Wisconsin Architect

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August 1984

WISCONSIN ARCHITECT

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Cahokia Mounds Historic Site
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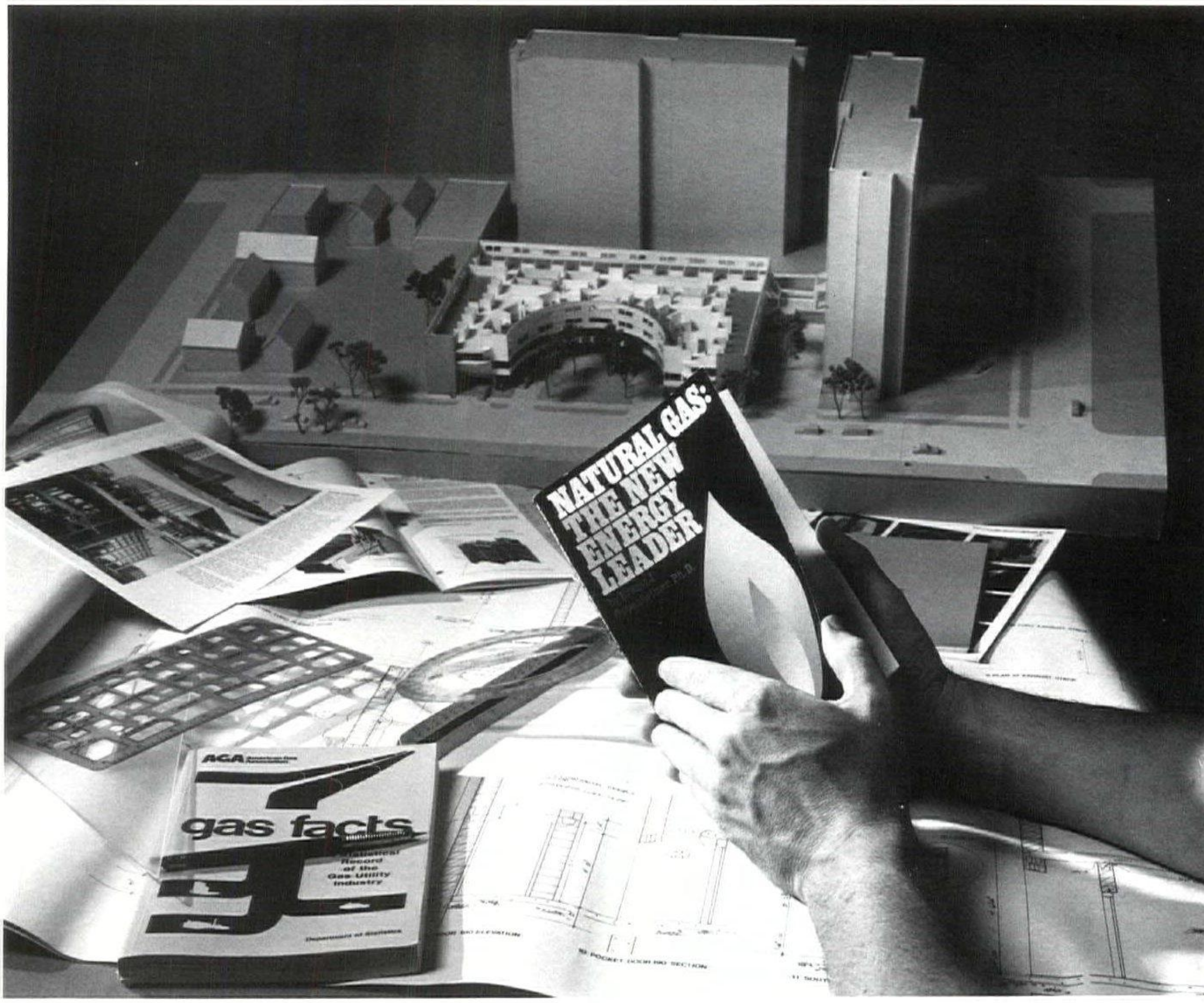

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WSA Communicator's Award

The WSA has announced the creation of an annual Communicator's Award program. The intent of this program is to honor persons whose work in the field of communications advances public understanding and appreciation of architecture, matters pertaining to contemporary architecture, and the architectural profession in Wisconsin. The award includes prizes totaling \$2,000 for 1984 and certificates for the winners and the organizations through which the communication took place.

Nominations will be received by the WSA until December 1, 1984. Communications work may be in film, print or electronic media and may be for a single event or a series. Nominations for the award may be made by anyone and should include sufficient information to make the nomination understandable. WSA members are encouraged to nominate individuals or organizations for this award. The winners will be selected based on the substance and quality of the communication or event, the breadth of the audience, and the nature of the audience to whom the communication was directed.

The Board of Directors of the WSA will appoint the jury which will be composed of one architect, one communicator, and one member at large. The jury will meet after the December nomination deadline and announce the winner prior to the end of the year.

Nominations should be sent to the WSA office in Madison. Questions about the program may be directed to Eric Englund at the WSA office.

The WSA is sponsoring this competition based on the theory that it might be a catalyst towards inspiring professionals in journalism to direct their time, effort, and professional skills towards architectural issues. What are those "architectural issues?" One of the assets of this type of competition is that those issues will be defined by the media representatives. In one media presentation it might focus attention on issues pertaining to contemporary design. In another media presentation it might focus on architectural selection. In another media presentation it might focus on computers in architecture. The scope of issues which might be explored are endless. We believe that matters pertaining to American architecture are of interest to the public and we sincerely feel that this kind of competition will be a viable and necessary catalyst towards focusing greater media attention on those issues.

Wisconsin architects will play a key part in this competition. **You** should encourage media in **your** community to take time to examine issues pertaining to contemporary architecture. You can submit nominations. Take the time to contact people with your local media and, if they undertake a presentation pertaining to architecture, **nominate them for this award.**

Here's an excellent opportunity to participate in the growing public involvement and interest in matters pertaining to contemporary architecture.

Introduction

by David Evan Glasser, Former Chair
Department of Architecture

This represents the third year that I have been asked on behalf of The School of Architecture and Urban Planning to edit the August issue of the **Wisconsin Architect** which focuses on energy in buildings. The range of articles included in this issue are representative of the broad impact of energy-related issues in architecture. While building design professionals will be primarily concerned with the esthetic implications of solar collection systems and other energy-saving technological devices, it is becoming clear that the legal ramifications of solar design will play an increasing role in arriving at informed decisions. The article prepared by Profs. Greenstreet and Weinstein describes the rights and obligations of property owners with respect to solar access and underlines the breadth of knowledge architects will be expected to bring to their professional activities in the future.

Also in this issue are several student projects, notably two theses involved with thermal performance which have established a new level of excellence within the Department for original research. Using computer simulation techniques developed by Prof. Utzinger, students have analyzed several prototypical situations in large institutional scale building types and developed data which will be useful to the profession as a whole. Both the O'Connor and Bochek projects were cited for Research Awards by our Department and are being considered for national distinction by the ACSA Research Awards Committee. The accomplishments of these students reinforces in our minds the need for architects to undertake and disseminate basic research about many aspects of architecture which we have come to take for granted. Our profession has come to rely on data developed by our engineering colleagues for such information as comfort standards, lighting levels and similar factors affecting design. These graduate students have demonstrated in a compelling way that architects can undertake this type of research and, perhaps, may be the best ones to do so given their understanding of the spatial implications of technical decisions.

Finally, mention must be made of the inclusion of an article about the work of Willis and Lillian Leenhouts who have practiced in Milwaukee for all their professional life. Although it is now fashionable to characterize ones work as energy-conscious for marketing purposes, there are architects who have been doing thermally responsible buildings for years. Foremost among these have been the Leenhouts who have contributed to our community a large body of elegant and energy-conscious buildings. Their work embodies a fine sense of craftmanship together with an integration of conceptual design and energy conservation concerns. We hope readers will share our deep appreciation and esteem for their excellent work which does credit to both the Leenhouts and our profession.

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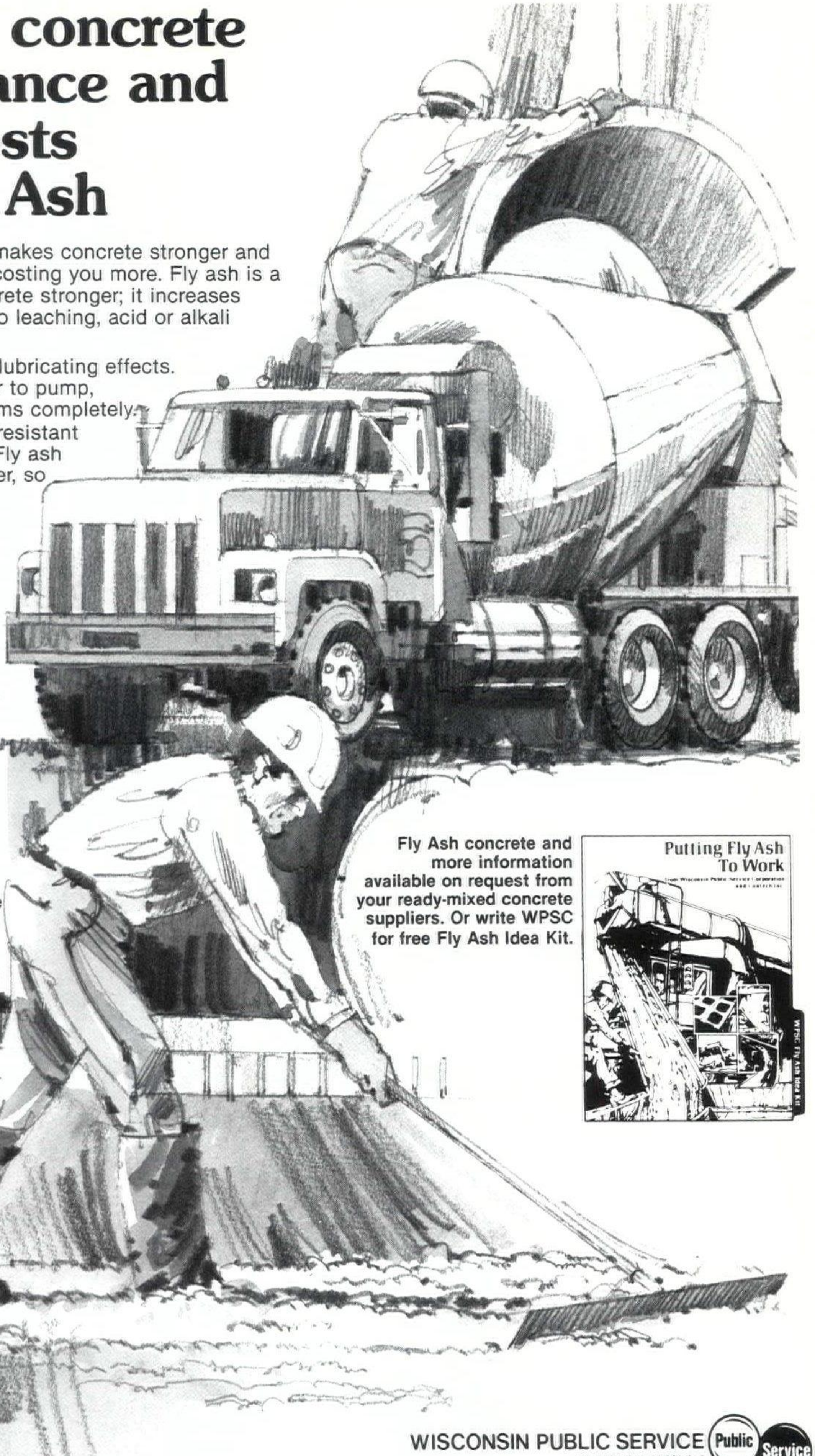

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The Legal Implications Of Utilizing Solar Energy Systems In Architecture

by Robert Greenstreet, Asst. Prof., Dept. of Architecture
and Alan Weinstein, Asst. Prof. Dept. of Urban Planning

With the widening use of solar energy equipment in the construction industry, the legal right of owners to receive unimpeded solar access has become an important factor affecting the decision to install such systems. In Wisconsin, a number of measures have been taken to address this issue which bear examination to help determine how they affect the architect's role in the design process, and how best the architect can advise clients hoping to take advantage of solar equipment.

Traditionally, American law has provided little protection of access to sunlight despite the fundamental necessity for such access to the proper operation of solar energy equipment. Buildings or vegetation on neighboring lots can cast shadows on solar panels or collectors which may not merely decrease the efficiency of the solar device, but can actually damage the equipment. Property owners who use solar equipment thus have a significant financial stake in assuring that their devices are not shaded by the structures, vegetation, or activities on neighboring lots.

However, providing the solar energy user with an absolute right to solar access may well mean that neighboring owners will face significant restrictions on the use of their own land. Such potential conflicts between neighboring land uses are not foreign to American law, and are treated regularly on a case-by-case basis through nuisance lawsuits and, more comprehensively, by municipal land-use regulations, subdivision review, and comprehensive planning. Until quite recently however, courts refused to find that blocking a neighbor's access to sunlight constituted a nuisance, and few states provided legislation to create a framework for planning or zoning control of solar rights. A 1959 Florida case illustrates the point. When the Fountainebleau Hotel proposed construction of a new wing, its Miami Beach neighbor, the Eden Roc, went to court in an effort to block the addition. The Eden Roc claimed that the new wing would constitute a nuisance, as it would cast a shadow over the Eden Roc's pool and cabana area for many hours of the day during certain seasons of the year. The court refused to find that the shading caused by the new wing would constitute a nuisance, holding that American law provided no legal right to "the free flow of light and air" from adjoining land.

This traditional view has come under increasing attack in the wake of the "energy crisis" that followed the dramatic increase in petroleum prices in 1974 and 1979. As the number of solar energy installations increased rapidly, courts and legislatures became more willing to grant significant solar access rights to property owners with solar energy systems, thus simultaneously placing restrictions — such as lowered maximum building heights — one the use of adjoining properties. Although the first grants of solar access rights occurred in the Sun Belt states of New Mexico and California, states in other parts of the country have also responded.

In the past two years, Wisconsin's courts and legislature have granted significant new solar access rights. The initial step in this direction was taken by the Wisconsin Supreme Court in the 1982 **Prah v. Maretti** case, where the issue of sunlight obstruction to a solar heated residence was considered for the first time in this state.

In 1978, Glenn Prah installed a solar heating system in his new house which included collectors fitted to the roof for the purpose of supplying energy for hot water and heat. As the house was the first to be built in the subdivision, the lot to the south was still vacant at the time of construction. However, two years later Richard Maretti purchased the neighboring lot and planned the construction of a house which, if completed, would substantially shade Prah's solar collectors at certain times of the day during the winter months. Despite notification and discussion of this problem, Maretti began construction, and Prah instigated a lawsuit to prevent continued construction of the house.

Prah claimed the right to solar access because his solar energy equipment had been installed before Maretti began construction of his intended dwelling and because he'd notified Maretti of the problem prior to construction of the new house, explaining the implications of shading upon the operating of the solar system. Maretti refuted this claim, asserting his right to develop his property in any way he pleased, as long as it complied with the relevant statutes and codes applicable to the area. The trial court agreed with this view, and denied Prah's claim. However, on appeal, the State Supreme Court reversed the decision, thus preventing Maretti from completing his house as planned. The Court's rationale for this major decision was based upon the importance of natural daylight, which has taken on new significance in the past few years. By upholding Prah's rights to unimpeded solar access, the Court intended to give credence both to landowners who invest in energy-efficient systems, and to society as a whole, encouraging the development and usage of alternative, renewable energy sources. Former policies which implicitly favor unhindered private development are therefore no longer considered to be compatible with society's broader concerns. However, the Court made it clear that any further legal actions it considered in this area would not automatically favor the right to solar access. The plaintiff in each case would have to prove substantially that certain elements exist to establish an action, such as the suitability of using solar heat in the neighborhood, the costs to the defendant, other remedies available to the plaintiff and the extent of the harm caused by the potential blocking.

Although the Wisconsin Supreme Court's decision in the **Prah v. Maretti** case sanctioned court enforcement of solar access rights in appropriate circumstances, the decision also noted that solar access was an area that would be better resolved by legislation than by litigation. The Supreme Court expressed the desire to see the Wisconsin Legislature pass appropriate laws to encourage, guide, and protect solar development within the state without generating conflict in the land development process.

The legislature responded to that desire, enacting a number of provisions that address the solar access issue, including:

— enabling authority for municipalities to plan and zone for solar access;
— provision for recording solar access easements;
— creating procedures for municipal permitting of solar access;
— limiting the rights of municipalities to restrict the installation of solar energy systems;
— authorization for municipal control of vegetation blocking solar energy systems; and
— providing for the imposition of damages for certain obstructions of solar energy systems.

Taken together, these provisions create significant potential rights and liabilities that need to be understood by all parties in the land development process.

The zoning and planning provisions of the legislation enable municipalities, including counties, to provide for solar access in both subdivision regulation and zoning. Local governments will now be able to use their existing land use powers to protect access to both the sun and wind. The legislation makes express provision for counties to grant special exceptions and variances for renewable energy resource systems, and requires that the county board provide a written statement of its reasons if it denies an application for a special exception or variance (59.99(7)(d), Wis, Stats.) Furthermore, the legislation strongly encourages the use of solar energy by empowering Wisconsin municipalities to issue solar access permits which would guarantee solar access rights. (66.032, Wis. Stats.) In a municipality which has adopted a solar access permit ordinance, a property owner who has installed or intends to install a solar collector would be allowed to apply to the appropriate municipal agency for a permit.

If the agency determines that the application has been satisfactorily completed, it will notify the applicant. The applicant in turn then notifies the owner of any property which the applicant proposes will be restricted so as to insure the applicant's solar access. Any person whose property would be restricted by the applicant's receipt of a permit may request a hearing on the permit application within 30 days of receiving notice from the applicant. Further, the agency is empowered to require a hearing on its own determination. Any such hearing must occur within 90 days after the last notice has been given to owners of property that may be restricted.

A permit will be granted if it meets certain standards; for example, as long as there is no unreasonable interference with the development plans of the municipality, or that it places no unreasonable or financial burden on the neighbors. Im permissable interference with th rights granted by the permit sub ject the interfering party to certai penalties. These may include dam ages for any loss by the perm holder, court costs and reasonabl attorneys fees. Furthermore, th permit holder may be entitled t an injunction to require any exces sive vegetation on a neighbor land that interferes with solar sy tems to be trimmed.

Municipalities are also em powered to provide an ordinanc for the trimming of vegetatio which blocks solar energy fron reaching the surface of a solar co lector. Any such ordinance ma include a designation for respons bility for the costs of trimming (66.033, Wis. Stats.) Such an ord nance might likely impose costs o property owners who allow vege tation on their property to grow i such a way as to block an existing solar energy collector.

The legislature also insured tha municipalities would face a di ficult task in attempting to restric the use of solar energy systems. N county, city, town, or village is pe mitted to place any restriction whether direct or indirect, on th installation or use of a solar energ system unless that restriction ca satisfy certain statutorily mandate conditions. (66.031, Wis. Stats.)

To further encourage solar energ usage, the law provides for "renew able energy resource easements which limit the height or location or both, of adjoining properties fo the purpose of providing solar o win access. The importance of thi provision lies in its ability to allov such easements to be recorded along with property deeds anc provides that they may be en forced against subsequent pur chasers of either the benefitted o the burdened property, unless tha right is explicitly restricted in the writing that creates the easement

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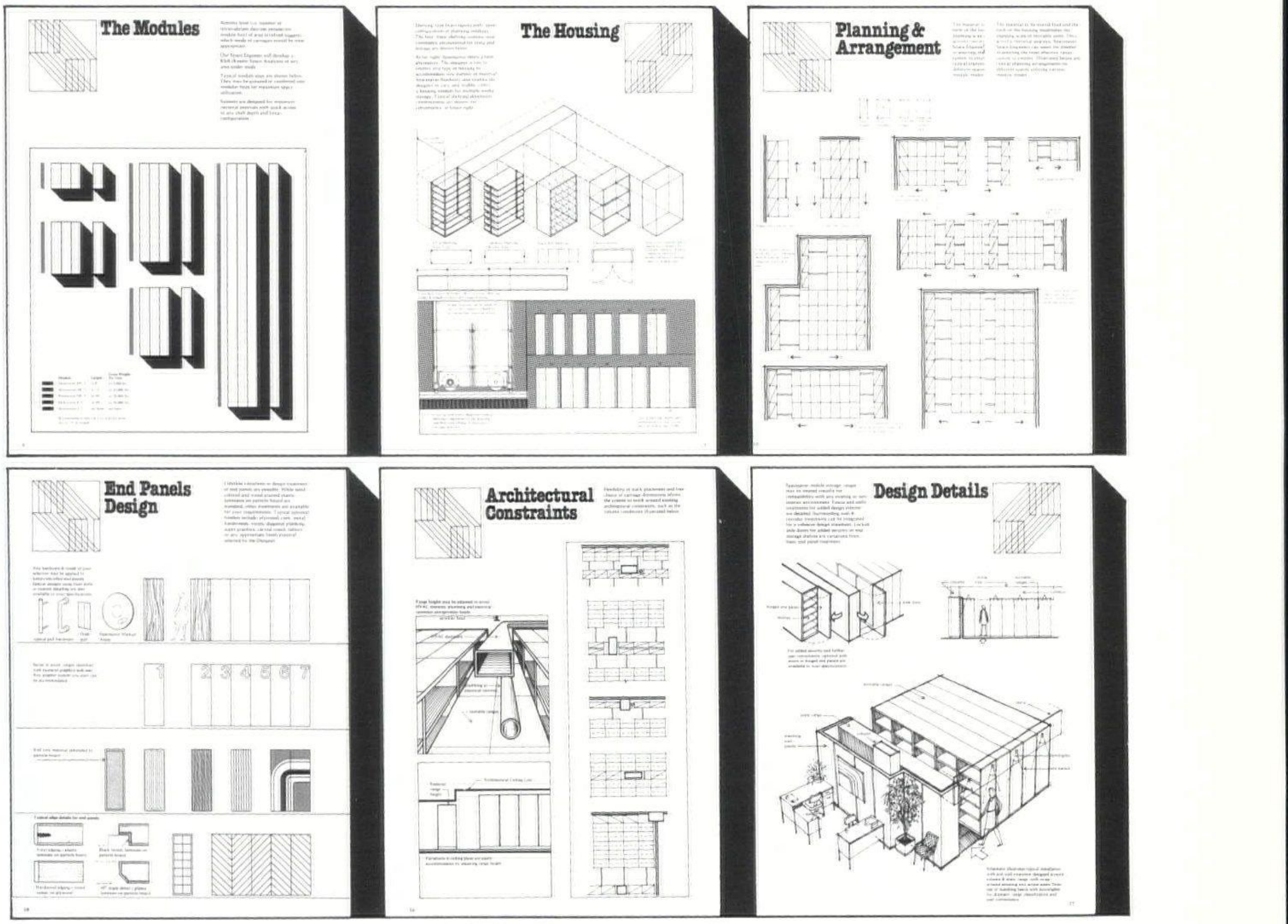

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Finally, the law provides for compensation in certain circumstances where solar access is obstructed. If solar energy is obstructed by a structure outside a neighbor's building envelope as defined by zoning restrictions in effect at the time the solar collector was installed, the owner of a solar energy system is entitled to receive damages, court costs, and reasonable attorney's fees from the persons whose property causes the obstruction. (700.41, Wis. Stats.) There are certain restrictions on the continued holding of a permit, although a transfer of title will not change the rights and duties granted the previous owner. The rights contained within the permit do not affect any obstructions existing **before** enactment of the Act however, or even for projects which were issued a building permit prior to permit application.

Certain implications of the legislation remain far from clear however, particularly in the relationship between the provisions enacted and the precedental standards established in **Prah v. Maretti**. In areas where there is no access to solar permits, for example, do the principles established in caselaw still apply?

There is further proposed solar legislation before the State Senate at present which, among other things, is intended to help clarify such issues, but it may be some time before revised legislation comes into force. Until such time, the architect is urged to take extreme care when dealing with projects involving solar equipment, and to advise the owner to seek expert legal assistance to protect necessary solar access.

Similarly, in the event that an architect is working in an area where solar permits may have been issued, and where potential development may be affected by rights granted to adjoining land, it would be prudent to advise the owner to instruct their attorneys to carefully check for such encumberances before design work begins. If AIA contract documentation is being used (AIA B141. Article 2.4), the owner may be aware of this responsibility, although it would certainly be in the best interests of all parties concerned if such issues are raised when necessary.

Furthermore, if the architect is working on a project which involves solar systems of any kind, and where subsequent construction on a neighboring site could ultimately affect its operation, the architect should advise the owner of the importance of securing a permit as soon as possible in the design process to ensure continued enjoyment of solar access.

Builders Exchange To Present: "Build Up Wisconsin!"

The historic Grain Exchange will house "Build Up Wisconsin", the second exposition presented by the Builders Exchange of Milwaukee. Over 50 exhibitors will showcase the most up-to-date products and services available in the construction industry including interior and exterior construction products; the use of computers in management control; and current trends in mechanical and technological systems.

WSA members are invited to attend, "Build Up Wisconsin" on Wednesday, September 12, 1984 from 11:30 a.m. to 8:00 p.m. at The Grain Exchange in the Mackie Building, 225 E. Michigan St., Milwaukee, WI. Advance registration is required. Contact Donna Conant, of Builders Exchange Division — Associated General Contractors of Greater Milwaukee at 414/778-4100 for further information.

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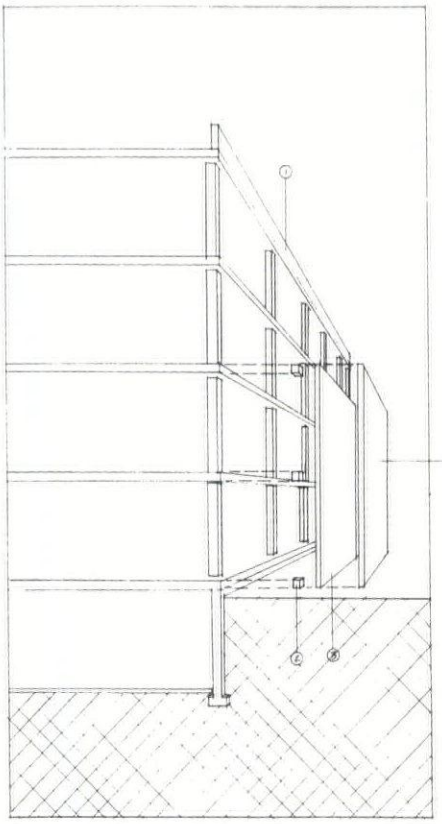
Educational Needs In Energy & Design

by Frederick Jules, Associate Professor and Chair-elect

I have been teaching studio work in Energy & Design for the past 7 years. Over this period, I have been reflecting on what, I am now convinced, is a major gap in the literature of building construction: the absence of comprehensive American detailing books addressed to large scale, energy-conscious building. This deficiency derives from a recent change in profes-



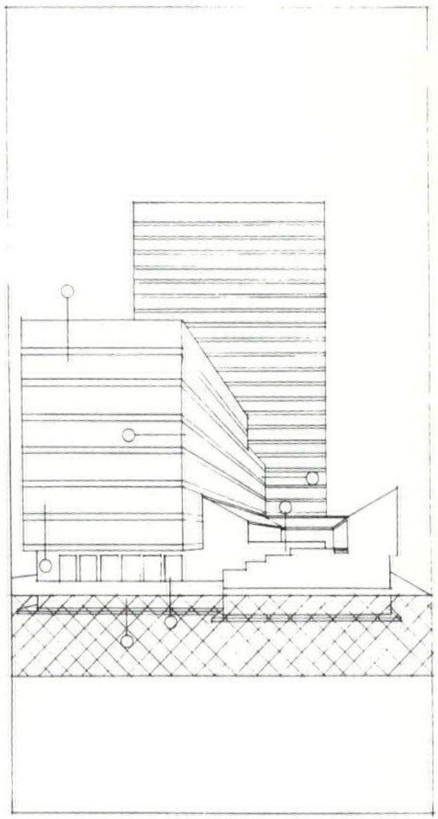
Concept of a frame.

sional practice from less energy-conscious detailing to more rigorous assemblies, which has changed most critical details in the last ten years.

The present condition in the field with respect to construction literature is thus: there are a number of good reference books for light frame construction and light masonry most of which do not address energy-conscious design. Works on major construction are fragmented, dealing only with parts of buildings such as roofs, or with systems, such as precast concrete cladding. Examples in these works are predominantly European, overly complex, not very energy-conscious, and in general poor examples of practice as it pertains to the United States. The European work is beautiful, but tends to be intricate in form and generally does not represent the common American use of direct solutions, and simply detailed application of standardized American products. Books on special systems such as precast concrete tend to show only the most complex applications stressing the extreme potentials of the system while giving cursory coverage of the most typical applications. Again, the examples, are generally European. Thus, there is a clear need for a text that is comprehensive with respect to energy-conscious detailing of large scale buildings which emphasizes current practice in the temperature climate zone of the United States.

A text of this sort must address two prime issues. The first is conceptual and must address questions as: What is the meaning of a detail? Can their symbolic and functional characteristics be separated and dealt with individually? What is the architects obligation in detailing? The second issue is simply how to organize, as well as limit, the scope of such a major endeavor and how best to present it. I have been working on these issues over a period of time and what follows is a summary of my progress.

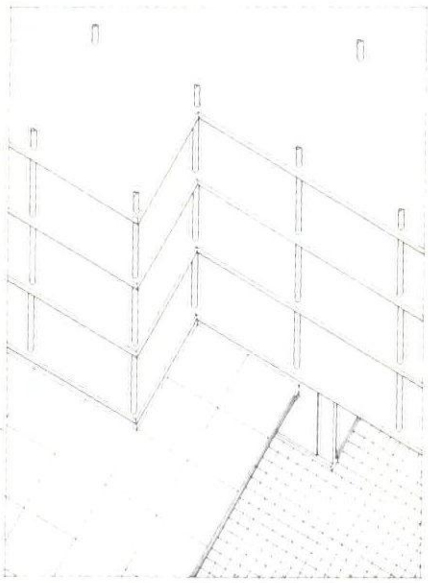
The primary question to be addressed is: What is the role of the detail in architectural theory, and what examples can be found to clarify this role, Initial response: Details have played a major aesthetic role in architecture since the earliest buildings. Theories of architecture deal directly or indirectly with



Common detailing locations.

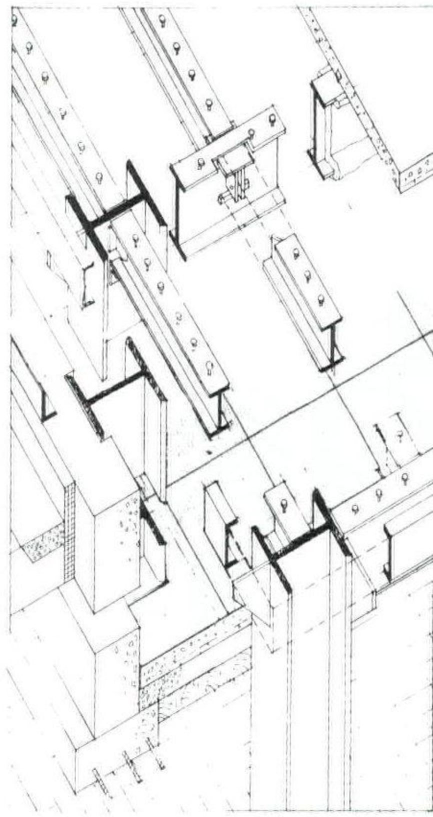
detailing and that is as it should be. It must be remembered that a definition of architecture must include the development of an essentially three dimensional habitable environment, stability of construction, and a method of selecting and expressing materials of construction. Theories of design address aspects of this definition and procedures that must be applied in the selection and organization of the components of construction which go to form buildings.

Details comprise an integral part of this process and can not be omitted from any theory of design without jeopardizing its meaning to architecture. It is generally assumed that principles of structural stability must be a constraint of architecture; building collapse is not tolerated. Viewing these principles as constraints is a negative stance. Positively stated, a construction is not architecture unless it exhibits stability. No one questions such an assertion nor do designers feel exceedingly constrained in formal expression by structural considerations. After all, all the architectural works of the past have exhibited structural stability and the variety of style and formal expression encompassed demonstrate enormous variety. The role of detailing has not had similar clarity in the development of architectural theory. Its inclusion is indeed the conceptual key to this inquiry. De-


Concrete frame.

tailing which responds to natural principles, as structures do to gravity, is one definition of architecture. Well detailed buildings exhibit as much variety in formal expression as do buildings responding to structural stability - there is essentially no limit to expression within the definition of architecture.

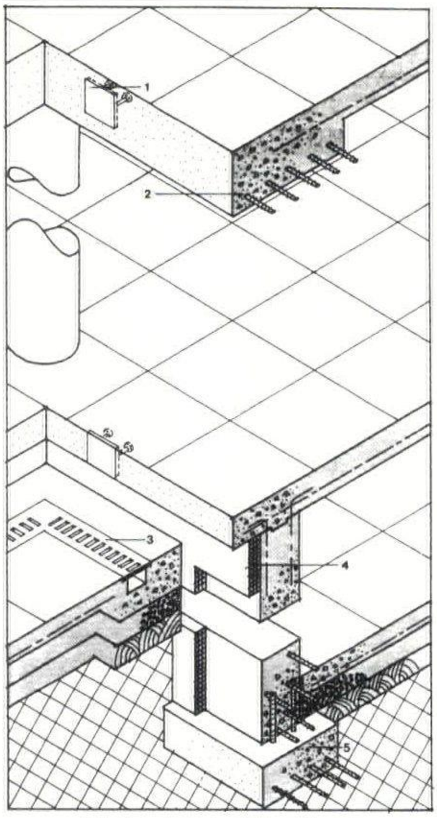
Historical arguments for particular detailing practices presented in theories of architecture have been assembled as part of my research, however for this report I will focus on issues that have current relevance. Of particular interest is the argument for the expression of construction in building form and detailing. Over the period which encompasses the modern movement, rapid growth in materials and methods of construction developed requiring architects to address appropriate expression for these new materials. Classic, Renaissance, and Gothic buildings represented direct expressions of masonry construction with their style conveying other social meanings. Purists of the modern movement required this type of construction expression to continue while, at least theoretically, removing any other social meaning that the material might express. If a concrete frame supported a wall it should be seen on the outside of the building, if the frame were steel it should be expressed in a similar fashion. But problems arose, clients and society required more thermal control of the interior environments and fire protection for large buildings, particularly those built in steel. Mies, who pioneered the expression of the modern sky scraper expressed steel directly in his small structures. A steel column was a support, connections were welded and then machined smooth so that the expression was direct. Faced with the problem of fire protection of highrise steel frames he did the next best thing. He cast the frame in a fire protective concrete covering and reintroduced the steel symbolically in a cover over the concrete. Is this true expression or is it decoration because it is a symbol and not the thing itself? It is decoration because it is a symbol as is the stained glass of a cathedral or the fluting of a column in classical architecture. In using these examples it is clear that construction and expression, or decoration, are integrally bound but performing different functions. The purest steel frame is a structure resisting gravity, housing human activity and expressing in a composed manner the elegance of steel. In a temperate climate, this structure can fail at the detail level as many of Mies' small structures do. In fact in a less than temperate climate, another master of modern architecture, Alvar Aalto developed a subtler attitude toward construction and expression. He felt, as did Ruskin, that buildings


Detail of frame and connector plate locations.

should be well built of durable building materials. His details dealt with the harsh Finnish climate and he applied the logic of modern insulating materials while presenting beautiful, enduring, and livable environments. He had to disregard the simplistic ideal of the outside material being and expressing the interior structure. Instead he took the tack that each material has its appropriate expression in its given location. He did not shy away from formal symbolic expression or decoration which still did not detract from a clear reading of materials and good construction practices.

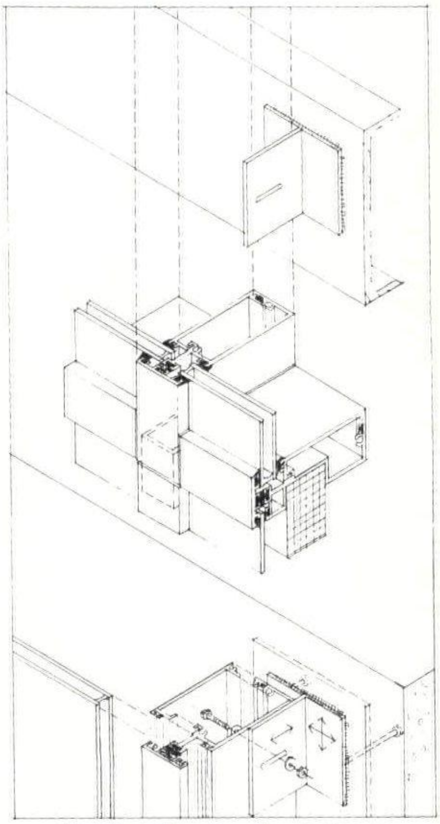
Aalto's Imatra church completed in 1959 is a particularly creative example of the use of double windows for sculptural as well as thermal rationales. It may represent the most rational approach to detailing for expression as well as technical functionality.

More recent architectural theory is almost exclusively interested in symbolic expression without regard for permanence or quality of construction. It is a reaction to the sterility of many mediocre modern movement buildings and the desire for a greater range of expression. This is a desirable attitude, but it is only one aspect of architecture and without considering building well it really isn't a complete architecture. A complete architecture is one with a rich range of expression executed in a manner that provides durable shelter. A work on energy-conscious detailing can not hope to enumerate the range of possible expressive intentions. A more useful tact is to present basic detailing conditions almost devoid of expressive intention, allowing the reader's imagination to expand into this area.



Exterior corner of steel frame.

As one can see from these illustrations, the work is attempting to present detailing as concretely as possible. Axonometric drawing is more immediately understandable than the more typical plans and sections, but is much more difficult to develop. It is hoped that by using this method a greater amount of information can be comprehended, thus making the reader's task easier. The initial conceptualization that meaning of a detail to a viewer and its technical objective are intimately related, yet separate issues, can not be seen in these illustrations. In this attempt to simplify comprehension, the expression of beauty of details seems to have been lost. A remaining issue of this work is how to regain it.


Curtain wall connection to frame.

The discussion above has dealt with the development of a conceptual basis for thinking about detailing. With the formation of this base, one is still left with the problem of limiting the scope the work to a managable and comprehendable size. I have attempted to do this by: 1) Limiting the inquiry to issues of the skin of buildings. 2) Categorizing types of building frames and cladding possibilities and connections between the two. 3) Identifying critical building detail locations. 4) Showing the simplest configuration that reveals the conceptual solution. Limiting oneself to the skin conditions is self explanitory since the skin is where energy is gained or lost. One can infer from the conceptual work that energy-conscious detailing requires careful analysis of the relation of skin to frame. I identified four basic frame types: steel, concrete, precast concrete, and masonry, and five general cladding materials: metal or plastic panels, glass, masonry, precast concrete and possibly wood as a sixth. These two systems, structural and exterior cladding, are connected to each other with a few basic connector types and strategies if one wants to be energy conscious. And finally, the critical detailing locations are: parapet walls, balconies, roofs, roof decks, cantilevers, grade connections, foundations, concave corners, convex corners, and openings both door and window.

The combination and permeations of these elements and relationships is overwhelmingly large. By combining them and solving them generically it may be possible to complete this work. The illustrations are preliminary and are presented to suggest how the work might unfold. Illustration 1. shows the concept of a frame, insulation, connectors and a skin. Illustration 2. shows the common detailing locations. 3. shows a concrete frame and 4. shows a detail of the frame and connector plate locations. 5. is a preliminary detail of an exterior corner of a steel frame. 6. shows how an insulated panel or glass curtain wall could conceptually attach to either a steel or concrete frame.

This work has been developing for a long time. Its future is unclear because of the immensity of the task. I hope in presenting it that it reawakens the readers to their own search for appropriate detailing.

Some Notes On The Thermal Response Of Offices And Atria

By Michael Utzinger, Assistant Prof.
UWM Dept. of Architecture

Over the last decade, the energy efficiency of the residence has been thoroughly studied. Today, an architect in Wisconsin can design a residence requiring less than an annual expenditure of 200 dollars for heating energy with confidence. But what of the office or the atrium? While a body of research and experiment describing the thermal response of offices is growing, little is known about the thermal response of atriums. Both offices and atria have been under study at the School of Architecture and Urban Planning. Jordan O'Connor studied the effect of skin strategies on the thermal response of offices and presented the results in his M. Arch Thesis. Pete Bochek developed a simple model of the thermal response of an unconditioned atrium, and then studied the effect of various architectural design parameters on the thermal response of the atrium. This work is presented in his recently completed M. Arch Thesis. These represent the first research theses in the area of energy-conscious architecture completed since I joined the SARUP faculty four years ago. Much of the work from both theses has direct application within the architectural profession.

Which is more important to the thermal response of an office structure; window area or insulation levels in the wall and roof? Is mass in the office more important than mass in the skin? Will variation of the skin color to control solar radiation affect the thermal response of the office? When mass and insulation are included in the skin (wall and roof), is the placement of the insulation to the outside versus inside important? These are some of the questions which Jordan O'Connor addressed in his thesis. He used the computer simulation program TRNSYS Version 11.1 to model thermal response of offices. A simulation program estimates the thermal response (eg. building air temperature or auxiliary heating requirements) of a building or building zone as a function of transient hourly weather data. The heating or cooling energy required by an office zone for an entire year can be simulated using TRNSYS. By changing a parameter in the model description, such as window area, and repeating the simulation with the same weather data, the effect of the parameter change on auxiliary energy requirements can be estimated. Weather data from cities representing four climates were used in the study. The cities used were Madison, Wisconsin; Seattle, Washington; Phoenix, Arizona and Apalachicola, Florida.

Rather than study an entire office building, a single office was examined. The office dimensions were 15 feet of exposed wall by 20 feet deep by 10 feet high which were viewed as prototypical. The exposed office wall faced south. Two experiments were run. The first was repeated for the four locations mentioned above. The building design parameters which were studied in the first experiment are presented in Table I along with the range over which each parameter is studied. The second experiment was run for the Madison, Wisconsin location only. The design parameters studied in this experiment are presented with their ranges of study in Table II. In each experiment all parameters were varied simultaneously to provide a measure of the effect of each parameter against the others and to study any interactions between parameters. The discussion in this article will be limited to results for the Madison, Wisconsin runs only.

When both mass and insulation are included in the building skin, does placement of the insulation to the outside of the mass improve the thermal performance of the skin? Common sense suggests that this arrangement will improve performance. The improvement is assumed to be due to the addition of the skin mass to the interior mass, leading to lower temperature fluctuations within the conditioned space. The results of this study indicate that the improvement in performance due to placement of the insulation on the outer side of the skin is negligible. Placement of the insulation toward either side of the skin will not affect the thermal performance of the skin. This is the most significant finding of the office study. In addition, insulation was found to be the most important parameter affecting heating loads. The greater the insulation level, the greater the separation between tempered and outdoor environment, and the lower the heating load. However, cooling loads increase in Wisconsin with the addition of insulation. This is due to the fact that internal heat gains and solar gains can be more readily dumped to the outside when

Table 1
Parameter Levels for First Study

Parameter	High Level	Low Level
1. Skin Heat Capacity (Btu/SF/F)	24	3
2. Skin Insulation (Btu/Hr/SF/F)	0.05	0.40
3. Skin Insulation Location	exterior	interior
4. Skin Color (Absorptance)	0.9	0.2
5. Room Heat Capacity (Btu/SF/F)	23.4	5.8
6. Construction Weight	3	1
7. Window Area (% of Floor)	50%	5%
8. Window Efficiency (Btu/Hr/SF/F)	0.2	0.6

Table 2
Parameter Levels for Second Study

Parameter	High Level	Low Level
1. Skin Insulation (Btu/Hr/SF/F)	0.05	0.09
2. Window Shading (Fixed Overhang)	yes	no
3. Window Area (% of Floor)	25%	5%
4. Occupancy Schedule	10 to 6	7 to 3
5. Night Ventilation	yes	no

the insulation levels are low. High insulation levels in the skin negates the effect of mass in the skin or of the color of the outer skin. In this study, High insulation levels means the equivalent of 4 inches of rigid insulation. When insulation levels in the skin are low (½" rigid insulation in this study), mass in the skin reduces both heating and cooling loads. In Wisconsin, the effect of skin mass on cooling loads is small, but the effect on heating loads can be substantial. A light skin color can reduce cooling loads substantially during summer, if insulation levels are not high.

Increasing the heat capacity of the office has the potential of creating a thermal flywheel. Excess gains during the day might be stored in the building mass to offset excess losses at night. Thermal capacity is only important when net heat gains occur during occupancy and net heat losses occur at night. If skin heat losses during the day exceed internal and solar heat gains, then energy is not available for storage to offset night losses. During summer, if night outdoor air temperatures exceed the building temperature, then heat stored in the structure cannot be dumped. In this study, increasing the building's thermal storage capacity did result in a reduction of both heating and cooling loads. The effect of storage is small when compared to the effect of insulation. Reduction of heating and cooling loads due to increasing the storage capacity from light weight construction to heavy exposed concrete construction is roughly 25% of annual loads.

Increasing window area in offices will only lower heating loads if the windows face south and they have high thermal efficiency. Thermal efficiency refers to the ability of the window to resist heat transfer between the building and environment. (Stock insulating windows have R-values from 1.8 to 2.5, depending on design.) For windows of poor thermal efficiency, increasing the area will increase the heating load. Cooling loads will increase with window area irrespective of window thermal efficiency. This study examined only windows facing south, southeast and southwest. East and west facing windows of the same area would introduce more solar energy into the office during summer. In the second experiment the effect of shading the south facing window with a fixed overhang was examined. The overhang was sized to project out a distance equal to half the window height and to provide a gap between the top of the window and overhang projection equal to one fourth the window height. This overhang design does reduce cooling loads in the office examined by the average of 15%. Simulations revealed that an overhang is more important in relation to large window areas. In the second study, the window area varied from 5% to 25% of the office floor area. At a window area of 5% of the floor, the overhang had little effect on the total cooling load. At a window area of 25% of the floor, the effect of the overhang in reducing the cooling load was substantial. In addition to reducing the cooling load, the overhang blocks solar energy during spring resulting in an increase in seasonal heating requirements. In this study the increase in heating was equal to 40% of the reduction in cooling.

The effects of occupancy schedule and night ventilation on heating and cooling requirements in the office were also examined. While these strategies don't directly affect the architectural form, their manipulation can alleviate some of the negative thermal effects of design decisions. An early versus late occupancy was studied. A late occupancy during winter was hoped to reduce heating loads by allowing a solar warmup. The reduction in heating due to late occupancy was small. An early occupancy during summer should reduce cooling requirements by shifting occupancy to the cooler portion of the day. In this study, early occupancy would substantially reduce annual cooling loads. The importance of early occupancy increases with increasing window area. Night ventilation means allowing fresh air to move through the building at night if outdoor air temperatures are lower than the building temperature and the building faces a cooling load throughout the day. Ventilation allows for cooling of the building structure permitting a greater potential for the storage of occupancy generated heat gains and solar gains. Night ventilation does result in a substantial reduction of cooling loads. Night ventilation in combination with early occupancy can more than balance the negative effect of large window area on cooling requirements. When an office is occupied early and provisions for night ventilation made, cooling demands are lowest, and the effect of increasing window area is very small. That is to say, these two strategies, when employed, negate the effects of window area on cooling loads. Whether or not a building will be occupied during the early day depends on the occupant, not the architect. The application of night ventilation has occurred in offices located in the central valley in California with success. The diurnal temperature profile is very large, permitting maximum night cooling. In addition, the relative humidity is low making condensation at night a low risk. While this study suggests that thermal benefits would result from application of night ventilation in Wisconsin, the issue of humidity levels should be studied carefully to assess the risk of condensation before night ventilation is widely employed in office building projects.

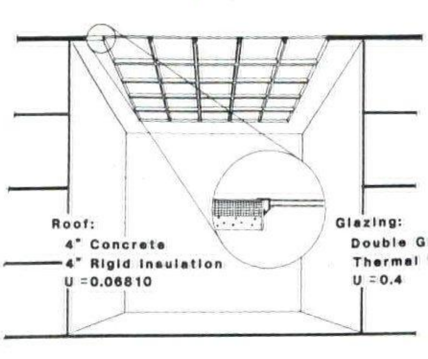
The average energy consumption for heating and cooling is 65,000 Btu/SF/year for all runs in this study. However, the best design gave annual energy requirements of roughly 10,000 Btu per SF per year. This represents a very low level of energy consumption compared to typical construction. This design includes high levels of insulation, massive construction, night ventilation, early occupancy and a modest window area. While modifications to reduce energy consumption do add costs to construction, they can often provide large savings in energy use.

The atrium is being included in more architectural programs every year. Atria are often not necessitated by the architectural program, however their additions are seen as adding greatly to the amenities in the project. The atrium can, if designed properly, reduce the energy consumption of the building. The thermal behavior of the atrium and its effect on energy requirements of adjacent building zones is not well understood. Pete Bochek conducted a preliminary study of the thermal response of atriums as his M Arch thesis. He examined atriums conditioned only by ventilation, without the addition of auxiliary heating or cooling energy. His primary questions were whether an unconditioned atrium could be designed in this climate which could be comfortable without heating or cooling energy, and how the unconditioned atrium affected adjacent building zones.

Modeling the thermal behavior of an atrium is more difficult than modeling the behavior of an office. Where air temperature in an office can be assumed to have one value throughout the space with little loss in accuracy, assuming one air temperature in an atrium will accurately model air temperatures throughout the space will only be true if the air is well mixed by a circulating fan. In addition, an atrium with large glazing surfaces on ceiling or wall will result in large solar loads incident on some but not all of the atrium surfaces. This asymmetry could lead to significant differences in surface temperatures and hence in mean radiant temperatures of the atrium. As mean radiant temperatures affect thermal comfort, the ability to model surface temperatures is important. Because of the potential for large temperature variation throughout the atrium, control of relative humidity to prevent condensation may be important.

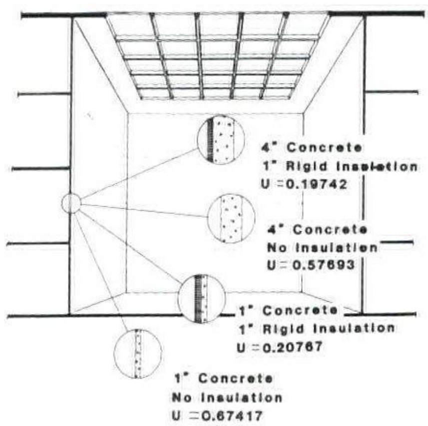
To model the atrium, the latest version of TRNSYS (Version 12.0) was used. This version allows the estimation of radiation heat transfer within a geometrically defined space and, hence, the mean radiant temperature of the space. However, this zone model in TRNSYS permits only one air temperature for the zone. Pete Bocheck attempted to create a number of conceptually sound models which would provide a measure of the stratification within the zone, but all of the models were unstable when computer simulations were attempted. Finally, a simplified model of the atrium was used to test the research questions. This model was a forty foot cube in which the following assumptions were made. First, the air was assumed to be well mixed by a fan allowing one air temperature to represent the atrium. Second, the glazing in the ceiling was assumed to be transluscent rather than transparent. This eliminated the complex calculations that would be required to accurately distribute beam radiation to the appropriate interior atrium surfaces. The atrium was assumed to be surrounded by office spaces, and only the ceiling was in contact with the outdoor environment. Five variables were assumed to affect the unconditioned atrium temperature and the heat transfer between the atrium and offices. These are glazing area, solar reflectance of the atrium surfaces, the amount of insulation in the wall between the atrium and offices, the amount of thermal mass between the atrium and offices, and whether the atrium was cooled at night by ventilation during summer months. The range over which each parameter was varied and the values of the constant roof insulation are illustrated in figures 1 through 4. The atrium model was simulated using Madison, Wisconsin hourly weather data.

Figure 1



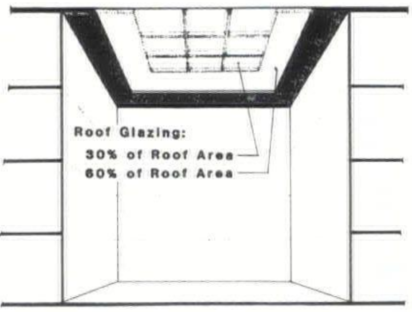
Constant Roof and Glazing Condition

Figure 2



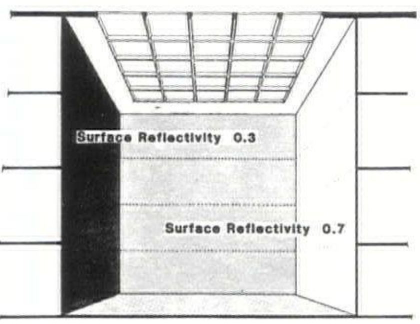
Insulation and Mass Conditions for Walls and Floor

Figure 3



Glazed Roof Area

Figure 4

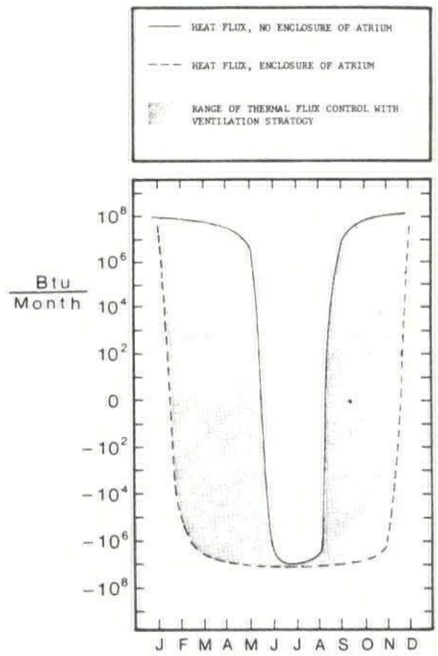


Reflectivity of Atrium Surfaces

How does the atrium compare to a light well without the enclosure? This is the first question to be answered. A comparison between atrium and light well is illustrated in figure 5. With only a light well, the office spaces lose heat to the outdoors eight months out of the year while gaining heat from the environment for two months. Transitions between heating and cooling occur during the remaining two months. When the light well is enclosed to form the atrium, the offices lose heat to the atrium for three months of the year and gain heat from it for seven months. Transition between heating and cooling occuring during two months. Thus the effect of enclosing the light well is to reverse the heat flow across the office wall for five months of the year. In this model the atrium was not ventilated. This result means that through proper ventilation control, heat transfer between atrium and environment might be eliminated during nearly half of the year. In addition, the surface area of the structure interacting with the exterior environment is much smaller with the atrium than the exposed light well. Construction costs with the atrium might be less.

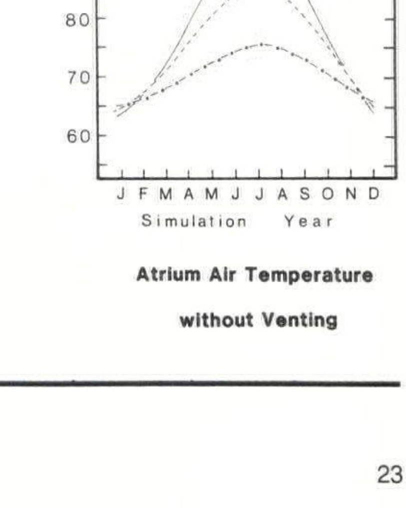
How do the parameters studied affect the average temperature in the atrium? Figure 6 illustrates the monthly average air temperature profile of the atrium when it is not ventilated at night. The three groups of curves are a function of insulation levels between the adjoining offices and atrium and the area of the horizontal glazing in the ceiling. When insulation is added to the wall between office and atrium, heat transfer between the zones is inhibited and solar gains to the atrium are retained in the atrium. As a result, the temperature of the atrium increases. The average atrium temperature is significantly higher at the large glazing areas. The average July temperature is 92° F at the large glazing area, and 82° F at the smaller glazing area. When the wall separating office and atrium is not insulated, excess solar gains are transfered into the offices, increasing their cooling load and lowering the average atrium temperature to 76° F. The size of the glazing does not significantly affect the air temperatures in this situation. While air temperatures are nearer the comfort zone if the atrium walls are uninsulated, the penalty is increased cooling loads in the office. A better strategy for reducing atrium temperatures without increasing office cooling loads is to ventilate the atrium at night and dump the excess daytime gains. Figures 7 & 8 illustrate the effect of night ven-

Figure 5



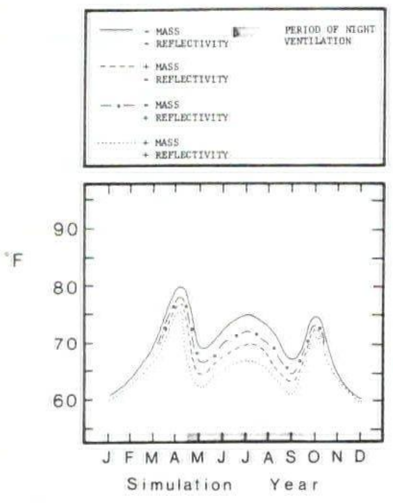
Heat Flux Control Through Ventilation

Figure 6



Atrium Air Temperature without Venting

Figure 7

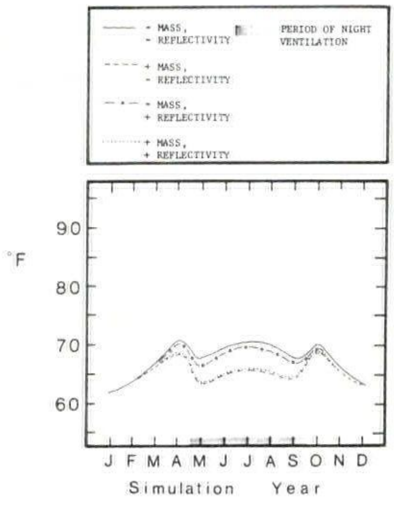


Atrium Air Temperature

with Venting

High Insulation High Glass Area

Figure 8



Atrium Air Temperature

with Venting

Low Insulation High Glass Area

tilation on air temperature in the atrium. In both studies, the glazing area is at the maximum studied and the atrium vented at night. Figure 7 shows the temperature profile when atrium walls are insulated and figure 8, temperature profiles when the walls are not insulated. In the later case, temperatures are consistantly between 63 and 70 degrees. Insulation reduces the thermal connection between office and atrium and drives the atrium temperature up. However, night ventilation has reduced the average July temperature by 20 degrees.

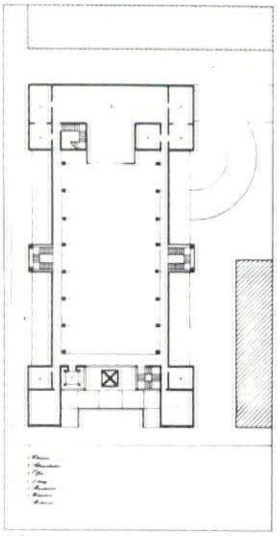
The effect of mass in the atrium walls and of the solar reflectance of the atrium is also illustrated in figures 7 & 8. The effect of these parameters is secondary to insulation, glazing and night ventilation, but important nonetheless. The effect of adding mass is to reduce the average air temperature of the atrium. The temperature reduction occurs during summer, mass having little effect on temperatures during winter. Without insulation, the reduction is roughly 5 degrees in the average summer air temperature in the atrium, with insulation, the atrium air temperature reduction is roughly 8 degrees. Increasing the solar reflectance of the atrium is only important when the atrium walls are insulated. For this situation, the summer atrium temperature can be reduced roughly 4 degrees by providing solar reflecting rather than solar absorbing surfaces in the atrium. The lighter surfaces will enhance the daylighting characteristics of the space as well.

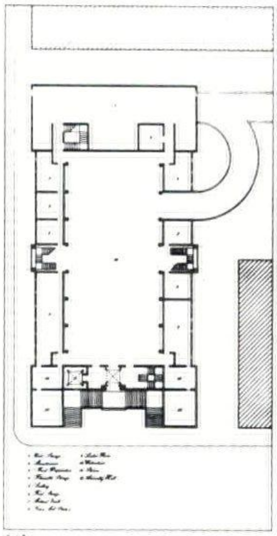
While this preliminary study does not include the complexities desired, especially the effects of latent loads, and thermal stratification. The trends represented in the study help provide an understanding of the thermal behavior of atriums. In addition, the potential for an unconditioned atrium (with ventilation) to be designed in Wisconsin and remain in the comfort zone appears feasible. This result is for an atrium with glazing in the ceiling, the worst orientation for this climate. SARUP is presently seeking funding to expand this research effort to include more complex models, models of different atria geometries and the analysis of atria with glazing in a side wall.

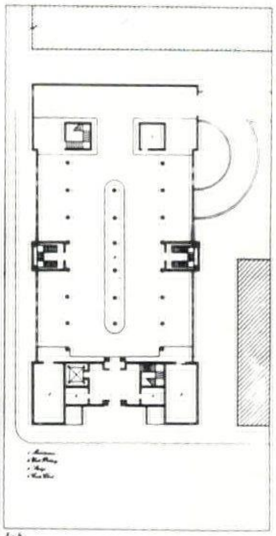
This article highlights the work of two excellent research theses. Additional material and a greater depth of discussion are contained in the original work. Jordan O'Connor's and Pete Bochek's theses are available for study in the SARUP Reference Center. I have enjoyed chairing their thesis committees and look forward to future students who will provide work as pertinent to the profession as is represented in these two theses.

National Guard Armory-Milwaukee

by David Evan Glasser, Associate Professor







As part of the UWM Department of Architecture's continuing commitment to energy-conscious design it offers a regularly scheduled graduate studio dealing with a range of design issues among which, use of solar energy, passive design, thermal storage and other energy conserving factors are given high priority. This past Spring semester we were particularly fortunate in having been able to secure the services of Hanno Weber as a Visiting Associate Professor to manage the energy studio, together with Assistant Professor Michael Utzinger who is well known to WSA readers for his articles on energy in buildings throughout Wisconsin. Prof. Weber is an active Chicago practitioner and was for several years one of the principal designers at SOM. He was also an Associate Professor at Washington University in St. Louis for many years before setting up practice in Chicago. He was, as a consequence, uniquely qualified, to offer

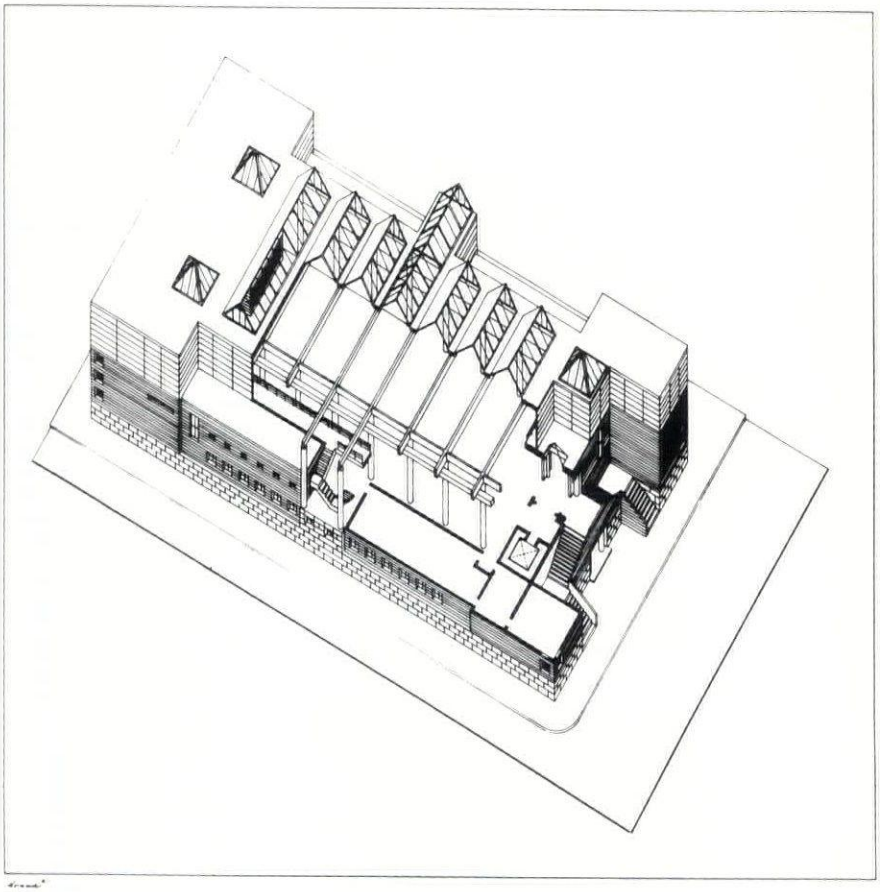
leadership in a studio seeking to integrate general design issues with those of energy consciousness and thermal efficiency.

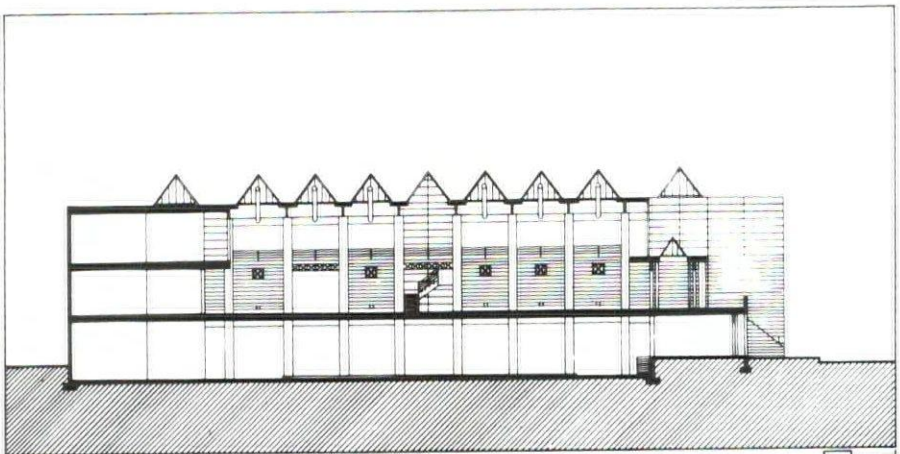
One of the studio projects selected by Profs. Weber and Utzinger for development was a proposed National Guard Armory to be built on a vacant site at the corner of W. State and 4th Street adjacent to Turner's Hall in Milwaukee - see site plan. The principal design concerns determined by the critics were:

A. Development of a sound program for an armory which could accommodate a range of functions including emergencies, social events, etc.

B. A building which by its scale and character would establish a coherent urban contextual relationship with surrounding structures.

C. The appropriate incorporation of as many energy conserving design features as were practi-



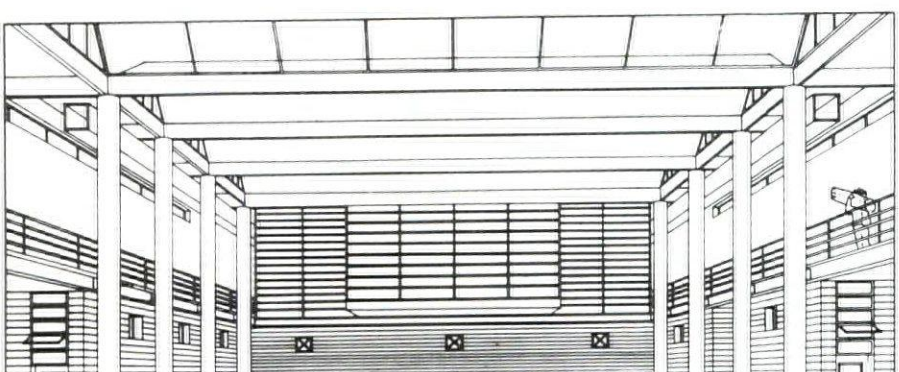


North-South Section

cable within the constraints of the project.

I had the opportunity to attend several reviews of projects during the term and was greatly impressed by the high calibre of the studio and its serious effort to treat energy concerns as integral to the design process and not, as often happens, as decorative technological afterthoughts.

The Axonometric and North-South section illustrate how the multi-storied, glass-roofed armory space fits within the overall building massing without overwhelrning the project. The interior perspective of the assembly hall portrays a carefully determined interior which derives much of its character from a skillful use of a number of energy conservation measures.



Assembly Hall

One of the projects, of particular merit in this latter respect, was the Armory designed by Joseph Theodore Heinowski, plans of which are presented here. Most noteworthy, from a design standpoint, are the simple and straightforward plan and the serene, architectural character of the building's primary spaces.

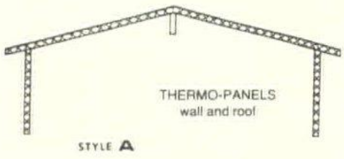
In order to provide for certain energy-saving requirements, Mr. Heinowski made the following design decisions:

Solar energy collection has been incorporated in the roof and top of the southern facade. In addition, the building has been given as compact a form as possible, minimizing the exterior exposed surface area. The energy proposal for the roof over the assembly hall is based on the following considerations:

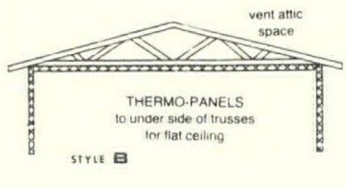
1. The use of a compact geometry which reduces the amount of skin area exposed to the exterior, thus reducing heat loss.
2. The roof of the assembly hall will be employed as a heat absorber for solar energy. Using the green-house effect in conjunction with active systems of redistribution will reduce annual heating loads.
3. Maximizing southern glass exposure and minimizing those on the East, West and North will reduce heat loss and facilitate heat gain.
4. To prevent over-heating in the summer, mechanical duct-work near the roof and openings in the upper facades will draw off additional heat gain and provide for natural air circulation.
5. Mechanical room locations near the southern facade and unit storage to the North were determined in response to solar requirements.

Although specifically selected for coverage in this article it should be said that this project was typical of the quality and completeness of those accomplished by the energy studio. In my mind, the uniform high standards achieved by the studio point to an increasing maturity on the part of our students and program in dealing with the integration of design and energy.

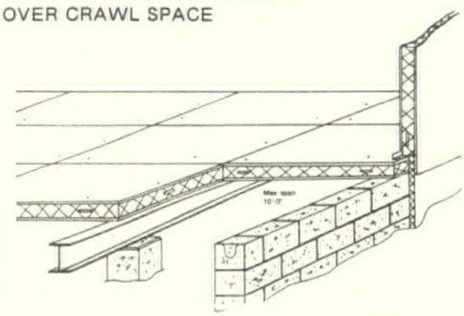
UNLIMITED DESIGN POSSIBILITIES



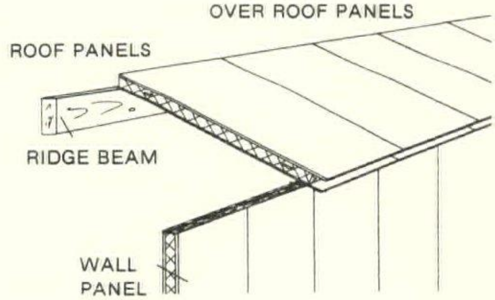
WALL AND ROOF PANELS ARE LOADBEARING



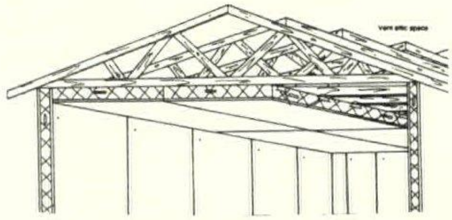
USING PANELS FOR FLOOR
OVER CRAWL SPACE



ROOFING REQUIRED
OVER ROOF PANELS



CEILING PANELS TO UNDER SIDE
OF ROOF TRUSSES FOR FLAT
INTERIOR CEILING



Chase Thermo-Panels, a new product recently introduced on the market in Wisconsin by Robert J. Chase. A walk in cooler manufacturer for over 29 years.

Chase Thermo-Panels are built with materials used over 15 years in the walk-in coolers and freezers where insulation is paramount.

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Our panels have been examined by energy experts, engineers and architects. Without exception they have been enthusiastic about the product. The builders that are now using them say, "This is the only way to build."

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We believe that this product is one of the most useful you will find when it comes to energy efficiency and it sells at a price that is affordable.

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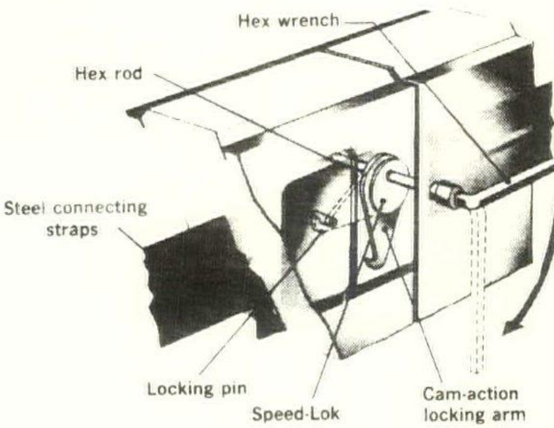
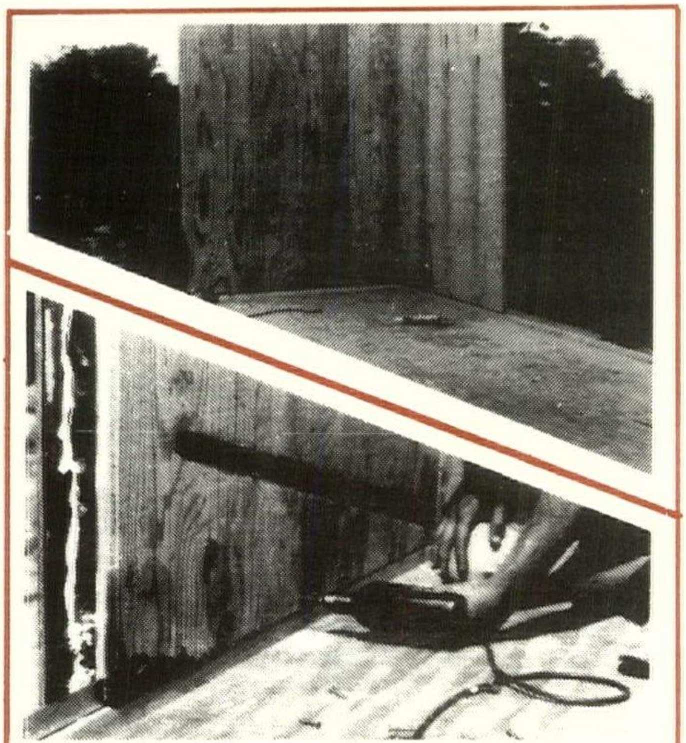
THERMO-PANEL SYSTEMS



Mechanical panel connection system makes field installation of Chase Thermo Panels fast and easy.



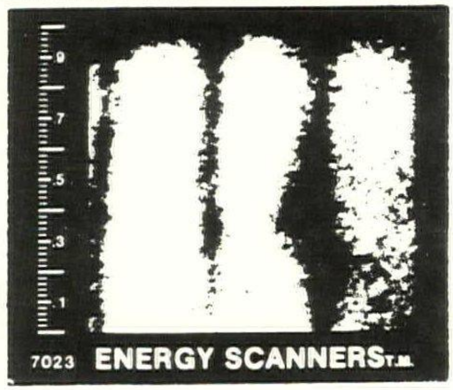
Large panels make erection fast and easy. Panel fabrication produced at the factory to insure highest quality standards.

PANEL CONSTRUCTION

3½ CORE = R 30
4½ CORE = R 38

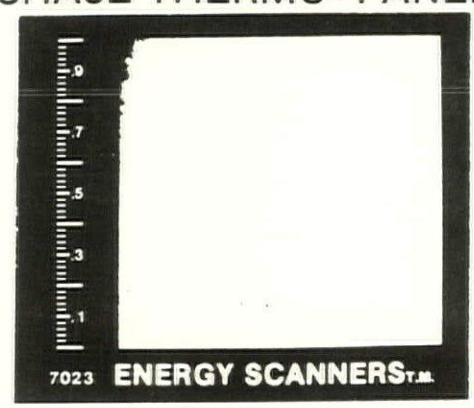
A high density (2.5 lb. per cu. ft.) urethane foam isulation is molded under extremely high pressure between plywood or other facings, resulting in a 100% insulated wall. **No 2 x 4's or other supports are required** in this load bearing panel, making this the most energy efficient wall and ceiling system available at a cost competitive with other current building systems.

STANDARD STUD WALL



Heat loss at all studs and voids in the insulation

CHASE THERMO- PANEL



NO HEAT LOSS,
not even at panel joint 100% energy efficient

Typical properties of urethane used in Chase panels:

Density	2.5 p.c.f.
Compressive	45 p.s.i.
% closed cells	93
R factor per inch	7.8

Fire hazard classification:
(core tested in 4" thickness)

Flame spread	25*
Fuel contributed	0*
Smoke developed	300*

*These numerical flame spread ranges are not intended to reflect hazards presented by these or any other materials under actual fire conditions.

LOAD CAPACITY FOR CHASE THERMO-PANELS

ROOF PANEL						
panel span (feet)	8	10	12	13	14	15
allowable load lbs. per sq. ft.	100	64	44	37	31	27
WALL PANEL						
lbs. per lin. ft.	4276	4049		3802	3547	3292

COMPLETE ENGINEERING DATA AVAILABLE ON REQUEST

A Visit With Willis And Lillian Leenhouts, FAIA

by Douglas Ryhn, Associate Professor

The following conversation occurred recently at Willis and Lillian's house in the Riverwest section of Milwaukee. The Leenhout's architectural practice has long been noted for consistant attention to energy conscious design. Our purpose was to learn something of how this came about.

Doug:
I have recently seen a listing of your many passive solar projects which goes back to World War II. Is that when it all began?

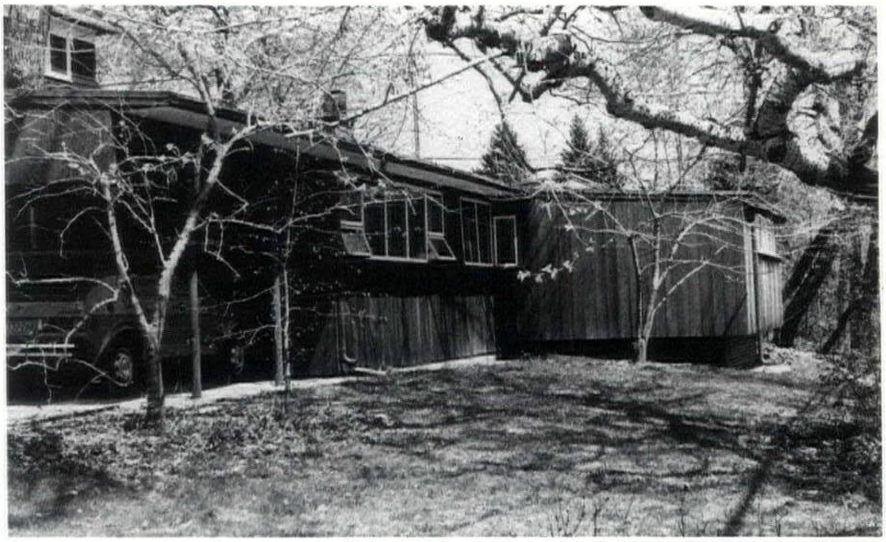
Willis:
Our work began right after the war but Lillian's desire to learn more about solar design began somewhat earlier.

Lillian:
I got out of Layton School of Art after 3 years in 1932, just as the great Chicago Fair "Century of Progress" was about to begin. A friend and I packed up one of those cardboard suitcases full of clothes and food and took the night bus to Chicago. We waited in the bus station until it was just getting light so we could spend the whole day at the Fair. Probably the most important thing that happened was seeing George Fred Keck's round glass house, the one with the airplane port on the ground floor. He thought everyone was going to have an airplane. The "House of Tomorrow" as it was called had evolved from a study of the 1854 Octagon House in Watertown, Wisconsin. The Keck house featured a central core containing stairs and mechanical equipment, cantilevered octagonal floors and an enclosure of large sheets of glass. It was reported that during supervision of construction, on a bitter cold January day, Keck noticed that the carpenters were working inside with their sleeves rolled up. This phenomona impressed him a great deal and he wrote to Washington D.C. to see if he could obtain information on solar gain. He was referred to his local weather bureau and the information he received started him on his pursuit of passive solar.

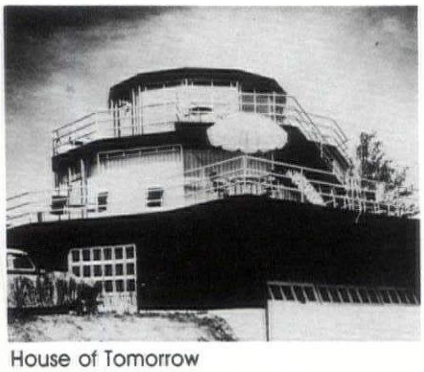
Doug:
Were there any other innovations that came out of the "House of Tomorrow"?

Willis:
I don't really think so. It seems as though technology was coming into its own and there were a lot of innovative building products that just happened to be related to energy.

Lillian:
Sometime during the period when I was working for Harry Bogner, double pane glass appeared on the scene. I believe the guy who invented it came from Milwaukee, I think his name was Haven. Anyway, he and one of the glass companies experimented for a long time before they were able to join the 2 pieces of glass with a small I beam type seal. Later others were able to literally weld the glass together to form the hermetic seal. Harry used insulating glass a lot.



Leenhouts Residence



House of Tomorrow
Photo Courtesy Elvehjem Museum of Art

Lillian:
To take advantage of the large sheets of fixed glass and still provide ventilation the Keck's developed a system of floor to ceiling panels that had louvers at the top and bottom. It was thought that a contractor could build a conventional structural frame and then merely install these panels to enclose the space. There is presumably a house in Fox Point that was constructed in this fashion.

Doug:
Do you feel that there was a growing energy consciousness at this time?

Willis:
One of his jobs was a Georgian style house and when some of the seals started to go the carpenter had to go out and replace hundreds of those little panes.

Doug:
Looking around your own house one is immediately aware of large areas of south facing glass and overhangs.

Willis:
Aristotle said, 400 years before Christ, that if you're going to build a house, build it high in the south and low in the north.

Lillian:
Somewhat along that same line, I became fascinated by a book by Carleton S. Coon. It was called *Seven Caves*. The author got interested in caves and found that whenever there was an area of limestone ledges facing south, such as in Turkey, there were probably ancient caves. He has excavated several of the caves and of course discovered how the former occupants lived by studying the junk they left behind. He also observed how the south opening with its natural overhang and an extended floor ledge for a fire could provide comfortable and secure shelter.

Doug:
Another aspect of orientation that I'm always reminded of when I'm here in your home is the wonderful play of light that seems to be produced in part by the smallest of clerestory windows.

Lillian:
I think that over time we've become quite clever at bringing light into buildings. Examples vary from simple interior light wells in old apartment buildings to the grand skylit spaces such as in the old Northwestern Mutual Life building at Broadway and Michigan here in Milwaukee. And of course modern atriums can do much to reduce the amount of electricity needed for lighting. There still has to be a good bit of attention paid to the subject of glare however and that means cutting down the contrast between the light source and the surrounding area. We've all suffered from the effect of a small bright window at the end of a dark room. Since light and heat are related though, it probably means control through overhangs. Glass does become reflective at very shallow angles, but that's probably only useful closer to the equator.

Doug:
What have you done here in the house with respect to heat absorption and storage?

Lillian:
Well, our latest attempt at solar collection is this door on the east side of the house. Before it was painted, it would get so hot in the morning you couldn't put your hand on it. Then we painted it white and it didn't get nearly so hot. Then we added a glass storm door and it gets hot again.

Willis:
Lillian has a homemade trombe wall, that I'm not in love with, made out of a sheet of plastic over the brick below the windows on the south side. It's not vented so the heat just works its way through the brick and she said it was 120 degrees in there the other day.

Lillian:
The north side of the house is slightly buried partly because of the natural southward slope of the property. Our daughter Robin and I dug down along the wall and put in about 2 feet of foam insulation, so now we feel a little more tucked in.

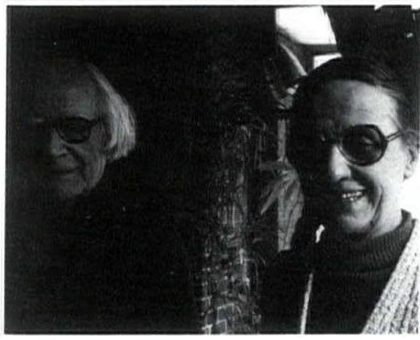
Doug:
My recollection is that you have utilized radiant heating in much of your work. Do you still find it a good solution?

Willis:
There's nothing like it. We've used radiant in most of our houses, in churches and a 13 story apartment building.

Lillian:
The engineering is quite good. They are usually closed systems so they don't require any special water treatment and the piping is compatable with the concrete. Our systems are buried in the concrete rather than in the crushed rock with concrete over the top. Also since the pipes are regularly spaced, sections can be prefabricated to help in the overall economics. But of course the real advantage besides efficiency i comfort.

Doug:
One would think that radiant sys tems would be a natural link-up with solar collectors but enough o that, back to your house.

It has a few other characteristics besides the many we've discussed that are energy related. For exam ple there are the variety of adjust able drapes that allow the use additional environmental control both for heat gain and heat loss the green house provides fresh vegetables and much desired moisture and of course the beautiful cluster of deciduous trees to the south, invisible in the winter and shade provider in the summer. Do you have any way of ranking the importance of any of these items?



Willis and Lillian Leenhouts

Lillian:
If there's anything we've learned living with the Wisconsin climate, it's that you can't just look at any one passive characteristic, they all go together. You must use the earth for what it offers and the same for the sun and wind and all the other natural resources. So we try and add all the bits together, because each one by itself is not enough.

On The Boards

ARCHITECT:
Architecture 360
Madison, WI

PROJECT:
Joseph E. Uihlein
Sr. Residence
Milwaukee, WI

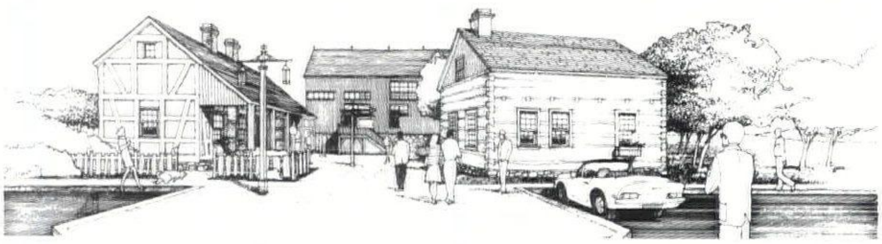
BACKGROUND:
Located on 4-½ acres of Lake Michigan shoreline, the Joseph E. Uihlein, Sr. Residence has recently been purchased by family members from the University of Wisconsin — Milwaukee, and will soon be converted into 6 luxury condominium units. The Jacobean style exteriors of the main house, attached "playroom", and coach house will remain intact, as will the replicated English Period paneled rooms throughout. New partitions and fixtures are unobtrusive, and will match plaster and paneling where incidental. An attached underground garage for the main house units has been incorporated with the existing site plan, preserving the formality of the landscaped grounds and approach drive. The estimated cost for the project is $800,000.00.

ARCHITECT:
Shepherd Legan Aldrian Ltd.
Milwaukee, WI

PROJECT:
Franklin Medical Complex
Franklin, WI

BACKGROUND:
Shepherd Legan Aldrian has been selected by the Franklin Medical Center (in affiliation with St. Luke's Hospital) to create the Master Plan for the development

of a multi-faceted health care facility on a 33.5 acre site in Franklin. Phase I facilities include an immediate care clinic, community education center, professional offices and in-patient/outpatient hospital facilities. A prime objective of the Franklin Medical Center is to incorporate a large conservancy district with proposed building and parking needs to create a sequence of orderly building development which respects the natural beauty of the site. Phase I planning (30,000 s.f. two-story building) is underway with construction scheduled to begin Spring 1984.

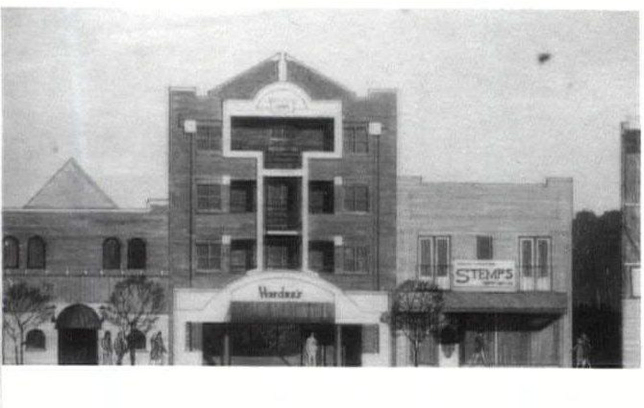


Settlers Square

ARCHITECT:
Kubala Washatko Architects
Cedarburg, WI

PROJECT:
Settlers Square
Professional Office Park
Mequon, WI

BACKGROUND:
Phase I developement of Settlers Square involves the "Reconstruction" of three historic structures, a log cabin, a half-timbered house, and a threshing barn, moved to the site from other locations in South Eastern Wisconsin. While adapting them for use as professional offices great care is being taken to preserve the historic character of each building.



ARCHITECT:
Martinsons/Zeck/Meyer, Inc.
Madison, WI

PROJECT:
Hardee's — State Street
Madison, WI

BACKGROUND:
This project is the latest in a series of recent, successful efforts by conscientious business leaders to maintain and upgrade the vitality of Madison's famous State Street. There is nothing temporary or less than quality considered in the planning and design of the building. It will accommodate a downtown Hardee's franchise on the ground floor and provide a mix of efficiency, one and two bedroom apartments on floors two through four above. The structure is classified fire resistive construction. The principal elevation on State Street picks up the established vernacular and elaborates to reflect more recent trends.

The Wisconsin Architect will publish forthcoming projects that are "On The Boards" using the format shown. If you have a project for publication, please submit the appropriate heading, copy, and graphics using the shown format to the WSA Office.

Society News

WSA SPONSORS ECONOMIC DEVELOPMENT FORUMS

Whether you are an accountant, architect, attorney, or banker . . . your economic future and that of your clients will rest with today's business development activities. As a professional, you have an important role in the economic development of Wisconsin.

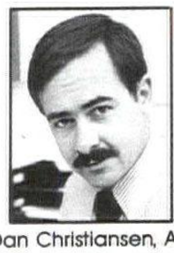
The Wisconsin Society of Architects, in conjunction with the Wisconsin Department of Development, the Wisconsin Institute of CPA's, the Wisconsin Bankers Association and the Wisconsin Bar Association will be sponsoring an upcoming series on economic development. These forums will be held throughout the state and are designed for professionals who advise business clients on the financial and regulatory aspects of expanding or starting a business in Wisconsin. Authoritative speakers and panels, video and slide presentations will highlight the seminar. A local architect will participate at each of the seven scheduled panels.

Registration materials have been sent to all WSA members. If you want more information, contact Karen or Sandra at the WSA office.

The dates and locations of the forums are as follows:

1) September 20, Madison, Sheraton Inn.
2) October 16, Wausau, Westwood Center (Wausau Insurance Co.)
3) October 17, Eau Claire, Holiday Inn.
4) October 18, La Crosse, Ramada Inn.
5) October 23, Appleton, Paper Valley Inn.
6) October 24, Brookfield, Midway Motor Lodge.
7) October 31, Racine, Racine Motor Inn.

PEOPLE AND PLACES



Dan Christiansen, AIA

Dan P. Christiansen, AIA, has joined PSI Design of Big Bend, Wisconsin, as Vice-President of Architecture.

Peterson-Twohig & Due, Inc., Architects, Planners, announces the election of Gordon L. Peterson, AIA, as Chairman of it's Board of Directors. Philip J. Twohig, AIA, was elected President of this Fond du Lac based Architectural firm, while Gary G. Due and Larry C. Beyer were named Secretary/Treasurer and Vice-President respectively.

LANGFOSS APPOINTED TO SPRINKLER COMMITTEE

Dale Langfoss, AIA, of Marshfield, Wisconsin has been appointed to serve as the WSA's representative on the recently appointed DILHR sprinkler committee. Legislation passed earlier this year requires DILHR to promulgate a new sprinkler code. This law was endorsed and strongly supported by the WSA. WSA members who have thoughts, comments, or suggestions for the new sprinkler code should contact Dale.

OPPORTUNITY KNOCKS

There have been many surprises coming from the State Capitol in recent months as many, many, many state legislators announce their intentions **not** to run for re-election this November. These announcements guarantee that the next Wisconsin legislature will have a high turnover. How high, you ask?

Of the 99 representatives who served in the Assembly during the 1981-82 session . . . **no more than 43 will be there next session.** Of the 33 Senators who serve during that same time . . . **no more than 17 will be there next year.**

Here's your opportunity to get in on the ground floor. Get to know the candidates for your Assembly and Senate district. They need your input, time and money to get elected. Once they are in office, you'll have a receptive ear on the multiple issues that they will be considering that have a dramatic impact on the way in which Wisconsin government is run.

Do it now.

It's as easy as picking up the phone and calling a candidate. Just tell them you want to volunteer some time or money or both. If you aren't sure who the candidates are for your Assembly or Senate district . . . call Eric at the WSA office.

MEMBERSHIP ACTIONS

SCHMITT, PATRICK L., was approved for Assoc. Membership in the Southwest Wisconsin Chapter.

JULES, FREDERICK A., was approved for AIA Membership in the Southeast Wisconsin Chapter.

ACORD, ROBERT J., was approved for AIA Membership in the Northeast Wisconsin Chapter.

MYERS, SHERRILL M., was approved for AIA Membership in the Southeast Wisconsin Chapter.

ARE YOU TAKING ADVANTAGE OF YOUR AIA MEMBERSHIP???

The AIA library staff will respond to questions either in person, by telephone, or by letter, on aspects of architecture and construction, architectural history, building types, etc., using the library's catalogued volumes, reference books, indexes, and more than 400 different periodicles.

PERMIT INFORMATION CENTER

One of the major points of contact between the Wisconsin business community and state government comes in the area of mandatory permits and state consents. For years it has been suggested by some that costs and time involved in obtaining such permits or consents are excessive.

The Wisconsin Department of Development has established the PERMIT INFORMATION CENTER to:

1. Resolve delays, confusions, miscommunications, and other problems that might arise with permits.
2. Facilitate the identification of permits that are needed and establish deadlines for the permitting process that businesses can count on.
3. Expedite the issuance of permits, including monitoring progress made in each step.
4. Provide information on permits and improvements in the permit process.

Each state agency has been directed by a new state law to cooperate with the PERMIT INFORMATION CENTER. The PERMIT INFORMATION CENTER claims that it is not just another layer of the bureaucracy. **You are STRONGLY encouraged to deal directly with the permitting agency FIRST and to approach the PERMIT INFORMATION CENTER ONLY where you run into problems.** HOWEVER, THE PERMIT INFORMATION CENTER IS NOT TO ACT AS AN ARBITRATOR IN DISPUTED CASES WITH THE PERMITTING AGENCY NOR AS A MEANS OF APPEAL OF A PERMITTING AGENCY DECISION. The motto of the PERMIT INFORMATION CENTER is found in the toll free number:

1-800-HELP BUSiness

WSA CASSETTE LIBRARY

HOW TO ESTABLISH A SUCCESSFUL PRACTICE . . . HOW TO DEVELOP YOU OWN PROJECTS . . . CADD . . . MARKETING FOR SUCCESS. These four 9 minute cassettes have been purchased by the WSA library for use by WS members.

To check out any or all of these cassettes, contact Sandra or Karen at th WSA office.

The WSA is trying to help you. Let us know what we can do to better serv the Wisconsin architectural community.

SHANNON AWARDED CITATION

The WSA Board of Directors has unanimously approved the award of Citation For Distinguished Service To The Profession Of Architecture to A Shannon. Art has served for six years as the public member of the Architec Section of the Registration Board. In serving in this capacity, Art has com mitted substantial time and energies towards improving the architectur profession in Wisconsin. The WSA Board of Directors is pleased to recogniz Art for his service to our profession.

WSA members are encouraged to submit to the Board of Directors the nominations for similar Citations.

STROLLING THROUGH BELOIT

A recent addition to the WSA Library is "A NEIGHBORHOOD STROLL" self-guided tour of Beloit's near east side historic district. Donated to th WSA library by Noble Rose, AIA, this brochure represents an exceller example of the influence of historical architecture on a City, and the wo in city capitalizes on public interest in this area.

To borrow this brochure or any materials contained in the WSA Librar simply stop by the WSA office or call Karen or Sandra at the WSA.

Thanks Noble for sharing this very fine product with your peers.

STRUCTURAL COMPONENT SHOP DRAWINGS

Current DILHR procedures require that structural component shop draw ings be submitted to DILHR for review **through** the office of the projec architect. The following language is being utilized by one Wisconsin a chitectural firm in their specification to clarify office policy on this matte If you have thoughts, comments, or alternative policy, contact Eric at th WSA office.

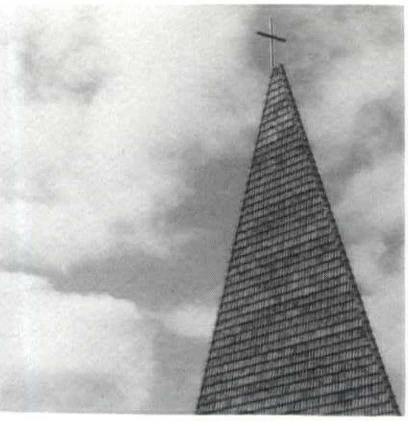
STRUCTURAL COMPONENT SHOP DRAWINGS

Eight copies to Architect, minimum which will be distributed as follows:

Architect (1) for temporary file.
Contractor (3), if more than eight copies are submitted originally, extr copies will be returned to the Contractor.
Approval copies (4) i.e.: Architect, Field Office and Job set, DILHR retaine copy and Sub-contractor's copy.

Each set to include the seal and signature of a Wisconsin registere Engineer (or Designer where acceptable by law), and applicable ap proval information require for DILHR approval.

The Architect will furnish to the component supplier a "Plan Approv Application" form completely filled out. The Engineer (or Designer) will sig the form and return with it (to the Architect) a Structural Plan Review fe (See Fee Schedule on back of current "Plan Approval Application" form The Architect will submit this information and data with the appropriat certified shop drawings directly to DILHR.



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Curtis L. Biggar, A.I.A.

For more information contact Vande Hey Raleigh Architectural Roof Tile, 1665 Bohm Dr., P.O. Box 263, Little Chute, WI 54140, 414-766-1181.

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For more information contact Robert J. Chase, Panel System, Inc., 16608 W. Rogers, New Berlin, WI 53151 414-784-9634.

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For further information, contact VELUX-AMERICA, Inc., P.O. Box 3268 Greenwood, SC 29648. 803-223-3149.

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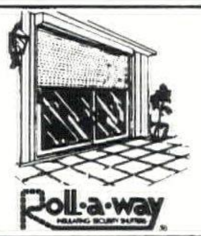

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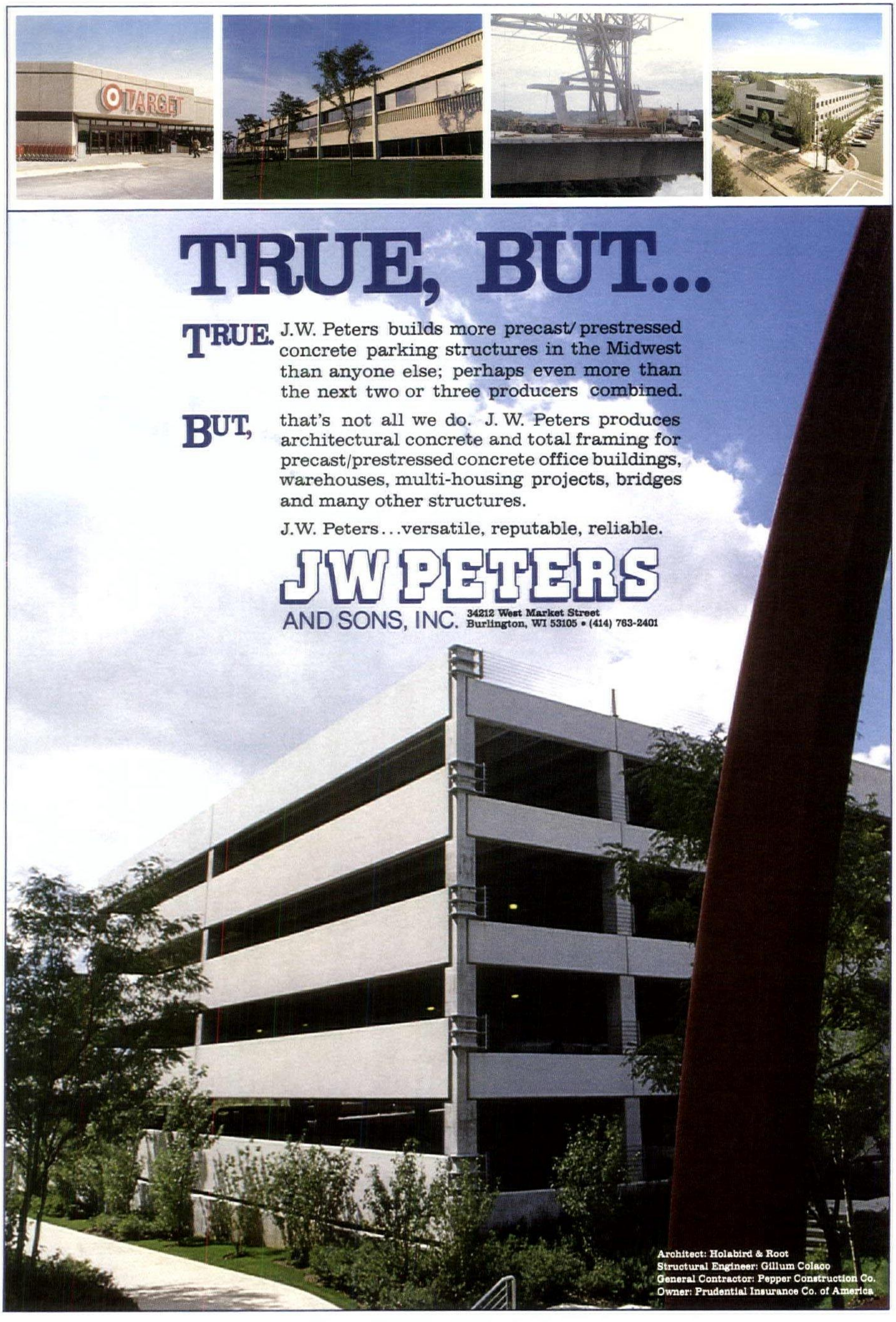

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