AIA JOURNAL

controlling costs
marketing by mail
recreation
education
urban design and
democracy

Haws polymarble fountains meet very demanding requirements at a cost comparable to ordinary fountains. They are durable, attractive, highly resistant to impact and abrasion, and available in six colors at no extra cost. The color runs throughout the material, so it won't chalk or fade. Flush-mounted, patented, push-button valves and new heavy-duty bubblers provide excellent vandal resistance.

■ Today, many polymarble models are excelling in practical application. For more information and product test results, contact Haws Drinking Faucet Co., 1441 Fourth Street, Berkeley, CA 94710.

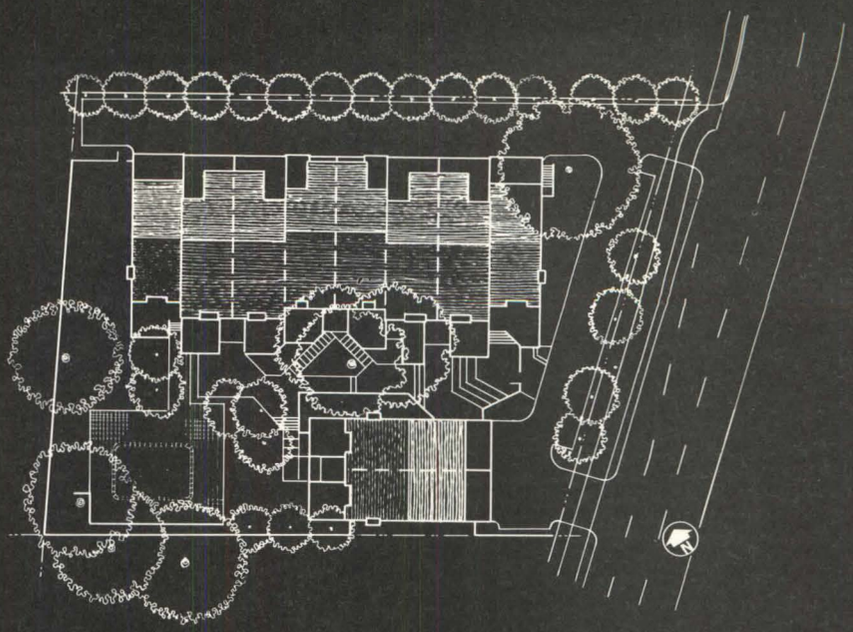
Haws offers the world's best drink

THE BEAUTY OF

polymarble®

Haws

Circle 1 on information card



Red cedar addresses vest pocket condominiums.

White Oak Townhouses, Menlo Park, California. Frank L. Hope and Associates, Architects.

These California townhouses are prototypes for a series of multi-unit housing projects on vest-pocket sites. Red cedar helped solve the problem of emphasizing each compact unit's individuality.

Their warmth and texture help each unit become a home while maintaining continuity over the structure's staggered planes.

Next time you need to solve a problem like this, consider the material with texture, warmth, durability and superior insulative properties. Let red cedar address itself to the problem.

For more details, write Red Cedar Shingle & Handsplit Shake Bureau, 5510 White Bldg. Seattle, Washington 98101. (In Canada: 1055 West Hastings St., Vancouver 1, B.C.)

These labels on bundles of red cedar shingles or handsplit shakes are your guarantee of Bureau-graded quality. Insist on them.

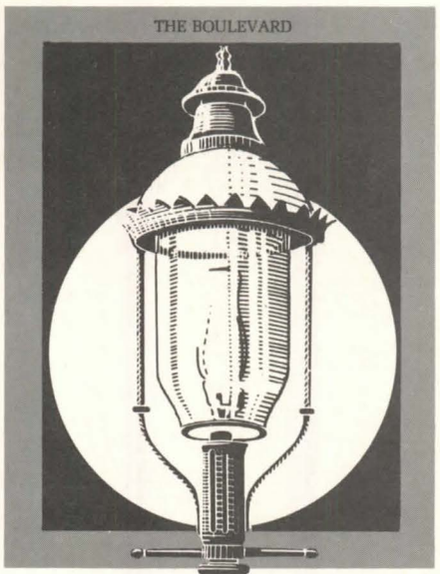
Circle 2 on information card

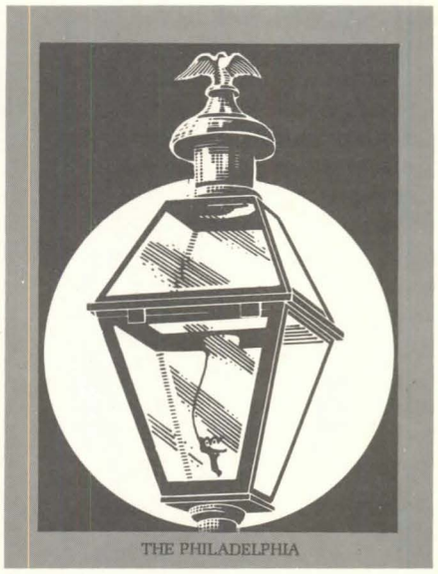
Red Cedar Shingle & Handsplit Shake Bureau

One of a series presented by members of the American Wood Council.

There's only one source for authentic fixture reproductions... the company who made the originals.


THE INDEPENDENCE SQUARE


THE BOULEVARD


THE PHILADELPHIA


THE CONEY ISLAND

Seventy-five, eighty-five, ninety-five years ago, thousands of Welsbach fixtures graced the streets of nearly every major city in America. Today, the same elegant fixtures and classic ornamental poles are available with gas or modern day electrical light sources.

There's the pompous Boulevard perched atop a stately fluted pole right off the streets of Baltimore. And the cheery Coney Island which seems so much at home amid a crowd of happy people. The Independence Square and the Philadelphia are truly colonial with design ancestry dating back to the 1700's. And many more.

To preserve the timeless charm of our richly endowed heritage, go authentic. And there's nothing more authentic than Welsbach.

WELSBACH

Welsbach Lighting Products Company, Inc.
3001 E. Madison Street
Baltimore, Md. 21205
(301) 276-4600

AIA JOURNAL

Cover: Suzy Thomas

Donald Canty, Editor; **Mary E. Osman** and **Peter H. Share,** Associate Editors; **Kathy Yu,** Editorial Assistant; **James E. Ellison, AIA; Dave Clarke,** Institute Department of Education and Research, Consulting Editors; **Suzy Thomas,** Art Director; **Michael J. Hanley,** Publisher; **Michael M. Wood,** Sales Manager; **George L. Dant,** Manager, Production and Business; **Michael A. Benoit,** Circulation Manager.

AIA JOURNAL, official magazine of The American Institute of Architects, published monthly at 1735 New York Ave. N.W., Washington, D.C. 20006. Telephone: (202) 785-7300. Subscriptions: for those who are, by title, architects, architectural employees, and to those in architectural education (faculty and schools), and to libraries, building construction trade associations and building product manufacturers: basic rate $7 a year, $12 two years, $6 to architectural students in the U.S., its possessions and Canada. For all others: $12 a year in the U.S., its possessions and Canada: other countries to those who are, by title, architects: $12 a year. All others outside the U.S., its possessions and Canada: $22 a year. Single copy: $2, payable in advance. Publisher reserves the right to refuse unqualified subscriptions. Change of address: give Circulation Department both old and new addresses; allow six weeks, second class postage paid at Washington, D.C. Microfilm copies available from University Microfilm, 300 N. Zeeb Road, Ann Arbor, Mich. 48106. Referenced in *The Architectural Index, Architectural Periodicals Index* and *Art Index*.

VOL. 62 NO. 5

Three New Tabulations of The Price Society Pays For Suburban Sprawl

"You don't have to move out of your home to live in a more expensive neighborhood," said Alan Greenspan, chairman of the President's Council on Economic Advisers, in an effort to find one of inflation's very few blessings. And if that home is a traditional, free-standing, single-family house in a typical suburb, it's already the most expensive type of dwelling to build and the most inefficient to operate. Moreover, the suburbanite isn't very likely to have black or poor neighbors because suburban governments usually act in their own economic interest to the detriment of the city—increasing sprawl and dissipating land and other resources.

These conclusions are evidenced in two recent reports. The first, titled "The Costs of Sprawl," contains the conclusions of a study developed under the joint sponsorship of the Department of Housing and Urban Development, the Environmental Protection Agency and the Council on Environmental Quality. It represents a first attack by federal agencies on urban sprawl, bringing together in one set of documents a factual analysis of the economic, environmental and social costs associated with various kinds of communities. The study shows that up to 50 percent can be saved in land costs, energy consumption, construction costs, municipal operating costs and air and water pollution if there is planned urban fringe and suburban development rather than haphazard growth.

The second report, prepared by the U.S. Commission on Civil Rights and titled "Equal Opportunity in Suburbia," says that the "urban employment picture has . . . been damaged by the lack of foresight or equitable planning in suburban growth." Major employers have relocated thousands of workers in the suburbs "without consideration for the housing and transportation needs of low-income or minority employees." This policy also continues the cycle of urban poverty as black cities are surrounded by overwhelmingly white suburbs.

"The Costs of Sprawl" deals with six hypothetical, prototype communities rather than actual places. It assumes as the basis of calculations a community of 33,000 people, with 10,000 dwelling units on a total area of 6,000 acres. It examines the impact of three possible forms of development in six such communities: "low density sprawl," typical of suburban development, with the entire community made up of single-family homes—75 percent sited in a grid pattern and the rest clustered; "combination mix," with half single-family houses and half in planned unit developments; and "high density planned," with 30 percent walkup apartments, 40 percent highrise apartments, 20 percent townhouses and 10 percent clustered single-family homes.

The savings in construction for the high density planned community are great. "Total capital (construction) costs for the high density community are 56 percent of those for the conventional low-density sprawl development, resulting in savings of $227.5 million. Savings in land cost amount to 43 percent ($12.725 million), with savings of 40 percent $15.103 million) for streets and 63 percent ($39.542 million) for utilities. Operating and maintenance costs in the high-density planned community are estimated to be approximately $2 million (11 percent) less per year than for the low-density sprawl development, due largely to less road and utility pipe links and reduced gas and electric consumption. Public operating costs may be reduced by 73 percent."

Four times as much land is used for residential purposes in the low density sprawl community than the planned high density one. Over 50 percent of the land in the high density planned community stays completely undeveloped, and it uses about half as much land for transportation as the low density sprawl community .The high density planned community generates about 45 percent less air pollution, due to less energy required for heating and for automobile use. Planning with increased density results in a saving of up to 44 percent in energy and water use. The time spent in travel is less with increased density; such developments take less time to clean and maintain; there are fewer traffic accidents. Crime, however, may increase with higher density, and there are potential "psychic costs, which are particularly dependent upon design and planning details."

The report does not recommend one type of development over another. But it does provide decision makers with an information base from which to work.

In "Equal Opportunity in Suburbia," the Civil Rights Commission asserts that although there is now legislation aimed at assuring the poor and minority groups equal housing, there's been only "lip-service adherence" by those involved in the development of suburban communities. As a result, the growth of the white and affluent suburbs runs concurrently with the deterioration of central cities, with their large and increasing percentages of poor and minority residents. The suburbanite benefits from the city's resources, says the report, but he offers no "reciprocal benefits to excluded urban minorities."

The commission urges enactment of legislation by Congress that would establish metropolitan housing and community development agencies in every state, whose purpose would be to guarantee the availability of housing at all income levels and without regard to race throughout the metropolitan area. The agencies would have "the power to override various local and state laws, such as zoning ordinances and building codes."

Another recent report states that sub-

urban land use barriers "exact a high price from our metropolitan regions and their people." Titled "Fair Housing & Exclusionary Land Use," it was published jointly by the National Committee Against Discrimination in Housing and the Urban Land Institute. The report finds that such barriers "severely limit the upward mobility of low- and moderate-income citizens, particularly minorities." The report mainly consists of summaries of court cases that challenge exclusionary land use and "gingerly" identifies some key issues to help determine the future course of litigation.

The emphatic point is made that suburban land use barriers "undergird and exacerbate racial and economic segregation. They ordain that the city—the hub and heart of the region—shall be the habitat of the elderly and the poor."

Massive Energy Study Places Its Primary Emphasis on Conservation

The principal finding of a $4 million, two-year Ford Foundation-sponsored study of national energy issues is that "it is desirable, technically feasible and economical to reduce the rate of energy growth in the years ahead, at least to the levels of a long-term average of about 2 percent annually. . . . Such a conservation-oriented energy policy provides benefits in every major area of concern—avoiding shortages, protecting the environment, avoiding problems with other nations, and keeping real social costs as low as possible." If the nation's energy growth rate is slowed by more efficient use of energy, "Neither jobs, nor growth rate in incomes nor household comforts will suffer," and with still more efficiencies and with a change to less energy-intensive activities, "energy growth can level off to zero" in a decade.

The study, conducted by the Energy Policy Project, is the work of an independent team of economists, engineers, scientists, writers and lawyers. EPP's final report, titled *A Time to Choose: America's Energy Future*, is the result of research and analysis by its staff and is based as well on some 25 specially commissioned studies. The report includes comments by a 20-member advisory board of American leaders, some of whom endorse parts of the report's findings but strongly criticize other parts.

Joseph A. Demkin, AIA, director of the Institute's energy programs, says that the report "backs up AIA's strong position on energy conservation in the built environment by calling for more governmental priorities on research and development. It makes an excellent case for the conservation of energy resources."

The report was presented to the public at a recent press conference, at which time S. David Freeman, project director, sharply questioned the Administration's present and contemplated energy policies, calling them "grossly inadequate." He said that the "slowdown from present growth rates would mean that from now until 1985 the nation could meet energy demand without resorting to developments that threaten grave environmental danger. . . . It would not be necessary to embark on large-scale development of Western coal and shale, nor would massive new commitments to nuclear power, increased oil imports or offshore oil developments in undisturbed areas be required."

To achieve major energy savings, the report says that the nation "must adopt a consistent, integrated energy conservation policy." Only the government by means of comprehensive and deliberate actions can make the "most fundamental decisions affecting energy." Higher fuel prices alone, the report contends, will not persuade builders to put insulation into new buildings, nor induce automobile manufacturers to provide for improved gasoline mileage in new cars.

Freeman said at the press conference that "energy growth and economic growth can be uncoupled." The report emphasizes that the "GNP could grow at essentially historical rates, while energy consumption grows at just under 2 percent." The report also finds that "it appears feasible, after 1985, to sustain growth in the economy without further increases in the annual consumption of energy." The report points out that the great bulk of savings over historical growth in energy consumption can be achieved by "technical fixes" in three key areas: "construction and operation of buildings to reduce energy needed for heating and cooling; better mileage for automobiles; and greater energy efficiency in industrial plants through investments in new technology and self-generation of electricity to use waste heat instead of more fuel to make process steam."

Substantial energy savings could be achieved through four goals:

- "Setting prices to eliminate promotional discounts and reflect the full costs of producing energy—especially important in achieving industrial energy conservation goals.
- "Adopting national policies to assure the manufacture and purchase of more efficient automobiles.
- "Developing incentives for increased energy efficiency in space conditioning of buildings.
- "Initiating government programs to spur technological innovation in energy conservation."

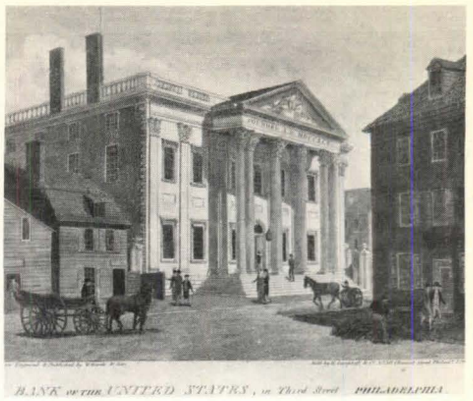
The report recommends specific policies to achieve these goals, among them:

- Elimination of subsidies to energy producers, such as depletion allowances.
- Redesign of electricity rates to eliminate promotional discounts and to reflect load costs.
- Enactment of pollution taxes to reflect environmental costs of fuels extraction and energy operations.
- Establishment of a federal loan program of easy credit for householders and small businesses to make economical energy saving investments in existing buildings.
- Revision of Federal Housing Administration standards for mortgages to specify minimum levels of heat loss and gain for buildings and minimum efficiency of space conditioning systems based on life-cycle economics.
- Initiation of government programs to provide credit to builders and owners to finance energy-saving technology, to upgrade building codes and provide technical assistance to builders.
- Shift of a sizeable portion of federal research and development funds to development of energy conservation technology.

In the past, says the report, citizens have been content to let major industries make the decisions. "But the fact is that the private interests of energy companies and the broader public interest do not always coincide. What is good for business is not always good for the rest of the country."

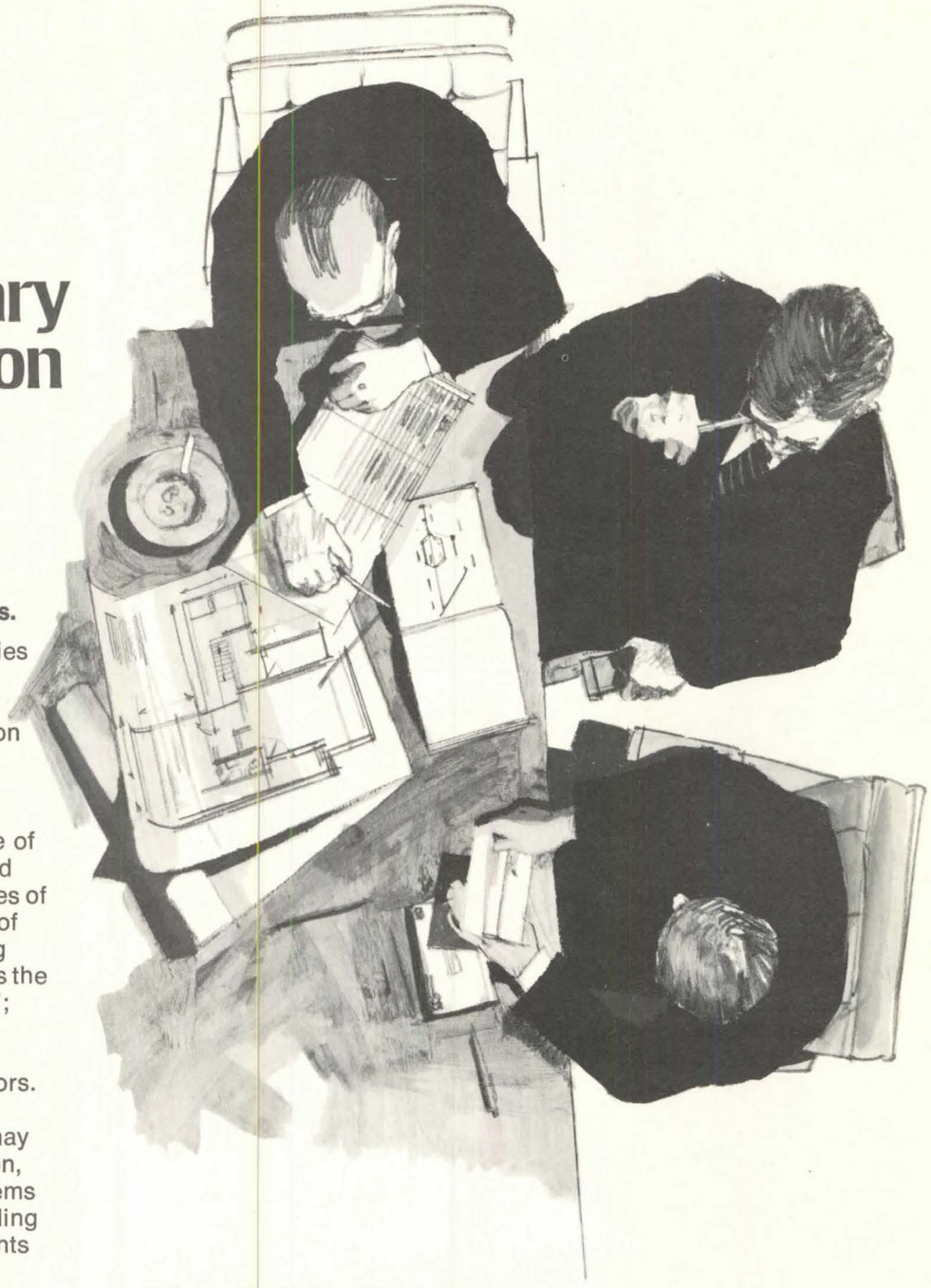
The only oil company executive on the advisory board, William P. Tovoulareas, president of the Mobil Oil Corp., issued a statement which takes issue with the report's findings. He characterized the report "as a formula for perpetual economic stagnation." In an advertisement in the *New York Times* of Oct. 18, Mobil questions whether Americans "would be

continued on page 10



A major bicentennial construction project of the National Park Service is underway in Philadelphia: restoration of the exterior of the nation's oldest bank building. Designed by Samuel Blodgett Jr. and erected in 1795, the building housed the First Bank, which was chartered in 1791 to give the new nation a central banking facility. Working drawings and specifications for the $1.7 million project are by Day & Zimmerman, under the direction of architect George P. Willman.

How to reduce unnecessary construction costs.



You may be paying more because you're paying less.

Although few other industries are as up-to-date in their application of modern technology, the construction industry and its clients are being denied the fullest enjoyment of all available economic savings because of a reliance on traditional and sometimes archaic practices of transacting business. One of the customs that is harming owners and builders alike is the practice called "retention"; another, the long-standing problem of "delayed final payments" to subcontractors.

While the practice of retention, in some cases, may have a place in construction, its abuse can create problems for all members of the building team. Delayed final payments cause many of the same problems. Both practices escalate building costs for the simple reason that the contractor must make allowances for them in his bid.

There are workable alternatives to these practices, alternatives that protect the interests of all parties while reducing building costs. These solutions are discussed in a free booklet now available, "The Owner's Handbook on Payments and Retentions". For added insights into reducing costs, send the coupon or write on your letterhead today.

The National Electrical Contractors Association
Dept. I-11
7315 Wisconsin Avenue
Washington, D.C. 20014

If electricity makes it possible, electrical contractors make it practical.

Please send me your free booklet, "The Owner's Handbook on Payments and Retentions".

Name_____ Title_____

Firm_____

Street_____

City_____ State_____ Zip_____


PPG
INDUSTRIES

A less expensive glass would have cost them more.

The owners of the Raleigh Office Building were developing a frankly speculative structure.

So they used high-performance glass — PPG Solarban® 575 Twindow® reflective insulating glass. And saved money.

Even though it was more expensive than plain tinted glass, Solarban 575 Twindow insulating glass permitted them significant savings on the cost of their HVAC equipment.

Not to mention the long-term savings they'll realize from lower operating costs.

Esthetically, they're getting the best looks money can buy. The reflective tones of Solarban 575 Twindow insulating glass give a building beauty that's noticeable yet not intrusive.

It gave the Raleigh Office Building a beauty that will bring them tenants.

And an economy that will bring them smiles.

For your next building, consider Solarban 575 Twindow reflective insulating glass. A less expensive glass might cost you more.

For more information, write for our new book, "Glass and the Future." PPG Industries, Inc., One Gateway Center, Pittsburgh, Pa. 15222.

PPG: a Concern for the Future

Architect: Seymour J. Levine Architects Inc. A.I.A.
Developer: The Raleigh Land Company
Project: The Raleigh Office Building

Circle 5 on information card

Going On from page 6
willing to—or should have to—accept the degree of government control over our lifestyles that the report recommends. . . . These recommended supply policies will keep energy scarce and expensive. . . . Even the low or zero-growth cases recommended in the report require considerable energy consumption and the development of new supplies." Mobil says that there are "viable alternatives to the economic stagnation that would result from the report's recommendations:

- "Conserve energy by wringing waste from the system. . . .
- "Begin developing additional energy supplies now. . . .
- "Eliminate government controls which frustrate development of additional energy supplies. . . .
- "Retain desirable environmental objectives, but review the timetable for reaching them in the light of the nation's energy needs. . . .
- "Encourage energy research, public and private, so energy shortages don't bring on economic disasters in the '80s and '90s."

Rogers Praises Campaign Financing Measure

When President Ford signed the campaign financing reform bill into law on Oct. 15, the AIA achieved one of its major legislative goals. The new law contains several provisions that conform to the campaign reform resolution approved by the board of directors last March and officially adopted in June at the 1974 annual convention. The AIA's advocacy of campaign financing reform originated with a resolution passed at the 1971 convention. The 1974 resolution expanded upon the original statement and urged substantial public financing, limits on the size of contributions and expenditures, limitations on giving by special interest groups, preservation of a role for political parties in campaign support, control and enforcement by an independent agency and complete disclosure of contributions.

The AIA has consistently supported action on the reform bill through its legislative minuteman program and through cooperative efforts with organizations such as the League of Women Voters, the National Council of Churches, Common Cause and various labor groups.

"This new statute," said Archibald C. Rogers, FAIA, president of the Institute, "will change political financing for the better and correct glaring inequities in the funding of present-day campaigns. The limitations on both contributions and spending will make campaigning for elected office more competitive and open to qualified persons without undue reliance on wealthy contributors or special interest groups."

In addition to ceilings on contributions and expenditures, the reform law provides:

- Public financing of Presidential campaigns, but not for Congressional races, and the establishment of an independent elections commission to enforce the law.
- A limitation on individual contributions of not more than $1,000 for one candidate in a federal election, and not more than $25,000 for all candidates for federal office during a single campaign period. Organizations are limited to contributions of not more than $5,000 per candidate.
- An expenditure limitation for candidates for the House of Representatives of $70,000 in both primary and general elections. The spending ceiling for Senate candidates is the greater of $100,000 or eight cents per eligible voter in primary elections and the greater of $150,000 or 12 cents per eligible voter in general elections.
- A limitation of $10 million for candidates in Presidential primaries for all primaries, with a limit in each state's Presidential primary of twice the amount allowed for a Senate candidate in that state. The ceiling for the Presidential general election is $20 million per major party candidate. Minor party candidates are eligible for partial funding based on the percentage of votes received in past or current elections.
- Public financing of Presidential elections to come from the $1 checkoff on federal income tax forms. Candidates may refuse the public funding or use it in any amount up to $4.5 million in primaries and $20 million in the general election.
- Dollar-for-dollar public financing for candidates in Presidential primaries after the candidate qualifies by raising $100,000 in individual private contributions under $250 spread among 20 states.
- Up to $2 million in public financing for major parties to support Presidential nominating conventions, with minor parties eligible for an amount based on the percentage of votes received in past or current elections.
- Permission for national and state political parties to contribute up to $5,000 per candidate per Presidential and Congressional election plus a total of $2.9 million in the Presidential election, the greater of $20,000 or two cents per eligible voter in each Senate campaign and $10,000 in each House campaign.

The statute creates a six-member federal elections commission to administer election laws and the public financing campaign, vested with authority to initiate civil action against violators. The President, Speaker of the House and the President Pro-Tem of the Senate will each appoint two individuals of different political parties from the general public to serve on the commission, subject to confirmation by both Houses of Congress.

AIA, Bureau of Standards Sponsor Research Architect

The AIA and the National Bureau of Standards have established a program whereby a distinguished practicing architect is given the opportunity to spend a year at NBS, where he will undertake individual research and also serve as a resource for ongoing NBS projects and programs while maintaining a liaison with the architectural profession.

The first research architect, selected by a joint AIA/NBS committee of representatives from the architectural and scientific communities, is John K. Holton. Holton, a Chicago architect, is associated with Mark VII Corp., a joint venture of Perkins & Will and Borg Warner Corp., and is director of physical planning and design for West Valley, a new town for 65,000 inhabitants being developed by the firms in Kane County, Ill. He is also a well-known consultant on modular housing.

A joint announcement by AIA President Archibald C. Rogers, FAIA, and NBS Director Richard W. Roberts says that Holton, and those who will follow him as research architects in years to come, "will establish new levels of communication between NBS and the architectural profession."

Errata: Los Bostongeles

Readers can be assured that both Charles Blessing and the editors know Los Angeles from Boston, the September issue to the contrary. In Mr. Blessing's portfolio "Seeing The City Whole" in that issue, the drawings of the two cities inexplicably were transposed during the production process. In the August article by Jeffrey Cook, on New Mexico solar energy applications, credit was incorrectly assigned for development of the "beadwall," a transparent wall using movable insulation to control heat flow. It was developed by David Harrison, who has our apologies. —Ed.

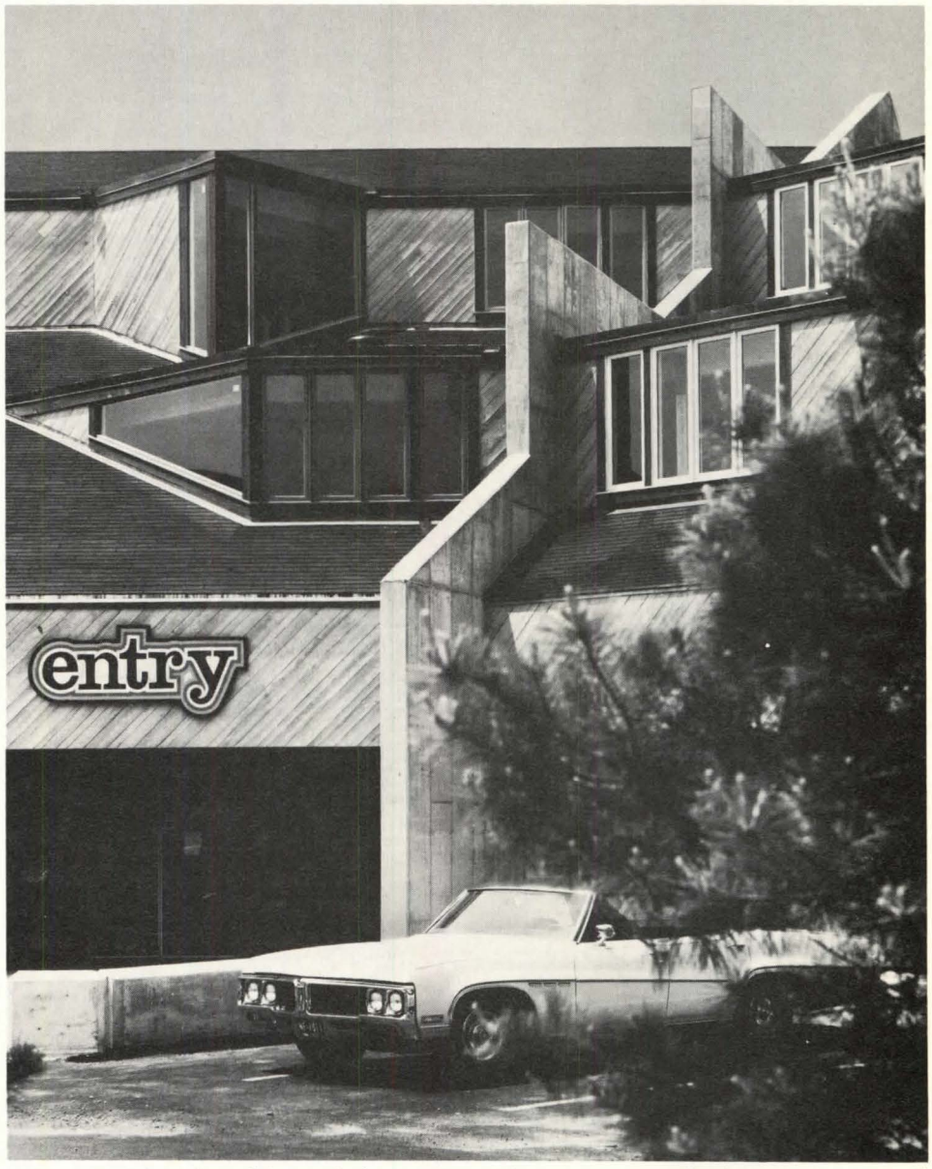
Professional Societies Hit OSHA, Code Discrepancies

The presidents of seven professional design societies have sent a letter to John H. Stender, administrator of the Occupational Safety and Health Administration, in which three definite areas of conflict between OSHA and existing building design regulatory standards are outlined. The letter, in effect, endorses an "OSHA white paper" that was prepared by the American Society of Civil Engineers, wherein it was stated that the use of codes and of the established code enforcement mechanism

Continued on page 15

New England Shopping Mall Has "California-Style" Architecture and a Rotary Screw Chiller that Turns Off When Weather Turns Hot

Looking more like a woodsy country manor than a busy regional center, the Talcott Village Exchange is heated and cooled by a water-source heat pump system. The developer's aim was to save both scenery and energy.



Dormers with redwood-framed clerestories and casements overlook entrance to mall.

Farmington, Conn. When last seen, the city of Hartford, Connecticut was still headed west. It is continuing the expansion begun soon after World War II as the growing population spilled over into the suburbs. In time its metropolitan area stretched out to touch, then overrun, the once isolated city of West Hartford and is now reaching out in the direction of Farmington, a village that was founded in the mid 1600's and with a population of approximately 15,000.

Most towns in Farmington's position start to build up center city hastily to welcome the approaching boom. People here are reluctant to do this, however. They are profoundly content with what they have: hundreds of fine old houses in a lush, rolling countryside setting plus a quiet, pleasant downtown with a subtle aura of New England charm. Their inclination is to resist the population push from the east and to preserve the clean and comfortable status quo. And at this writing it appears that the citizens of Farmington have a good chance for keeping the place intact.

A New Town in Town. Farmington's hope for preserving the status quo hinges on the "New Town" approach to land-use planning which has been tried with good results in several parts of the world. In theory, this approach eliminates the hazards of patchwork random growth by shifting the burden away from center city to an undeveloped area. Starting from scratch, land-use specialists work up a master plan for the project, which could range in scope from a self-sufficient community of modest size to a whole city. Brazilia in South America may be the ultimate example of the conceptual approach. In any case, the opportunities for bringing about orderly and well thought-out development are vastly greater than if the planners were restricted to compromising around existing buildings, roads and services.

Farmington's "new town" is Talcott Village begun by owner James S. Minges in 1969 on 200 acres of 40-year-old forest, more than half of which has been left in its natural state. Located ten miles out from the center of downtown, it is described as a total living community where people can reside, work, play, shop and socialize without going outside its boundaries. Residential buildings on the site include 128 condominium units, 271 rental apartments and 22 single-family homes. Already completed or in various stages of planning and construction are three low rise office buildings, a 300-room inn and conference center, a professional park, twin movie theaters, a

**One of a series of reports giving recognition to the efforts of architects and engineers on behalf of resource conservation.*

Circle 6 on information card

In very cold weather when recovered heat is insufficient for the building's needs, the chiller comes on line to extract supplementary heat from well water.

health club and spa with indoor and outdoor swimming pools, and a day-care school.

Regularity Breakup. Flagship of Talcott Village is a ¼-million-square-foot, four-story structure called "The Exchange." The main level and mezzanine of this building make up an enclosed-mall shopping center. The two upper levels are devoted to commercial office space. The construction is of exposed heavy timber without conventional wall and ceiling finishes in both retail and office areas. A sloping roof with dormer-type windows keeps the building small and low in scale for its size. Interior wood trusses add to the angularity which is part of the conscious breakup of what the architects consider the "deadly regularity" normally found in square-box office space.

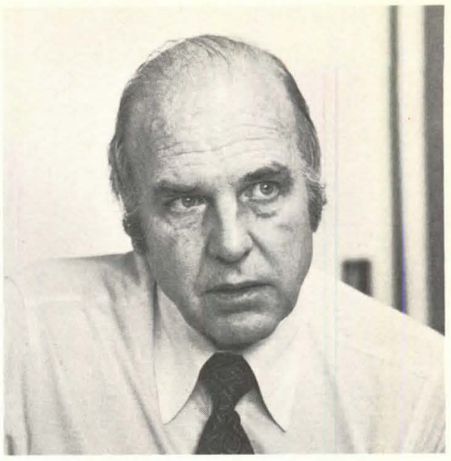
The interior environment of The Exchange is conditioned throughout the year by an energy conserving closed-loop water-to-air heat pump system. The system operates in conjunction with a series of wells which serve as a heat source in winter and a heat sump in summer. A notable feature of the system is a relatively new mechanical element, the rotary screw package chiller, which is used only for heating and not at all for cooling.

A Mayo Maybe. Farmington is also experiencing some home-grown expansion pressures in addition to those arising from its role as a suburb to Hartford. Located there in a dramatic new office building is the world headquarters of Heublein, Inc. which is booming as a result of the breathless success of its Smirnoff vodka. Among other firms that have important facilities here are IBM and Kodak. Probably the most important local influence is the State of Connecticut Health Center, adjacent to Talcott Village, which has been under continuing development since the 1950's. Long-range plans for the center involve hundreds of acres and many expect it to someday achieve the clinical capability and reputation of a Mayo or a Leahy.

Portions of the medical complex have been completed and are being staged into operation. The Health Center includes a 200-bed teaching hospital, classroom buildings for undergraduate education, outpatient clinics, domitories, an animal research tower, administrative facilities, the state medical examiner's office, and a structure for family medicine. Under active consideration is a proposal to relocate the Veterans Administration hospital and related services onto the site.

Urgent growth pressures such as these eventually proved beneficial to at least one native resident of the area. James Minges owned a large tract adjacent to the hospital site which he had wanted to put to use dating back to 1955. The townspeople, however, were generally against any large-scale development and back then it took him over five years to get approval to build a modest three-building office complex of only 78,000 square feet.

California Schemers. Minges scored a breakthrough when he called on the planning and architectural firm of



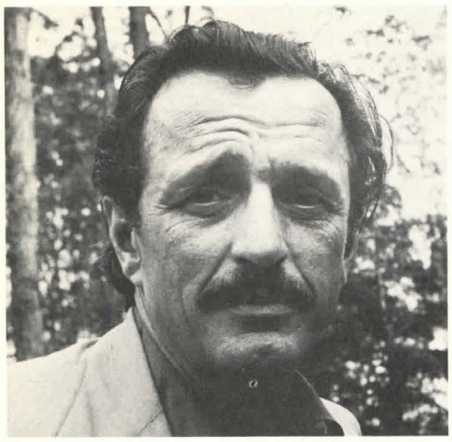
Builder James S. Minges' timely prescription for a "new town" provided some welcome relief for Farmington's growing pains.

Callister, Payne and Bischoff to come up with a new-town master plan involving his property and surrounding tracts as well. Headquartered in Tiburon, a remote hamlet northeast of San Francisco, they had achieved a national reputation for imaginative land-use schemes and community planning. The firm's founder, Charles Warren Callister, was one of the pioneers in so-called California-style design, a characteristic of which is liberal use of mellow tones of rough-sawn wood.

After a lengthy study, the firm prepared a coordinated plan which was then submitted to the town board for review. The plan proved to be a most convincing instrument for winning approval for Talcott Village. In the plan, the board clearly saw the opportunity for relieving downtown's growing pains and gave its approval.

Much of the environmental quality of Talcott Village can be traced to the developer himself. Although he started his career as a professional civil engineer, his interests in conservation led

Sloping roof of The Exchange mall helps building appear small in scale despite its four levels and ¼-million square feet.



Architect August Rath of Tiburon, Calif. feels there are some pleasant alternatives to shopping and working in a blockbuster.

him to qualify as a registered landscape architect. He now heads the consulting firm James S. Minges & Associates, Inc. which handles assignments in both engineering and landscape architecture.

Heritage Legacy. "I originally thought the project should have a very strong New England flavor," recalls builder Minges. "But after seeing Heritage Village, which the architects had done earlier in Southbury, Connecticut, I was captivated by its western feeling and thought they could create some of that same rustic woodsy architecture for this project."

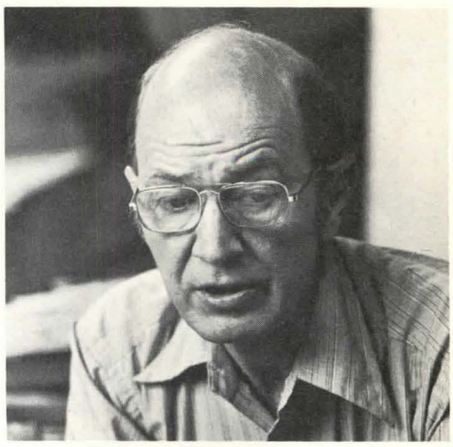
The Exchange as well as most of the residential buildings feature an imaginative adaptation of wood, inside and out. Windows—all ponderosa pine units with insulating glass—are major contributors to the community's "wood look." Most impressive in the shopping mall and office interiors are the exposed wood beams and rafters, some of which are as much as 24 inches in depth. The trusses and beams are of laminated design which accounts for the notable statistic that "there are 30 tons of glue" in the structural framework erected on the site.

"We wanted the people who live, work and visit here to experience the joy of natural materials," says architect August Rath. "The warmth and character of wood creates a greater harmony between building and land. It is the only renewable building material available and is also the most energy efficient, especially when you consider that the energy used in its 'manufacture' is solar."

Neatness Counts. The Exchange is heated and cooled by scores of independently-controlled electric heat pump units. These are deployed throughout the structure, suspended above the many shop and office spaces. The heat pumps are of the water-to-air type with various ratings ranging from 1½ to 4 tons. All are coupled into a closed loop of pipe carrying circulating water. Because of the open ceiling feature of the design much of the mechanical system is visible to the people below. Electrical conduit, heat pumps and the short branches of air duct associated with each one, the network of glass fiber water pipe, are all on view giving much the same impression as a cutaway drawing of a building's innards.

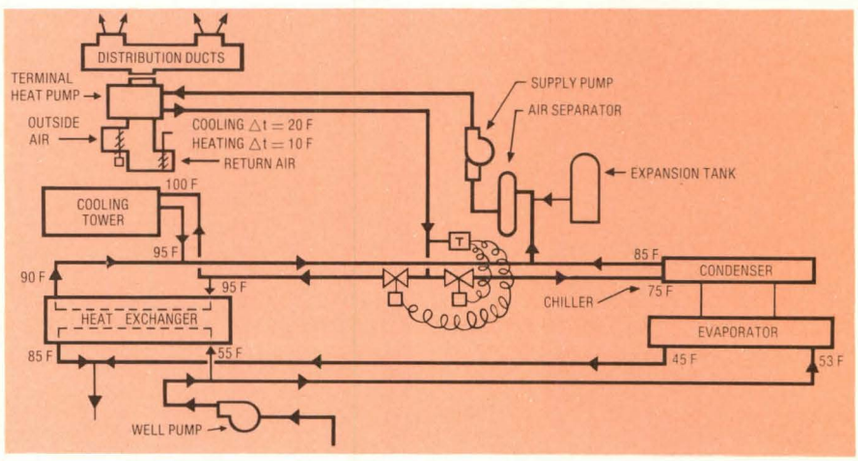
The mechanical components are painted in vivid reds, greens, blues and yellows and contrast pleasantly with the soft natural wood colors of the cathedral ceiling. When a mechanical system is exposed like this and expected to complement the decor, neatness of installation is essential. The runs of pipes and ducts, for example, must be straight and parallel, corners square.

Does this requirement make the design of the mechanical system a more difficult task? "Not the design itself," answers engineer Evert M. Johnson. "As they come off the drawing board, mechanical layouts are inherently orderly affairs. The tools of the draftsman —T-square, triangle, protractor, etc.— make them all that way. But we do have to supervise the installation more closely to make sure the trades don't improvise shortcuts. Some improvisation on the job is O.K. when the system will be concealed above a finished ceiling, but not when it is to be on display over the life of the structure."



Engineer Evert M. Johnson will allow shortcuts sometimes but not when ducts and pipes are destined to be parts of the decor.

Energy Exchange. The use of an independent heat pump unit in each separate area opens the possibility for optimizing energy use in this multiple-zone structure. The water-to-refrigerant heat exchangers of all units are connected together by the closed loop of circulating water. A major advantage of this system is that it recovers excess heat from one zone and transfers it to another that requires it.



WATER-SOURCE HEAT PUMP SYSTEM

The basic subsystem for space conditioning The Exchange comprises a packaged water-to-air terminal heat pump unit and the short runs of distribution ducts. There are about 450 such installations, each assigned to one particular zone and controlled by an independent thermostat. Any given unit can be on heating or cooling to suit the needs of its space regardless of the season. All units are coupled into a six-inch main carrying circulating water which serves as a means for exchanging heat energy among units. In winter this system recovers enough heat energy to meet the heating demands of the structure without supplementary heat until outdoor temperature drops to 20F.

In summer water from a well-water heat exchanger is mixed with water circulating through the main loop to keep it in the 90-95F range. The heat exchanger is in effect taking heat from the loop and rejecting it into the deep wells. The cooling tower supplements the well-water heat exchanger. When the latter cannot carry the full load, the tower takes heat from 100F water and rejects it to outside air.

In winter the rotary screw package chiller is brought into the system. Its evaporator takes heat from well water directly, dropping it from 55F to 45F. The 85F water from the condenser is mixed with the circulating water in the mains connecting the terminal heat pump units.

photography by Otto Baitz

Florist's knotty pine counters and light valances blend with exposed timber above.

Between seasons some parts of the building require cooling while others need heating. Hence some heat pumps will be operating in the cooling mode, depositing heat in the closed circuit. At the same time, other heat pumps will be functioning in the heating mode, extracting heat from the circuit to warm the areas calling for heat. When heating and cooling requirements are essentially in balance, the building may be said to heat and cool itself.

During summer months, excess heat is rejected into 55F water drawn from four deep wells on the site. Even in hottest weather, condensing head is kept low. Energy is conserved since at low condensing head, the heat pump compressor motors require less power input. In winter the heat generated by machines, lights and people is recovered for use in the building where needed. The random mix of operating modes–some terminal heat pump units on cooling putting heat into the water loop and some on heating extracting heat–is such that loop water temperature is above the 75F operating minimum until outdoor temperature drops to 20F.

Below this point supplementary heat is required and it is supplied by a 220-ton rotary screw chiller. The chiller, which does not operate at all in summer, removes heat from 55F well water and dissipates it into the closed loop. The chiller is effectively in cascade with the terminal heat pumps to provide a portion of the "lift" involved in extracting energy from 55F well water.

Blockbuster Antithesis. Energy conservation aspects of its mechanical system contribute generously to making The Exchange an appropriate building for today's needs. But they are hidden attributes and the public judges environmental relevance on what it sees. What people see here is a blending of building with site producing a feeling that must be described as pleasant despite the busy commerce it shelters.

"The Exchange is the antithesis of most people's image of a shopping center," says Augie Rath. "The vision that usually comes to mind is a blockbuster building in the middle of a parking lot. Our aim was to furnish space that was less overpowering and less institutionalized to help make shopping and working good experiences."

The informal residential shape of the structure helps achieve that aim. Credit must also be given to the woodland setting which nature supplied and which the builder took pains to preserve as much as possible. Minges estimates that the cost of saving trees and land contours added some $1500 to each residential unit in Talcott Village.

"It is interesting to note," Rath points out, "that nothing in local codes prevents a builder from going in there with heavy equipment and flattening everything in sight. If you want to explain this tolerant attitude on the part of the citizenry you might look into New England history. The first order of business for the early settlers was to cut timber to make way for homes and agriculture. A clearing in the forest was a most desirable thing. Perhaps the feeling persists even if only subconsciously." Land-use theorists could infer from this that they may have to face subtle resistance from an unexpected quarter: the American heritage itself.

DESIGN SUMMARY

GENERAL DESCRIPTION:
Area: 265,000 sq ft
Volume: 3,500,000 cu ft
Number of floors: three plus mezzanine and partial basement
Number of rooms: 45 retail shops, 50 private and general offices

CONSTRUCTION DETAILS:
Glass: double
Exterior walls: ¾″ T&G rough-sawn pine boards on wood studs, 3½″ mineral wool insulation (R-13), gypsum board; U-factor: 0.06
Roof and ceilings: asphalt shingles on ¾″ plywood deck, 3½″ mineral wool insulation (R-13), 1½″ T&G planks between exposed purlins; U-factor: 0.05
Floors: concrete slab on grade
Gross exposed wall area: 33,800 sq ft
Glass area: 7500 sq ft

ENVIRONMENTAL DESIGN CONDITIONS:
Heating:
Heat loss Btuh: 8,745,000
Normal degree days: 6200
Ventilation requirements: 50,000 cfm
Design conditions: 0°F outdoors, 75F indoors
Cooling:
Heat gain Btuh: 7,685,000
Ventilation requirements: 50,000 cfm
Design conditions: 93F dbt, 78F wbt outdoors; 75F, 50% rh indoors

LIGHTING:
Levels in footcandles: 25-75
Levels in watts/sq ft: 1-3
Type: incandescent and fluorescent

CONNECTED LOADS:

Heating & Cooling (800 tons)	1100 kw
Lighting	530 kw
Cooking	85 kw
Water Heating	50 kw
Other	300 kw
TOTAL	2065 kw

PERSONNEL:
Owner: Talcott Village, Inc.
Planners: Callister, Payne and Bischoff
Architect: August Rath
Consulting Engineers: James S. Minges & Associates, Inc.
General Contractor: Felix Buzzi & Son
Electrical Contractor: Mafco Electric Co.
Mechanical Contractor: Morris Fierberg Co.
Utility: Hartford Electric Light Company

Going On from page 10
is the logical way to achieve safety without conflict, overlap or duplication of regulations (*see* Aug., p. 14).

The societies make up the Interprofessional Council of Environmental Designers and include the AIA, American Consulting Engineers Council, American Institute of Planners, American Society of Civil Engineers, American Society of Consulting Planners, American Society of Landscape Architects and National Society of Professional Engineers. They say that conflicts exist in these areas: "where the OSHA regulations contain material not related to the health and safety of the employee; where the OSHA regulations do not provide recognition for latitude in design to achieve equivalent safety that is present in modern building design standards; and where the OSHA regulations require a level of safety greater than that proven adequate in the modern building design standards of the nation."

It is further recommended that an advisory committee—as permitted by law—be established to help resolve the conflicts and to include architects, engineers, planners and landscape architects "qualified by knowledge and experience."

Design Bicentennial Receives Endorsement

Nine professional design organizations have established the American Design Bicentennial, Inc. (ADB), which recently was endorsed officially by the American Revolution Bicentennial Administration. The aim of ADB, says Paul D. Spreiregen, AIA, who is its director, is to demonstrate as part of the nation's celebration of its 200th birthday the "major role that American design has played in the development of our country." The purpose is not "to put on a good design show of outstanding design creations," says Spreiregen, but rather to point up "the really significant ways in which design affects our everyday lives and to portray the contributions that various design fields have made to American life and history."

ADB is composed of representatives from the AIA, American Consulting Engineers Council, American Institute of Graphic Arts, American Institute of Interior Designers, American Society of Civil Engineers, American Society of Landscape Architects, Industrial Society of America, National Society of Professional Engineers and Package Designers Council. The organization has been funded to date by a grant of $40,000 from the National Endowment for the Arts, which was matched by funds and services by the participating societies.

Spreiregen reports that the ADB is working on five major projects: 1) a public television series; 2) a radio series;

3) publications, which will include not only books and pamphlets but also such things as a chronological time chart of American design, posters and games with three-dimensional cutouts; 4) educational filmstrips; and 5) exhibits.

Two kinds of teams have been organized to prepare the projects: "connoisseur" teams, made up of experts in various design fields, such as architectural history, clothing, packaging, etc., and production teams. Coordination will be by two editors, whose names are to be announced soon. At the present time, ADB is in the process of finding sponsors for the various segments of the total program. It estimates that about $2 million to $3 million will be required for the successful development of all aspects of the varied proposals.

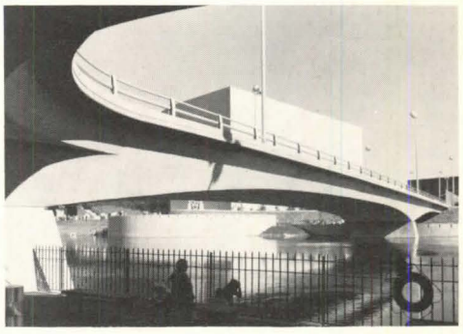
William M. Goldsmith, a Chicago industrial designer, is chairman of ADB, which is headquartered at 2215 Observatory Place, in Washington, D.C. AIA representatives are William Ensign, FAIA, Washington architect, and Gerald E. Crane, AIA, chairman of the urban planning program, University of Michigan.

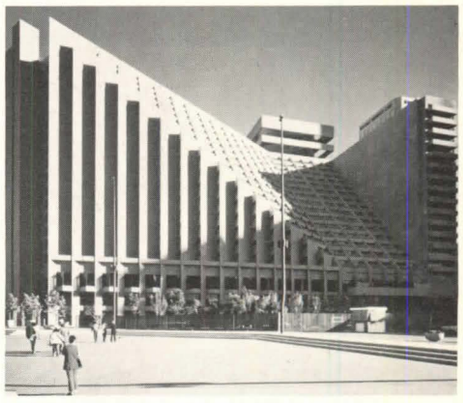
Prestressed Concrete Awards to 19 Buildings

The Prestressed Concrete Institute conducts an annual awards program to recognize excellence in architectural and engineering design using precast and prestressed concrete. Nineteen winners have been selected in the the 1974 program for achievements in "esthetic expression, function and economy." The jury was chaired by Archibald C. Rogers, FAIA, president of the Institute. Other jurors were John C. Harkness, FAIA; Waldo G. Bowman, past president of the American Society of Civil Engineers; Allan F. Duffus, president of the Royal Architectural Institute of Canada; J. Raymond Carroll, vice president of the National Society of Professional Engineers; and Charles S. Matlock, chairman of the committee on bridges, American Association of State Highway and Transportation Officials.

This year's winners are:

- Edith Abbott Memorial Library, Grand Island, Neb. (architect: Stanley J. How & Associates)
- Crown Center Hotel, Kansas City, Mo. (architect/engineer: Harry Weese & Associates; master planner: Edward Larrabee Barnes, FAIA; associated architect/engineer: Marshall & Brown, Inc.)
- George Brown College of Applied Art and Technology, Toronto (architect: Fairfield + Dubois and Alan R. Moody)
- Harvard University Undergraduate Science Center and Chilled Water Plant, Cambridge, Mass. (architect: Sert, Jackson & Associates, Inc.)
- Baylor University Medical Center Parking Building, Dallas (architect: Harwood K. Smith & Partners, Inc.)
- Industrial Indemnity Co. Office Building, San Diego (architect: Deems/Lewis & Partners)
- Atlantic Oceanographic & Meteorological Laboratories, Miami (architect/ engineer: Ferendino/Grafton/Spills/Candela)
- Washington Street-Stevens Street Couplet Bridge and Underpass, Spokane, Wash. (architect: Culler, Gale, Martell, Ericson)

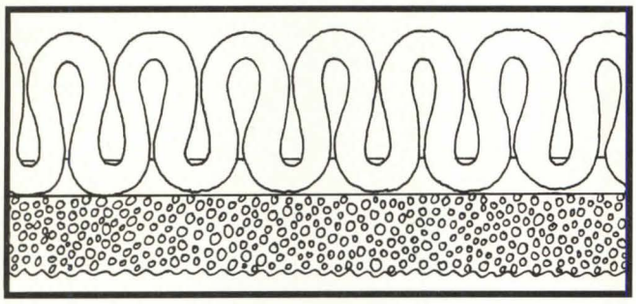




- Regency Hyatt House Hotel, San Francisco (architect/engineer: John Portman & Associates)
- Hoolulu Park Grandstand, Hilo, Hawaii (architect: Richard S. Matsunaga & Associates, Inc.)
- Charlotte Civic Center, Charlotte, N.C. (architect/engineer: Odell Associates Inc.)
- Outpatient Clinics Building & Parking Garage, University of California Medical Center, San Francisco (architect/engineer: Reid & Tarics Associates)
- Laura Spelman Rockefeller Hall, Princeton University, Princeton, N.J. (architect: I.M. Pei & Partners)
- Ohio Bell Northeast Data Center (architect/engineer: Dalton Dalton Little Newport)
- Santiam River Bridge, Linn County, Oregon (architect/engineer: Oregon State Highway Division, Bridge Section)
- Mission Valley Viaduct, San Diego (architect/engineer: California Division of Highways, Office of Structures)
- Gulf Intracoastal Waterway Bridge, Corpus Christi, Tex. (architect/engineer: Texas Highway Department, Bridge Division)
- Reconstruction of the upper level of the

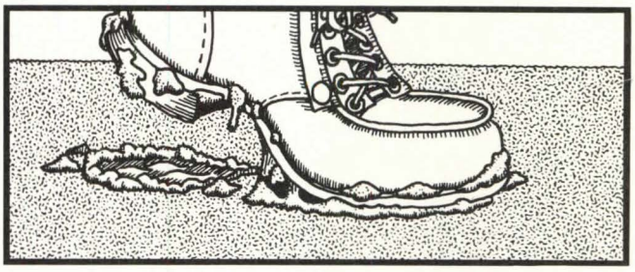
continued on page 62

P·O·W·E·R·B·O·N·D™
The problem solver.



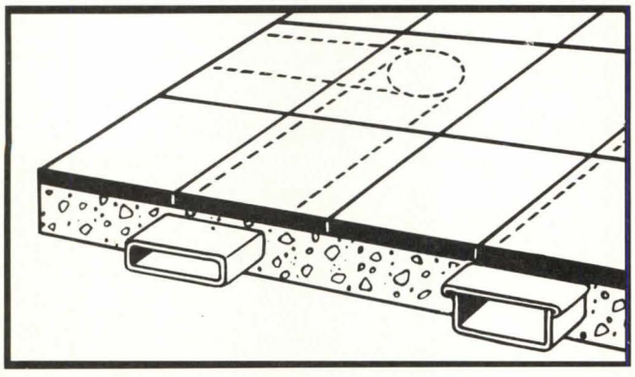
UNIQUE CONSTRUCTION GIVES IT DIMENSIONAL STABILITY.

We make Powerbond by thermo-welding a dense, tough pile surface to a closed cell vinyl backing that adds comfort, quietness and wear-life.



SOIL-HIDING NYLON PILE SURFACE ASSURES APPEARANCE RETENTION.

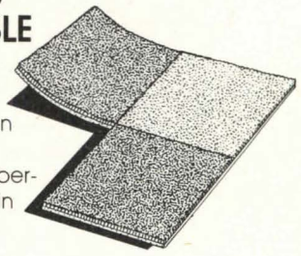
Powerbond's esthetically beautiful, tough, dense pile surface is made from a second generation anti-soil nylon. This allows for maintenance as low or lower than other floor coverings. And it comes in a great range of colors that stay clean and colorful.



POWERBOND MAKES UNDER FLOOR SYSTEMS TRULY ACCESSIBLE.

When you need to get to your underfloor access just cut and remove as much Powerbond as you have to. Thermo-welding assures the materials stability. Just follow the prescribed directions—fold back—replace. It's that easy!

POWERBOND TEX-TILES MAKE A TRULY PORTABLE FLOOR COVERING.



Powerbond comes in 18x18 inch squares called Tex-Tiles, that you can pick up and put down as required. They've got the same "miracle" properties as Powerbond. And they come in a wide variety of colors that let you design your own patterns.

CUT IT OUT.

If for some reason you need to replace or repair your Powerbond, no problems. Cut out the damaged spot and put in a new piece. No one will ever see the patch and it won't take any more time to do than cutting out and sending in this coupon for more information about this beautiful problem solver. Or call (212) 953-4356

A1-11

COLLINS & AIKMAN
919 THIRD AVENUE
NEW YORK, N.Y. 10022 Box B-9

I'd like more information on Powerbond Floor Covering.

NAME_____

TITLE_____

ADDRESS_____

CITY_____

STATE_____ ZIP_____

Circle 9 on information card

Professionalism.

AIA JOURNAL

The public practice of architecture never has been a strong tradition in America as it has, say, in Britain. But various articles in this varied issue touch upon possible seeds of such a tradition—in the need to find new areas of practice for the flood of young people coming into and through architectural schools; in the distinctly architectural direction of a local planning and development agency; and in two federal agencies, one of which shared its annual design awards between in-house and contract architects and another, GSA, which is revising its screening and selection procedures to place a new premium on professionalism. This last indicates that there are advantages in the strengthening of public-sector architectural capability not just for government and the public itself, but also for the private practitioners of architecture. For the stronger these capabilities, the better the architects that government is likely to hire, and the better the work that those selected will be permitted — even encouraged—to do. D.C.

Coping with the New Waves of Aspiring Architects

Robert L. Bliss, FAIA

Recently, our architectural schools have been rather enamored of their new buildings and bemused with their new programs. We have come down from our attics, up from our cellars and trooped out of our barracks, blinking in the sunlight and finding that a lot more people love us than we thought. The startling enrollment demand upon schools of architecture can only be ignored to the detriment of the schools, the profession and, most importantly, our society and our environment.

While new visibility is part of our popularity, and the generalized environmental interest accounts for some of it, the present enrollment pressure exceeds anything anticipated. Perhaps the immediate postwar period was comparable but it was of shorter duration, fewer were involved, and it did not contain the same affective potential that the current mass holds.

Utah is fairly typical. We have been in a new building for four years, have had five graduating classes in the new six-year master of architecture program and are oversubscribed for 1974-75. The building was, we thought, generously programmed for 15 years of deliberate growth. Last fall we had a 30 percent jump; this fall we are being inundated.

In April, a phone survey of eight Western schools indicated that for every opening, they were turning down between two to eight applicants. One school (Oregon) has students in a "holding pattern" for two years before their applications will be reviewed. (Whether circling about over the college qualifies the applicant for state residency is unclear.) Most schools of architecture are among the very few growing schools on their campuses. Most universities are penalizing or not admitting nonresidents. Most universities have yet to redistribute funds, faculty and facilities.

Mr. Bliss is chairman of the department of architecture at the University of Utah, Salt Lake City.

The Western Interstate Commission for Higher Education, in July, surveyed its member schools and found that ". . . the greatest numbers of openings are in the fields of business and management, education, engineering and social sciences. They showed no openings at all in law, architecture and environmental design, area studies, public affairs and services."

During July and August, the Association of Collegiate Schools of Architecture also surveyed its members and received responses about 1974-75 enrollment from 33 (of 79 accredited) schools with good geographic and institutional spread. Its findings:

"In undergrad programs in architecture 11,444 students applied to 30 programs; 3,761 were accepted and 5,052 qualified applicants were either turned away or advised into other programs. The acceptance rate was 32.9 percent, and of the 7,683 turned away, 5,052, or 65.8 percent, were qualified.

"In M.Arch programs where the applicants had an architecture background, 1,754 applied to 21 programs; 649 were accepted and 757 qualified applicants were either turned away or advised to attend other schools. So the acceptance rate was 43.1 percent, and of the 1,105 turned away, 757, or 68.5 percent were qualified.

"In M.Arch or B.Arch programs for people who already have degrees in a disparate field, 711 applied to eight programs, 132 were accepted and 554 qualified applicants were turned away. So the acceptance rate was 18.6 percent and of the 579 turned away, 554, or 95.7 percent, were qualified."

Using the above figures, extrapolated to include all schools, discounted for multiple applications, still would conservatively indicate 4,000 to 5,000 qualified applicants unable to enter any architectural school in 1974-75. (This does not include environmental design, landscape or planning students.) That could fill a dozen new medium-sized schools.

The benign tolerance that architectural schools received on most campuses in the past is finally turning to outright concern as university enrollments stabilize but architecture is forced to reject students. Numbers and lost tuitions talk, but the lag in redistribution of budget, faculty positions and space increases progressively. Acquisition of newly constructed space, for example, is often a 10- to 15-year process. Our unlamented barracks have meanwhile been destroyed.

What does all this presage for society, the profession and the schools? Some will say, "Après nous, le déluge" and feel that nothing much can be done about it. Quotas, limitations, restrictions will be the response. This must not become the general case, for the wastage in brains and talent is already at an intolerable level. If one looks at any city, any suburban area, any rural area, it is obvious that the raw need for legions of qualified, skillful people to work on environmental problems cannot conceivably be met. If we visualize all of the constructed area of this country and the land area over which it is dispersed, the beneficent impact of architects, landscape architects and planners is a laughable percentage per square foot. It is a problem that will not be touched by traditional education (and limited enrollments), by traditional patterns of practice, or by traditional misconceptions of the architect's role by society.

It seems strange that society holds architects in a love-hate, prestige-ridicule role. John Foster Dulles was constantly being titled "Architect of (such things as) the Southeast Asia Treaty Organization." E. Howard Hunt (or was it Gordon Liddy) was headlined as "Architect of the Watergate Break-in."

We are still thought to be expensive, not terribly competent, somewhat unconcerned with major problems such as housing and rather artsy. There is *no* general realization of what an educated architect

They cannot be accommodated without emergence of new patterns of architectural practice.

can contribute, or even of his concerns. This is our failure! The public demand upon the architect will not be changed except by contributory actions of our profession—aided and abetted by the schools—actions that clearly demonstrate both the architect's ability *and* interest. (Nothing we have done has been more effective in this regard than the community design centers.)

Our past response to the public's slight disdain has been to feel unappreciated, to become protective, restrictive, negative and to hide behind "health, safety and welfare." The economics of practice, or the practices of practice, are said to be too debilitating to allow time for leadership on issues about which the public expects us to respond. This is our profession's own fault and will only be changed by it.

Just as the least imaginative response to burgeoning enrollments is to arbitrarily restrict them, the response to the prospect of more architects on the loose is sufficient cause for a riotous AIA chapter meeting. Some may suggest that a school should not have been established locally in the first place; others may have second thoughts and see an "oversupply" of graduates as driving down the hourly rate for draftsmen. It is obvious that greatly increased numbers cannot be accommodated with the traditional patterns of architectural practice. However, with changing patterns of practice, with many parallel opportunities in finance, real estate, construction industry, planning and government, there is a greater need for the qualified, skillful professional than we can meet.

For the past decade, schools have sought educational reform. It has been a movement toward concentration, intensification, interdisciplinary relations and a generally broadened education. It has been away from technical and trade training, away from ludicrous mortality rates and away from narrow, specialized craft professionalism. Students are entering architecture from a wide variety of backgrounds. They bring to us new views and capabilities not common under the old five-year sequential pattern, and they are impatient to find better ways to *deliver* competent architectural services.

The recent Case & Co. survey of the profession showed that "the typical AIA member is male, white, married, about 46 years old . . . is probably a partner or sole proprietor in a firm of fewer than 10 people." Also, ". . . AIA members believe their profession is making an increasing contribution to our environment, but that the profession's influence on society in general is decreasing—in other words, the architect's work is not being sufficiently recognized by the public."

There are about 35,000 registered architects in a U.S. population of 200,000,000. How such a small group of such limited characteristics, in such small and delimited practices can make an increasing contribution to the environment and have a decreasing influence on society (doing more and being appreciated less) escapes one. Our capacity for illusion seems matched by our penchant for delusion.

The Case study also indicates that 96.3 percent of our profession is in private practice and only 3.7 percent in teaching or public and private agencies. Given the student demand and assuming a positive response to it by the schools and profession, our greatest immediate need is definition and encouragement of new roles for architects. For too long, the only acceptable path for the architect has been to ultimately become a private practitioner.

Many more teachers are needed immediately in colleges, but we should view the entire range from elementary environmental awareness through trade training to graduate education and research as being the open field for more architects.

Public and private agencies continually increase in their power over programs and in many instances vast amounts of construction dollars. Better prepared architects should be moving into these areas to guide programs and establish a climate in which their colleagues can perform at their best, rather than at the mediocre level of most public work. Infiltrate if necessary. While the percentage of architects in teaching and public service (and politics) may not change drastically, the influence for architecture can be far greater than numbers would indicate.

The truly untouched markets for architects and architecture remain virgin: architects as housing developers; architects as designers and producers of "mobile" homes (over 25 percent of new housing); architects as directors of turnkey and package building operations; architects in responsible positions in major industries related to building; architects directing building-recycling companies; architects in real estate, finance, development and construction; architectural clinics and joint practices that can broaden the client base and serve a wider public. For years we have considered many of these practices beneath us. What we were ignoring was our rug being removed.

In the universities there are many combined masters programs developing: architecture and public administration; architecture and business management; architecture and law are a few, but more exotic marriages are sure to happen. Utah students are currently coming into architecture from 27 different undergraduate fields; however, the leading fields are business, civil engineering, art, geography, psychology, history, sociology and math.

Being able to recognize the potential of situations, seeing things that should be done, having new capabilities, opens enormous areas to the profession. New patterns of practice must be suggested and nurtured if we are to take advantage of the promise that greatly increased numbers of architects hold.

To say that we cannot afford to educate all who are qualified and wish to be educated in architecture is patent nonsense. Expanded enrollments, many additional schools, broadened programs, particularly expanded practice opportunities, will produce a critical mass of graduates that will not be ignored. We should look forward to its ultimate impact. □

Designing for the Pauses That Refresh

Douglas Schroeder, AIA

There is a two-part pulse to human activity: concentration on a task, or even on play, and relief from such concentration. This pulse runs through our daily lives. None of us is always "on"; we need and value the "off" moments when we can rest, stretch or otherwise recharge our energy and interest.

Yet, architects too often ignore this pulse. We tend to be single-minded in our designs, focusing upon major functions of buildings to the neglect of the varied needs of the human beings who will occupy them—notably the need for satisfying and revivifying moments of relief. We tend to ignore the second essential beat of the pulse.

Often we are encouraged in the neglect by our clients, who, as managers, can be equally single-minded in their quest for efficiency in their buildings—and in their employees. There can be little sympathy for the provision of spaces for "goofing off" during the work day.

There is also societal reinforcement of this neglect. We have a rigorous attitude toward work that can make attention to relief from work seem frivolous if not un-American.

And so the worlds of work and recreation are thoroughly separated as areas of architectural concern. Architects are deeply involved in designing facilities for long-time leisure, for vacations and for the "great American weekend." My purpose here is to point out the opportunities, and the need, for the application of architecture to short-time leisure—relief, respite, the "breaks" or intermissions that punctuate our lives.

Among the clearest of these opportunities are those that arise in the design of office buildings. The office worker, from executive to clerk, performs tasks that are increasingly complex, often repetitive, usually sedentary and demanding of intense concentration.

His need for relief and change during the day has been recognized by the medical profession in terms of mental and physical health and by management in terms of sustained productivity. It has been institutionalized in the universality of the coffee break.

Yet, it has not often been designed for, beyond the occasional provision of a small lounge or canteen. So the office worker takes relief where he can find it—at the water cooler or coffee machine, or by making a walk down a corridor a social event. Storage and file rooms become impromptu gathering places and the Xerox machine a social center.

As architects we must realize—and influence our clients to realize—that well-designed relief spaces have as much productivity-increasing potential as do good lighting and ventilation.

Ideally, such spaces should give office workers a wide variety of choices of relief activity—reflecting the wide swings in mental and physical condition that most people experience during the work day.

Beyond provision of coffee and snack foods in comfortable settings, there should be places for active play involving use of muscles (even saunas and swimming pools in larger office buildings); reading and meditation rooms; nap rooms for workers who may not have slept well, have eaten too much or recently have been ill.

Among the few examples of office buildings providing such amenities are those of the House and Senate in Washington and, nearby, the White House (with its swimming pool turned press room, once again there is talk of a swimming pool).

Clearly, not all office buildings can offer such a wide range of relief spaces and facilities, but equally clearly it would benefit both management and workers if there were more.

Not all of them need be indoors. An important form of relief can be getting out of the building altogether, especially if it is a sealed building, and onto a plaza or other open space for a break or lunch. The value of this kind of "breather" can be enchanced by providing places to sit, a choice between shade and direct sunlight, backdrops for planned or spontaneous happenings, etc.

Unfortunately, these opportunities also are too often wasted. The architect and client fail to perceive the potential uses of outdoor spaces beyond circulation and perhaps the occasional static display of art. Plazas are placed in perpetual shade, made difficult to reach, left without seating or anything else inviting human use.

Opportunities for designing for relief—for the second part of the pulse of human activity—are by no means limited to office buildings. Everything said about them here could also be said about factories. In fact, since new industrial plants often are built in industrial parks, there are even greater chances for introducing outdoor relief areas and opportunities—ballfields, flower gardens, reading benches amid landscaping.

The Japanese have frequently provided exercise areas both inside and outside their factories. Calisthenics and sports are compulsory in some of them. We would not want to go that far, but it shows the value that the Japanese place on active relief from work as a means of increasing productivity.

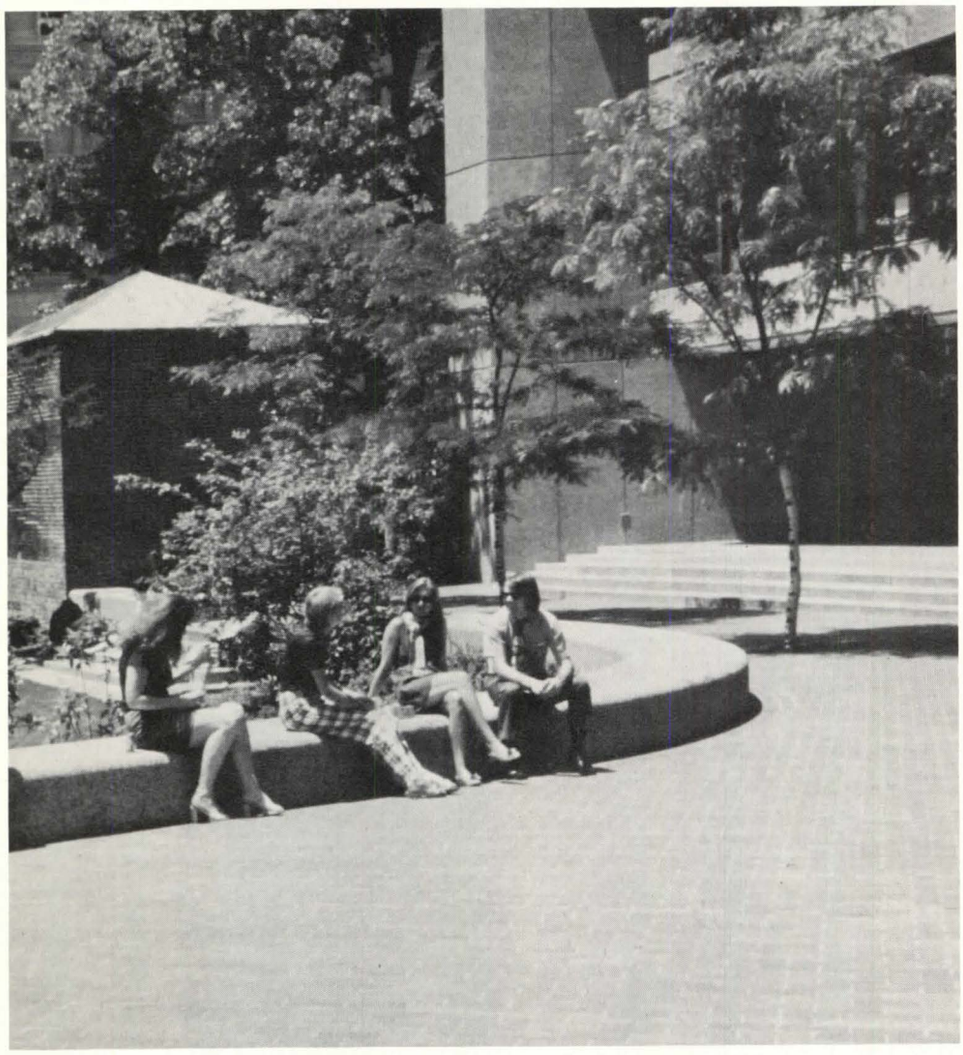
The need for relief spaces also carries over into the world of play. Most of our older sports stadiums left the spectator, when he was tired of concentrating on the game, with little more than a "seventh-inning stretch" at his seat for relief. Some newer ones, such as Houston's Astrodome, are providing special rooms with views of the playing field for eating, drinking or just changing one's position and vantage point for a while.

Similarly, performing arts facilities in this country have been deficient in accommodating audiences at intermissions, leaving them to crowd into corridors, stairways and lobbies. Now some are emulating the Europeans, especially the British, in providing comfortable foyers and galleries and food and drink service.

In medical facilities, the need for well designed relief spaces is particularly acute. Waiting rooms anywhere—in transportation terminals, business offices, government bureaus—are incubators of boredom unless designed otherwise, but in doctors' and dentists' offices and hospitals, they are also tinged with dread. It may not be possible to make these places sources of positive relief, but it is possible to make them pleasant and reassuring.

Mr. Schroeder, a partner in the Chicago firm of Hinds & Schroeder, will assume the chairmanship of the AIA's committee on architecture for the arts and recreation in January.

Architects and clients alike neglect the dual pulse of human activity: concentration and relief.



The courtyard of AIA headquarters provides a well-used and unusually pleasant relief space. Inside, space for an employee lounge was put to other use and breaks are taken in improvised settings such as this combination Xerox and coffee room.

And in hospitals, there is the additional need of providing places where recuperating or otherwise ambulatory patients can entertain visitors or simply sit and enjoy being away from the confines of their rooms and beds. Special hospital waiting rooms outside delivery or operating rooms require especially humane design.

Educational facilities, from grade school to college, provide most of the best examples of designing for the concentration-relief pulse. Elementary schools designers, in particular, seem to have realized that the pupils' concentrations spans are limited and that many opportunities for relief are required.

They also have discovered that the pupils can absorb much more by experiencing a variety of activities in varied settings. The elementary school day is broken into many short activity periods, each with its own facilities and area of the classroom. The children move from place to place and subject to subject in the course of the school day.

At the college level, some designers have placed a premium on social spaces, both inside and outside buildings. They consciously promote opportunities for creation of places in which students and faculty can meet and talk.

These designers realize that the student might learn as much for social interaction and nonconcentrated discussion as in the classroom or from a book. The social spaces not only provide relief from formal learning activities but also promote the relaxed exchange of ideas and insights.

These efforts have resulted from the designers' intuitive understanding of human behavior. We must now supplement this intuition, drawing from the behavioral sciences, both to inform our design for the concentration-relief pulse and to measure the results.

I am convinced that the results will include better physical and mental health for the users of our buildings, and increased productivity and decreased absenteeism in work situations. If real and measurable, such results can be shown to more than offset the cost of more and better designed relief spaces. □

The Public Practice Of Urban Design in a California Community

Jacob Robbins, AIA

Urban design and the architecture of urban growth have not been significant elements of architectural practice in America, although the profession as a body has made pronouncements and recommendations on these subjects, notably the urban growth report of AIA's national policy task force.

The growth unit concept proposed in this report, if widely adopted, could offer new opportunities for architectural firms to undertake major design commissions at urban scale. This is unlikely to happen in the immediate future, however, and meanwhile there are unrecognized opportunities for architectural practice at this scale in the public sector.

Privately developed new towns have long been recognized as areas of architectural endeavor. But there are also many existing communities that are growing at new town rates with local government planning and managing development. It is here that architecture can find a new role.

I am practicing architecture in and for one such community, the City of Fremont, Calif. Located on the east side of San Francisco Bay and south of Oakland, Fremont was incorporated in 1956 out of five communities with a combined population of 25,000. At the time of incorporation, it was California's third largest city in area, encompassing 92 square miles.

Fremont has been committed to planning from the beginning. One of the first acts of its city council was the commissioning of a general plan, which has guided the city's growth to its present population of 120,000.

With a growing industrial base, easy adjacency to other employment centers and a plentiful supply of relatively low-

Mr. Robbins is community development director for the City of Fremont, Calif.

Major elements of the urban structure plan initiated by Fremont's urban design staff are the hills on one edge, San Francisco Bay on the other and a string of settlements and central business district along linear transportation corridors.

The City of Fremont's development department operates on the model of an architectural office.

cost agricultural land, Fremont became a magnet for residential development activity. To guide it and work effectively with the development industry, the city created a community development department in 1969, and I became its director three years later.

The department administers all city regulations affecting private development and generally represents the public interest in the city's design and construction. I speak of myself as practicing architecture because the department, in its focus and functions, is the public sector analog of a private architectural firm.

A full-service architectural practice provides its clients with long-range planning of building and development programs, subsequent feasibility studies, site utilization concepts, architectural and engineering design and finally supervising and administration of construction.

Similarly, the functions of our department include long-range planning for the city, feasibility studies and site planning through the subdivision process and district (or growth unit) design. We provide architectural design input directly in the city's capital improvement program and indirectly on private projects through a review process. We see to the quality of construction through building inspection activities.

Moreover, following the model of a private architectural practice has been very useful in management of the department. It has kept our focus on the quality of our product—the built and functioning city. For us, the building of the city is our architectural commission.

This means that we attempt to use legislative and regulatory tools as creative instruments for design rather than as straightjackets on imagination. It also means that we use every opportunity to weave into the development process the particular ability of the design professional to synthesize functional, social, economic and esthetic concerns in shaping what is built.

There are now six architects, including myself, on the 42-person staff of the department. Four architects, with a civil engineer, constitute an urban design group in our long-range planning section and a fifth architect is engaged administratively in processing development proposals.

The following are the major elements of our urban design program:

An urban structure plan was produced after a series of overall city form studies undertaken by planning consultants. As architects, our effort was to simplify the plan so that a clear structure for the city was articulated. The structures of the really memorable cities of the world, we felt, were simple and thus strongly felt in the everyday activities and experiences of the residents.

The structure that we set down for Fremont describes the strong edges of the bay to the west and hills to the east. These two elements are connected by open space along water courses at the north and south ends of the city.

The built-up area within these edges, concentrated at intervals in pre-incorporation settlements, forms a linear corridor. There are cross-axes at the central area and other nodes at the older settlements.

The urban structure plan has been adopted by the city council and planning commission as part of the open space element of the general plan. Like the rest of the general plan, it will be updated regularly. Already, we are aware that we may have gone too far in the direction of simplification, and that the structure plan will have to include more information.

District design is the next order of urban design we are undertaking. This is essentially planning at the growth unit scale and has two basic parts: a set of criteria for measuring private development proposals and specific, mandatory plans for circulation, open space, utilities and overall concept of the district or neighborhood.

This kind of district design, which we also call "target planning," is an effort to solve a dilemma common to many communities: It is clearly desirable that the development of neighborhoods be designed in relation to one another and to overall goals for the city. Yet the city does not own the land and does not have the capacity to implement the design.

We took as our model redevelopment planning, in which plans drawn by public agencies become criteria for private development. Such criteria are invaluable to the laymen who make up planning commissions and city councils. Otherwise, attention is focused on details and gimmicks used to sell particular development proposals. It is also important for the development community to know, in advance of investment in planning, what yardsticks will be applied to their proposals by the city.

Our district designs include urban form plans using the language of edges, modes, landmarks, vistas and similar urban design concerns, adding them to the more typical focal points of public response to residential development such as streets, sewers, parks and types and size of housing. Also included are designs for locating types of units on specific topography. We expect that some developers will follow these designs very closely.

Project design review is most difficult and sensitive part of our urban design program. The zoning regulations of the city call for site plan and architectural review for most projects except individual residences. This is carried out by a staff planner with participation of the urban design team.

The difficulties arise from the fact that such review is qualitative and judgmental and may even involve matters of taste. Therefore, we are very careful to stay within the area of public's interest and not intrude unduly upon the private purposes and design goals of the owners and designers.

Most of the design problems that we have encountered to date have to do with the automobile, its storage, arrival and departure; the relationship of projects to adjoining areas of the city; and the quality and use of open space. We are also concerned with problems of energy conservation, orientation, privacy and outlook. We add esthetic design concepts to applications totally devoid of them and make alternative design proposals in cases of major deficiencies.

One such case involved two adjacent developments planned around a large neighborhood park and school site. As

Design consciousness is applied at the scale of the city, neighborhoods and individual projects.

originally designed, the developments would have made the park a "buried treasure," inaccessible and nonapparent to most of the residents. Our alternative placed most of the houses within 600 feet of the park and made it a visible element of the streetscape from almost every property in the developments.

Another proposal responded to the requirements of the automobile by creating two long alleys, using up most available open space and pushing living room windows of the residences unpleasantly close to one another. Our alternative was a generous landscaped automobile court as an entry for all of the units, freeing open space and allowing more distance, and therefore privacy, between facing units.

Capital improvements design gets our department directly into traditional architectural services, if in a limited way. The largest job of this kind currently on our boards is the revision of a civic center master plan and design development drawings for two buildings within it.

The first civic center master plan was prepared shortly after Fremont's incorporation and another resulted from an international architectural competition in 1966. Subsequently, the city's growth forced dramatic increases in the requirements contained in the competition program and, in 1972, a consultant was engaged to expand and revise the plan. In 1973, our department began extensive work on the revised plan to achieve a better fit between it and the still-emerging fabric of the city.

Design capability in a public architectural office is strong medicine. Architects in private practice and other public officials question the desirability of having our department do architectural designs. My justification is simple: In order to keep qualified architects involved in other parts of our urban design program, it is necessary to provide opportunities for specific architectural design work.

A final effort of our department is public information, although we are unable to give it high priority. Urban design and architecture are not great public events in our city so that we must educate as well as inform.

Our immediate purpose is to develop a constituency for urban design so that our work will have greater support and thus greater impact. But an equally important aspect of our public information program is to get feedback about "user needs" in relation to our major work of architecture—the city itself. □

An example of district design or "target planning." The effort here is to establish a framework for private development through designing the infrastructure, open spaces and overall character of a neighborhood. Deployment of dwelling units also is suggested and, while not mandatory, is expected to influence developers' site planning decisions. Essentially, the district designs establish criteria for evaluating development proposals.

Toward a Design Process That Re-enfranchises Citizens and Consumers

David Lewis, AIA and
Raymond L. Gindroz, AIA

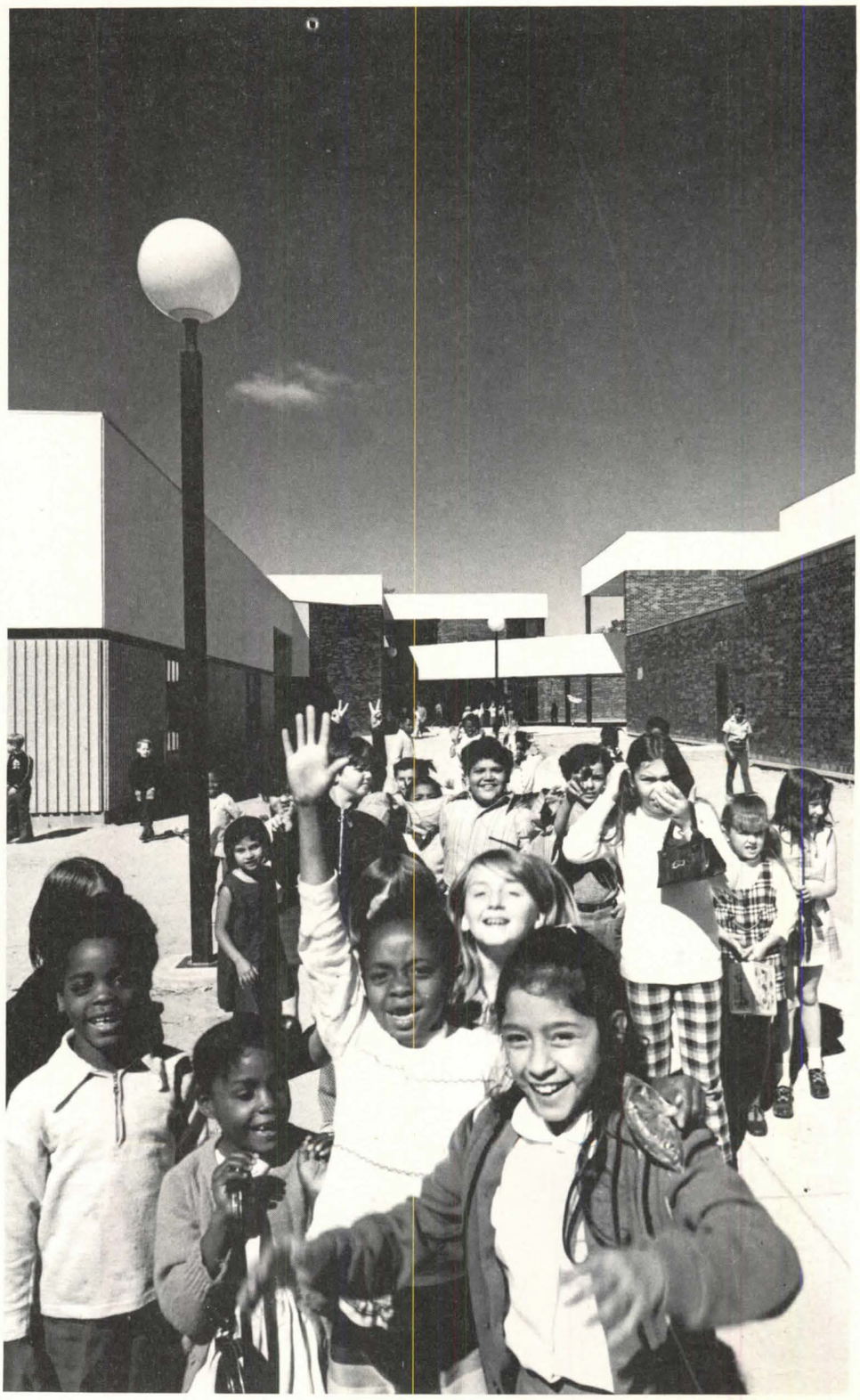
Seven years ago in an industrial city torn by racial discord, a group of black and white citizens from all sectors of the community got together to program, design and ultimately build a remarkable new kind of community education center.

We were the architects for that process, and the experience has deeply influenced the mode of our subsequent practice. It was a revelation that the creative involvement of such a wide range of people not only was possible, but also could produce an environment unique to that situation and incredibly rich in the complexity of its response to that wide a range of participants.

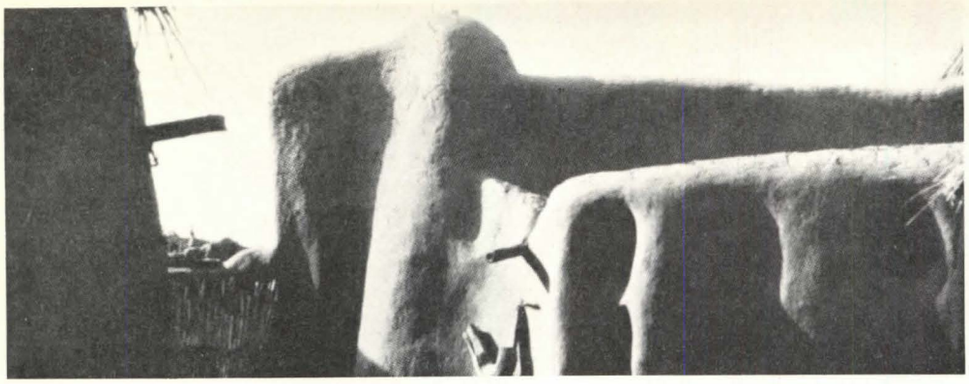
In the course of a complex and open process involving a great many people, sometimes in bitter confrontation, sometimes in quiet working sessions, a building form emerged that included learning areas for children and adults; a health center; theaters and a library; a community fieldhouse; offices for social services; a food co-op; workshops and studios; food services for the elderly; and a public restaurant and lounge. And the idea evolved of setting out these uses along enclosed gallerias, linked at each end with the city's streets.

Today the human resources center in Pontiac is used every day by more than 2,000 people of all ages and backgrounds. It is a happy place, full of activity, laughter and color. When you are in it, the center seems to celebrate not integration, but pluralism, individuality rather than conformity. And for the citizens who planned it and now participate in its running, it is in a very real sense theirs.

What we learned there, and have since seen repeated in a number of our subsequent situations, is that when consumers and citizens are openly enfranchised early in the design process, and invited to assume creative and responsible roles, planners and architects suddenly find available



Messrs. Lewis and Gindroz are partners in the Pittsburgh-based firm Urban Design Associates. Lewis was Andrew Mellon professor of architecture and urban design at Carnegie-Mellon University, 1963-68; since 1968, Gindroz has been a critic in urban design at Yale University.



to them undreamed of resources of local perception and wisdom, and the reinforcement of the community in which they make their lives.

The irony is that until very recently this was always the way of doing things. It has only been in the past few centuries, perhaps even just the past few decades, that citizens and consumers have been excluded from the process of making decisions that affect the traditions and physical form of their community. This exclusion was particularly true of the large-scale public projects of the 1950s and early '60s, where programs were defined in the closed executive chambers of government, and designs were drawn, formally and abstractly, in the studios of smart architectural firms, often hundreds of miles away.

Most contemporary architects respond to the "organic" quality of so-called primitive Mediterranean or African towns or villages, or the streets and arcades of the Renaissance cities, for their visual richness without, we suspect, fully grasping how relevant they are to many of the problems we face in our cities today. Essentially urban places such as these are public works of art. These courts, footpaths and streets, steps, rainwater conduits and portals, built by the people themselves working in direct dialogue with wind, sun and shadow, sand, water and stone, are profoundly personal to the people who live there because they articulate, often with intricate vocabularies, the language of the individual's relationship to his community and the continuities of his culture.

In contrast with 20th-century environment builders, whose technology is so powerful that they can dominate nature anywhere, the technology of the primitive builder barely enabled him to impose his will on his environment. The forms of Mediterranean villages such as Mykonos or Parog, the Gorfa villages of the Matmata at the edge of the Sahara, or the villages of the Dogon, are at once traditional yet also the rich and personal utterance of each man's sculpting hand, building and shaping in direct dialogue with materials. As Herman Haan reports Diankouno as saying of the compound that his father and he built for their family in his Dogon village *(top)*:

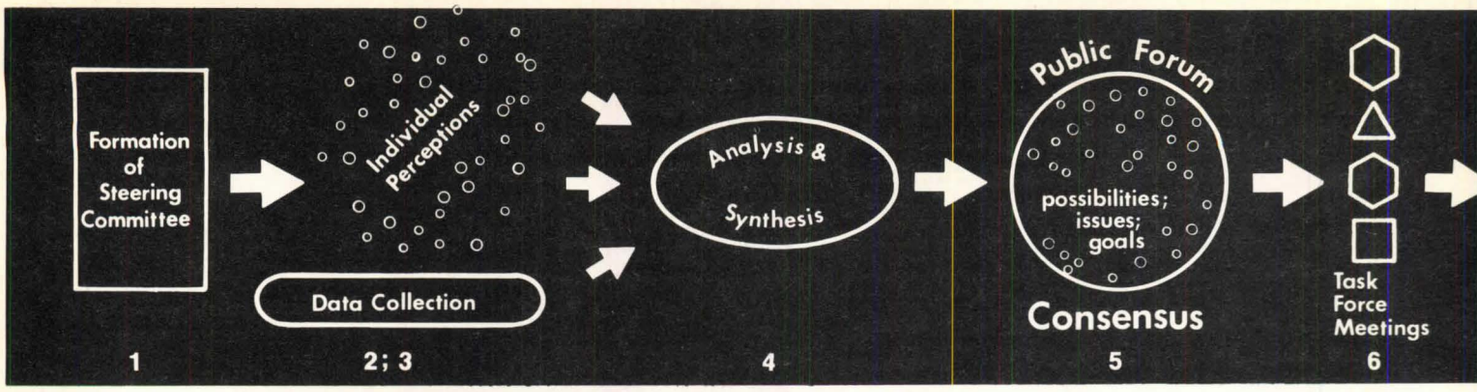
"This is the shape of clay, and it is the shape of a hand, and a hand follows the shape of clay and clay follows the shape of a hand. Hands can't follow a square. Tender forms, water is tender, clay forms are tender, water can follow tender forms, tender forms accompany water, that's why tender forms are good and nice. Why should you caress your tender wife and not your house?"

The connection of Diankouno to the processes in which we have been involved during the past 10 years is not as far-fetched as it may seem at first.

In Pontiac the people themselves, as individuals working together, basically influenced that center's complexity, physically and programmatically. Its language, unexceptionally late '60s post-Corbu, is as traditional to our culture as Diankouno's formal language is to his. We as architects were part of a public team, working directly in terms of a public culture. Design, rather than words, became the language of complex relationships, alternate policies, negotiation and ultimate commitment. But like Diankouno's language, or that of the whitewashed walls and steps of Mykonos, and the arcades of Venice and Milan, idiosyncracy is situationist; post-Corbu is rewrought until it is local and personal to that community.

For some years before Pontiac we felt that a fundamental flaw in the design of individual buildings, and more particularly in civic design, was that citizens and consumers were not involved. Not only the design professions but the entire bureaucratic decision-making process seemed to be set up to exclude the people most affected by their products.

What we have come to call "zipatone planning," large horizontal planes of single uses backed up by public depart-



ments and bureaus, each with its own budget, legislation, priorities and procedures, was rapidly destroying the intricacy and human scale of the inherited city. And it seemed that the prime intent of single-client, single-site, single-budget architecture was to deliberately fracture local continuities and scales by the insertion of art-object buildings, rather than the patient discovery of the appropriate and fitting.

But things have begun to change in the last 10 years. Communities all over the nation have learned to protest.

How many planners and architects have found themselves in these years face-to-face with an irate public at a time when projects are apparently complete and ready for bids?

Conversely, who, until a few years ago, would have involved secretaries and janitors in the design of an office building, elderly people in the design of their housing, or children and teachers in the design of their school? And who would have involved a city in the design of its core?

In addition to the Pontiac center we have been involved during the past 10 years in a variety of projects in which citizens and users have been fully enfranchised. These include housing, community and education centers, health facilities, and a "town center" in a major city, Cincinnati.

Each of these projects has been based on the idea that everyone should be viewed equally as a citizen: bankers, elected representatives, bureaucrats and the man-in-the-street. There are many roles, many contributions to be made, and everyone must be listened to. Then the results will be rich, intricate and appropriate.

How is an effective design process involving a large number of people organized? It must be carefully designed.

In our experience the random involvement of people without a clear sequence of events and without clearly understood roles for participants results in chaos. We have found that these are the essential conditions for success:

• **The goals of the process must be articulated at the outset**. Even if, as the process moves forward, the goals change, it is extremely important that at the beginning there should be a shared perception of why the participants have come together and what they want to achieve. In this way people can select their roles, and encourage others to join in.

• **There must be effective leadership.** It must be firmly established in the community and recognized by all participants. Essential to good leadership is the power to get the results of the process implemented.

• **There must be continuity.** Unstructured open processes, in which new people join and others drop out as time goes on, end in frustration and confusion. It is well to have a citizens' steering committee of some kind formed at the beginning of the project, whose prime function is to provide continuity within inevitable complexity.

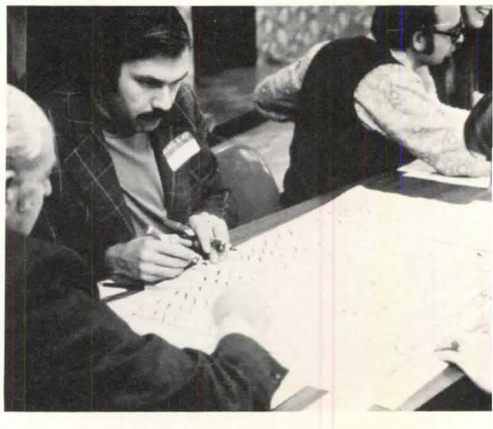
• **Dialogue is the most important part of the process.** Open forums keep processes honest, and ensure that they remain true to their goals and time-lines. Hidden agendas are to be expected. Politicians have them; so do developers; so do bureaucrats; and architects, too.

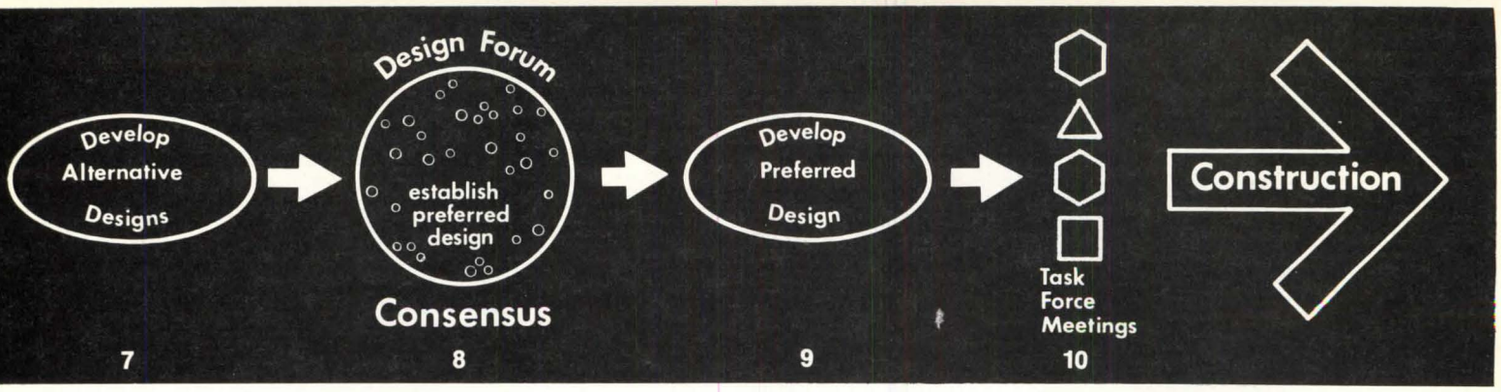
The course of the process must be designed for special interest groups to play important roles, particularly in working task forces. Public forums are needed to interrelate these roles, and to make sure that the blending of special interests is done so as to serve in the best interest of the product and the community as a whole.

Open forums, involving everyone concerned with the project, are also excellent protection against the numbing experience of dealing with bureaucrats who are far removed from direct contact with the project and its users, and whose hidden agenda is likely to be the sanctity of regulations rather than the true goals and needs of the particular program.

• **Architects and planners must be very clear about their roles.** They are technical people; they are also the "voice" of the process. Although they may, and should, make recommendations, they should not dictate policies or implement programs. If they take sides, or if they are expected to implement programs, they will inevitably lose credibility.

Design must be the language of the process, and design invention the catalyst





to opening up new programmatic possibilities. The architect/planner must therefore develop design documents in such a way that everyone can read them clearly, and enjoy them, and make his contribution to their evolution as the process moves forward.

• **Most importantly, the process must have a clear beginning and end.** A timeline should be drawn, so that as the process unfolds the participants will know where they are in it. Participants can check where they are, how their tasks interrelate with those of others, how close they are to their goals and what the remaining interim steps are.

The first step in every process is to design and commit to a critical path. From several of our projects that were designed through such processes, we have abstracted the framework shown above. The steps of this prototype critical path are:

1) Formation of a steering committee. The role of the steering committee is to guide the process, chair public meetings, and to ratify key decisions as the program unfolds.

The composition of this committee will vary with each program. For example, in the development of the first neighborhood center in Gananda new town, in upstate New York, the governing body was the development corporation of the town in dialogue with the board of education. In the Pontiac human resources center, progress was guided by the board of education and an interagency council of public officials.

2) Perceptions of problems, issues, goals and possibilities. This step is an exploratory one in which the designers meet with as broad a range of participants as possible to discuss their views of the problems, and the ideas and resources they can contribute.

The optimum form for this step is a series of individual interviews and small group discussions in which participants feel free to express their ideas. For example, in the development of the urban design and program for the Queensgate II Town Center in Cincinnati, over 100 people were interviewed. Minutes were made of each meeting and incorporated into the design program.

The Gananda process, however, used a very different form for this step. Over 200 people participated in three day-long sessions, funded by Education Facilities Laboratories, in which they played a series of "planning games" designed to elicit their perceptions of what a neighborhood center in that area should be.

3) Developing a data-base. Parallel with the exploration of people's perceptions of the issues, the planners develop a careful data-base in terms of traffic, land uses, budgets, etc., in order to understand the technical aspect of the problem.

4) Analysis and synthesis. The architect/planner's most essential task is to take his understanding of all the participants' perceptions of the problem, together with his technical understanding of the physical planning aspects of the problem, and synthesize them into an inventory of problems, issues and goals. This is then diagrammed in a series of easily understood planning drawings and models.

5) Forum on problems, issues and goals. These drawings and models are then presented in an open forum to all those who were contacted individually. It is essential that each participant be able to see his contribution of perceptions and ideas included in the presentation. The purpose of this forum is to arrive at a consensus among the participants that can become the basis of a program.

6 & 7) Development of design alternatives with working task forces. Based on the goals agreed to in the forum, the architect/planners then develop a series of program alternatives in diagrammatic design form. These are tested in a series of meetings with appropriate task forces of subcommittees and then narrowed to a short list of design alternatives.

In the Bronx, in New York City, when we were developing the design and program for a multiuse educational and social service center, this stage involved the development of diagrammatic floor plans of required space for each of the several agencies that offered the kind of programs requested by the community in the public forum.

8) Forum on design. The design alternatives are then presented in a larger open forum to arrive at a consensus on which of the design alternatives best responds to the problems, issues and goals agreed to in the first forum.

In the Bronx, this took place in two sessions. The first was a "design-in" for the agency officials with whom we had developed the diagrammatic plans. The design-in was shared with other agencies. The design was presented in a detailed and colorful mode. That was the vehicle for discussing and establishing a detailed program for the center. The results of the four-hour session were consensus on the plan and tentative commitments for leasing specified amounts of space. The second session was a presentation to the community as a whole to obtain a consensus that the design achieved the objectives articulated in the first forum.

9) Detailed design. The architect/planners then develop in greater detail the design of the preferred alternative.

10) Implementation. The working subcommittees identified earlier in the process then take up the task of securing the necessary political, legislative and financial commitments to implement the program.

In Pontiac, the city and the board of education went to HUD, HEW, the state and the county to secure the necessary supplementary funding to build the human resources center.

In the Bronx, each individual agency secured its own operational funding for programs in the center, while a nonprofit development corporation was established to secure capital funding for construction.

In Cincinnati, a special mayor's committee developed from the process. It includes leaders of the business community, the universities, local foundations, government and local communities, and will secure funding for the town center.

Does this all mean that we are near the end of the beaux-arts tradition? If we are not, at least an alternative to it is in the making. In the processes described here the architect/planner was a member of a broadly based team working together to design and build.

Five hundred years ago Alberti encouraged the architect to be an artist, an intellectual and a noble. Today we encourage him to be a citizen. □

GSA Unveils New Formats for A/E Questionnaires

Architects and engineers are well acquainted with Standard Form 251, "The U.S. Government Architect/Engineer Questionnaire." They've used it since 1961 to testify to the fact that they are qualified for government contracts and to give the feds information about a firm's experience, personnel and capabilities. Now the old 251, which over the years has evolved for some firms into a many-paged brochure, with full-color photographs and long lists of projects, is about to go. The General Services Administration proposes a complete overhaul and a replacement of 251 with two new forms: SF 254 and SF 255.

Enactment of Public Law 92-582, which "encourages firms lawfully engaged in the practice of architecture, engineering and related services to submit annually statements of qualifications and performance data," and complaints from A/E firms and federal agencies prompted the revisions of 251. Consequently, an ad hoc committee of contracting officials and representatives of the A/E professions was empaneled to review 251.

The committee determined that 251 "lacks project-oriented information" to evaluate a firm's capabilities for an identified project; fails to reflect adequately the capabilities of related professionals, such as planners and landscape architects; contains "superfluous and irrelevant information" and at the same time omits other desired data; lacks flexibility to cover the diversity of large, multidisciplinary firms; is not adaptable to computerization or to data retrieval purposes; lacks specific information required by some agencies; and does not result in uniform submissions.

It was decided that two forms were required, the first (SF 254) to provide agencies with general information which could be computerized for fast retrieval, and the second (SF 255) to give agencies detailed information about a firm's capabilities to perform a specific project. Consequently, proposed forms have been prepared and are currently being circulated among federal agencies for comment. Also, a controlled test of 100 design firms is being conducted for GSA by the Committee on Federal Procurement of A/E Services, of which the AIA is a member. Any interested AIA member may comment as well, and forms are available upon request from Arnold J. Prima Jr., AIA, administrator, government affairs, at Institute headquarters. Comments from agencies, test firms and members will be submitted to GSA. After comments are reviewed by the ad hoc committee for possible inclusion in final forms, the forms will be recirculated to federal agencies for final approval. It is expected that the forms will become operational in 1975 and will be required a year later.

The proposed 254 form, "Architect/Engineer and Related Services Questionnaire," is only four pages in length, in contrast with the nine-paged 251. Questions cover professional services other than architecture and engineering, and it can be easily programmed for data retrieval. Intended to restrict responses to only that data which will fit in the provided spaces on the form, 254 discourages expensive brochures. As a matter of fact, GSA states that "additional information, photos, descriptions or promotional materials issued by a firm should not accompany submission" of 254, "since respondents are limited to providing only the information called for on that form."

In addition to the usual name and address, questions 3, 5 and 5A on 254 provide basic information regarding a firm's makeup and background. Questions 7, 8 and 9 give information on a firm's size and capabilities, and questions 10 and 11, which cover projects and experience, show whether a firm is highly specialized or widely diversified.

The project code list, used on questions 10 and 11, is limited to 100 different types of services or projects, but every effort was made by the committee to cover the broad range of professional services of design firms. A line is provided for "write-ins" if a firm thinks that such a field of practice should be on the form. Firms completing 254 may indicate that they are qualified in no more than 20 categories. This decision was made on the assumption that few firms are "eminently qualified in more than that number of technical disciplines," and professional service firms are encouraged, in fact, to list only those project areas in which they have "outstanding qualifications and experience." If they choose, firms may indicate competence in only one or two areas of specialization and use all the remaining of the 30 spaces in question 11 to show projects that demonstrate that competence.

If they desire, design firms may tailor 254 to different contracting agencies. For example, they may point up their competence in the design of airports to agencies specializing in Air Force projects. Form 254, like the old 251, should be submitted annually at least to agencies for which an A/E firm is qualified to work.

Form 255, "Architect/Engineer and Related Services Questionnaire for Specific Project," is both a new form and a new procedure. It will be filed by design firms *only* when invited to do so by formal public announcement or at the request of a federal agency. (Proposed projects will be announced in the *Commerce Business Daily,* which is available on an annual subscription basis of $63.50, plus an additional $56.80 for airmail service, from the Government Printing Office, Washington, D.C. 20402.)

Form 255, which affords government officials with detailed information about a firm's capabilities for a given project, covers such topics as names of possible collaborating firms, background and training of key personnel, prior experience on similar jobs and capabilities and equipment for the specific announced project. Respondents are not limited to the spaces provided on 255, and photographs, brochures and testimonials may be attached.

GSA says that 255 "is not intended as a substitute for 'discussions with no less than three firms' as required by P.L. 92-582. Initial screening of respondents will be based on the information contained on the form. Expected to "upgrade federal A/E procurement," 255 also assures the design firm that it will be considered on the basis of data pertinent to a given project. This form "will be closely examined by federal officials," says GSA, and it is expected that this procedure will give new, small or highly specialized design firms a greater opportunity to procure federal work. *Mary E. Osman*

New Data for Cost Estimating at the Conceptual Stage

James Y. Robinson Jr., AIA

There are numerous systems of cost estimating, and many claims are made that cost control problems will disappear if one system or another is used. Yet estimates continue to go awry, with sometimes disastrous results. For example, a Michigan court has held that an architect whose estimates for a project were substantially below the actual costs had violated his contractual duty. The decision—upheld by the state supreme court—could cost the architect his fee, plus damages.

The architect was caught in one of the construction industry's most troublesome traps: By the time costs can be determined, it is often too late to control them.

The problem is that presently there is no substantial, comprehensive and dependable data base behind the systems for cost estimating in the conceptual stages of design. The result is that there are sometimes panic cuts in design features or radical substitution of materials and methods of construction when the bids are in.

Consequently, in 1972, the AIA began work on a cost forecasting and cost control system that has come to be called "Mastercost." In its first phase, say its designers, Mastercost will be a "national building cost data file, for large-scale pooling and sharing of critical cost information." In an effort to provide budgetary road mapping early in the design process, Mastercost will "collect critical cost data continuously from a large variety of building projects around the country, convert the data into forms most useful at the concept stage," and then distribute the data to subscribers.

Contractors' schedules of values, as required by AIA contract forms and normal industry practice, constitute the best construction cost information available in compact form. Therefore, Mastercost will begin with these schedules and, in effect, translate them from the language of construction into that of conceptual design.

Key to this translation, and to the potential usefulness of Mastercost, is a framework for organizing cost data according to a system of major building elements—essential functional parts, or chunks, of buildings *(above)*. This is intended to more closely match the way in which an architect approaches a project in the early design stages.

Unlike the specifier, when the designer begins the work of putting together the jigsaw puzzle of a building project, he thinks first of the big pieces of the puzzle. He does not conceptualize in terms of specific materials or assemblies. Therefore, traditional craft and materials breakdowns are of little use to him at this point.

Essentially Mastercost will take such

Group element (Level 2)	**Element** (Level 3)
01 Foundations	011 Standard foundation 012 Special foundations
02 Substructure	021 Slab on grade 022 Basement excavation 023 Basement walls
03 Superstructure	031 Floor construction 032 Roof construction 033 Stair construction
04 Exterior closure	041 Exterior walls 042 Fenestration
05 Roofing	
06 Interior construction	061 Partitions 062 Interior finishes 063 Specialties
07 Conveying systems	
08 Mechanical	081 Plumbing 082 HVAC 083 Fire protection 084 Special mechanical systems
09 Electrical	091 Service & distribution 092 Lighting & power 093 Special electrical systems
10 General conditions & profit	
11 Equipment	111 Fixed equipment 112 Furnishings 113 Special construction
12 Site work	121 Site preparation 122 Site utilities 123 Site improvements 124 Off-site work

Mastercost Construction Element Categories. The basic framework for the system's organization of cost data is the list of building elements shown here as Level 2, and taken into further detail in Level 3. Organizing costs according to these elements, or "chunks," of a building is intended to better match the thinking of a designer at the conceptual stage than craft and materials breakdowns.

Level 1 categories, not shown, include construction, furniture and equipment supplied by owner, design and management, site acquisition, leasing/occupancy, financing and contingencies. The Level 2 and 3 categories here, of course, fall within the Level 1 category of construction. Under development are further breakdowns that would constitute additional levels of detail.

Mr. Robinson, a 1963 graduate of Tulane University, is a principal in the Charlotte, N.C., firm of Ferebee, Walters & Associates, and chairman of the AIA committee on automated practice technology.

(757)

① Building type: ART CENTER (UNIVERSITY) ⑥ Bid date: OCT 71
② Location: COOK COUNTY, IL. ⑦ Est. construction period: 24 MTHS
③ Client: PRIVATE INSTITUTION ⑧ Market conditions: COMPETITIVE
④ Architect: (e.) ⑨ Number of bids: 11 (invited)
⑤ Type of contract: STIPULATED SUM

⑩ Brief description of building: TWO STORY FACILITY SEPARATED IN TWO BLOCKS: ART GALLERY 126' x 134'; OFFICES & CLASSROOMS 60' x 134' WITH SCULPTURE COURTYARD IN BETWEEN. ART GALLERY COMPRISES EXHIBIT & SUPPORT AREAS WITH SOME OFFICES. OTHER BLOCK CONTAINS 4 CLASSROOMS AND STAFF OFFICES.

⑪ Occupancy group: F.2. ⑫ Construction type: II

⑬ Number of stories - below grade: 1 - above grade: 2

Level	Gross floor area
⑭ Basements	13,300 sf
⑮ Ground floor	24,010 sf
⑯ Upper floors	10,670 sf
⑰ Penthouses etc.	- sf
⑱ Gross floor area:	47,980 sf
⑲ Net floor area-assignable/~~rentable~~:	40,290 sf
㉑ Net finished area:	34,680 sf
㉒ Plan type:	SIMPLE RECTANGULAR
㉓ Use units:	N.A.

㉔ Basement volume:	142,750 cf
㉕ Vol. balance bldg.	635,950 cf
㉖ Building volume	778,700 cf
㉗ Roof area:	28,170 sf
㉘ Footprint area at grade:	24,010 sf
㉙ Basement wall area:	6,060 sf
㉚ Exterior wall area:	31,640 sf
㉛ Fenestration area:	4,130 sf
㉜ Exterior closure area:	35,770 sf
㉝ Partition length:	2,593 lf
㉞ Partition area:	33,850 sf

㉟ CONSTRUCTION DESCRIPTORS:

Foundations (011)

011 Standard foundations : Reinf.conc. [✓] Masonry [ ] Other .....
Soil cond. ... POOR - WET & SANDY ... Bearing cap. 1,500 lbs/SF
Slope of site : flat [✓] sloping [ ] ..... % slope av.

012 Special foundations : Unusual subsurf. cond. DEWATERING NECESSARY
Piling - Concrete [ ] Steel [ ] Wood [ ]
Shoring - Steel [✓] Wood [ ] Caissons [ ]

Substruct. (022)

021 Slab on grade : Structural [ ] Non-structural [✓]
022 Basement excavation : Water problems [✓] yes [ ] no
023 Basement walls : Reinf. conc. [✓] Masonry [ ] Other .....
Waterproofing [✓] Dampproofing [ ]

breakdowns as found in the schedules of values and, through a system of cross referencing on the schedules, reorganize the data according to the list of building elements.

With the organization of cost data according to building elements, Mastercost will allow the architect to make his early estimates independent of specific materials choice, letting him reflect in conceptual estimates from the earliest stages the effects of height, site condition, building configurations, interior functional uses and other factors. It will permit the architect to assign and adjust percentages of the budget for allocation to each element of the building.

The list of elements for Mastercost is not an arbitrary or whimsical arrangement of building components. It is the product of a great deal of cooperative effort, in which the AIA and its consultants have worked with a number of other groups, including the General Services Administration, the nation's largest building client/owner.

As a system, Mastercost is designed to assist the architect in several ways. By providing information by building type and size on an area and volume basis, it will simplify budget checking. Too many projects are well underway before it is discovered that budget and design concept are incompatible.

Provided that the budget is adequate, the designer ideally should be able to allocate it for the best possible solution. Few architects, however, enjoy the luxury of a client with unlimited resources; so the designer must check the major building elements required by the facility program against the budget, and then alter plan configurations, details or specifications to balance budget requirements. This process starts before materials and methods of construction have been established.

Mastercost Standard Building Description Form. Shown here is the first page of a three-page input form designed for the architect to identify a project by type, size and location and synopsize its construction methods and materials as simply and concisely as possible. The form (above) would accompany the schedule of values and, in essence, establish the context for the cost data.

Mastercost Schedule of Values. The basic source of Mastercost financial data, (right), this *input schedule* is completed by the contractor immediately after contract award and checked by the architect.

Divided into standardized specification headings, the schedule is cross-referenced between the Uniform Construction Index categories on the left and the Mastercost construction element categories on the right. It thus allows the translation of the cost data from the language of construction into the language of conceptual design (the basic building elements).

oject: wner:	Architect: Contractor:	Project No. Date:	

em description		Item amount
GENERAL REQUIREMENTS		
a. Mobilization & initial expenses	(10)	
b. Site overhead & fee	(10)	
SITE WORK		
a. Clearing & demolition	(121)	
b. Grading & earthwork (site)	(121)	
c. Excavation & backfill (foundations)	(011)	
d. Excavation & backfill (basement)	(022)	
e. Fill below grade slab	(021)	
f. Rock excavation	(012)	
g. Pile foundations & caissons	(012)	
h. Shoring	(022)	
i. Underpinning	(012)	
j. Site drainage & utilities	(122)	
k. Foundation & underslab drainage	(021)	
l. Dewatering	(012)	
m. Paving, landscaping & site improvements	(123)	
n. Off-site work	(124)	
o. Railroad, marine work & tunnels	(124)	
CONCRETE		
a. Conc., forms & reinf. (foundations)	(011)	
b. Conc., forms & reinf. (slab on grade)	(021)	
c. Conc., forms & reinf. (basement walls)	(023)	
d. Conc., forms & reinf. (superstructure)	(03)	
e. Conc., forms & reinf. (exterior walls)	(041)	
f. Conc., forms & reinf. (site work)	(123)	
g. Concrete finishes (exterior walls)	(041)	
h. Concrete finishes (interiors)	(062)	
i. Concrete finishes (site work)	(123)	
j. Precast concrete (exterior wall panels)	(041)	
k. Precast concrete (structural components)	(03)	
l. Precast concrete (site work components)	(123)	
m. Cementitious decks	(03)	
MASONRY		
a. Masonry foundations	(011)	
b. Masonry basement walls	(023)	
c. Masonry exterior walls	(041)	
d. Masonry interior partitions	(061)	
e. Interior paving & finish	(062)	
f. Exterior paving & masonry (site work)	(123)	
METALS		
a. Structural steel in foundations	(012)	
b. Structural steel framing	(03)	
c. Metal joists & decking	(03)	
d. Metal stairs	(03)	
e. Misc. & ornamental metal (building)	(063)	
f. Misc. & ornamental metal (site work)	(123)	
WOOD & PLASTICS		
a. Rough carpentry (framing & decking)	(03)	
b. Rough carpentry (exterior wall)	(041)	
c. Rough carpentry (partitions)	(061)	
d. Rough carpentry (roof, other than framing & decking)	(05)	
e. Heavy timber & prefab. structural wood	(03)	
f. Exterior wood siding & trim	(041)	
g. Fin. carpentry, millwork & cabinet work	(063)	
h. Wood paneling	(062)	
i. Wood stairs	(03)	
j. Plastic fabrications	(063)	
THERMAL & MOISTURE PROTECTION		
a. Water & dampproofing (slab on grade)	(021)	
b. Water & dampproofing (basement walls)	(023)	
c. Water & dampproofing (exterior walls)	(041)	
d. Thermal insulation (foundation & slab)	(021)	
e. Thermal insulation (exterior walls)	(041)	
f. Thermal insulation (roof)	(05)	
g. Roofing shingles & tiles	(05)	
h. Shingles on exterior walls	(041)	
i. Preformed siding & panels	(041)	
j. Preformed roofing	(05)	
k. Membrane roofing, traffic topping	(05)	
l. Sheet metal & roof accessories	(05)	
m. Sealants & calking	(041)	

Item description		Item amount
8. DOORS & WINDOWS		
a. Exterior doors & frames	(042)	
b. Exterior windows & curtain walls	(042)	
c. Interior doors & frames	(061)	
d. Exterior glass & glazing	(042)	
e. Interior glass & glazing	(061)	
f. Hardware & specialties (exterior)	(042)	
g. Hardware & specialties (interior)	(061)	
9. FINISHES		
a. Lath & plaster (exterior)	(041)	
b. Lath & plaster (interior)	(062)	
c. Gypsum wallboard	(062)	
d. Tile & terrazzo	(062)	
e. Acoustical ceilings & treatment	(062)	
f. Wood flooring	(062)	
g. Resilient flooring	(062)	
h. Carpeting	(062)	
i. Exterior coatings	(041)	
j. Interior special flooring & coatings	(062)	
k. Interior painting & wall covering	(062)	
10. SPECIALTIES		
a. Chalkboards & tackboards	(063)	
b. Compartments & cubicles	(061)	
c. Signs & supergraphics	(063)	
d. Partitions	(061)	
e. Lockers	(112)	
f. Toilet, bath, wardrobe accessories	(063)	
g. Sun control devices	(041)	
h. Access flooring	(063)	
i. Miscellaneous specialties	(063)	
j. Flagpoles	(123)	
11. EQUIPMENT (specify:)	(111)	
12. FURNISHINGS (specify:)	(112)	
13. SPECIAL CONSTRUCTION (specify:)	(113)	
14. CONVEYING SYSTEMS		
a. Elevators, dumbwaiters & lifts	(07)	
b. Moving stairs & walks	(07)	
c. Conveyors, hoists, etc.	(07)	
d. Pneumatic tube systems	(07)	
15. MECHANICAL		
a. Exterior mechanical (to 5 ft. of bldg.)	(122)	
b. Water supply & treatment	(081)	
c. Waste water disposal & treatment	(081)	
d. Plumbing fixtures	(081)	
e. Fire protection systems & equipment	(083)	
f. Heat generation equipment	(082)	
g. Refrigeration	(082)	
h. HVAC piping, ductwork & terminal units	(082)	
i. Controls & instrumentation	(082)	
j. Insulation (plumbing)	(081)	
k. Insulation (HVAC)	(082)	
l. Special mechanical systems	(084)	
16. ELECTRICAL		
a. Utilities & serv. ent. to 5 ft. of bldg.	(122)	
b. Substations & transformers	(091)	
c. Distribution & panel boards	(091)	
d. Lighting fixtures	(092)	
e. Branch wiring & devices	(092)	
f. Special electrical systems	(093)	
g. Communications	(093)	
h. Electric heating	(093)	
TOTAL	$	

Building type: ART CENTER
Location: Cook County, IL. **Client:** Private institution

Bid date: Oct. 1971 **Market conditions:** Competitive
Est. const. period: 24 months **Type of contract:** Stipulated sum

Building description: Two story facility in two blocks, art gallery 126' x 134', offices and classrooms 60' x 134' with sculpture courtyard in between. Art gallery comprises exhibit and support areas with some offices. Other block contains four classrooms and staff offices.

Statistics:		Ratios:	
Gross floor area:	47,980sf	Net to gross floor area (GFA)	0.60 : 1
Net floor area:	40,290sf	Volume to GFA	16.23 : 1
Volume:	778,700cf	Ext. closure area to GFA	0.87 : 1
Use units:	n.a.	Roof area to GFA	0.59 : 1
No. of stories above grade:	2	GFA per	n.a. sf
No. of basement levels:	1	Complexity factor	3.164 EU : 1

OUTLINE SPECIFICATION:

011 Flat site, conc. fdns., wet and sandy soil. 1501b/sf bearing capacity.
012 Dewatering & steel shoring
021 Non-structural slab on grade
023 Reinf. conc. walls, waterproofed
03 50% reinf. conc. 50% steel. 100#/sf floor load, 30#/sf roof. Bay sizes: 20' x 25', 56' to gallery.
041 Stone finish; o.13 U factor
042 Alum. double glazed windows. 13% of ext. closure.
05 2" rigid insulation, built-up roofing, o.15 U factor.
061 Masonry 60%, stud 30%, demount. 10%, wood drs. 80%, glass 20%, metal frames. 0.054 lf per sf of GFA.
062 Floors: concrete 85%, resilient 13%, tile 2%. Ceilings: suspended 85%, applied 15%; plaster 42%, drywall 50%, acoustic rated 8%. Walls: paint 47%, plaster 30%, drywall 20%, tile 3%.
063 Washroom accessories, darkroom cabs.
07 Dumbwaiter
081 Copper piping. 1 fixt. per 1,499 sf.
082 100% air cond., double duct system: 240 sf per ton; 65 Btu/hr per sf; 1.02 cfm per sf. Remote heating source.
083 Standpipe
091 106.6 sf per kva, 120/208v primary and secondary distribution.
092 100 ft. candle lighting intensity
093 Fire alarm, clock, PA, telephone
10 50% performance bond, fire insurance by owner.
111 Nil
112 Kitchenette and chalkboard
113 Nil
121 Sculpture court
122 Water and sewer connections, steam line, exterior lighting
123 Nil

Cost Summary: Cost per sf:$40.08 **Cost per cf:**$2.47 **Cost per.....$**

Mastercost Case Study. This is an example of one possible way that Mastercost output data may be documented for subscribers to the system. It represents a highly compressed summary of input data derived from the schedule of values and building description form. This is an early design for the project sheet (above and right) and the categories vary slightly from those shown previously.

Continued experience with many similar projects is the backbone of most architects' cost estimating, and lessons are learned from a series of successes and failures to bring the building in within the budget. But even with a great deal of experience, results can be unreliable, and the data may change over time. Mastercost, with its sizeable and well-organized data base, will provide a sort of "instant" or "ready-made" experience for subscribers, and the data yielded will be current and dependable. A cost index for making time and geographic adjustments will be an essential part of Mastercost and is under development.

Mastercost, however, is not intended to relieve the architect of the need for exercising his own judgment or of his contractual responsibilities. It is not a cure-all for all cost problems. It is a tool that will allow the architect to make better judgments and better estimates, based on an increasing flow of accurate and useful information.

It is a long way from concept to a complete and operational cost control system, which Mastercost aims at achieving. An initial feasibility study, completed earlier this year by AIA's consultants, Hanscomb Roy Associates Inc., of Chicago, indicated that the primary users of Mastercost are expected to be small- and medium-sized firms. The next step is a test run of the experimental system. This demonstration program will test the system's response to the needs of its potential subscribers. Part of the test program will be a series of seminars to show users how to make the most of the system. User education also will be an important and necessary part of the eventual expansion of Mastercost into a nationwide system.

As the system is being developed, it will be well suited to computer use, with access to Mastercost files through computer terminals a possibility. But computer equipment can be costly if underutilized, and it is by no means universally used. The system, then, will not depend upon automated data handling on the part of the subscriber.

When will Mastercost become generally available? Prior to launching a national system, it will be necessary first to subject the concept to substantial testing in actual use, survey the market, set up an operational entity, begin to gather dependable data and initiate an educational program.

emental Category	Element cost		Element amount ($)		Cost per SF		%
	Quantity	Unit Rate	Sub	Group	Sub	Group	
FOUNDATIONS	24,010 sf	3.12		74,799		1.56	3.6
1 Standard foundations	24,010 sf	2.54	60,999		1.27		
2 Special foundations	-	-	13,800		0.29		
SUBSTRUCTURE	142,750 cf	1.07		152,300		3.17	7.4
1 Slab on grade	24,010 sf	1.68	40,390		0.84		
2 Basement excavation	142,750 cf	0.18	25,000		0.52		
3 Basement walls	6,060 sf	14.34	86,910		1.81		
SUPERSTRUCTURE	52,140 sf	5.21		271,794		5.66	13.3
EXTERIOR CLOSURE	35,770 sf	6.19		221,580		4.62	10.8
1 Exterior walls	31,640 sf	5.56	175,940		3.67		
2 Fenestration	4,130 sf	11.29	45,640		0.95		
ROOFING	28,170 sf	2.17		61,129		1.28	3.0
INTERIOR CONSTRUCTION	151,830 sf	1.91		289,264		6.03	14.0
1 Partitions	33,850 sf	2.42	82,018		1.71		
2 Interior finishes	34,680 sf	5.41	187,472		3.91		
3 Specialties	47,980 sf	0.41	19,774		0.41		
CONVEYING SYSTEMS	- No.	-		2,400		0.05	-
MECHANICAL	778,700 cf	0.54		421,688		8.79	20.6
1 Plumbing	32 No.	1,816	58,117		1.21		
2 HVAC	5,519 MBH	64.73	357,271		7.45		
3 Fire protection	47,980 sf	0.13	6,300		0.13		
4 Special mech. systems	-	-	-		-		
ELECTRICAL	450 kva	397		178,700		3.72	8.7
1 Distribution	450 kva	236	106,025		2.20		
2 Lighting and power	47,980 sf	1.18	56,525		1.18		
3 Special elec. systems	47,980 sf	0.34	16,150		0.34		
GEN. CONDITIONS & PROFIT				247,394		5.16	12.0
NET BUILDING COST:				$ 1,921,048		$ 40.04	93.4
EQUIPMENT	47,980 sf	0.04		1,892		0.04	0
1 Furnishings	- sf	-	-		-		
2 Fixed equipment	47,980 sf	0.04	1,892		0.04		
3 Special construction	- sf	-	-		-		
GROSS BUILDING COST:				$ 1,922,940		$ 40.08	93.4
SITEWORK (excl. 123)	49,120 sf	2.78		136,728		2.85	6.6
1 General sitework	49,120 sf	0.93	45,748		0.95		
2 Site utilities	49,120 sf	1.85	90,980		1.95		
3 Off-site work	-	-	-	-	-	-	-
CONSTRUCTION COST: (excluding 123)				$ 2,059,668		$ 42.93	100.0
NET STANDARD BUILDING COST: (net building cost less 012, 084, 093)				$ 1,891,098		$ 39.41	

Currently, funds are being sought to secure financial support for the remaining necessary research and development work. A good beginning has been made, but all these things require time, and it may be a couple of years before Mastercost is nationally available.

Meanwhile, architects can benefit from the preparatory work by using the basic formats for their own projects. Thus, they can begin to build their own cost data base, with the use of a standardized vocabulary. Then, when it comes time to share information with colleagues, all will be speaking the same language.

The sample forms shown here, still under development, give an idea of how Mastercost will work. The basic form of input is the contractor's schedule of values modified to incorporate the building element codes and standardized for use by all Mastercost participants for the sake of comparability.

Like the basic list of elements, the specification section headings on the sample schedule on page 35 are not considered absolutes. They were designed to be as comprehensive as possible and to be supplemented, augmented and changed as experience dictates.

It was considered impractical to have a heading for every item in a building and to the maximum extent possible headings reflect subcontract work or major parts of subcontracts. Some items not responsive to the list of elements (e.g., concrete in foundations, on the exterior, in walls, roof or floor, etc.) are subdivided into pieces matching the elemental categories.

The second essential mode of input is the standardized building description form (p. 34), which provides the context for the cost data. It identifies the building by type and location and synopsizes the materials and systems used in its construction.

This form has been designed to be completed in less than 20 minutes by the job captain or project manager, working from the contract documents. It has been office-tested by the writer and others and found to be quite easy to fill out.

The data collected through the schedules of values and building description forms will be organized by Mastercost and made available to subscribers in highly compressed and usable form. The case study example illustrated is but one of the infinite possible ways of organizing, displaying and utilizing this data. The continuing research and development program will explore the avenues of most benefit to the potential users of the system.

Mastercost will constitute a storehouse of cost information that does not now exist— and a uniquely valuable tool for a profession acutely, if not painfully, conscious of the need to know and control where each project dollar is going. □

CHICKERING & SONS' PIANO-FORTE MANUFACTORY, TREMONT STREET, BOSTON.

Adaptive Use, Cont. Apartments from a Factory and a Store

Carleton Knight III

With the growing energy crisis much attention is being focused on America's older buildings. Not only is a tangible part of the man-made environment lost when one of these structures is demolished and replaced with new construction, but also energy, which older buildings were designed to conserve, is wasted. Thus, more and more older buildings are being recycled to new uses—often as shops or offices.

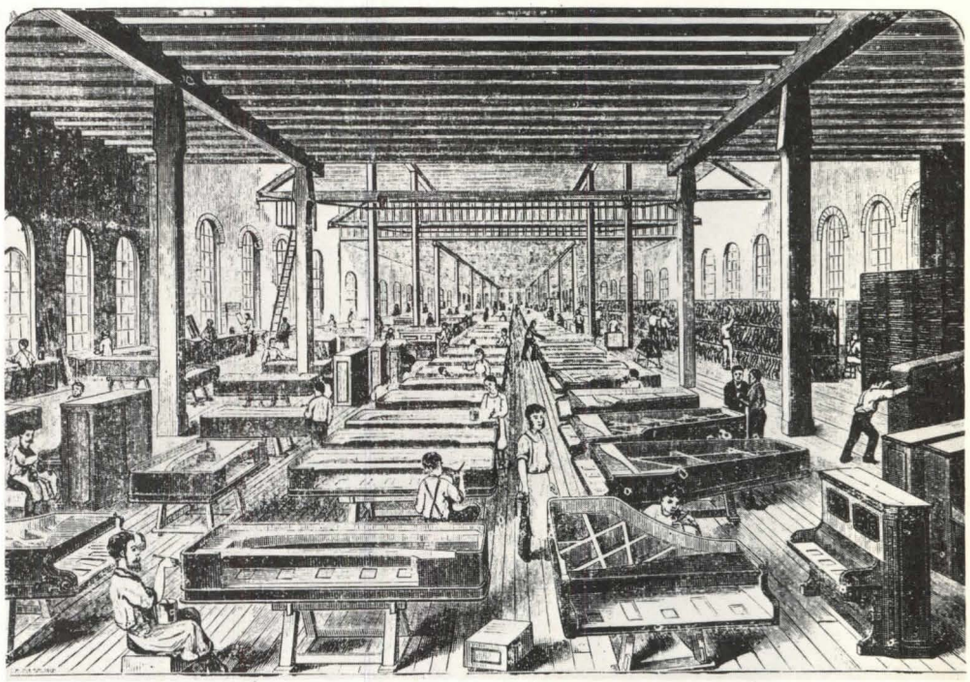
But can buildings not designed for housing be converted economically to such use? The answer—from recent examples in Boston and New York City—is emphatically yes.

By 1971, Boston's Chickering Piano Factory (1853) had fallen on hard times. Pianos were no longer being made there and the building had been converted to light manufacturing. A few artists lived there, too. The owners were $280,000 in arrears in property taxes and the building was unsafe electrically. It seemed like a good candidate for the wrecking ball.

But because of two individuals—planner Robert Gelardin and architect Simeon Bruner—the building today is good for at least another 121 years. Having seen the success of New York City's Westbeth and having conducted a market study in Boston, they determined that the 250,000-square-foot structure could be converted into 174 apartment/studios for artists. The Piano Craft Guild, as the project is called, opened earlier this year at 791 Tremont Street in the city's South End.

Gelardin and Bruner, along with a third partner in the venture, architect Leland Cott, got a big boost for their efforts from the innovative Massachusetts Housing Finance Agency, which loaned $3,382,916 on the project. The agency is responsible for state-subsidized housing and has not hesitated to support other adaptive use projects involving older buildings.

The architects were also the developers and thus were able to keep close tabs on the reconstruction costs and hold them



Mr. Knight is assistant editor at the National Trust for Historic Preservation and is a regular contributor to the Going On section of the AIA JOURNAL.

down to the budgeted $10.50 per square foot—about one-third the cost of similar new construction. Even with inflation, according to Bruner, the Piano Craft Guild could be done today for about $18 a square foot. They purchased the building for $2.50 a square foot.

How did they keep the costs down? The first step was to make a conscious decision to "let the building be itself and not try and force it into a mold." Wood columns were left exposed as were the brick walls. Wood floors were patched with new wood where needed, but no attempt was made to match the old and the new; the effect is a nice contrast. Pipes are exposed as are electrical conduit and outlets.

Major design elements had to have two reasons to be included. Thus, while a large entry lobby was esthetically desirable, cutting through the floor to make two lobby levels also turned the basement area into rentable commercial space (a gallery is in place and the tenants are considering starting a co-op coffee shop). Dormers were added to the roof to overcome a structural problem, but also to create 36 duplex units, reachable by inexpensive metal ships ladders.

After consulting with the city's artist community, several features the artists wanted were included—extra large hallways; 8-foot high entry doors to the apartments; tackboard walls; electrical outlets at ceiling height (as high as 20 feet in some units) for spotlights; commercial slop sinks; and darkrooms.

The building is shaped like a square doughnut, and the 22,500-square-foot central courtyard is to be landscaped following tenant sugestions. As a result of the building's lack of a modular structural plan, all the units are different and the structure is filled with nooks and crannies.

Rentals for the units, which range in size from 500 to 1,740 square feet and include studios to three-bedrooms, are based on income—a requirement for state agency funding. Low-income persons pay from $91-$140 and moderate-income, from $151-$198. Market-rate units (25 percent of the total) range from $205-$401. More than 500 applications have been received for the 174 units and only six market-rate units remain unrented.

Above, a characteristic Piano Craft Guild apartment; right, the McCreary building.

The tenants, who must go through a screening process, are an interesting mix of painters, sculptors, musicians, actors, dancers, writers and photographers. There is also a quiltmaker, radio news announcer and musical instrument restorer, among others.

From the artists' viewpoint, the Piano Craft Guild is an unparalleled success, but it is also a success for the city—rather than being a physical liability to the neighborhood and an economic burden to Boston, the building has a clean face and now contributes to the tax rolls. It is proof that an old building can have a new life at a reasonable cost.

Two years ago, a developer in New York City bought the castiron McCreary department store (1868) with the intention of tearing it down and building a highrise apartment building. That did not happen and the same developer wound up converting the building into apartments.

To understand the story of how this happened, one must first understand the

Both buildings yielded a variety of dwelling units at bargain costs.

developer, Rockrose Development Corporation, which, although it intends to go into new building, has done a number of other adaptive use projects around the city and is actively looking for more. Rockrose is made up of three of the Elghanyan brothers, young, American-born of Iranian extraction. The oldest is Henry, 33, the lawyer; Tom, 29, is the businessman; and Fred, 25, is the engineer. When the youngest, Jeffrey, is graduated from college, he will join the firm—as the architect.

They very much enjoy redoing old buildings. "Financially, if you've got the will and can be flexible with government administration, then you can be successful," says Henry, who points out that reconstruction and adaptive use costs "20 to 30 percent less than new construction."

The McCreary building was in an ideal location—a 17,000-square-foot site at 11th Street and Broadway in Greenwich Village. The building had been converted into a shoe factory that was abandoned in 1940. In 1971, it had suffered a fire. Rockrose bought the building and began applying for the necessary variances and permits for a new building.

At this point, community interest began to build and the Friends of Cast Iron Architecture, among others, asked Rockrose to consider restoration and adaptive use. The developers said that in this case such a plan was economically infeasible. The community, however, did not give up easily and then asked the developers how they might help to save the building.

"This certainly was a strange approach from a real estate point of view," says Henry, "but a welcome one. We took another look and said that if the community would help us meet the code problems, then we would solve the technical problems."

The community did help through appearances in support of variances before the Board of Appeals. These were granted and "made the building possible."

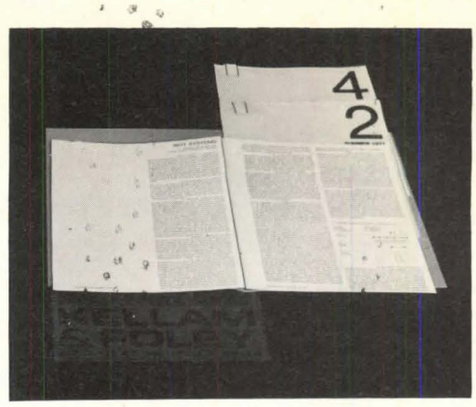
Architect Stephen Jacobs modified the interior layout to hold 144 units, no two of which are the same. A new floor was constructed between the existing first and second levels (there had been a 20-foot ceiling) and an additional floor and new roof was constructed above the cornice. These changes permitted three additional levels of apartments (units on the roof also have gardens). The third, fourth and fifth floors have sleeping lofts. Commercial space is rented on the first floor.

The castiron exterior was painted and new glass installed. Inside, elaborate Corinthian columns pop up everywhere (an early plan to bury them in the walls was fortunately discarded). The developers also rejected a plan to sandblast the columns and opted instead for steam-cleaning so as not to damage the decoration. Units from studios to three-bedrooms rent for $235-$565.

As with most such projects, there were problems, but not enough to keep the brothers from trying again. "Banks seem to be afraid of renovation," says Henry, who was finally able to secure a $4.1 million permanent mortgage from Lincoln Savings Bank after being turned down by many other lending institutions. Despite the problems, the project was completed.

In both Boston and New York, both the city and the public came out winners. □

Direct Mail as a Marketing Tool For Architects



Martin McElroy and Sarah J. Hnidey

"An architect shall not use paid advertising; indulge in self-laudatory, exaggerated, misleading or false publicity; or solicit, or permit others to solicit in his name, advertisements for any publication presenting his work," states the 1974 AIA *Standards of Ethical Practice*. Compliance with both the letter and the spirit of the AIA canon of ethics requires the professional to stick to the facts and limit his expression of them to the circle of his personal contacts. But does this really prevent the professional from using direct mail promotional tools to let those who award the contracts know what he has done and what he is ready, willing and able to undertake?

Professional ethics aside, the use of indiscriminate media that reach an anonymous audience is an ineffective means of stimulating new business or of keeping lines of communication open with former clients. Today's arsenal of complex service packages cannot be meaningfully conveyed by broadside mailings.

Effectiveness in the marketplace is the compelling motive for directing messages to a specifically defined and receptive audience. Direct mail communication allows the architect to inform clients and prospective clients about the nature of his services, the process by which they are rendered and their relationship to broader issues. Conducted on a regular basis, direct mail communication can contribute to the creation of a body of informed clients and a more desirable climate for both the conduct and marketing of a professional practice.

The nucleus of the effort to reach a specifically defined and receptive audience is the firm's business development list, which is comprised of those with whom the architect has had personal or professional contact: the school superintendent met in Atlantic City, the bank president who rounded out the last foursome, the new corporate facilities officer who was the target of the last sales call.

Mr. McElroy is a principal in the Philadelphia firm of Weld Coxe Associates, consultants in communications management. **Ms. Hnidey** is a member of the firm's public relations staff.

Only the firm's principal can make the value judgment that will produce a mailing list of 50 decision makers; left to someone else, the list may consist of 500 low-echelon flak-catchers. Self-discipline is the midwife that assists in the birth of the mailing list. It is self-discipline that the firm's principal will have to apply in order to perform the often tedious task of assembling and keeping current a complete list of the people with whom the firm has done and will do business.

Once the mailing list is established, the firm has a proper audience for direct promotional communication, and may then consider the proper vehicle to reach its chosen audience. The choice will depend upon the individual firm and its audience, as well as upon the economics and what information it has to communicate. The most common mailing pieces are the new brochure and organizational or address change announcements. Reprints of articles that appear in trade or professional journals make first-rate selling tools because they combine the discriminatory power of the mailing list with the third-party credibility of editorial coverage. Many firms undertake extensive publicity campaigns for the purpose of generating feature articles.

The special publication is one form of direct mail promotion that is receiving increased attention and use. In the special publication universe, the newsletter is the most familiar. But to consider special publications only in terms of the traditional newsletter concept is like thinking of a society limited to printed newspapers—imagine no *Time, Psychology Today* or *Business Week*. Society's reliance on a broad spectrum of media for commentary, analysis and elucidation indicates the potential of well-conceived direct mail marketing tools to observe, explain and discuss considerations of significant importance to the prospective architectural client.

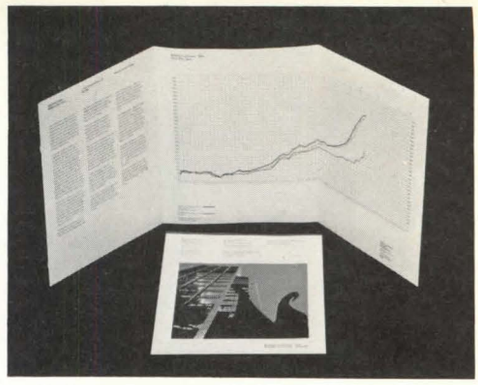
An important step in the creation of a regular special publication is the formulation of an editorial objective that is consistent with the firm's marketing objectives. For example, two years ago, Ferebee, Walters & Associates, a medium-sized architectural firm in North Carolina, found itself regularly in competition with two very large local firms. It needed to communicate its appropriateness as a choice for significant commissions. This provided the marketing objectives for a special publication. The firm's audience was composed primarily of laymen who could benefit from learning how design concepts are generated from programmatic requirements, and this observation established an editorial objective.

To bring the two objectives together, the firm created a minimagazine format, which describes one significant project per issue with emphasis on the relationship between its architectural features and the program requirements. The final two pages of the eight-page publication report the involvement of the principals of the firm in matters of public interest. The pieces are used for mailing to the firm's business development contact list and as "leaving" pieces at the conclusion of sales calls. Although it would obviously be reaching to suggest any direct impact from the publication, the average dollar value of the firm's projects has risen significantly in the past two years.

A firm in the Midwest with an established reputation for the excellence of its engineering department decided its publication's marketing objective was to communicate the growing capability of its design department. The editorial objective sought to give the audience—again laymen—an explanation of the relationship between architectural form and engineering systems.

The result is a poster with graphics that immediately assert the design orientation of the firm. Diagrams and text describe an individual project in detail. Dozens of additional copies of an issue that presented a new university stadium were requested by the university's development staff for distribution to its own audience, an unexpected residual benefit that extended the firm's visibility.

A lay audience may present opportunities to instruct, as was true in the publications just cited. But the corporate or governmental selection officer may very often be a professional who is attuned to contemporary approaches to architectural practice. Here it may be appropriate to



affirm or broaden his thinking (and your own) on a pertinent issue.

When the General Services Administration was first investigating construction management some years back, the Nolen-Swinburne Partnership, in Philadelphia, produced a special publication on the subject. It was a comprehensive definition of the nature and objectives of construction management that gave significant testimony to the firm's aptitude to develop and produce a sensitive and special service. One government agency requested additional copies to distribute to its field offices nationwide.

Decide what the audience knows and needs to know about your profession and about you. What are their interests? The public school market may be highly receptive to discussions about cost control; a developer may be interested in an analysis of zoning negotiations.

A firm in Philadelphia, seeking to reinforce its image as a diversified design firm, recognized that its clients would be receptive to a regular update on the work of the firm and it developed an annual report format to convey it. The 16-page booklet simply lists the firm's active projects by building type, but the list is abundantly illustrated to present photographically the design orientation of the firm. The publication actually was an annual report only because it was produced once a year, and said so on the cover. A sense of identity was accrued when the initial success was reinforced the second year by the repetition of the format and basic layout—something that is, unfortunately, not true of many annual reports.

What the format *is* has less to do with the success of the publication effort than the consistency with which it is used. When Coca-Cola had to package its product in cans, it was faced with the fact that a curved bottle means "Coke" in the minds of consumers. Be assured that cans with hour-glass shapes received due consideration before the now familiar white wave form, the red can and the script typography were chosen to reassure the consumer of the legitimacy of the liquid inside the can. Similarly, with direct mail publications, the physical entity of every issue should be consistent in size, editorial organization and approach to color and illustration, with just enough variation to identify each issue as distinct from another.

The importance of format should not be overlooked with regard to many more routine types of direct mail correspondence. An address change or the introduction of a new key staff member deserves the best foot forward. The terse "we wish to announce" may have far less impact than a letter of introduction signed by the head of the firm and mailed to clients whom the new man may be expected to meet in coming months. It is a door-opener for him that may make the face-to-face meeting a much more positive experience for all concerned.

The importance of the signed covering letter in direct mail communication should not be overlooked. It is the covering letter (which should be composed carefully) that keeps the recipient's secretary from stashing the publication or article reprint with the junk mail, and it is the credibility of the signed covering letter that keeps her boss from doing likewise in his own mental warehouse.

How much direct mail is too much? A frequency of three or four times a year may be appropriate in order to modify the audience's image of the firm or to maintain an understanding of a particular capability of the firm. One or two mailings are sufficient to maintain contact and currency with the marketplace.

There is no inherent virtue in regularity. It is far better to make a timely response to a public issue about which the firm is qualified to speak than to maintain an arbitrary schedule. A tight routine, however, can keep the program from overwhelming the office each time a deadline rolls around. It is also wise not to date each issue, although the covering letter should be dated. This will maintain the publication's currency as a leaving piece for sales calls and avoid the potential embarrassment of mailing the winter issue in April, or the May issue in June, which will happen every time an important interview or project charrette asserts its priority.

Since 1923, Smith, Hinchman & Grylls Associates, Inc., has been delivering an appropriate message within a consistent format on a quarterly basis. With a primary editorial objective of demonstrating building cost control capability, the firm's 8½ x 11, six-page fold-out, "Building Cost Index," features a graph comparison of S, H & G's building cost figures for a three-month period with those calculated by *Engineering News-Record* and the Bureau of Labor Statistics.

An editorial on current cost conditions is another regular feature of the publication. Each issue also highlights recent firm projects and items of current interest. A recent issue included a list of delivery times for "hard-to-get" construction items —pertinent information for the readers, who comprise a large cross section of owners in industry and government.

Fluff and self-servitude in a special publication are not persuasive. The value of the direct mail campaign will be determined ultimately by the genuine substance of its content. A little soul-searching, mind-exploring or discussion with professional associates can turn up a storehouse of relevant and substantial information worthy of publication and valuable as sales tools. Get it down into a clear and organized message.

Decide who your audience is and choose the best vehicle and format to deliver your message and accomplish your marketing objective. Speak up, for you will probably be performing a needed service that will be heard and produce meaningful results for the audience of prospects, and tangible rewards for the communicating professionals. □

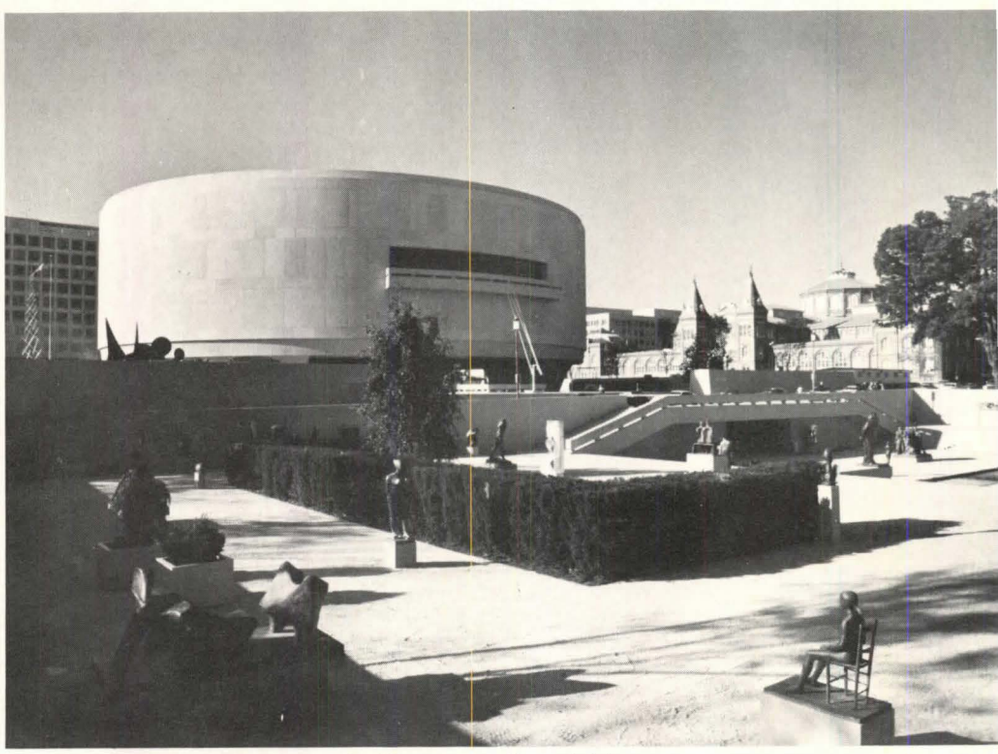
After a 36-Year Wait A Modern Art Museum Opens on the Mall

The opening of the Joseph H. Hirshhorn Museum and Sculpture Garden in the nation's capital in October brought forth more hoopla than any architectural event that city has witnessed since 1921 when Henry Bacon, architect of the Lincoln Memorial, was pulled by architectural students on a ceremonial barge down the Mall's reflecting pool. That splendiferous ceremony lasted but a single night. The opening of the Hirshhorn went on for three nights, and the festivities were augmented by pre-opening dinner parties all over town.

Some 15,000 invited guests at the museum feasted on such delectables as champagne and melon chunks and prosciutto to the tune of $60,000, according to local newspaper reports. The tab—picked up by the Smithsonian Institution, to whom title to the art collection has been transferred—was paid for by "private funds." The engaging and ebullient philanthropist Hirshhorn danced in the courtyard, listened to an original musical composition by one of America's foremost composers, William Schuman, that was commissioned for the occasion, and heard speeches by S. Dillon Ripley, secretary of the Smithsonian Institution, and others knowledgeable in the arts.

In spite of the conviviality of the opening ceremonies—plus the fact that Washington's first major facility devoted exclusively to modern art puts the city immediately in the big league with such art centers as New York City and Los Angeles—there has been controversy about the conditions of Hirshhorn's gift to the nation. He insisted that the museum bear his name, which didn't sit well with some critics in light of the fact that the nation's taxpayers footed the bill to erect the museum and will pay the cost of maintenance. But the donor has been generous, giving not only his remarkably rich collection of art but also $1 million toward the construction of the $16 million museum, designed by Gordon Bunshaft, FAIA, of Skidmore, Owings & Merrill.

At the dedication of the Hirshhorn, Smithsonian's Ripley recalled that 36 years previously Congress had legislated the creation of a new gallery as a foil to the collection of old masters in the National Gallery of Art, the gift of Andrew W. Mellon, which was then under construction on the Mall. "The ensuing years since 1938," said Ripley, "had managed to bring little if any recognition by the Smithsonian itself of the incredible surge of activity in contemporary arts in this country. Thus the effort by a number of us to make up for a generation of neglect, which has culminated in a gift to the nation by Joseph Hirshhorn and his foundation, filling the gap in time."

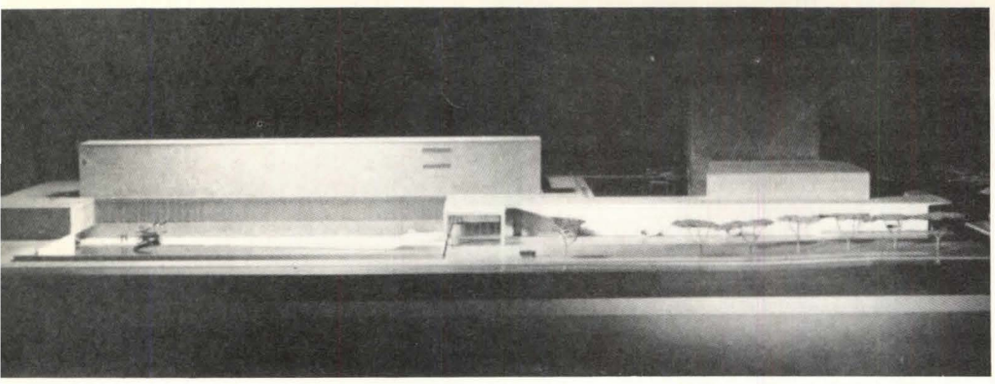


In 1938, the 75th Congress authorized that the architect for a new Smithsonian gallery be selected by means of an open architectural competition. It was, said the *Architectural Forum* of July 1939, when the competition winner was announced, "the first time since the days of Thomas Jefferson that the architecture of an important building in the nation's capital had been selected by open competition. Considered from this view alone, it is an event of wide public interest and concern." The magazine continued: "The great majority of the final contestants had already distinguished themselves professionally, a fairly strong argument against the common claim that competitions are a lottery in which almost any incompetent might be lucky enough to win."

The jury for the competition was chaired by Frederic A. Delano, chairman of the National Capital Parks and Planning Commission, and other members of the jury were architects John A. Holabird, Walter Gropius, George Howe and Henry R. Shepley. The jury selected the design submitted by Eliel and Eero Saarinen and associate J. Robert F. Swanson as the winner, with second place going to Percival Goodman of New York City.

Albert Christ-Janer, in his book titled *Eliel Saarinen* (University of Chicago Press, 1948), says that the Smithsonian project was important "in establishing a precedent for future competitions for federal structures." He also tells how the jury "braved a storm of protest" in recommending a design that departed from "the

Contrasting approaches to design of a museum on the Mall: the circular Hirshhorn (above and right) and the rectilinear Saarinen competition winner of 1939 (top).



column-consciousness of the public buildings in the nation's capital." The *Architectural Forum* also praised the jury, saying: "That an impeccable jury should have chosen—for Washington—a building without the usual Roman draperies is not only a tribute to their courage and honesty, but gives, at long last, some hope that the capital may show three-dimensional evidence of its existence in the 20th century."

The jury praised the Saarinen/Swanson design as "especially appropriate in relation to the site. It offers a remarkable clarity of composition in mass and restraint and dignity in expression which appears to the majority of the jury especially suitable for a building to be built on the Washington Mall." According to the program, the site was to be on a plot directly across the Mall from the National Gallery of Art. The program instructed that the new gallery was to be "conceived as a dynamic rather than a static museum of art. . . . Above all, it will be its purpose to strive . . . to stimulate a confidence in American creative capacity and to restore to American art a healthy relationship to the life of the community."

There were 408 submissions in the competition. Ten designs were selected as finalists. A prize of $7,500 went to the Saarinen/Swanson team; Goodman, as second place winner, received $3,500; and the other eight were given an honorarium of $1,000 each. According to the rules of the competition, whose professional adviser was Joseph Hudnut, professor of architecture at Harvard University, the first prize winner was to be employed for a total fee of $18,000.

Funds for construction of the building were to be raised either from private sources or by means of new Congressional appropriation. Congress never granted the funds, nor did any philanthropist come forth. This failure was not for lack of energetic efforts by Edward Bruce, head of the national arts program at the time, but plans for the new gallery were set aside after his untimely death.

The Saarinen/Swanson design envisioned an exterior of metal, marble and glass. The exhibition areas were to be lighted by a continuous window strip that overlooked a court and a promenade on the borders of a pool sited near the main entrance. There was to be a theater complex, with an auditorium whose lines would complement the lines of the roof of the exhibition galleries.

Allan Temko in his book, *Eero Saarinen* (Braziller, 1962), gives an interesting account of the competition. He quotes Charles Eames, who was one of the designers who "clustered about" Eliel Saarinen at Cranbrook in Michigan. Eames recalls that Eero Saarinen "thought out the whole thing carefully, and then told us the first thing to do would be to make 100 studies of each element that went into the building. We would then pick the best, and never let our standards fall below that. Then we would make 100 studies of the combinations of each element. . . . Then 100 studies of the combinations of combinations." Eames is quoted as saying that when the design was finished, "Eero was almost in tears, because it was so simple." Temko says that the "luminous exhibition hall and flanking auditorium were Eero's," but that the "dry dignity and classic restraint" were Eliel's. "Years later, Eero remarked that, if the Smithsonian were to go ahead, he would redesign it completely in accordance with his mature thought."

But in all those intervening years, the nation never went ahead to erect a museum, owned by the people, whose aim would be to celebrate the creativity of modern artists, until Congress in 1966 authorized the Hirshhorn.

Undoubtedly, back in 1939 many people would have disapproved of the streamlined Saarinen design. Its simplicity, in contrast with the classical "draperies" of the National Gallery of Art, would have found critics. It's interesting to contrast this clean and understated Saarinen design with that of Bunshaft. The "gutsy" Hirshhorn itself hasn't won the hearts of all architectural critics. In Washington, some people call it the "marble doughnut." And one critic termed it a "maimed monument" sited on a "maimed Mall," saying that the sculptures "do battle with the hard, bleak geometry of their setting, losing scale and power." Another says that it is "brutally unsympathetic" in scale and feeling. Bunshaft himself is quoted as saying that his intent was to display art "without architectural distractions" and that the building itself is a "large piece of functional sculpture."

Whatever the critics' views of the exterior, there has been nearly unanimous agreement that the building works exceedingly well as a place for viewing art. Mr. Hirshhorn's verdict: "It's got space, it's got character." *Mary E. Osman.*

The Army Engineers' 1974 Design Awards

The Chief of Engineers Distinguished Design Awards Program was established in 1965 as "one method of encouraging good design throughout the Army's Corps of Engineers." The awards are "presented to foster esthetic and functionally distinguished designs for structures built by the Corps," either through its own personnel or by firms and individuals in private practice, contracted for by the Corps' local district or division. This year's jury, comprising Archibald C. Rogers, FAIA, president of the AIA, Harry M. Weese, FAIA, and O'Neil Ford, FAIA, in selecting four out of the 25 entries for awards was "pleased to note that two of the winning designs were accomplished by architects on the staff of the Corps" and interprets that as an "encouraging trend" that holds out hope for the "continuing healing of the prior schism between architects in private practice and those in the public employ."

Nominations to the awards program are made by the local district itself, and in premeating the maximum number of designs possible the jury "noted an improved quality in design submissions." An honor award was presented to the addition to the officers' open mess, Presidio of San Francisco (architect, Robert B. Wong, AIA, under the supervision of the Sacramento district). This award is given only at the discretion of the judges "to recognize exceptionally distinguished accomplishment."

A maximum of three awards of merit may be presented each year as recognition of "excellence in design." The three winners were: overlook structure, Santa Rosa wash project, Tat Momolikot Dam, Papago Indian Reservation, Ariz. (designed by the Los Angeles district); base chapel, Peterson Field, Colo. (architects Muir & Young under the supervision of the Omaha district); and Cross Lake ranger station, Crow Wing County, Minn. (designed by the St. Paul district). Honorable mentions went to the new main library, Fort Monmouth, N.J., (architect, Charles Fitch, AIA, under the supervision of the New York district), and the Kingman building, Fort Belvoir, Va. (architect, Callmer & Milstead, under the supervision of the Norfolk and Baltimore districts).

In designating the addition to the officers' open mess (left) recipient of the honor award, the jury "appreciated the good judgment of the architects and the Corps in sensing the importance of preserving and enhancing the original building." The new addition is the third to be placed on the oldest adobe building in San Francisco, and the architect worked closely with the local historical society to maintain the integrity of the original structure. "The design," the jury notes, "is not only a most sensitive solution to this important objective, but it also incorporates spaces that function well and are obviously inviting to the user." The addition, which was sited to the rear of the existing building, was designed in a contemporary style that would be compatible with the color, texture and appearance of the older structure.

Of the overlook structure, Santa Rosa wash project (top right), the jury expressed pleasure that "this fine rough site was not surmounted by a slick and formal structure." The site had been chosen to provide an overview of the dam and related points of interest. To minimize damage to the hillside, the contractor was required to construct a tramway that was similar to those used in mining operations.

Program requirements for the base chapel (center right) called for "a nondenominational chapel that would be compatible for individual denominational services." In giving it an award of merit, the jury commented, "It is pleasant to see a building that visibly employs but two materials: brick and copper roofing. Its simplicity is refreshing in these times of sporty religious buildings." It was, however, "disappointed with the traditional approach to interior finishes and detailing."

The Cross Lake ranger station (bottom right) was designed to serve as an operating center for a ranger controlling a compound. The jury noted that "the campground building is a welcome example of siting a building in a fine, lush forest area while keeping the building subordinated to its surroundings. It is not an imposing structure and that is most fortunate." *Peter H. Share*

Supplementing History; The Environmental Impact of the Great Pyramid

Colin Keizer and Randy Casteel

Presented on the 29th of Phamenoth
in the twenty-first year of the
reign of Cheops, ruler of the Two
Kingdoms, son of Amon-Re.
Most Royal Pharaoh, beloved of the gods,
honored father,
Greetings:
The enclosed draft environmental impact statement for your royal highness' funerary works and pyramid is submitted for your entertainment and perusal. Should some error by my unworthy self come to the attention of your omniscient perception, I most humbly beg your forgiveness and enlightenment. It is unnecessary to remind the all-knowing one that construction must begin soon, and his decisions are awaited patiently.
Your Most Humble and Devoted Subject,
Chephren, Superintendent of the Works
of the Pharaoh, Prince of the Blood

SUMMARY SHEET.
Nature of this report: Draft environmental impact statement.
Sponsor: Cheops, ruler of the Two Kingdoms, son of Amon-Re.
Type of proposed action: Administrative approvals necessary to permit construction of the Pyramid, Mortuary Temple, Valley Building (funerary works), five auxiliary chamber-pits for boats and a one-quarter-mile long, 15-foot wide covered causeway between Valley Building and Mortuary Temple.
Required actions include: Approval of site and structure by the Pharaoh, approval and authorization of design development, working drawings and project cost estimates by the Pharaoh.

Messrs. Keizer and Casteel, a liberal-arts freshman and a junior in civil engineering at the University of Washington, prepared this statement as an assignment in a summer 1974 course on environmental roles and issues taught by David L. Bonsteel, associate professor, department of architecture.

Official title of proposed action and summary of the proposed action: Great Pyramid of Cheops. Proposal would cover about 13.1 acres; 481.4-foot-tall monument to house body of deceased Pharaoh plus selected household goods.
Summary of environmental impacts: It is believed that biological, geological, botanical and atmospheric conditions will not be significantly altered by this action. The main impact will be: 1) an increase of vehicular traffic on the Nile and quarry roads; 2) serious air pollution emissions; 3) heavy pedestrian and beast-of-burden traffic; 4) reduction of burial space; 5) visual and acoustical impacts on nearby residents, the latter ending upon completion of construction; 6) fewer overall options for choice of royal burial grounds in the vicinity of the capitol; 7) large influx of slave labor, creating impacts upon local food supplies, living space, residential acoustics and pollution emissions; 8) impact on Tura limestone quarry, Aswan granite quarry and Giza limestone quarry, requiring levies of approximately 100,000 men per annum.

I. DESCRIPTION OF PROPOSED ACTION.
A. Type of action requested, i.e., one pyramid, large: It has been decreed by King Khufu, also known as Cheops, that a tomb shall be built for him in the form of a pyramid and shall be vaster in dimensions than that of his father, Seneferu.
B. Project description: The Pyramid of Cheops, hereinafter referred to as the Great Pyramid, will be constructed in the northwest corner of a plateau situated on the edge of the Sahara Desert approximately five miles west of Giza, Egypt, and one quarter mile from the west shore of the Nile River.

The Great Pyramid will have a base which will measure 756 feet on each side, a total base area of 571,536 square feet (13.1 acres) and will rise to a maximum height of 481.4 feet. Its four sides will be inclined at an angle of 51°52′ from the ground. The center of the Great Pyramid's core will consist of a nucleus of hewn stone. When completed, the core of local stone and the outer facing of Tura limestone will be composed of approximately 2.3 million separate blocks, each averaging some 2½ tons in weight and reaching a maximum of 15 tons. As opposed to the native-quarried limestone of the core, the facing limestone is brought from Tura by boat on the Nile. Care must be taken that these stones are of a uniform quality, both as regards color and size. Dressing these stones will require the attention of some four thousand professional stonemasons, and the setting must be carried out with extreme care and accuracy.
Description of principal facility: The first and lowest chamber (11′6″ high; east-west, 46′; north-south, 27′1″) is some 150 feet below the base of the pyramid.

The second, middle chamber lies low in the central core of rough limestone blocks. It is not extensively dressed. The chamber is set 24 feet east of a point dropped directly down from the top of the pyramid.

The third, "King's Chamber" (19′1″ high; east-west, 34′4″; north-south, 17′2″), is built entirely of granite. The ceiling of this chamber, weighing some 400 tons, is flat, composed of nine stone slabs. Compartmentalized in a set of four layers and one conical, pointed "roof," this construction is expected to withstand any but the most severe geological shocks.

The elevated burial chamber that has been employed in the design of the Great Pyramid is contrary to the long-established burial customs but will be an innovation which will be beneficial to the king in that he will be closer to the heavens when laid to rest.
Description of adjunct facilities: Adjacent service facilities include the Valley Building, Temple and connecting causeway. Unfortunately, the priests of Anubis refuse to release any details of the interiors of the two buildings. It was with the greatest difficulty that they could be convinced to release the overall dimensions of their buildings. The mortuary temple is 171 feet from north to south and 134 feet from east to west. The Valley Building, on the shores of Lily Lake, is 83 feet from

'Pleased as he was, Pharaoh looked upon it and said, I have a magnificent idea.'

north to south and 169 feet from east to west. The Mortuary Temple is located east of the center of the east face of the pyramid, with part of the pyramid wall forming the rear wall of the temple. Access to the pyramid court is by a double door in the rear wall of the temple. Access to the temple is by the causeway entrance.

The Valley Building is connected to the Mortuary Temple by the causeway, a covered stone corridor 10 feet wide and 11 feet high. Once again, the priests have refused to release details, save that they have commissioned the artist Zoser-Teti to embellish its interior and exterior. The causeway, as the two buildings, will be constructed of Tura limestone by lay priests working under the supervision of commissioned architects.

C. Functional design:

1) Function: The pyramid is "to forever remind man of the greatness of Cheops," and to be accomplished by size alone. That he may rest in peace, all access to his chamber is blocked by the most massive of stones, which are then hidden beneath layers of carefully placed, perfectly fitted limestone. For him, no lesser stone than that of Tura would suffice; thus, the monument is also dedicated to Tura and its gleaming white stone.

2) Site design: Situated on a low rock plateau, a short distance from and overshadowing the capitol, the pyramid sits firmly on a foundation of solid bedrock. Around the base of the pyramid is a wall of local stone, which is placed so as to leave room for a thin strip of Tura flagstones all around the pyramid.

Access to the site, while the pyramid is under construction, will be by a large ramp, which is to be extended up the east wall as the pyramid grows higher. All heavy items will be pushed and dragged up this ramp on sleds and rollers of wood. Construction employees, professional and skilled workers and slaves will be housed on or near the site for the duration of construction. Facilities for support of approximately ten thousand nonskilled and four thousand skilled workers are required. Expansions in trade routes to the capitol will require the construction of new housing and business facilities in that city and several port cities on the Nile.

3) Building design: In the footstep of his revered father, who is now with the gods, the Pharaoh has decreed that he shall build a pyramid for his earthly body. Unlike the stepped structures of his forefathers, this pyramid is flat-sided, rising to a point which can be seen for miles in every direction. Faced with the most carefully dressed and polished Tura limestone and topped with a gilded granite capstone, this is a monument designed to outlive all.

II. JUSTIFICATION FOR PROPOSED ACTION.

A. Basis for action: The Pharaoh's word is law. That which he decrees shall be done, is done. Nothing is impossible to the all-knowing one.

B. Inadequacy of existing facilities: For role of the pyramid, see project description, "functional design."

General conditions underlying the need for a new pyramid: The Pharaoh, in his wisdom, knows that all men are mortal. Though this is not to admit that the Pharaoh, too, is mortal as are men, he has decreed that the day will come when he shall decide to rejoin his father, Amon-Re, in the vault of the skies. Thus, he desires, as have his predecessors, that the people supply him with a safe place to store that which he must leave behind, his earthly body. Great is the wisdom of Pharaoh.

That his earthly form may reside in the surroundings to which it is accustomed, the Pharaoh has decreed that no existing structure is suitably magnificent to do justice to him; therefore, such a structure must be built. Beautiful is the reign.

C. Project planning history: In the fifth year of his reign, the Pharaoh decreed that he would have built a monument befitting his station as ruler of the Two Kingdoms and the son of Amon-Re. Thus, he commissioned his most humble and unworthy son, Chephren, Superintendent of the Works of the Pharaoh, and bade him design a pyramid like unto the pyramid of Seneferu, save that it be larger in every dimension.

As he commanded, so it was done, and the greatest of all pyramids was begun, but lo, it came to pass that the Pharaoh was not pleased with a burial chamber placed beneath the very foundation of his monument and ordered far-reaching redesigns. Striving mightily, his unworthy son succeeded in moving the royal chamber up above the base of the pyramid.

Pleased as he was, Pharaoh looked upon the work and said, "I have a magnificent idea!" It is rumored that the prince paled and appeared faint. Pharaoh continued, "We shall have a tall corridor of polished limestone, rising into the very center of our pyramid, and it shall be a marvel for all to view. There at the head of this, it pleases us to name it the great gallery, we shall have our burial chamber."

The word of the Pharaoh is law. Architects were commissioned at great expense and they worked night and day to complete the design. Stonemasons hewed carefully in the quarries of Tura and their products received the highest transportation priority.

D. Public participation: Pharaoh decreed that in the season of inundation, there should be a levy of his loyal subjects, and 100 thousand of them should work in the quarries and on the pyramid. Later, Pharaoh decreed, "The levies are of the people; therefore they shall be fed by the people. There shall be levies of food, clothing and moneys to support our faithful, hard-working subjects."

Thus, there have been numerous public hearings and discussions on the proposed project. All public hearings have been announced well in advance, and participation has been far above expectations. Public enthusiasm, as can be seen in the official transcripts of the hearings, has been tremendously good.

E. Proposed method of financing: Employing conventional methods of financing, the king will decree an increase in taxes for initial expenses, with an increase in taxes to follow as needed. Funding

The architects assured Pharaoh that his pyramid would be built to last.

sources are also expected to include more than generous donations from any and all subject nations.

III. ENVIRONMENTAL IMPACT.

A. Natural setting and climatology:

Vegetation: Any and all vegetation within the construction site and along the most used transportation access routes will be wiped out. Drifting clouds of dust will affect vegetation within a radius of five to ten miles.

Soils, drainage and surface stability: Pounded into dust, any area within the construction site or along the most used transportation access routes will be worn down to a hard-packed crust or bedrock within a matter of months. Drainage, however, should improve as the area receives more use. Obviously, water will run off of rock more quickly than off dirt or sand. As for surface stability, with the first high wind there will be no surface. All that will remain will be rock and hard-packed crust.

Atmosphere and air quality: Because of workers and construction devices, air quality will decline during construction because of dust and will improve at the completion of the pyramid. The probability of exceeding national and secondary ambient air quality standards will increase during construction and fall off after construction reaches its final stages and return to normal after construction is completed. In addition to dust and dryness, the cumulative odors of body sweat, fresh blood, old blood, open-pit toilets and various other smells make it advisable not to breathe the air. If this is unavoidable, a physician should be consulted immediately after inhalation.

B. Land Use:

1) Residential: The project will create an impact on local residential areas, with an influx of professional and skilled workers who do not wish to live on the site.

2) Commercial: There will be increases in every aspect of the commercial field, with specific impacts in the area of production of structural stone, food production and services, housing, transportation and tooling.

3) Industrial: Impact on industry will largely be in the area of transportation, such as shipbuilding, and in the area of tool production.

4) Transportation: There will be a major impact on every kind of transportation. Shipping on the Nile is expected to double, which will be hazardous, as the river will be running full during the height of construction periods. Transportation on land, using the accepted methods of sleds and rollers, will increase dramatically. Movement of product, by draft animal or cart, is expected to double, perhaps triple, at the height of the building season.

C. Community development:

Labor force: The project will employ eight thousand full and part-time workers for a period of 20 years for construction. Afterwards, some 50 men will be employed on a full-time basis for custodial work. All the men will be housed in barracks that will lie a short distance from the pyramid.

Of the eight thousand employed, levies of one thousand men will be employed for a period of three months annually transporting stone from the quarries to the pyramid. The mean weight of the blocks is about 2½ tons and can be handled by a gang of eight men. Each gang will be required to move an average of 10 blocks in the 12 weeks that they are employed each year. All the latest advancements in block moving are being employed on the project and there will be a comprehensive safety program.

D. Wastes and pollution:

1 Noise: Noise will be of no impact because of the distance to the nearest community, which is five miles away in the outskirts of Giza.

2) Sewage: Sewage control will be handled by natural infiltration of effluent. Latrines will be installed throughout the construction site and behind the barracks and then by percolation the effluent will be filtered naturally with no contamination effect on the quality of the ground water because of the depth of the water table in this area.

3) Solid waste: All solid wastes collected from construction and support facilities will be dumped over the side of cliffs both north and south of the pyramid. These dumps will be operated as sanitary landfills and will be landscaped to match the surrounding countryside when the pyramid is finished.

V. RESOURCE COMMITMENTS.

Short-term benefits and costs: With recent estimates predicting that the pyramid will take about 20 years to complete, the total working period will be 10 years of dawn-to-dusk workshifts.

As the construction of the pyramid is but one of many projects, present and pending, there is little doubt but that industry will profit by the necessary expansion of facilities.

VI. ALTERNATIVES FOR PROPOSED ACTION.

A. No action:

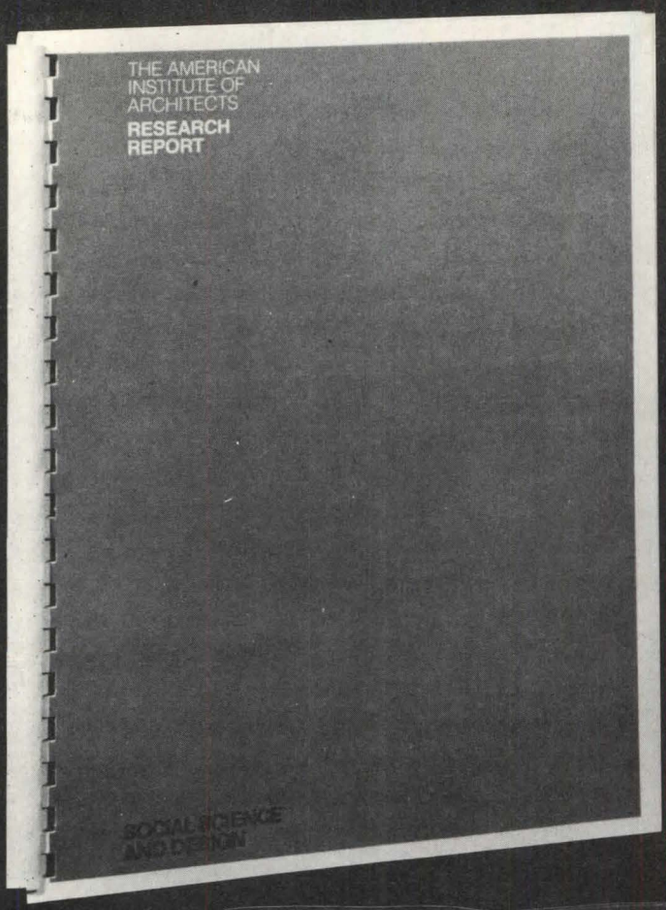
1) Unfeasibility of status quo: The Pharaoh is not well disposed toward the idea of sharing a pyramid with one of his predecessors. Nor is he known to favor the idea of cremation, or the idea of common burial.

2) Potential adverse impact of no action: The Royal Son and Supervisor of the Works of the Pharaoh, having become used to and enjoying life on this earth, is not well disposed to consider the potential adverse impact of no action.

B. Alternatives within the proposed action:

1) Reduction of overall size of pyramid: See "Justifications for the proposed action, inadequacy of existing facilities."

2) Alternative construction techniques: The limitations of the available technology make necessary the chosen construction technique as it is the most enduring yet to be developed. Pharaoh has been assured by his leading architects that his pyramid, built to last and using modern specifications, will endure for thousands of years. □

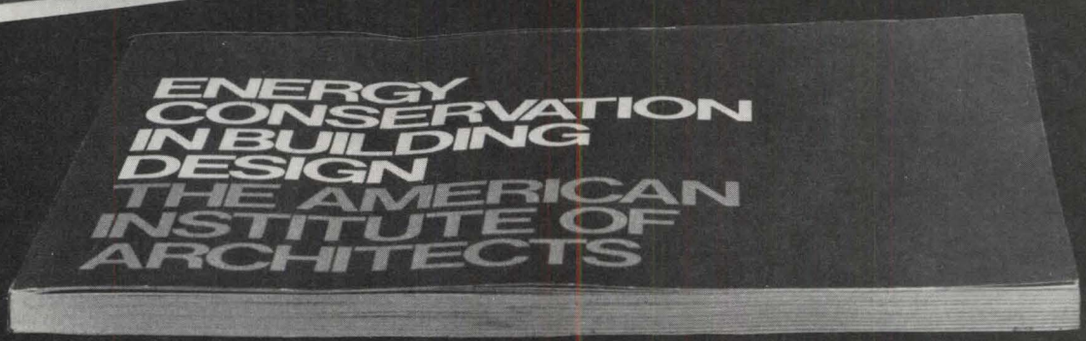


Environments

Contains a process model for architect and social scientist collaboration in designing environments; also tells how the model was developed.

Energy & Design

A report on architectural and institutional opportunities to conserve energy in building design, partially written by the AIA Research Corporation.



Publications Marketing, 1735 New York Avenue, N.W., Washington, D.C. 20006

Please send me the following item(s) by return mail:
Note: Please include check with order if total is under $20.

☐ **Check enclosed**

☐ **Bill me**

☐ **Energy Conservation (4RC201)** **5.00**

☐ **Social Science and Design (2R110)** **2.50**

Prepaid order — additional 2% discount

NAME_____

STREET_____

CITY, STATE, ZIP_____

Tennessee Textured Marble

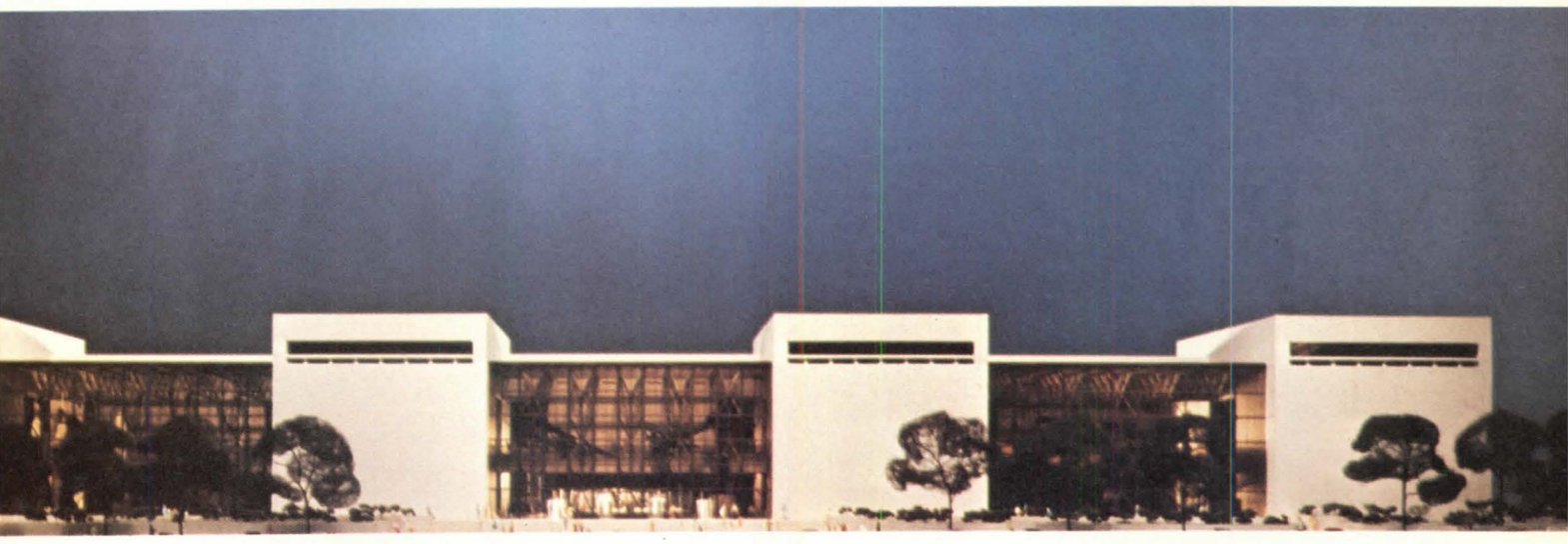
A stone of rare character for the National Air and Space Museum

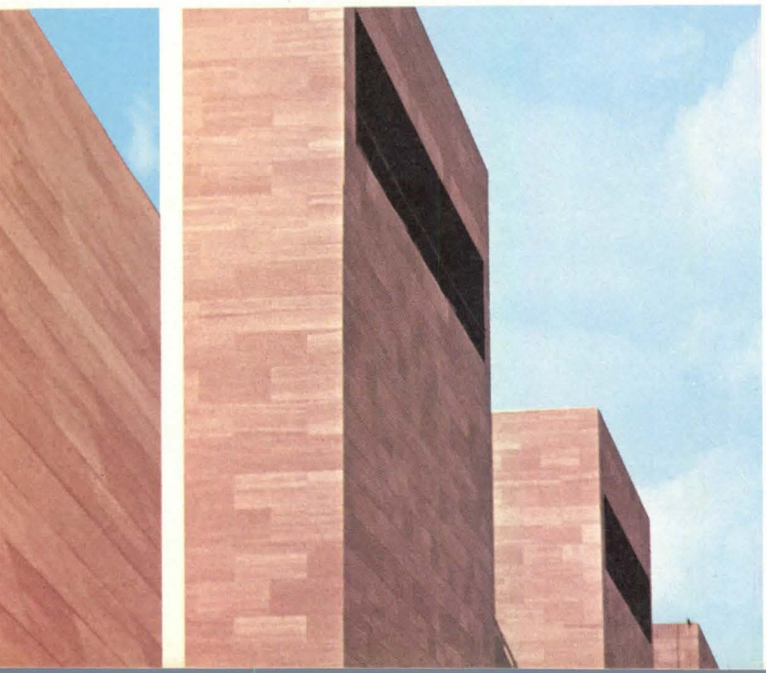
In the hills of Tennessee, nature's ancient artistry created a singularly interesting stone whose beauty we have enhanced with a new, deep-texturing process.

Essentially warm in tone, Tennessee Textured has a subtle coloration that varies with changes in light. And close up, the eye is captivated by a curious dark, delicate veining that runs through the stone.

Tennessee Textured is a material of rare character that offers designers something truly out of the ordinary with which to work. Would you like to see a sample?

Hellmuth, Obata & Kassabaum, *Inc., Architects*
Gilbane Building Company, *Construction Manager*
Peter Bratti Associates, *Erection Contractor*





The National Air and Space Museum is now rising on the Mall in Washington. The Tennessee Textured is 1¼" thick and supported on a steel grid system. A typical piece of stone measures 5' x 2½'.

THE INNOVATORS IN STONE PRODUCTS

georgia marble company

3460 Cumberland Parkway
Atlanta, Georgia 30339
404/432-0131

a Jim Walter company

Circle 11 on information card

BOOKS

Cities and Geology. Robert F. Legget. New York: McGraw-Hill, 1973. 624 pp. No price given.

As urban development proceeds apace, and as the question of environmental impact faces all participants in the development process, sound knowledge of the relationships between geology and urban growth becomes of increasing importance. Legget's *Cities and Geology* is an outstanding introduction to these relationships and will be invaluable to the environmental geologist and the urban planner alike.

After a brief introduction, Legget first turns to history to illustrate how the fate of some early cities was dependent upon local geological conditions, how the interaction of natural forces and man's impact upon nature have on occasions had disastrous results for his cities, and from these examples he derives the themes that are addressed in the body of the text: the relationships between urban planning and geology; the hydro-geology of cities; foundations and excavations; the materials used to create cities; and geological hazards. He concludes with a fine summary of "what every city should do": Keep good geological and local subsurface records, records of utilities and the like.

Each chapter proceeds in a clear and workmanlike fashion, including an exposition of basic principles and a well-selected set of examples, largely North American and European, organized around a fine collection of illustrations. The references accompanying each chapter are useful, but would have been easier to use if they had been organized in a more conventional manner, rather than being stacked in lists preceding the index, footnote style, in a manner demanding that the reader constantly flip back and forth between text and citations.

That minor cavil apart, the volume is a well-produced basic text, the best on the subject currently available. Legget's writing is clear and economical, the examples and illustrations appropriate. In short, this is a fine sourcebook. *Brian J. L. Berry, Chairman, Department of Geography, University of Chicago*

1975 Dodge Construction Systems Costs. Dodge Building Cost Services. New York: McGraw-Hill Information Systems Co., 1974. 216 pp. $33.80.

The fifth in the Dodge stable of construction cost publications, the first edition of this annual cost data book is designed for architects to estimate project costs during schematic design. A cooperative venture of Dodge and the Wood & Tower cost consultant firm, the book is largely devoted to labor and material cost listings for several hundred commonly encountered assemblies.

These assemblies are collected under eight so-called "architectural systems," comprising exterior walls, partitions, interior wall finishes, floor finishes, ceilings, roofing, floors on grade and superstructure. As a group, these "systems" account for up to about half of the costs of the typical commercial, institutional or industrial building.

The primary purpose of the bulk of the listings is to provide the architect with a "workable method of analyzing the comparative costs of different building systems and assemblies" during the early phases of a project. Although the book does not provide detailed listings for such "systems" as mechanical, electrical, conveying, equipment, specialties, foundations and site work, it does contain a number of average building cost tables for a variety of building types, broken down into 17 "systems," with low, mean and high average costs for each. These tables are designed for a "quick check" of average costs of buildings that may be similar to that under design.

There is also a space planning guide listing typical area sizes for schools and general hospitals and a locality adjust-

ment table for 84 cities. The brief but concise instructions should be studied very carefully to understand the interrelationships between the parts of the book and to avoid the potential pitfalls inherent in the use of any cost book by the uninitiated. The disclaimer at the end of the foreword should also be read with care.

The reader's attention is directed to the article on the AIA's proposed Mastercost construction cost control system on page 21 of this issue. The concerns expressed in this article are indicative of the growing movement toward making the art of construction cost forecasting a more exact science than it is today. One of the first Mastercost objectives is to standardize cost vocabularies and definitions to reduce errors attributable to the current babel of cost tongues. When we are all finally speaking a common cost language, books such as this new one from Dodge should increase in value as aids to architectural practice. *Robert Allan Class, AIA, Director, AIA Technical Programs*

Materials and Methods for Contemporary Construction. Caleb Hornbostel and William J. Hornung. Englewood Cliffs, N.J.: Prentice-Hall, 1974. 292 pp. $16; student edition, $12.

This is an excellent textbook for architectural students. The book consists of 32 study units, requiring about two semesters of two-hour periods.

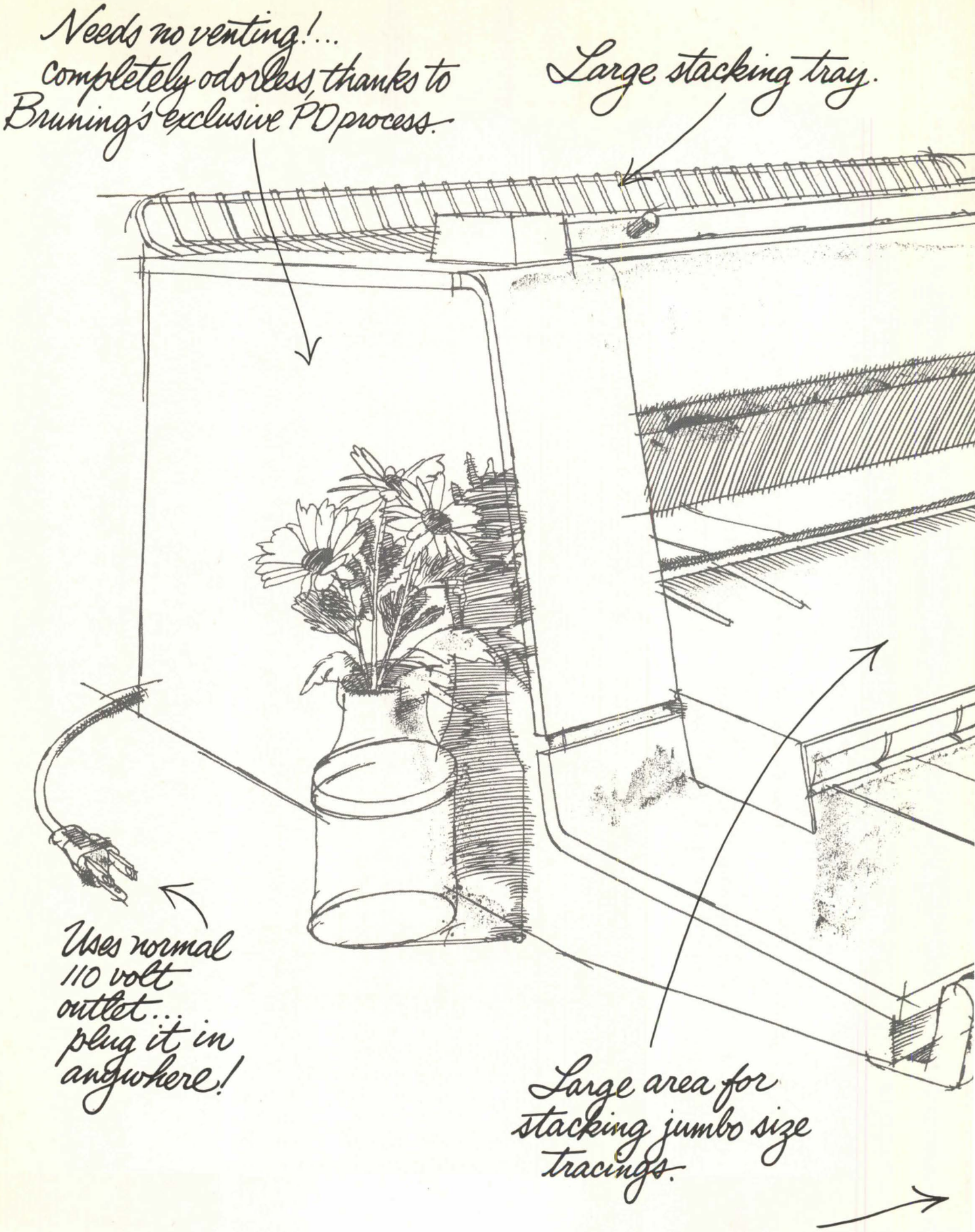
Following an overall discussion of the building process is a consideration of the preliminary factors of building: earth formations, soil tests, utilities and site preparation and excavation. Units follow on footings and foundations; site and building drainage; and materials, their properties and required techniques for use. There are study units also on paints, flooring, plastering, insulation and acoustics, roofing and siding, and doors and windows.

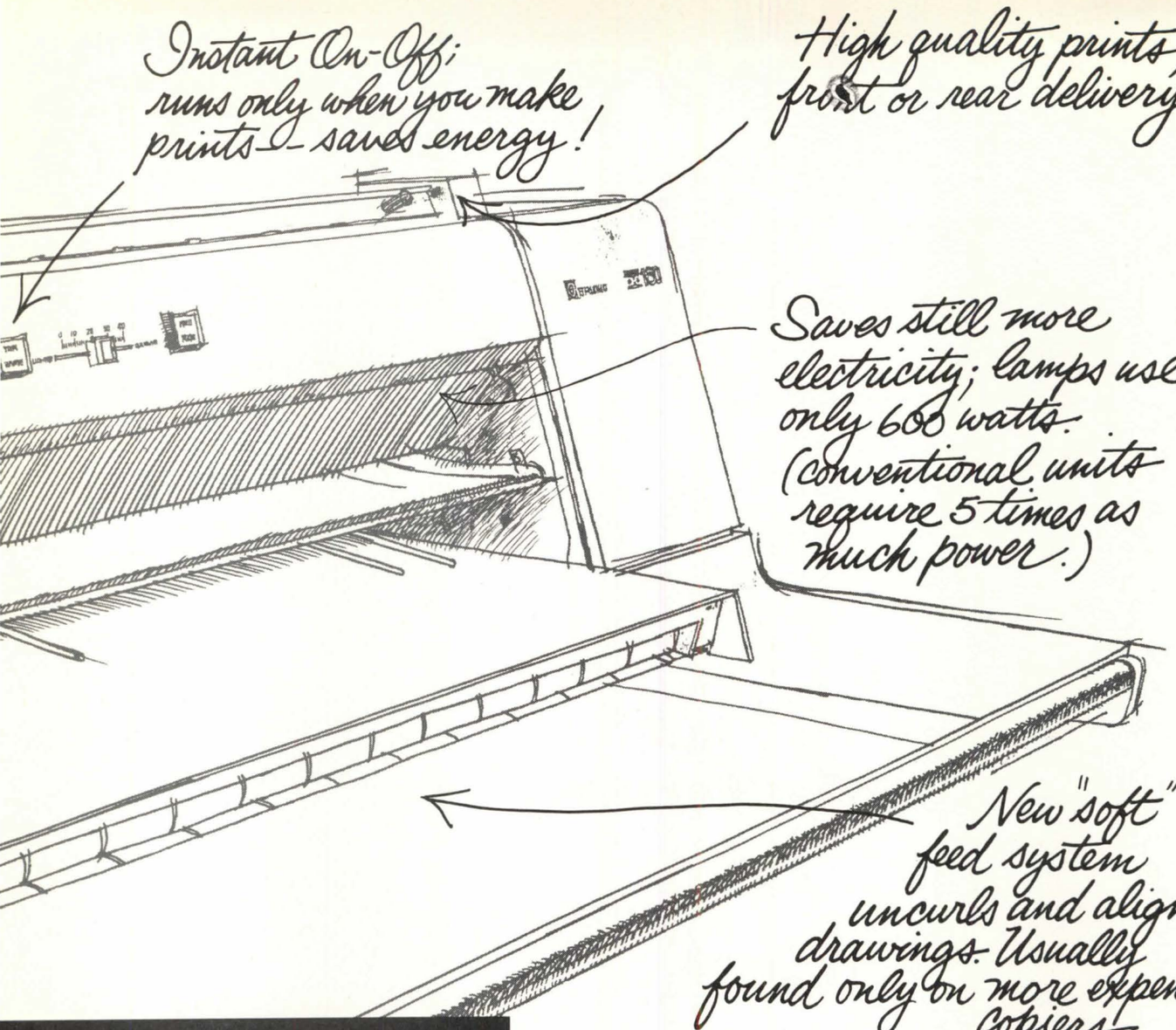
Each unit has a detailed introduction and technical and supplementary information, as well as review questions and assignments.

City: A Story of Roman Planning and Construction. David Macaulay. Boston: Houghton Mifflin, 1974. 112 pp. $7.95.

Young people will gain a great deal of knowledge about the way the ancient Romans planned and built cities from this book by a man who can both write and draw. His clearly written text and the black and white drawings reveal what superb planners of cities the Romans were. Using an imaginary city called Verbonia, Macaulay tells how the city's population and size were determined, how the master plan gave the residents freedom to determine the character of their city, how spaces were allowed for public squares, temples, shops, houses and all the other

continued on page 58


Needs no venting!... completely odorless, thanks to Bruning's exclusive PD process.
Large stacking tray.
Uses normal 110 volt outlet... plug it in anywhere!
Large area for stacking jumbo size tracings.
It's fast -- 40 fpm production-level volume.



Announcing one of the world's engineering wonders:

The new Bruning PD-160 engineering copier.

Only Bruning has the PD® process.
The unique non-polluting process that made our PD-80 convenience copier famous in less than two years.
Now that same exclusive PD process appears in the PD-160.
It's an engineering copier that borders on the unbelievable.

Call 800-447-4700 toll-free (in Illinois call 800-322-4400) to get the whole story. Or write Bruning, 1834 Walden Office Square, Schaumburg, Ill. 60172.

We help engineers communicate.

BRUNING
DIVISION OF
ADDRESSOGRAPH MULTIGRAPH®

rcle 14 on information card

Books from page 55

elements of a city, how sewer systems and streets were laid out. He gives details on the construction of bridges, houses, apartment buildings, public baths and amphitheater. And with it all, the reader will gain an insight into our cities of today.

Design Manual for Structural Tubing. New York: American Iron and Steel Institute, Committee of Steel Pipe Producers, 1974. 111 pp. $2.25.

As this manual outlines, steel pipe and tubing has the advantages of resistance to buckling in compression and bending, high torsional resistance and high resistance to wind loads. There is also ease of detailing, erection and assembly. The aim of this manual, the first of its kind on pipe and tubing to be issued by the American Iron and Steel Institute, is to help architects and engineers select the best available structural components for a given design problem. A major part of the manual is devoted to tables that give allowable column loads and beam loads and specific design information for round, square and rectangular pipe and tubing. A two-page table summarizes data on structural pipe and tubing designations covered in the standards of the American Society for Testing and Materials and specifications of the Canadian Standards Association.

Pumping Stations for Water and Sewage. Ronald E. Bartlett. New York, Wiley, 1974. 150 pp. $12.

A general lack of technical information on pumping station design has made engineers look either to pump manufacturers or to their own experience, writes Bartlett. His aim in this book is to summarize present-day practice. Emphasis is placed upon pumping stations for water and sewage, with brief references to pumping stations for land drainage and irrigation. There is information on types of pumps, motors and switchgear, as well as on the layout of buildings and aspects of installation, operation and maintenance. The metric system is used, with a conversion table supplied in one of the appendices.

History Preserved: A Guide to New York City Landmarks and Historic Districts. Harmon H. Goldstone and Martha Dalrymple. New York: Simon and Schuster, 1974. 576 pp. $12.95.

This guide to the officially designated landmarks and historic districts in Manhattan, the Bronx, Brooklyn, Queens and Staten Island will please all those who love New York City. There are district maps, chronological charts, discussions of architectural styles and copious illustrations to make it a highly recommended guidebook to this rich and varied urban conglomeration.

LETTERS

Social Balance: It was a pleasure to read the article titled "Henry Klumb in Puerto Rico" in the July issue for two reasons: first, because our beliefs appear to coincide and, second, we did a great deal of work in Puerto Rico simultaneously.

Our beliefs coincide particularly where Klumb states that the profession of architecture should strive to be an instrument of social betterment. How true! The only reason why we would not perform a social service is where the architect is unable to convince his client that the client's ideas in respect to a given project serves false gods or are contrary to social good. Even there it should be noted that the architect who finds that he is directed to serve false gods ought to decline to serve. That takes a great deal of courage and, fortunately, it is seldom necessary. The client usually follows the architect when the latter takes the trouble to explain the situation.

This leads us to the now old but still true belief that form should follow function. The profession on the whole gave this belief a quiet and an unostentatious funeral only a few years ago. It is my contention that there is no free choice between form and function. What is required is not a choice between black or white, but a mixture of both in socially perfect balance. Dr. Karl Menninger speaks of the "crime of punishment," which would apply to an architect who derives satisfaction from designing a prison as mean and vindictive as possible rather than as humane as possible. Contrariwise, an architect who is commissioned to design a hospital should design it so that it would contribute to the healing process as much as possible.

We say that not architecture alone but all professions should be directed toward humanism. *Isadore Rosenfield, FAIA*
New York City

Credit Due: We are most pleased to see the news item in the July issue about the award of $1,346 to two of our students by the National Society of Interior Designers Educational Foundation in its 1974 environmental design project awards program.

We were distressed, however, to see the error in which it was stated that the students are from the University of Washington (in Seattle). The design was accomplished by students Brian Berg and Coral DeWilliams as an interdisciplinary project of the departments of architecture and interior design at Washington State University in Pullman. *Robert M. Ford, AIA*
Professor of Architecture
Washington State University
Pullman, Wash.

EVENTS

Dec. 2: Postmark deadline, requests for applications, nominations for recognition of communities that contribute to the "quality of life." Contact: *Environmental Monthly*, 284 Alexander Ave., Bronx, N.Y. 10454.

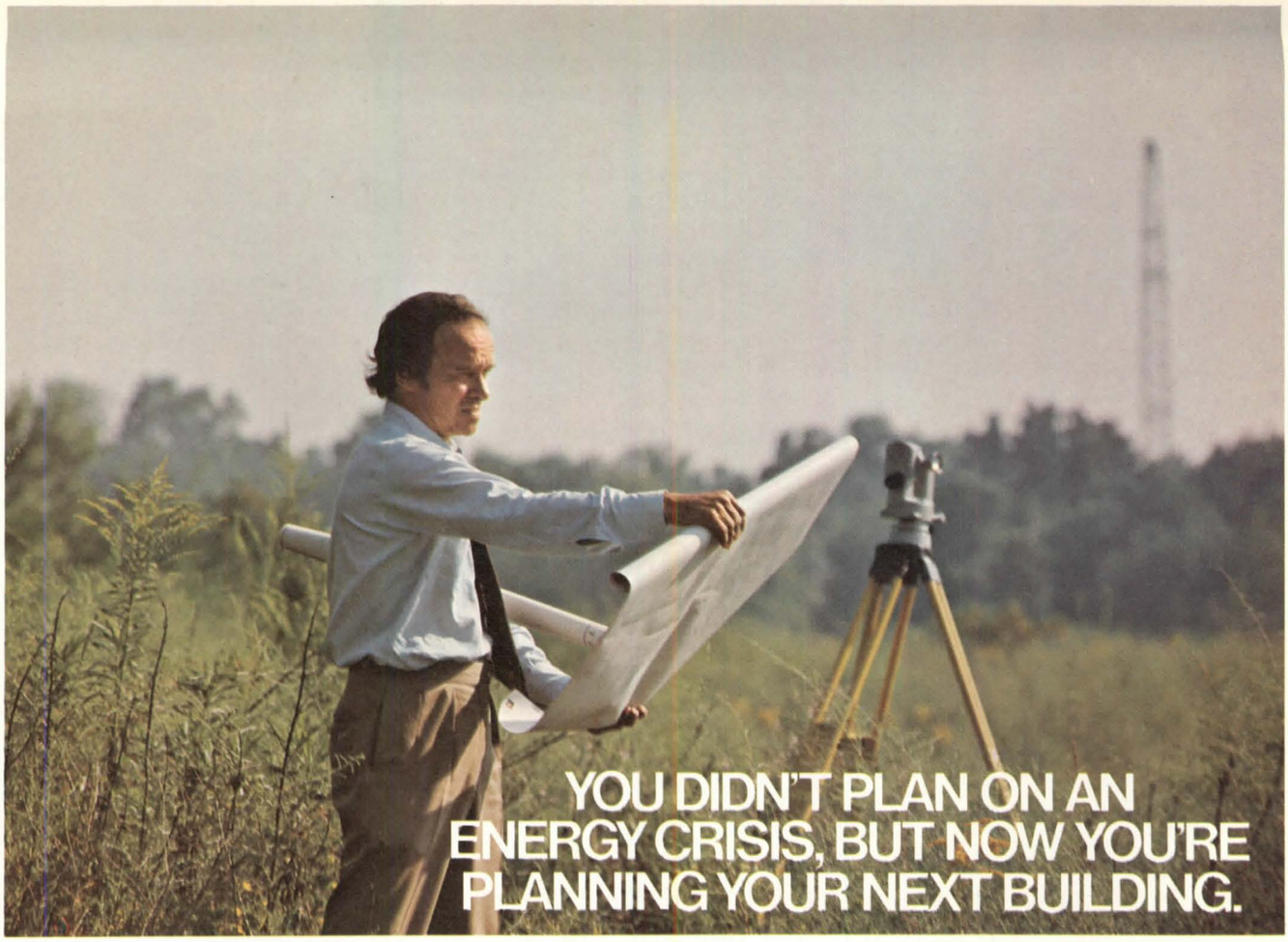
Dec. 2: Postmark deadline, applications for White House fellowships. Contact: President's Commission on White House Fellows, Washington, D.C. 20415.

Dec. 4-6: Seminar on Bicycle/Pedestrian Planning, Design and Implementation, San Diego, Calif. Contact: Metropolitan Association of Urban Designers and Environmental Planners, Inc., P.O. Box 722, Church St. Station, New York, N.Y. 10008.

Dec. 5-6: Conference on Designing with Plastics, Miami Beach, Fla. Contact New York Management Center, 360 Lexington Ave., New York, N.Y. 10017.

Dec. 6: Postmark deadline, entries for 1975 Contractor of the Year Award. Contact: National Remodelers Association, Inc., Awards Committee, 50 E. 42 St., Room 806, New York, N.Y. 10017.

Dec. 8-13: Conference on Earthquakes and Lifelines, Asilomar Conference Grounds, Pacific Grove, Calif. Contact: Engineering Foundation, 345 E. 47 St., New York, N.Y. 10017.



Which building material will you use?

You've got energy shortages to think about. Air-conditioning costs. Heat gain through the long, hot summers. Heat loss in the winter months. Heating equipment costs. The whole set of energy-use factors suddenly has become critically important. The building material you use affects all of them.

Compare the energy conserving capability of masonry, for instance, with double-plate glass walls.

At 4:00 P.M. on a hot August day in Washington, D.C., the heat gain through a square foot of west-facing insulated brick and concrete block wall will be 2.2 Btus an hour.

The heat gain through a double-plate glass wall in the same location will be 173 Btus a square foot in an hour. A big difference.

Project this differential over 10,000 square feet of wall. You come up with a heat gain through masonry of 22,000 Btuh, while the heat gain through double-plate glass is 1,730,000 Btuh.

In the case of the masonry wall, cooling equipment with a two-ton capacity can handle the heat gain. But with the double-plate glass wall, about 143 tons of cooling capacity will be needed.

An analysis of a typical 10-story building shows that over its useful life, the air-conditioning cost for a square foot of our masonry wall will be about 23 cents. For the double-plate glass wall, it will be $7.60.

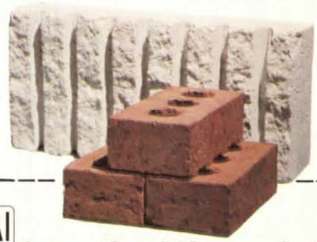
It takes a lot of money to buy, install and create space for all the extra air-conditioning equipment required by the double-plate glass wall. A lot of money and a lot of energy to run that equipment.

Compare the heat loss in winter. It has a dramatic effect on energy consumption and building operation costs.

Our masonry wall, for example, has a "U-value" of .12. The double-plate glass wall has a "U-value" of .55. (U-values are used to determine heat loss through one square foot of wall area in Btuh per degree Farenheit differential across the wall.)

This means that the masonry wall is about 450% more efficient, on the average, than the glass wall in reducing heat loss.

Over the useful life of the building, the heating cost per square foot of wall area for masonry will be about 30 cents. For double-plate glass, about $1.38.



In a time of one energy crisis after another, masonry makes eminently good sense as a good citizen.

The masonry industry believes that the thermal insulating qualities of masonry are an important economic consideration to building designers, owners and investors, and all citizens.

Masonry walls save on air-conditioning and heating costs. And just as important, they are less expensive to build. The masonry wall we've described would have a 38% lower initial cost than the double-plate glass wall.

If you'd like to find out more, write to us and we'll send you a booklet comparing the thermal insulating qualities of masonry walls with double-plate glass walls, metal panel walls and pre-cast concrete walls.

International Masonry Institute a
823 15th Street, N.W., Washington, D.C. 20005 / (202) 783-3908

Please send the booklet comparing insulating qualities of masonry with other building materials.

Name Title

Address

Company

City State Zip

Nature of Business

AIA

Circle 18 on information card

Dec. 10-12: International Building Exposition, McCormick Place, Chicago. Contact: INBEX, 5 S. Wabash Ave., Chicago, Ill. 60603.

Dec. 17-20: International Conference on Housing for Emerging Nations, Tel Aviv, Israel. Contact: Association of Engineers and Architects in Israel, 200 Dizengoff St., Tel-Aviv P.O.B. 3082, Israel.

Dec. 26: Postmark deadline, nomination forms, R. S. Reynolds Memorial Award. Contact: Maria Murray, AIA Headquarters.

Dec. 31: Postmark deadline, Federal Highway Administration fellowships and scholarships. Contact: FHWA National Highway Institute, HHI-6, FHA, Washington, D.C. 20590.

Dec. 31: Entries due, International Aluminum Extrusion design awards. Contact: Aluminum Association, 750 Third Ave., New York, N.Y. 10017.

Dec. 31: Applications and submission of work due, Rome Prize fellowships. Contact: Executive Secretary, American Academy in Rome, 101 Park Ave., New York, N.Y. 10017.

Jan. 6: Postmark deadline, applications for design fellowships. Contact: Roy Knight, Architecture + Environmental Arts Program, National Endowment for the Arts, Washington, D.C. 20506.

Jan. 6: Abstracts due, call for papers, Symposium on Living Aggregates, to be held at American Society for Testing and Materials annual convention, June 22-27, Montreal. Contact: Cecil H. Best, ASTM, 1916 Race St., Philadelphia, Pa. 19103.

Jan. 6-10: Course on Solar Energy Thermal Processes, University of Wisconsin, Madison, Wis.

Jan. 15: Postmark deadline, entries in the National Construction Photography Contest. Contact: Richard T. Haas, Associated General Contractors of America, 1957 E St. N.W., Washington, D.C. 20006.

Jan. 16-18: AIA Grassroots, East, Statler Hilton Hotel, Washington, D.C. Contact: Robert A. Harris, AIA, AIA Headquarters.

Jan. 19-23: National Association of Home Builders convention, Dallas.

Jan. 21-23: National Swimming Pool Institute convention/exposition, MGM Grand Hotel, Las Vegas.

Jan. 23-25: AIA Grassroots, Central, Palacio del Rio, San Antonio, Tex. Contact: Robert A. Harris, AIA, AIA Headquarters.

Jan. 27-29: AIA Grassroots, West, Double Tree Inn, Tucson, Ariz. Contact: Robert A. Harris, AIA, AIA Headquarters.

Jan. 31: Entries due, Design in Steel award program. Contact: American Iron and Steel Institute, Design in Steel Award Program, 633 Third Ave., New York, N.Y. 10017.

GOING ON

Continued from page 16

Broad Street Bridge over Genessee River, Rochester, N.Y. (engineer: Berger, Lehman Associates)

• Bridge No. 4, Q.E.W./Highway 20, Niagara Falls, Ontario (engineers: B.S. Richardson, L.N. Francis and T.I. Campbell)

Miami Conference on Federal A/E Procurement

Architects and engineers will be briefed on new federal agency programs and policies by government representatives at a national conference to be held in Miami, Jan. 9-10, 1975. The conference is sponsored by the Committee on Federal Procurement of A/E Services, whose members include the AIA, the American Consulting Engineers Council, the American Society of Civil Engineers, the Engineering Division of the American Road Builders Association and the National Society of Professional Engineers.

Arthur F. Sampson, Hon. AIA, administrator of the General Services Administration, is scheduled to lead off the conference with a discussion of "GSA's New Look and Outlook." He and other GSA spokesmen will then explain new government forms 254 and 255, which will replace current form 251.

Representatives of the departments of Housing and Urban Development, Defense and Transportation and of other federal agencies will also be participants in the conference program.

Architectural firms are encouraged to send more than one participant because of overlapping workshops. Early registration is urged because of limited hotel and conference space. Prior to Jan. 1, registration fees for the first registrant from a firm are $85, and $50 for subsequent registrants from the same firm. After Jan. 1, these fees will go to $95 and $60, respectively.

For additional information, write or telephone Marshall E. Purnell, co-director of federal agency liaison, at AIA headquarters (202) 785-7384.

Editorial Director Named

Carole Jacobs has been appointed editorial director of AIA publishing services. Prior to joining the Institute staff, she operated her own firm offering editorial, design and production services to Washington-based associations. Previously, she was an editor with Microcard Editions and a production editor with Charles E. Merrill Publishers.

Deaths

Robert I. Ballinger, Philadelphia
Joseph Batka, St. Petersburg, Fla.
Albert H. Howze, Houston
Herman T. Hunter, Springfield, Ohio
Angus V. McIver, FAIA, Great Falls, Mont.
Harry Ray Nay, Wheeling, W. Va.
R. Richard Royce, Columbus, Ohio
Raymond LaVann Shores, Birmingham, Ala.
John D. Wagenet, Oakland, Calif.
J. A. Wohlberg, Tampa, Fla.

Barnett Sumner Gruzen, FAIA: Founder and senior partner of the New York City-based firm of Gruzen & Partners (formerly Kelly & Gruzen), last year Gruzen received Manhattan's Diamond Jubilee Medallion for his contributions to the city's man-made environment. His firm's designs include many structures in the City Hall area, such as the $58-million Police Headquarters opened last year, the U.S. Courthouse Annex at Foley Square and the Downtown Manhattan High School. The firm recently joined forces with Skidmore, Owings & Merrill to create the design of the U.S. Embassy complex in Moscow, to be built on a 10-acre site a mile from the Kremlin walls.

Gruzen, who died on Sept. 27 at the age of 71, was educated at the Massachusetts Institute of Technology. After two years of professional practice, he won the Rotch Traveling Scholarship and studied for two years at the Ecole des Beaux Arts in Paris. The winner of many awards for his designs, he was a former president of the American Technion Society and a past chairman of the Federation of Jewish Philanthropies.

Ernest Pickering, FAIA: Dean emeritus of the University of Cincinnati's college of design, architecture and art, Pickering retired 11 years ago, after almost 40 years of association with the university, including 17 years as dean. During this time, he and his colleagues saw the student body increase a thousandfold and the college's facilities grow from a few rooms scattered over the campus to the modern, multi-floored complex that now houses the college. Pickering died on August 30 at the age of 81.

He served for many years as chairman of the Cincinnati City Planning Commission and was a past president of the Cincinnati Chapter AIA and the National Association of Schools of Art. He was the author of several books, including *Architectural Design, Shelter for Living* and *Homes of America.* He was a graduate of the University of Kansas and the University of Illinois and studied at Harvard University and in Paris at the Ecole des Beaux Arts.

Newslines

Standards for health care facilities receiving federal financing are outlined in the booklet "Minimum Requirements of Construction & Equipment for Hospital & Medical Facilities," issued recently by the Department of Health, Education and Welfare. Included are special design considerations for the handicapped, minimization of the effects of natural disasters and uniformity in fire safety measures. The publication is available for $1.25 from the U.S. Government Printing Office, Washington, D.C. 20402 (HEW Pub. No. HRA 74-4000).

J. Kenneth Baird, AIA, has been awarded the doctor of humane letters degree by Hartwick College, Oneonto, N.Y. The Utica architect designed 10 of the 15 buildings on the college campus.

The Louis I. Kahn Memorial Lectures have been established by the AIA in honor of the gold medalist who died last March. An endowment has been established with the Association of Student Chapters/AIA for a series of five lectures, to be given each year at ASC's annual forum. The first, scheduled for the upcoming forum at Fargo, N.D., on Nov. 29, will feature a debate between Patrick J. Quinn, dean of the school of architecture, Rensselaer Polytechnic Institute, and Ann Griswold Tyng, lecturer, graduate school of fine arts, University of Pennsylvania.

The Center for International Environment Information is a new organization established with United Nations support whose aim is to increase public understanding in the U.S. and Canada of global environmental problems. The center—located at 345 E. 46 St., New York, N.Y. 10017—will publish a twice-monthly newsletter titled *World Environment Report.*

A scholarship fund of $4,000 has been presented to California Polytechnic State University's school of architecture and environmental design by the Architectural Secretaries Association's Southern California chapter. The funds were raised from a festival that centered on the work of Frank Lloyd Wright, which was sponsored by the ASA chapter and the Cultural Heritage Foundation, Inc.

"A Guide for Codes Adoption and Codes Enforcement" is the title of a booklet that contains a series of 10 articles written by Daniel M. Taylor and published in *Southern Building,* Aug. 1973-May 1974. Copies may be obtained by written request to Leo J. Zuber, Assistant Regional Administrator for Community Planning and Management, HUD, Region IV, 1371 Peachtree St. N.E., Atlanta, Ga. 30309.

The first overall installation code for fuel gas is now available from the American National Standards Institute, 1430 Broadway, New York, N.Y. 10018 ($3 each). It offers general criteria for installation, operation and maintenance of gas piping and gas equipment on consumer and industrial premises.

The Architectural Photographers Association has prepared a traveling exhibit of 49 color and black and white prints on architectural photography. Each print is mounted separately with a caption on a 24-inch square board. It is available upon request from APA, 435 N. Michigan Ave., Suite 1717, Chicago, Ill. 60611.

The Association of Collegiate Schools of Architecture and the Kawneer Corp. have produced the first two "learning packages" for public distribution. The first, a 134-paged learning tool on environmental control systems titled "ECS," may be ordered from author Chalmers Long Jr., School of Architecture, Rice University, Houston, Tex. 77001. A check for $4.50 should be made payable to Rice University. The second package, a four-panel, 12-foot poster on decision making, may be ordered from the producer, Coy Howard, School of Architecture and Urban Design, University of California, Los Angeles, Calif. 90024, for $8 per set, with a check made payable to ACSA. □

Statement Required by the Act of October 23, 1962. Section 4369, Title 39, United States Code, showing the ownership, management and circulation of:

AIA JOURNAL

Published monthly at 1735 New York Ave. N.W., Washington, D.C. 20006. Statement filed October 17, 1973.

The names and addresses of the Publisher, Editor and Managing Editor are: Publisher: Michael J. Hanley, 1735 New York Ave. N.W., Washington, D.C. 20006; Editor: Donald J. Canty, 1735 New York Ave. N.W., Washington, D.C. 20006.

The owner is: The American Institute of Architects, a nonstock, nonprofit New York membership corporation, qualified in the District of Columbia, 1735 New York Ave. N.W., Washington, D.C. 20006. Stockholders holding 1 percent or more of the stock are: None.

The known bondholders, mortgages and other security holders owning or holding 1 percent or more of total amount of bonds, mortgages or other securities are: None.

No person, corporation, partnership, trust or other entity beneficially owns an interest amounting to 1 percent or more.

	Average No. Copies Each Issue During Preceding 12 Months	Single Issue Nearest to Filing Date
Total number copies printed	32,000	32,300
Paid circulation		
Sales through dealers and carriers, street vendors and counter sales	None	None
Mail subscriptions	27,814	29,364
Total paid circulation	23,523	23,970
Free distribution by mail carrier or other means	7,658	7,516
Total distribution	30,181	31,486
Office use, left-over, unaccounted, spoiled after printing	819	814
Total	32,000	32,300

I certify that the statements made by me above are correct and complete. (Signed) Michael J. Hanley, Publisher

Michael J. Hanley
Publisher
Michael M. Wood
Sales Manager
Tom Crow
National Accounts Manager
George L. Dant
Manager, Production and Business
1735 New York Ave. N.W.
Washington, D. C. 20006
(202) 785-7300

ADVERTISING SALES OFFICES

Chicago (312) 251-4960
John Bradbury
Central Sales Manager
2206 Elmwood
Wilmette, Ill. 60091

New York (201) 729-9331
Tom Crow
79 Hilltop Trail
Sparta, N.J. 07871

Washington, D.C. (202) 785-7271
Michael M. Wood
1735 New York Ave. N.W.
Washington, D.C. 20006

West Coast Representative
(213) 459-3278
Genia Logan
615 Kingman Ave.
Santa Monica, Calif. 90402

ADVERTISERS

52″x 52″ domes form exposed ceilings fast, economically

Economy is the important key to Ceco's 5′ module system for concrete floors and ceilings. These 52″ x 52″ fiberglass domes are used floor by floor to save on time and money. And architect-engineers like this simplicity.

You too can get design freedom and versatile floor treatments with Ceco's standardized waffle-slab or one-way rib floor forming systems. With Ceco fiberglass forms or steel forms you can choose either small or large modules and design for either exposed or suspended ceilings.

Ceco's concrete forming services are backed up by 60 years of experience in formwork specialization. Please see Sweet's files or consult your nearest Ceco district office.

U of Tennessee Library, Chattanooga
Architects:
D. Derthick and Henley, Architects
Contractor:
H. E. Collins Contracting Co.

CECO concrete forming services

The Ceco Corporation • General Offices
5601 West 26th Street • Chicago, Illinois 60650

Circle 20 on information card

POUND WISE

Because a good businessman isn't penny foolish. He expects business-like performance from his carpet. And Pound Wise gives him the rugged durability of 6-ply Celanese PCP Fortrel polyester yarn. Plus the assurance of a 5-year wear guarantee. But there's another plus. Pound Wise has the comfortable, congenial good looks he doesn't expect in a business carpet. Textural, extravagant sized rows of quarter-gauge nubby loops. Available in 12 natural colors. This carpet is a wise choice for the man who sets an appreciable value on appearance. For only a few pennies more.

Pound Wise is one of five Capital Assets carpets. Rugged commercial carpets for big business. Each different in appearance, for places where appearance is an asset to business. Capital Assets completes a line of commercial carpets for every installation from the ground floor to the executive suite. Available in every commercial fiber, construction and price range. And all commercial quality, because we make nothing else. Write or call for catalogs.

Fortrel® and Fortrel PCP are trademarks of Fiber Industries, Inc., a subsidiary of Celanese Corporation.

Because we're committed to commercial quality and nothing else.

CELANESE FORTREL

wellcocarpetcorporation

WELLCO CARPET CORPORATION ☐ P. O. BOX 281 ☐ CALHOUN, GEORGIA 30701 ☐ TELEPHONE: 404/629-9276 ☐ A WHOLLY OWNED SUBSIDIARY OF MANNINGTON MILLS, INC. SALEM, N. J.

Circle 21 on information card