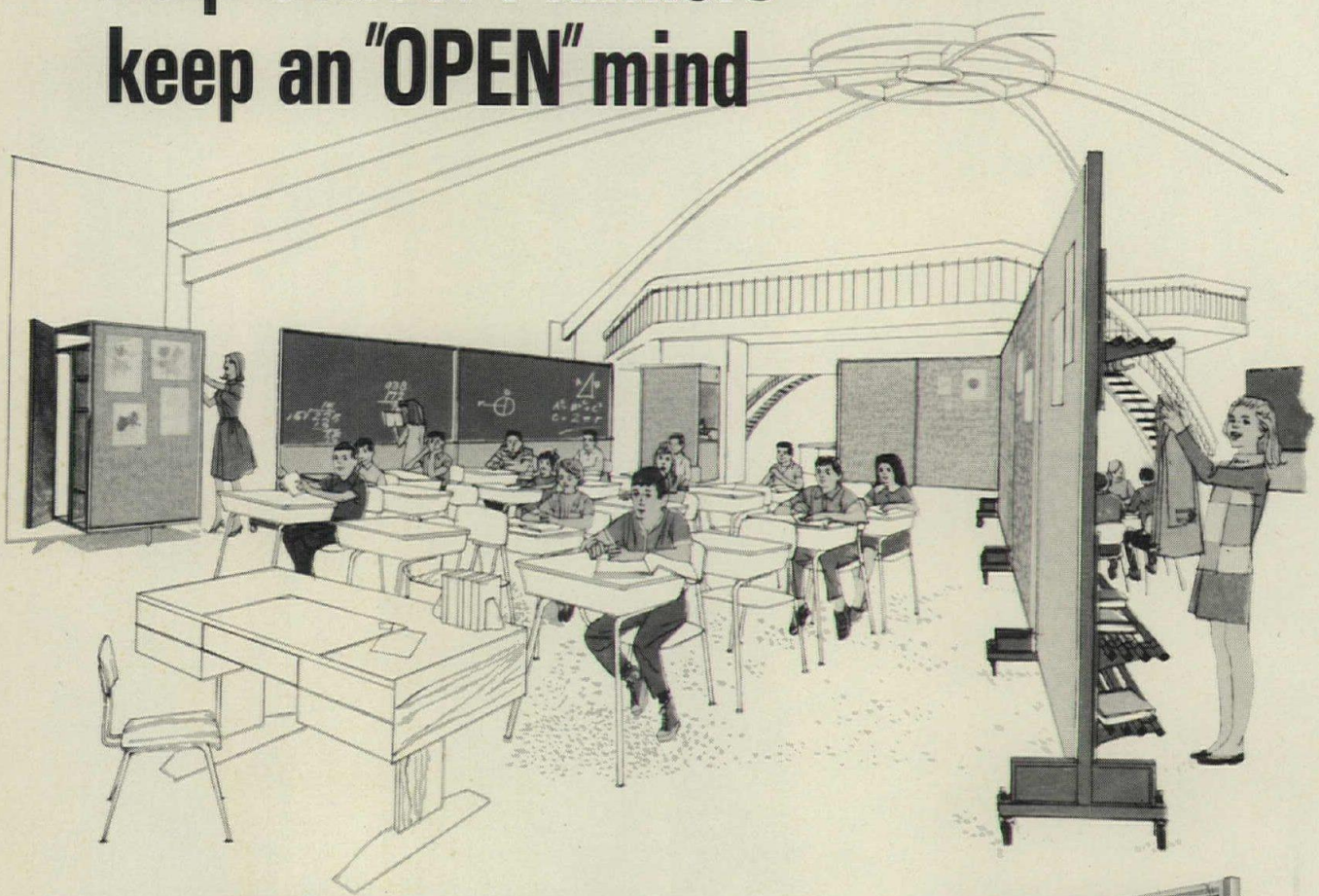

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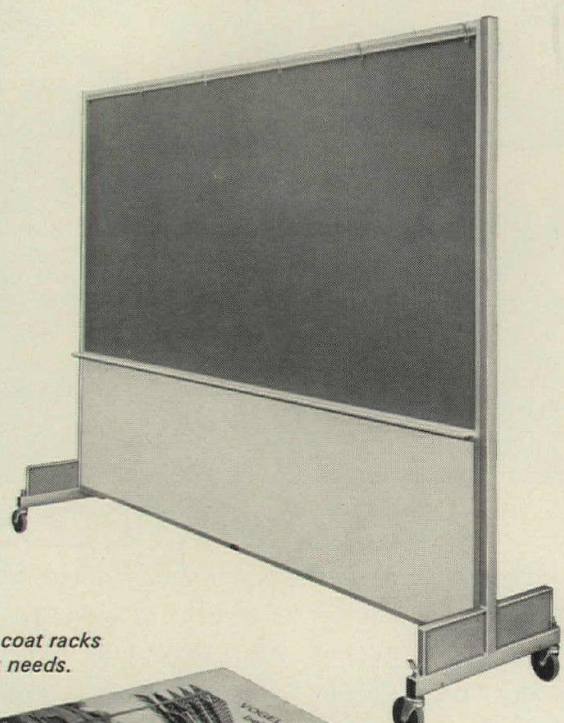

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(Continued from page 118)

man in a paper on "Interactions between man and his resources" defines the ecological approach as seeing "the natural world as a series of inter-related systems in a state of dynamic equilibrium into which man intrudes as an unbalancing factor. The study of these complex, inter-related systems by proponents of this approach has led to support for multiple-path, multiple-choice, and systems analysis methodology in dealing with resource problems rather than 'linear chain-reaction determinism'."

While the birth rate of the United States has been declining since 1957, and France and Japan's population growth rate appears to be almost stationary, demographer Nathan Keyfitz points out that on a global scale the rate of annual population increase has reached 2 percent or higher as of 1968. A rate of 2 percent applied to a population of 3.5 billion people gives an annual increase of 70 million people — only eight countries have populations as large as 70 million people! Such a rate of increase amounts to a new United States every three years, a new Chicago every two weeks.

In his paper, Sterling B. Hendricks of the Mineral Nutrition Laboratory of the U.S. Department of Agriculture states: ". . . The danger signals are up with respect to excess population demands for food supply as much as for other resources. It is folly to ignore them." William E. Richer of the Fisheries Research Board of Canada estimates that food production from the sea can be increased to not much more than 2.5 times that being produced in 1968. He points out that the world's ocean and inland waters cannot begin to supply a complete ration for the world's peoples.

In the final and longest paper, M. King Hubbert of the Geological Survey concludes: "Looking into the future, . . . the physical realities discussed in this book dictate that the curve of human population must follow one of three possible courses: (1) It could continue to rise for a brief period and then gradually level off to some stable magnitude capable of being sustained by the world's energy and material resources for a long period of time; (2) it could overshoot any possible stable level and then drop back and eventually stabilize at some level compatible with the world's resources; or (3) finally, as a result of resource exhaustion and a general cultural decline, the curve could be forced back to a population corresponding to the lowest energy-consumption level of a primitive existence. The one type of behavior for this curve that is not possible is that of continued and unlimited growth. It is interesting to note that in their July 1970 report the President's National Goal Research Staff, apparently not influenced by Ehrlich, NAS/NRC or the countless other population biologists, demographers, or ecologists who have testified to the contrary, sees the issue of population as one of distribution, not of new growth.

In the final book, 1976: *Agenda For Tomorrow*, Stewart L. Udall, former Secretary of the Interior under Presidents Kennedy and Johnson, begins with the premise that ". . . our failure to achieve the balanced pattern of growth that is the hallmark of a genuine civilization (can be)

(Continued on page 142)

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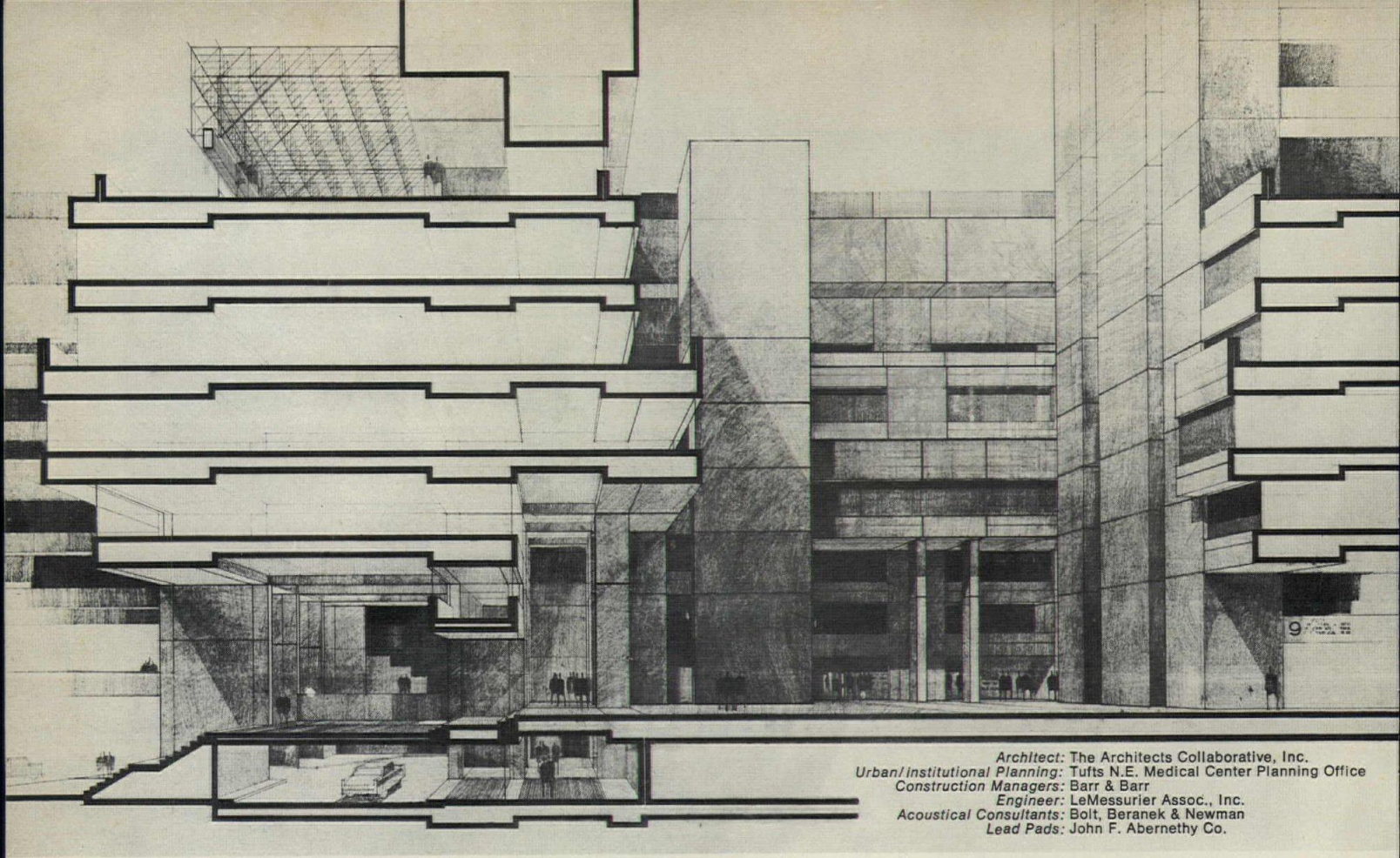

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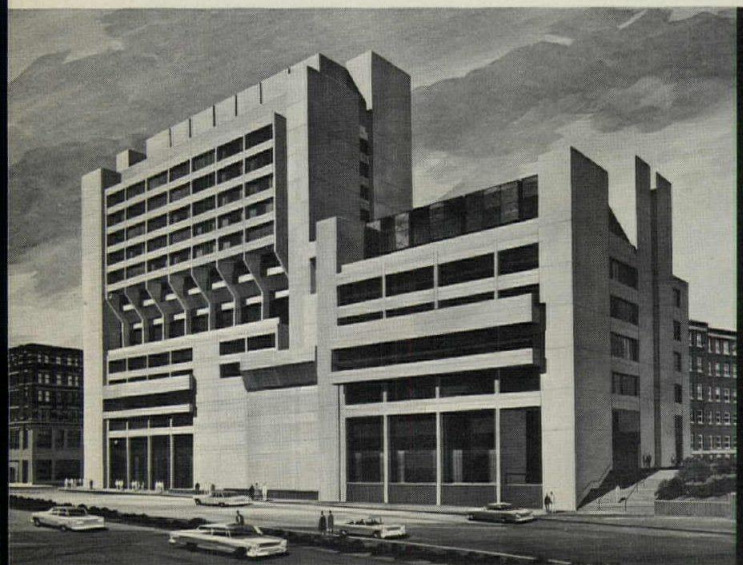

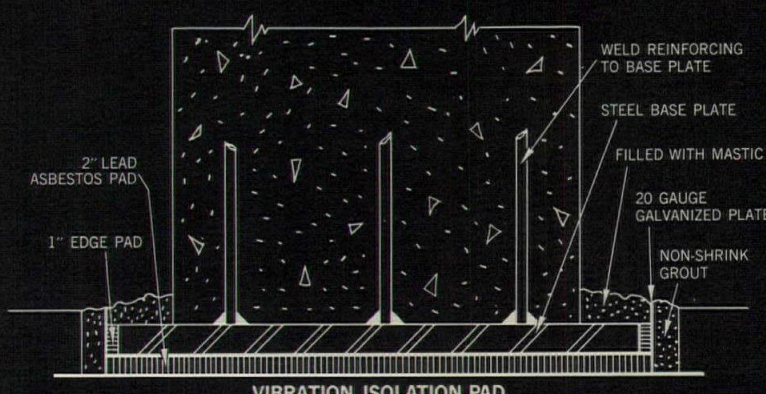

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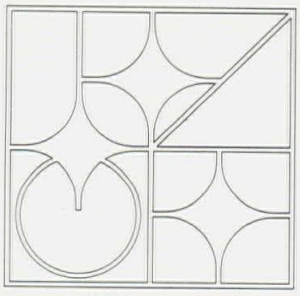

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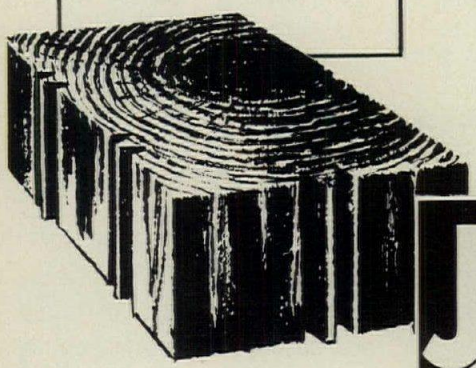

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On Reader Service Card, Circle No. 368

(Continued from page 126)

identified as the main American weakness." Writing on what he terms the "urban affliction," he blames the uninspired leadership that came from politicians and planners in the post-World War II era, for "the failure to build livable cities and the closely related failure to make a multiracial society work."

Udall joins the other authors in concluding that population pressure is "the paramount impediment to an environment that will promote life-enhancing opportunities in all nations. . . . For a nation proud of its scientific prowess, we are remarkably fatalistic about the future."

As an answer to our urban problems, Udall proposes Project 76, "a plan that will enlist all segments and cities of America." He states: "A program that embraces the all-encompassing dimensions of the new conservation must be an integral part of Project 76. . . . The cost accounting of the upcoming age of ecology will . . . entail an application of the systems approach to the intricate system of life itself. . . . These dimensions will compel the architect, the industrial designer, and the government functionary to become aware of all the ramifications of change."

While maintaining faith in the existing institutions of government, Udall criticizes the Congress for failing in its most vital function: the synthesis, shaping, and supervision of the nation's paramount goals and priorities. He suggests that the House and Senate sit for two or three weeks each year as a committee of the whole to undertake a "searching analysis of our national performance and aspirations." Out of this meeting might come "a new intimacy between the Congress and the people . . . . (and) once Congressmen realized that their constituents were enlightened on vital issues, they would be better able to function with informed perspective — rather than skilled special-interest pressure — as their main guide."

Together, these three books lead us a step forward in explaining the present and anticipating the future of the earth system. Hopefully these authors will not suffer the same fate as the Greek prophetess, Cassandra, who was never believed, but whose predictions always came true.

NOTICES

Partners and Associates

SKIDMORE, OWINGS & MERRILL, ARCHITECTS, Portland, Ore., have appointed GEORGE T. OKAMOTO, EDWARD D. PEDERSEN, PHILIP A. RUDE, and ROBER L. SCHULTZ as participating associates.

FLYNN, DALTON, VAN DIJK & PARTNERS, Cleveland, Ohio has named NEIL WILLIAM GUDA, FRED H. HOLMAN, JR., and PAUL J. GRIECO as associates.

W. ALLAN TUOMAALA AIA has been appointed vice president and ARNOLD F. SERLIN AIA, has been named secretary of LEONARD G. SIEGAL ASSOCIATES, INC., ARCHITECTS, Detroit, Mich.

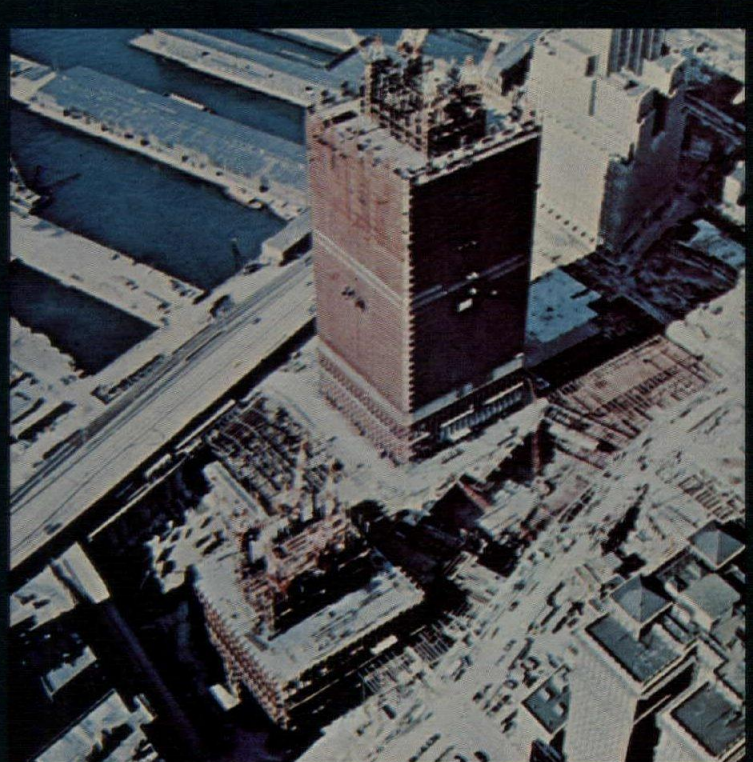
RAYMOND and SIDNEY EPSTEIN have announced the appointment of RALPH EPSTEIN as president of A. EPSTEIN AND SONS, INC., of Chicago, New York, Washington, D.C., and Paris.

BERNWARD U. KURTZ AIA is now an associate with THE EGGERS PARTNERSHIP, New York, N.Y.

ROY C. NEUMANN has been elected to the board of directors of STANLEY CONSULTANTS, Muscatine, Iowa.

(Continued on page 150)

Another step towards a perfectly dry Manhattan.



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New York City's World Trade Center, which will cover thirteen city blocks, will be one of the largest building complexes in the world.

And it'll also be one of the driest because Tremco sealants and glazing systems will be used in the right places.

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The Tremco glazing system — Mono, Pre-shimmed 440 Tape and Vision Strip — is also recommended for the plaza buildings surrounding the skyscrapers. And there are good reasons why: Weather tightness. Windows that are evenly balanced for high wind loads. No pressure points. And neat sight lines. So whether you're planning to build a 110-story skyscraper or a one-story warehouse, Tremco can solve the sealant problems. No, we don't have an all-purpose sealant. We're just an all-purpose sealant company. Call your Tremco Representative today and see for yourself.

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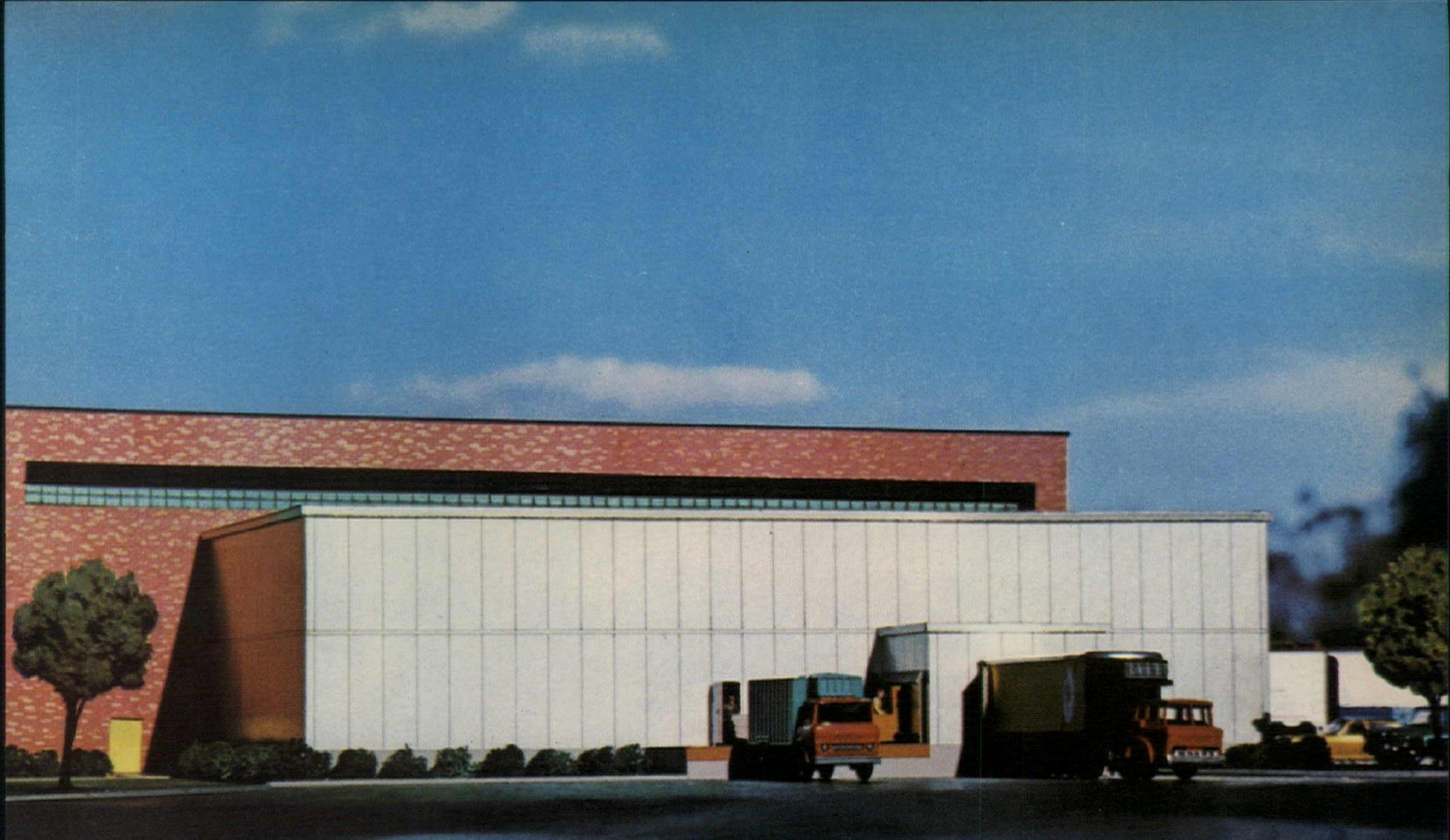
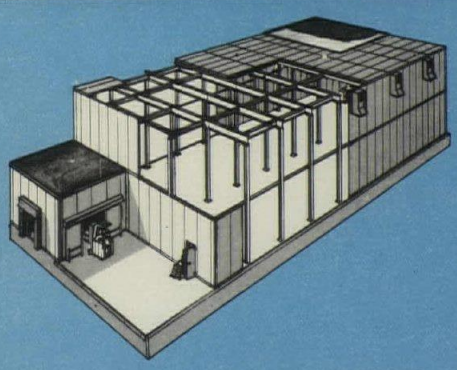


Bally Refrigerated Warehouse Buildings . . . like Bally Prefab Walk-Ins . . . keep pace with the evolution in mass feeding. Food processing and commissary cooking for satellite distribution require giant capacity refrigerated buildings. Bally's pre-fabricated / pre-engineered refrigerated structures can be assembled quickly in any size up to 36 feet high with standard metal-clad panels. Urethane insulation, 4-inches thick (equal to 8½″ fiberglass) cannot pick up moisture . . . is ideal for outdoor use. Factory assembled refrigeration systems are easy to install and service. They fill every temperature requirement, (as low as minus 40°F), for processing or storage. Learn about important Bally features from our 32-page book and urethane wall sample.



Cut-away view illustrating structural steel, insulated panels, roof construction, and refrigeration units in a typical Bally building.

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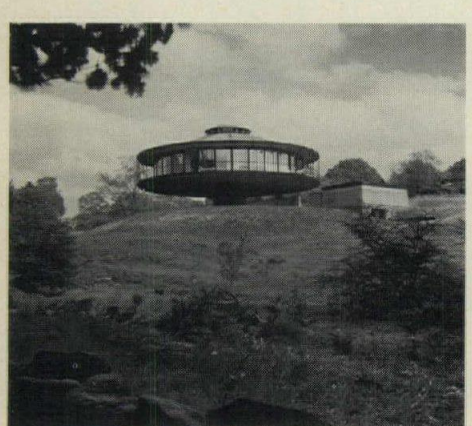

This Connecticut home would be striking even if it didn't revolve. But it does. Turning 360 degrees in either direction in 48 minutes. Creating excitement and looking elegant every inch of the way.

The unique design is almost overpowering.

Almost. The exterior application of red cedar shingles provides just the right touch of restraint. Cedar's rich texture lends the structure a look of stability and warmth. And makes the home feel at home in its natural environment.

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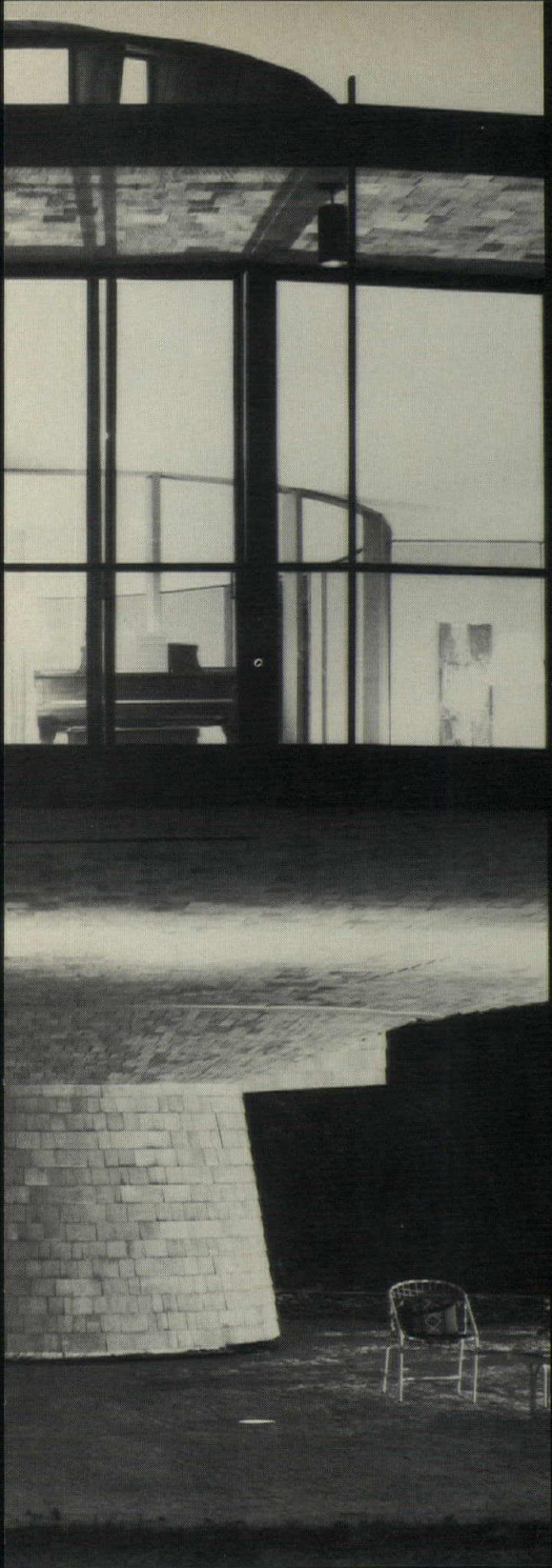
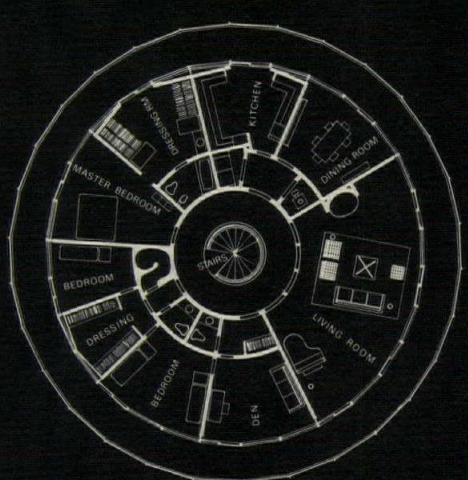
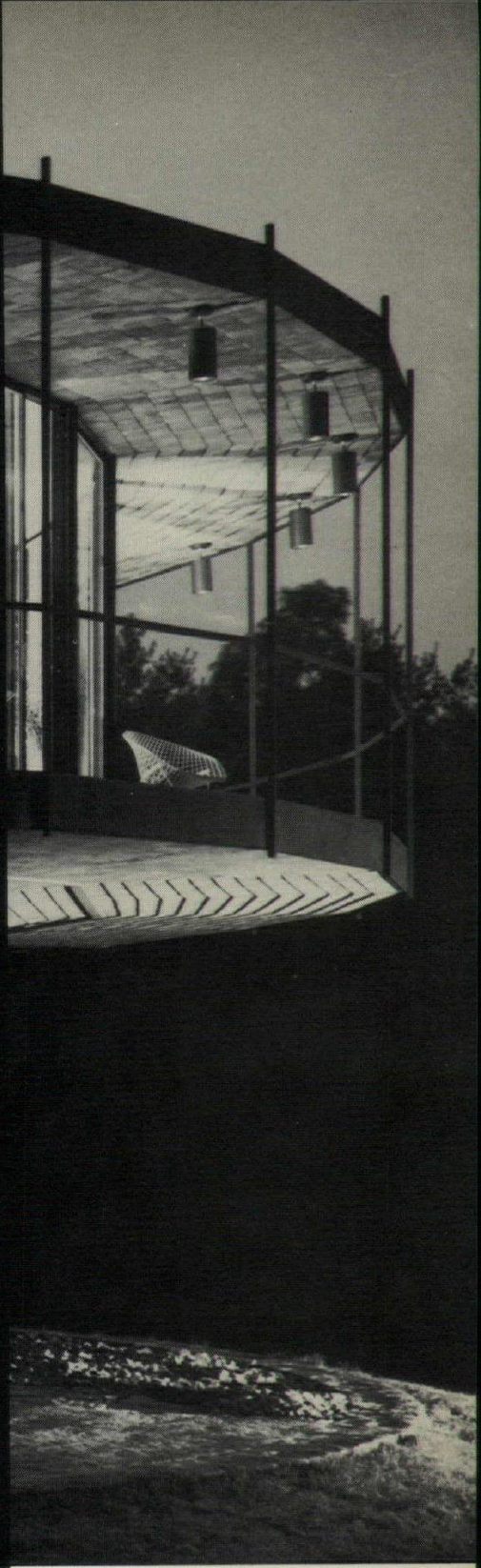


Red cedar shingles round out a revolutionary design.





maintenance-free for decades.

Complement your next design with the enduring beauty of red cedar Certigrade shingles or Certi-Split shakes. They're worth it. For details and money-saving application tips, write: 5510 White Bldg., Seattle, Washington 98101.

(In Canada: 1055 West Hastings St., Vancouver 1, B. C.)

Certigrade Shingles No. 1 grade, 16" Fivex.
Architect/Owner: Richard Foster

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The base material for Powerbond pile vinyl has closed-cell construction which means water—or anything else—can't penetrate the base material. Unlike sponge rubber, it can't deteriorate. Matter of fact, it's the only material that flushes back water.

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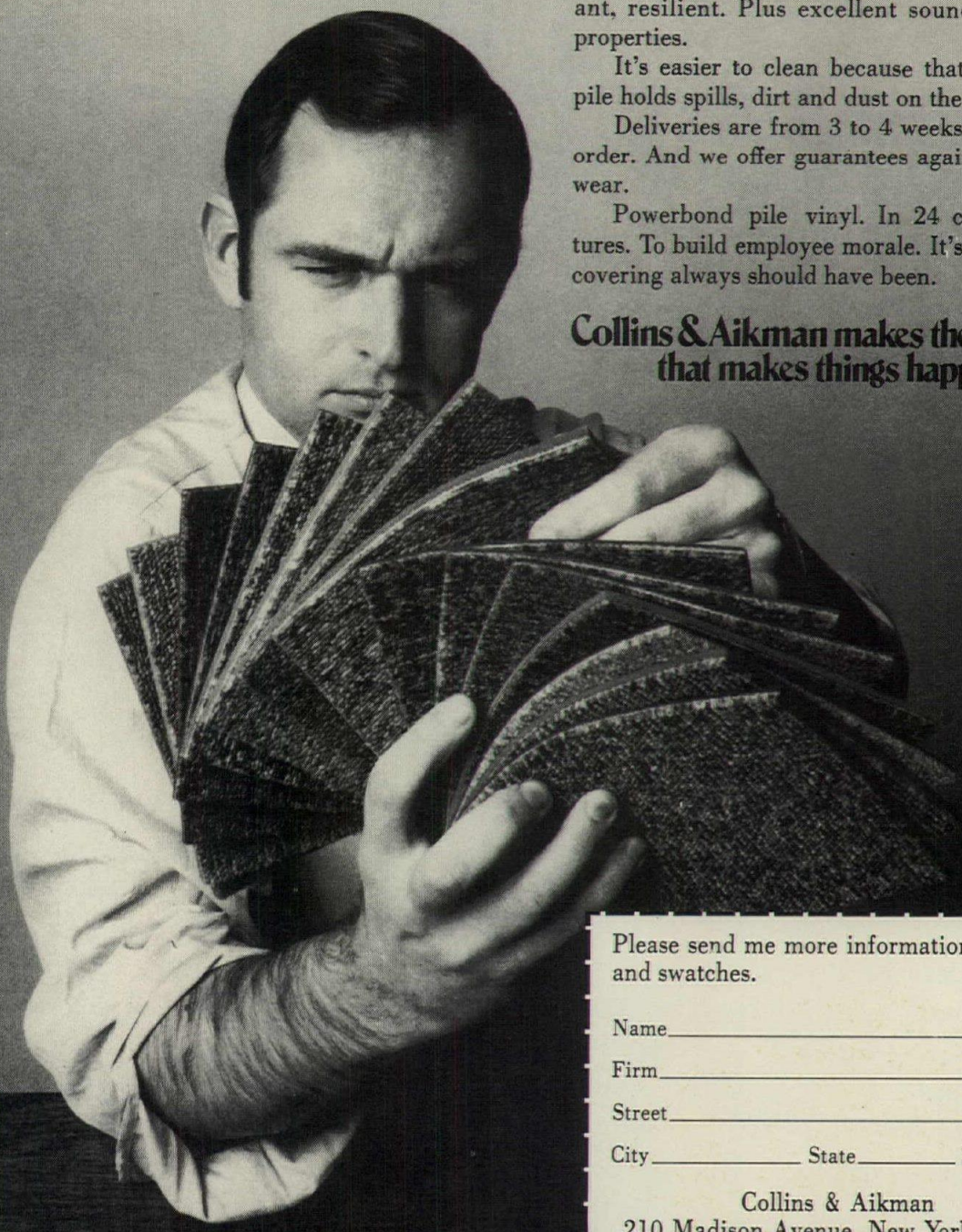

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One of the problems in choosing a door is knowing which door to choose.

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U.S. Plywood has more people who know more about doors than any other manufacturer.

And even if you find yourself in a situation we don't know about, we know where to find the way out.

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SEE BETTER

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SEE BETTER than you do with typical troffer lighting WITH LESS LIGHT in the zones that produce glare and veiling reflections.

Our new HVP (High Visual Performance) luminaire enables you to see better because most of its light ouput is within the 30°-60° zone, and only a relatively small portion is directed more horizontally (into the glare zone) or more vertically (into the veiling reflection zone).

HVP is a low-brightness luminaire that is very comfortable to live with. For instance, in a 60′ x 60′ office lighted to 100 footcandles it yields a Visual Comfort Probability of 95. This means that 95% of the people seated in the least favorable position—at the rear wall directly under a row of lights—will still find the lighting comfortable. Visual comfort reduces fatigue and assures a more efficient working environment.

Another important benefit from HVP is the reduction of veiling reflections, those reflections of the light source in the task which decrease the contrast between detail and background and make seeing more difficult. If you're having trouble with reading this page it may be because reflections of the light source are bouncing up into your eyes, masking the words you are trying to see. You can, of course, get rid of the problem by tilting the page or moving your head, but this can be inconvenient and awkward, especially if you are working at a desk in an office or classroom.

Wouldn't it be better if the lighting system itself provided the solution by reducing that part of the light that is reflected back into your eyes and increasing the part that helps you see the print? That's what HVP does.

Since HVP provides better visibility, it will, in a number of situations, permit the use of fewer fixtures, with related savings in installation cost, branch circuiting and air conditioning. In almost every case this new low brightness system will create a less distracting, quieter, more agreeable ambience.

HVP utilizes two 40-watt fluorescent lamps. It is 12″ wide, precisely modular, and is designed to supply or to return air.

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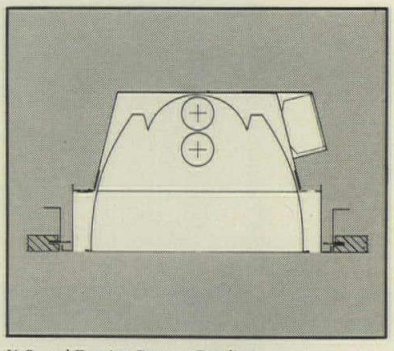

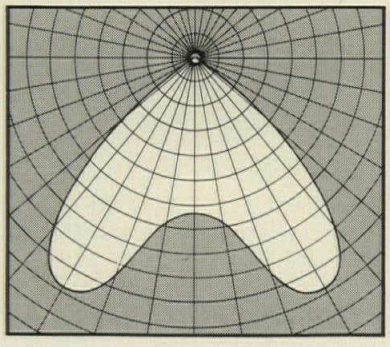

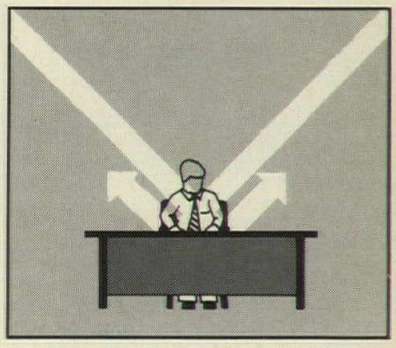

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(Continued from page 138)

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JEROME H. PARMET, INC., 8 W. 40 St., New York, N.Y. 10018.

A.A. ALLART & ASSOCIATES, 203, 709–11 Ave., S.W., Calgary 3, Alberta, Canada.

FRANK SACK, 4936 Elliot Ave., South, Minneapolis, Minn. 55417.

SANCHO/KENNEDY ARCHITECTS, 342 Madison Ave., New York, N.Y. 10017.

HAMBY, KENNERLY & SLOMANSON, 540 Madison Ave., New York, N.Y. 10022.

RENZO PIANO, 15–29 Piazza della Vittoria, Genoa, Italy.

New Firms

WARREN E. KAFFKA ARCHITECT, 62 High Ridge, Ridgefield, Conn. 06877.

RICHARD ZEGLER, NEUMANN & TAYLOR AIA, 114 E. 32 St., New York, N.Y.

FRIDAY ARCHITECTS/PLANNERS, 26 South 20 St., Philadelphia, Pa. 19103.

J. ROLAND LIEBER, ASLA, landscape architect has opened offices at 1109 East Las Olas, Fort Lauderdale, Fla. 33301.

Mergers and Expansions

JOHN LoPINTO, ARCHITECT and PISANI AND FALCO ASSOCIATES, ARCHITECTS AND PLANNING CONSULTANTS merged to form LoPINTO, PISANI, FALCO ARCHITECTS, 1295 Northern Blvd., Manhasset, N.Y. 11030.

PECKHAM-GUYTON, INC. ARCHITECTS of St. Louis, now has an office at 411 Nichols Road, Kansas City, Mo. 64112.

KUNHARDT AND ROGERS of New York, N.Y. has opened an office at 1109 E. Las Olas Blvd., Ft. Lauderdale, Fla. 33304.

GOLDEN THORTON LABAU INC., ARCHITECTS, West Hartford, Conn. has announced a new interior design department, with CLIFFORD MITCHELL as Architect in Charge.

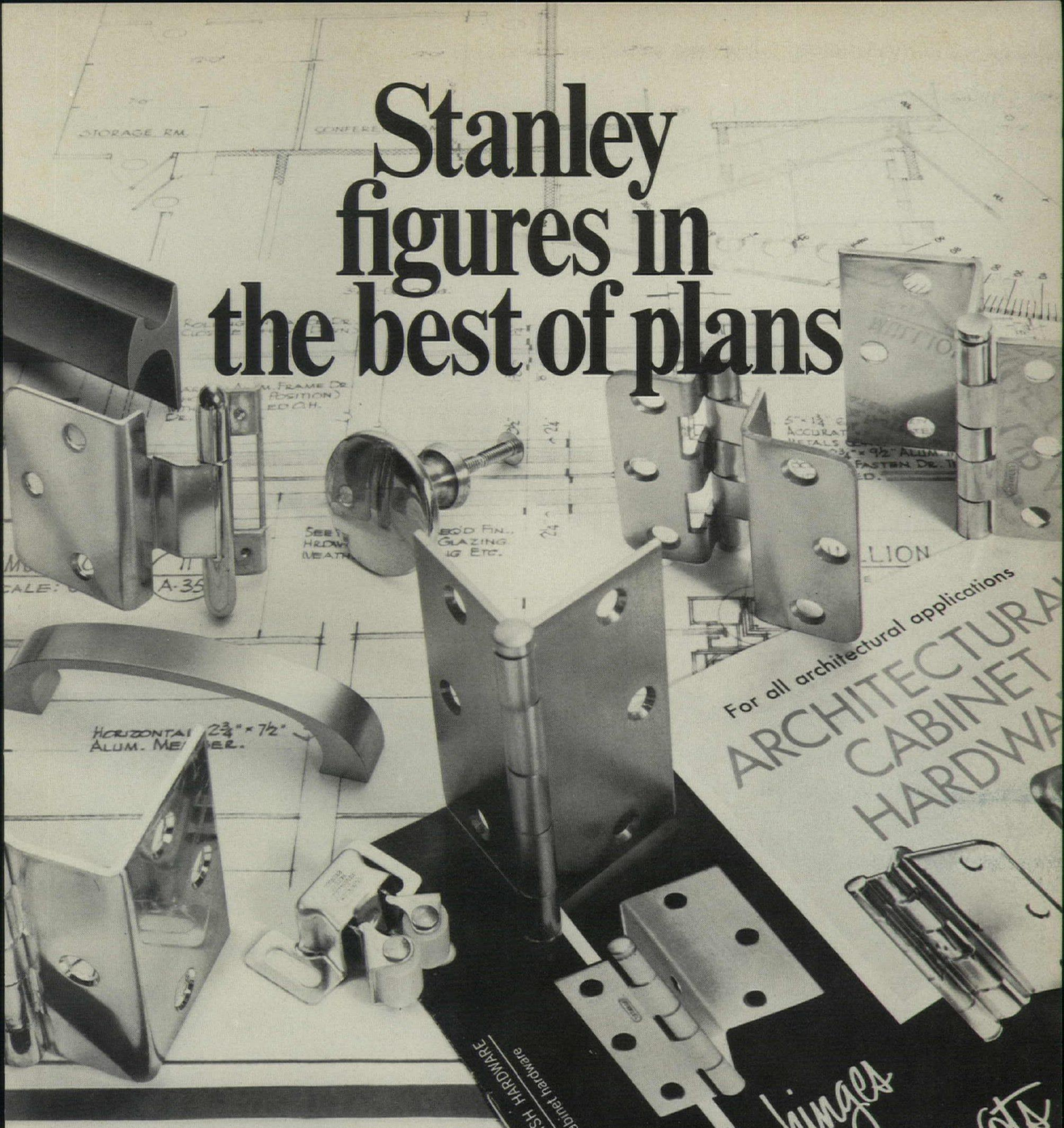
SCHAEFER SCHIRMER & EFLIN ARCHITECTS, ENGINEERS & PLANNERS, announces an office at 808 Merchants National Bank Building, Topeka, Kans.

Name Changes

ROBERT GOETZ ASSOCIATES has formed the new firm of GOETZ, HALLENBECK, & GOETZ, Oakland, Calif.

THE PIERCE, LACEY PARTNERSHIP, INC. ARCHITECTS AND PLANNERS is the new name of PIERCE, LACEY & ASSOCIATES, Dallas, Tex.

Stanley figures in the best of plans



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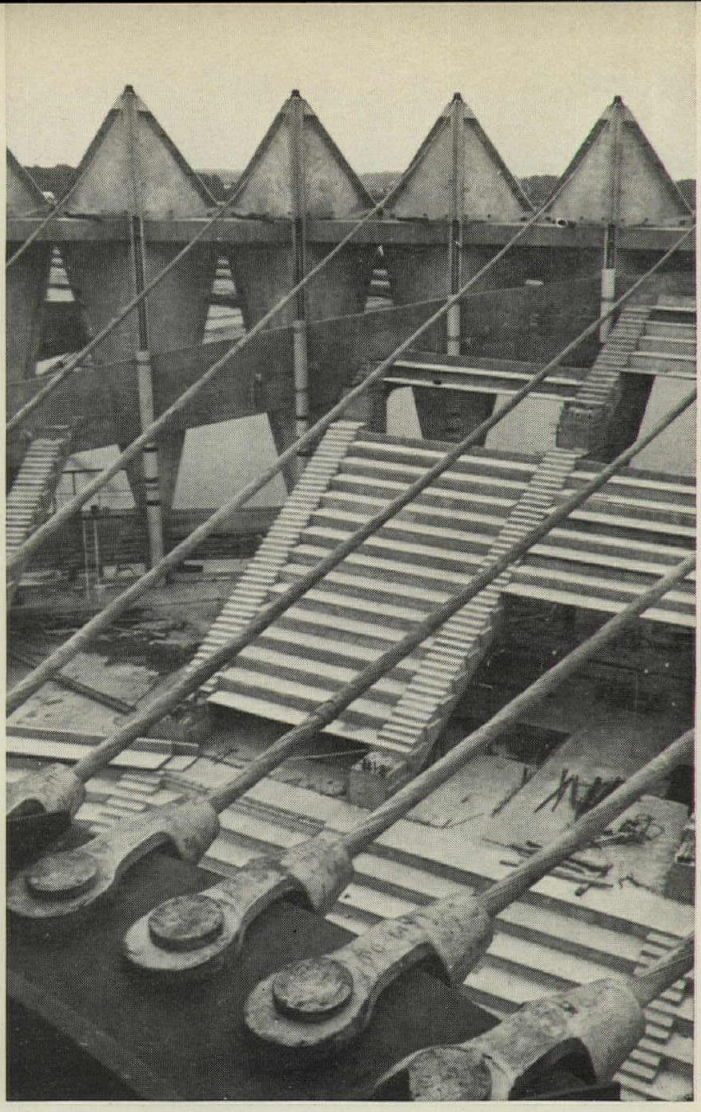
Single-layer cable system supports 320-ft-dia coliseum roof

Set into the edge of a 14-acre, man-made lake, the circular coliseum seats from 7,336 to 11,027, depending upon the particular event. There are extensive exhibit and banquet facilities. Parking areas on the full 75-acre site accommodate 3,200 cars and 25 buses.



Owner: City of Hampton, Va.; Architect: A. G. Odell, Jr. and Associates; Consulting structural engineer: Severud-Perrone-Sturm-Conlin-Bandel; Steel fabricator and erector: Bristol Steel & Iron Works, Inc.; General contractor: McDevitt & Street Company.

The new $6.5-million Hampton Roads Coliseum serves more than a million people in Tidewater Virginia with sports events, exhibitions, shows, and conventions under its column-free roof. Located in Hampton, the facility is convenient to Norfolk, Newport News, and Portsmouth.

MORE THAN 1.3 MILES OF STEEL CABLE. Bethlehem Steel provided 7,344 ft of 2-in.-dia, zinc-coated pre-stretched, steel strand for the single-layer cable roof. Shipped in specially packaged coils—48 lengths, each 153 ft long—the cables were fabricated with open sockets on one end and adjustable anchor sockets on the other.

SIMPLE ERECTION PROCEDURE. In the roof erection scheme, the steel tension ring was raised to the height of the perimeter connection points and supported by falsework. Next, the anchor-socketed ends of the cables were lifted, one by one, to the perimeter connecting points where they were inserted through weldments and affixed with spanner nuts. Then, cables were lifted and connected to the tension ring. After all 48 cables were in place, the tension ring was lowered to its final position via the removal of the upper part of the falsework. (A six-in. length of thread, specified for the end of the anchor socket, permitted final adjustment of cable lengths.)

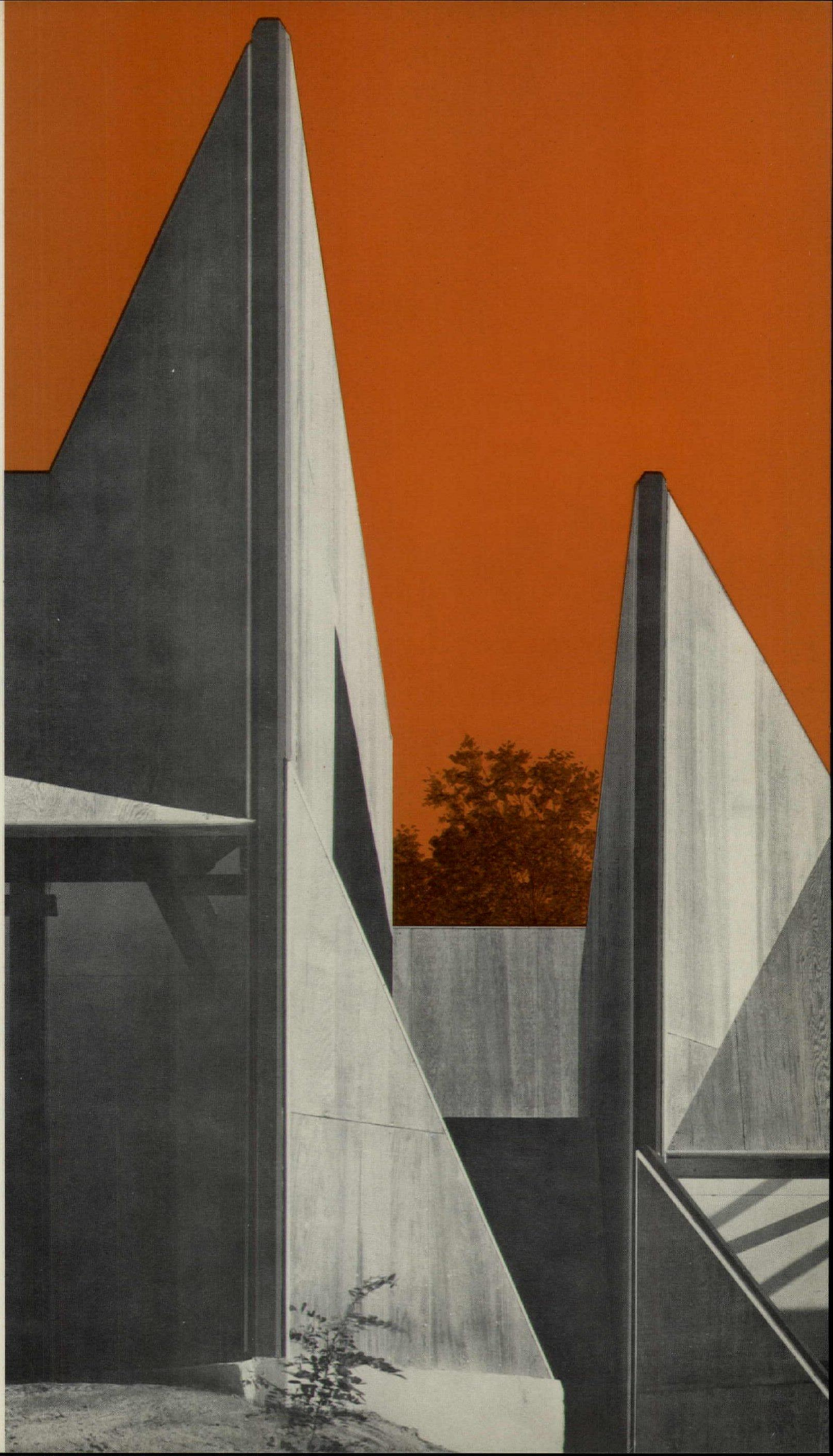
INTEGRATED SUPPORT SYSTEM. The compression ring, normally present in a cable system of this type, is located 17½ ft below the tops of the diamond-shaped perimeter panels. The panels were designed to be reminiscent of white boat sails characteristic of the Tidewater area.

STRUCTURAL STEEL ON CABLES. Some 350 tons of Bethlehem steel plate and structural members were used in this structure. Of these, about 50 tons were light shapes, which were placed atop the cables. They support the unusual folded roof which melds into the side panels. The area under the roof and above the cables contains a portion of the coliseum's mechanical and electrical system, including ductwork for its 1,000-ton air-conditioning unit.

CABLE DATA AVAILABLE. Bethlehem furnished the information required for the specification of cables and end-fittings for this major structure. We'll be happy to supply this data for your designs. Just write: Room 1049 HRC, Bethlehem Steel Corporation, Bethlehem, PA 18016

BETHLEHEM STEEL

Plywood design collection:



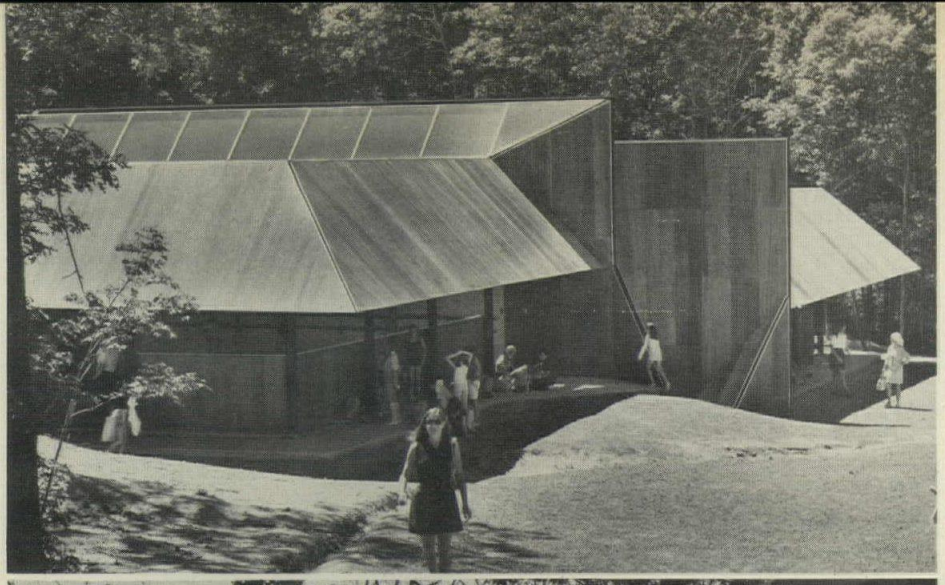
Usdan Center for the Arts, Huntington, New York.

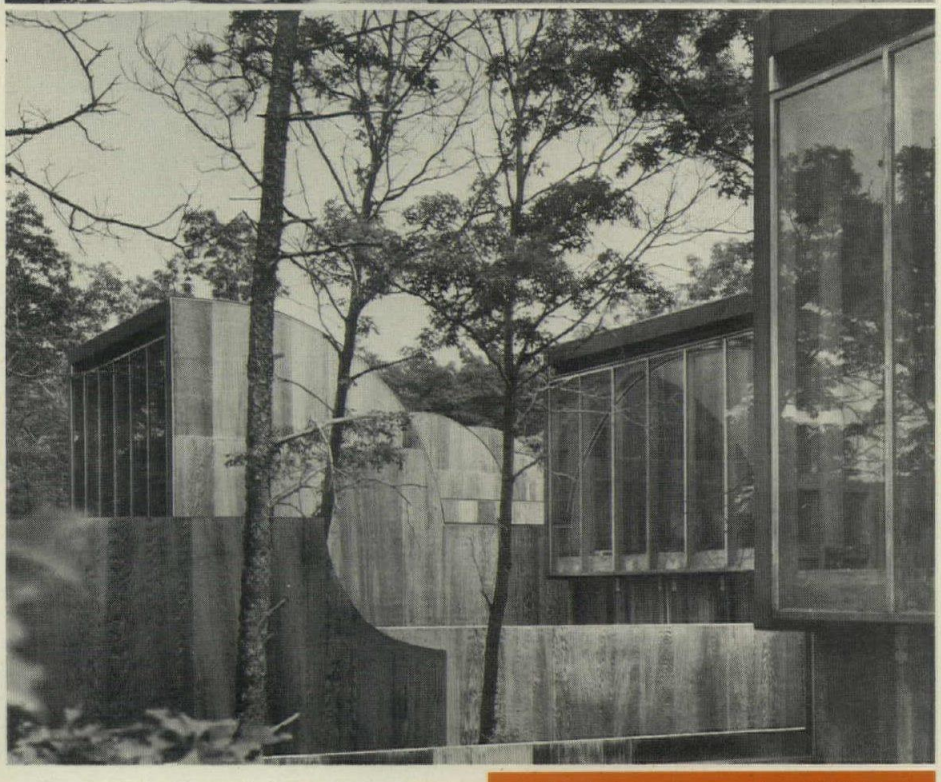
Owner: Henry Kaufmann Campgrounds, Inc., an agency of the Federation of Jewish Philanthropies.

Architects: Conklin & Rossant.

Structural engineers: Lev Zetlin & Associates.

Contractor: Reema Construction Co.





An architectural hard-edge goes to camp.

The buildings are basically open-air, wood- and steel-frame structures with a plywood skin. Plywood is also exposed on the interiors. The buildings are multi-planar or vaulted in form. Differing planes or surfaces are separated by a hinge-like joint as shown in the detail.

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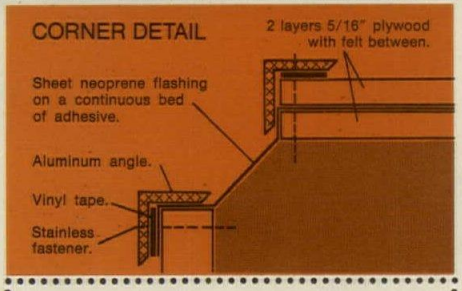

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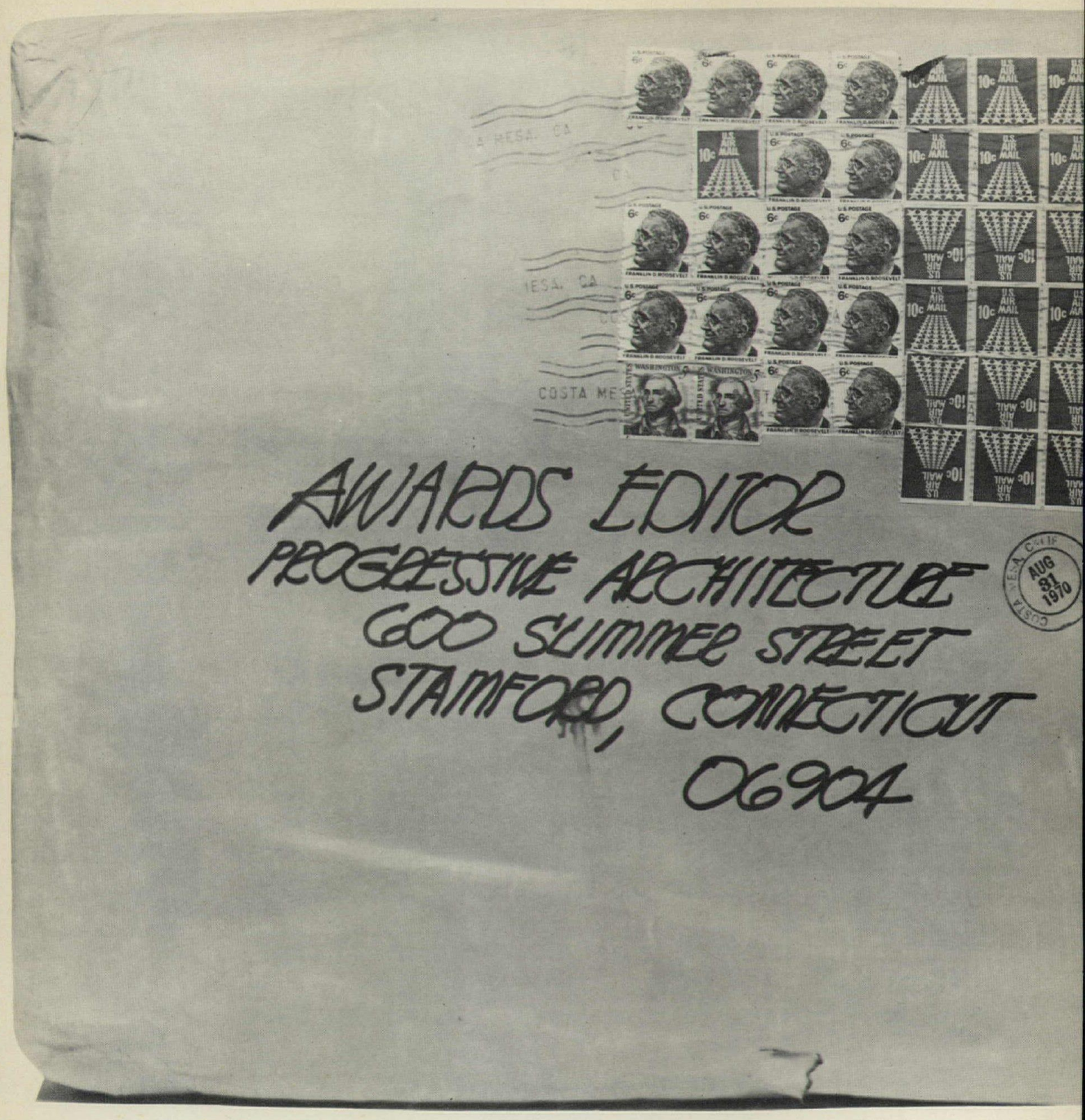
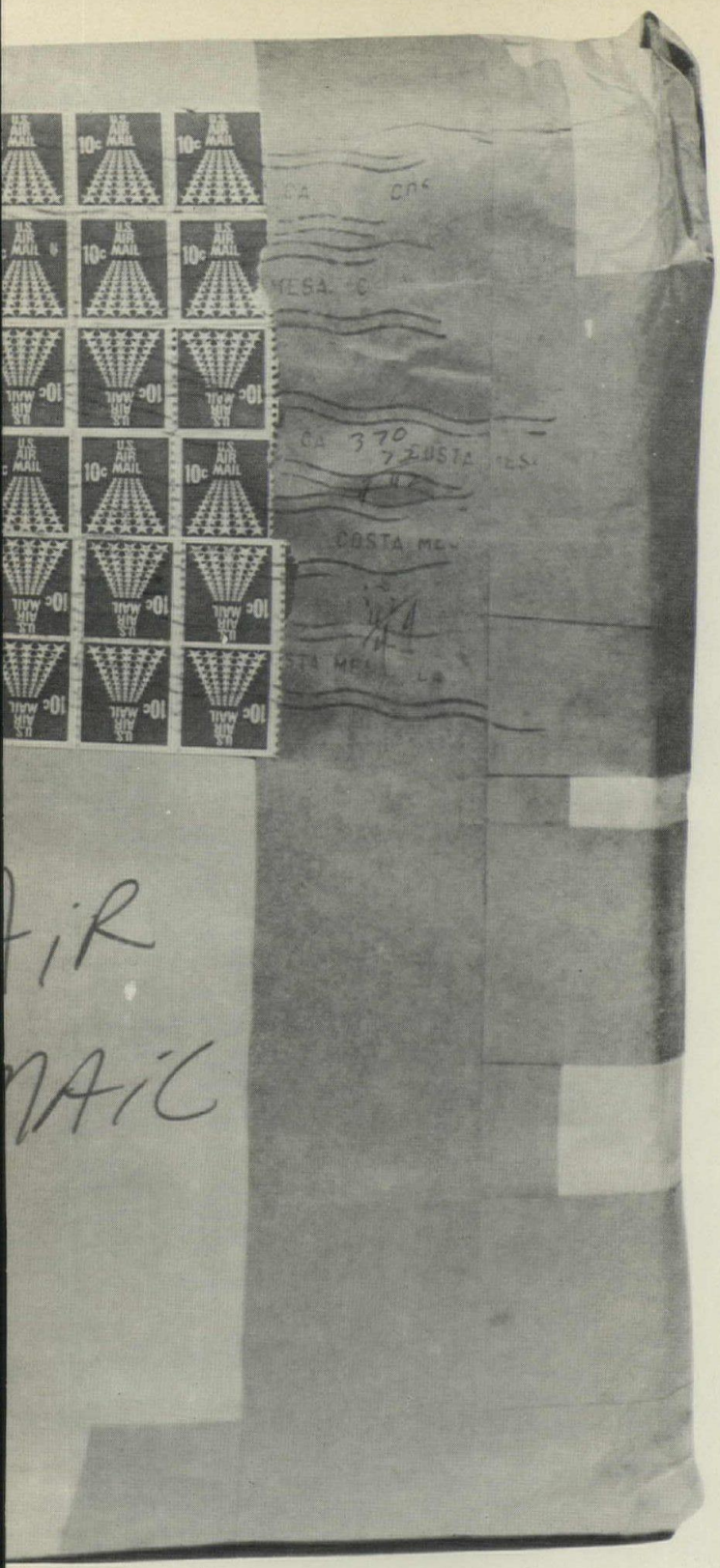


More than 700 packages like this were received by PROGRESSIVE ARCHITECTURE between July and September. Each one is an entry in the 18th Annual Design Awards competition. Each one is a design idea that could well be a major breakthrough in schools, commercial buildings, hospitals. In any of the twelve categories covered by the competition.

The submissions are judged by a panel of distinguished architects, critics, educators and engineers who come to our Stamford offices to



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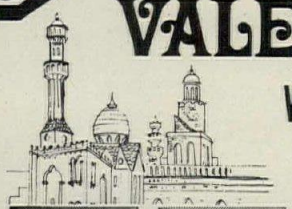

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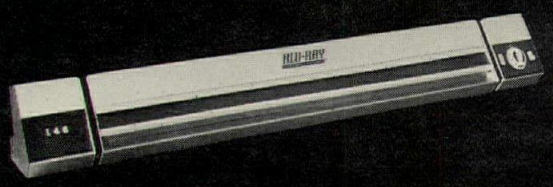

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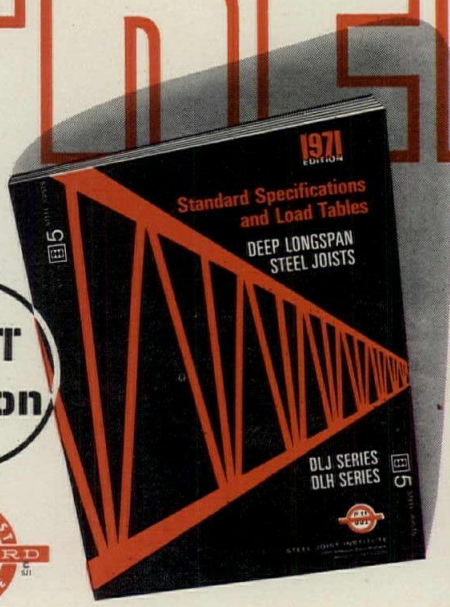

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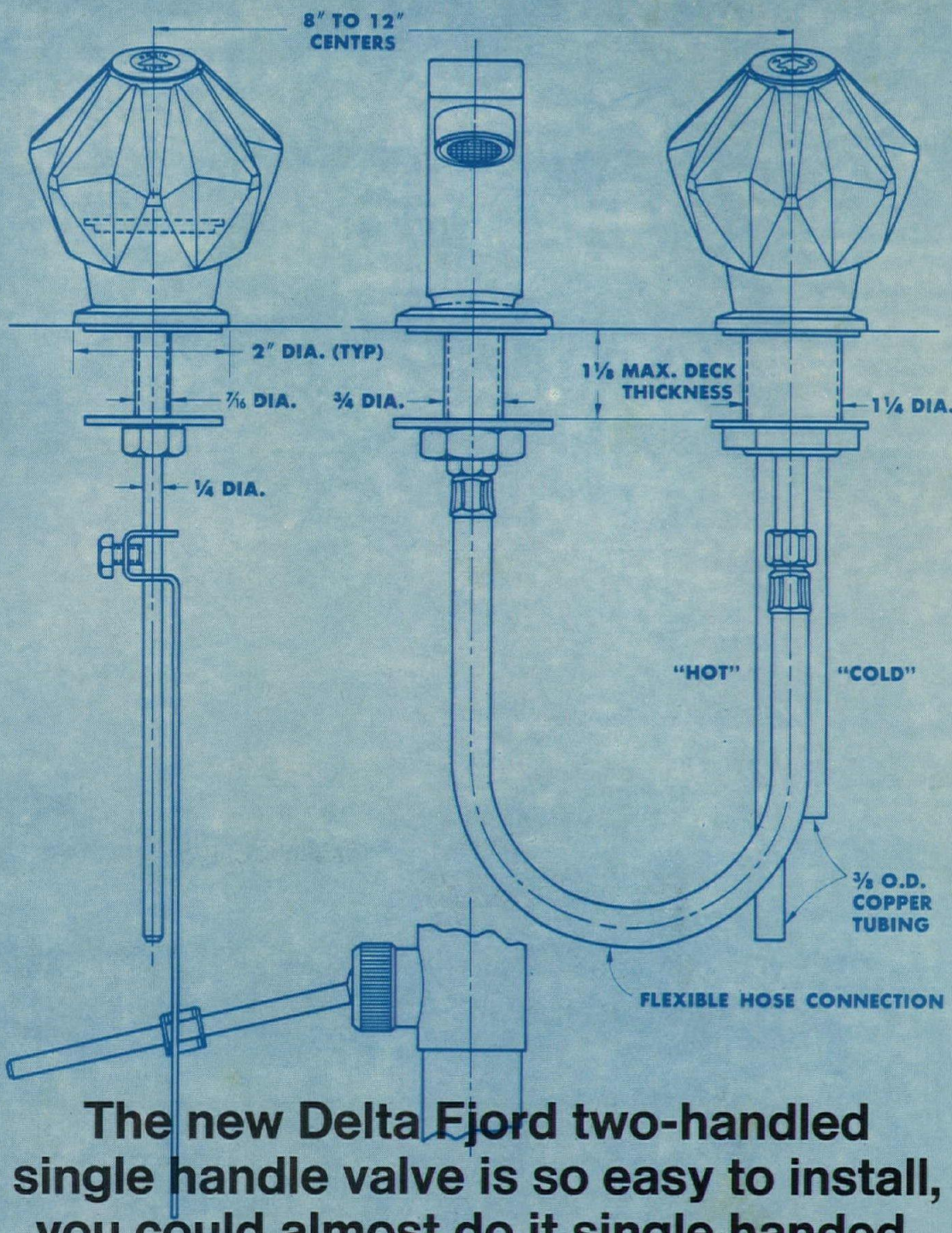

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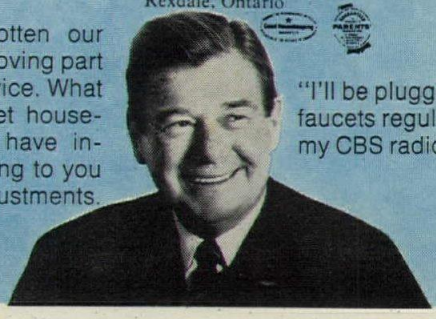

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