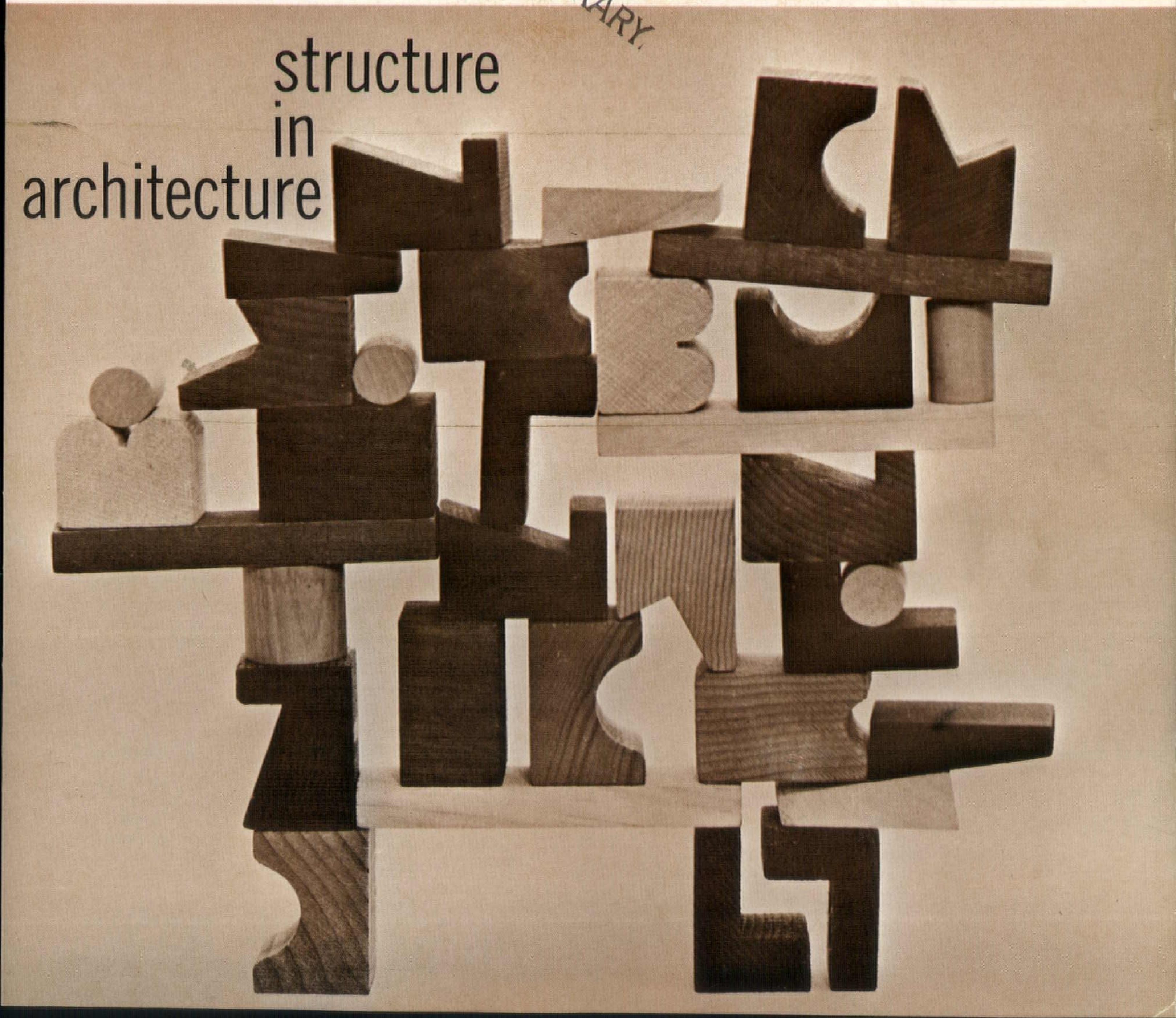
SKYLINES

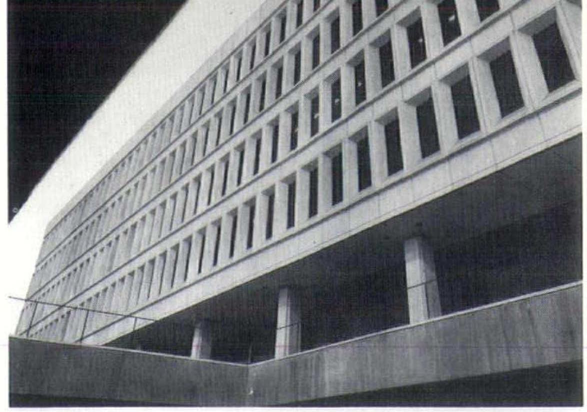
MIDWEST ARCHITECT / FEBRUARY MARCH 1968

structure in architecture



Missouri State Office Building . . .

Features one of the most modern design concepts seen in Kansas City's growing downtown skyline. Over 7,000 lineal feet of the new Glen O'Brien "Quick Change" Feature Post Partitions are being installed to efficiently organize the interior of this modern State service facility.

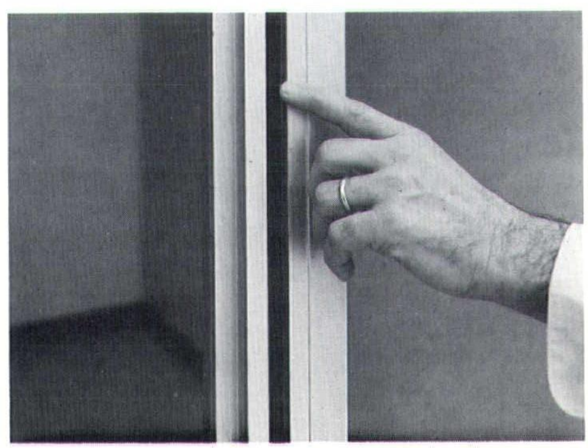


Architects. KIVETT & MYERS
General Contractors:
SHARP BROS. CONTRACTING CO.

Partitions by Glen O'Brien . . .

View above illustrates how perimeter private offices are constructed adjacent to general office areas providing attractive and efficient working units tailored to departmental requirements.

Available in a full range of modular designs, materials and colors.



Recessed Black Feature Post Design (right), with glass side lights and painted doors, provides clean-cut "Futuramic" appearance to office areas.

SKYLINES MIDWEST ARCHITECT

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STRUCTURE IN ARCHITECTURE

George W. Lund, Feature Editor

George W. Lund AIA
Chairman
SKYLINES Editorial Board

AN EDITORIAL COMMENT:

STRUCTURE IN ARCHITECTURE

It has been said that, "One cannot set himself up as a wise man without being wise—unless he is without conscience or is willing to endure constant indigestion." Conversely, few experiences can be much more rewarding than teaching or sharing the truth. There is security and a source for courage in being well-informed which gives able men the confidence to step forward and lead. If we rebel against technology rather than letting it work for us . . . or against new structural systems because the "old way" seems to be the easiest, we're overlooking valuable economic tools. The structural engineer together with the architect, can plan economies early in the program. This should be done.

This issue of SKYLINES unearths what a structural consultant has to offer and how he can save the client construction money. Then we see how the computer can aid us in structural design tasks, and make them somewhat less tedious. Finally, there is a refreshing article on land about urban planning written specifically for SKYLINES by a San Francisco planner.

George W. Lund

Bob D. Campbell is a principal in the firm of Bob D. Campbell and Company, Inc., Structural Engineers, Kansas City, Missouri. He is a graduate of the University of Texas and has a Masters Degree in Architectural Engineering. After post graduate experience in Texas, he established the Kansas City firm which developed into the present company whose principal involvement is as structural engineer consultant to architects and other engineers.

put your structural engineer back on the main track

Engineers of the structural nature are, many times, misunderstood and not altogether separated from our locomotive engineering cousins who drive trains. This article is an effort to confuse or maybe only advise those of our architect friends that have helped put us on a siding, when we need to be back on the main track.

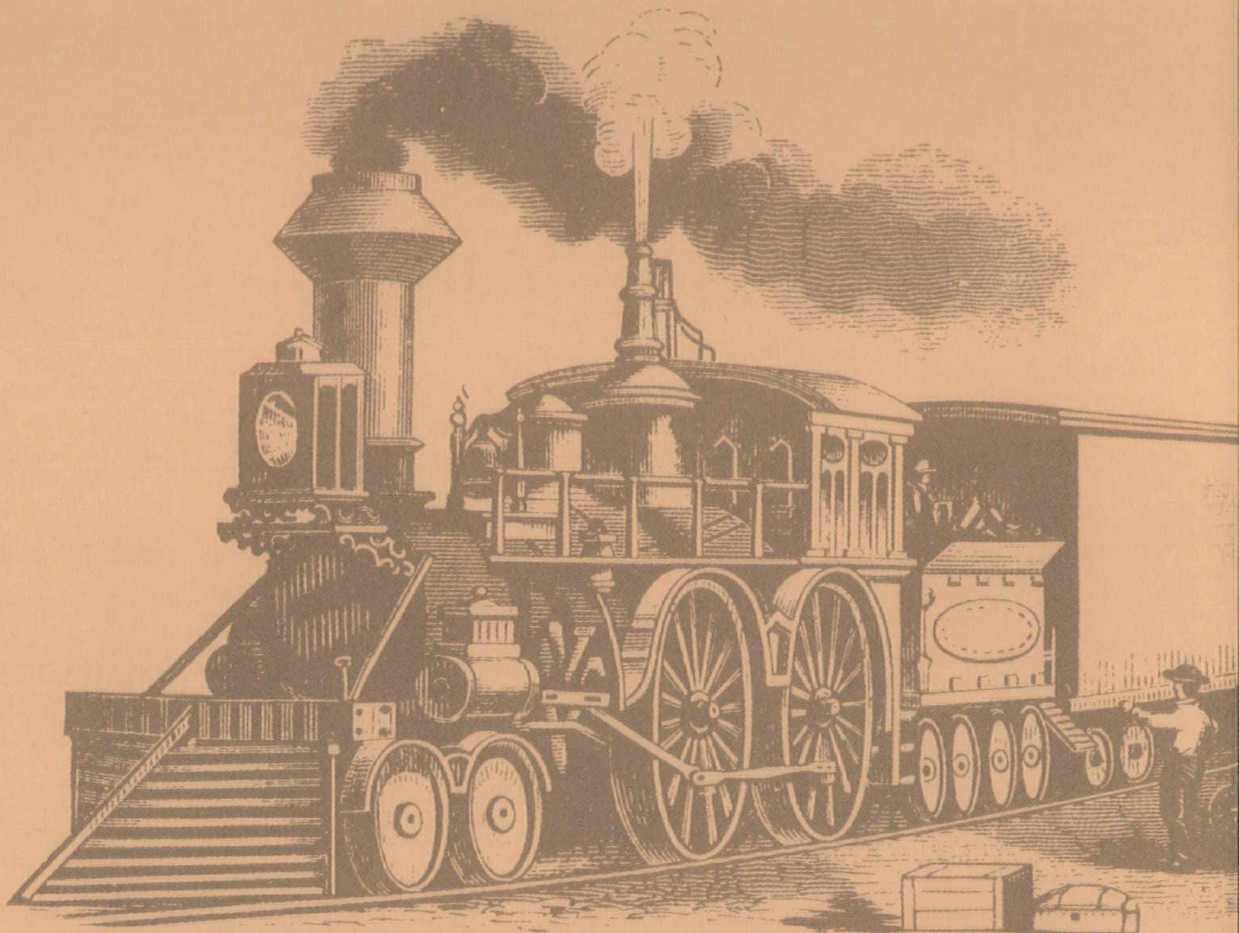
Do you know any place where an investment could yield 1,000% in six months? This type of yield is quite possible in most construction work. This could come about by permitting the Structural Engineer on the project sufficient time to balance his design of the structural elements.

This is not necessarily a pitch for more fee. More take home pay would be only one of the benefits of putting the Structural Engineer back on the main track of attention to the main building elements.

From 1954 to 1958, I spent a large portion of my time reviewing jobs for the U. S. Lift Slab Corporation, to determine adequacy for safe lifting. This review of approximately 700 different jobs produced in over 100 different engineering offices for several million square feet of floor yielded several interesting observations.

One of the main observations from this four to six hour review of each job was that consistent balance of design was seldom present, though only a few hours were needed to reveal such a fact. This imbalance consisted of varying factors of safety for the principal parts of the structure.

The slab, in bending, might have a factor of safety of 3. The shear capacity of this slab might result in a 2.5 factor of safety, while the columns would carry only 1.75 times the design load. In many cases a pound or two of steel could have been reduced from the slab and not have changed the safety of the building. Some of this saving could have been 10 times the engineering cost of revising the plans. Therein is the source of 1,000% gain in investment to the owner within six months time. It is possible he would have gotten a better building, too, with the engineer on the main track.

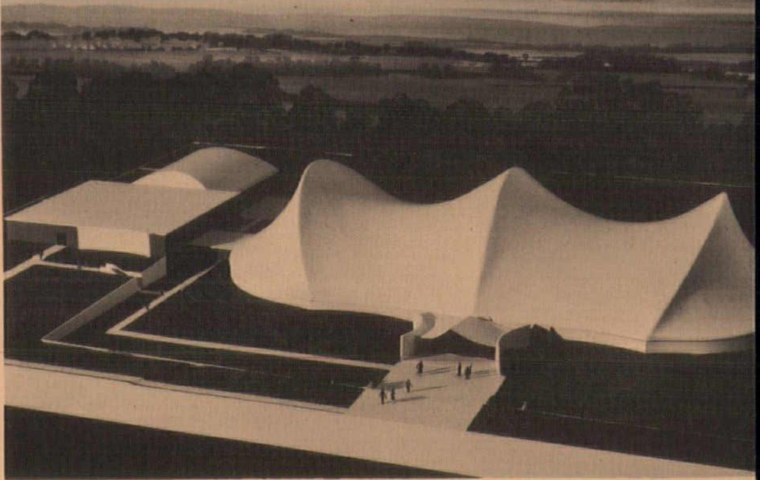


This thesis is not intended to indicate that engineers do not tend to their business. They seem to tend toward too much time at the minor tasks of their job. The architect could do very much to put his engineer back on the main track by eliminating some of the sidetracks that follow:

1. Leave the Structural Engineer out of conferences and meetings where he has little or no interest.
2. Consult with the Structural Engineer in the early stages of planning. Any effort that reduces engineering time tends to reduce cost of the building and vice-versa. That is, a well engineered beam used 100 times will be better in many ways to 50 different beams designed for one or two uses which should, but seldom does, take 50 times as long to engineer.
3. Leave the product engineering to the product manufacturers. Also, by specifications, leave the responsibility of structural performance of their product with them. That is, if the flush valves from the water closets break off while flushing, make sure the manufacturer is liable instead of the Structural Engineer. Do likewise, with precast panels, patented wall systems, stair railings, neoprene glazing strips and a million other items which have structural connotations, but in reality have little to do with the satisfactory performance of the basic building frame.
4. Clarify the project and meet the budget in concept before proceeding through working drawings. Changes during late stages of drawing not only wreck the finances of the design team, but many times play havoc with the economics of the job.
5. Provide sufficient time for completing, checking and coordination of the drawings.

All these little side tracks seem to go somewhere in themselves; however, if you cannot get the engineers back into the trains, at least try to get some who are aboard back on the main track.

A. Truog-Nichols Warehouse and Office Building



B. Graceland College Proposed Field House

getting the most out of your building structure

BOB D. CAMPBELL
STRUCTURAL ENGINEER

At the risk of losing some of my architect clients, I will attempt to present what I think would be a help to the "young" architect in an effort to get the most for his client from utilization of the building structure. The basis for this discourse will be primarily economics and efficiency, since function and esthetics are areas where I have much yet to learn from the architect.

There are several approaches which I would like to enlarge upon and give examples of their successful use. These approaches are:

1. *Repetition of Module*
2. *Use of Low Labor Systems*
3. *Use of Appropriate Systems*
4. *Use of Smallest Module Permitted by Function*
5. *Use of Highly Efficient Systems*

1. REPETITION OF MODULE

Probably the "standard" module idea is the most productive scheme which can be utilized. This idea reduces the cost of any type of framing. The classic example of this approach is the hyperbolic paraboloid shell. Photograph A is the Truog-Nichols warehouse and office building. The form alone for this roof can cost as high as $3.00 per square foot, but by careful reuse of the form, roof costs of less than $1.00 per square foot of floor space have been accomplished. This is less than bar joists and metal decks for comparable spans.

This approach requires discipline which has some rules-of-thumb:

A. Pick an efficient module
B. Repeat, repeat, repeat!
C. No variation of module permitted!
D. Make all functions fit within the module, if possible do not change systems.

Plan C shows a school where economically designed joists were used on a classroom module in an interesting manner.

2. USE OF LOW LABOR SYSTEMS

The cost of construction labor is increasing yearly. Any system which reduces the use of hand labor, will generally reduce the cost of the structure. The machine fabricated steel joist, which has low field labor costs, is hard to beat, particularly for light loads. Precast, where it can be used without excessive field labor has cost advantages for this same reason. Chart D, which is a runout of costs, shows a cost comparison of several prevalent framing systems under several loading conditions.

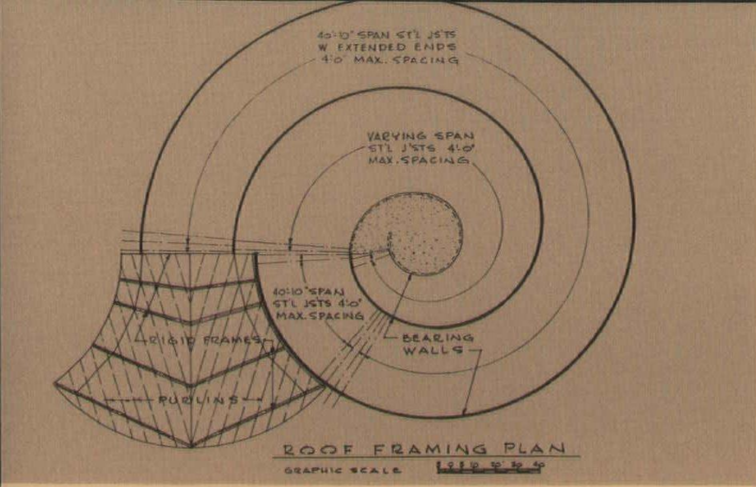
3. USE OF AN APPROPRIATE SYSTEM

In aviation, Boeing 707's are not used for basic training, nor are Cessna 150's used for transcontinental passenger service. The structural field has similar economical considerations. Again, referring to Chart D, where only roof loads are to be considered, steel joists are difficult to beat economically. Yet when a 250 pounds per square foot load is to be carried, steel joists are likely to be the most expensive system. On the other hand, flat slabs for buildings where only a roof load exists, generally require extra cost over steel joists or thin shell concrete.

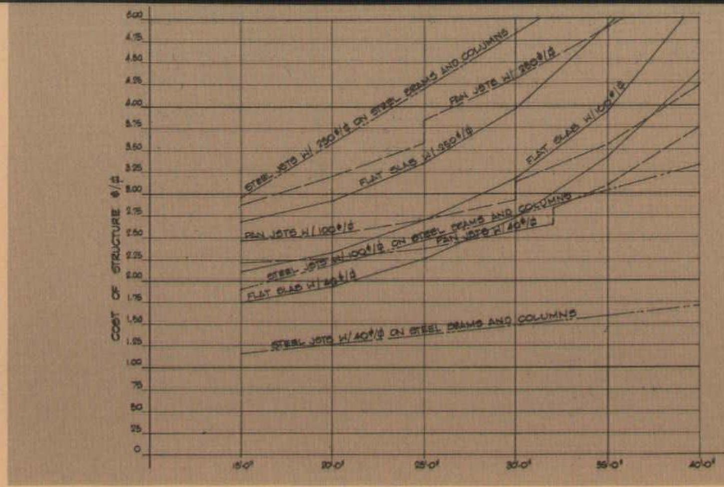
Yet, the cost runout shows that for reasonable spans and high live loads, the flat slab costs cannot be matched. A general rule-of-thumb would state that, for economy, the dead load should not exceed the live load in pounds per square feet of framing.

4. USE SMALLEST MODULE PERMITTED BY THE FUNCTION OF THE STRUCTURE

Economy, as well as satisfactory performance, is related to the smallest spans which will provide satisfactory use of the space. Chart D, which includes the cost of supporting columns, shows that costs generally increase with an increase in span. We have been called in on several case



St. Louis County School



D. Structural Framing System Costs

studies where extra cost resulted from the floor spanning completely across a building, which was then subdivided to smaller spaces by partitions. Differential deflection, thermal camber of the roof, creep, and other common variables caused functional difficulties for which the owner has actually paid extra cost to obtain!

5. USE OF HIGHLY EFFICIENT SYSTEMS

This function of economy is related to structural efficiency. Basic efficiency of structural systems means that inherent depths of structure are incorporated to provide low stresses. Hyperbolic paraboloids use the total depth of the roof slope to reduce stresses to the point that 3" slabs can span 40-50 feet.

Photograph B shows the proposed Field House at Graceland College, Lamoni, Iowa. The three arches utilize the 58 feet of roof rise with resulting low compression stresses. The tension members between the arches are parabolic and use the 28 feet of sag to keep the stresses quite low.

Actually, where space, when needed for esthetics, can be used to increase the depths of beams and joists, the cost of these elements will be lower, to a point.

In summarizing, one very basic idea stands out and this is that we can obtain greater economies in our structural systems by considering all possibilities in the very early stages of planning and fitting this into design so the two can work together rather than apart. We realize that there are exceptions to every rule, but the total concept has to be reviewed before it is impossible to back-up. Sometimes a more expensive (thinner) structure results in less total cost. This may be because of savings in walls, partitions, pipes, etc., related to changes in building volume.

One cost study relative to planning economy showed that a 30¢ per square foot addition in structural design for a building resulted in the addition of another entire occupied floor which was possible under the building restrictions. This alone permitted the owner to increase his income from the building by 100%.

It should be quite clear that there are savings of several times the structural engineer's compensation possible if the architects and planners will allow the consultant to make the most effective use of their technology.

NOTES/CHART D ABOVE

A. Loads shown are superimposed loads.

B. Price Basis. Kansas City Area, January 1968, for medium size job 20,000 to 30,000 per square foot and single floor.

C. Curves are idealized to accommodate scatter of data due to breaks in material costs. (Pan joist system break is due to extra charges for pans over 14" deep).

D. Costs increase slightly for multistory construction, due to compound column loads, higher lift, etc. Costs reduce slightly for more area and increase rapidly for smaller areas, particularly for concrete systems.

E. Costs included floor system framing — 3 or more square bays each way. The supporting column costs are included, but no cost allowable for vertical stacking or high-rise columns. Footing, fireproofing, extra building volume to accommodate deeper system, etc., costs are not included.

F. Pan Joist supporting beams are wide and same total depth as joist system. Add approximately 15¢ per square foot for waffle system costs.

G. Flat slab system has drops of approximately 1/2 the slab thickness extending 1/6 of span from center line column each direction.

H. Steel joists have 3" slab on corruform except 40 pounds per square foot system has steel metal deck.

Jack Gillum discusses structural (architectural) engineering and the computer

The computer is no longer the "Exec-u-toy" of the structural engineer, but a tremendous tool which when used correctly enables him to make a significant contribution to the practice of architectural engineering. In the ten years since the first attempts were made to utilize computers seriously in the field of engineering design, significant progress has been made in the development and implementation of computing techniques to make the computer an invaluable tool to the profession. One might dramatize the effect of a computer in engineering calculations by comparing the speed of hand or slide rule multiplications to that of the current third generation computers which are capable of 375,000 or more multiplications per second.

During the early application of the computer to structural engineering calculations, it was used primarily for the analysis of highly indeterminate and complicated structures. However, through experience and a greatly expanded knowledge of computer programing the state of the art today has reached a point whereby the sophisticated structure can now be solved accurately and easily while the routine structure is no longer handbooked but designed by rigorous methods through the use of a great variety of programs.

The computer is not a magic black box which you tell to design a structure; it cannot perform anything that a well-schooled and experienced engineer couldn't perform if given enough time. It is not a cure-all for poor engineering but conversely requires a better engineer in order to use it.

Stephen Anson Coons of MIT in the 1966 September issue of **Scientific American** has quite aptly stated man's relationship to the computer. "Man is quite good at inventing and organizing ideas, making associations among apparently unrelated notions, recognizing patterns and stripping away irrelevant detail; he is creative, unpredictable, sometimes capricious, sensitive to human values. The computer is almost completely what man is not. It is capable of paying undivided attention to unlimited detail; it is immune to distraction, precise and reliable; it can carry out the most intricate and lengthy calculation with ease, without a flaw and in much less than a millionth of the time that would be required by its human counterpart. It is emotionless, or so we suppose. It suffers from neither boredom nor fatigue. It needs to be told only once, thereafter it remembers perfectly until it is told to forget, whereupon it forgets instantly and absolutely.

When man and machine work together, the shortcomings of each are compensated by the other which leaves both partners free to exercise their individual powers in a common enterprise. The potential of such a combination is greater than the sum of its parts."

To get down to specifics, it is easy to see how the engineer can use a computer to his advantage in solving the space frame, free form thin shell, or

Jack Gillum is the senior partner of Jack Gillum and Associates Consulting Structural Engineers. Mr. Gillum graduated from the University of Kansas in 1950 and has completed graduate work in structures at the University of Denver and University of Colorado.

His firm has recently opened an office in Kansas City and has additional offices in Boulder, and Chicago with immediate plans to open offices in New York City and Los Angeles. The firm pioneered the use of the electronic computer as a tool to optimize structural design and maintains an IBM 1130 Computer at the home office in Boulder, Colorado.

provide the first, second and third mode of vibration for a structure, but how can we use the computer in the solution of a typical architectural problem? To answer this let us consider the various stages in the evolution of an architectural solution. During the diagrammatic or schematic phase the architectural engineer, making full utilization of the computer, can design and make a detailed cost analysis of various framing schemes by varying materials, column spacings and floor depths, and thereby provide the architect with detailed information on structure and its effect on the total concept relative to aesthetics and cost.

The production schedule becomes important almost immediately once the schematics are approved by the owner. Through the use of CPM (Critical Path Method) or PERT (Program Evaluation and Review Technique), the coordination of time schedules, manpower requirements, owner and consultant decisions can realistically be solved thereby enabling the architect and his consultants to complete the production of contract documents on time and at a profit.

After the architectural concept, materials, bay sizes, etc., have been determined in the schematic phase, a more detailed preliminary design can now be made whereby the structure is optimized for cost and individual member sizes are set. At this stage a total cost analysis should be made to insure that the project is within the budget. Here again, cost estimating and the myriad of simple calculations are made simple through the use of the computer.

The final design and cost analysis phase is one in which the structural engineer with his black box can really swing. This phase is one in which the tedious repetitious hand calculations are relegated to the computer, thereby enabling the engineer to make a rigorous analysis of every member or different condition within the structure instead of a few so called typical situations. The deflections as well as all critical stresses for all members can be readily and methodically calculated. Currently, the more sophisticated computer program libraries enable the engineer to analyze as well as design the members in one continuous operation. It is in this stage that the handbook and the empirical approximate solutions become obsolete and the most exacting analysis is performed, thereby making the solution of the most sophisticated problem possible.

In a nutshell then, the computer can be the architectural or structural engineer's good right hand, not thinking for him, but giving him time to think and create better structures by relieving him of the tedious and often impossible or rather impractical multitude of hand calculations; it gives him time to create total structure instead of bits and pieces. Coupled with good imaginative engineering, the computer opens up unlimited possibilities for the future of architecture.

The following reflections upon the current state of city planning practice are cast in general terms. There are no specific references to or judgments upon city planning in Kansas City or elsewhere. The author has no special competency to comment upon local practices, problems, failures or achievements. This would require special study and wide exposure over a period of time to the local scene. It is felt, nevertheless, that these general comments are applicable and relevant to Kansas City since there is a remarkable uniformity throughout the nation in the overall nature of the problems of planning for urban expansion and renewal.

There is a thorough going re-appraisal underway among city planning practitioners and theorists, critical of the failure of conventional theory and practice and seeking new ways of understanding and planning the urban environment. Awareness and understanding of these currents of thought and criticism are essential if the efforts to shape the urban environment into a more, rather than less, humane condition are to remain equal to the difficulty of the task.

URBAN PLANNING

By Peter Walker
Sasaki, Walker Associates, Incorporated

It is ironic that at the same time many architects, dissatisfied at the irresponsiblity and inadequacies of the laissez-faire, individual building approach to shaping the physical environment, have turned their interests toward the wider environmental concerns of urban planning, that many professional city planners have abandoned their visions of the possibility of the comprehensively planned city. There is today a remarkable lack of consensus among city planning practitioners as to the proper role, scope and methodology of city planning. This state of confusion and uncertainty is apparent every time there is a large gathering of planners and more especially in the publications and journals emanating from the various professional sub-groups operating within the city planning area of activity.

That this should be true is not surprising. The questioning arises from the fact that, for many reasons, the application of conventional city planning techniques has been widely demonstrated to be seriously inadequate. Our urban areas still suffer from dislocations, malfunctions, and environmental deficiencies which, theoretically, the application of "planning" should have cured. This applies not only in the older urban areas but in the newer areas where the latest in zoning, subdivisions and general plan controls have been applied from the beginning. The reality of this situation was brought home to a recent large meeting of planners in Houston, Texas. Zoning type land use controls, perhaps the main tool of the city planner in action, have never been applied in Houston.

It was rather amusingly apparent to the gathered planners that Houston looked, or functioned, despite the complete lack of zoning controls, no differently from any other American city of similar size. More serious, perhaps, is the conclusion of a recent study of new planned communities in California. These communities are judged by the authors, despite massive infusions of "planning", to be indistinguishable in most essential respects from the "unplanned" suburban sprawl around them. Some critics have even argued that these planned communities are more sterile as to physical and social environment and amenities than are adjoining "mixed-up" areas, whether new or old.

It has become apparent that the complexities of the urban decision-making process, political and economic, regarding the use and development of land—has rendered, by contrast, the simplistic categories of traditional planning theory obsolete. Perhaps the chief victim here has been the ideal of the comprehensive general plan. This realization has also tended to create the split planning personality referred to in a subsequent paragraph.

A major precipitating factor producing the climate of uncertainty is that ideas and advice emanating from the planning agencies has been more or less openly ignored by a wide variety of legislative bodies and administrative departments. This has caused considerable demoralization among the public agency planners, primarily at city and county staff levels. While more professional glamour and prestige adheres to the practice and role of the private city planning consultant, he too has relatively little of real accomplishment and achievement in the urban scene to show for his widespread efforts. It is also now apparent that, despite repeated efforts at definition, city planning is not a definable quantity. It is not a body of knowledge which, like medicine or law, can be transmitted in the schools and practiced in established and more or less effective patterns. The range of relevant concerns is too broad and the number of variables too great for such definition.

From the point of view of city planning as a profession, the most obvious symptom of the current crisis is the not-very-well-concealed mutual antagonism between two basic orientations—that of the planner preoccupied with "physical" solutions and criteria and that of the planner who operates primarily within a socio-political-economic framework and who brings to his task a great deal of the latest computer technology and a new professional jargon. Both of these groups have, at their poles, a tendency toward all-or-nothing—an intolerance for the vision and concerns of the other with a subsequent loss of viable and applicable solutions incorporating the interlocking contributions of both.

There is a third group, however, (often with training or strong interests in both of the above areas) who, bored with the classical utopian vision cast in comprehensive master plan terms but also aware that mere data, no matter how detailed, does not in itself produce automatic answers to complex choices and alternatives, is nevertheless intensely interested in the quality of the environment —both social and physical. This group is less "all or nothing", being more pragmatic and willing to work hard for a limited accomplishment in order to demonstrate, if only partially, the viability and desirablity of a well "planned" environmental solution. This third force is sophisticated enough to seek out the very widest range of information about the problem to be solved rather than trying to limit the frame of reference and imposing preconceived forms and relationships.

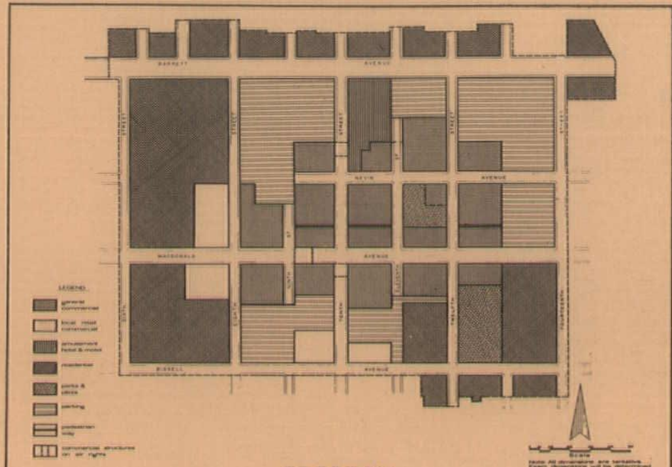
This approach depends strongly upon the "generalist with a specialty"—a strong area of competency with a well developed sense of the necessity of involving other specialists. The basic requirement involved here is a well developed sense of relationships—an acceptance of complexity and the need for dialogue and involvement. This is not at all the same as the "committee" approach where sheer multiplicity of involved persons and suppression of individual points of view is supposed to lead to acceptable answers and decisions. It demands, in fact, highly developed individual points of view and toughmindedness within the area of special competency.

These differences within the ranks of city planners is an expression of the need for understanding and developing an awareness of relationships. The fact that the persons involved in the practice of city planning today includes not only the architects, landscape architects and the traditionally trained city planner (the environmental designers) but also the economist, the urban sociologist, the transportation expert, the lawyer, the political scientist, and the systems analyst is evidence of this complexity and that all of these have a vital role to play.

There is no need to de-emphasize specialized training and practice but to develop understanding and awareness of the need for a coordinated and comprehensive process of decision making and solution production at every level of planning. The necessity of a better decision making process in urban planning is clear. Hopefully, the conflict, questioning and reappraisals are a prelude to development of new, more effective patterns of application of diverse skills and insights.

For the "physical" planners this means the humility and restraint to insist upon the development and application of non-physical program factors before presuming to fix physical forms. For the "non-physical" planner it means recognition that data and programs must be stated in terms which are relevant to the identification of appropriate physical plans and forms. It means the acceptance all around of the fact of complexity in the shaping of urban environments.

Awareness and acceptance on the part of environmental design-oriented professionals of the need to get involved collaboratively in this multi-faceted decision-making process is less a restriction upon their role and contribution than an opportunity to more fully achieve their environmental goals. Any extension of influence in the decision making and physical form giving process will depend upon two things—the development of new insights and greater competency in their own area of special concern **and** the ability to seek out and apply the insights and contributions of others. In short, a combination of greater awareness and sophistication about the range of relevant concern with more singlemindedness in achieving success in physical environmental terms.

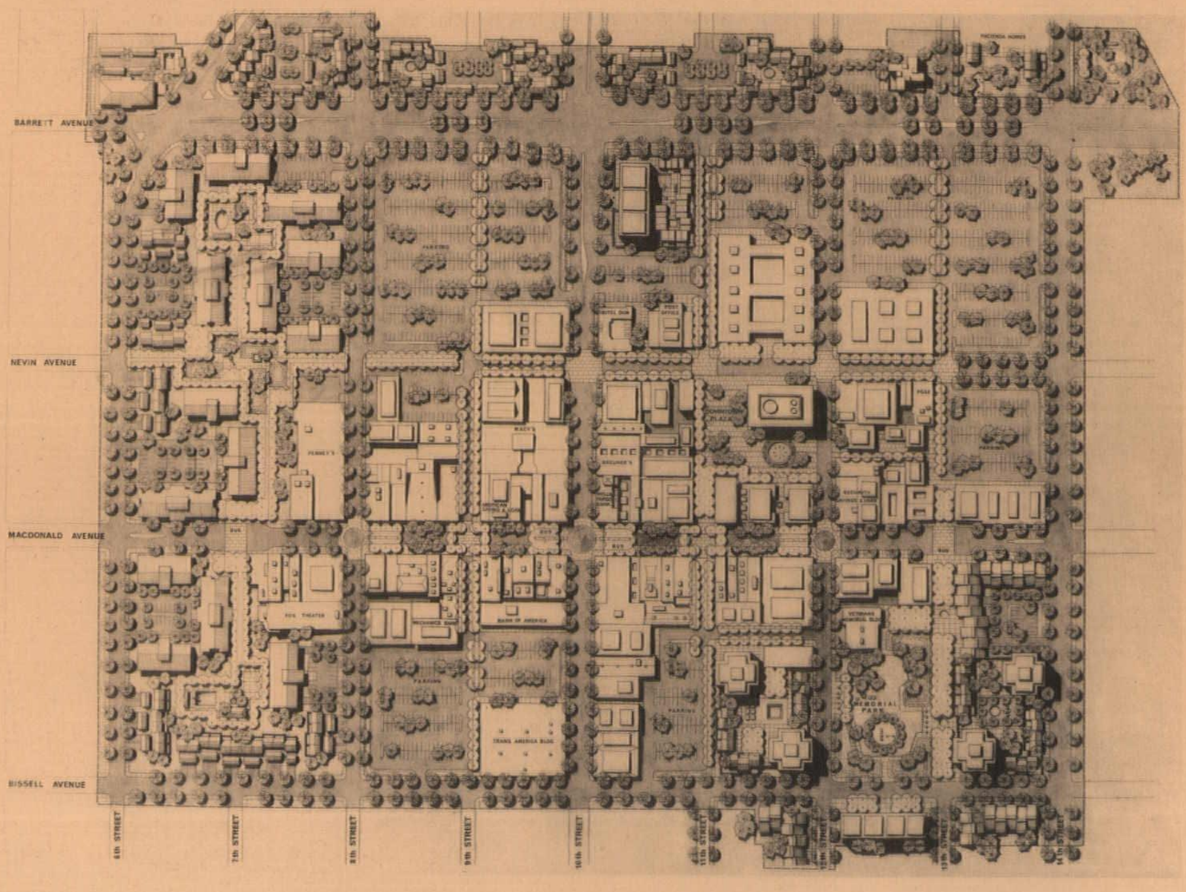


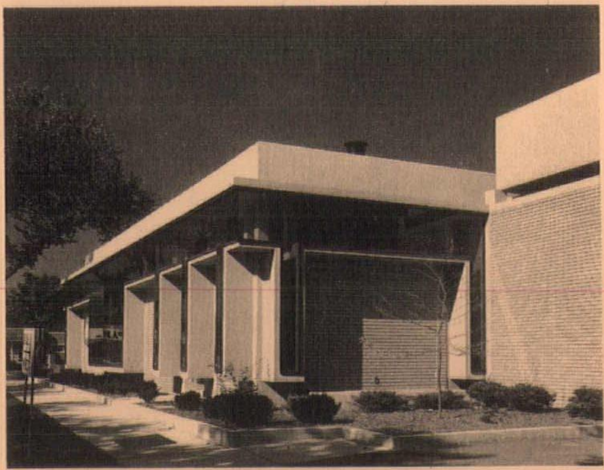
PROGRAM

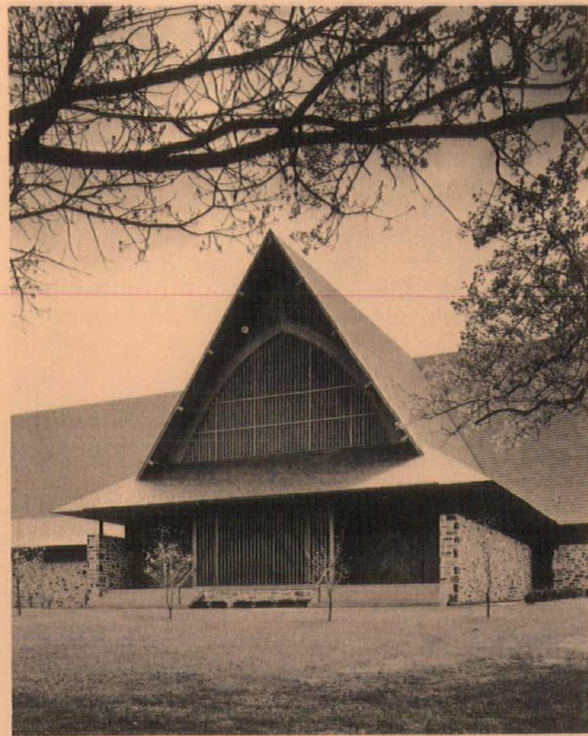
These two plan documents of a downtown redevelopment project underway in Richmond, California indicate the relationship between plan and program.

Preparation of the basic land use document (program) required applications of the full range of social, political and economic considerations, as well as some basic physical factors, primarily auto circulation, parking, pedestrian circulation and the condition of existing buildings. Beyond that, however, the "plan" is absolutely two-dimensional or non-environmental. Preparation of the design plan, with application of highly articulated physical environmental goals and techniques is indispensable if any of the benefits of environmental design concern (coordination, relatedness, separation, clarity, variety, excitement, beauty, scale, convenience, etc.) are to be achieved in anything but accidental terms. It is precisely at this point that many large "planned" projects, whether new suburban communities or downtown redevelopment projects, have failed. The designer who understands the connectedness of program with plan and the necessity for design follow-through will be much better able to demonstrate the validity and possibility of his physical environmental concerns and goals.

PLAN







New booklet being offered by AIA tells how to select an architect, what they do, how their fees are determined, and how to work with them.

your building & your architect

The booklet's author is Donald Canty, former senior editor of THE ARCHITECTURAL FORUM and now director of Urban Information Center of Urban America, Inc. and editor of its magazine, CITY. Mr. Canty is not an architect — he is a journalist with a well-deserved reputation as an objective critic of architects and architecture. The American Institute of Architects selected his article for the use of prospective building owners because it is an informed non-architect's candid view of how architects' and their clients' interests can best be served.

In YOUR BUILDING & YOUR ARCHITECT, Mr. Canty discusses the methods used to select an architect, and the things to look for in making that selection. He tells just what services an architect offers, and how he charges for these services. He shows how to analyze the function of the proposed building and how the architect serves as a diagnostician of the new building situation. Mr. Canty then discusses how to go from concept to construction, including the function of the general contractor, the lines of authority from client to workmen, and possible sore spots — craftsmanship, changes and the calendar.

It's a well prepared booklet, and available now upon written request from the Executive Secretary's Office. Address all requests to Mr. John Lee Smith, Executive Secretary, Kansas City Chapter AIA, 800 West 47th Street, Kansas City, Missouri 64112.

CITY BLOCK pre-shrunk masonry units were specified in KCEA sponsored Vista del Rio Apartments, Kansas City, Missouri.

Architect: John Lawrence Daw & Associates; General Contractor: J. E. Dunn Construction Company; Photography: Joel Strasser.

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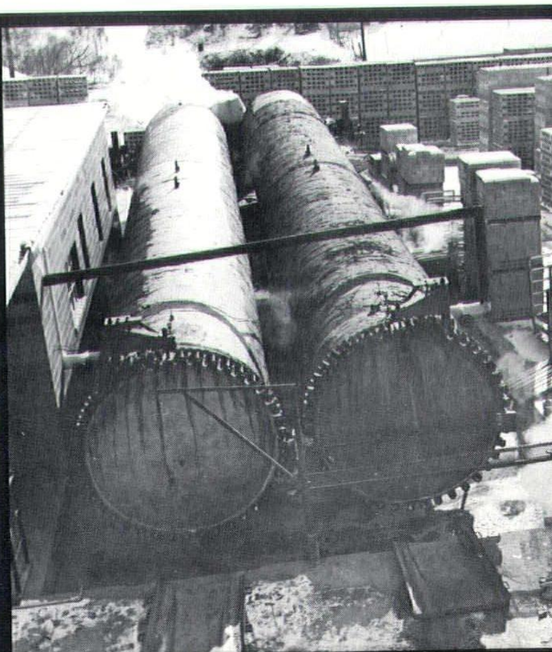

Producers' Council Notes

MEDICAL FACILITIES SEMINAR APRIL 24.

The Kansas City Chapter of The Producers' Council, Inc. will present the seminar at the President Hotel for area architects, engineers, hospital administrators, planners, and building material manufacturers for the purpose of exchanging ideas on the latest trends in hospitals, clinics, diagnostic centers, nursing and convalescent homes. Not only will the design, structure and operation be discussed, but also subjects concerning safety for the individual; environment; communications and transportation; maintenance; and structure.

Dr. Louis Block, noted hospital consultant from Silver Spring, Maryland, will be the keynote speaker, and will discuss the next decade's medical facilities needs and goals. A panel composed of area professionals will further discuss industry trends. The panel consists of Mr. Angus McCallum, F.A.I.A.; Mr. Ray Perkins of the engineering firm of Holloway, Perkins, and Eisman; Mr. Jack Reed, Superintendent of the physical plant at K.U. Medical Center; Mr. R.W. Westergren, Hospital Administrator of Trinity Lutheran Hospital; and as their moderator, Mr. Walter Coburn, Executive Director of the Kansas City Metropolitan Health Planning Council.

Products and product concepts of participating manufacturers (members of Producers' Council, Inc.) will be discussed and displayed.

Mr. Chuck Mendenhall, is the Coordinating Chairman for the local P.C. Chapter.

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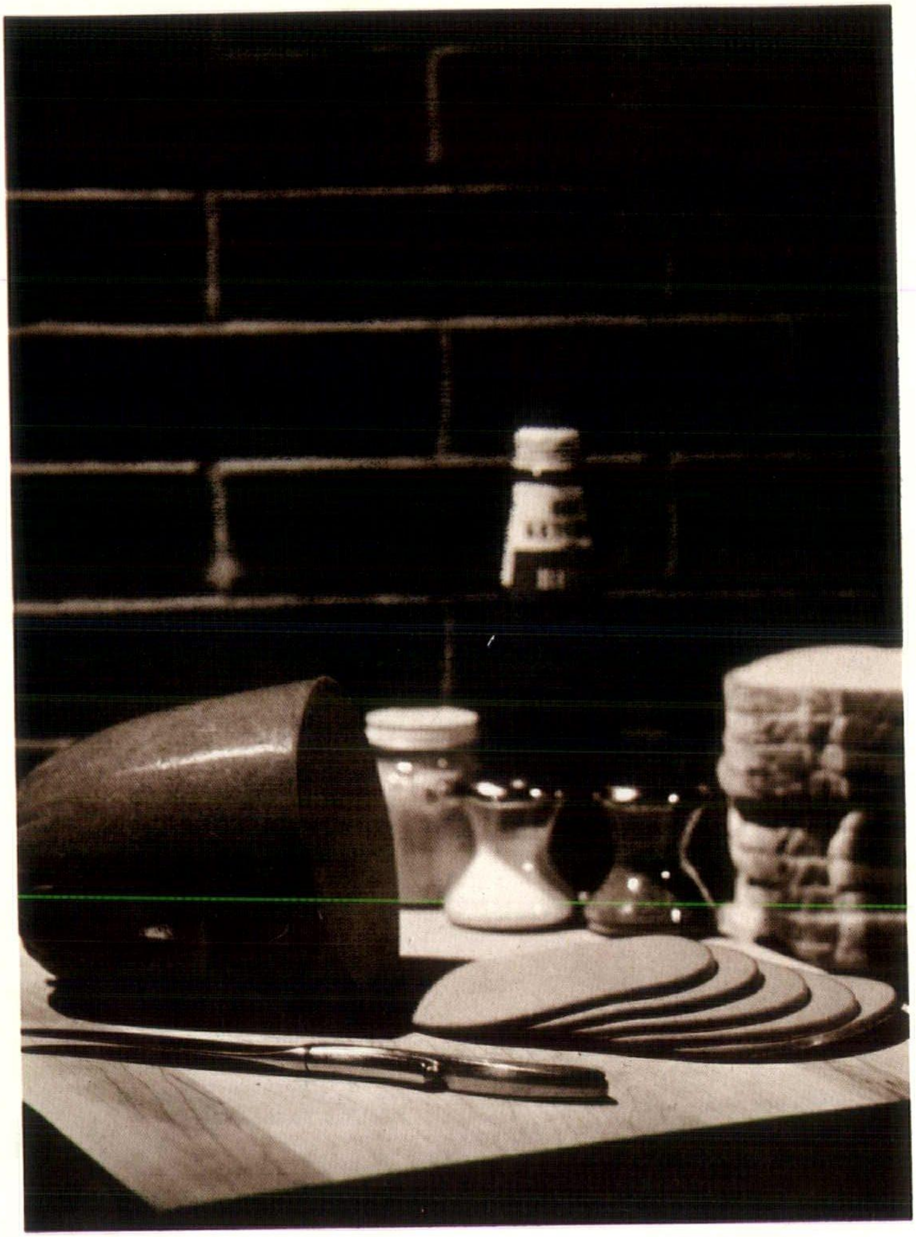

BALONEY AND BRICK

A sandwich is the last place in which you would expect to find brick. Why, then, should you expect sandwich meat such as baloney to be used in connection with construction? Expect it or not —baloney is being widely incorporated in some information on construction materials.

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