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ROUND TABLE: HOUSING AND COMMUNITY DESIGN FOR CHANGING FAMILY NEEDS

BUILDING TYPES STUDY: MEDICAL FACILITIES

ARCHITECTURAL ENGINEERING SPECIAL REPORT: NEW ROOFING SYSTEMS

FULL CONTENTS ON PAGES 10 AND 11

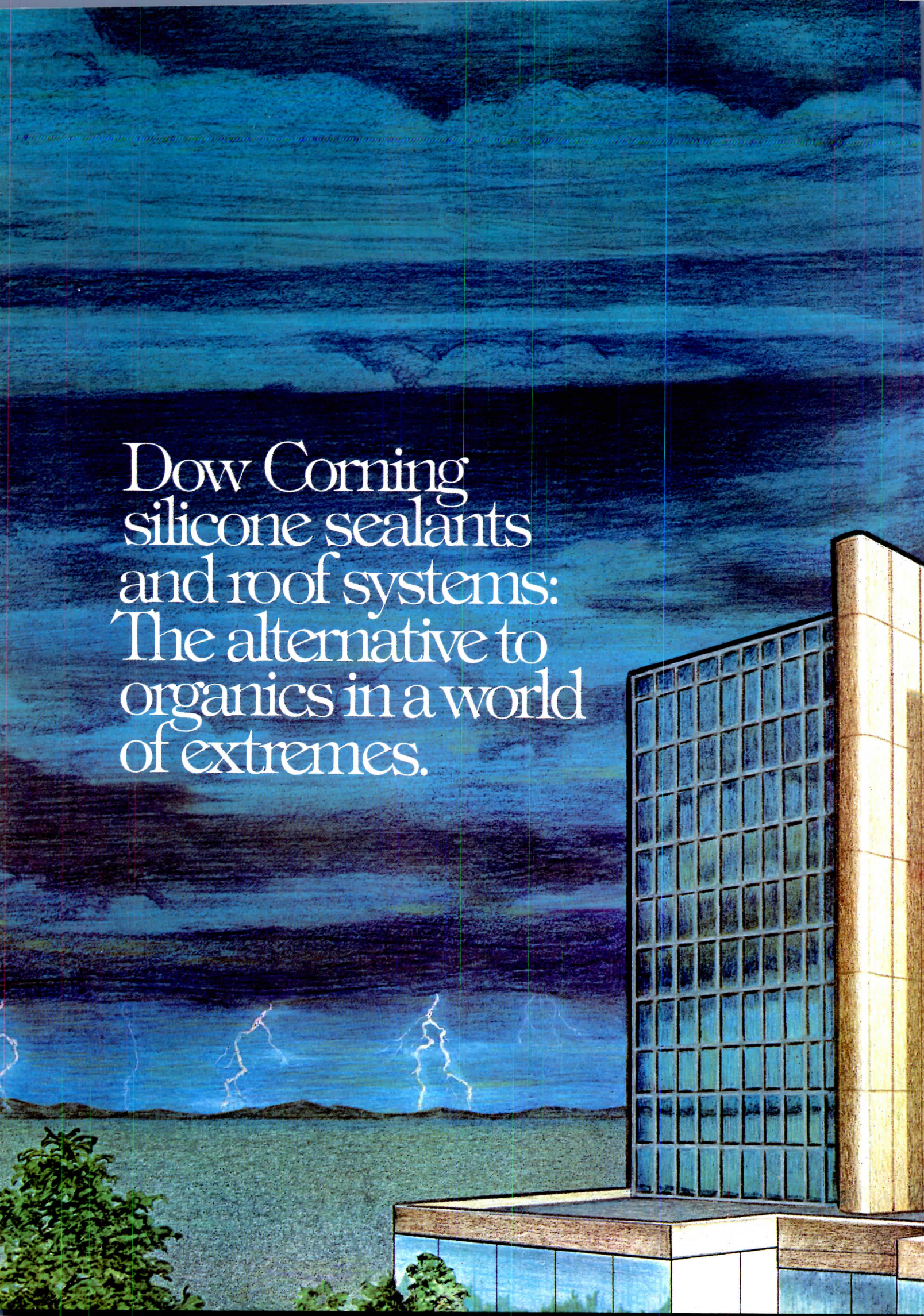
ARCHITECTURAL RECORD

OCTOBER 1979

10

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The background of the advertisement is a dramatic landscape. The sky is a deep, dark blue, filled with heavy, dark clouds. Several bright, jagged lightning bolts are visible, striking down from the clouds. In the foreground, a modern building with a grid-like facade of windows is partially visible on the right side. The building's windows reflect the dark sky and lightning. The overall mood is one of extreme weather and resilience.

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GENERAL CONTRACTOR: M. A. Mortenson Company, Minneapolis, Minnesota.
STEEL ERECTOR: N.H. Sandberg Erection Company, St. Paul, Minnesota.

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GENERAL CONTRACTOR/ERECTOR: Peter Kiewit Sons' Co., Omaha, Nebraska.
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STRUCTURAL CONSULTANT: LeMessurier Associates/SCI, Cambridge, Massachusetts.
GENERAL CONTRACTOR/CONSTRUCTION MANAGER: Morse/Diesel, Inc. Chicago, Illinois.
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HOSPITAL & HEALTH SERVICES CONSULTANT: E. D. Rosenfeld Associates, Inc., White Plains, N.Y.
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GENERAL CONTRACTOR: B. G. Danis Co., Dayton, Ohio.
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On building awareness by architects of the new needs of our changing families

Some months ago, I was invited to lunch with Muriel Fox, who is president of the Legal Defense and Education Fund of the National Organization for Women. She was planning a "National Assembly on the Future of the Family," which is to be held in New York City on November 19th. It is intended "to explore innovative and practical solutions to the family problems of the 1980s. . . including discussions on child care, education, status and security for homemakers, workplace changes to aid two-breadwinner and single-parent families, special needs of minority families, and new family roles for older people."

Mrs. Fox' question to me was in what ways, and to what extent, could architects and planners be involved in designing housing and communities that would aid in the solution of these family problems—which relate mostly to the fact (which I had not known) that only seven per cent of families in America today are the traditional "nuclear" families with a working father, homemaking mother, and children at home (had *you* known that?). You may also be surprised at the number of families in America today that are "two-paycheck families," that are two-career families without children, that are headed by divorced and widowed women, that are elderly, or whose members are unrelated and who don't have children.

And Mrs. Fox wondered if we are designing and building the kind of suburban and urban housing and communities that meet the needs of these "non-traditional" families. She thought not—or at least that a lot could be done to improve the situation.

I thought that Mrs. Fox' serious question about the role of architects and planners in coping with these changing family needs deserved a serious answer—or at least a serious attempt to look for answers.

And therefore, on June 26th, RECORD held a day-long Round Table on "Housing and Community Design for Changing Family Needs." The program was developed and organized by senior editor Mildred Schmertz with the help of Architect Susana Torre, and they invited as participants leading feminists, socio-economists, demographers, sociologists, a psychologist, a builder/developer, a HUD official, and architects. Ms Schmertz's report on that Round Table is on pages 97-104 of this issue and offers for all architects

and planners some real food for thought. And it is not (as I had feared when we started this effort, and when 12 of the 16 Round Table panelists turned out to be women) all feminist food. As panelist Betty Friedan said near the close of the Round Table: "This was a good conference because women and the situation of women was not our only subject. We talked about the needs of single people living alone, families of single people, about couples whose children had grown, about men outside traditional families. . . . I think that within the set of basic assumptions America is built on, including respect for the individual and the need for roots and the need for family—and with the woman now defined as a person—we could begin in a pragmatic way to make it possible and profitable for our system to design and build a new kind of housing to meet the new needs we have defined here. . . ."

Having said that much, I don't want here to try and summarize the Round Table—for I think it requires and deserves careful reading. But I think it is fair to "preview" and say that the panelists did think there was much that could be done—now blocked by stereotypes of the woman's role, by local zoning, by lending practice (for instance, it is very hard to get the cost of a child-care center included in the mortgage for a housing project) and by Federal regulation. The panelists talked some about unit design—with major (and thoughtful) mention of the "stereotyping effect" of interior kitchens; sort of the unhappy opposite of Good Old Dad's den (do any dads still have dens? Or even their own chair?). But the bulk of the conversation—and here something clearly can be done—was about community design, about the need for child-care facilities close at hand, for social organization within housing projects, for close-at-hand laundry facilities and take-out food services. The panelists talked about the social implications of projects that group the poor, or the elderly; and one of my favorite quotes of the day was psychologist Sandra Howell's observation that if you put 600 boys in a single project it would be called an institution.

The discussion was thoughtful, enlightening, and my consciousness was raised, I urge you to read it—beginning on page 97.

—Walter F. Wagner Jr.

Denmark, cold and fuel-poor, strives for building efficiency

Denmark, a tiny country almost totally dependent upon imported energy, is striving mightily to curb its energy utilization while maintaining its present high standard of living.

Most of the attention so far has been directed at energy conservation in buildings, which account for roughly half the country's annual energy consumption.

The government is supporting an elaborate research program aimed at developing new designs, devices and techniques for improved energy efficiency in homes and buildings. Parliament has voted to subsidize home and building owners who improve the energy efficiency of existing structures, and building codes to cover new structures are constantly tightened.

Coal is substituted for petroleum products whenever possible, and an energy-saving ethic is fostered by the country's opinion molders.

The International Energy Agency, a consortium of 19 industrialized countries, is impressed by what Denmark has accomplished. It has designated that nation as its "lead country" for energy conservation demonstration efforts. Clearly, IEA expects the accomplishments of the Danes to be copied by other nations.

That Denmark is earnest in its quest for energy conservation is not surprising. The country (population 5 million, land mass about that of Vermont) has a heating season lasting more than eight months.

But it has no domestic source of energy—no coal (most is imported from Poland), no oil, and only a small amount of natural gas from the country's holdings in the North Sea. Hydro power is impossible because Denmark has neither rivers nor mountains. Solar power is being studied but it will have limited application—the country enjoys only 750 hours of sunshine each year, with only 150 hours of this sunshine during times of peak heating loads.

The government adamantly insists that it will go forward with plans for nuclear power, but public opinion polls in the wake of the Three Mile Island incident show that many people are opposed.

The Danes put great stock in district heating systems, and already more than 20 per cent of the country's houses are connected with these hot water and radiator systems. Officials claim that such systems result in a 50 per cent improvement in energy utilization. Underground pipes carry the heat to the houses, and rates for district heating systems, which get a one-time 30 per cent subsidy for construction from the government, are a little lower than comparable gas heating. The government wants one-third of all homes to be served by district heat by 1984.

The Danes began to stress energy conservation right after the Arab

oil embargo. Among the first steps was an energy-efficiency building code, which was worked out by government officials to set savings targets and by the country's architects and engineers to develop standards for reaching the targets.

Increasingly, the codes have been tightened. For example, modifications approved early this year specify that any wall with windows comprising more than 15 per cent of the area of the wall must be fitted with triple-glazed windows.

Other insulation standards are generally expressed in performance language and differ in a number of areas.

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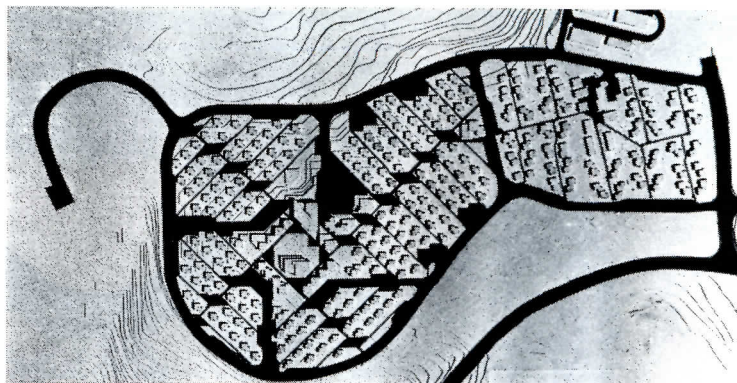


A heavily instrumented house that is part of the thermal insulation laboratory of the Technical University of Denmark is on exhibit at the school. Called the "zero-energy house," this structure intends to show that a dwelling can achieve self-sufficiency in space heating and domestic hot water by using extra insulation, heat recovery from body heat and appliances, and solar energy systems.

The house's name is something of a misnomer since some auxiliary heating is required, but only very little. The house is designed with two "dwelling boxes" separated by a large glass-roofed atrium that is not heated. The boxes are prefabricated units with 30 cm (12 in.) of mineral wool insulation in the walls and 40 cm (16 in.) in the roof and the floor.

Energy efficiency improvements in existing buildings are handled not only traditionally but also through a system in which layers of insulation are added to exterior walls. These layers are plastered and painted. The Danish government will permit homeowners to deduct 50 per cent of the insulation costs from their taxable income, up to a maximum of 3,000 kroner (about \$600).

The Danes are eager to share their accomplishments in energy conservation with others. In September, an exhibition was held in Skive, in Jutland Province. Called "Low Energy 1979," the exhibit included a multi-story building with 34 flats, nine one-family houses, and nine attached houses, as well as the thorough renovation of older buildings. — William Hickman, *World News, Washington*.



Israel's West Bank settlements draw the religious

Israel's settlements on the occupied West Bank have long been controversial from the political point of view. The 15,000 settlers who live in the 50-odd settlements are the vanguard of the government's policy to settle the West Bank of the Jordan.

The settlements themselves are surrounded by fences, in contrast to the stone villages and towns of the West Bank, home to a million Palestinian Arabs. Moreover, the settlements in most cases differ from the hundreds of *kibbutzim* and *moshavim* (cooperative apartments) already in existence in Israel.

In most cases the settlements are isolated and surrounded by an Arab population that resents their presence. Because of security problems, most of the settlements are located on hilltops. This isolation has forced the architects to plan the settlements so that they are totally independent units. For this reason, the average size of a West Bank settlement is much larger than a *kibbutz* or *moshavi*—with each settlement having between 250 and 300 families, as well as its own school.

So far most of the settlers have been attracted to the area for religious reasons—the Biblical connection to Judea and Samaria.

Yosi Naim, the Jewish Agency's architect in charge of West Bank settlements, says that in most cases the land area being dealt with is small and the topography is difficult. This, he says, has presented a number of problems. Architects have had to get used to building on steep inclines—15 to 25 per cent, though some settlements are built on inclines of 30 per cent or more. Mr. Naim says this has made it difficult for the settlers, who are used to living along the coastal plain. He adds that the agency faces a constant struggle explaining to settlers the constraints of the land. But the educational efforts have paid off, according to Jewish Agency officials, who say the contact has led to close cooperation between the planners and the West Bank settlers.

The planners have also had to take into account climatic conditions. Most of the hilltop settlements lie at heights of 600 m. or more. This subjects them to strong westerly winds. Mr. Naim says this has forced

the architects to design houses that can withstand the strong winds. Most houses face north or south and have few windows on the western side.

Bet-El, which lies within 15 miles of Jerusalem, is a typical example of what Jewish Agency architects and planners face. The settlement, like most on the West Bank, is located on a Biblical site and bears its early name. It is only 20 minutes from Jerusalem, and most residents still commute to their jobs. The employment problem exists at all the settlements except those in the Jordan Valley (part of the West Bank), which is agricultural in nature. The government is attempting to build small workshops and factories at the settlements to eliminate commuting to the larger cities.

Bet-El's planning began in October 1978, and six months later the first group of 60 families moved into temporary quarters. As is the case in all the West Bank settlements, a temporary area for prefabs was set up as building of the permanent quarters went forward.

The total allocation for Bet-El, a settlement planned for 250 families, is 55 acres. More than half the area is allocated for permanent houses, with some ten acres going for temporary quarters. The rest of the land is for public use—parks, recreational areas, schools, synagogues, and commercial and industrial areas.

The settlement is planned around a center that includes shops and the synagogue. The center typically has a number of three-story buildings, with the top stories going to families who do not want to live in private homes.

As for the houses themselves—each one is built on a plot of 320 sq. m. and has a view. Most of the houses look alike and are built with conventional building techniques. Mr. Naim stresses that the architects' main problem with the houses was space constraints.

Bet-El is similar in size and structure to most of the settlements in Judea and Samaria. Though Israelis are by no means unanimous on the issue, the present Israeli government would like many more settlements like Bet-El in the next few years. — Neal Sandler, *World News, Jerusalem*.

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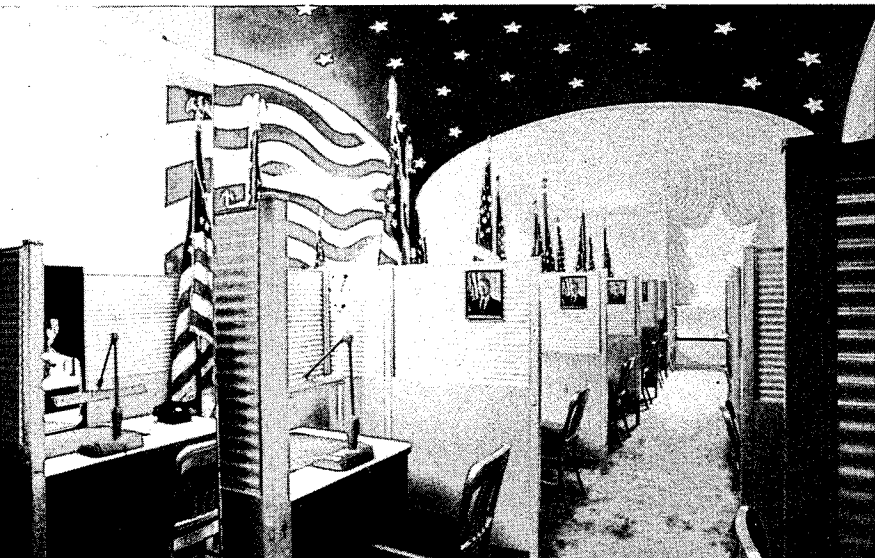
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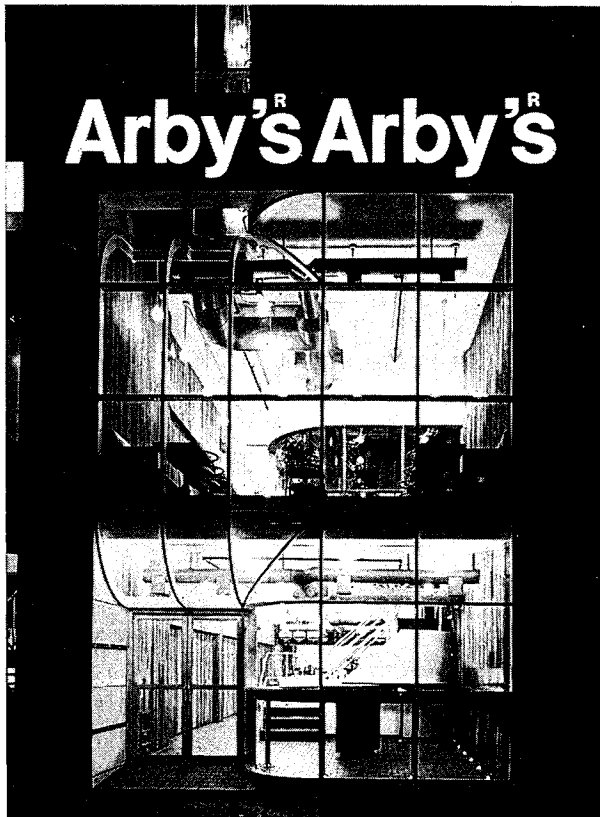
Distinguished Building: Darius Plaza, Old Town Area, Chicago—Booth Nagle & Harney/Ltd., architect. Gehry called the mixed-use building, which combines retail and residential quarters, "a very vigorous statement. I find it meticulous," to which Hodgetts added, "It's a good urban building because it doesn't tear up the fabric. . .really conscientious."



Distinguished Building: Rust-Oleum Corporation International Headquarters, Vernon Hills, Illinois—C.F. Murphy Associates, Inc., architect. "The straight building with a quirk!" said Gehry, and Hodgetts explained, "It starts off as a perfectly straight building, then you walk in and find these salamanders all over. It has a terrific sense of procession, [but] it's peculiar, almost perverse. . ."

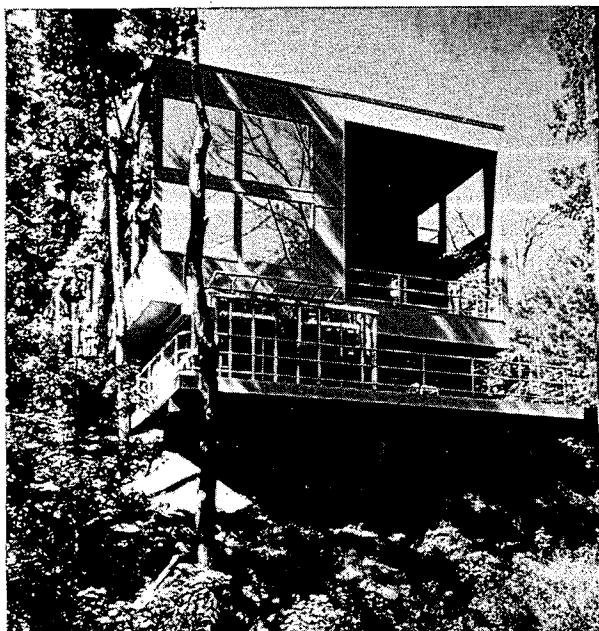


Distinguished Building: Hospitality Lounge, Fourth Federal Design Assembly—Stanley Tigerman & Associates, architect. The architect claims that the design, for Washington's Pension Building, uses only stock GSA furniture. "All three of us feel that the Lounge is an incredible work of art by a genius," said Gehry. "This should go on record."

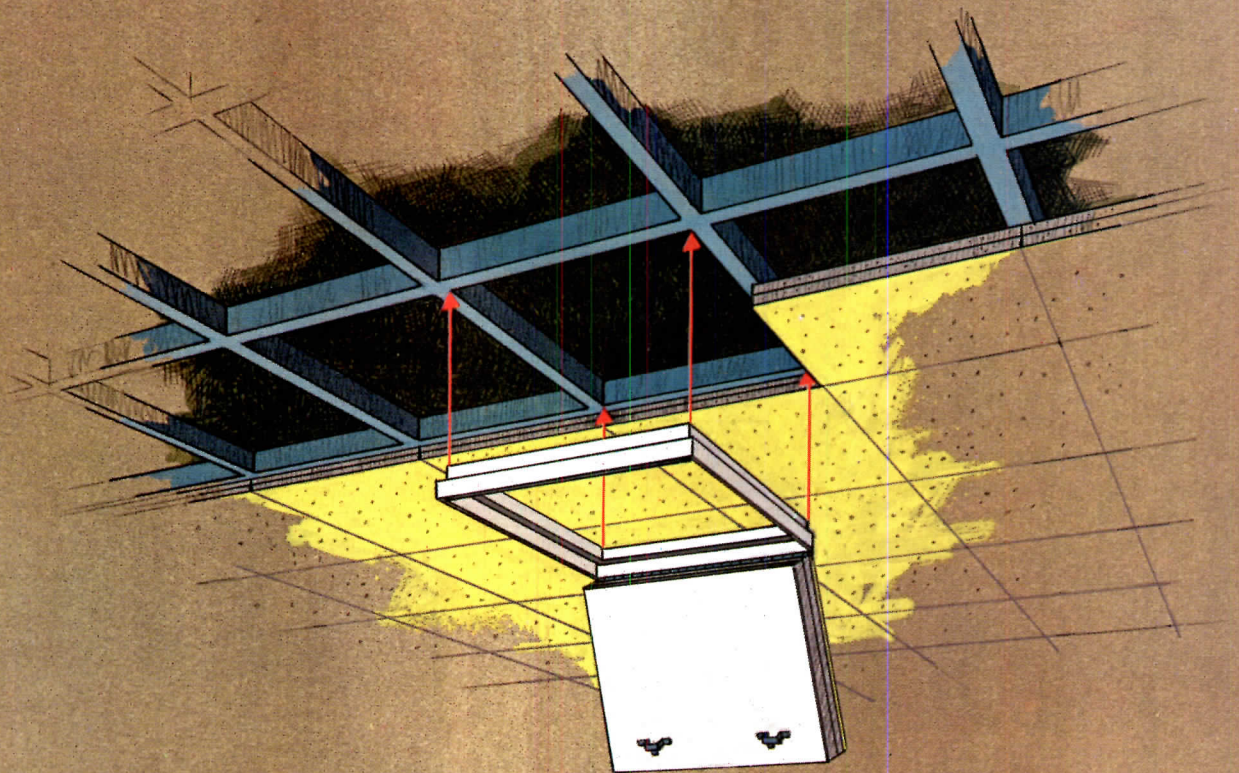


Distinguished Building: Arby's, Chicago—Stanley Tigerman & Associates, architect. Gehry Vreeland said of the design, "I keep comparing Arby's to Grand's Restaurant, that early Venturi oeuvre, but this is much more developed, more baroque. . ."

Distinguished Building: House on a Ravine Site, northern suburb, Chicago—Michael Dick Associates, Inc., architect. "This is a highly skilled, competent design," said Hodgetts, who characterized the project as "the tastiest of the bunch." Said Gehry, "I vote for this as having the most presence."



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Weighing your decision to settle, or defend against, liability claims

When a professional liability claim is brought against an architect, an early evaluation must be made by the architect, his attorney and insurance company whether to try to settle the claim or defend against it. Whatever the merits of the claim (or lack thereof), their evaluation must consider, among other things, the potential cost to defend the claim and the likelihood of damages being awarded to the plaintiff. In addition, an architect who is confronted with a proposal to settle a liability claim must be aware of both the provisions in his professional liability insurance policy related to claim settlements and the legal significance of those provisions. A recent California case illustrates what can happen when a design professional refuses to settle a claim on the basis of speculative advice from an insurance broker.

by Arthur T. Kornblut, Esq.

Professional liability insurance policies often contain clauses which require the insurance company to get the architect's permission before a claim can be settled. To prevent an architect from arbitrarily refusing to give consent to a proposed settlement, other policy clauses typically will limit the insurance company's financial obligation on a claim to the amount of the proposed settlement. If the architect refuses to consent to the settlement, and the claim must be defended in court or in an arbitration proceeding, the architect will have the financial risk for the amount of any judgment in excess of the proposed settlement. This approach balances the interests of the insurance carrier, which normally wants to be extricated from claims as inexpensively as possible, and the insured, who for various reasons may want to defend against a claim at any cost. Regardless of their personal interests, each party has an obligation to the other to act in good faith with regard to the other's interests.

The very recent California appellate case of *Transit Casualty Company v. Spink Corporation* illustrated what can happen when there is a failure to acknowledge all parties' interests in the handling of a professional liability claim. Spink, an engineering firm, was among those sued by the heirs of a construction worker who was killed by the collapse of an unshored trench. When the claim was filed, Spink notified its two insurance carriers: American Motorists Insurance Company, which provided the primary coverage of \$100,000 with a \$15,000 deductible, and Transit Casualty Company, an excess insurer, which provided an "umbrella" policy with a

\$1,000,000 limit. American Motorists retained a law firm to handle Spink's defense, but Transit Casualty relied on its claim representative to look after its interests. Spink also retained a law firm to act as its personal counsel.

At first, the defense attorneys felt the claim could be defended, and Transit's representative was so informed. Then, with the discovery of new facts, this optimism was replaced with a concern for potential liability. However, Transit was not told of this even though it had asked to be kept informed. A month before trial, the plaintiffs offered to settle the case against the defendants for \$300,000. The defense attorney retained by American Motorists recommended that Spink contribute \$50,000 to this settlement. Spink's personal counsel did not fully support this recommendation, so officials in the Spink firm then consulted their insurance broker.

According to the court, this broker, who had a specialty of selling professional liability coverage to engineering firms, thought a settlement would impair Spink's future insurability and be disadvantageous to the engineering profession in general. Spink, guided by his recommendation, thus refused to settle the case.

After the trial opened, the judge recommended acceptance of the settlement offer. Spink's entire share would have been \$76,000, well within the primary layer of coverage. Although representatives of American Motorists believed settlement would be advantageous, Spink still refused to settle. Again, Transit's representatives were not informed of these developments. When the trial appeared to be going badly, Transit was notified and it sent a lawyer to observe. The jury returned a verdict of \$632,000 against Spink and the other defendants. To satisfy the liability on the judgment, Spink paid \$15,000, American Motorists paid \$100,000 and Transit \$175,000. Subsequently, Transit

paid \$285,000 to settle other death and injury claims resulting from the trench collapse.

The insurer sued the engineer on breach of duty to attain a reasonable settlement

Transit then sued Spink and American Motorists, charging that the rejection of the settlement offer was unwarranted, and it led to Transit's ultimate direct damage by forcing the case to trial. Transit's suit was based on the concept of a duty to achieve a reasonable settlement. This duty normally operates on the insurance carrier to settle a case when it is appropriate, taking into account its own as well as its insured's interests. Here, however, Transit contended that the duty was breached by the insured's wrongful refusal to settle.

Spink argued that the clause in the insurance policy gave it power to refuse settlement, and it eliminated any duty to settle on its part. The court disagreed. The court pointed out there is a public interest in the extra-judicial settlement of lawsuits. Because the settlement clause could defeat this interest, it must be narrowly construed to prevent unreasonable rejections of settlement.

Spink claimed it had not breached its duty with regard to settlement because the insurance company retained control over settlement matters. The court rejected this argument, as well. Not only did Spink have the independent advice of its own attorneys, but it also was the only party to invoke the settlement clause. Neither insurance company invoked the clause to protect itself from liability in excess of the offered settlement. To counter Spink's contention that it had not violated its duty of reasonable settlement, the court noted that Spink "produced no genuine evidence that the settlement would have actually damaged its insurability or blemished its professional standing. The only testimony on the score of impaired insurability was entirely speculative."

It is meaningless to generalize that all professional liability claims should be either defended vigorously or settled promptly. Each claim must be evaluated on its merits by the architect, the defense attorney and insurance company representatives, with collective judgments made about such diverse factors as the validity of the claim, the potential defense costs, the claim's effect on the professional's reputation, the chances of success in court or in arbitration, and the impact on future insurance premium costs.

Mr. Kornblut is a registered architect and practicing attorney in Washington, D.C.

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Designing barrier-free toilet rooms within old & new buildings

Conflicting code criteria, special products with special prices and the constraints of existing structures make the design of toilet rooms the most difficult aspect of barrier free design. In a building with more than one toilet room, there must first be a decision on which ones are to be accessible. If there is only one toilet room for each sex, then both must be made accessible. If both can be converted to unisex toilet rooms, only one needs to be accessible in an existing building. If a building has toilet rooms on more than one floor or wing, then only one accessible toilet room may not be a reasonable solution. Some codes, in fact, require more, although there is no generally accepted approach. As a rule of thumb, new buildings should have at least one accessible toilet wherever toilet rooms are located for the non-handicapped. In existing buildings, general access to toilet rooms can be examined carefully along with the feasibility of conversion for each type of toilet room. The selection of retrofit targets should be based on a judicious evaluation of the need for close bathrooms, the feasibility of modification and the availability of strategic locations.

by Edward Steinfeld

In some large complex buildings with many toilet rooms, such as dormitories and hospitals, a particular wing or floor might be chosen as the location for accessible sleeping rooms. All the toilet and shower rooms serving those sleeping rooms should therefore be accessible but others would not have to be, except for a few strategically located facilities to accommodate guests and visitors.

There should be at least one accessible water closet and lavatory in each accessible toilet room. In new construction, men's toilet rooms should also have at least one accessible urinal, although not all codes require it. Many men who use wheelchairs prefer to use urinals since they do not have to transfer.

Circulation space

All accessible fixtures should be along an accessible path of travel from the entry to the room—no stairs, adequate clearances and maneuvering room at doors. They must also have adequate space to position a wheelchair or convenient use of the fixture. A common error in attempts to make restrooms accessible results in the "wheelchair trap," akin to the lobster trap. Satisfactory clearances are provided to allow passage of a wheelchair into the room. However, once inside, there is either no room to turn a wheelchair around or the entry door has insufficient maneuvering clearances to allow opening the door from inside the restroom.

Edward Steinfeld is an architect and an associate professor of architecture at the School of Architecture and Environmental Design, State University of New York at Buffalo. He is Secretary of the ANSI A117 Committee.

This is the fourth article in a series of six by Mr. Steinfeld on barrier-free design. The previous three articles appeared in the March 1979, May 1979 and July 1979 issues.

Although some codes require a 60-inch diameter turning area in the toilet room, a wheelchair can be turned around in spaces with shapes that are not circular as well, e.g. a T-shaped space. Moreover, clear space under lavatories can be used as part of the turning area.

Water closets and toilet stalls

Early accessibility codes and the existing ANSI A117.1 standard required a 36-inch wide by 56-inch deep toilet stall. Experience over the years demonstrated that these dimensions were difficult for many wheelchair users to manage. Many codes were revised as a result of consumer pressure to require a stall large enough for a wheelchair transfer to be made with the chair parallel to the water closet. This transfer position is preferred by many wheelchair users. Some rehabilitation experts feel that a position where the chair is facing the water closet at a slight diagonal to it is safer and more convenient, particularly when chairs do not have removable armrests. Semi-ambulatory people need support from grab bars while sitting down and standing up; for them, a narrow stall is best because bars can be close on either side. Dimensions of 60 inches by 60 inches are required by many codes because they allow both a parallel and diagonal transfer. Recent research has demonstrated, however, that most people who prefer a parallel transfer can also do a diagonal transfer. However, many people need a stall at least 48 inches wide for the diagonal transfer. The minimum depth of a 36-inch wide or 48-inch wide stall must be 66 inches to enable the door to close once a wheelchair is in the stall. If a 60-inch-wide stall is used, the depth can be reduced to 56 inches and still be satisfactory. This is the

standard inside dimension for prefabricated toilet stall partitions. Other advantages of the 60- by 56-inch size are that the door can be located on the side and, in retrofit, the space for two conventional stalls can be combined to make an accessible stall.

Stalls wider than 36 inches must have the water closet located close to one side, leaving a wide transfer space on the other side. In a 60-inch stall, a grab bar is only needed on the near side but one should be provided at the back wall to give additional assistance to semi-ambulatory people. The flush valve should be on the open side. Tank-type water closets have standardized valve locations which limit options for right- or left-handed stalls. If a person can transfer onto a water closet in one direction, he should also be able to transfer off it in the other direction. Handedness, therefore, is not an issue for access although it is for space planning.

Wall-hung water closets are shorter in length than tank type units and they provide extra toe clearance, allowing a closer wheelchair approach. Thus, when floor-mounted fixtures are used, three inches should be added to the depth of a stall.

Another advantage of wall-hung units is that their mounting height is flexible. Research on water closet heights has demonstrated that people who have difficulty bending prefer heights of 19-21 inches to the top of the seat but most wheelchair users prefer heights of 17-19 inches. Conventional water closets can be used to obtain a height of 17 inches by adding a thicker seat. Although an 18-inch height would be a good compromise, so-called "wheelchair toilets" are 19-21 inches to the top of the seat. Also, most codes specify 19, 20 or 21 inches. At these heights, many wheelchair users find their legs dangling and some have difficulty maintaining balance on the seat.

Grab bars come in a great variety of shapes and sizes. There are some that approximate the shape of pretzels! There are also many differences among code requirements for grab bars. Vertical and diagonal bars are helpful in pulling oneself up to a standing position but are not useful for preventing a fall or transferring to a wheelchair. The horizontal bar provides the greatest safety. It should be mounted at a height of 33 inches on center, start at a point no more than 12 inches from the back wall of a stall, and be at least 40 inches long. There

are some manufacturers who make pivoting bars. These can be helpful in providing additional assistance to semi-ambulatory people on the open side of a 60-inch-wide stall. But if they are heavy and awkward to move, they can be an obstacle to the wheelchair user. Bars attached to toilet seats are useful to some people. However, they do not project beyond the toilet far enough; and the bars are usually too low since bars higher than about 8-12 inches above the seat will prevent the seat from being opened fully for bowl cleaning. Moreover, being fixed in position, they are an obstacle to wheelchair transfers. Grab bars should be 1¼-1½ inches in outside diameter for optimum gripping. Smaller diameter bars can be used if they have plastic grips.

All doors to toilet stalls should swing out to provide the necessary maneuvering room and allow rescuers to open the door if a person has an accident inside.

Lavatories and mirrors

The "wheelchair lavatory" is an example of a barrier-free product designed initially for the health facility market. Although many codes are written to require the use of these lavatories which have a much narrower profile and are much longer than conventional models, they are really not necessary. Goose neck spigots and wrist blade faucet controls, which often come with "wheelchair lavatories" are also not necessary. Many conventional lavatories are acceptable if mounted high enough to provide adequate knee and toe clearance. The mounting heights of conventional lavatories vary. A typical height is 31 inches to the rim. Research on preferences demonstrates that ambulatory people prefer a height of 34 inches, which ironically, is often specified for accessible lavatories. A 32 in. height is better for wheelchair users. Such a mounting height can be obtained in conjunction with adequate knee clearance if a sink with a fairly narrow profile at the leading edge and a receding bowl shape is used. Some paraplegics and quadriplegics have no feeling in their legs, so they can easily damage their skin without knowing it. Legs must be protected against burns and scrapes from the plumbing and the underside of lavatories. Lavatory faucet controls can be any lever design or push-type unit. The best are the electronically activated types that don't require touching.

Codes have not been written with gang-type wash basins in mind but such fixtures can be acceptable. If spigots or water spray come close to the leading edge, the knee clearance required for lavatories can be reduced.

Another accessibility product from the health care field is the tilted mirror. If they are fixed in a tilted position, such mirrors cannot be used by ambulatory people—they see only their stomachs. Adjustable mirrors are subject to vandalism. A standard mirror with its lower edge at 40 inches from the floor is satisfactory, although a full height mirror is preferable. It is clear that providing accessibility to lavatories and mirrors does not require special equipment.

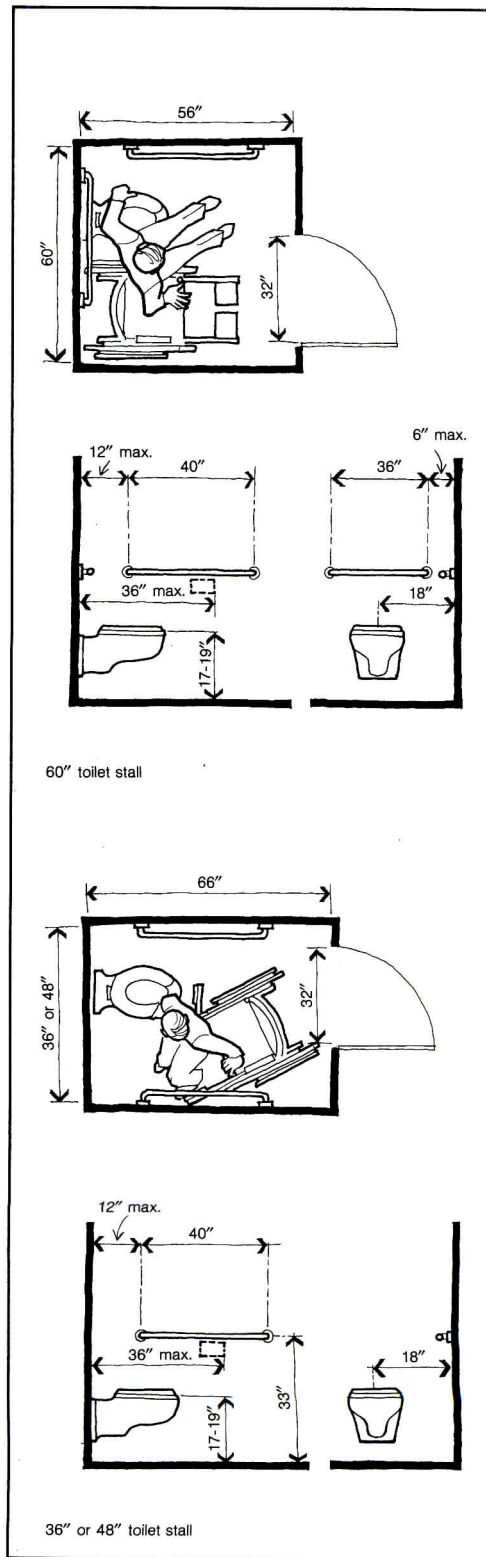
Dispensers and receptacles

There are two basic accessibility concerns regarding dispensers and receptacles. The first is selecting products that can be operated by people who have difficulty using their hands, and the second is locating the items where they can be reached easily from a wheelchair. Dispensers that require two hands or awkward manipulations to use or unclog should be avoided. Toilet paper dispensers should be installed on the near wall of accessible stalls. They should be no more than 36 inches from the back wall and under the grab bar so that the paper is accessible and access to the bar is not blocked. A simple roll is better than a roll with a paper-saving device. Some people may have great difficulty with folded paper dispensers if they clog easily. Toilet paper dispensers should not be so bulky that they clutter the stall or make sitting on the toilet awkward. Towel and soap dispensers and garbage receptacles should be located with their highest operable part at 54 inches from the floor if a wheelchair can be positioned for a side reach. If a forward reach must be used, the highest operable part should be no higher than 48 inches. If dispensers and receptacles are mounted over counters or lavatories, their height must be even lower for convenient use—44 inches maximum to the highest operable part. The reach limits found in codes vary from 40 to 63 inches. Codes do not reflect the fact that the position of the body and the task to be performed determines, to a great extent, the maximum height to which one can reach. For some reaching tasks, such as those in toilet rooms, fine manipulations do not have to be made and heavy weights do not have to be lifted. Almost all people who use wheelchairs can do a side reach to 54 inches for such tasks. This is also a convenient height for ambulatory people. Most toilet room equipment could be used conveniently by ambulatory people when mounted with the highest operable part of 48 inches. This is generally a much more convenient height for wheelchair users and a necessity if a side reach is not possible. In general, there is usually no need to mount some equipment lower than others, if the 48-inch mounting height is used; 54 inches can be used as a universal height if there is space to allow a side reach. But if a 40-inch height is required, many dispensers become very inconvenient for tall ambulatory people and two separate mounting heights are necessary.

In conclusion

Since toilet rooms are such a critical personal concern for the disabled, accessibility issues should be a particularly important design concern during building design. Although there is considerable diversity among building regulations on accessible toilet rooms, architects who are knowledgeable about the human factors need will have less difficulty meeting the requirements. In renovation projects, literal compliance with codes sometimes cannot be achieved within the budget available. However, knowledge of options and

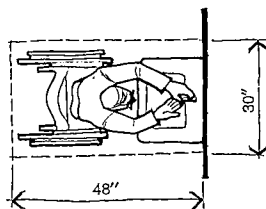
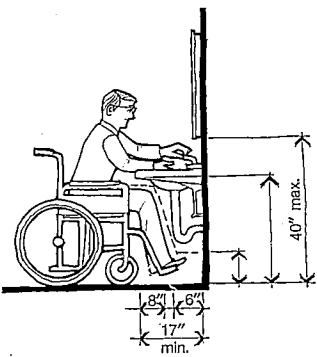
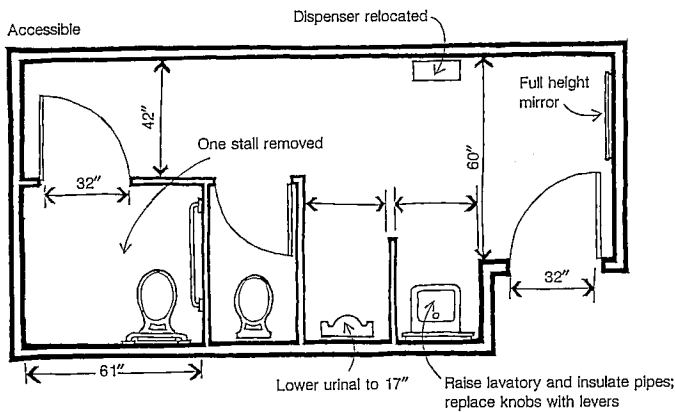
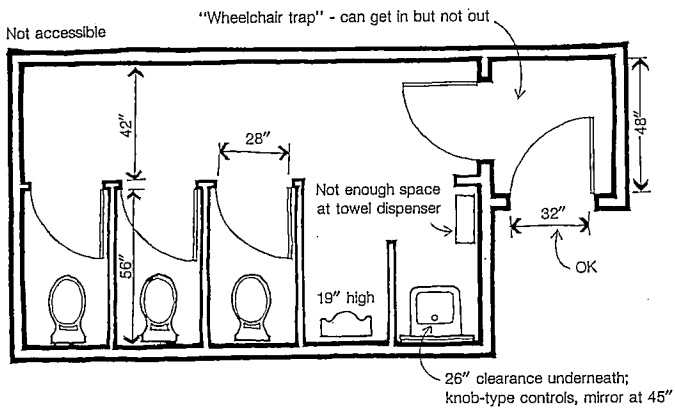
alternative approaches can help architects provide at least a minimal degree of accessibility. The most difficult problems are caused by tight circulation at entries and around toilet stall doors. With the exception of grab bars, larger toilet stalls, and underside protection of sinks, there are no special requirements for disabled people as long as the basic space clearances and reaching limits are adequate. Enough space can usually be provided by removing superfluous partitions. Unfortunately, existing building regulations often require special toilets, sinks, mirrors and unreasonably low mounting heights for fixtures that really are not necessary. Also, a strict interpretation of the 5-foot turning radius required by some codes makes modifi-



ation of small toilet rooms difficult.

There are many so-called "accessible toilet rooms" that really aren't accessible. Codes and regulations are often not comprehensive enough or are out of date with the state of the art. Also designers and code reviewers sometimes have inadequate knowledge about how the regulations should be applied. In the toilet room, seemingly insignificant features such as a 2-inch difference in toilet height, or where the toilet paper dispenser is located, can ruin all the good intentions of the code or the designer. Getting approval of regulatory authorities is not enough. Designers must become fully aware of the issues and the many ways in which accessibility can be accomplished.

Toilet room renovation: example 1



Lavatory

Design Criteria

Minimum number:

1. A reasonable number but never less than one toilet room should be accessible.
2. An accessible unisex toilet room can be provided to serve both sexes; this approach may not be acceptable in new construction if other public toilet rooms are provided separately for men and women.
3. In large buildings, at least one toilet room on each floor or building wing should be accessible.

Circulation space:

1. Enough space to turn around—60 in. diameter clear floor space or a T-shaped space; 60 in. deep over-all on each side.
2. The clear floor space used for turning may be part of the knee space required under lavatories.
3. Adequate clear widths at doorways and other circulation areas (see design criteria for internal circulation, in the preceding article of this series, July 1979, page 67).
4. Adequate clear widths on an accessible path of travel from the entry doors.

Water closets and toilet stalls:

1. At least one accessible in each accessible toilet room.
2. Acceptable stall sizes: a) 60 in. wide by 56 in. min. deep; b) 48 in. wide by 66 in. min. deep; c) 36 in. wide by 66 in. min. deep; add 3 in. to depth for floor-mounted water closet; 60-in. wide stall preferred.
3. Height: 17-19 in. high to the top of the seat.
4. Water closet location: 18 in. on center from one side wall or partition.
5. Grab bars: 33 in. high, on center; at both sides for 36 in.- and 48-in.-wide stall; at near wall of 60-in.-wide stall; at back of 60 in.- and 48-in.-wide stalls; side bars start at a maximum of 12 in. from back wall and should be at least 40 in. long.
6. Flush controls: hand-operated and located on open side of asymmetrical stalls or compartments.
7. If stalls are not provided, clearances and grab bars should follow 60-in.-wide stall criteria.
8. Doors: 32 in. min. clear; swing out; maneuvering clearances as with other doors; side location for door OK on 60-in.-wide stall.
9. Location of toilet paper dispenser: on near wall, 36 in. max. from back wall, 19 in. high on center.

Lavatories and mirrors:

1. Height: 29 in. min. clearance under leading edge for depth of 8 in.; 32 in. height to top of sink preferred as well.
2. Toe clearance: 6 in. deep max. (measured from back wall or pedestal) by 9 in. high min.
3. Over-all length: 17 in. min.
4. Faucets: lever operated, push-type or electronically controlled; self-closing or timed flow units should remain open for 10 seconds.
5. Underside: exposed hot water and drain pipes insulated; no sharp or abrasive surfaces.
6. Mirror height: 40 in. max. from floor to bottom edge.

Urinals:

1. At least one accessible in every accessible men's room.
2. Type: stall type or wall hung with an elongated rim no higher than 17 in. above the floor.
3. Floor clearance: 30 in. wide by 48 in. deep in front.
4. Flush controls: hand- or electronically-operated; mounted at 44 in. max. height.

Dispensers and receptacles:

1. All should be accessible.
2. Floor clearance: 30 in. by 48 in.
3. Height: 48 in. max. to highest operable part if floor clearance requires a forward approach; 54 in. max. if a side approach can be used; 44 in. maximum if located over a counter or lavatory.
4. Control type: operable with one hand.

Grab bar design:

1. Width: 1¼-1½ in. diameter for all grasping surfaces.
2. Materials: non-slip surface, free of sharp edges.
3. Strength: bar and connectors capable of supporting at least 250 lb. at point inducing greatest stress.

Specify the Elkay features that make sense to users:



For one, there's Elkay's *non-pressurized* storage tank system—which eliminates severe water-damage problems if failure ever occurs overnight, during weekends, annual shutdowns, or any other time.

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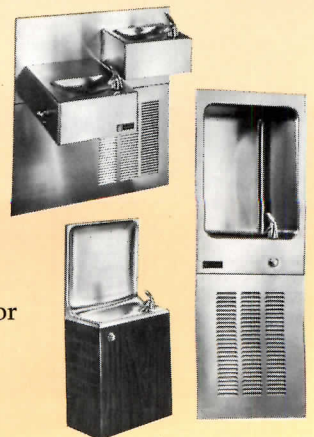
For instance, Elkay's combination TM tube-tank type cooling system—fully insulated



with UL listed polyurethane foam—provides fast recovery. And the Elkay Cascade basin with multi-level deck design has been proven in tests to be most splash resistant.

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Circle 42 on inquiry card

Value of nonresidential rehabilitation will double by mid-1980's

Soaring construction costs and Federal incentives are creating a positive environment for rehabilitation of existing structures. Expenditures for nonresidential additions, alterations and major replacements are expected to increase from an estimated \$15 billion in 1978 to as much as \$30 billion annually by the mid-1980's. Sharply rising building and land costs are stimulating private investment in revitalizing older structures. Equally important, the Federal government is providing owners and developers with significant incentives to modernize or recycle existing commercial, industrial and institutional structures, as government policymakers increasingly realize that jobs and shopping facilities are just as important to rejuvenating a metropolitan area as improving housing.

The Department of Interior currently estimates that there are nearly 700,000 historic nonresidential buildings in the United States. In the past, there were few tax inducements for saving such structures. In fact, the incentives were to remove the older structures and build new. The 1976 Tax Reform Act changed that.

To encourage the retention and modernization of historic buildings, the Reform Act allows owners either to amortize the cost of rehabilitation over five years, even though the useful life of the building might be much longer, or accelerate the depreciation on the total value of the improved property.

Next, the concept of "conserving and upgrading" existing buildings was greatly expanded in the Revenue Act of 1978. Owners now can obtain a 10 per cent tax credit for the cost of rehabilitating nonresidential buildings that are at least twenty years old, regardless of historic significance.

Primarily, these tax inducements attract funds to restoration work from investors seeking tax shelters. Many times, however, there are not enough of these investors to revitalize a commercial area. Consequently, the Federal government has established the Urban Development Action Grant Program, administered by the Department of Housing and Urban Development, to attract bigger blocks of funds from the private sector and appropriate state and local development agencies.

Action grants encompass both new construction and renovation of existing nonresidential buildings, but their primary objective is to spark increased rehabilitation of older, rundown commercial districts. They are the "seed money."

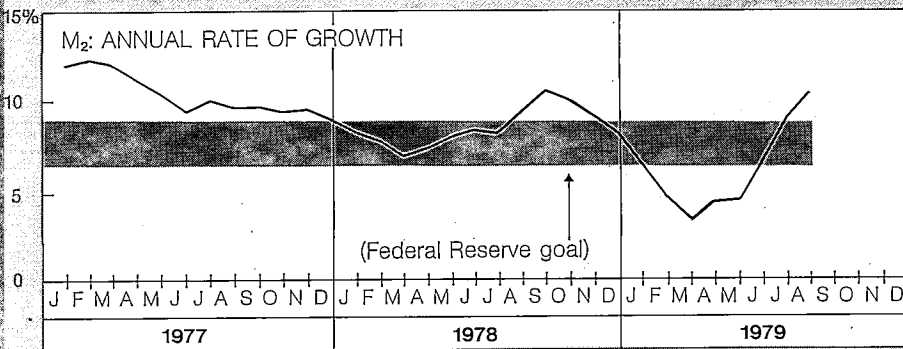
On the basis of submitted proposals, HUD sends grants to local and state redevelopment authorities. These agencies, which can add their own monies, either lend the funds to developers at below-market rates, or use the funds as equity investments in projects. In turn, these funds help developers attract construction and permanent financing from private financial institutions. As developers repay the agency loans, or as cash flows from the projects, the Federal government encourages local agencies to invest the money in other commercial redevelopment projects.

Phillip E. Kidd

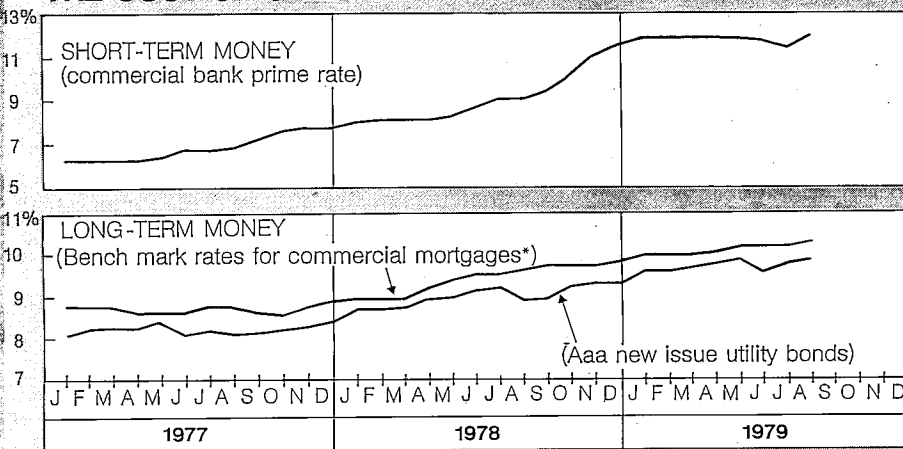
Director of economic research

McGraw-Hill Information Services Company

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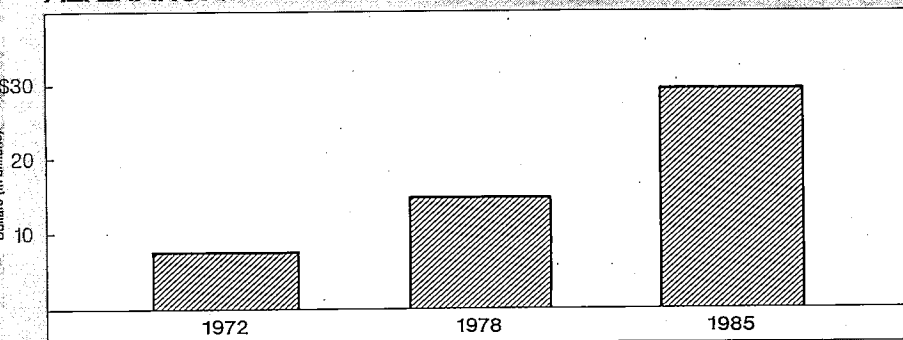


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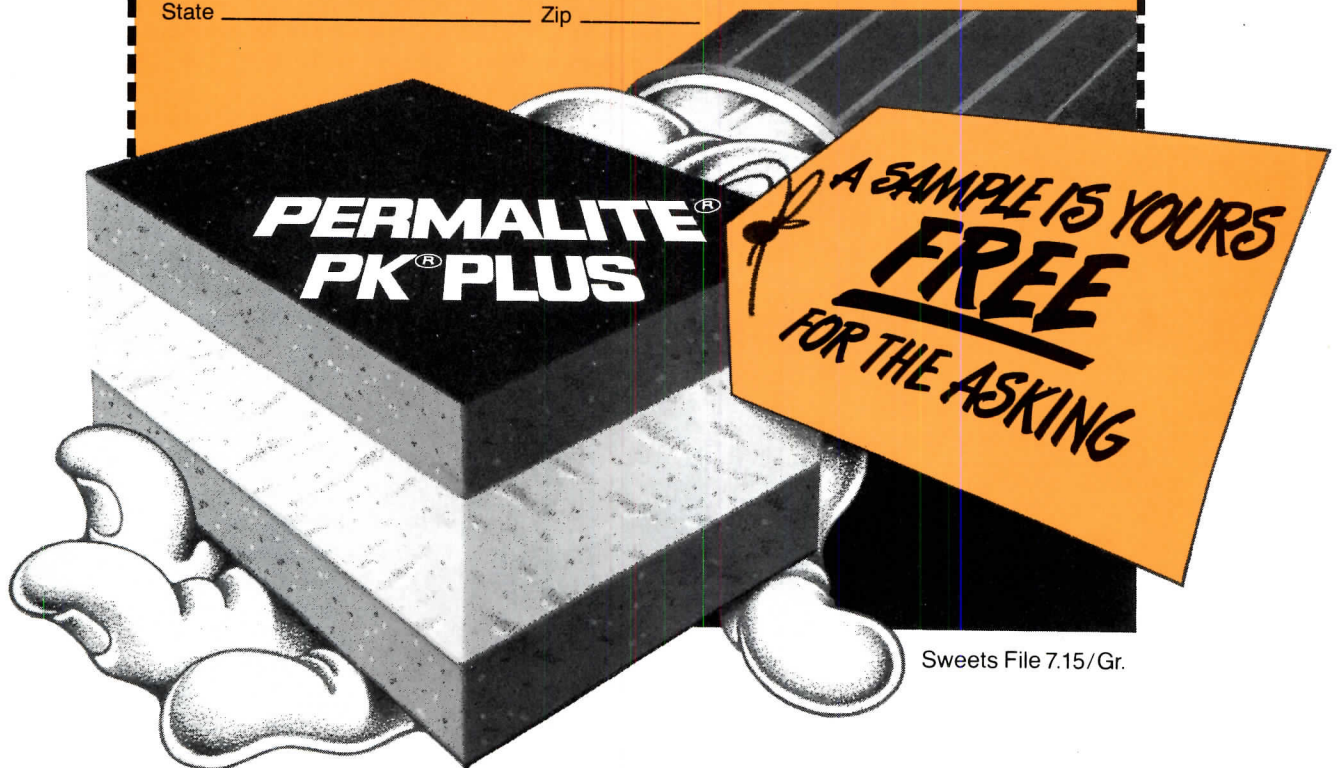
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CELEBRATION OF JUSTICE: THE FEDERAL BUILDING, COURTHOUSE IN FORT LAUDERDALE, FLORIDA

Last December, *RECORD* published this building by William Morgan Architects and joint-venture engineers H.J. Ross when it was almost complete. That article discussed the

"hows and whys" of its construction and the process of getting it built. This newer look, taken at the time of the recent dedication, shows how Morgan's strong perseverance paid off. His unusual

abilities have not only brought us a handsome building, but a building that should determine the character of an emerging city in terms of innovative land use, in

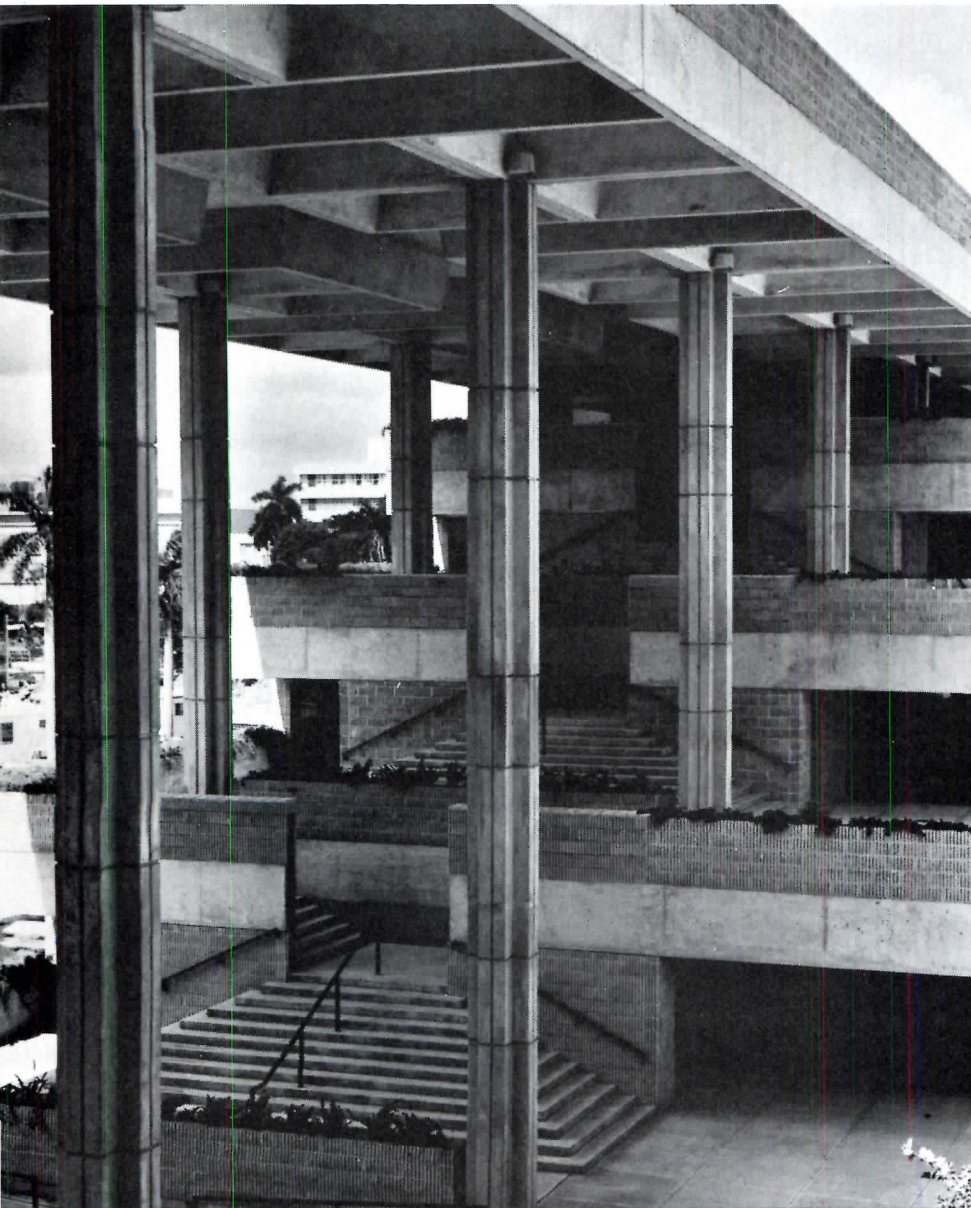
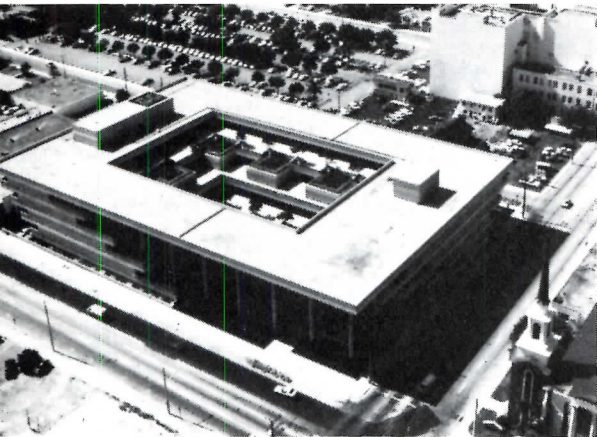
terms of lower costs for public construction and in terms of public amenity. Indeed, it sets a desirable future character for what are now loosely knit downtowns all across the country. —*Charles Hoyt*



THIS BUILDING BREAKS THE RECENT PATTERN OF TOWERS IN PARKING LOTS

As can be seen in the background of the aerial view, a good part of Fort Lauderdale's business and government area is devoted to open parking lots. William Morgan Architects and joint-venture engineers H.J. Ross's program from the GSA called for a low garage and a tall building, a minor variant on the norm. Taking a cue from his own ideas about what a city should be, and from nearby older buildings such as an adjacent church (bottom photo), Morgan demonstrated lower costs for a lower building that covered the site to the sidewalks, and concealed beneath it that curse to urbanity—the parking lot. The benefits are obvious. For the first time in a long time Fort Lauderdale has a new building that *looks like* it is downtown and not in the middle of a suburban nowhere. More importantly, it sets a direction for future land use that will bring cohesion to that downtown. Another program mandate concerned appropriate character. Instead of a high rise with applied monumentality, here is an ex-

posed, forceful, concrete structural system—developed earlier by Morgan and engineer William Le Messurier for the Jacksonville Police Memorial Building (as described in *RECORD*, January 1978, pages 117-124). Both projects demonstrate a more subtle concern with monumentality than that term normally connotes. And it springs from the proportions and volumes of indigenous American Indian architecture, which Morgan is about to more fully explore in a book that may become definitive.



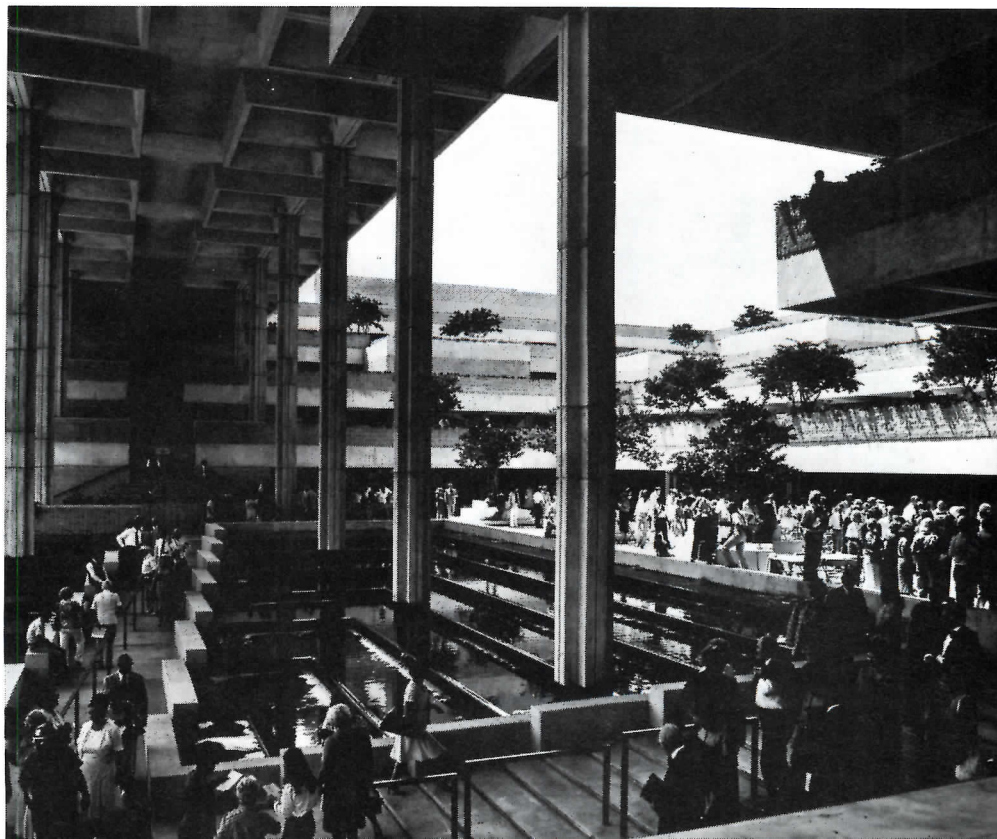
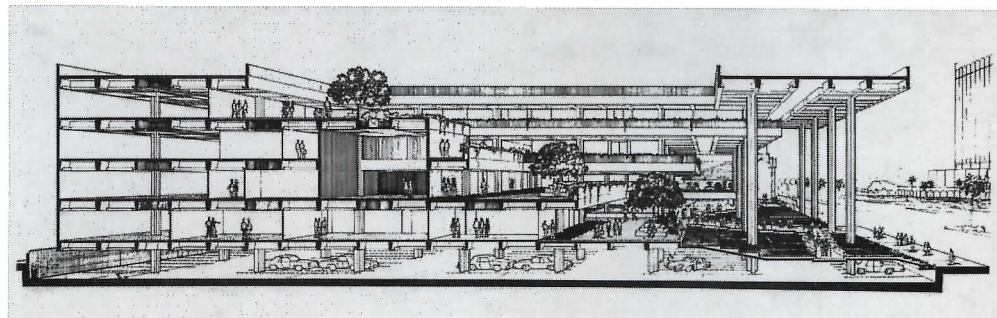
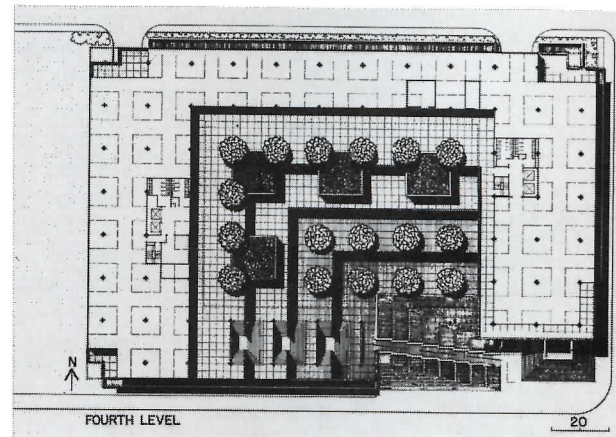




As in the case of the Jacksonville Police Memorial Building and State Office Building discussed on the previous pages, the architects have not been content to produce a public building without something for the public: in this case, a grand urban space on ascending levels that can function like a town square. The photos below—taken at the dedication presided over by Vice-President Mondale in August—show the possible uses of the central open space for more jubilant proceedings than those going on indoors.

While the previous two buildings are essentially covered by open parks, this building contains its open space within its own structure. The result is like an oasis that is an interesting mix of the formal and the informal. But because of the surrounding walls and peristyle, it is the essence of being in a place with specific urban character. As seen in the photo below, it has an effect that Piranesi or the Mayans might have envied. The result for the street is a building that has both an appropriate presence and an inviting transparency—in line with the idea of accessibility, but as a counterpoint to the thinly disguised desolation of the wide-open spaces that exist on many surrounding blocks. By contrast, the ascending plaza (and the corner entrances to the parking level, seen in the bottom photo on page 83) seems to have been carved from a solid volume that is firmly there. Given the magnitude of identifying a real, hoped-for city, it may seem surprising that there is also a strong functional logic (see overleaf).

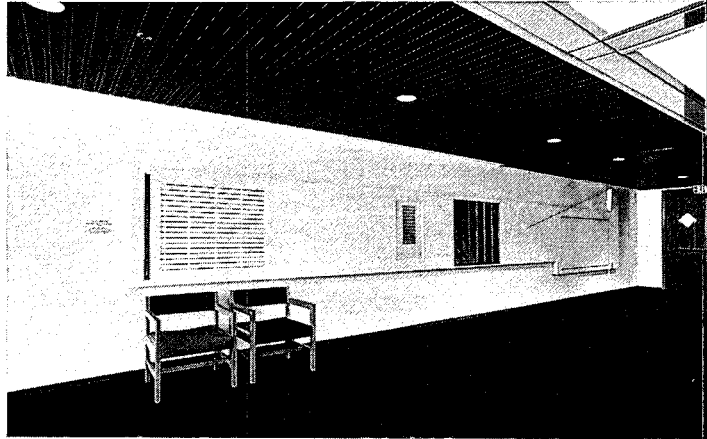
MORGAN HAS PRODUCED A TOWN SQUARE OUT OF BUDGETS FOR LESSER THINGS



Because of the stepped nature of the plaza, the largest enclosed floor area is nearest grade (see section). Containing various GSA offices frequently visited by the public, this area is appropriately sized to be self-contained in its functions and, as appropriately, the most accessible. Next in size and accessibility, the floor above contains mostly court facilities, including the courtrooms (photo below)—which project up through the third-level terrace for more height, natural light and an external expression of importance. Altogether, the court functions occupy some thirty per cent of the building. The third and fourth levels hold less frequently visited GSA offices. There is a logical and comprehensible arrangement. As discussed last December, the building has been completed for appreciably less than the \$14.5-million budget. It and Morgan's Police headquarters are part of an exhibit jointly sponsored by the American Correctional Institution and the AIA.

HOUSE, Fort Lauderdale, Florida. Joint-venture architects: *William Morgan Architects and H.J. Ross Associates, Inc.*—project architects: *Gonzalo Gaitan and James Rink, Jr.* Associated architects: *Wright Ferguson, Glasgow & Schuster.* Engineers: *H.J. Ross Associates, Inc.* Consultants: *Ranger Farrell and Associates* (acoustical); *William Lam Associates, Inc.* (lighting); *Stresau, Smith & Stresau* (landscape); *Dave Meyer & Associates, Inc.* (graphics); *Rolf Jensen & Associates, Inc.* (fire safety). General contractor: *Henry C. Beck Construction Management.*

FEDERAL BUILDING, U.S. COURT-



TWO NEW ENERGY SOURCES

Gunnar Birkerts, working in the Detroit suburb of Birmingham, will have been in America 30 years this December. Born in Riga, Latvia, and coming from Germany, where he had attended architecture school, Birkerts borrowed \$20, took a bus from New York City to Eero Saarinen, and like many people from places Baltic, planted his hopes amidst the lakes and woods of the Midwest. As one of the most inventive and introspective of the vast Saarinen spawn, he has built a varied practice, which will soon be celebrated in an astonishingly beautiful monograph to be published by Yukio Futagawa, Japan's premier architectural photographer. Two of Birkerts' recent works are shown here, a regional office building for IBM in the Detroit suburb of Southfield (left, overleaf) and the Calvary Baptist Church in Detroit itself (page 92). Both are captivating essays about the role of intuition in design, and about the sources of energy—physical and spiritual—that Gunnar Birkerts has so efficiently and elegantly packed together in the course of his own development. — *William Marlin*

Near the intersection of too many expressways, in the Detroit suburb of Southfield, is a distinguished business machine.

It is the 14-story steel-framed regional office building for IBM, designed by Gunnar Birkerts and Associates—a compact proposition about architecture's role in saving energy. Which is precisely what IBM wanted to do, having long-term economy in mind, and also wanting to set an example for others. What IBM has gotten is, more than an example, an inspiration of enormous technical refinement and symbolic power.

Energy conservation in buildings is not just a function of high-tech tomfoolery, wonderfully efficient new gadgets, or convening a lot of solar panels; it is fundamentally a matter of basic design character: orientation to the site and the natural elements, fenestration, the choice of materials, coloration. Every architect knows about these "passive" factors, or should—yet the simplest ways of saving energy have not been given their esthetic due in proportion to their great practical potential. Birkerts' building is a pause for reflection on this score.

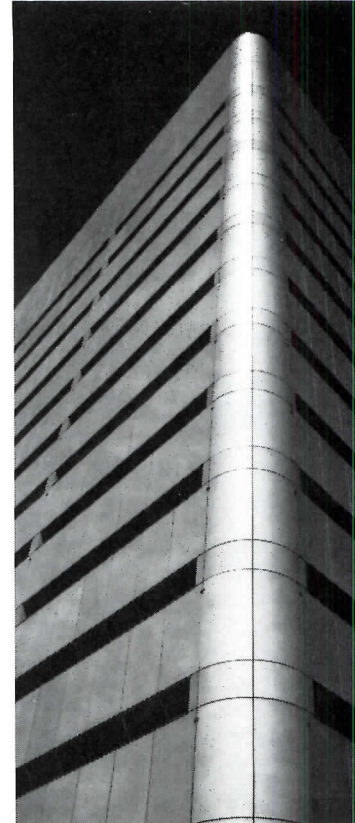
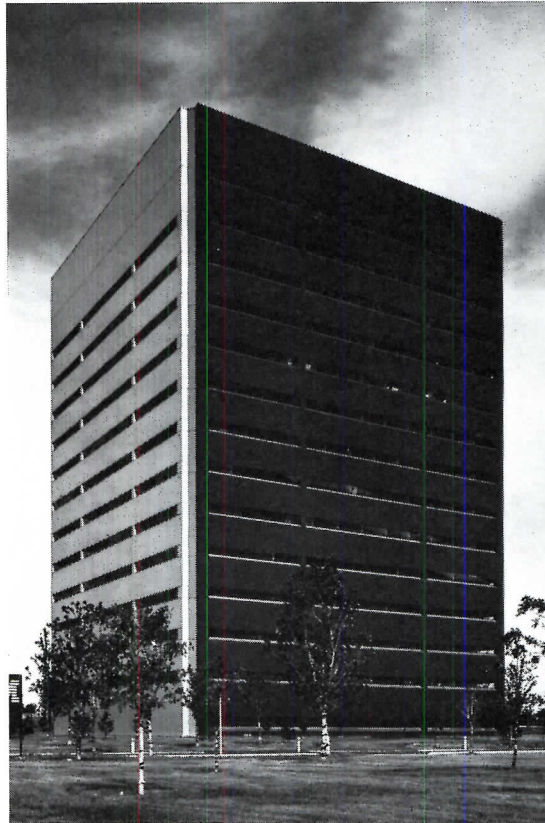
The key element was the skin of the building, and when it comes to basic design character, the skin here is fundamentally new in both its formal composition, technical make-up, and visual effect. So fundamentally new, in fact, that the skin has been copyrighted. Here is how this taut metallic sheathing works, with its glistening glass ribbons:

First of all, the glass area of the facades is only 20 per cent of their total wall area. Far from being a "come down" for glass, Birkerts has made the two-foot-high horizontal ribbons of it all the more expressive in a perfect balancing out of utility and beauty. Because of the inward slope of the glass, it is shielded by the exterior wall for most of the working day, and yet (this is an eye-opener) the sense of the surroundings, looking out these "windows", is if anything larger, easily as luminous, as what we used to get looking out through ye larger lites of yore.

Daylight is introduced (and pleasingly diffused) inside by way of a curved matte-finished reflector of stainless steel (a most spiffy kind of sill) that runs along the lower edge of the ribbons of glass. This "sill" bounces the light onto a curved panel *inside*, an eggshell-colored reflector of prefinished aluminum runs along the upper edge of the ribbons. The light is thus bounced deep into the floors, from the inside reflector, up onto the ceilings, and back down into the spaces; moreover, the placement of the inside reflector and the play of softened light occasioned by it seems to open up the view toward the outside, in effect making the glass ribbons seem much bigger than they actually are.

Now around the perimeter of the ceilings, where they intersect with the upper edges of the interior reflectors, there is a continuous fluorescent lighting strip, and at night, or on dark days, this arrangement reverses the direction of the light. For example, on dark winter days, it illuminates the

Gunnar Birkerts' office building for IBM combines sleek metallic surfaces and an extremely elegant and innovative window system to produce a poetic image for an energy-saving epoch

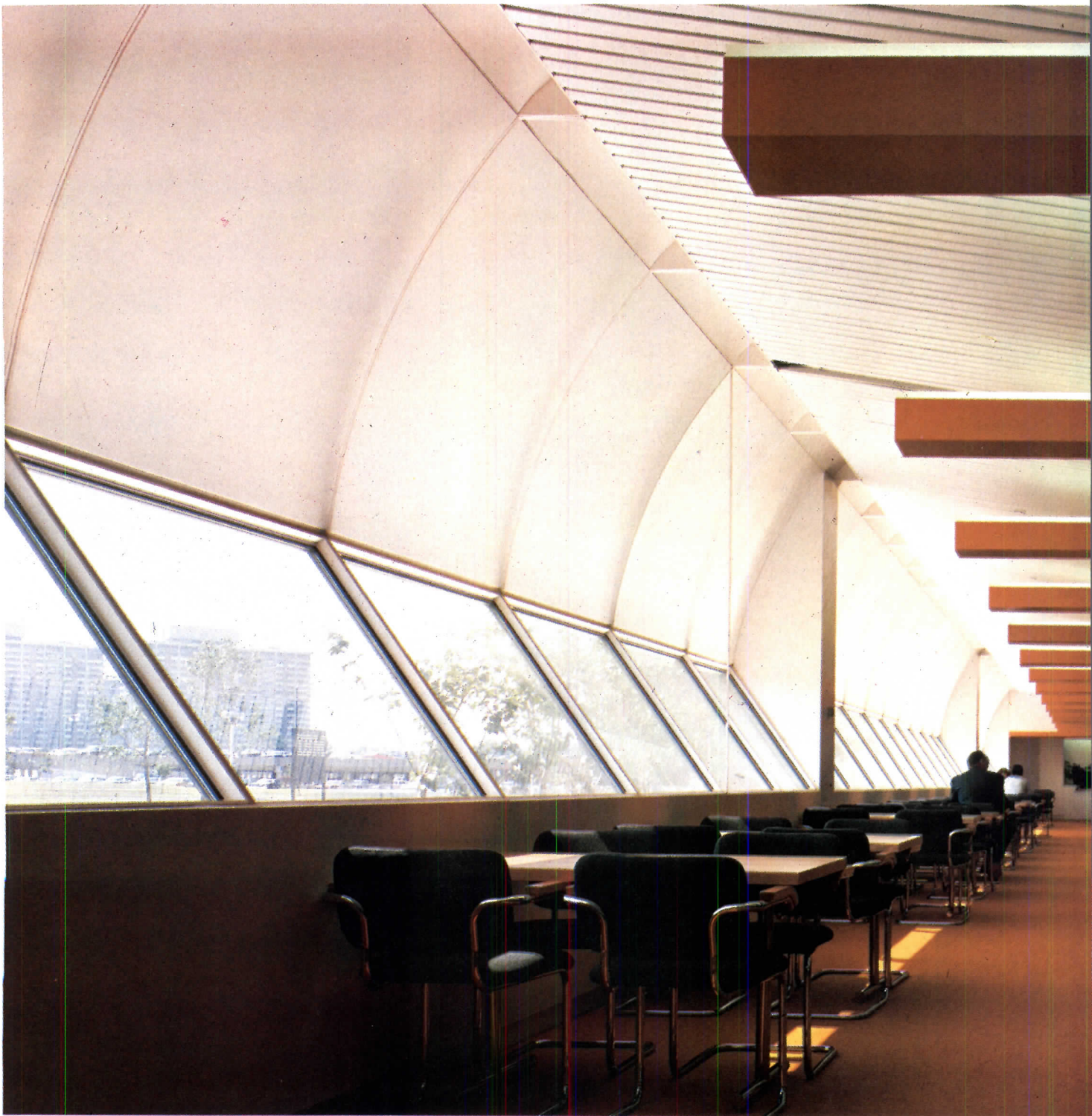
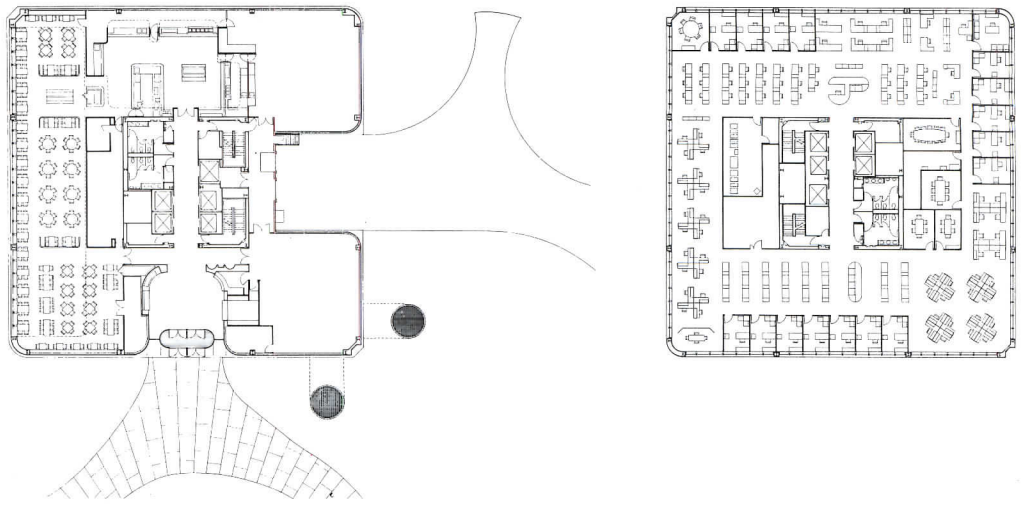


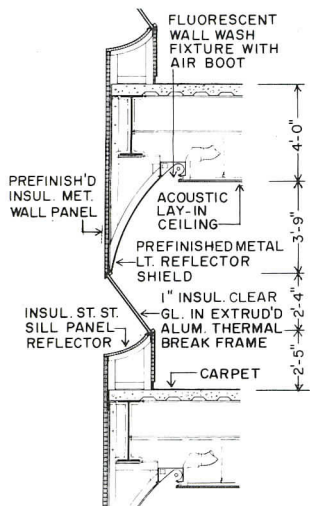
A bright, natural aluminum clads the IBM building on its south and west elevations, reflecting the heat and light, whereas a charcoal gray color is used on the north and east elevations for absorption. Although this contrast of color does not greatly affect the level of energy-usage in this energy-saving structure, the contrast does send out signals as to the over-all

purpose and character of the architecture. Where the same finishes meet, an elegant rounded corner detail is used; where they contrast, a crisp notched-out corner appears. The main entry (above), embellished with orange and red, has an oblong vestibule, shooting the red theme inside to denote all circulation (right) from corridors to elevators.

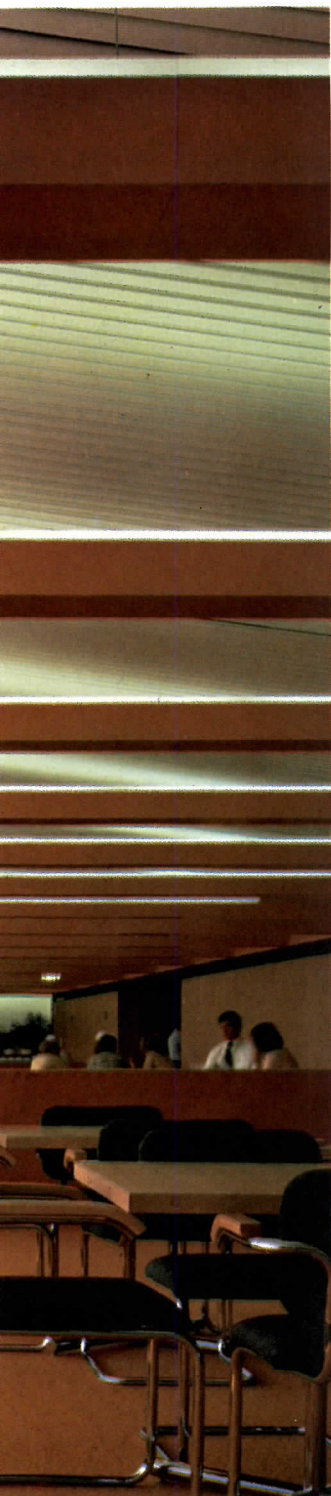


RETORIA, photos by T. Kitajima





Only 20 per cent of the exterior wall area of the IBM building is glass. Horizontal ribbons of it (see section, left) slope inward, picking up light from a curved reflecting surface running along the bottom and throwing the light upward onto a curved interior reflector where it is diffused and thrown deep into the office spaces. In plan (opposite) the building is a straightforward square with an elevator core; the no-nonsense activity to be found in such a business machine is efficiently arrayed around the core. Economical but elegant surfaces are used throughout the building, set off by flourishes of color. Great energy savings are a direct result of basic design character.



The dining area of the IBM building (left), directly accessible from the lobby (previous page), shows off the building's skillful balance of natural and artificial lighting with especial drama. Although there is comparatively little dependence on artificial lighting, the fixtures are cleanly designed. The exterior ribbons of glass, sloping up to meet the curving interior reflector, are a model of immaculate detailing and the suave joining of surfaces and fittings.

interior reflector, supplementing what daylight is coming in, and because this reflector is the wall surface above the window, the comparatively small area given to glass is made to appear more generous—this in contrast to the normally dark wall surfaces that would surround window openings in more conventional installations. The fluorescent fixture is housed in an aluminum cove that is contoured, in turn, to the larger reflector below. A marked reduction, or absence, of natural light coming in activates photocells, activating the fixtures; the technology—reaching fulfillment—disappears.

The energy efficiency of this solution is enhanced by the thickness of the wall, the inward curves of the two reflectors requiring an over-all thickness of 24 inches. Although this extra thickness had some effect on the ratio of net to gross square footage, it was determined that this "premium" would be repaid in under eight years by the energy savings—and indeed, the savings in peak solar load is about 40 per cent, taking into account the fact that some heat is transmitted by the reflector through the glass. Inside, the levels of artificial light have been kept to 50 footcandles, using two watts per square foot of electricity, this being supplied with prismatic acrylic lenses. Taken with the unique character of the outer wall and window treatment, reliance on electric light is minimized. All told, these design measures have achieved a usage level of 54,000 Btus per square foot, and that meets the norms that have been proposed by the Federal government—a great buy, and without one corner cut as to design quality or conceptual conviction.

In metaphorical terms, Birkerts' solution also conveys what the building is mainly meant to accomplish; for example, its exterior is a two-tone job. A metallic silver, on the southerly and westerly elevations, reflects the light and heat; a charcoal black, on the northerly and easterly elevations, absorbs them. Not that this color contrast affects energy savings all that dramatically. What it does do is symbolize the importance of careful orientation (a consideration that our "endless" supplies of energy almost squelched, along with our glib assumptions about the ability of technology to overcome the "inconvenient" unevenness of nature). As such, the IBM building is a signal that such traditional considerations in architecture as orientation, the ways our buildings latch onto the movement of the sun and the lay of the land, are more eternal than our piteously short-lived infatuation with our supremacy over them. Even with the familiar square-plan structure, even with all four sides gotten up according to the same methods and with the same materials, that color contrast—simple as it may seem—is the metaphorical tie that binds this building and its innovations together and makes them live and read as a unified message.

Driving into this section of Southfield, a loose collection of commercial and office structures futilely attempting cohesion, the Birkerts building is the only one in sight that.

instantly gives a sense of composure and true style. Around its base are walks, shrubs, and an informally landscaped park. All of which barely succeeds in distracting attention from the fact that the building (in common with all its less sophisticated neighbors) has a parking lot outside its front door. Approaching the "machine," one is struck by the architectural form rising up—an intriguing combination of reflectivity, transparency, and mechanistic "cool." The main vestibule—a rounded shape and space acting as a transition zone from the park and parking lot to the supercharged, no-nonsense atmosphere within—is done in oranges and reds, the red being carried inside as the primary circulation color: from the vestibule, through the lobby, and into the elevator cabs. This sparing but consistent embellishment with color, handsomely setting off the sleek, crisp finishes and surfaces, finally serves to point up the most enjoyable aspect of the building as a whole—its intense but soft luminosity within. Saving energy as a matter of its own integrity as a structure, the IBM building gives off much more energy than it will ever consume.

If physical energy is economized at the IBM building, energy of another kind has been maximized at Birkerts' Calvary Baptist Church. Its park-like site in Detroit is on the edge of a large urban renewal area and right next to a large, historic cemetery. Its congregation is black and spirited, gregarious and forward-looking.

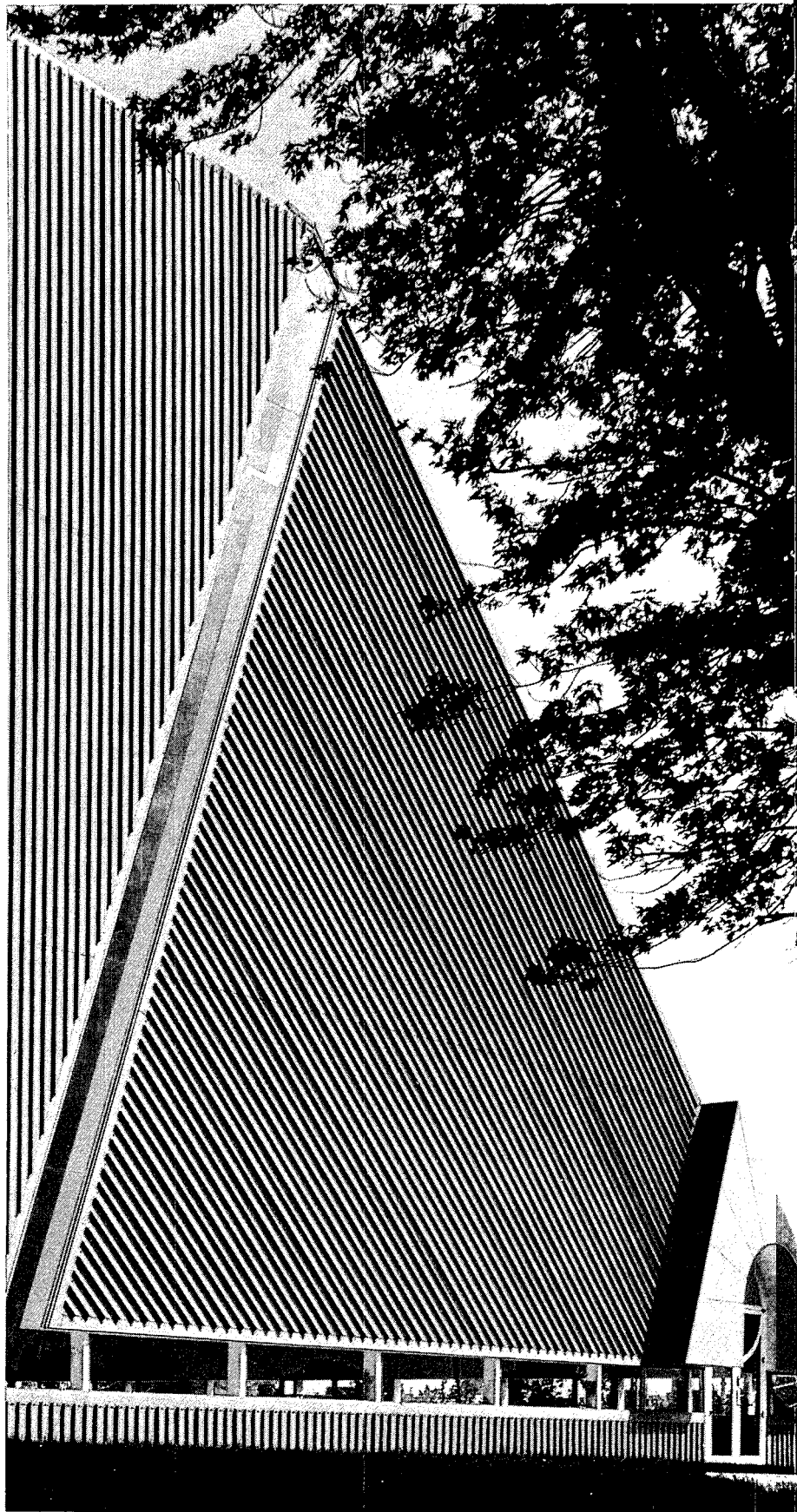
The exterior material is essentially plain—standard preformed ribbed metal panels—but the building's shape is scarcely unassuming. Combined with custom trim and standard strip windows, the panels are laid up in different directions so that the ribbing creates lively contrasting patterns of line and shadow. Furthermore, all this metal is prefinished with a pumpkin color.

The geometry, however playful, and the materials, however basic and industrial in their connotation, yields a strongly angular and singular shape that not only reads out in the environment as a symbol of excitement and encouragement but also reads inwardly as a receptacle of Christian faith.

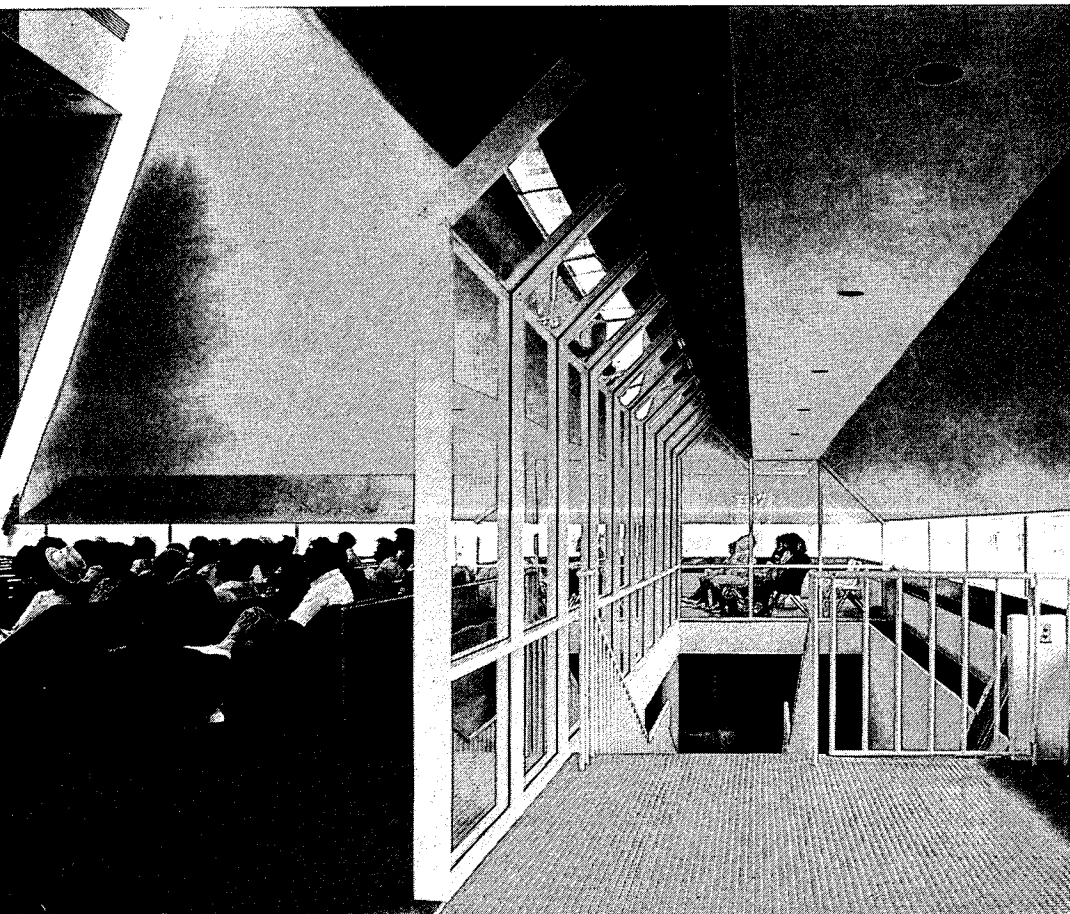
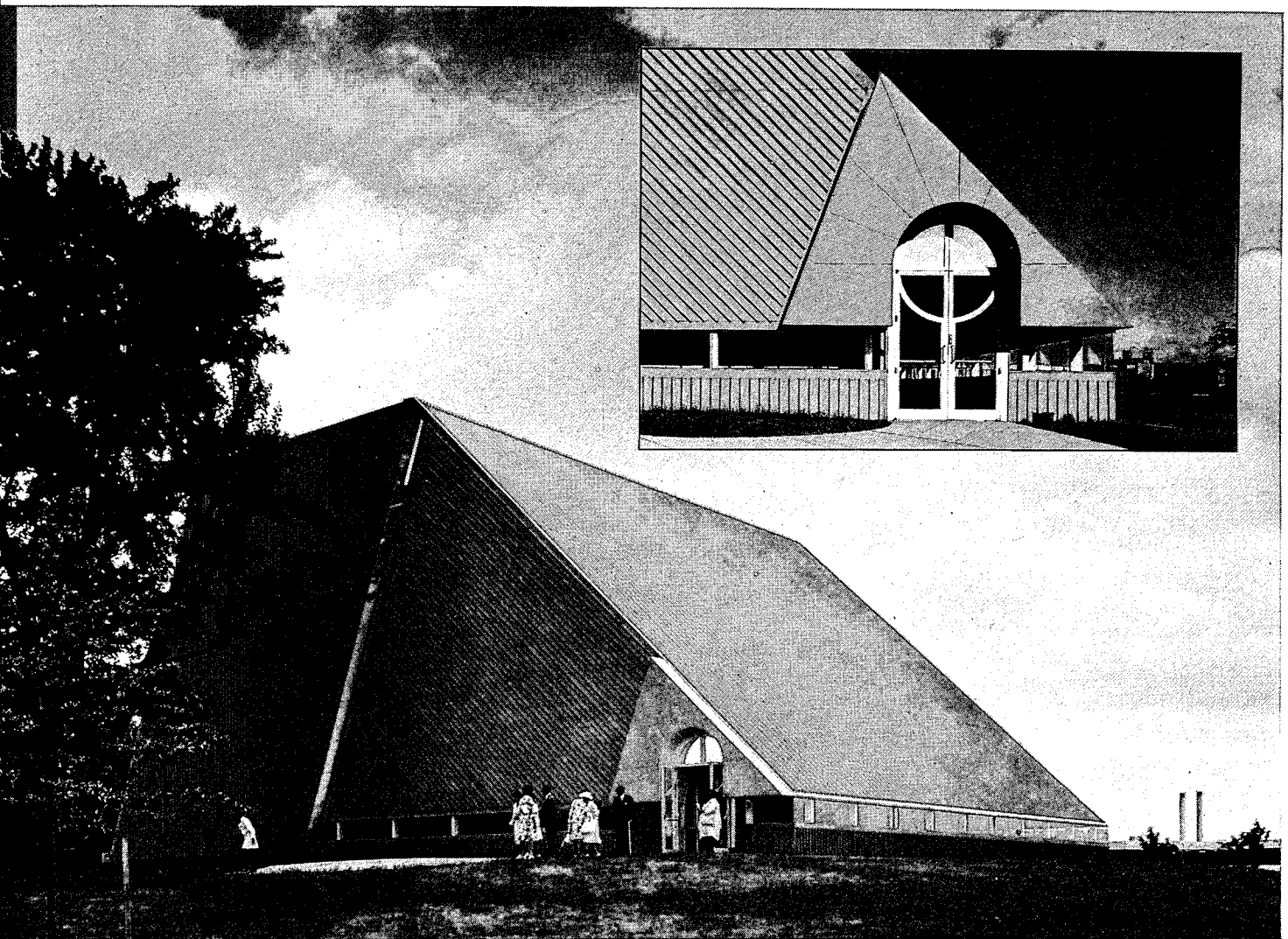
Located on a slight rise, Calvary is approached along a curved processional path that leads to the main entrance to the nave. In this luminous room, every surface, element, and vista is conceived to raise the liturgical encounter into a realm of unity and hope.

Entering the nave, one is met head-on by great faceted sweeps of mirror that angle up over the space from behind the altar, and it is from this feature that all manner of Biblical allusion springs. The congregation, coming in, seated, or caught up in the fervor and gospel of the ceremony, meets itself head-on, the mirrors setting up a resonance of reflections that is as irresistibly foot-stomping as Mahalia Jackson singing. Total immersion in the elements of faith is thus not left to baptism alone.

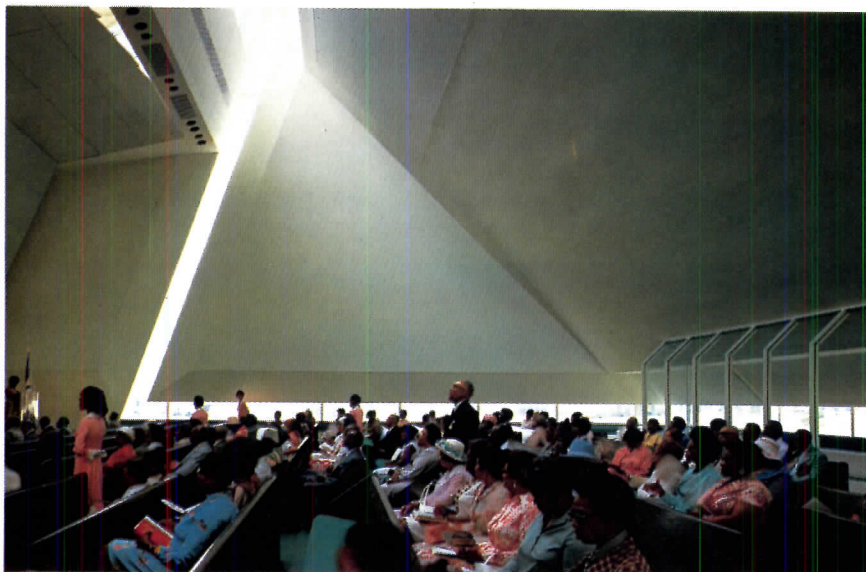
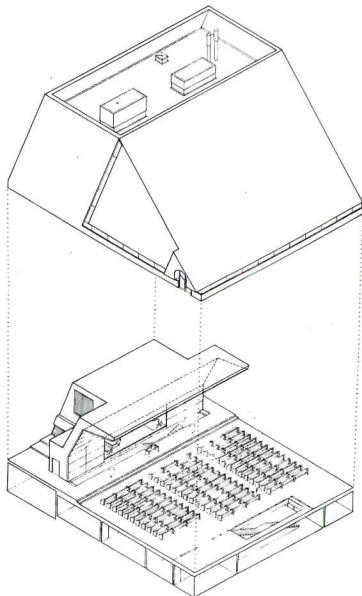
For this purpose, there is a long baptismal pool running along the base of the



In Motown, spiritual energy is maximized in an assertively angular, pumpkin-colored structure for The Calvary Baptist Church



The Calvary Baptist Church in Detroit by Gunnar Birkerts and Associates has a strong angular, singular geometry. The exterior material is standard preformed ribbed metal panels. Horizontal and sharply angling ribbons of glass run where the roof and wall surfaces of metal meet. The main entrance to the nave level with its rounded portal (above) gives into a luminous, unified room or, more directly, it leads downstairs to an all-purpose area where support activities of the church are accommodated, everything from choir rehearsals, to sermon-making, to smaller meetings of the congregation. The building is intense in its outward industrial imagery while being purposefully tranquil within.





The main feature of the church nave is an immense faceted sweep of mirrors that angles upward from behind the altar and then out over the congregation. The choir is housed in a recess of the mirrored wall, along with the reflection of the congregation, so from sermons to spirituals, everyone is absorbed in everything going on. At the base of the mirrors runs a long baptismal pool, lined with ceramic tiles, and this is a metaphor of the River Jordan. Taken with the arrangement of the mirrors, the effect is of having people lining both sides of the "river" as the baptism ceremony goes on. The dominant color inside is a cool green, even to having a green aniline dye rubbed into the red oak pews. The skilled handling of geometry and light inspires devotion, and emotion.

mirrored wall (the mirrors are attached to plywood backing with mastic, and with stainless-steel angles, channels, and clips). This pool, lined with ceramic tiles, symbolizes the River Jordan, and with the reflectivity in here, one looks up into the mirrors to see the sensation of people having gathered on both sides of the "river."

With this arrangement of the mirrors, the baptismal ceremonies can be seen from every seat in the sanctuary, as can the choir, which is in a recess of the mirrored wall. When the gospel singing gets going, the physical and reflective interaction between the choir and the congregation is total and brightened by the light coming in through a large clerestory window above the mirrors. The interior is also enlivened by views of the surrounding neighborhood that are let in through the ribbons of window and then flashed around the room by the mirrors. Like a prism, the shape of Calvary—its arrangement of windows, that reflective surface inside—refracts the light of the world.

Birkerts' team has seen to it that every detail of the building contributes to this feeling of being both transcendent to and rooted in the frequently harsh, limiting reality of a dense industrial world—a world that is a very short drive away here in Detroit. The very assertiveness of the building's shape, the metallic die-stamped decorum of its material, leavened by the swing-high, sweet-chariot signals sent out by its coloration—all are both a reference and challenge to the local industrial climate: a symbolic confluence of the River Jordan and River Rouge.

Inside, shimmering amidst the mirrors' clarifying focus on the myriad sensations and encounters, the big room—finished in dry-wall, molded out of two-foot-deep open-web steel joists in a plane 30 degrees off the vertical on the sloping east and west walls, and then, too, out of vertical trusses supporting the main roof slope, organ chamber, mirrored wall, and clerestory—the big room is a softly lit hollow, green and holy. The pews of red oak, treated with a green aniline dye, closely match the green carpeting. The seat-cushion fabric also matches. So there is a sense of waves, reaching toward some shore, and of people walking on them toward it. Later, they may walk away from it, taking stairs next to the main entrance down to an all-purpose level where everything from choir rehearsals to church suppers is accommodated—this level having its own green vista to the outside through a wall of glass. Images and metaphors are multiplied by this architecture, being a parable of the loaves and fishes, or (thinking of one church supper in particular) it must have been harmony and grits.

The Calvary Baptist Church and the IBM office building are examples of Gunnar Birkerts' inventiveness, his fascination for the means and the imagery of technology, and of his trusting to intuition the essential shape of his architectural concepts. Not that Birkerts does not also trust to rational analysis—he does, indeed—but he knows that intuitive

and analytical insights are complementary.

Coming to completion now are his Corning Museum of Glass, in Corning, New York, the Addition to the Law School of the University of Michigan, at Ann Arbor, and the Duluth Public Library in Duluth, Minnesota. Beginning construction is his United States Embassy in Helsinki, Finland. Thus Birkerts is observing his 30th year in America, and his 20th in private practice (following his 1950s "apprenticeships" with Eero Saarinen and Minoru Yamasaki) by completing and beginning a group of buildings that are quite clearly of international distinction for their craft, the passion of art and symbol and metaphor that is given off by them, and for the care with which straightforward functional requirements have been met.

Color is in this work, and texture. The buildings, however smooth, sleek and gleaming their geometric character may be, however assertive their symbology, however "modern," seem to have some kind of memory about them, as though a cumulative cultural achievement or a cumulative social concern were skillfully summarized by their presence.

Visiting Birkerts at home in Bloomfield Hills ("I like it there because I can still hear my own heart beat"), one may chance upon two precious volumes, bound with leather, linen, and metal trim, *Latvju Raksti*, and opening them, one comes upon a vividly illustrated history of pattern, color, texture, culture and custom in his native Latvia. Clearly the road from Riga to Michigan, and from the Saarinen years to his present stature, has been a winding but finally clarifying search for Birkerts—and without hesitation, he acknowledges that it has been a search for personal and spiritual equilibrium, as much as for a way or style of building that is "right" for him:

"I realized, back with Eero, that I was beginning to be guided by the subconscious and the intuitive; in fact, I am still not conscious of every line I draw as the spontaneous combustion of creativity starts happening," says Birkerts. "Around Eero, I was dumbfounded by the craft and meditation he put into things—and the painstaking modeling; I tended to be quiet and inconspicuous, getting into the habit of privately, intensely visualizing design, not making models to test out every detail. I still have to use all my strength to do this visualizing, and I go through periods of tremendous compression when this occurs, when the release comes.

"Of course, you have objective facts and functions to consider when you're designing—all quite pragmatic (my clients are all quite pragmatic). But within these facts and functions, coming out of the situation of the site, climate, the spirit of the people and their objectives, there does come a certain essential character, a poetic image, you might say. You have to realize that, look for it, respect it. Then you get back to available technology, the means of your 'reality,' but because of such subconscious, intuitive probes, your 'reality' is all the more real to you and, I think, it will be to others. I do not want to design

buildings just for today. You can always make points by solving immediate problems 'adequately.' But that kind of opportunity is expendable."

Even as Gunnar Birkerts leaps back and forth between inwardly formal gleanings and outwardly functional and programmatic limits, certain key themes have come to the fore, and these are evident in this recent work—dramatically so in Calvary and IBM. These themes include an appreciation for the inherent elegance (and economy) of simple geometric forms and for simplified but immaculately sewn garb for the geometry to "work" in—the "skin" that acts as a foil to the inner structure and outer setting of the building. Another theme is a preoccupation for natural light, and he is constantly coming up with fundamentally fresh yet seemingly unforced ways to let natural light in, and in ways that make it seem as if the buildings themselves are the light source.

Letting it in at Calvary and IBM is not technical contrivance but—with its softened, diffuse reflectivity—a matter of quietly commenting on a practical and symbolic element of the architectural experience. At the church, this light and these reflections are more evidently symbolic, but this is not to say that IBM is without spiritual and cultural ties: In a poignant way, IBM is a breakthrough to the best instincts of both a local and national past, even as the energy-conserving ethic may have engineered it. This is the past of Henry Ford and of the industrial and mechanical memorabilia he was boyishly obsessed by, and the past of Thomas Edison, in whose honor Ford set up an institute in nearby Dearborn 50 years ago. How deft the symmetry of this building, coming 50 years later (and a hundred years after the light bulb itself). And how knowing, Gunnar Birkerts' leaving such a high-caliber tolerance for human and sensory qualities in the course of assembling such a precisely engineered "fixture." What might have been merely exacting and efficient, dispassionate and iconic, is an extrusion of the emotions of our era.

IBM SOUTHFIELD CENTER, Southfield, Michigan. Architects: Gunnar Birkerts and Associates—William Wolfe, project director; Barbara J. Bos, interiors; Gunar Ejups, director of field supervision. Engineers: Skilling, Helle, Christiansen, Robertson (structural); Halpert, Neyer & Associates (foundations); Joseph R. Loring & Associates (mechanical/electrical). Consultants: James C. Scott & Associates (landscape architecture); Wolf & Company (costs). Contractor: Darin & Armstrong.

THE CALVARY BAPTIST CHURCH, Detroit, Michigan. Architects: Gunnar Birkerts and Associates—Charles Fleckenstein, principal-in-charge; Barbara J. Bos, interiors; Gunar Ejups, director of field supervision. Engineers: Skilling, Helle, Christiansen, Robertson (structural); Halpert, Neyer & Associates (foundations); Hoyem-Basso Associates (mechanical/electrical). Consultants: Geiger & Hamme (acoustics); Wolf & Company (costs). Contractor: A. Z. Shmina & Sons.



HOUSING AND COMMUNITY DESIGN FOR CHANGING FAMILY NEEDS

Next month in New York City, the Legal Defense and Education Fund of the National Organization for Women will sponsor a National Assembly on the Future of the Family. RECORD editor Walter F. Wagner will chair a panel on new environments for new family needs. As a source for this event RECORD recently held a Round Table which examined current and proposed housing and planning policies in the context of the changing needs and self-perceptions of women and families. Our aim was to try and determine the architectural and planning consequences of these changing concepts of single and family life.

Today in the United States, 44 per cent of the mothers of children under the age of six are working and only 7 per cent of existing families are traditional nuclear families in which the man is the sole wage earner and the woman the full-time mother and homemaker. Nearly half of all two-parent families in America are "two-paycheck" marriages. An increasing number of households consist of dual-career couples without children. More divorced or widowed women are becoming full-time workers. The number of elderly is increasing. Further . . .

At the same time that the fuel shortage should be dictating construction at higher densities, suburban sprawl continues. Without regard to these demographic and economic facts, suburban houses and urban apartments are still being built to designs and located in community patterns and densities which more or less suit the traditional, auto-dependent nuclear family. The RECORD Round Table of architects, planners, social scientists and writers suggested that architects, planners and developers must begin by ridding their minds of the female-home maker stereotype and her stereotypical family.

Patricia Carbine, who in her role as publisher and editor-in-chief of *MS Magazine* has long been putting female stereotypes to rest, said: "We are finished with the idea that the house is primarily the responsibility of the woman. As women we have reached the point where we understand and want to share with our families the understanding that the place where we live is the place where we *all* live and where we are all responsible. The duties performed in the house are not the function of helping the women but of helping each other in a shared way—literally taking on the responsibility for the running of that dwelling; and I think to approach the whole question of the future with any other notion is exactly wrong."

Like Ms. Carbine, focusing upon woman's true needs as shared with her household, was architect and developer Lynda Simmons, executive vice president and director of development for Phipps Houses, a non-profit, philanthropic corporation which provides model housing at moderate cost for moderate- and low-income families. Said Ms. Simmons: "I would like to make an ideological point—I think for me as an architect, a feminist, and a developer with some influence over this process, my goal is to create housing that will allow individuals—men, women and children—to fulfill themselves. I don't think in terms of 'What does the woman need?' What I am interested in is, how can we create dwelling units in which the people who live in them share the responsibilities? How can we design physical arrangements which don't interfere with that sharing and don't create second-class-citizen status for the women and girls. For instance, what is wrong with interior kitchens, which are black holes of Calcutta, is that the men won't go there. If women think that men are ever going to take over their share of household

chores and everything else, as long as such kitchens exist they are wrong. We have to eliminate things that create inequities in social relations and thereby interfere with social relations. The stereotype kitchen is the separated kitchen; the stereotype person is the one who is supposed to go in there and work.

"The problem for designers is, how do you create spaces in which many different kinds of households can function. I believe that we must create units that are usable over time by different sorts of households at different stages of family or non-family development."

Ms. Simmons' concept that dwellings must be designed to be usable over time was reinforced by environmental psychologist Dr. Sandra Howell, who is a member of the faculty of the School of Architecture and Planning at M.I.T.: "I am particularly concerned with some of the stereotypes that lead designers and developers to believe that the family does not change over time; that people do not grow and develop; that what is established as a household for a family that has very young children is not seen as a household that has to be modifiable by the members of the family as they change and grow. To assume that once a person is 'there,' he or she is always there, is to create another stereotype.

"We must not segregate by stage in the life-cycle. I am increasingly distressed, and I am really paraphrasing the late Margaret Mead, with the tendency in this society, perpetuated by developers in the private sector as well as the public sector, to say, 'This is all for the family with five kids; this is all for young couples, or singles; this is all for empty-nesters; this is all for old people.' If you had 600 units full of adolescent boys, would you not call it an institution? And yet we are allowing, in the public sector and in the private sector, that many units all on the same site, all clus-



Patricia Carbine, publisher and editor-in-chief, *MS Magazine*

Muriel Fox, executive vice president, Carl Byoir & Associates, Inc. and president, NOW Legal Defense and Education Fund



"We are finished with the idea that the house is primarily the responsibility of the woman. We now want to share with our families the understanding that the place where we live is the place where we all live and where we are all responsible."

—Patricia Carbine

tered, for people over the age of sixty-five. I think this is part of the stereotyping. We allow a false notion of preferences to be used to form the societal goals for which we design."

If stereotyped dwelling units are being built to fit stereotyped families, who is paying attention to the real housing needs of real people? "Almost nobody," said several of the panelists. Dr. Howell put it strongly: "It seems to me that housing is often designed as though preferences were needs. When a family goes into the marketplace to look for a home, they really typically do not have free choice. Yet the way they choose is then taken by a marketing expert and read as a matter of preferences when it is a matter of constraints.

"We don't know the answers as to what families need as they change, what women need as they change; and I use the word 'need,' rather than 'preference,' because we have to look at human behavior. I am a psychologist, and I don't think we are looking at behavior in a way which evaluates the match between house and people."

And women must learn how and when to articulate their needs. Said Ms. Carbine: "One of the things that has been wrong and has created the problems, is that important users—that is to say, half the population which happens to be female, have not been included in early policy planning, in early development planning, in the whole question of how dwellings get designed and used. I think that if we do nothing else here, we ought to agree that women have to be included in policy planning in the future, in order to overcome some of the inherent problems in having policy set by people who have vested interests in not staying in the dwelling."

Architects who are women can make more difference than they think. Said Ms. Simmons: "I think that many things in many apartments would never have

been built or designed as they are if they had been designed by women. Male architects, because they aren't at home, have not had the experience of taking care of the kids, taking care of the house. Men talk to each other when they are designing houses and they don't make a point of getting women to go over the plans. One of the things that HUD could do would be to require in the design review process that every job be assessed from the standpoint of the homemaker.

"You have all these regulations about the handicapped, who are five per cent of the population. What about women, who are fifty per cent of the population? We now have ramps in buildings because there are a few handicapped people—when women with shopping carts and baby carriages have been pulling those damned things up steps for generations."

Much of the research on needs is done from too limited a perspective, according to Dr. Howell, who used current literature on energy conservation in the home as an example: "You discover a very peculiar definition of the American lifestyle, which concludes that the American family will never be willing to give up its picture window; never be willing to have the north side of the house without windows, and never a common wall. That isn't the American way, the reports tell us—as though the American housing consumer actually made the original decisions as to how tract houses were going to be built. Again I think that until we really begin to approach the decision-makers and confront them with who the American family is and what their major interests behaviorally are, we are going to get this peculiar mythology as to what the American lifestyle is all about."

If the needs and preferences of real households were met, what could houses and apartment units be like? Architect and



Betty Friedan,
author and feminist

author Susana Torre has done extensive research and documentation in the field of domestic design. She has recently received a grant from the National Endowment for the Arts to develop architectural and infrastructural criteria for housing which reflects the changes in family structure of present day society. "The kitchen I have in mind," said Ms. Torre, "would, in its most radical version, probably look more like a restaurant kitchen with everything hanging out. Everybody in the house could just take things and use them and put them back where they found them.

"When everything is tucked neatly away behind closed doors, the appliances and the objects somehow have to be organized by one person, usually a woman, who knows where everything is—and often this lack of accessibility and visibility is not the best way to promote ready cooperation on the part of other members of the household.

"There should be a central storage room, or stockroom, in the house, even where there is a limited amount of space. There are commercially available storage units on casters. Everything can be made very compact, as long as you have a two-foot-six-inch aisle in the middle where these things roll. Everything that has to do with maintenance and cleaning would be readily available and visible for all to see, thereby freeing some of the closet space in the individual rooms."

Several panelists suggested that guestrooms, not included in the dwelling units, could be located elsewhere in large developments. Ms. Simmons reported that Phipps Houses has included such rooms in hospital housing it manages to handle the flow in and out of doctors and patients' relatives. Larger developments can also have community rooms and kitchens to be rented out by the tenants for larger gatherings.

Individual apartment and dwelling units, however, will

George Grier,
demographer and policy analyst



"When a family goes into the marketplace to look for a home, it must choose among limited alternatives. The house the family selects is then assumed by marketing experts to reflect its preference rather than its narrow options."

—Dr. Sandra Howell

probably continue to become smaller, but as Ms. Simmons pointed out: "We need to use all the design tricks we can to increase the illusion of space—large windows, low windowsills, light colors. There are corners and alcoves that can be successfully furnished separately. In other words, the more you get away from or can vary the rectangular room by putting corners and odd little spaces to use, the more you are providing the ability to carry on different sorts of functions. Such an alcove can hold either a giant stereo set or it can have a daybed or it can have a screen around it and, if it has a window, it can become another room. These corners add little to the total amount of square footage. We don't get these spaces because, unfortunately, architects tend to like to draw straight lines. Corners and alcoves are a relatively inexpensive way of meeting all these needs, and I think that builders who have incorporated them would testify that it increases marketability.

"I think, furthermore, that large developments should be planned in such a way as to increase feelings of neighborliness. In a huge development of ours, I put only six apartments on each floor, so that there is a sense of intimacy on a small scale, despite the fact that the building itself has 900 apartments. People appear to like their neighbors if they don't have too many of them."

Although the housing developments architect Simmons plans and manages encourage neighborliness by their spatial arrangements, she doesn't believe that social relationships can be enhanced by physical design alone. Better social organization, she believes, must provide the human benefits once found within the now-vanishing traditional family. "Something I have been after for years," she told the panel, "and have finally succeeded in doing, has been to hire full-time person to be what we

call a community development specialist—someone who helps create the social organization within the building, especially when people are working, especially when people are under the pressures of being poor. HUD has approved such a post for subsidized housing throughout the country. Now everybody wants to move into our buildings. They are organized by floors. We have committees that work on the youth center; committees that work on joint suppers, where we have 200 families in the back yard bringing down covered-dish suppers and cooking chafers. These committees tell us what is wrong with the management, and they work with teen-agers. They have a tenant patrol.

"We made physical as well as social changes. We put a fence around all the grounds to keep out the junkies and all the other people who cause trouble. The grounds now belong to the tenants. We built a youth center, which was not part of the original HUD program, and we did all this with HUD's cooperation. It is a pilot project. We now have people working on all these things. We have people relating to each other. We have older people coming down two or three times a week and spending an evening with their punchbowl and bridge, having a great time. The teenagers who tried to destroy the building when the blackout occurred two years ago are now helping the old people get in the groceries."

Ms. Simmons' demonstrations of the way a well conceived and implemented social service system within large developments leads to greater community participation by the tenants led to a discussion of another kind of participation—self help.

How much planning should architects, planners, and builders do, and how much should they leave to the users? Should the users have more options than choosing color schemes and



Eunice Grier,
socio-economist

Dr. Robert Gutman,
professor of sociology,
Rutgers University
and professor of architecture
and urban planning,
Princeton University



pushing furniture around? How much does the developer have to build? Shouldn't we allow people more room to act on their own and develop their own environment within a framework? Should we build loft buildings?

Said Ms. Simmons: "There is a market for that, but I think it would be a mistake to say that should be everything, because if you have a couple of small kids, the last thing you want is one big open space. You have to have rooms with doors.

"The whole New York City loft phenomenon, however, really indicates that there is a tremendous unmet need here of people wanting more spacious surroundings. In the old days many people could afford them, but now you have to be rich."

Self help is a particular interest of Louis Sauer, architect and chairman of the Department of Architecture, Carnegie Mellon University: "I am an advocate of people being able to choose and intervene for themselves with a minimum of professional help. I want to get architects out of housing. Maybe it will take a hundred years—because it is obvious that there are many people who choose not to intervene for themselves in housing.

"We have the most sophisticated housing self-help industry in the world in this country; but we cannot build a house and leave most of it unfinished. This is because the valuation given in the mortgage is going to penalize the developer for doing this and certainly in HUD it wouldn't even qualify—so forget it!

"The problem is rooted in the institutionalization of codes. Everybody can get in their two cents worth on what is business for them by lobbying to get a code change, so there is no regulatory system over the codes."

Architect Danforth W. Toan continued: "Self-help programs, unfortunately, require two things: one is initiative, and the other one is money. You have to have your own financing to do it,

"Can housing be conceived as helping the economic development of the people who are going to live in it? Can it be a way of learning construction skills, for example, especially for women?" —Joan Forrester Sprague

and that limits it to the upper-middle-class to a much larger extent than it should. We must find a way in which banks would risk brownstone adaptations by lower-middle-income people as in the Park Slope part of Brooklyn. But the financial institutions obstruct this process terribly."

Architect and feminist Joan Sprague asked: "Can housing be used as economic development for the residents who are going to live in that housing? Can housing be used as a way of learning skills, especially for women who may be interested in construction skills and don't really have access to learning them?"

Ms. Carbine was realistic: "Let me speak from the point of view of a lending institution. I am going to give you \$20,000, and if you don't pay me back, my only recourse is to repossess the house and sell it to somebody else. Then I have got to have a house that I can sell to somebody else for the amount of money that I loaned you.

"So until we have an increase in the level of skill and sophistication of the people who are supposed to be doing the self-helping and self-modification, it is not going to work. And it has to be recognized that this is one of the longer-range things that requires starting small, and a lot of education, not just for the banks but for the people who are going to do it, because right now very few can do it."

Moving up to the scale of the community: What kinds of urban and suburban environments do we want today and what are our chances of getting them in the next decade? Dr. Robert Gutman, professor of sociology at Rutgers University and professor of architecture and urban planning at Princeton, suggested that much that we are asking for may indeed come about: "I don't want to seem like a Pollyanna, but it seems to me that there are a lot of things happening on the American scene at the moment which suggest that some of these

things we are asking for are much more likely in the near term than they have been in the past.

"Not only is the gas shortage compelling people to think about higher-density land-use, but the whole environmental movement which we have been experiencing for the last decade is also encouraging people to think of a more economical use of land. This implies more compact development. I think the fact that housing costs have been, for some time now, rising faster than personal income—the reverse of the situation that occurred in the decade following the war—means that people are thinking of new ways of saving in the design and construction of housing.

"Then there's the general concern about improving the quality of life, both for men and for women. This is getting people interested in the idea of better community facilities, child-care facilities, and so on. I don't want to minimize the difficulties that we all struggle with on a day-to-day basis. But I think there are certain long-run cultural changes, at least in the area of the suburban housing I deal with, that suggest things are looking up in many respects. We need more push and more resourcefulness, however, in trying to find specific ways of translating some of these cultural dispositions into practical policies. But the public support may be forthcoming.

"There was a recent curfew in Levittown, New Jersey. The reason for the curfew was that the previous night a certain number of the residents of Levittown rioted and burned down some of the local gas stations, and also blocked the main traffic artery.

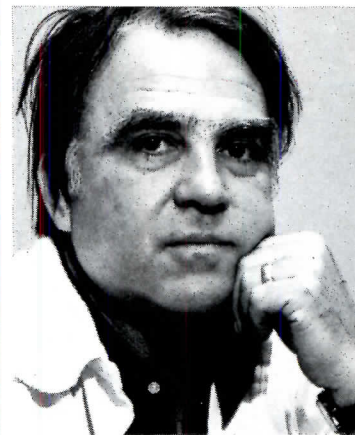
"Is it conceivable that these people who are embittered—and with good reason, because they really depend upon two cars in the garage and the availability of gasoline—will now see the wisdom of some kind of new housing policy that will argue in favor of higher density?

"I think the way that ques-



Dr. Sandra Howell, environmental psychologist, School of Architecture and Planning, M.I.T.

Louis Sauer, architect and chairman of the Department of Architecture, Carnegie Mellon University



tion is answered over the next decade has a lot of implications for whether the things we are talking about are viable or not." **Although the forces outlined by Dr. Gutman may indeed point the way to higher density land use in new housing construction with all the community services and amenities concentration makes possible, what can be done to adapt our existing housing stock to today's needs, such as the requirement to save energy?** Socio-economist and energy specialist Eunice Grier reminded the panel that "one of the things we have to face up to is that we really did a marvelous job during the 1960's in building housing in this country, and whatever problems there are with that housing—we do have comparatively new housing stock. How can this housing be adapted to meet the needs of the kinds of households we have today?

"During the first part of the 1970's we built more housing units with seven rooms or more than any other individual-size housing. So our newer housing is also larger housing.

"We have to take into account what is happening to energy costs. Much of the housing we have now is built to extremely inefficient energy standards. Houses are poorly insulated; layouts are bad; the locations are bad. They are low density. Where the big item for low-income people might once have been the rent or the mortgage payment, today, the energy bill is getting to be at least as large as the mortgage payment or the rent. One wonders what a lot of these families are doing for food, because, once the rent and the utility bills have been paid, there just cannot be a great deal left over.

"Furthermore we are not getting to be a more densely populated country. We are getting to be a much more spread-out country, particularly in metropolitan areas. Between 1950 and 1974 the metropolitan popu-

"The big item for low-income people was once the rent or the mortgage payment. Now the energy bill is getting to be at least as large as one or the other, and maybe in the coldest months of the year can be even higher."

—Eunice Grier

ation of this country grew by 79 per cent; but during the same years the growth in metropolitan and area in square miles grew by 17 per cent. This has caused a tremendous increase in average daily vehicle miles.

"Our most numerous housing type is the most energy-consuming—the single-family detached house. These are in place, and it is going to be a while before we can turn over to some other type—if we ever can—that might conserve more energy.

"Even the rehabilitation that is going on now in a lot of inner-city neighborhoods—so-called gentrification, which can be very attractive—uses more energy. A young professional who buys an old house previously occupied by several low-income families, tears it all out and reconstructs it, putting in some big skylights and enlarging some windows, may thereby consume more energy than the previous occupants.

"Income is another important factor in energy and conservation. The higher the income group, the more energy it consumes. Poor households are already pretty close to the limit of what they can do to reduce their energy consumption. They are already using fuel only for the essential elements of life."

How bad is the fit between what our real housing needs are and what is being produced today? According to Dr. Gutman: "The situation today has declined from the standard set just after the war. Then we saw development of new housing types, new kinds of settlements to respond to the new family formations of the veterans who were coming home. The American housing market at the time, with a good deal of support from the Federal government through Federal mortgage policy and fairly liberal land-use policies, was able to respond to that need and to convert that need into effective demand.

"But for the last decade or so housing production in the

United States has been stalled. That does not mean we haven't been producing new housing. But developers have not been in a position to produce the kind of housing which the public would want to buy if it were available.

"You can see that very clearly, I think, in the development of housing forms. The suburban housing form has been locked into the same basic builder's colonial in all parts of the country now for the past decade. The only hopeful sign has been the generation of townhouse developments.

"As we know, multi-family housing is the part of the housing market that manages to support the volume of housing stock that we have now. It is not a problem of the developers. The developers would love to build the kind of housing that would respond to the things that we have been talking about, simply because there is a potential market for them. As we have been saying, there are millions of people who perhaps would like to move, even though they don't move, at the ages of fifty and fifty-five. But there really is nothing for them to move into that has the advantages, both economically and physically, of what they presently live in. The same is true of young people and all these new households that have emerged. For the most part, the housing just is not available for them.

"So in New Jersey we find ordinary fifty- and sixty-thousand dollar suburban houses being occupied by single middle-income males because these are the only places they can find in the area where they want to be. And, of course, there are similar mismatches in the case of single-parent households and households of people living together. There is enough money around so that housing can be bought, but it really is a case of bad fit.

"At some point I hope the question we will tackle is, how can we loosen up the situation? What is standing in the way of



Mildred F. Schmertz,
senior editor, ARCHITECTURAL RECORD

Lynda Simmons,
architect, developer
and executive vice president and
director of development for
Phipps Houses



giving developers and architects and the other people in the building industry the kind of support that would make it possible for them to respond to this potential demand? It is not the developer; it is not the architect; it is not the purchaser. There are other policies that are operating in our society that are preserving this mismatch, and it is these that we have to address ourselves to."

Those who suffer the most from the mismatch between their needs and the available housing are the old, the poor, the single and one-parent families, most of whom are women, and those who must rent, many of whom are young and just starting out. George Grier, demographer and policy analyst, is deeply concerned about our accelerating loss of rental housing and apartment units. "We are not building rental housing at nearly the rate we have to use it. We are converting much of what we have to condominiums and we are rehabilitating much of the older rental stock of our cities into either single-family-occupancy townhouses or into condominium status.

"But what is concerning me also is that we are simply doing away with the whole rental class of housing in this country, which is going to do almost unlimited damage to some of the things we hold most dear, including mobility. Once we have done with our rental housing stock—and we are doing away with it at a very rapid rate in this country—young people will no longer be able to move freely from one place to another.

"One of the main reasons we are doing away with rental houses is the tax incentive for house purchases. Unfortunately the people who can give mortgages believe that only certain people are worth giving mortgages to. So that is really not an open option for many people."

Architect Toan pointed out that: "Our big problem today is that houses typically have been

“We are doing away with the whole rental class of housing in this country, which will do unlimited damage to our mobility. Young people will no longer be able to move freely from one place to another.” —George Grier

designed for the two-parent family, which is no longer in the majority. We must pay attention to the problem of the one-parent family, because that is where the dysfunctional aspects of the house become most critical.”

Mr. Grier agreed and supported Mr. Toan's assertion with demographic facts. “We still think in terms of the family-centered household, but a very rapidly-growing number of households do not contain any families. As a matter of fact, between 1970 and 1978, which is the last date for which we have census statistics, 56 per cent of all household growth consisted of non-family households—whose members are unrelated, and who don't have children.

“That, I think, poses a whole different set of questions for designers. How do they take account of the needs and lifestyles of such households? There may be several women living together, several men living together, men and women living together, and there is a lot of popular stuff about that, which overshadows the fact that much of this is a matter of economic necessity. Much of this is adaptation to changing needs and changing housing availability in society. But our units are not designed for non-family households at all.”

Nor are they designed for people living alone. Author and feminist Betty Friedan presented even more startling figures. “Only seven per cent of Americans are now living in the kind of traditional family for which almost all housing, both public and private housing, has been built: mom, pop, and the children—and then mom, pop, and the grandchildren.

“The significant increase that is changing the population mix is people living alone—divorced, widowed, single. In addition to people living alone—i.e., one unit, one-person families, if you want to call them that—one person in need of family, there is



Allene Joyce Skinner,
director, Women's Policy
and Programs Division,
Department of Housing and
Urban Development

Joan Forrester Sprague,
architect and founding member
of the Women's Development
Corporation



an increasing number of couples. While fifty per cent of marriages end in divorce, most of the divorced people do remarry, so the couple is still quite a large demographic unit. Except for the couples, the common denominator for all these people is isolation. The way to break through this isolation is to change the housing built for the individual unit alone. We have to open out the walls, but not just inside the apartment or the house for sharing the housework. We have to do something that is much more difficult for Americans—broaden the concept of family to encompass the needs of all of the great majority now who need space to get out of isolation by the sharing of certain functions. We will be breaking new ground, because there is no model anywhere. The only model you can get usually has something to do with college campuses. Consider the Marlboro Music Festival or look a little bit at the experience of Leisure World which, no matter how it has been criticized, has met needs of older people.”

Representing HUD at the Round Table was Allene Joyce Skinner, who is director of the Women's Policy and Programs Staff, Office of Neighborhoods, Voluntary Associations and Consumer Protection for the agency. She augmented Ms. Friedan's argument with significant data on the number of women living alone. “In 1976 there were 18 million women who were heads of households. We don't have data specifically on how many single fathers or other individuals were living alone, but we know that the tendency is greatly increasing. Yet we are continuing to build the kinds of housing units that interfere with their ability to have the kind of shared living that several of you have talked about. That is a great concern of some of the people in HUD.

“As economics of housing price more and more families out of aspiring to home ownership, or even being able to afford to

rent unsubsidized housing, it is women who are most affected. Out of the eighteen million women who head families in this country, for example, one-third live below the poverty level. How much housing can you buy if your income is \$3,000 a year?

“There is a popular myth that women control the wealth of the country. However, Margaret Griffin reported in recent testimony on the Hill that only 61 per cent of American women, compared with 92 per cent of American men, had income from any source. Among those with income, the average income for men was \$9,289. But for women it was only \$3,799.

“As we look for solutions to their housing needs, we have to keep in mind that there will have to be solutions that take into consideration the economic status of the 24 per cent to one-third of American families that are headed by single parents who are women, and who are at or below the poverty level.”

Women with jobs who have children, even those who are neither single nor at the poverty level, can expect their ability to pay for available housing reduced by the energy crunch. Architect Toan pointed out that “such women are usually relegated to jobs that are close to the home, usually in a service industry at relatively low pay. These jobs are unstable. I think many two-income families are going to find that their second incomes are going to dry up as the mobility of the population decreases, particularly in the suburban area.”

Muriel Fox, executive vice president of Carl Byoir & Associates, Inc. and president of the NOW Legal Defense and Education Fund reminded the panel that, today, the prices of homes are based upon two incomes per household. What is to become of the single person, man or woman who can find no place to rent yet cannot buy?

George Grier argued: “If w

“As the economics of housing price more and more families out of being able to aspire to home ownership, or indeed to afford to rent unsubsidized housing, it is women who are most affected.” —Allene Joyce Skinner

believe that certain kinds of people must be accommodated in rental housing because it is the only kind of housing they can afford, since they cannot make down payments, then we ought to be doing something about increasing the tax breaks for the development of rental housing.

“We must also provide increased funds for the construction of housing for the elderly, not just for their sake but because there are a very great many older people who are occupying housing that is too big for them and they are suffering as a result.

“They really don’t have an alternative. We ought to be providing alternative housing subsidized by the government. I propose differential subsidies, depending on the degree to which the community facilities, either already in the community or provided with the housing, are adequate.

“If the housing were sited in a place where its elderly occupants could get to the needed community facilities, then the subsidy would go up. It would have to, because the development would certainly be more expensive. This would be one way of promoting the construction of housing for the elderly within communities where the facilities are available. Alternatively, if the developer wanted to build the facilities and the government would subsidize him for that, either way the elderly would get facilities they need in conjunction with the housing.

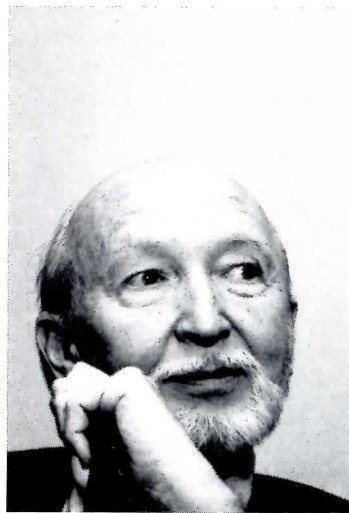
“Another possibility is simply that the government starts subsidizing the provision of basic community facilities like shopping, laundromats, et cetera, in locations where it would be convenient to the housing as an energy-conservation incentive. I think if we don’t do some of these things—and fast—we will inevitably come to the point where we are going to be subsidizing all housing, even for the middle class. It will not take us

very many years before that is the only way we can provide any more housing in America.

“Furthermore, in recognition of decreased resources, vastly increased housing costs, land costs, and finance costs we ought to provide a differential taxation for differential-sized housing in relation to the size of the household in the housing. In other words, if you have too many rooms for your household, then you get taxed more—relatively more—than the household that has fewer rooms per member. I know this is a very unpopular idea and there are some of us, myself included, who would suffer from it; but it would change the incentive pattern and would encourage development of smaller housing units.”

RECORD editor Walter Wagner expressed reservations: “I am worried about taxing too-large houses. Think of the older people who stay in their homes. It seems to me that they do this partly because of their feelings of belonging to their community, but also because of the fact that the house is paid for, so they are down now to paying taxes. Would it not be possible—or would it not be more palatable—to create incentives of that sort without laying the big tax on the existing homeowner?”

Mr. Grier agreed that this made sense and was probably the only way such a concept would become politically feasible. Dr. Howell, however, found the idea of taxing older people out of their too-large houses unrealistic and totally unacceptable: “Your parents and my parents may have houses that are much too large for them, but the majority of people over the age of sixty-five in this country own houses which are over forty years old. Most are no bigger than three bedrooms; more likely two bedrooms. There was a time in this country when the two-bedroom house was considered the family house. Most of the older home owners are low- and



Danforth W. Toan,
architect and planner



Susana Torre,
architect and author

moderate-income home-owners. Of the population over the age of sixty-five, approximately 70 per cent live in their own homes. They are working-class homes bought by working-class people in the thirties.

“More than economics forms older peoples’ attachment to their houses. We spent the entire 200 years of our past history making it a status symbol to be a homeowner—and then, all of a sudden, you are saying, ‘Let’s disenfranchise these retired people. They can no longer have the same status.’”

Mr. Grier insisted on his point: “I would agree with you that many older people do live in houses which, by the standards of housing that we have built recently, are relatively small. But they are still larger—three bedrooms, sometimes two bedrooms—than they need.”

Dr. Howell: “Who says so?”

Mr. Grier: “Many of those older people are saying so—and they will be saying so increasingly as the energy bills continue to go up. But they have no alternative. What I am saying is that we really need an alternative, and the middle-income housing that has gone up has been well planned, well constructed, and has consisted of smaller units usually with adequate community facilities for older people.”

June R. Vollman, associate editor of *Housing* magazine pointed out that “People do not buy housing the way they used to—to live in all their lives; houses that the children grow up in and the grandchildren, and maybe the great-grandchildren come back to visit. They buy them because they figure that within five and a half years, they are either going to move into a better house, or another kind of house, as their needs change. As the children grow up the couple moves into another house—that is what tract housing is for.”

Dr. Howell disagreed: “That is not true statistically. Statistics

“We all had our first houses as a result of the GI bill . . . should there not be such mortgages available today, for instance, for people after the age of forty or fifty to get financing for the different kind of housing they now need?”

—Betty Friedan

show it is just at the age of fifty to fifty-five that the mobility curve in the United States drops precipitately.”

Ms. Skinner suggested that policies be developed to allow elderly homeowners to remain where they are. “While the statistics of elderly living in small houses versus very large houses may not even be available, there are numbers of elderly who don’t need as much housing as they have in terms of their ability to pay the taxes on it and their ability to maintain it. This has been established by studies of housing occupied by elderly women which we have done at HUD. A policy which gives a combination of subsidies, incentives, and grants so that a person or couple still has a portion of the home to occupy but then has a small rental unit as part of it, would provide a flexibility that we need.”

Dr. Howell agreed: “It is an excellent idea; and, as a matter of fact, there are about eight such tiny pilot programs on that, and they have received inadequate publicity.” Mr. Toan told the panel that his local zoning ordinance has an unusual provision—that a house which is over twenty years old can be divided into a two-family house. “The estimates that have been made by housing study groups within our community estimate that, of the houses both over twenty years old and less than twenty years old, over fifty per cent of them have essentially two households living in them already.

“If we could break into this local institution of zoning and permit this kind of thing to happen on a much larger scale, we would have a chance to revive and to save, perhaps, the suburban community, because we would intensify the use and diversify the use.”

Dr. Gutman urged that more women get on zoning boards and gave an encouraging example: “I was adviser to a township in New Jersey that was consider-



June R. Vollman,
associate editor, HOUSING

ing a proposal from a developer for a 1,500-unit suburban town-house development, and I originally suggested to the planning board that they demand in return for their approval that the developer put in a series of community facilities, including a child-care center, as well as a library.

“Of course the planning board was already prepared to demand schools, but I had a very difficult time convincing them that they ought to ask for the other facilities. This development took a long time to get started and in the course of a two-year period a woman was added to the board. What I was struck by, the second time we went around on this, was that as a result of the views of the female member of the planning board, the township finally asked for the additional community facilities I recommended—and got them. The composition of these planning boards is a very critical matter. If women or men whose consciousness is raised with respect to these issues can be encouraged to serve on these boards, we might be able, at least on the suburban scale, to improve the quality of our residential environments.”

Ms. Simmons made the important point that what is needed for political impact is a “larger coalition, not just women, to get our ideas across, because the changes in government policy which we propose involve the great majority of the population. If we limit our attention to the needs of just women, we are not going to have the votes to offset the tendency for government subsidies to be cut out at every level and in every area. I think further that we must develop strategies which require very small subsidies, because we are not going to get large ones.”

Betty Friedan had the last word: “This was a good conference because women and the situation of women was not our only subject. We talked about families of single people, and single

people living alone, about men, about couples whose children are grown. I think that within the set of basic assumptions that America is built on, including respect for the individual and the need for roots and the need for family, with the woman now defined as a person, we could begin in a pragmatic way to make it possible and profitable for this system to design and build a new kind of housing to meet the new needs we have defined. There is even money from the new kinds of families over the age of forty where there are not any more little kids—and that money is just as useful to pay for housing as the money for that so-called family-forming that all the architects and the designers were geared toward in the past.

“My husband and I took advantage of the GI mortgage in my young married and home-making years with the children we all did. Otherwise we wouldn’t have had mortgages. We wouldn’t have been able to afford them. Should there not be such mortgages available today, for instance, for people after the age of forty, or even after the age of fifty, who may still have 35 years ahead of them? Can they get financing to have the different kind of housing that they now need?

“What we need to do here is something that a lot of us in the Womens’ Movement have had some experience in doing effectively. We have to change every one’s consciousness so that there will be a wide public awareness of the housing need and the demand. We will bring about new government policies and incentives and mortgage arrangements which will recognize the kinds of populations we now have. Once we have the government initiatives our entrepreneurs will make the most of them—some will even make exorbitant profits, but that is absolutely fine with me if they build what is needed.”

—Mildred F. Schmertz

Walter F. Wagner, Jr.,
editor, ARCHITECTURAL RECORD





The Whole Grain / Dan Whitney



"The Bank" / Otto Baitz



In Season / Elliott Kaufman

THREE RESTAURANTS:

***Interior-design
diversity
meets the
marketplace***

Despite a growing pluralism in design approaches, architects can still hear accusations that they would force a sameness of appearance—especially for interiors—on an unwilling public. In truth, the diversity-seeking public may have not caught up with current events. Most recently, the results of the last Record Interiors program—in January, 1979—illustrated great imagination in architect-designed spaces of many kinds. And it is interesting to see in this article that same diversity in one interior type—restaurants, where compelling reasons for such differing designs can be explored in more detail. On the following pages, RECORD makes the comparison of three projects by different architects for clients with varying marketing goals—along with brief descriptions of other projects by the same firms that illustrate general design trends and directions for this specialized type of commission. Each project reflects not only the particular owner's approach to marketing, but it captures elusive qualities of ambience that may have bedeviled conscientious architects up until the recent era. —C.K.H.

The Whole Grain's architects have had diverse experience in the design of facilities for light eating

In three restaurants, the Whole Grain (shown at right), a McDonalds in San Francisco and Le Bistro in Cincinnati (photos below), architects Wudtke Watson Davis, Inc., have displayed an unusual mastery of a specialized area of design for the currently expanding types of light-food facilities. By contrast to the Whole Grain, McDonalds (bottom photo) is a fast-foods operation that the architects have made into something more special. Not only have they managed to restore an original facade, but they have provided seating for more relaxed eating on a new mezzanine with views of the activity below. By a keen understanding of the operation, they have turned the potential liability of the vertical arrangement into an asset. Protruding out of a narrow space into a hotel concourse with sidewalk-style tables, Le Bistro (photo below) increases its visibility and the options available to guests who may want a snack and/or may want the traditional hotel bar service. Given the not overly-lively character of such concourse spaces in many new commercial developments of many types, it offers at once a successful marketing formula and a generator of needed activity. Altogether, the types of restaurants discussed here cover a full range of light-food possibilities with style and design assuredness. And they represent a growing market for architects' work.



THE WHOLE GRAIN: FOCUS ON FOOD

In designing this restaurant in Cleveland, architects Wudtke Watson Davis have created a simple but theatrical environment where all eyes are on the appetizing displays. And they have created a particular imagery that tells in the presentation a lot about the food. The Whole Grain is the result of a program by client Stouffers to develop a prototype design that would bring older restaurants into line with both current ideas about simple, lighter foods, and about more self-service. (Here, the main business is lunch.) The architects were involved in everything from the prototype's name and the increased efficiency of the angled self-service



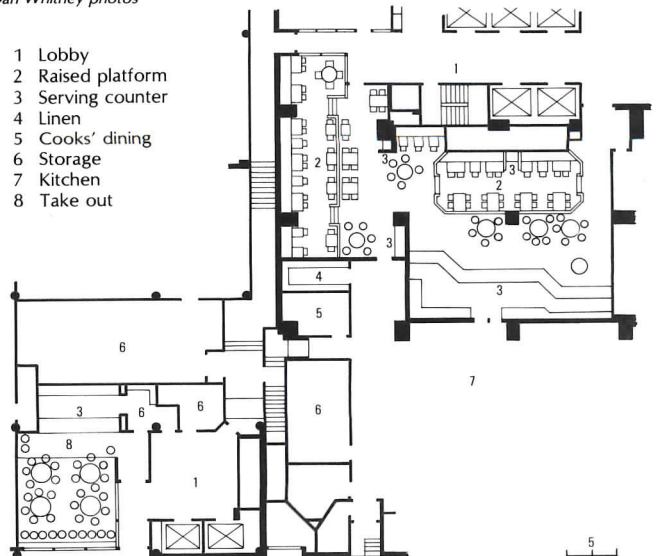
Dan Whitney photos

counters, to the design of the kitchen. A basic design problem was the space on the ground floor of a high-rise office building. It was the sort of leftover space that exists after higher rent facilities have been carved out on the desirable perimeter. An early decision was to program the remote area (bottom of plan) as a required take-out facility. In the main space, vertical existing obstructions were used to separate tables into more intimate groups—while still maintaining views toward the carefully arranged and lighted self-service counter. Due to the limited peak hours of operation, it was essential that as many diners be accommodated as possible without crowding, and this was accomplished by both a tight

seating plan, separated by level changes for privacy, and by the use of high tables with stools in locations where low seats would have produced a feeling of being closed in.

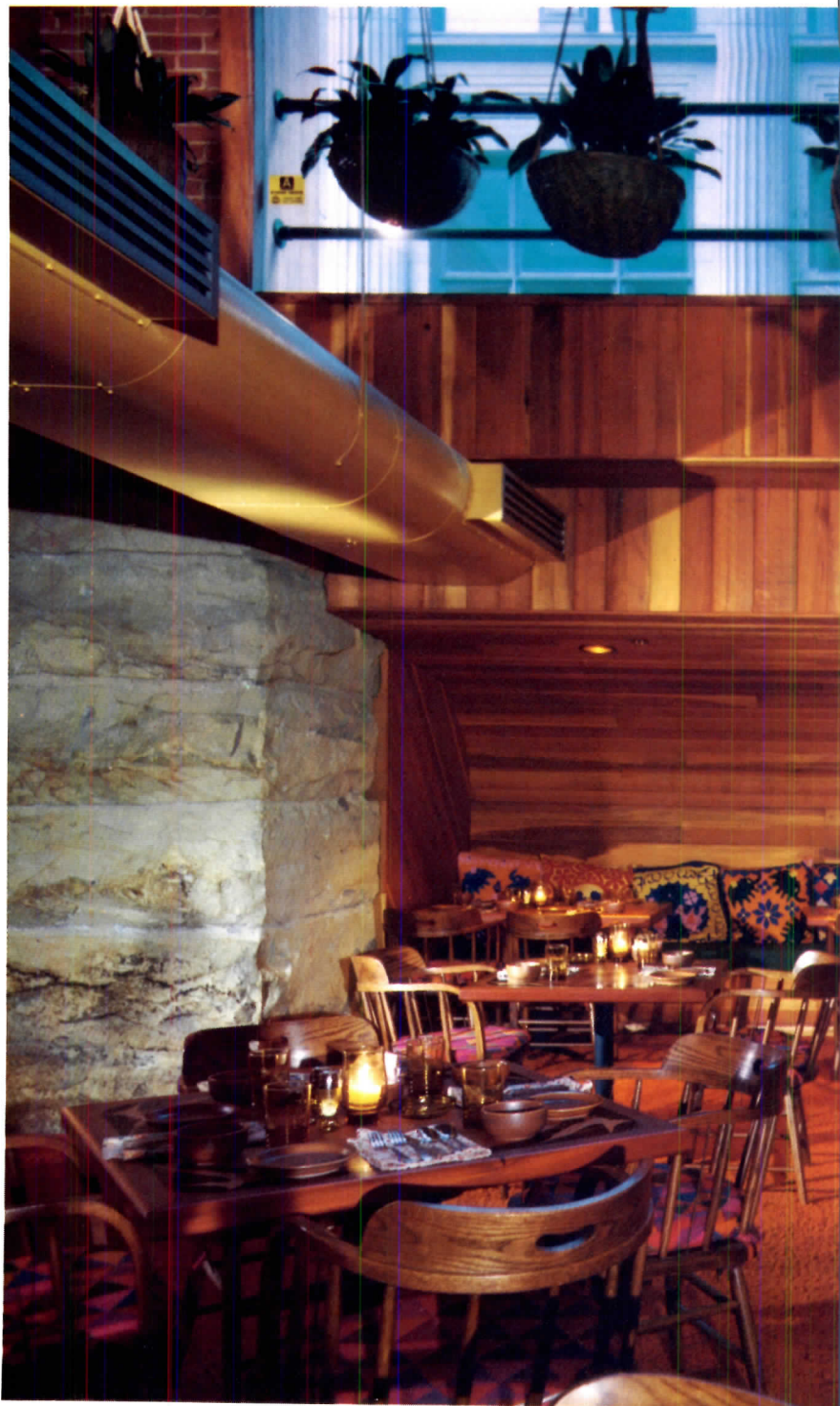
THE WHOLE GRAIN, Cleveland, Ohio. Owner: *The Stouffer Corporation*. Architects: *Wudtke Watson Davis, Inc.*—principal-in-charge: *Donald E. Wudtke*; design architect: *Will Adams*; project architect: *Dan Whitney*; interior designer: *Kit Cameron*. Engineers: *William and Hack (structural)*; *Denk-Kish Associates, Inc. (mechanical/electrical)*. Consultants: *Robert Green Design (interiors/graphics)*; *The Marshall Associates (food service)*. General contractor: *Schirmer-Schneider*.

- 1 Lobby
- 2 Raised platform
- 3 Serving counter
- 4 Linen
- 5 Cooks' dining
- 6 Storage
- 7 Kitchen
- 8 Take out



The Rusty Scuppers' architects know the formula for creating something for everyone in a full-service atmosphere

The Borel Restaurant chain's Rusty Scupper restaurants—as mainly designed by architects Edmund Stevens Associates—extend coast to coast in both suburban and urban locations. While the suburban facilities tend to be in new buildings like Stevens' ever-evolving prototype (photograph below), those in urban locations tend to be in existing buildings, like the ones in Pittsburgh (shown at right) or Providence (photo bottom). And they get a universal clientele for drinks and/or dinner. By now, Stevens has a good number of Rusty Scuppers under his belt, and—while being well familiar with such basics as the required ratio of kitchen to dining areas—he also knows how to create the kind of environment that satisfies the wide range of customers. Accordingly, the typical restaurant for the chain consists of a series of spaces and different levels that are open enough to each other so that diners can see the activity elsewhere without necessarily being in it. Natural light and growing plants create the sense of a special place. In furnishings carried out with Shari Stevens, there is a conscious effort to project an identifiable image (what restaurateurs call a theme) by use of American folk art that augments the exposed wood structure and sheathing. A good part of what Stevens describes as fun is making the most of rigid constraints.



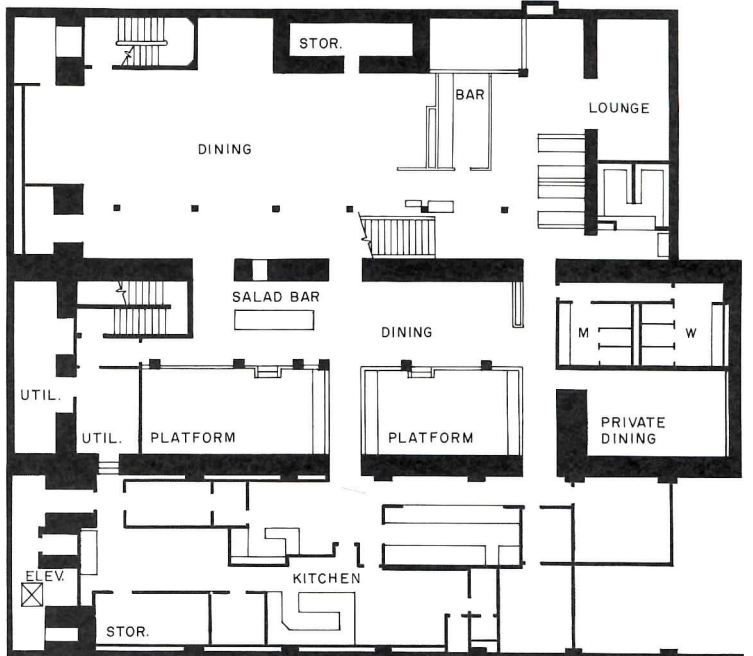
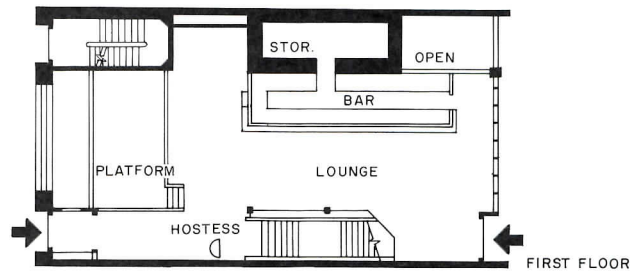
THE RUSTY SCUPPER: EATING AS AN EVENT



Located in downtown Pittsburgh, this installation for a national chain is the work of architects Edmund Stevens Associates, who have designed many Rusty Scuppers before (see column at left). It is part of an innovative development in a group of late-nineteenth-century former banks, appropriately named "At the Bank." Because the most economical space existed in the confines of basements in three adjoining buildings, the spaces had to be woven through dividing walls and up through the street-level floor of only one of the buildings, the old Mellon Bank (photo left). In order to maintain the chain's usual ratio of approximately one-third kitchen area



Otto Baitz photos



LOWER FLOOR

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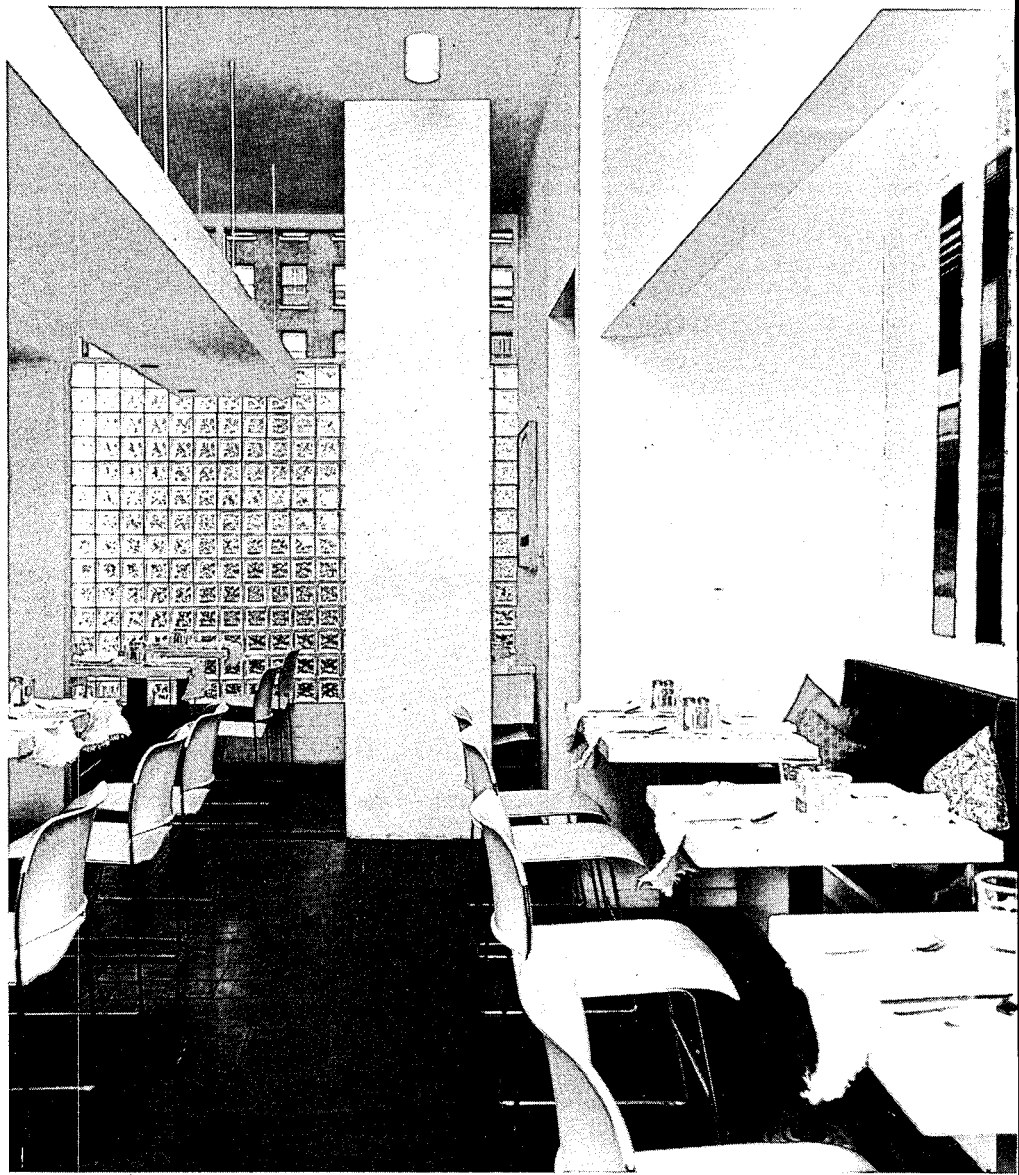
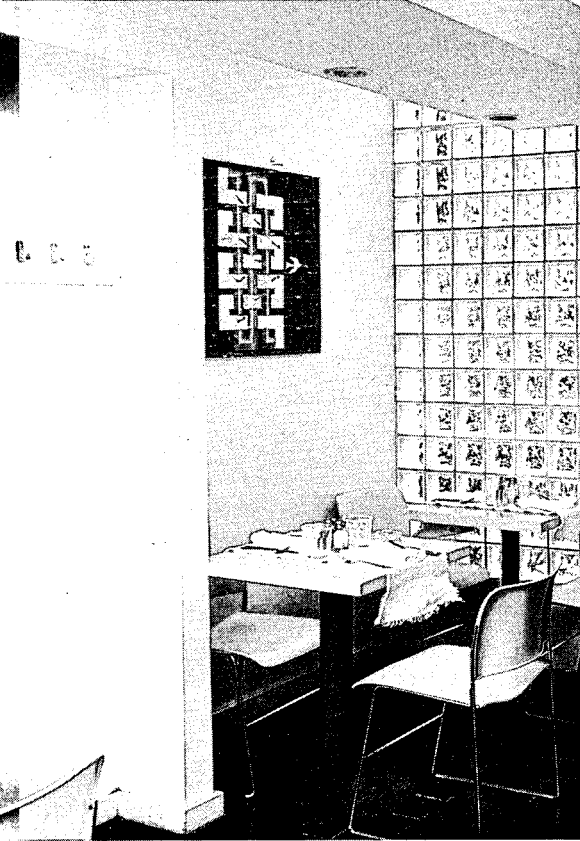
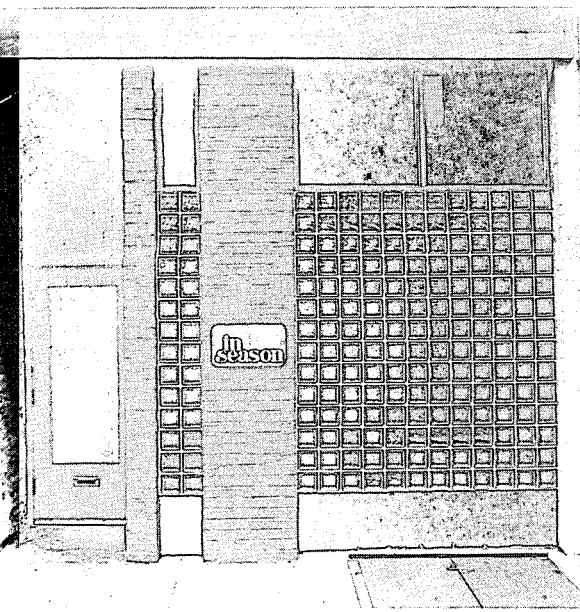
two-thirds dining area (which must be adjacent), both the dining rooms and kitchen had to be located in the basement. As a result, access to the kitchen is through an elevator under the sidewalk, and access to the dining rooms is through a street-level bar, which—because of its extreme popularity with the City's singles—has sometimes created a circulation bottleneck. Still, Steven's knowledge of the company's successful business formula has made the place into the "draw" that "At the Bank"'s developers had wanted.

The architects were able to incorporate elements of the gutted shell—such as riveted cast-iron beams (photo left, top) and exposed brick and stone walls—to achieve a

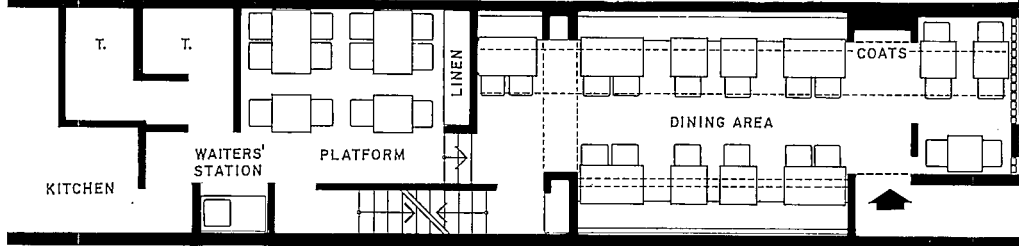
somewhat different sense of event than that on which the chain usually thrives (see column left). Avoiding intrusion onto the classic facades of "At the Bank" was a primary concern of the architects, while projecting the informal image of the restaurant onto the street.

RUSTY SCUPPER RESTAURANT, Pittsburgh, Pennsylvania. Owner: *Borel Restaurant Corporation*. Architects: *Edmund Stevens Associates—project architect: Gary Homan*. Engineers: *Charles Chaloff (structural); Associated Consultants (mechanical/electrical)*. Consultants: *Shari Stevens (interiors); Paul Bisno (kitchen); Richard Mannilla (restaurant)*. General contractor: *Barger Construction*.





Elliott Kaufman photos



IN SEASON: IN SCALE WITH QUALITY

Architect Oleg Krühly's work for the In Season Restaurant brings good design to an audience that is completely different from those on the previous pages: that which wants individually prepared high-quality food in an intimate ambience, and still at reasonable costs. Given a low number of seats (here 48), the importance of minimizing the cost of physical surroundings (and their contribution to the amount of the check) becomes all the more important. Accordingly, Krühly has proceeded with the barest of means to produce an intimate restaurant that is bright and crisp from the most unlikely of spaces. Previously a coffee shop with

a hokey shingled exterior, the space had been painted black to disguise proportions that were 4 times as long as wide. To seemingly make matters worse at first, Krühly took down a suspended eight-foot-high ceiling to make the 13-foot-wide space almost as high as wide. An existing air duct directly above the previous ceiling had to stay for budgetary reasons.

But despite the limitations of space and budget, the architect has succeeded in his goals by using a lot of what was there including the kitchen, lavatories, patched slate floor and even some of the original light fixtures with a coat of paint. Making judicious use of new materials, and the critical input of two other designers (one of whom installed the

completed design), he divided the ungainly length into three sections: a small group of tables and chairs at the front, a long section of tables with banquettes in the middle and a raised, intimate-height area near the kitchen. A visually-unifying suspended plywood "box" covers the air duct and contains down lighting over one row of banquettes.

IN SEASON RESTAURANT, Philadelphia, Pennsylvania. Owners: *Kenneth Silveri/Andrew Schloss*. Architect: *Oleg Krühly*. Design critics: *Everardo Jefferson, John Randolph*. Engineers: *David R. Wittes Consulting Engineers* (structural); *Joseph Schoet* (mechanical). General contractor: *John Randolph*.

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MEDICAL FACILITIES

BUILDING TYPES STUDY®537

Coming up this December is the second biannual awards program to recognize fine design in the health-care field. It is co-sponsored by the Graduate School of Architecture and Urban Planning at the University of California at Los Angeles, the Columbia University Graduate School of Architecture and Planning, and by ARCHITECTURAL RECORD, which will publish the winners next spring. Knowing that architects are increasingly intent on proving that fine design *does* pay in the most pragmatic terms, we are publishing three primers about this kind of "profitability." In a field where the client has often thought of "design" as pasted-on visual pleasantries, a lot of education must be done so that the less measurable (but no less beneficial) dimensions of design do not get hidden with the mops and pails. There are architects working mainly in this field who know all about mops and pails, of course, and the organization of tasks, personnel, tools, machines, and allocations of space is reassuring to the clinical, complex hospital "client" who is also strong on analysis but often not on synthesis. The buildings here are impressive on both counts—the Baldwin Community Medicine Facility of the Mayo Clinic at Rochester, Minnesota (above, overleaf); the Center for Preventive and Rehabilitative Medicine of the Daniel Freeman Hospital at Inglewood, California (page 120); and The Butler Hospital, at Providence, Rhode Island (page 124). None of these architects are resting on their laurels, and with respect to the awards program, their examples should inspire those who would like to have their own search for fresh architectural answers studied. Those who are interested in entering should write Harriet Gold at the UCLA Graduate School of Architecture and Urban Planning; 405 Hilgard Avenue; Los Angeles, California, 90024 (be sure to include \$50 to for the entry fee). Do this by October 31. You will be sent all the specifics about the content and format for entering your buildings. The entries (to be sent by November 30) will be gone over by a fine national jury. Not only do we suspect that a lot of new design talent and technical ingenuity will be revealed, but thinking strategically, all architects have a lot to gain by way of the leverage that such high-visibility excellence can produce. So enter—and not only those of you who have done a lot of hospitals already. After all, even experts would have to acknowledge that laurels, rested on, can turn into weeds. —William Marlin



The Baldwin Community Medicine Building, of the Mayo Clinic, by Skidmore, Owings & Merrill

The name Mayo means the best in medicine, but with the completion of its new Baldwin Building for Community Medicine, the name Mayo also means the best in architecture.

With the rest of Mayo serving an international (and not infrequently well-heeled) range of patients, this building—pulling previously scattered community-medicine functions together—is for the local crowd.

Baldwin is the work of Walter Netsch of the Chicago office of Skidmore, Owings & Merrill. Clad with subtly striated buff-colored limestone, it is located on the edge of the extensive Mayo complex giving a dignified, quiet, almost domestic edge to the neighborhood. Containing 112,000 square feet, with a seven-level garage for 575 cars just adjacent, it is one of the tidiest applications yet of Mr. Netsch's "field theory," his unique form of planning analysis that yields a geometric pattern based on human and functional relationships. This generates a multi-dimensional

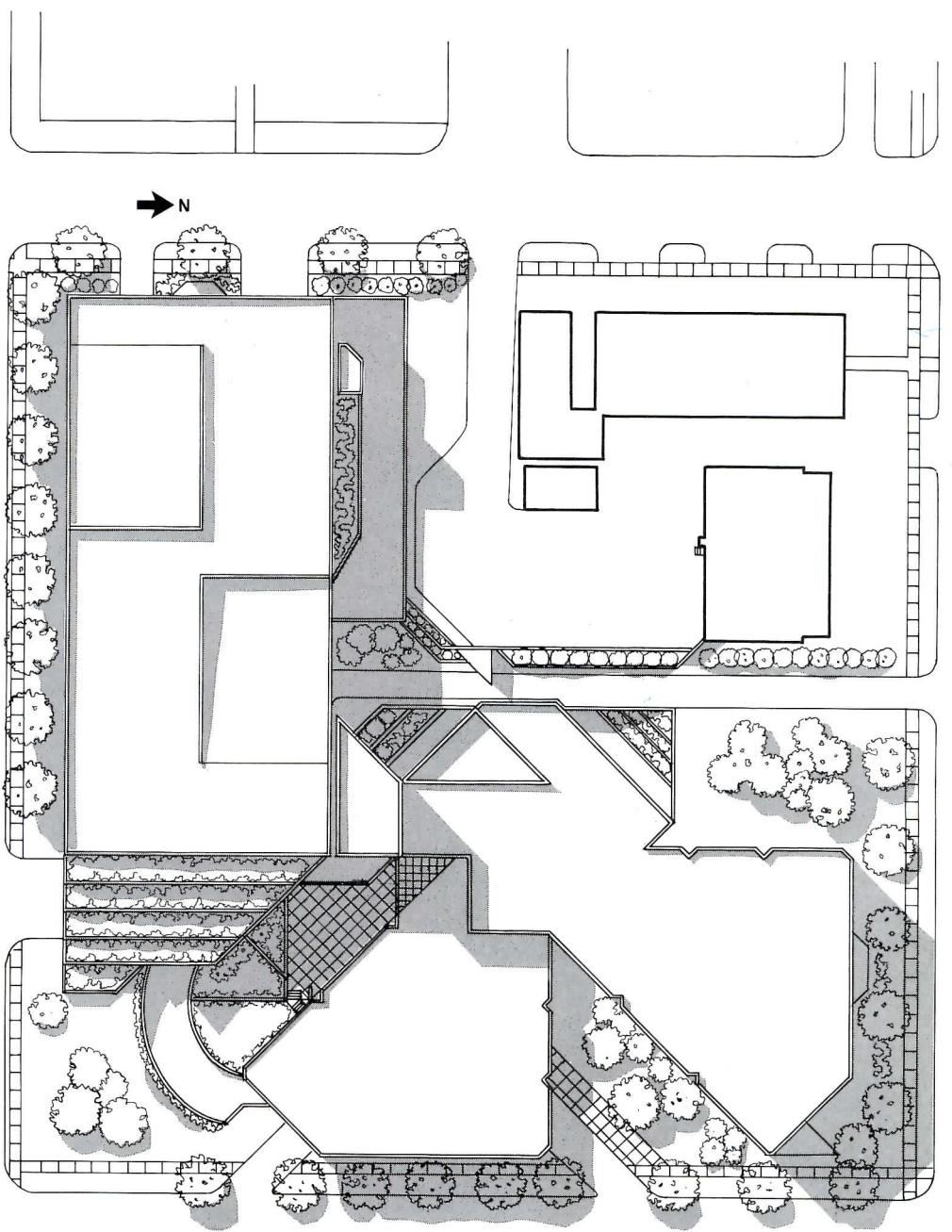
lattice of diagonal and orthogonal lines and modules which engender the basic composition of the structure.

In the Baldwin Building, the "field's" yield—based on studying the most efficient relationship between the core control points for the staff (one for each of the three clinic floors) and the runs of examination rooms (there are four 13-room clusters of these rooms per floor in a pin-wheeled, double-V arrangement)—is in fact the angle between the double V's as they meet the staff cores. From this angle springs the geometry of the whole place. This is particularly rich and revealing as one experiences the planes and pattern of layout of the floors—where but the floors would a "field" be most fully expressed? Even the carpeting has a computerized weave, whipped out overnight, with tans, browns, russetts, and oranges that pick up this angularity of line, plane, and space.

The general areas of function are broken

down this way: On the basement level, deep down, there is a huge stockroom that serves the entire Mayo complex (this building connects with the complex through an underground pedestrianway). The level of the pedestrianway—called the "subway" around here—takes in a duplicating shop, diagnostic facilities, a business and administration area, and a two-level skylit lounge for patients. Just inside from the lowest level of the garage through automatic sliding glass doors, the lounge looks out on a lovely terraced garden. As encountered from the garage, the skylight and garden view provide a sense of occasion on arrival; and as encountered from the pedestrianway, they punctuate the terminus with light and excitement.

The main level has a large lobby in front of a glass vestibule with travertine benches, inside and out, for waiting; educational facilities, including a 65-seat seminar/projection room and cubicles where patients see a little



©Nick Wheeler photos

The Baldwin Building of the Mayo Clinic presents a subtle, handsome, almost residential quality to its surrounding, as a structure devoted to community medicine well should. Clad with buff-colored striated limestone, the building extends over a canopied drop-off area (overleaf, page 115, top) from which cars proceed into a seven level parking garage with stepped-back tiers planted with evergreens. The main building, which has a good-looking relationship with the garage by way of a terraced garden nestled between them (overleaf, page 114), has three levels, in addition to both a lower pedestrianway level containing services and a connector to the large Mayo complex and, below this, a basement containing extensive central storage functions. Deeply indented window strips help save energy, yet frame generous views (overleaf, page 115, bottom). Reception and waiting areas of intimate, relaxing scale (pages 116-117) give way to examination areas (page 119).



strip of film about ambulatory, pre-natal care, or whatever as part of the whole Mayo thing for "prepping" people; an obstetrics department, facilities for the acutely ill, and assorted control and administrative functions. The second level is given over to internal medicine, extending over the entrance as a canopy, and the third level is for pediatrics.

Arriving patients can drive in under the canopy outside the main lobby to be dropped off, or they can be dropped off down by the lounge outside the entrance to the patient parking areas of the garage (there is a separate entrance for staff).

The effect of the garage on the neighborhood is delightfully dealt with by having stepped back the easterly elevation in tiers that face the landscaped court nestled between the garage and the main building. These tiers are planted with evergreen trees, although there had been some talk about amber waves of grain. At any rate, this treatment is a whole lot better than just having a huge garage in the front yard.

The design of the typical floors, divided

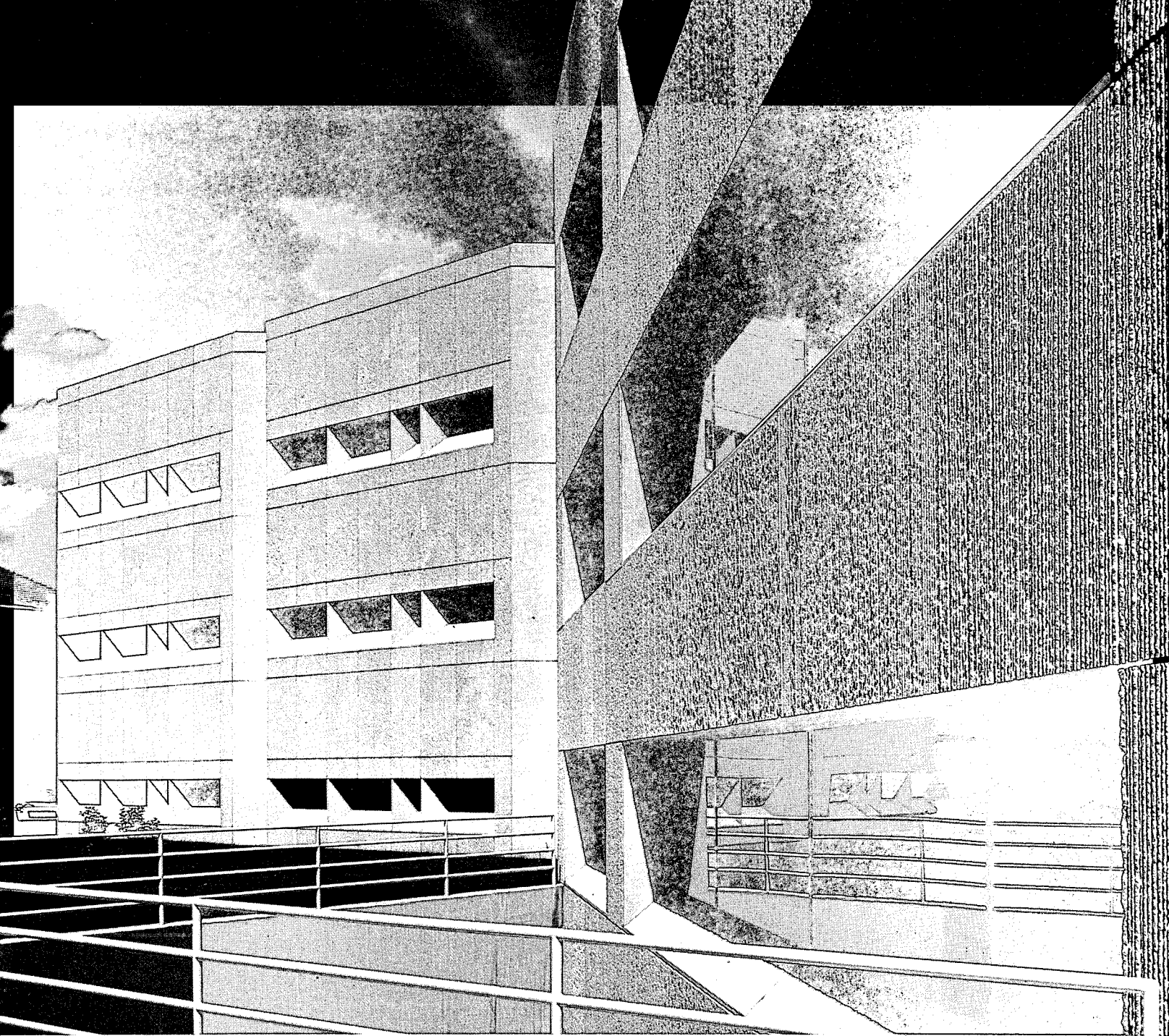
as they are into those V-shape arrangements of rooms is nothing short of ingenious, and very clear. Each of the rooms in these four 13-room modules typically serve for examination and consultation *and* as the physicians' offices (they are called ECOs). These ECOs are a slight adaptation of the legendary Mayo exam room.

Central control desks provide complete visibility and ready access to the halls and ECOs. Waiting areas, broken down into a friendly, intimate scale, are scattered about each floor—as are small areas for staff consultation. Without seeming to be hiding or secretive, for example, doctors can go off and talk about a case (or just b.s.) without disturbing other busy staff members or the patients. This breaking down such of functions into bright, small spatial morsels, and distributing them about the interior in a relaxed, almost homey way, is one of the strongest aspects of the building.

The efficient use of physical energy was also a major planning and design factor, and this is reflected by the character of the archi-

tecture and its material elements. For example, the use of glass is sparing—beautiful, but sparing. Only the main lobby and the skylight pedestrianway area downstairs uses glass extensively. The solution throughout is slit-style windows, running in strong horizontal bands, 18 inches deep, along the facade where the ECOs and the physicians' work areas are placed. Sitting down in them, the view is generous and pleasant. The sills and the mullions are angled—again, sprouts from the "field"—and this angularity opens up the sense of view while also protecting the glass from the stronger summer sunlight and heat again. Wood-slat blinds help temper the light as well. If there is energy economy in this handling of the building elements, there is also (as importantly) an intriguing, integrated play of light and shade and shadow that liven up the entire building in a kinetic, sculptural way and adds to its surroundings. "Design" is no addendum here.

The human and the functional success of this building is vividly experienced in three basic areas the public lounge areas, the staff





cores on each floor giving out to the branching halls of the clinic areas, and the ECOs themselves. In all cases (the carpeting being but one example) wood, warm colors, and rich textures appear throughout the building. As in the carpeting, the draperies in the patients' dressing rooms have a pattern derived from the "field." Another example, looking to the furnishings, are the clusters of "field theory" chairs in the waiting areas, these named by Mr. Netsch for the artist Vasarely and originally developed in his late 1960s renovation of Frank Lloyd Wright's Robie House in Chicago (these chairs resemble some of the paintings being done by Vasarely at that time, and of course Mr. Netsch is an avid, scholarly collector of contemporary art). As to the coloration of walls, each of the levels is assigned a color which is carried through—yellow on the first, orange on the second, and rust on the third.

All of the appointment, reception, administrative, and records activity housed in the staff cores are efficiently spliced and inter-coordinated, not only in terms of

accessibility to their respective clinic floors but also vertically in terms of access to central storage and records functions. The desks have oak tops and side panels, and above each of these cores the ceiling is dropped slightly, containing lighting of a comparatively high intensity, to dramatize these "ports of entry" on each level.

The famous Mayo exam room is another—some would say *the*—success story here, because not just anyone is allowed to fool around with something as sacred as the image of old Dr. William Worrall Mayo's horse and buggy. This room is the revolution. The problem was that the doctors' personal professional paperwork and their work area for consulting with patients tended to get hopelessly messed up. A kind of medical paper chase went on in every exam room. The architects, responding to the Mayo staff's grief over this problem, simply came up with the "revolution" of having two different work areas so that the doctors could easily scoot from one stack of paperwork to the other. This is admittedly an additive revolu-

tion; which is to say, that these second, private desks can be put in or taken out, depending on how "senior" the doctors are. The patients coming in to be examined and consulted with are met with a micro environment of great warmth and considerateness and privacy. Outside each room is a mystical panel of lights—red, yellow, blue—that tells everyone in what various states of undress, scrutiny, or scrambling the patient is in.

This work is interesting and instructive on yet another level, at least for architects if not also for doctors and hospital administrators (and hopefully for them as well). Walter Netsch, and Skidmore, Owings & Merrill generally, are not what one would call "hospital architects." They certainly do not do just hospitals; they do hospitals once in a while and quite well, indeed. Is it not to be expected that Mayo, of all places, would have gone to the hottest-shot "hospital architects" around? Apparently the client did not think that specialization and endless expertise in this one area was essential. Which is wise and



which is right. These doctors respect architectural professionalism and, by extension, aesthetic conviction and technical sensibility—much as they believe they and their own colleagues deserve respect. In this atmosphere, plus the fact that the board has very enlightened, forward-looking pragmatists from many areas of society, the architects were entrusted with the authority to *design* in the fullest sense. The doctors' committee on the job did have certain fixed ideas from which the architects were to design—such as their wanting to inter-connect the services and related support functions vertically. This is where the architects began to sense the lightness and intimacy that the doctors wanted out of the situation—both functionally and psychologically. This is where the architects got their "angle" on the scheme.

The Mayo doctors also tend to be very objective, intelligent, incisive thinkers—about everything (including their and their profession's ruts, assumptions, rituals, and remedies). They think and rethink every issue so that, on any point, they get a second and

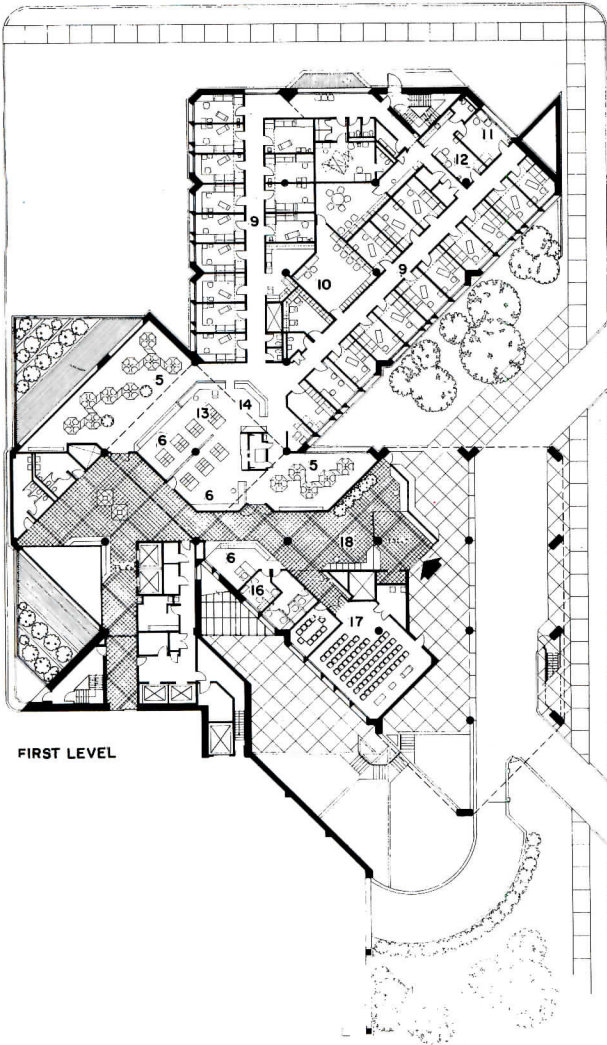
third and fourth opinion. Such an attitude could only help the architect of a health-care facility and his design, and it certainly did here; every detail, every study of such things as the location of reference and consultation areas to the lighting valances along the clinic corridors to the energy benefits of task lighting, got this kind of additional opinion.

And why don't most? Walter Netsch, thinking of the problems of over-specialization generally, says, "You know, it's that damned forest-and-the-trees problem. The problem of the hospital architecture specialist or expert is that he can tell you about every tree and what species it is and about its leaves, nuts, or blossoms; and you know, he can take those damn trees, one at a time, and do them to *death*—oh!—and then take all these trees and put them together in a grove so damned dense the light can't get in or out. True expertise, and true design freedom, is in understanding the flow, the sap, the living forces—the "systems," if you will. For instance, you take the tremendous up-and-down efficiency of the 'system' at Baldwin,

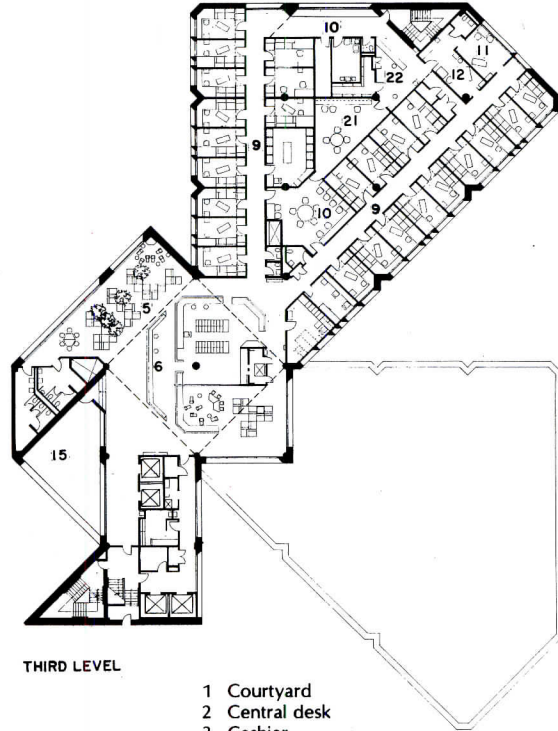
and the doctors' wanting that efficiency led to our search for an order of a visual and spatial nature that is analogous to the procedures used by doctors as they search for order—some direction of treatment."

Of course, the Mayo has had the demand that has required it to develop increasingly efficient methods for helping people. That it is doing so without sacrificing the humanity, harmony, and handsomeness of the physical setting makes Baldwin all the more important a model—a model of form in attitude, and in architecture.

THE BALDWIN BUILDING FOR COMMUNITY MEDICINE, THE MAYO CLINIC, Rochester, Minnesota. Architects: Skidmore, Owings & Merrill—Walter A. Netsch, design partner-in-charge; Richard Lenke, management partner-in-charge; Craig Hartman, senior project architect; Robert Wesley, senior technical coordinator; Donald Ohlson, project manager; Maris Peika, studio architect; Patrick McConnell, interior design; Parambir Gujral, mechanicals. Engineers: Skidmore, Owings & Merrill; Des Man Parking Associates (structural, parking garage). Contractor: M.A. Mortenson.

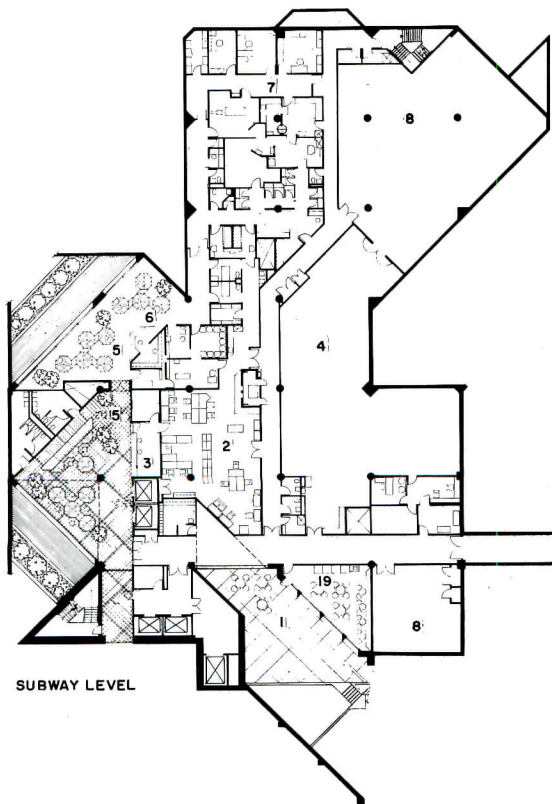


FIRST LEVEL



THIRD LEVEL

- 1 Courtyard
- 2 Central desk
- 3 Cashier
- 4 Shop area
- 5 Waiting
- 6 Reception
- 7 Radiology
- 8 Storage
- 9 ECO (examination-consultation-office)
- 10 Staff meeting
- 11 Doctor's special procedures
- 12 Nurse's special procedures
- 13 Appointments
- 14 Control
- 15 Play terrace
- 16 Administration
- 17 Seminar
- 18 Entry
- 19 staff lounge
- 20 Patient histories
- 21 Library
- 22 Nurse's work



SUBWAY LEVEL

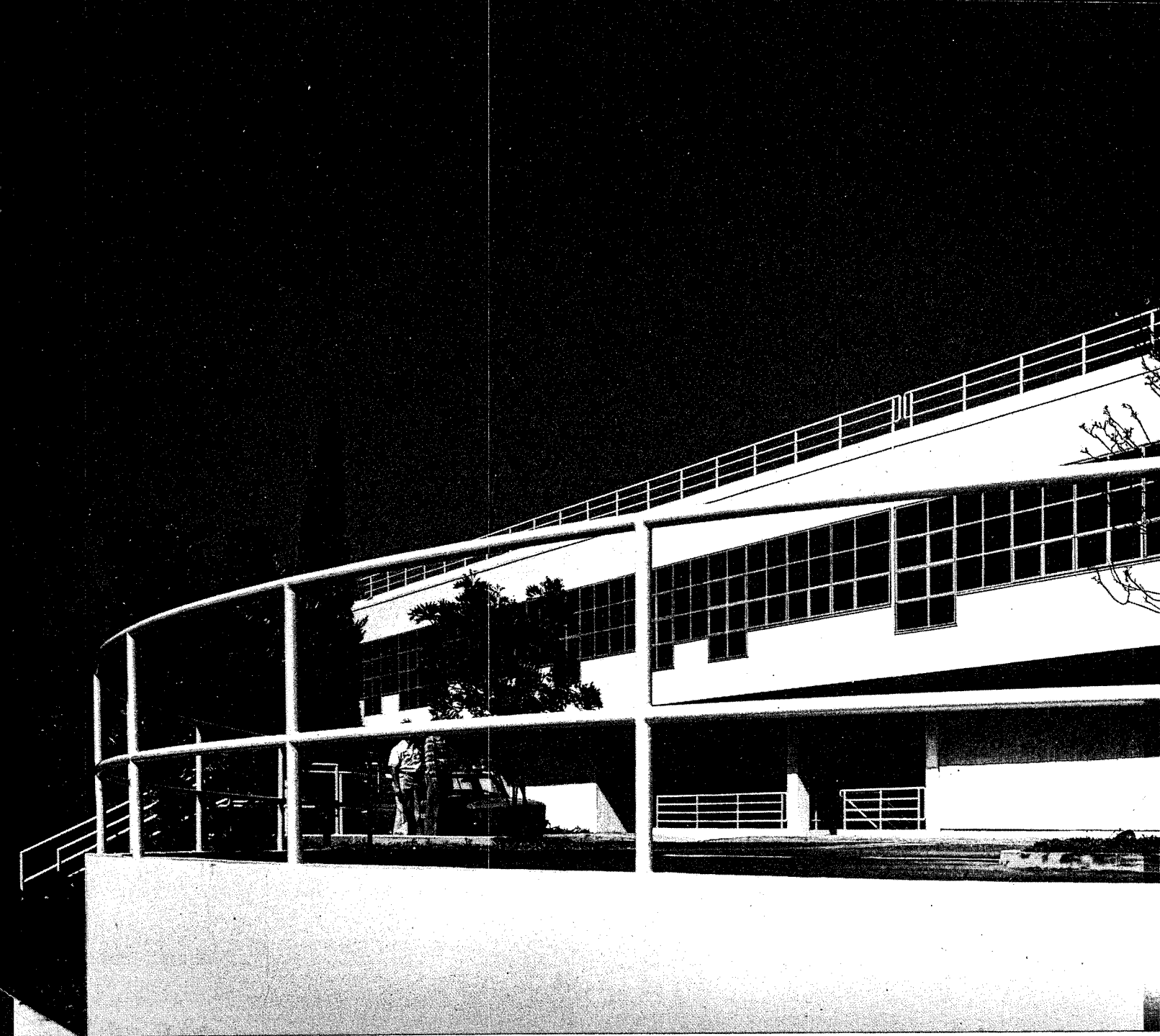


SECOND LEVEL



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Center for Preventive and Rehabilitative Medicine, Daniel Freeman Hospital, by Bobrow/Thomas

That architectural quality is made to fly over the cuckoo's nest when it comes to health-care facilities is not news to most people—those whom many architects like referring to, in yet another messing up of the English language by professional chicspeak, as “viewers” and “users.” What most people know, or at least half know, is that many hospitals are intimidating, demoralizing, impersonal and ugly; they also know that they are paying a lot to experience all this.

What these “viewers” and “users” outside the medical and architectural professions may not understand so fully is that the chances for quality tend to be undermined by the incredible complexity of functional, programmatic, and indeed ego relationships embodied in a health-care world; by the increasingly sophisticated mechanical and electrical networks needed to service or link up personnel and machines; and by the strict codes covering fire, safety, health, and acces-

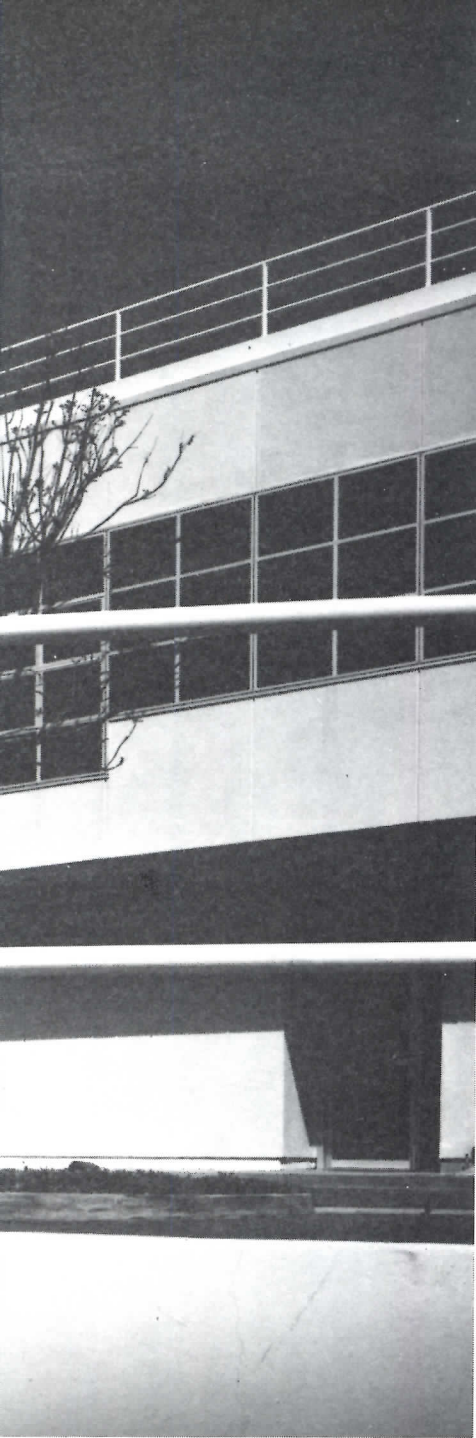
sibility. The architectural firm of Bobrow/Thomas and Associates in Los Angeles is one place where such undermining factors are being dealt with squarely, with utmost professional diplomacy, strategy, and coordination, and with architectural results that are clear, simple, and efficient in the strictest functional terms.

This ability is exemplified by Bobrow/Thomas's Center for Diagnostic and Rehabilitative Medicine at the Daniel Freeman Memorial Hospital in Inglewood, California. The Center, with 100,000 square feet, represents the first phase of the hospital's expansion plans and, while providing space for 70 rehabilitation beds, physical and occupational therapy, emergency services, outpatient surgery, and various educational activities, it is designed to be easily expanded in the future without excessively disrupting the programs or the architectural character.

The concepts that were given form in

the Center were worked out by a team made up of the hospital's medical and professional staff, the architect's well-rounded representation of designers, planners, as well as health planners, and professional nurses. These concepts came out of a shared resolve to create a building that would uplift the image of health-care facilities, while also satisfying practical needs, naturally. But the key thing to stick with here is that this resolve was born of a belief that *image*—the very visual and even psychological perception that people and the public have of such facilities—was not peripheral to the “design problem.”

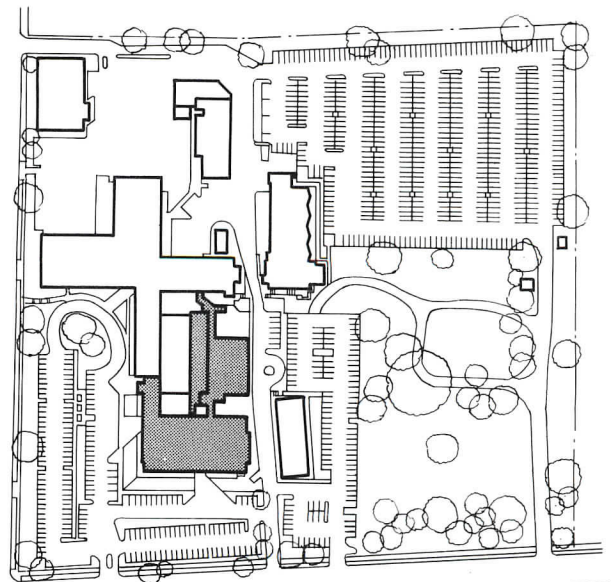
This set of concepts generated a number of specific design decisions. For example, by going for a sub-grade level, the three-level Center's above-grade height is only two, and this creates a scale that is more domestic and relaxed than the familiar institutional image of hospitals. This effort to incarcerate the impersonality of such places once and for all



Julius Shulman photos



The Center for Diagnostic and Rehabilitative Medicine at the Daniel Freeman Memorial Hospital is, at a comparatively modest 100,000 square feet, a very sizeable accomplishment in the lessons it offers about creating a health-care environment that is functionally efficient and flexible, emotionally and psychologically uplifting, and in terms of design merit, that is worthy of high marks by any standard or in the context of any building type. What the architects, Bobrow/Thomas, did was establish both a physical and philosophical grid to go by, making possible easy expansion in the future—and making possible, too, an over-all atmosphere of clarity, convenience, and enormous human warmth. The simplest of lines and materials, stucco and glass infill, convey the message that assumptions about hospital architecture are also being rehabilitated.





affected the basic plan. The circulation is very clear and straightforward; the visual, graphic, and spatial clues of where to go are all very simple and utterly logical; patients or people visiting patients may get around in here without asking half a dozen people where to go. This circulation is characterized by an open, luminous sequence of inter-connected areas—not by a series of big or small enclosed spaces running along antiseptic corridors.

Quite obviously, this matter of de-institutionalization is expressed by the Center's two central courts, which are richly landscaped, rather like oases—and these courts, on several levels, function very well for therapeutic as well as recreational purposes.

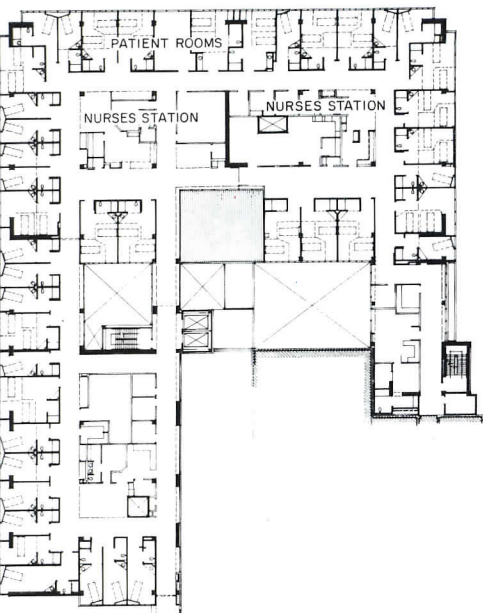
Another element here is the use of natural light, which as more people are realizing by this time is the best "task lighting" available. The task here at Freeman is to let a lot of cheer in and around, and this cheer then serves to define the circulation pattern. At the major intersections of the single-loaded, open-ended corridors, light also floods in, further providing orientation.

In plan, an underlying circulation grid has been established for the hospital's over-all expansion, and from this grid the Center has been stepped off. Similar flexibility for expansion is at work in the tightly grided skin of the building, which is of stucco and glass infill articulated along vertical breaks that quietly bespeak the plan grid. This solution not only allows for easy change inside and out, on down the road, but it emanates an esthetic that fits in well with the older hospital buildings and (this is kind of nice) "recalls" some of that simple, beautiful discipline of line and plane associated with the architecture of Southern California back in the good old days of modernism.

Inside the building, especial attention was given to the patient areas, which have homelike qualities, small-scale alcoves for socializing, and revolve around a dining room for family-style eating. In a classic example of patients, visitors, and staff spontaneously reprogramming a space, this dining room has ended up being used as a popular lounge and meeting area. As for those areas for rehabili-

tation therapy, plenty of well-lit spatial leeway has been left, not only for the equipment, but also so that the patients and staff (very close relationships between them develop in an environment like this) can design and re-design these areas. This is one health-care facility that set out to improve the image of its wider world, but beyond doing that, a territory for emotional and spiritual exploration has been opened where patients can exercise in the fullest sense—that is, exercise control.

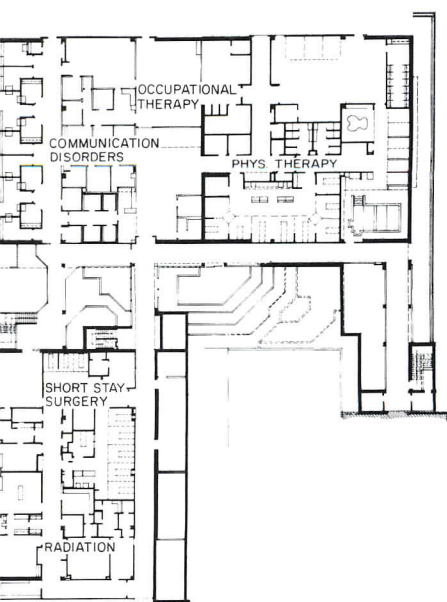
THE CENTER FOR DIAGNOSTIC AND REHABILITATIVE MEDICINE, THE DANIEL FREEMAN MEMORIAL HOSPITAL, Inglewood, California. Architects: *Bobbrow/Thomas and Associates*. Engineers: *S.B. Barnes & Associates (structural)*; *James A. Knowles & Associates (mechanical)*; *Charles B. Farrow, Inc. (electrical)*. Landscape architects: *Emmet L. Wemple & Associates*. Consultants: *Coopers & Lybrand (economics)*; *Log/An (scheduling)*. Contractor: *Stolte, Inc.*



SECOND FLOOR



FIRST FLOOR



GROUND FLOOR



Julius Shulman photos

The spatial mainstays of this building's human message are two central, multi-level courts that have been beautifully landscaped and serve both therapeutic and recreational functions. These courts also illustrate the importance of natural light, which is the tie that binds the entire circulation network together as it comes inside, defining corridors and flooding their key intersections. The simplicity of the stucco-and-glass infill, married along a series of preset vertical breaks, and the visual and emotional luxury of the beautiful light and lush planting both serve to instill a strong, encouraging presence in the building itself while also, in stylistic terms, extending the formal characteristics of earlier modern architecture in the region of southern California. In many respects this is a very vernacular venue—vibrant and full of hope—and a "hospital" at that.





The Butler Hospital, by The Hillier Group, enhances a rich institutional heritage

The Butler Hospital, founded in 1844 in Providence, Rhode Island, is one of the nation's primary pioneering institutions in caring for and curing those who are mentally disturbed. Although closed in 1955 for a time because of steadily dwindling financial support, it sprang to life again in 1957 as a short-term ambulatory-acute psychiatric hospital and, since the early 1970s, it has been affiliated with the medical school at Brown University. Its beautiful grounds by the Seekonk River and its wonderfully styled and detailed Gothic Revival buildings made (and make) Butler an environment of extraordinary visual quality and—not incidental to its function—one of great therapeutic value. These aspects have been carried through Butler's recent upgrading and expansion by The Hillier Group in which the scale and spirit of both old and new have been spliced together.

The key decision coming out of the architects' deliberations with the hospital staff

was to create a residential scale and feeling to foster a familial, cooperative, reinforcing attitude between patients and staff.

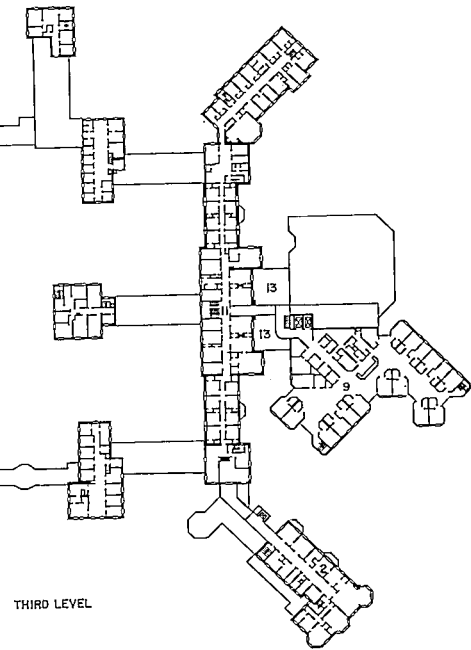
This objective led to their combining the inpatient units and the dining facilities in a new 148,000-square-foot wing, and this wing was placed at the existing entrance, thus promoting efficient interaction between inpatient, support, and administrative activities.

This placement is pointed up by a beautiful glass-enclosed garden forming a symbolic link between old and new and preserving the historical character of the original main building, which is a real charmer. At this point, too, the stairway, elevators, and a bridge connecting the two come together, and this is the locus from which all circulation springs. This garden, encased with reflective glass, and with seasonal heating and cooling, is used year round.

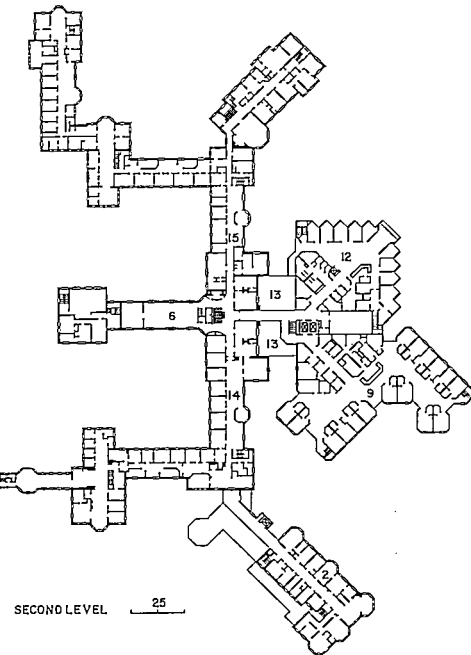
The administrative offices and the admitting and testing areas are connected by an

extension of an existing porch, and this porch, in its homey, old-timey fashion, is the new main entrance and lobby. Porticos and arches are repeated, extending out to a gazebo, which adds a light visual and functional note to the Gothic. This porch also creates a more sympathetic stylistic element between the two century-old buildings between which the new lobby, distinctly contemporary in its appointments, is sandwiched. Beyond this entrance and control point, on the more sylvan side of the setting, extends the new inpatient wing, which had to be assured of quiet and privacy.

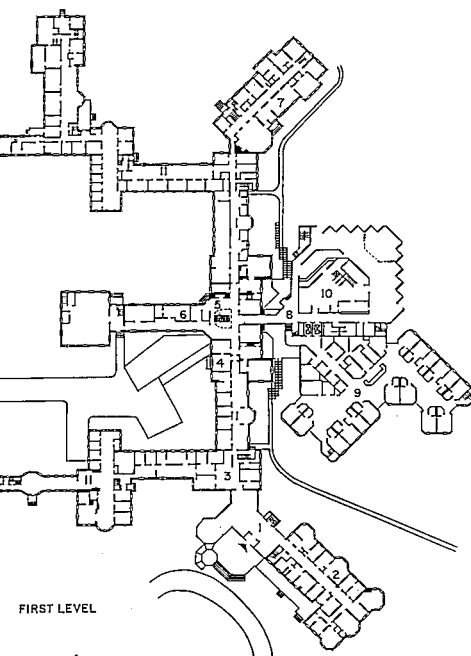
This unit includes four levels of inpatient units, a two-level section that houses the dining facilities, an intense-treatment area, and the mechanical core. Visual interest and human scale are created by recesses, chamfered corners, and repetitive windows set at an angle. Each of the inpatient units, with 24 beds, has the rooms ringing the periphery of



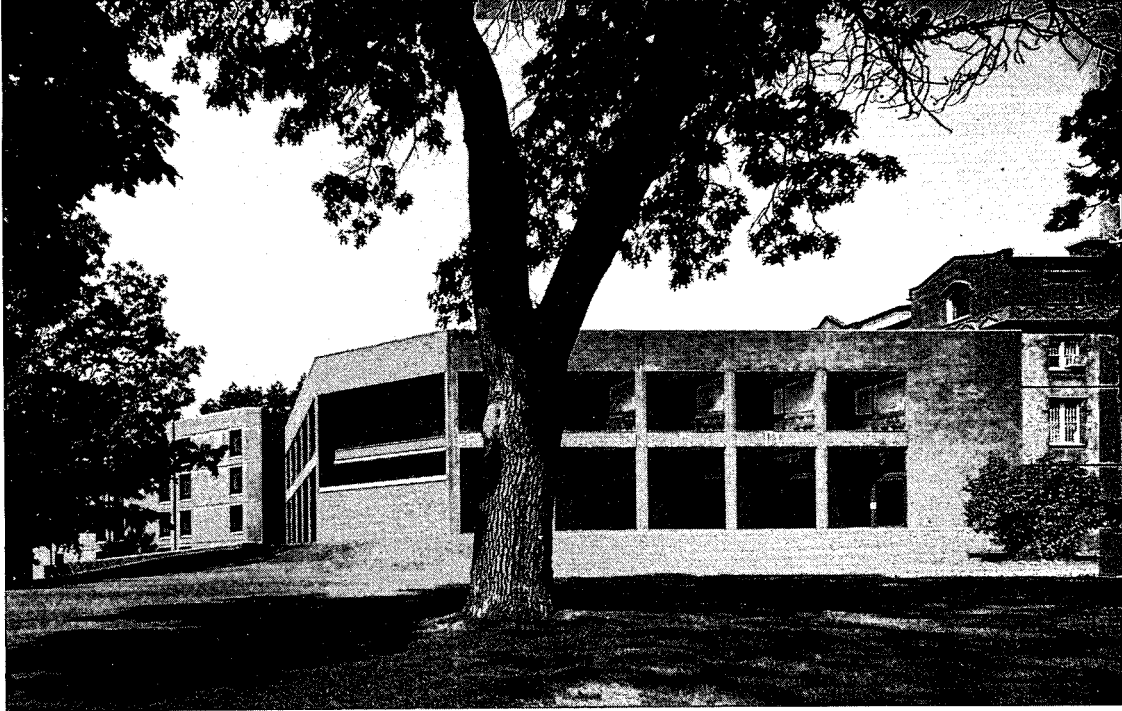
THIRD LEVEL



SECOND LEVEL 25



FIRST LEVEL



John Brefach photos

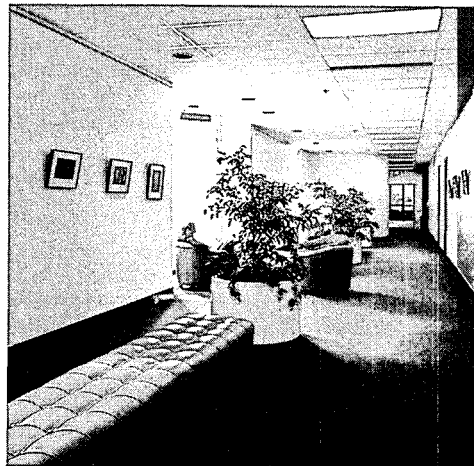
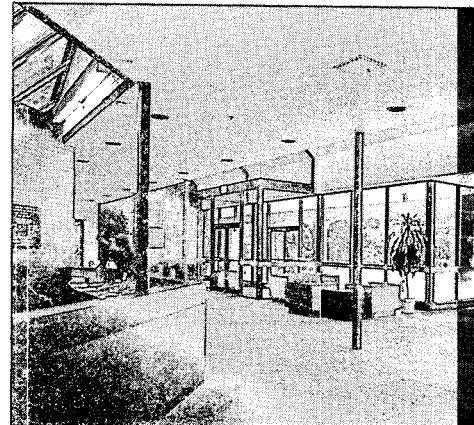
- 1 Lobby
- 2 Administration
- 3 Admitting and testing
- 4 Emergency
- 5 Medical records
- 6 Activity therapy
- 7 Day hospital
- 8 Interior courtyard
- 9 In-patient units
- 10 Food services and cafeteria
- 11 Existing
- 12 Intensive treatment unit
- 13 Interior garden below
- 14 Professional offices
- 15 Diagnostic /treatment





The Butler Hospital in Providence, Rhode Island is a beautiful blending, functionally and esthetically, of 19th-century Gothic Revival and new, humanely scale construction. This juncture is pointed up by this new glass-enclosed garden area in which the old architecture is retained, enlivened by contemporary elements. The new main lobby, just in from the long arcade and porch shown on the previous pages, is shown immediately below. The inpatient units, shown far below, are interconnected with well-lit and warm-colored areas that have expansive views to the landscaped grounds and the nearby Seekonk River.

John Brefach photos



the floor, and these rooms center, in turn, around activity areas that are angular in plan, have thorough support and servicing, and relaxing lighting and views.

The nursing stations have visual contact with the patients in these activity areas, or day rooms, as well as with the corridors and the individual rooms. These rooms, with tempered, plastic coated glass to ensure the patients' safety and security, and thus eliminate the need for using such primitive barriers as bars or screens, have expansive views of the grounds and the river. They have vinyl wall coverings in warm colors, desks, tables, side chairs, tack boards, built-in wardrobe units, private half baths, and carpeting. The communal areas are similarly furnished in a residential spirit (this is a tradition going way back at Butler). The choice of finishes supports this; though these choices also reflect a concern for durability and maintenance, visual appeal and emotionally uplifting qualities called the shots.

Most of the inpatients are able to move around the hospital. The cafeteria and an

arboretum provide very pleasant areas where the patients can interact outside their own rooms or activity areas. The cafeteria, on the first floor, is oriented away from the hospital, out toward the river. Severely disturbed patients are housed in an intensive-care unit above the cafeteria, and though they cannot go out and roam around and must interact amongst each other, they too have that river view. This intensive-care unit has 12 patient rooms, and compared with the other, larger inpatient precincts, it has fewer communal areas, no private baths, and two especially quiet activity areas. The differences in level of disturbance in patients, which have to be very objectively dealt with by the health professionals here, and accorded proper interpretation in the planning and esthetic features of hospital design, have been skillfully and humanely dealt with at Butler Hospital. In its soft-spoken efficiency, in its sparing but knowing incorporation of an historical setting, The Hillier Group has successfully invigorated the life and capabilities of an extraordinary institution.

THE BUTLER HOSPITAL, Providence, Rhode Island
Architects: *The Hillier Group*. Engineers: *Wilbur E. Yoder Associates (structural); Kiely Associates (mechanical, electrical)*. Consultants: *Environ Design Associates (environmental)*. Contractors: *Dimeo Construction Co. and H.V. Collins*.

Single ply: a promising approach for ailing roofs and new roofs

The built-up roof still is the least costly membrane system for keeping a building dry, and if properly specified, applied and maintained it gives excellent service. But it is no secret that single-ply roofs, though no panacea for roofing problems, are showing increasing promise, particularly for reroofing applications. As field labor becomes more difficult to find for "hot" roofing, and the cost of oil-based products rises, synthetic-based materials and single-ply bitumen membranes are likely to be used more frequently for new roofs as well as failed ones.

The membrane roofing industry today is in a state of change, partly because of the alarming failure rate of conventional built-up roofs, partly because of the rising cost and uncertain quality of asphalt which is derived from oil, partly because of labor-related problems—especially contractors' difficulties in attracting field labor and in meeting safety requirements laid down by government—and partly because of the higher investments contractors have to make today in equipment for constructing built-up roofs. Given a \$4-billion roofing market more manufacturers have entered the field offering new ways of keeping a roof watertight: single-ply systems, cold-applied systems, and inverted-roof systems.

While single-ply systems have only a very small fraction of the total membrane roofing market now, the volume is gradually increasing because their cost is becoming more competitive in relation to built-up roofing, and because they offer a cost-saving solution to reroofing over a deteriorated or defective built-up roof—and replacing a built-up roof is about three times as costly as putting down the original roofing system. Furthermore, single-ply systems work well in new roofs for unusual shapes such as folded plates and for steep slopes.

In a National Bureau of Standards survey* by Rossiter and Mathey published last year, the authors note that a built-up roofing system, properly designed, specified, applied and maintained, will keep a roof watertight for 15 to 20 years or more. An important reason for the continued usage of built-up roofing, they say has been its low cost compared to other types of systems.

Original reasons for the introduction of elastomeric membranes, the authors suggest, were attempts to provide improved roofing

membrane performance, to simplify application procedures, and to overcome some deficiencies of built-up roofing such as low-temperature brittleness and inability to accommodate substrate movement. Also, at the time these new materials were introduced (in the early 1960s), architects were designing a lot of unusual roof shapes such as domes, folded plates and hyperbolic paraboloids. The early promise of these materials was not fulfilled because of their high cost and instances of poor performance resulting from poor workmanship and lack of a "systems" understanding of how the materials would perform in place; for example, how movement of cracks and joints of the substrate would stress and split these membranes.

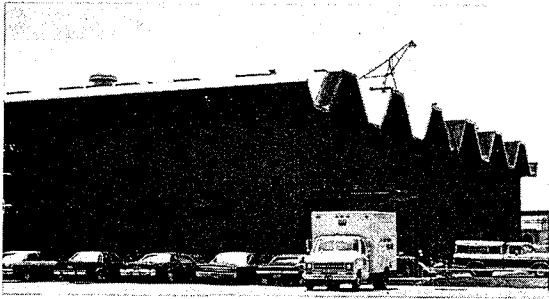
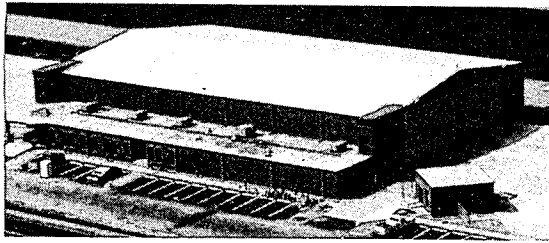
In contrast—as a notable example of an elastomeric roof that has performed excellently since the 1960s—the NBS report cites the membrane used for the cable-suspended concrete decks of the terminal building at Dulles International Airport, designed by Eero Saarinen. The membrane is a partially adhered single layer of neoprene coated with liquid Hypalon. Important design aspects of the system were bond-breaker strips at the laps of the sheet and omission of adhesive from the central portion of the sheet to avoid high stresses in the membrane.

There are a number of reasons for the resurrection of synthetic single-ply membranes in second-generation form, according to engineer C.W. Griffin, Jr. in the upcoming second edition of his book, "Manual of Built-up Roof Systems," to be published by McGraw-Hill. These include: 1) the cost of petroleum, 2) dissatisfaction with built-up roof performance, 3) successful performance of the synthetics in Europe, 4) lessons learned in the U. S. and Europe from failures in materials and workmanship with the first-generation synthetics, and 5) improved working conditions for field labor. Among the improvements in these synthetics, Griffin says, are thickened sheets, improved rein-



In a reroofing application, workmen laid a bitumen-based composite membrane on the roof over the lobby of the Hotel Intercontinental Miami. The aluminum top face protects the membrane from the sun's rays. Roofing consultant was Peter Corsell Associates.

*NBS Technical Note 972, "Elastomeric Roofing: A Survey," by Walter J. Rossiter, Jr. and Robert G. Mathey, Center for Building Technology, National Bureau of Standards. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C. 20402. \$2.30.



Koppers Co., Inc.

Adhered single-ply membranes work well for steep slopes and unusual roof shapes. Aluminum-faced bitumen membrane was installed over panelized wood decking on the 1-in-7-slope roof of a private airplane hangar in New Orleans (top). The level roof of the attached office building has a five-ply coal-tar roof over fiberglass insulation. Because of splits in the roofing and deteriorated flashings on the saw-tooth roof of a gymnasium in Ft. Wayne, Indiana (left, center and below) the school district's architects, Fanning & Howey, decided to reroof with the same type of aluminum-faced membrane. Prior to installation of the membrane, the valley floors were sloped to drains using tapered insulation and covered with two plies of felt. The membrane was installed using a cold adhesive, with the top edge overlapping the edge of the ridge. All joints were fused by heating the bitumen of the membrane with a torch.



forcing methods and more reliable techniques for sealing laps of the single-sheet membranes in the field.

On the liability side, Griffin points out, are the lack of performance criteria and poor reporting of technical data, and, more importantly, the simple lack of such data. The performance of conventional built-up roof membranes is documented by research, and comparable data are needed for the new synthetic membranes for rational comparisons of these radically different materials. An important question, for example, is what is the contraction of a synthetic membrane when outdoor temperature drops to sub-freezing. What should be the required tensile strengths and permissible elongations of these materials. They must be more for an adhered system than for a loose-laid system,

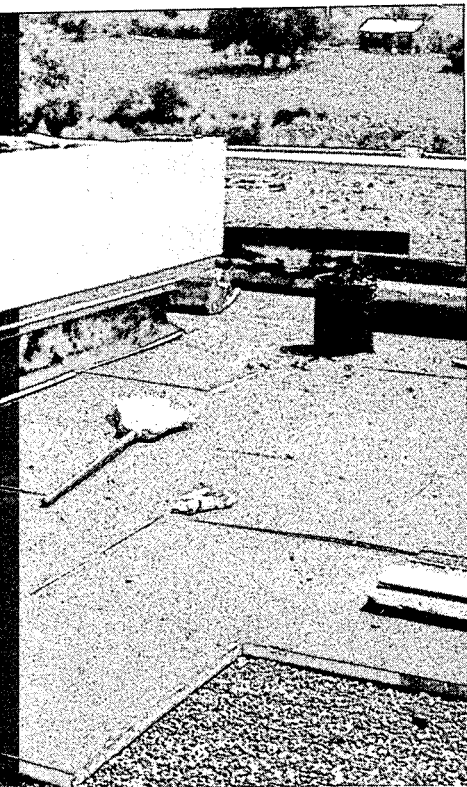
but how much? Development of standards to help the designer make more rational product selections is going to take time. Meanwhile, says Griffin, the designer's chief guide will be manufacturers' recommendations, the track record of his product, and his record of honoring guarantees.

The single-ply membranes include bitumen-modified systems, elastomers, and plastics

These three families of sheet materials used for single-ply roofing can be fully adhered, partially adhered with adhesive or mechanical fasteners, or loosely laid. Fully-adhered and partially-adhered systems weigh the least, but some of the fully-adhered systems require the most labor and demand clean, dry, crack-free substrates. The loose-laid systems take the least labor for laying the membrane, though

gravel or stone ballast must be placed on top of the membrane to prevent uplift from wind. The weight of this ballast may add 10 or more lb per sq ft to the dead load of the roof—a disadvantage for a lightweight structural system. Loose-laid systems are favored for many reroofing jobs because they can be applied over failed built-up roofs by simply installing the membrane over the old roof once loose gravel has been removed and rigid insulation board has been laid to protect the new membrane. The only attachment necessary is at the edges of the roofs and roof penetrations. Moisture in the original system, provided it is not excessive, can be vented easily.

The partially-adhered and loose-laid systems avoid problems of splits in the membrane because the membrane floats free



The designers of a large department store in the Kansas City area had allowed column stubs to project above the roof of the building to provide for a possible third story, making it possible for consultants Peter Corsell Associates, Inc. to use these openings for venting the origi-



nal roof after a bitumen-based composite membrane was installed over it as a new roofing system. As a first step, rigid insulation board was laid over the old roof after loose gravel had been removed. The bitumen-based composite, which for this application has a polyethylene film as its top layer, was unrolled and the seams made by melting the bitumen with heat from a propane torch. The roofing membrane is ballasted with 10 lb per sq ft of gravel evenly placed by means of a spreader. Column stubs were flashed using the aluminum-faced bitumen and vents were installed on top. An advantage of the loose-laid system, in addition to labor savings, is that it is easier for any residual moisture to move to the vents and out of the roof system.



over cracks or joints in the substrate, and, with partially-adhered systems, stresses in the membrane are distributed between bonded areas.

The bitumen-modified systems are most nearly akin to conventional built-up roofing. The KMM membrane, for example, is a laminate comprising a flexible plastic core with thicker modified bitumen layers on each side. The standard material, is 160-mil thick, and is protected on both faces with polyethylene film. The aluminum KMM membrane, 120-mil thick, has a top layer of embossed aluminum in place of the polyethylene, and is suitable for steep-slope applications and for flashing, with the aluminum face protecting the bitumen from sunlight. The standard membrane is unrolled onto the roof with 4-in. end and side laps which are sealed by heating with a

propane torch. The aluminum membrane is applied with a cold adhesive.

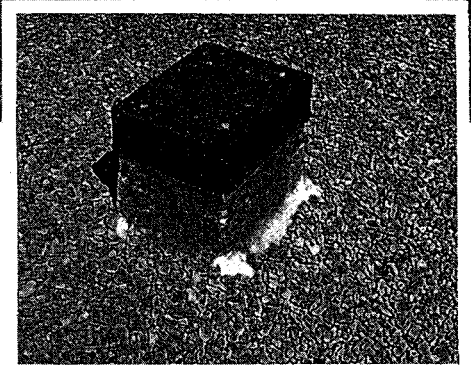
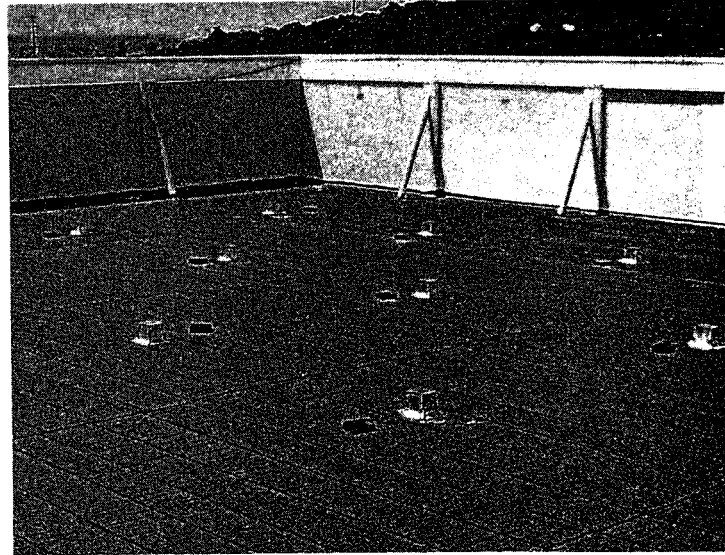
Another bitumen-based material, developed in Germany and marketed here as Awaplan, comprises a polyester mat saturated with asphalt which is coated with plasticized asphalt and has a top surfacing of granules. This material can be fully adhered or can be loosely laid by overlapping and sealing the laps with hot asphalt, a propane torch or a hot-air blow gun.

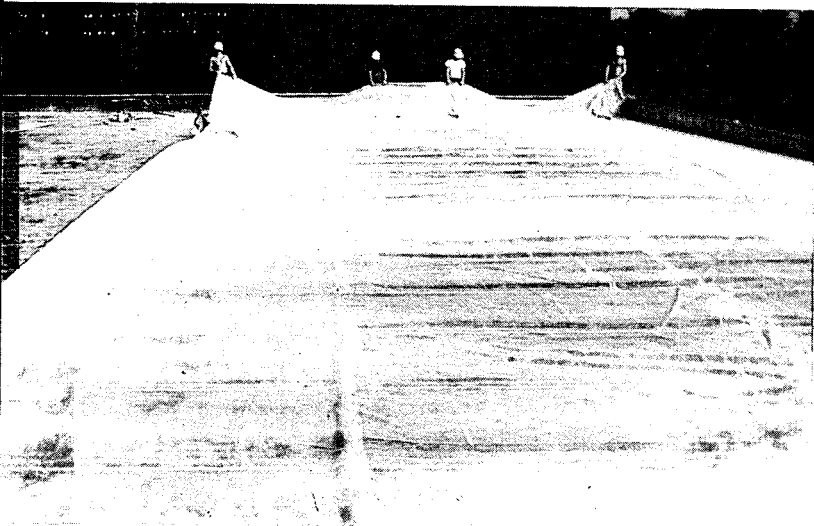
An asphaltic material used in Sweden, reports consultant Werner Gumpertz of Simpson, Gumpertz & Heger, has a heavily-reinforced asphalt-impregnated sheet coated on both sides with asphalt. A small crew gradually unrolls the material while a moving row of "bunsen burners" in front of the roll melts the underside layer of asphalt. Weight

of the roll forces the tacky sheet into the insulation previously laid on the deck.

Another asphaltic-based system that relies upon the self-adhesive nature of the membrane itself is the CRM roof membrane, which is a composite of a sheet of rubberized asphalt and a top layer of polyethylene film. It is applied to a clean deck or substrate that has been primed to aid adhesion. Because of the self-adhering nature of the rubberized asphalt, side and end laps of the compliant roofing membrane bond to themselves when pressure is applied with a garden roller. The membrane is protected from the sun with a layer of gravel or granules adhered to the surface, or with coatings.

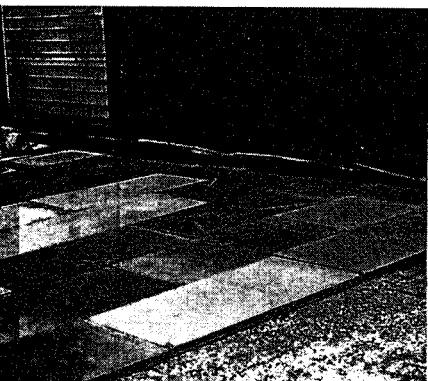
The balance of the sheet-applied membranes are all synthetic materials. And these can be subdivided into three categories: 1)





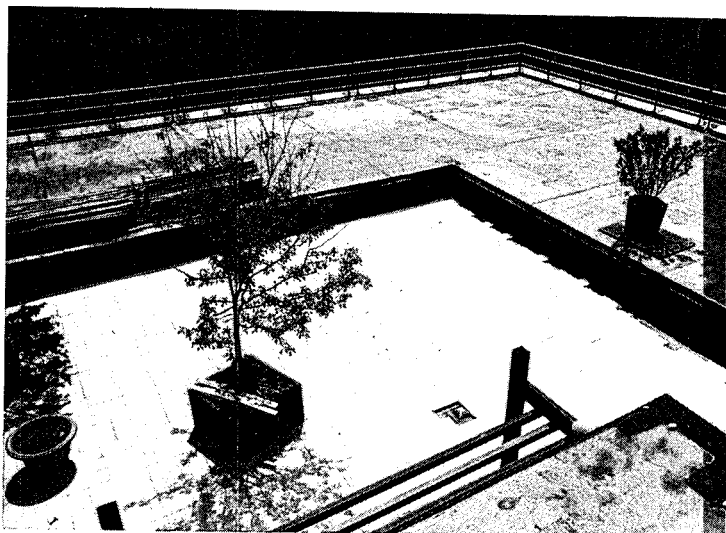
Carlisle Tire & Rubber

Synthetic-rubber membranes frequently are used in loose-laid systems. The material is supplied to the job-site in large sheets (45 by 150 ft) and in 10-ft-wide rolls 100-ft long so that field joining can be minimized. The reason is that seams and joints must be adhered using a contact cement that involves a waiting time after it has been applied, and requires that the sheets be properly aligned so that seams are even and flat and "fishmouths" are avoided. The re-roofing application shown left is for a high-rise office building in the Greater New York area. The loose-laid insulation board protects the membrane from puncture by the gravel still adhered to the original roof. The EPDM elastomer used in these two installations is somewhat permeable, allowing entrapped moisture to escape as vapor. The membrane is attached to the building only at the edges and at penetrations. Uncured neoprene often is used for flashings.



Because a midtown New York art gallery wanted assurance that water would not penetrate the roof of their building and damage artworks, consultant Peter Corcell chose an EPDM elastomeric membrane, loosely laid. For the roof deck area adjacent to the penthouse, large pavers cover the membrane so the area can take foot traffic for cocktail parties and

gallery openings. The remainder of the roof beyond the fence barrier was covered with gravel for ballasting and protection of the membrane from sun. The owner has now decided to install skylights in the outer area of roof. The roof over the penthouse (to the right in the lower photo) also has an EPDM membrane ballasted with gravel.



elastomers, which are thermosetting, 2) thermoplastics, and 3) intermediate polymers. The elastomers are the synthetic rubbers such as EPDM (ethylene propylene diene monomer) and neoprene. These thermosetting materials must use a contact adhesive for sealing joints, and this requires a five- to 15-minute wait between application of the adhesive and pressure sealing with a roller. To mitigate this problem, manufacturers can provide factory-fabricated sheets, with vulcanized seams, in sizes up to 45 ft wide and 150 ft long. More commonly, synthetic rubbers are furnished in rolls 10 by 100 ft.

EPDM is the most popular of the synthetic rubber materials for roofing membranes, particularly for flat roofs. It is less expensive than neoprene, while it has much better weathering resistance than butyl rubber,

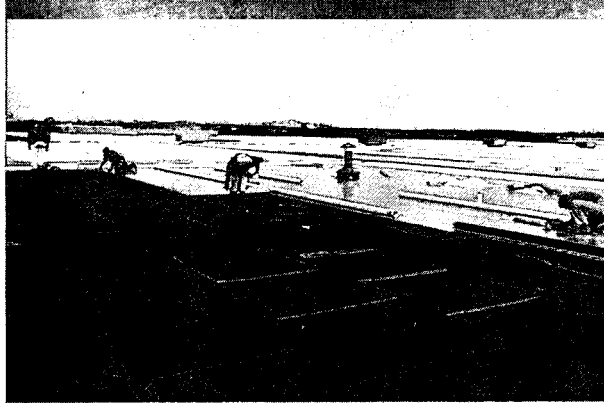
which it has largely replaced for roofing applications. It is flexible down to -75 F, and it has superior ozone resistance. Its higher permeability allows some escape of water vapor that might be trapped below the membrane—though this is no substitute for proper venting practices.

A major difference between the thermosetting synthetic rubbers and thermoplastics, such as polyvinyl chloride (PVC)—one of the most popular of the new synthetic sheet membranes—is that joints can be easily sealed using solvent cements or by means of heat using a tool that resembles a hand-held hair dryer or using a "walking" heat gun.

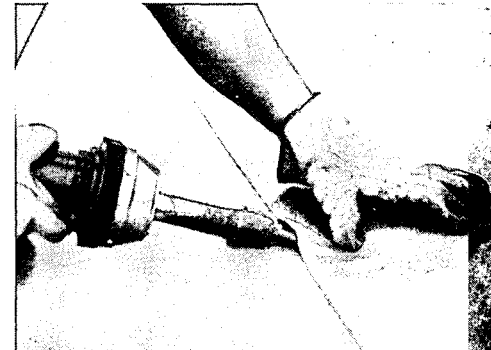
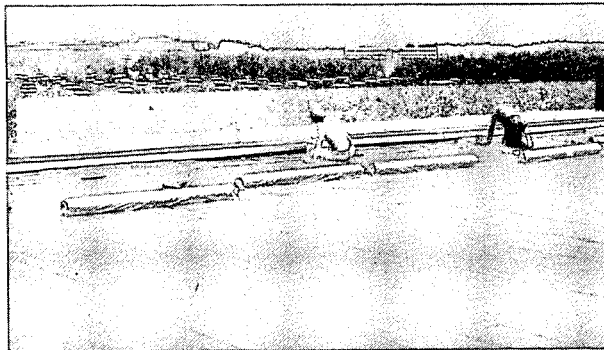
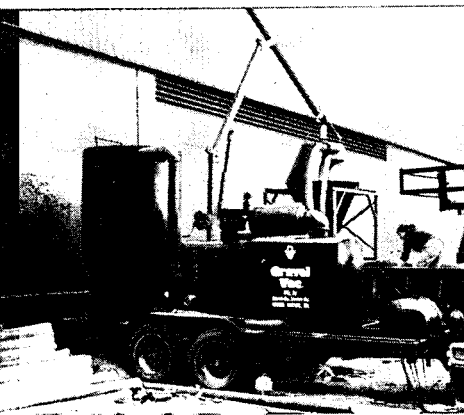
Polyvinyl chloride is a common building material used in its rigid form for pipes and siding. To make it more flexible, more extensible, and tougher, chemists add plasticizers.

The manufacturer needs to select the proper combination of plasticizers to achieve the desired physical properties to keep costs under control and avoid deleterious characteristics that might make the material unacceptable for roofing. Low-cost plasticizers usually are only additives that can evaporate or migrate out of the PVC. High-cost polymeric-type plasticizers, on the other hand, unite chemically with the PVC and are more or less permanent. If plasticizers migrate out, the material shrinks because of lost volume and becomes rigid and brittle.

Griffin cites the statement of one manufacturer of PVC roofing that samples cut from a 10-year-old roof membrane in Europe showed a plasticizer loss of only 11 per cent, which, extrapolated, would indicate a life of 20 to 30 years.



Seams were sealed with a hot-air gun, which is the preferable technique for cold weather. The alternative technique, solvent-cement adhesion, is used when the weather is warm enough for the solvent to evaporate and the PVC sheet is pliable. A bead of sealant is added over the seam for extra measure.



The 4-ply roof of a large warehouse in New Jersey failed after only a few years. Consultants Peter Corsell Associates determined that the rigid insulation had inadequate adhesion to the metal deck, which they believe might have contributed to the failure. They think that uplift of the membrane and insulation caused by wind could have caused the relatively brittle asphaltic membrane to split. The replacement roof used a loose-laid PVC membrane. As insurance against uplift damaging the new membrane, the consultants specified that the insulation be mechanically attached to the metal deck with special fasteners. Because there was scant margin for adding dead load to the structure, an estimated 3 lb per sq ft of gravel was removed from the original roof. The structure could accept an additional 3 lb per sq ft of dead load, according to the structural engineer, so the PVC membrane was ballasted with 6 lb per sq ft of gravel.



PVC contracts more than other membrane materials during cold weather because of its high coefficient of thermal expansion/contraction. For this reason, architects and consultants should instruct roofing contractors to allow excess material where the membrane is attached to building elements such as parapets and rooftop mechanical equipment. To counteract shrinkage from loss of plasticizer and to reduce thermal movement, some manufacturers have added woven-glass fibermat or nylon or polyester fabric to the PVC membrane.

Unprotected PVC is vulnerable to ultraviolet and ozone attack so protective coatings or coverings must be used. When PVC is used in inverted roof systems (protected membrane roofs) with insulation applied over the membrane, thermocycling, ultraviolet

exposure and potential roof traffic damage are reduced because of the protective layer of insulation and gravel. PVC is not compatible with asphalt and fumes from coal-tar pitch, so care must be exercised in reroofing applications.

Only a few of the intermediate polymers are used in roofing, among which are chlorinated polyethylene (CPE) which is fabricated in sheets, chlorosulfonated polyethylene (whose trade name is Hypalon) which is used in sheet or liquid form, and polyisobutylene (PIB) which is used more for waterproofing than for roofing. Sheet Hypalon systems are on the market with factory-bonded backing sheets which are fully adhered to the roof deck. One of these, Lexply, is a proprietary formulation with a number of ingredients compounded with Hypalon as the base poly-

mer. A cold water-soluble adhesive is used.

Fluid-applied membranes have a narrow range of applicability because they can only be applied over smooth substrates without cracks, which might include concrete and plywood. For concrete, cracks must be sealed or taped, and for plywood, joints must be taped or the surface covered with a glass mat to reinforce the membrane, according to Griffin. Furthermore, the substrates have to be very clean—no grease or dirt or loose particles.

More recently, fluid-applied membranes such as silicone or urethane/Hypalon have been used to protect foamed-in-place urethane foam over roof decks. The foam should have a density of at least 3 lb per cu ft, be well adhered to the structural deck, and be free of surface irregularities.

A single-ply roof takes less labor to apply, but good workmanship is essential

The process of installing a single-ply membrane is inherently simpler than that of the 3- or 4-ply built up roof. But there is no margin for error in adhering the side and end laps of the membrane, though it may be easier to detect leaks with smooth-surface single-ply membranes than built-up roofs. Sheets of synthetic rubber such as EPDM need to be carefully aligned because they are adhered with a contact adhesive. If any "fishmouths" form when these sheets are contacted, they should be cut out and the area patched. PVC sheets, on the other hand, can be joined using solvent cement or heat guns, the latter being favored for cold-weather application. Crews should be sufficiently skilled and trained to do the work, and all joints should be carefully inspected. Care must also be taken in preparing the substrate.

Advantages of the single-ply roof cited in the NBS survey mentioned earlier include: 1) extensibility—elastomeric membranes may bridge "non-working" joints and cracks in the substrate without cracking and splitting provided they are not bonded or are reinforced at these locations; 2) cold temperature resistance—some elastomeric membranes remain flexible as low as -50F, whereas bituminous membranes become brittle between 0 and 45F; 3) light weight—some elastomeric membranes weigh only 1/10 as much as smooth surfaced bituminous systems; 4) low-temperature application—some systems can be applied, manufacturers say, even at subfreezing temperatures; 5) reduced labor costs—since elastomeric membranes are normally one ply, the labor required is low compared to that for fabricated multi-ply membranes; 6) ease of repair—membrane damage such as puncture, split or tear can be easily repaired; 7) a loose-laid elastomeric roof can be removed by taking off the ballast, cutting the membrane where necessary, and removing sections of sheets—an advantage where major changes are made to a building.

Although some manufacturers of elastomeric roofing products allow dead-level application which can lead to ponding, the authors of the NBS report and some consultants say that all roofs, including single-ply, should have a 2 per cent slope (1/4 in. per ft). While some of these membranes have performed well as pool liners, roofs are subjected to thermal and structural stresses that do not occur with pools.

Against these are some disadvantages that the architect must weigh: 1) lack of information on long-term exposure—many materials and systems have not been in use long in this country, although some have experience records of 15 years and more in Europe; yet there is a question whether climatic conditions are comparable; 2) lack of performance and design criteria comparable to those available for built-up systems; 3) dependency on workmanship—it is critical in elastomeric roofing since instructions must be carefully followed, substrates must be properly prepared, and membrane surfaces must be clean, especially at seams.

Manufacturers and distributors of single-ply roofing products:

1. The Barra Corporation of America, Inc., Fairfield, N.J. 07006
Material: plasticized PVC sheet (Braas Rhenofol)
Systems: loose laid with ballast, or mechanically fastened
2. Carlisle Tire & Rubber Company, Carlisle, Pa. 17103
Materials: EPDM or neoprene sheet membrane (Sure-Seal)
Systems: 1) loose laid with gravel ballast, 2) bonded with adhesive plus fasteners, 3) membrane for protected membrane roof
3. Dynamit Nobel of America, Inc., Northvale, N.J. 07647
Material: plasticized PVC sheet (Trocal); coated white for unballasted applications
Systems: loose laid with ballast or mechanically fastened
4. Gates Engineering Co., Inc., Wilmington, Del. 19899
Materials: neoprene, EPDM, polyisobutylene (PIB)
Systems: 1) neoprene fully adhered (new roofs), 2) neoprene mechanically fastened (reroofing), 3) polyisobutylene (PIB) applied with hot asphalt over insulative core
5. B.F. Goodrich Company, Fabricated Polymers Division, Construction Products Department, Akron, Ohio 44318
Material: Hypalon-based weathering surface over mineral-reinforcement backer (Lexply)
System: bonded to deck and seamed with adhesive
6. W.R. Grace & Co., Construction Productions Division, Cambridge, Mass. 02140
Material: composite of rubberized asphalt with top layer of polyethylene film, self-adhesive surface on bottom face (CRM)
System: roof deck primed and membrane pressure-rolled to deck
7. International Roofing Systems, Inc., Pawtucket, R.I. 02862
Material: polyester-reinforced PVC, 32 mil or 36 mil with white reflective surface (Weather-Tite and Solar-Lite)
System: loose laid or mechanically attached
8. Koppers Company, Inc., Pittsburgh, Pa. 15219
Material: bitumen-based laminate with plastic core and polyethylene outer layers; second type has embossed aluminum top layer (KMM)
System: standard grade is for loose-laid roofing; aluminum grade is adhered for roofs with slopes more than 1/2 in. per ft. Joints are heat-fusion sealed
9. Moisture Membrane Systems, Inc., Tucker, Ga. 30084
Material: 80-mil sheet of copolymer bitumen and anthracite micro-dust, plasticized by heat (Carbofol)
Systems: 1) loose laid, 2) mechanically fastened, 3) bitumen bonded, 4) protected membrane roofs
10. Republic Powdered Metals, Inc., Medina, Ohio 44256
Materials: neoprene, polyisobutylene sheet
Systems: 1) neoprene mechanically fastened, 2) neoprene loose laid, 3) polyisobutylene (PIB) laid in hot asphalt (Geoflex)
11. Royal Marketing Associates, Inc., Pawtucket, R.I. 02862
Material: Hypalon with factory-bonded backing sheet (Uniroof)
System: fully adhered to deck with adhesive and seams heat welded
12. Sarnafil U.S., Needham, Mass. 02192
Material: PVC sheet reinforced with glass fiber and PVC sheet reinforced with polyester (Sarnafil)
Systems: 1) fully adhered, 2) loose laid, 3) mechanically fastened; laps sealed with solvent or hot air gun
13. Tamko Asphalt Products, Inc., Joplin, Mo 64801
Material: laminate of plasticized asphalt coating over polyester mat saturated with unblown, unfilled asphalt (awaplan)
Systems: fully bonded with built-up roofing equipment or by torching or loose laid by sealing laps with asphalt or by torch or hot-air gun.
14. USM Weathershield Systems Company, Stanhope, N.J. 07874
Material: plasticized PVC; 34-mil unreinforced sheet, 35-mil reinforced sheet, 48-mil reinforced sheet (Braas Rhenofol)
Systems: 34-mil sheet loose laid and ballasted, 35-mil sheet loose laid and ballasted, 48-mil sheet smooth and spot attached
15. Water Guidance Systems, Inc., Canton, Mass. 07021
Materials: 1) plasticized PVC, 2) CPE (chlorinated polyethylene), 3) EPDM (Plyroof)
Systems: 1) homogeneous PVC sheet loose laid, 2) nylon-reinforced PVC sheet loose laid, 3) nylon-reinforced EPDM loose laid, 4) polyester-reinforced CPE loose laid, 5) nylon-reinforced PVC fully adhered

For more information, circle item numbers on Reader Service Inquiry Card, pages 201-202

BUILT-UP ROOF INSULATION / Roof insulation, drainage and vapor retardant products for built-up roofing systems are featured in a 28-page booklet. Details on composition, advantages, applicable standards, limitations, sizes, wind loading, and technical data are provided for *Fesco* board and *Fesco-Foam* roof insulation. Roof/ceiling "U" values for both products are shown in tabular form. ■ Johns-Manville, Denver.

circle 400 on inquiry card

LAY-IN CEILING / A six-page folder describes the *Quadralon 441* luminaire ceiling system, said to offer high-quality light and low-energy use in an economical vaulted lay-in ceiling. *Quadralon* is particularly recommended for new construction and renovation of schools, speculative office buildings, etc. ■ Armstrong Cork Co., Lancaster, Pa.

circle 401 on inquiry card

MARKETING SOURCEBOOK / Over 2,100 multi-client reports and syndicated services available from consulting firms are conveniently listed in the third edition of the "Directory of U.S. and Canadian Marketing Surveys and Services." Included are 149 industrial and consumer marketing research companies and media research firms, ranging in size from international groups such as A.D. Little and A.C. Nielsen to a number of one-man operations. Capabilities of each firm are described briefly, and grouped into three categories: continuing services; individual surveys over \$1,000; and surveys under \$1,000. A loose-leaf binder, the *Directory* will include two upcoming supplements or the subscription price of \$125.00. ■ Charles H. Line & Co., Fairfield, N.J.

circle 402 on inquiry card

VINYL FILMS & FABRICS / Actual samples of laminate quality "LT" vinyl films and "LF" vinyl fabrics for non-metallic substrates are presented in a product folder. Intended for such architectural applications as demountable or movable partitions, the "LT/LF" series are UL-listed Class A for fire resistance. All materials can be matched with fabric-backed wallcoverings from the *Wall-Tex* and *Guard* collections, so that partitions and adjacent walls can be coordinated. ■ Borden Films, Columbus Coated Fabrics, Columbus, Ohio.

circle 403 on inquiry card

FIRE PROTECTION EQUIPMENT / A 56-page illustrated catalog contains a full line of standpipe and sprinkler fire protection equipment for interior and exterior applications. Included are lines of hose, extinguisher and special use cabinets; fire hose and extinguishers; racks, reels, nozzles and valves; and fire department connections. ■ Croker Standard Div., Fire-End & Croker Corp., Elmsford, N.Y.

circle 404 on inquiry card

COMPOSITE FLOOR DECKS / A comprehensive line of steel decks in 1½, 3-, and 3-in. depths in both cellular and non-cellular designs is presented in a 24-page technical brochure. New engineering data provided includes a stud value chart of composite beam design, a concrete volume chart, a design example, and loading diagrams for bending moments and deflections. Shoring tables

conform to the most recent standards established by the S.D.I. ■ Epic Metals Corp., Rankin, Pa.

circle 405 on inquiry card

METAL BUILDING INSULATION / "Energy Saving Insulation Systems for Pre-Engineered Metal Buildings," a 16-page brochure on *Thermax* insulation board, provides a detailed description of the product, its thermal properties and recommended uses as an exposed wall and/or ceiling insulation in both new and existing buildings. Results of major fire tests conducted on *Thermax*, including the FM full scale corner test, are included in the literature. ■ The Celotex Building Products Div., Tampa, Florida.

circle 406 on inquiry card

OUTDOOR LIGHTING / An eight-page color brochure discusses the features and benefits of *Module 600* wall- and pole-mounted luminaires for diverse outdoor lighting applications. Heavy-duty modular units provide controlled light sources using a number of HID lamps. Photos show luminaires in place; charts provide photometric data for each fixture. ■ Holophane Div., Johns-Manville, Denver, Colo.

circle 407 on inquiry card

LABORATORY ALARM / A color brochure describes a central alarm/monitor system designed to provide around-the-clock protection against undetected over- and under-temperature conditions in ultra-low temperature freezers, refrigerators, incubators, environmental rooms, etc. As many as 64 remote sensor units can be connected to the central console by a single data line. ■ Forma Scientific, Marietta, Ohio.

circle 408 on inquiry card

HUMIDITY THERAPY EQUIPMENT / A complete line of hospital therapeutic humidifiers, from extra-large tents to bedside units, is presented in a product catalog. *Cold Steam* atomizing units are featured; these can be adapted to child or adult therapy in any size hospital room, or be used in conjunction with oxygen therapy. ■ Walton Laboratories, Moonachie, N.J.

circle 409 on inquiry card

OSCILLOGRAPHIC RECORDERS / Competitively priced 2-, 4-, 6- and 8-channel oscillographic chart recorders using plug-in signal conditioners are shown in a color catalog. One and 2-channel multiple sensitivity units are also shown. Models are available with hospital-approved line cords, and which meet UL-544 leakage specifications. ■ Gul-ton Industries, Inc. East Greenwich, R.I.

circle 410 on inquiry card

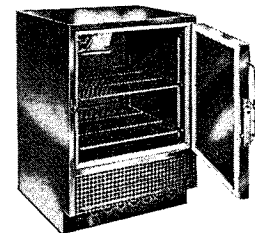
BATHS AND CIRCULATORS / Counter-top and freestanding refrigerated and heated baths and circulators are described in a laboratory equipment catalog. Liquid capacities range from 2.3 to 50 gallons; units have a direct digital setpoint and display feature which eliminates the need for thermometers. ■ Forma Scientific, Marietta, Ohio.

circle 411 on inquiry card

more literature on page 141

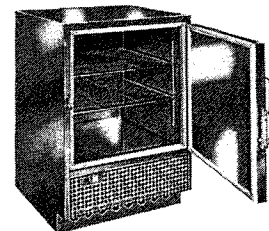
WE FIT IN

STAINLESS STEEL UNDER COUNTER LAB REFRIGERATORS AND FREEZERS



UC-5-BC refrigerator has a blower coil cooling system with automatic off-cycle defrosting and condensate evaporator in condensing unit compartment. Two adjustable stainless steel shelves are provided.

UC-5-F-BC freezer is equipped with automatic timer electric defrost. Capacity—5.4 cu. ft. (155 ltr.)

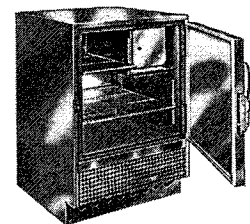


UC-5-CW* refrigerator with cold wall cooling system is equipped with push-button defrost, automatic reset and condensate evaporator. Capacity—5.4 cu. ft. (155 ltr.)

UC-5-F-CW* freezer is equipped with manual hot gas defrost. Capacity—4.6 cu. ft. (130 ltr.)

UC-5-CW-E refrigerator has the same interior features as the UC-5-CW but modified to make it *totally explosion-proof*. Capacity—4.9 cu. ft. (140 ltr.)

*With explosion proof interior only.



UC-5 features a two-tray ice cube cooling system with manual defrost and stainless steel defrost water tray. The cooler section has two adjustable stainless steel shelves. The entire UC-5 series features polyurethane insulated thin wall construction and air-tight neoprene thermo-break door seals. Capacity—5.4 cu. ft. (155 ltr.)

Jewett also manufactures a complete line of blood bank, biological, and pharmaceutical refrigerators and freezers as well as morgue refrigerators and autopsy equipment for world wide distribution through its sales and service organizations in over 100 countries.



Circle 65 on inquiry card

Refer to Sweet's Catalog 11.20/J for quick reference.

MAINTENANCE FREE ?

TCS ?

WORRY FREE!

Where architectural metals are concerned, the answer to the first of these questions is obvious, and the term itself virtually self-defining. A material to which it can legitimately be applied should need neither replacement nor repairs throughout its normal life span if properly installed. Expressed in the simplest manner, "maintenance-free" means "worry-free".

As for the second question, no other roofing and flashing metal can match TCS (Terne-Coated Stainless Steel) in maintenance-free longevity. Furthermore, it has many outstanding secondary characteristics. Among these are uniform weathering to an attractive warm gray; no staining of adjacent surfaces because of wash-off; and perfect solderability.

We will be happy to send you more detailed information (please call us without charge by dialing 1-800-624-6906).

FOLLANSBEE STEEL CORPORATION • Follansbee, West Virginia

LABORATORY PRODUCTS / Equipment for science, industry, research and education is presented in a 187-page laboratory catalog. Products include incubators, hazardous material storage refrigerators, environmental chambers, pollution instruments, fire extinguishers, timers, etc. ■ Lab-line Instruments, Inc., Melrose Park, Ill.

circle 412 on inquiry card

GERIATRIC HEALTH CARE / Research sponsored by this manufacturer of products and furniture for hospitals and other health facilities has been incorporated in two booklets written for professionals responsible for geriatric patients. "The Prosthetic Environment—A New Approach to Care for the Elderly" and "Geriatrics: A Learning Module" highlight the major environmental problems involved, and provide realistic suggestions to enhance the quality of living of elderly persons. ■ Lumex, Inc., Bay Shore, N.Y.

circle 413 on inquiry card

INSTALLATION STANDARDS / To be used as a guide for coordination and work sequencing, "Recommended Practice—Installation of Scientific Laboratory Furniture and Equipment" describes methods preferred by manufacturers of these products. ■ Scientific Apparatus Makers Assn., Washington, D.C.

circle 414 on inquiry card

WATER PURIFICATION / Water purification equipment and sterilizers for the laboratory are described in a 32-page catalog. Five sections divide the product line into reagent grade water systems, distillation systems, cartridge systems, purity meters and sterilizers. Each section is introduced by a technical discussion. ■ Barnstead Co., Boston.

circle 415 on inquiry card

WASHROOM/HOSPITAL ACCESSORIES / A guide for architects and other design professionals, 10-page catalog describes washroom, hotel-motel, hospital and janitorial products. Hospital items include lavatory stations, bedpan washers, grab bars and safety rails, etc. ■ Accessory Specialties, Inc., Yonkers, N.Y.

circle 416 on inquiry card

LABORATORY FURNITURE / Catalog describes the *Multiflex* work station, adjustable in height and position as well as configuration, with cabinets that can be relocated or deleted to provide open knee spaces. ■ Hamilton Industries, Two Rivers, Wisc.

circle 417 on inquiry card

ICE MAKERS / Commercial ice making and beverage dispensing equipment is covered in a 6-page color brochure. Product data and ice production rates are given for flaked and cubed ice makers, ice dispensers, bins, combination ice machines/drink dispensers, and carbonation cabinets. ■ Ross-Temp, Mason City, Iowa.

circle 418 on inquiry card

STORAGE TANKS / Under- and above-ground steel tanks for liquid fuel storage are described in a 18-page catalog. Tanks and storage units from 185 to 30,000 gallons capacity are included, along with accessories, installation instructions, and protective coating features. ■ Highland Tank and Mfg. Co., Toystown, Pa.

circle 419 on inquiry card

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Quality interior construction specialists
for over forty-five years:

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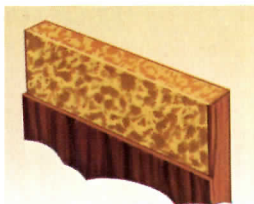
A Rockefeller Realty Group Company

Circle 67 on inquiry card

Pella designs wood folding doors with a distinctive difference.



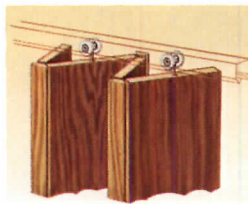
Pella changes the image of folding doors with attention to detail that is the hallmark of excellence in design. The result is a series of exceedingly attractive folding doors of superior wood construction and mechanical precision that will be an asset in almost any interior environment. For distinctly elegant flair, choose the handsome Designer series shown here. Or choose plain panels, 3 $\frac{5}{8}$ " or 5 $\frac{5}{8}$ " wide, with genuine wood veneers finished in clear lacquer, or unfinished to allow custom painting, varnishing or staining. An attractive but economical alternative is Vinylwood in a variety of wood grains and white. All in all, Pella has more to offer than other wood windows and doors.



Durable wood construction. High quality veneers or vinyls are bonded to strong, stabilized wood cores with water-resistant plastic glues. This solid construction resists warping even in humid areas.



Smooth operating hinging system. Pella wood folding doors open and close quietly, evenly and easily thanks to individual, special steel-alloy springs which run horizontally through each panel to serve as hinges.



Quiet, dependable track and roller system. Free-riding hangers, attached to every other panel, allow doors to glide easily, while double rollers maintain proper balance and minimize sway. Nylon-tire construction eliminates noisy metal-to-metal contact.



FREE CATALOG. For more detailed information, send for your free copy of our full-color catalog on Pella Wood Folding Doors. See us in Sweet's General Building or Light Residential Construction File. Or look in the Yellow Pages under "doors" for the phone number of your Pella Distributor.

Please send me your catalog on Pella Wood Folding Doors. I would also like information on: Sliding Glass Doors, Casement Windows, Double-Hung Windows, Awning Windows.

Name _____
 Firm _____
 Address _____
 City _____
 State _____ Zip _____
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Mail to: Pella Windows & Doors, Dept. T31J9
 100 Main St., Pella, Iowa 50219.
 Also available throughout Canada.
 This coupon answered within 24 hours.



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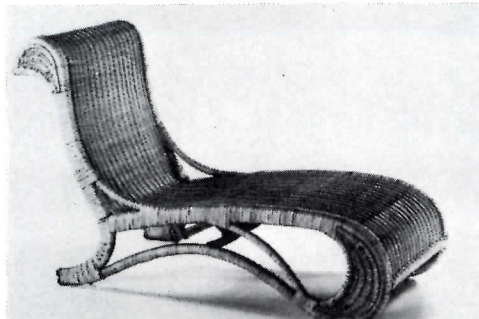
Only Pella offers it all.

Circle 68 on inquiry card



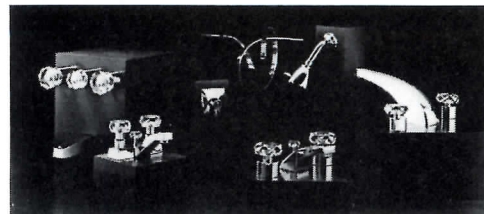
PLUMBING FITTINGS / The "Vola HV1" is a deck-mounted single control mixing valve with fixed spout. Water temperature and flow are controlled with a single up and turn motion; the brass faucet is available in 10 epoxy colors plus polished chrome and brass. The wash basin is vitreous enamel over steel, and comes in round (shown), oval and rectangular forms, and red, yellow, brown, black and white colors. ■ Architectural Complements, Lincoln, Mass.

circle 302 on inquiry card



RATTAN LOUNGE SEATING / Pliable rattan strong enough for high traffic contract applications is used in the "Samantha" chaise as shown; other lounge pieces include an armchair, ottoman, low table and bar table with casters. Seat and back pads are optional. ■ Stendig Inc., New York City.

circle 306 on inquiry card



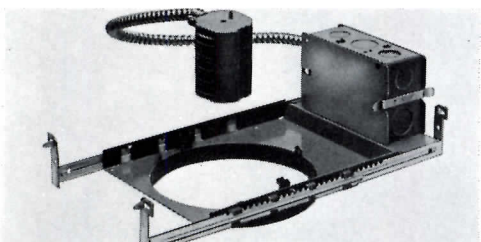
PLUMBING FIXTURES / Highly-styled bathroom faucets and bath/shower controls are offered in the "Crescendo" product line. Solid brass in chrome or gold finished, "Crescendo" fixtures have massive lucite handles. Fittings available include both center-set and wide-spread lavatory faucets with pop-up wastes, and ledge or wall-mount tub fillers or three-valve tub-shower combination fittings. ■ Eljer Plumbingware, Wallace Murray Corp., Pittsburgh.

*circle 307 on inquiry card
more products on page 145*

LIFE SAFETY SIGN / Said to be easily comprehended by any person regardless of age or language, this international fire escape sign uses dramatic graphics to indicate the fastest exit in emergency situations. A silhouetted black figure is depicted fleeing from a large red flame: the figure itself, and the directional arrow below it, can point either left, right, up or down stairs. The plastic sign is available in sizes for door, hallway, or large area mounting. An opaque version can be used as a cover for standard electric exit signs. ■ International Safety Signs, Inc., Brockton, Mass.



circle 303 on inquiry card



RECESSED FIXTURE / The H-17 Flexall incandescent fixture combines a plaster frame with an adjustable screwbase socket and over 30 different trims. The bar hangers are adjustable for 16- to 24-in. joist spacing. Three reflectors work with the housing: two shapes in spun aluminum and one larger unit with a white baked enamel finish. In addition to basic lighting units, the "H-17" can accommodate three special trims: a moisture-proof shower light, a 20-watt fluorescent, and a low-voltage eyeball for 12-volt high-efficiency operation. ■ Halo Lighting, McGraw-Edison Co., Elk Grove Village, Ill.

circle 304 on inquiry card

OFFICE RATTAN / Natural rattan shells are woven over all-welded tubular steel frames in this chair line. Foam-cushioned seat and back may be upholstered in fabric, vinyl or COM. ■ Virco Mfg. Corp., Los Angeles.



circle 305 on inquiry card



St. Mary's College, C. F. Murphy Assoc., Architects, Keith Palmer, Photographer.

KALWALL®

The most highly insulated light transmitting material.
Saving energy for 25 years.

KALWALL CORPORATION

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See Sweet's 8.14/Ka, 7.8/KaL, 13.11a/Ka, 13.2c/Stu.

Circle 69 on inquiry card

For total washroom design, Bobrick is your single source.

1. A Total Design Concept in quality stainless steel washroom accessories and laminated plastic toilet compartments.

2&3. Designer Series washroom accessories including warm-air hand dryers can be color coordinated with laminated plastic toilet compartments.

4&5. A full line of high quality hotel bathroom accessories—available in satin, bright polished, or new bronze finishes.

6. A complete selection of large capacity waste receptacles for recessed, surface-mounted, and free-standing application.

7. Choose from more than 65 dispensers—designed for practically every soap product used today.

8. A variety of durable toilet tissue dispensers with many quality features, including spindles that save paper and protect against theft and vandalism.

9. For the physically handicapped, specify stainless steel grab bars and patented partition-mounted accessories.

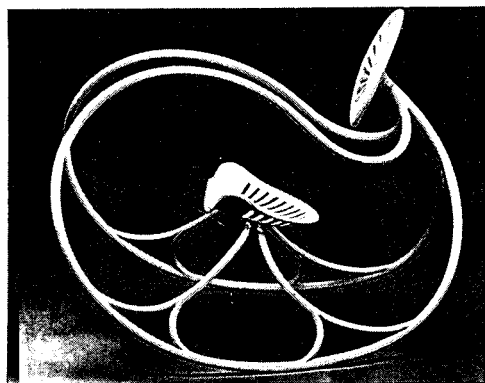
10. The only name you need to know in Washroom Equipment. Functional design, trouble-free operation, durability, and ease of maintenance since 1906.

Let us send you our Washroom Planning Guides and Catalogs. Bobrick Architectural Service, Lincoln Building, 60 East 42nd Street, New York, NY 10017. Bobrick products are available internationally.

Photo No. 1: TSPS Building, Walnut Creek, California. Architect: Howard Johnson and Associates, San Francisco, California.

Circle 70 on inquiry card





FURNITURE/SCULPTURE / A truly functional work of art, this tubular metal rocking chair is offered signed, numbered and dated by the creator, Canadian sculptor William Lishman. Fabricated from 1- and 3/4-in. tubing hand-bent on forms, with a cast aluminum seat and back, the "Lishman" rocker is finished in durable white nylon for use indoors or out. Easily assembled with two bolts, the finished dimensions are 45-in. long, 34-in. wide, and 36-in. high. Retail price is \$450.00 F.O.B. Buffalo, N.Y. ■ Opeongo Inc., New York City.

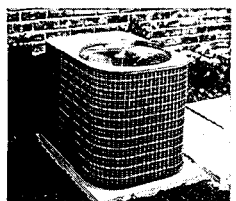
circle 308 on inquiry card

REFLECTIVE COATING / A resin-based copolymer of water-clear color, sprayable *Plasticool* is a sunlight heat reflective coating that achieves 93 per cent reflectance, eliminating solar radiant heat loads and lowering temperatures 10F to 25F under coated surfaces. It can be applied to any surface without a primer, and acts as a rust inhibitor when used to recoat steel buildings. *Plasticool* is corrosion resistant, and comes tinted in a variety of shades. ■ Coating Laboratories, Owasso, Okla.



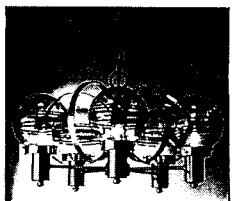
circle 309 on inquiry card

RESIDENTIAL HEAT PUMP / Packaged heat pumps are part of a hvac line engineered for the specific needs of single- and multi-family home-builders as well as light commercial uses in all areas of the country. Shown is the HS Series Thrift Air split system heat pump; also available are the HB, WhispAir vertical heat pump for wall-mounted installation, and HR units for either slab or roof applications. The nine models in the heat pump line provide from 22,000 to 120,000 Btu/hr cooling and from 21,000 to 118,000 Btu/hr heating capacities. ■ Westinghouse Residential Commercial Air Conditioning, Norman, Okla.



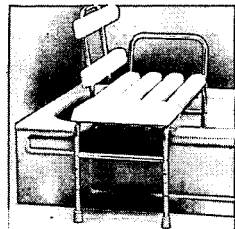
circle 310 on inquiry card

CONTEMPORARY CHANDELIER / The "Light Years" line of residential fixtures features brass or chrome finish highlighted with bands of platinum and gold. Lighting products include this five-light chandelier in chrome finish, chrome wall bracket, ceiling fixtures in polished brass or chrome, a four-light chrome or brass lighting strip, double swag lights, and banded glass cylinders. ■ Virden Lighting, Cleveland.

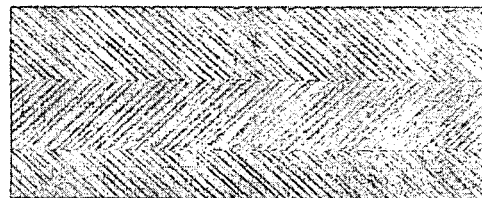


circle 311 on inquiry card

TUB TRANSFER SEAT / For use by patients with limited mobility, this padded transfer tub seat allows the user to close the shower curtain for privacy and to prevent wetting the floor with shower water. Polyurethane padded cushions on seat and angled back are completely covered in moisture-proof vinyl; seat height is adjustable from 18- to 22-in. The two legs of the seat resting inside the tub are equipped with suction cups for increased stability. Transfer seat weighs 14 lb and fits most standard tub sizes. ■ Lumex, Inc., Bay Shore, N.Y.



circle 312 on inquiry card



CEMENT TEXTURE / Rough embossing in a chevron design gives "Portland" 15-oz vinyl wallcovering the appearance of a cement wall. "Portland" has a Class A flame rating, with fire hazard levels of 15-0-10. Available with a sheet-backing in 54-in.-widths, its cost is said to permit its use in areas requiring massive quantities of wallcoverings. ■ J. M. Lynne Co., Inc., Westbury, N.Y.

circle 313 on inquiry card

MEDUSA

for Creative Concrete Construction



Whatever your concrete construction requirement—Medusa makes the cement to fill your creative need.

MEDUSA WHITE PORTLAND CEMENT—lends itself to unlimited architectural creativity in color, form and texture. Write for colorful, informative brochure.

MEDUSA CUSTOM COLOR MASONRY CEMENTS—provide the modern building team with a wide assortment pre-mixed masonry cement colors. Colors that will enhance the aesthetic beauty of modern masonry— as well as its acceptance.



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Circle 71 on inquiry card

PPG OFFERS A STUNNING ALTERNATIVE TO THE DRAB SLAB

Discover a spectacular exterior wall treatment that puts new designs on all that it surrounds. Discover PPG's Solarcool® Spandrelite® wall cladding.

In addition to dramatic beauty, Solarcool Spandrelite wall cladding offers outstanding performance capabilities. In new or existing applications. And at a cost that's lower than the expected exterior wall treatments: masonry, aluminum, stone and polished stainless steel.

An advanced structural silicone glazing system with the mullions inside can make Solarcool Spandrelite wall cladding appear seamless.

You're free to choose glass types and thicknesses previously unimagined.

And Solarcool Spandrelite works as an energy-efficient opaque curtain wall or a window area. Can even hang in front of insulation.

Since 1965, PPG has led the world in creative application of structural

silicone glazing systems. And began to build more "oohs" and "aahs" into buildings.

Find out more. See Sweet's 8.26/Pp. Or write Environmental Glass Sales, PPG Industries, Inc., One Gateway Center, Pittsburgh, Pa. 15222.

PPG: a Concern for the Future

Circle 72 on inquiry card



Offices opened

Carlton Goodwin, Jr., AIA and Spencer L. Scott, III, AIA announce the formation of their new firm, Goodwin-Scott-Architects, Incorporated for the practice of architecture, planning and urban design, located at 801 Plaza One, Norfolk, Virginia.

Eli Attia & Associates Architects announce the opening of their office at 101 Park Avenue, New York, New York for the practice of architecture.

Les Bellinson and Daniel Tinney announce the establishment of Bellinson-Tinney-Architect-Planner. The new office is located at 111 Southwest Third Street, Miami, Florida.

Formation of Bermudes-Marshall Architects has been announced by Victor E. Bermudes and Michael G. Marshall, principals in the new firm. Their offices are located at 5560 Ruffin Road, Suite 100, San Diego, California.

Eugene W. Betz Architects, Inc. with home offices in Dayton, Ohio announce the opening of their second office at 132 East New England Avenue, Winter Park, Florida.

Logan L. Donnel Associates have established a new firm for the general practice of building and structural technology. They are located at 1800 Commerce Street, Boulder, Colorado.

Flack + Kurtz Consulting Engineers, with offices in New York and Denver, announce the opening of offices in an expansion of the firm's operations at Gateway I, Newark, New Jersey.

Gensler and Associates/Architects announce the opening of their New York office, located at 150 East 58th Street, Suite 2410, New York, New York. Margo C. Grant will be principal-in-charge.

Golemon & Rolfe Associates, Inc., Architects, Houston, has announced the opening of the firm's Austin office at 1586 Austin National Bank Tower on Congress Avenue at 6th Street, Austin, Texas.

Architects David Michael Harper and Paul Albert Buzinec have formed the architectural firm of Harper & Buzinec, located at 117 Majorca Avenue, Suite number 1, Coral Gables, Florida.

Harris & David, Inc., a firm offering architectural design and engineering technical support services, has opened its offices at 150 Causeway Street, Boston, Massachusetts.

Innerplan, a new management-oriented facilities planning and interior design firm, has been formed as an affiliate of John Carl Warnecke & Associates, Architects and Planning Consultants. John Springer, AIA, is president of the New York-based organization.

Joel Ives, AIA, has announced the opening of his office for the practice of architecture at 18-00 Fair Lawn Avenue, Fair Lawn, New Jersey.

Fredrick Kuhn has established a new architectural firm called Fredrick Kuhn & Associates, located at 1452 Randolph Street, Detroit, Michigan.

Donald F. Leach, Kenneth A. Rodrigues and Eddy Z. Shen are pleased to announce the formation of their architectural practice: Leach-Rodrigues-Shen Associates AIA Architecture and Planning, 3080 Olcott Street, Suite 215-D, Santa Clara, California.

Neil Stanton Palmer, AIA has opened a new full-service office in Irvine, California, to handle planning, architecture and interior design. The offices will be located at 18002 Skypark Circle, Irvine, California.

Peterson/Von Sund/Partnership, a new architectural and planning firm in Sacramento, has opened an office at 1010 Hurley Way, Suite 300, Sacramento, California. Partners in the firm are Wilson Peterson, AIA and Gerald von Sund.

RTKL Associates, Inc. an architectural engineering and planning firm will open full service office at 8330 Meadow Road, Suite 100, Dallas, Texas.

Severud-Perrone-Sturm-Bandel and Tibor Szegezdy Associates announce the formation of Severud-Perrone-Szegezdy-Sturm Consulting Engineers.

Charles R. Sikes, Richard W. Jennings and Frank S. Kelly announce the formation of the architectural firm of Sikes Jennings Kelly with offices at 2500 West Loop South, Suite 410, Houston.

Charles S. Sink, FAIA and Richard L. Combs AIA announce the formation of their partnership under the name of Sink/Combs & Associates, 3003 East Third Avenue, Denver, Colorado.

WME/Interior Architecture, Space Planning and Design was announced by partners Don Wudtke, AIA, Larry Matarazzi and Eric Engstrom

ASID. They are located at 233 Sansome Street, San Francisco, California.

Michael A. Ernest and Keith Watson-Donald announce the establishment of a professional practice in Yaletown Square, under Watson-Donald & Ernest: Architecture, Programming, Planning, Management located at #200-1290 Homer Street, Vancouver, British Columbia.

Alfred C. Webber, Jr. announces the opening of his office for the practice of architecture at 152 East Evergreen Street, West Grove, Pennsylvania.

Weyl-Midwest, Inc. an association of Chicago architects and engineers, has been organized and will be located at 5483 North Northwest Highway, Chicago, Illinois.

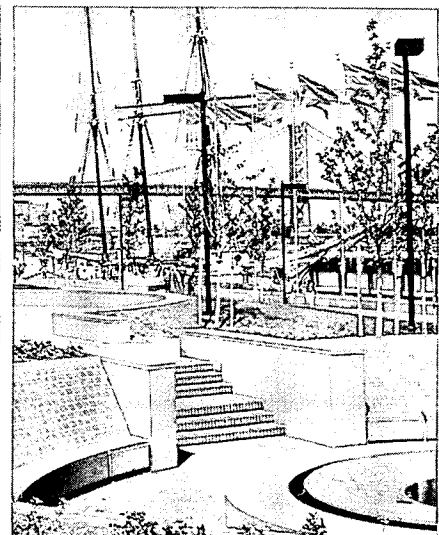
Donald T. Yoshino announces the opening of architectural offices at 1909 Union Street, San Francisco, California.

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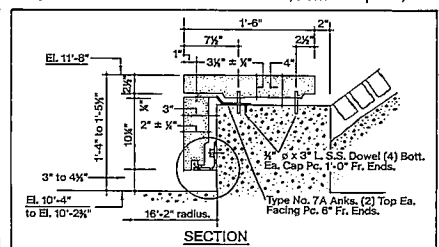
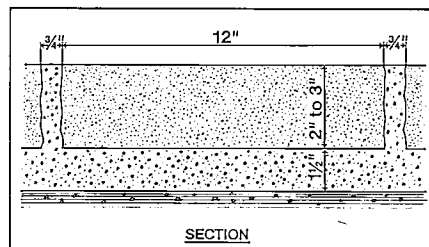
Not-so-pedestrian plazas for pedestrians.



Architect: Joe Karr & Associates, Chicago, IL
Sturr Young, Associate Architect, Oak Park, IL



Architect: Murphy Levy Wurman, Philadelphia, PA
Project Architect: Vincent Maiello, Philadelphia, PA



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SPECIFICATION GUIDE for Hot-Dip Galvanizing

This specification guide is intended to be used as a help in developing an office master specification for coating structural steel.

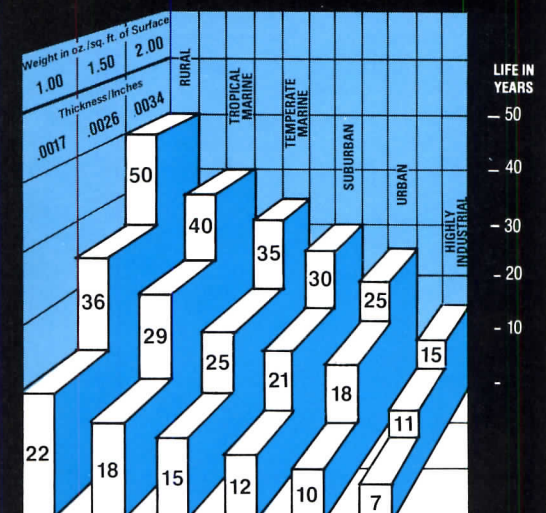
MINIMUM REQUIRED ZINC COATING WEIGHT¹ and EQUIVALENT THICKNESS² FOR GALVANIZED PRODUCTS

Applicable ASTM Specification and Product Form	Avg of Specimens Tested	
	Avg Wt oz/ft ¹	Avg Thk mils ²
ASTM A123 Galvanized Structural Shapes, Plates, Bars, and Fabricated Assemblies		
1/8" and 3/16" thick steel	2.0	3.4
1/4" and thicker	2.3	3.9
ASTM A153 Galvanized Hardware Castings		
Rolled, pressed, and forged	2.0	3.4
Thickness — 3/16" & over, length over 8"	2.0	3.4
Thickness — 3/16" & under, length over 8"	1.5	2.6
Any thickness, length 8" and under	1.3	2.2
Bolts and drive screws (over 3/8" dia.) and similar articles	1.25	2.1
Screws, stove bolts, and bolts (3/8" dia. and under) and similar articles	1.0	1.7
ASTM A386 Galvanized Assembled Steel Products		
Castings		
Rolled, pressed & forged	2.00	3.4
Thickness — 3/16" and over	2.00	3.4
Thickness — Under 3/16"	1.50	2.5
Bolts and drive screws (over 3/8" dia.) and similar articles	1.25	2.1
Bolts and drive screws (3/8" dia. & under) and similar articles	1.00	1.7

¹ASTM Method A-90 "Weight of Coating on Zinc-Coated (Galvanized Iron or Steel Articles)" shall apply for determining if coating weights satisfy specifications.

²ASTM E-376, "Recommended Practice for Measuring Coating Thickness by Magnetic-Field or Eddy-Current (Electromagnetic) Test Methods" shall apply for coating thickness approximations.

ANTICIPATED LIFE OF ZINC COATINGS IN THE ATMOSPHERE



This graph shows you the results of environmental exposure tests to measure the protective life of galvanized zinc coatings in various environments. It also shows that the life of the coating is directly related to the coating thickness, i.e., the amount of zinc available to protect the steel.

To estimate the maintenance-free life for your application, simply identify the environment and the coating weight specified and read the estimate from the chart.

RELATED SPECIFICATIONS AND PUBLICATIONS

American Society for Testing and Materials

ASTM A-90-69	"Standard Test Methods for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles."
ASTM A-123-78	"Specification for Zinc (Hot-Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars, and Strip."
ASTM A-143-74	"Recommended Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement."
ASTM A-153-78	"Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware."
ASTM A-384-76	"Recommended Practice for Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies."
ASTM A-385-76	"Recommended Practice for Providing High-Quality Zinc Coatings (Hot-Dip)."
ASTM A-386-78	"Specification for Zinc Coating (Hot-Dip) on Assembled Steel Products."
ASTM D-2092-68 (1974)	"Recommended Practice for Preparation of Zinc-Coated Steel Surfaces for Painting."
ASTM E-376-69 (1974)	"Recommended Practice for Measuring Coating Thickness by Magnetic-Field or Eddy-Current (Electromagnetic) Test Methods."

American Hot Dip Galvanizing Association

AHDGA (ASTM)	"Recommended Practice for Touch-up of Damaged Galvanized Coatings."
AHGDA & ZI	"The Design and Fabrication of Galvanized Products."
AHGDA & ZI	"Inspection Manual for Hot-Dip Galvanized Products."

American Welding Society

AWS	"Welding Zinc Coated Steel"
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The Interpretation of Ordinary Landscapes, edited by D. W. Meinig, Oxford, \$4.95.

Reviewed by David Clarke

Speaking of Peking, Edmund Bacon in his *Design of Cities* remarks, "The city is deeply enmeshed in ritualistic formulae and religious concepts which do not concern us now. Nevertheless, it is so brilliant in design that it provides a rich storehouse of ideas for the city of today." So special has the professional designer's vision, and therefore his use of language, become that Mr. Bacon has managed to say—if I may paraphrase—that Peking is a rich storehouse of ideas in spite of the fact that it has so many ideas. Oddly and sadly enough, the so-called synthetic and cross-disciplinary fields of environmental design have become cut-off from the core of humanistic searching as if they were like any other late twentieth-century fields of specialization. The explosion of specialization has left a vacuum where the center used to be; on the ever outward moving vectors, we no longer agree each to each on the meaning of the word "idea."

Most people demarcate da Vinci as the last person to achieve any kind of comprehension of the totality of contemporary knowledge. Others have tried since, like Toynbee, the Durants, or perhaps especially Mumford, but they all inevitably end up as specialists in their own right. In fact, it is all unknowable. There's too much of it, it's added to too fast, and it changes too fast. But what if one could discover where all this knowledge, all this purposefulness, could be found to concentrate—like, to use an unpleasant simile, loose mercury concentrates in a fish? Then one could return to the felicitous and self-sufficient method of direct observation, pioneered (ironically) by the father of science himself, Aristotle.

This book is, if you will excuse the expression, a landmark in the emergence of just such an endeavor. The pun results from the locus of the presumed concentration: the landscape. The book (a book of readings) is a sustained homage to the two generally accorded pioneers of this brand new field, now old men. There are forty-two pages of personal data on the duo in an appendix. One is J. B. Jackson, an American cult figure, and the other is England's W. G. Hoskins, of somewhat less obscurity due to some excellent BBC specials.

David Clarke is executive editor of the *Journal of Architectural Education*.

The backgrounds of these people, and the other (younger) writers represented here demonstrate the degree to which the university has been traditionally ill-equipped to support existing inquiries of this nature, or to help produce new ones. The study of culture through landscape has as yet no berth in such institutions; and it seems to be the case that substantial ping-ponging through both life and centers of learning is required in order to begin to understand how this field is genuinely distinct from others that at first glance seem to be appropriate hosts.

J. B. Jackson's background includes schooling in America, Switzerland, and France; a Harvard B.A. in history and literature; time spent on his uncle's ranch in New Mexico; some newspaper work; a year at MIT studying architecture; and several years service in combat-intelligence in World War II. In the latter experience—initially as a result of his duties and soon by dint of passion—he became a serious student of aerial photographs, maps, guide books, and local lore. As D. W. Meinig notes, "Therein he could see how many of his interests in history, geography, architecture and ideas seemed to converge and find expression in a kind of descriptive and interpretive literature which had no American counterpart." Back in the USA, perhaps inspired by the then new French periodical *Revue de géographie humaine et d'ethnologie*, Mr. Jackson began publication of *Landscape*, a periodical initially devoted to the human landscape of the American South-West but soon broadened by reader response to international scope. For 17 years, from 1951 to 1968, Jackson edited and frequently contributed to this startling and influential periodical while teaching part-time at Harvard (through the Carpenter Center for the Visual Arts) and at Berkeley (through the Department of Landscape Architecture). At age 60 or so he gave up driving his BMW motorcycle across the country and wrote his magnum opus *American Space: the Centennial Years, 1865-1876*. His collected lectures on later eras are due out shortly.

The important thing to grasp is that, while Mr. Jackson is indisputably associable with any number of specific landscapes, his goal is the grasp of the cultures represented in them, and how cultural changes are reflected in physical transformations over time. If you can see that, and not be deflected by the strong and constant presence of whichever landscape is under scrutiny at the moment, you can begin to understand how and why Mr. Jackson remains consistently non-judgmental throughout his entire oeuvre. Unlike artists, architects, land-

scape architects, antiquarians, conservationists, eco-freaks, environmentalists, planners, etc., he is not concerned with how the landscape *should* be but rather with how it *is*. And he would not, for example, study Peking's landscape as if it were a supermarket for whatever might look nice in Philadelphia, but rather to use the vastness of such an artifact to discover the ideas (in the normal sense of the word) that might be frozen in its texture. If, after long association, you discover that Mr. Jackson is indiscriminately and subtly fond of *all* landscapes, it is because all landscapes are made by man, and Mr. Jackson has grown fond of mankind.

Mr. Hoskins has been a little less exotic and a little more academic. His main formative elements seem to have been a degree in economic history from Exeter and a life-long love of the Devonshire landscape. Contrasts with Mr. Jackson are strong: Mr. Hoskins is clearly judgmental and is wholly concerned with past landscapes, while Mr. Jackson is not judgmental and is as curious about the present (and future) as he is about the past. Mr. Hoskins has focused on the finest of detail in pursuing his local lore, while Mr. Jackson has been more interested in the level of patterning. Mr. Hoskins has more or less stopped at uncovering history, while Mr. Jackson has seemed to consider history as merely landscape in the past-tense, a simple shift in conjugation that is incidental to the effort of ferreting out ideas. Nevertheless, both men have had the same discomfort in university settings, with Mr. Hoskins finally settling into the Department of English Local History at Leicester University College—a department created especially for him. He later switched to being a Reader in Economic History at Oxford at a point when his field of study was sufficiently clarified to ward off corruption. His magnum opus is *The Making of the English Landscape*.

Meinig's collection of representative writings of these two people and some of their brilliant students is important for two large reasons: it affords the opportunity to witness and assess the unfolding of the new humanities, fresh out of the side of the cold corpse of the old humanities. For that reason alone it should startle and give pause to both the English professor doing his computer search for anomalies in Shakespeare's plays and the architect blindly poking in the ruins for shiny or otherwise clever objects to pep up his buildings. More importantly, it may once again give us a common place to meet so that we can laugh at each other's excesses instead of just our own.

Books received on page 187

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An invaluable reference guide for architects and designers. Annually indexes and organizes the contents of the major architectural, landscape, urban design, and interior design publications.

ARCHITECTURAL STAINED GLASS, edited by Brian Clarke; *Architectural Record Books*, McGraw-Hill, \$29.50.

A series of essays and illustrations of stained glass by designers from England, Germany, and the U.S. Stained glass as medium, and glass as material are viewed within the context of contemporary architecture. With a generous sampling of graphically bold designs and 32 pages of color.

BETWEEN SILENCE AND LIGHT: SPIRIT IN THE ARCHITECTURE OF LOUIS I. KAHN, by John Lobell; *Birkhäuser Books*, clothbound \$15, paper \$7.95.

A pious presentation of the thought and design of Louis Kahn. Contains Kahn's lectures on architecture and the creative process, along with photographs of his major buildings.

COURTYARD HOUSE IN CHINA, by Werner Blaser; *Birkhäuser*.

Expounds the basic principles of the courtyard house in China past and present—timber construction, the open plan, the nonbearing wall, and the dialogue between house and garden. Published in conjunction with a special traveling art exhibit. Bilingual, German and English.

DESIGNING HOUSES: AN ILLUSTRATED GUIDE TO BUILDING YOUR OWN HOME, by Les Walker and Jeff Milstein; *The Overlook Press*, \$5.95.

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ENGLISH ARCHITECTURE: A CONCISE HISTORY, by David Watkin; *Oxford University Press*, clothbound \$13.95, paper \$7.95.

A compendious handbook of extant English architecture ranging from Saxon and Norman periods through the 20th century. Over 300 photographs illustrate this succinct chronology to present an intelligently written and focused guidebook.

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A helpful and instructive resource book for the home gardener. Classifies and advises on landscaping methods and plant choices, with an eye toward aesthetic and practical considerations.

THE HOUSES OF MANKIND, by Colin Duly; *Thames and Hudson*, \$6.95.

A social anthropologist's account of the evolving domestic structure as a response to both environmental and cultural principles.

HOW TO BUY A HOME AT A REASONABLE PRICE, by Robert Irwin; *McGraw-Hill*, \$12.50.

A pragmatist's guide to acquiring, financing, build-
continued on page 197



"I went for design. He went for cost. We both went for powder dispensers."

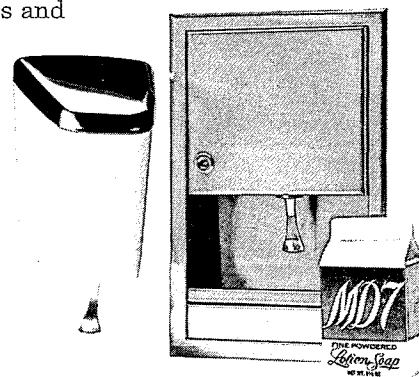
As the designer of this building, I had two things to consider when I chose the soap dispensers for the washrooms. Cost and design. The building owner asked if there wasn't an alternative to liquid soap. He said the dispensers always clogged or leaked. He also mentioned there was more waste with liquid soap—and the dispensers always seemed to need refilling.

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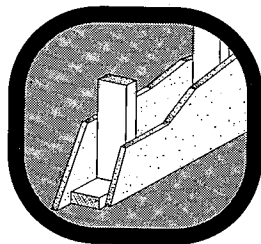
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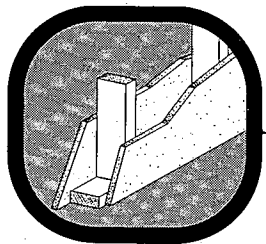
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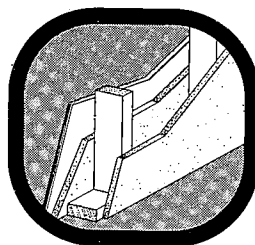
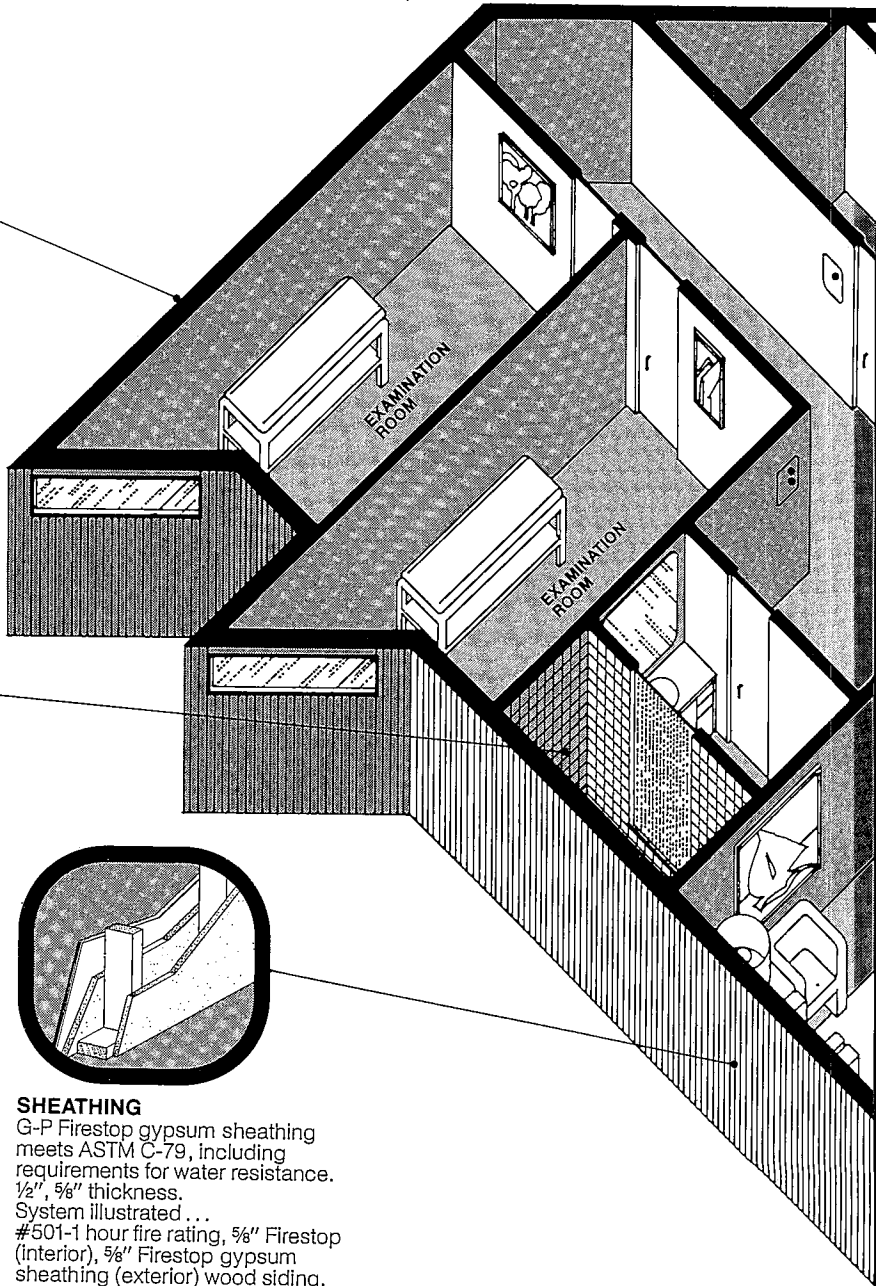
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HOW TO SAVE MONEY ON YOUR BUSINESS RENT, by Diane C. Thomas; Peachtree Park Press, \$14.95.

An instructive easy-to-read guide for the tenant. Comprehensive advice for cutting costs and making effective and economical leasing choices.

ILLUSTRATED GLOSSARY OF ARCHITECTURE, 850-1830, by John Harris and Jill Lever; Faber and Faber, clothbound \$13.95, paper \$9.95.

A visual lexicon which illustrates and explains architectural details. Illustrations are organized chronologically for greater accessibility.

MODERN HOSPITAL, by Ervin Pütsep; Lloyd-Luke Ltd., £20.

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STONE AND MAN, by Andreas Feininger; Dover Publications, \$6.

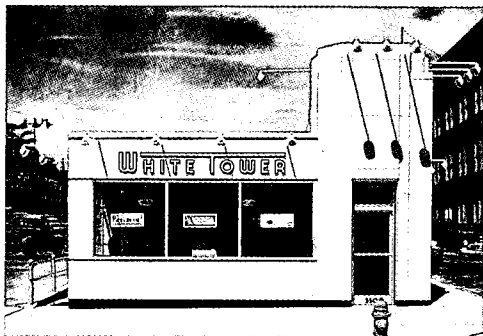
A photographic essay of man's natural environment and cultural development as chronicled in stone. Over 100 illustrations with accompanying text.

VENICE FOR PLEASURE, by J.G. Links; Farrar, Straus and Giroux, \$10.95.

A genial, informative, and sensitive guidebook for the sentimental traveler. Illustrated with historical maps and prints—focuses not only on the Venice of today, but also that of yesterday.

VISIONARY DRAWINGS OF ARCHITECTURE AND PLANNING, 20th CENTURY THROUGH THE 1960s, by George R. Collins; The MIT Press, \$15.

An exhibition catalog of visionary drawings from The Drawing Center in New York, with catholic commentary. Visual and literary exploration of the paper architecture of Wright, Mies, Kahn, Gropius, Fuller, and others.



WHITE TOWERS, by Paul Hirshorn and Steven Izenour; The MIT Press, \$17.50.

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ADVERTISING INDEX

For detailed data, prefilled catalogs of the manufacturers listed below are available in your 1979 Sweet's Catalog File as follows:

- G General Building (green)
- E Engineering (brown)
- I Industrial Construction and Renovation (blue)
- L Light Residential Construction (yellow)
- D Interiors (white)

A

Aiphone U.S.A. Inc.	186
Alkco Mfg. Co.	199
All-Steel Inc., One of the C.I.T. Companies	36
G Amarlite Products Div. of Anacohda .	56
G-L American Olean Tile Company	19
G-E-I American Telegraph & Telephone Co.	50-51
G-L Andersen Corp.	28-29
Architects Book Club	165to167
Architectural Record Books	68A,68D,178,192,194
Architectural Record Seminars	76-77, 156-157, 172-173
G-H-L-D Armstrong Cork Co.	74

B

G-E Bally, Case & Cooler, Inc.	161
G-D Bigelow-Sanford Inc.	69
G Bobrick Corporation, The	144
G-E-I Bradley Corporation	17
Brick Institute of America	53
G-E Burke Flooring Products Div. Burke Industries	32-6

C

G-E-I Caterpillar Tractor Co., Engine Div. ..	74
Clayburn Industries	32-5
G Cold Spring Granite Co.	147
Congoleum Industries Inc.	32
G-E Crouse-Hinds Company	63

D

I DeSoto Inc.	26
G Dover Corp., Elevator Div.	48
G-I Dow Chemical U.S.A.	134-135
E-I Dow Corning Corp.	Cov. II-1
Dukane Corp.	158
G-E-I-D Dupont De Nemours & Co., Inc. E.I. Teflon	6-7

E

Eljer Plumbingware Div. Wallace Murray Corp	163
G-E Elkay Mfg. Co.	32-2
Engineers Testing Laboratories, Inc.	193

F

Fentron Industries Inc.	32-1
G Flexiwall Systems, Div. of Wall & Floor Treatments Inc.	177
G Follansbee Steel Corp.	140
Forms & Surfaces Inc.	12
G Fry Reglet Corp.	160

G

G-H GAF Corp. Building Products Div.	24
G-H-L-D Gail International	136
G-E-I-D General Electric Co., Plastics Div. Lexan Georgia Pacific Corporation	75
54, 188-189	
G-E-I Grefco Inc., Building Products Div. ...	62
E Grunau Co.	152

H

Haworth Inc.	80
G-E Haws Drinking Faucet Co.	151
Helios Tension Products	176
G-L Howmet Aluminum Corp.	168

I

G-H Inryco Inc.	44-45
G-I ITT Phillips Drill Division	68
G-E-I ITT Reznor	30

J

G Jewett Refrigerator Co., Inc.	139
G-E-H Johns-Manville Building Systems Division	20-21
E Johnson Controls Inc.	66-67
E Joy Mfg. Co.	52

K

G Kalwall Corp.	143
G Kawneer Co., Inc.	23
G KDI Paragon	177
G-I Kemlite Corp.	154
Keystone Group	14-15
G-D Krueger Metal Products Co.	174

L

Laminators Safety Glass Association	179
Lundia Myers Industries Inc.	49
G Lyon Metal Products Inc.	42

M

G-D Masonite Corp. Commercial Division	159
Medusa Cement Co.	145
Mitchell Engineering Co. Div. Ceco Corp.	68
G-E Monsanto Co. Plastics & Resins Div. .	16
G-I Musson Rubber Co., R.C.	74

N

G-H National Gypsum International Operations	175
G Nucor Corp., Vulcraft Div.	64-65

O

G-L Olympic Stain Co.	79
G-E-I-L-D Owens Corning Fiberglas Corp.	8-9, 38-39

P

Peerless Electric Co.	68
G-L-D Pella Rolscreen Co.	142
Phillips, Eindhoven	68B-68C
G-H PPG Industries Inc. Coatings & Resins	169
PPG Industries Inc. Fiberglass	Cov. III
G-E PPG Industries Inc. Commercial Glass Div.	146

R

Rauland-Borg Corp.	177
G-I Raynor Mfg. Co.	Cov. IV
RCA Rubber Co.	162
Red Cedar Shingle & Handsplit Shake Bureau	162
G-I Robertson Co., H.H.	46-47, 138
Rockefeller Center Construction Corp.	141
G-E Rohm & Haas Co.	31

S

G-I Sears Roebuck & Co.	18
Shand Morahan & Co., Inc.	22
G-E-I Shatterproof Glass Corp.	79
G-L Simpson Timber Co.	5
E Sloan Valve Co.	200
G Sony Video Products Co.	25
G Soss Mfg. Co.	158
St. Joe Minerals Corporation	148
Standard Structures Inc.	32-3
G-I Stark Ceramics Inc.	160
G-H-L Stolle Corporation Subs. Aluminum Company of America	162

T

Tab Products Co.	150
G-I Tremco Mfg. Co.	190-191

U

Ulrich Planifiling Equipment Corp. ...	186
G U.S. Borax	187
G-E-I United States Steel Corp.	2-3, 71to73, 170-171

V

Vecta Contract Group	27
E-I Viking Corp.	180
Vincent Brass & Aluminum Co.	153

W

Wellco Carpets	78-79
Western Wood Products Assn.	133
G Wheeling Pittsburgh Steel Co.	158
Whitney Library of Design Div. Watson-Guptil Publications	160
G-I Windsor Door Co. Div Ceco Corp.	155

Z

Zero Weather Stripping Co.	70
---------------------------------	----

Fiber glass solar screens warmed this building operator's heart by cooling the air conditioning bill 7% in summer. And by making the building more comfortable in winter.



Phil Iatesta, Chief Engineer of Bethesda (Md.) Air Rights Building, shows how easily solar screen unlocks for window cleaning. He expects payback through energy savings in less than two years.

On summer days, the operator of this office building had to switch on the air conditioning at four or five o'clock in the morning just to get a head start on the day's heat.

Even so, it was hard to keep temperatures under 80 F—or tenants happy—on the hottest summer days.

But then, in May 1978, he installed fiber glass solar screens to screen out the heat of the sun on the south, east and west faces of the building.

From May until October '78, solar screens kept temperatures 76 F or below even on the hottest days. Better yet, the air conditioning wasn't switched on until 6:00 a.m.—a cool saving of up to \$120 per day in elec-

tricity or about 7% per degree day.

There were winter advantages, too. The screens eliminated hot spots up to 82 F near sunny windows and allowed a more uniform setting of thermostats. That in turn enabled tenants on the shady side to do away with individual electric heaters.

Money savings isn't the whole story. Fiber glass solar screens add daytime privacy and a more pleasingly uniform building exterior because they appear practically opaque from the outside. Outward vision is excellent.

Solar screens of fiber glass cost only about \$2.00 to \$2.50 per square foot, installed. Yet they deliver

invaluable comfort and they can pay for themselves by saving energy. For information write PPG Industries, Inc., Fiber Glass Division, Dept. AR, One Gateway Center, Pittsburgh, Pennsylvania 15222. In Europe, contact Sommergasse 29, CH. 4056, Basel, Switzerland.

PPG: a Concern for the Future

Fiber Glass



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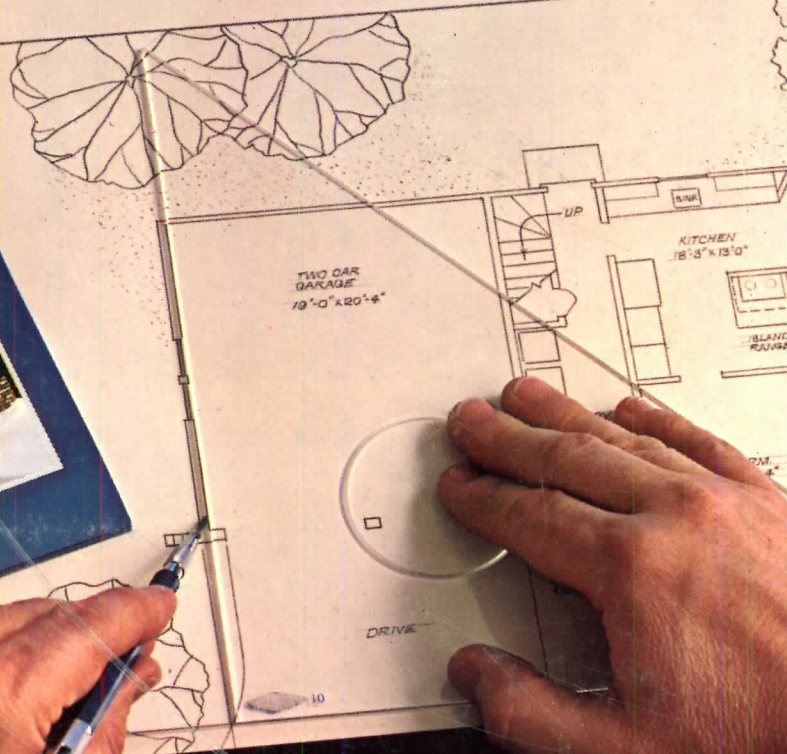
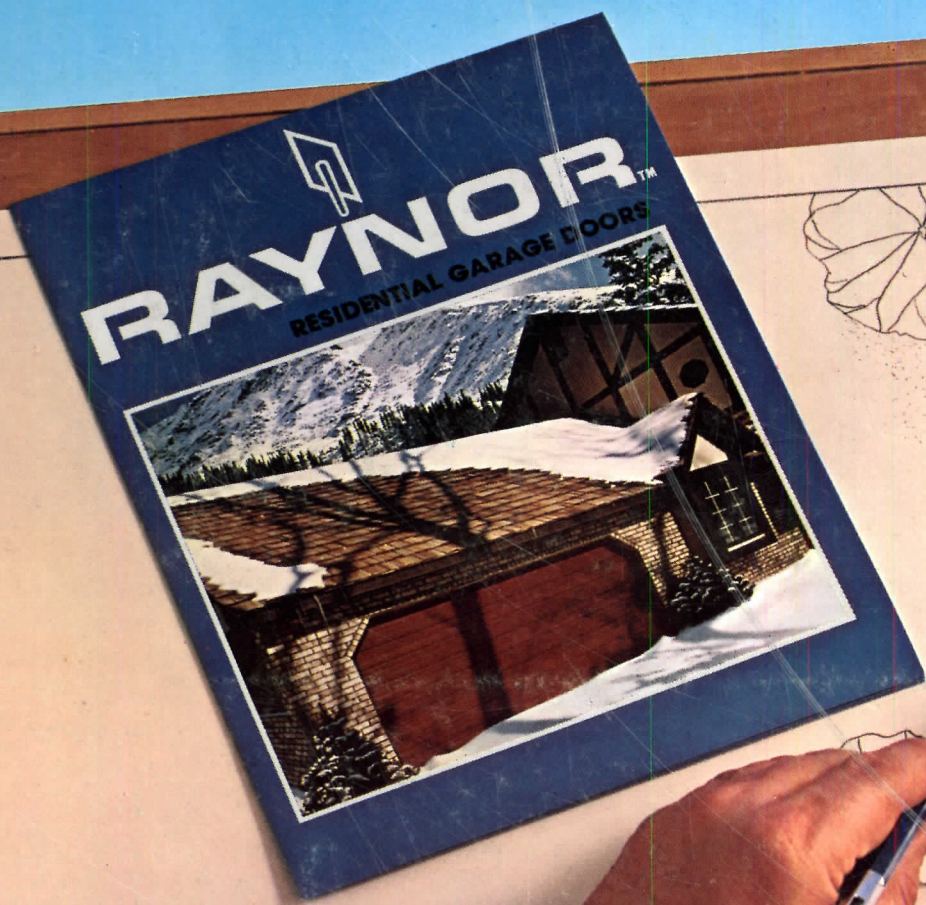
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Service...like undamaged delivery by our own truck fleet. Plus professional installation by our factory-trained distributors located throughout the country. They pledge prompt follow-up service for parts and repairs if ever needed. In the end, the last word you get from us is—satisfaction! For a copy of our catalog write Raynor Manufacturing Company, Dixon, IL 61021. Or call a Raynor Distributor near you. You'll find his number in the Yellow Pages under "Doors".

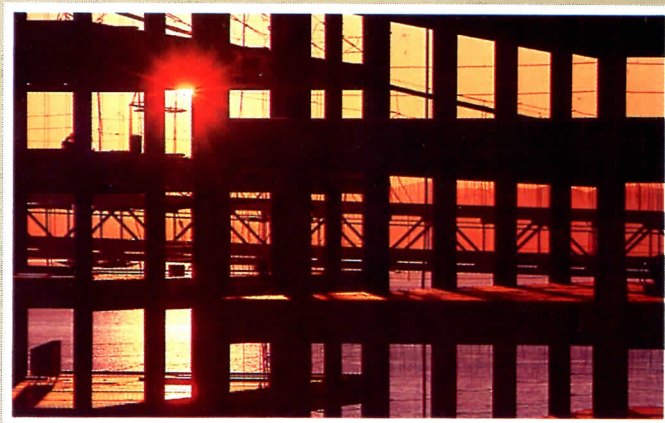


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GARAGE DOORS

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When you're planning to build or reconstruct a building's distribution systems, get the facts before you make a choice. 3M Modular Distribution Systems offer you two distinct advantages. Total capability, to handle everything you need today. And total flexibility, to accommodate changing needs for the lifetime of the building.

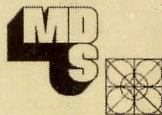


3M/MDS single-source systems give you design freedom. They're literally manufactured to fit the specific requirements of your building. Installation is easy and allows better cost control.

All service is carried in the ceiling or floor plenum. Out of the way, out of sight, yet always accessible. Power and lighting service travels in factory pre-wired multi-outlet ducts. Plug-in systems link overhead light fixtures to ducts. Electronics and communications have separate duct assemblies. And all services are delivered to point of use inside Communi-Power Poles, partitions or walls.

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