POTOMAC VALLEY ARCHITECT

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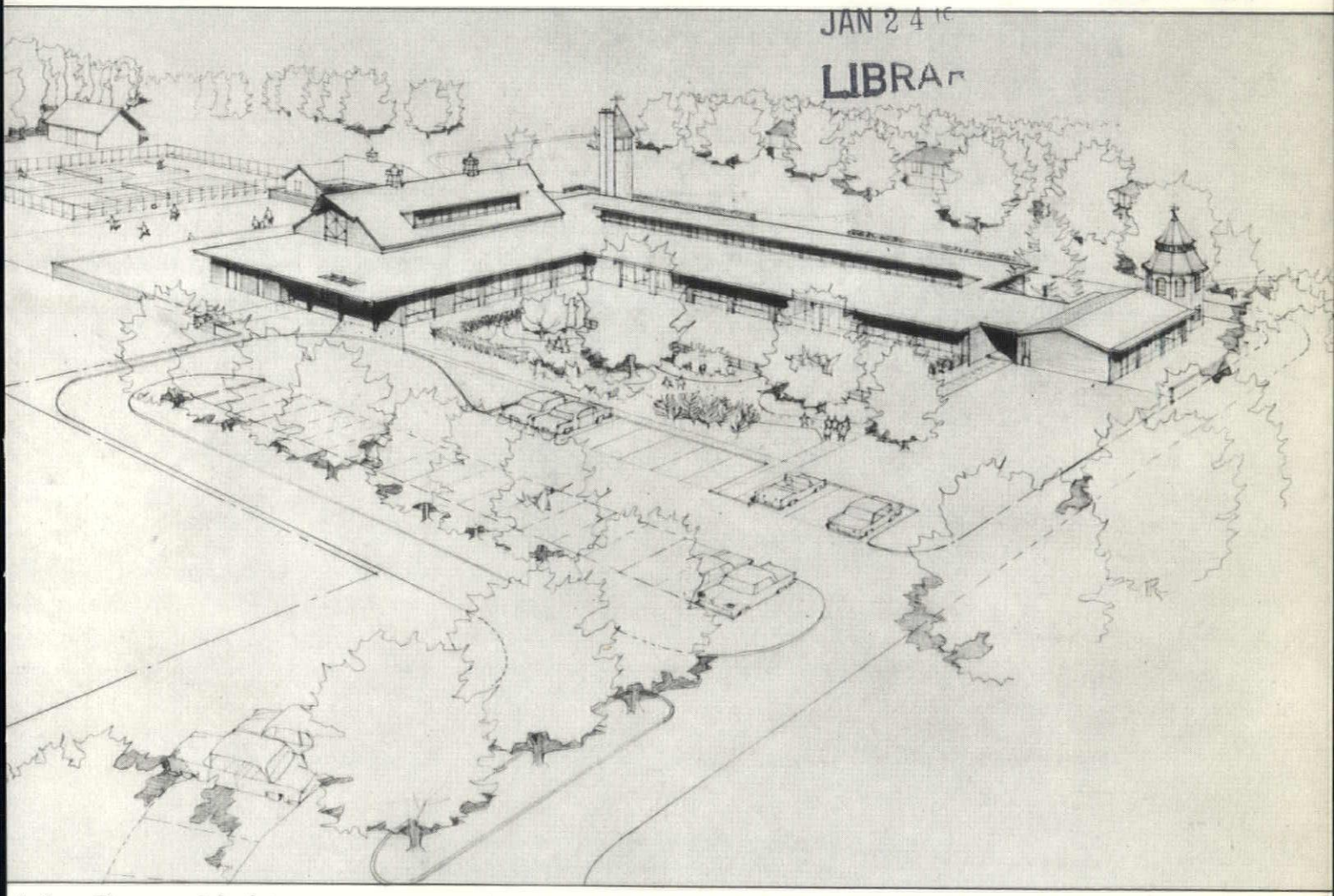

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OF MARYLAND
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NEXT REGULAR MEETING
12 Noon, February 7
Brook Farm Restaurant
7101 Brookeville Rd., Chevy Chase, Md.
MARCH MEETING
March 7, 1962

NEW FIRM

Terry Fred Horowitz, AIA, and Walter Seigel, AIA, two new members of the Potomac Valley Chapter of Maryland, announce the opening of an architectural firm to be known as Horowitz, Seigel, AIA, Associates, with offices located at 6406 Georgia Avenue, N.W., Washington, D. C. The telephone number is RA. 3-7018.

NEW ADDRESS

John E. Moore, Treasurer of the Potomac Valley Chapter, AIA, has moved his office for the practice of Architecture to 7815 Old Georgetown Road, Bethesda, Md. The telephone number is 654-0350.

AWARDS

The firm of Cohen, Haft & Associates is the recipient of two awards in the recent competition program of the Washington Board of Trade. A residence for Dr. and Mrs. David Eden, in Bethesda, Md., and an office building on Spring Street in Silver Spring were the winning entries. A principal in the firm, Jack C. Cohen is the President of the Potomac Valley Chapter.

SCHOOL OF ARCHITECTURE FOR MARYLAND

by Andrew H. MacIntire, A.I.A.
Chairman, Education Committee

The possibility of a School of Architecture is being considered by officials of the University of Maryland. Our Chapter, for some years, has tried to interest the University in such consideration and has, through inter-Chapter contact, attempted to keep up our concern for such a school. Recently Mr. Russell B. Allen, Assistant Dean of the College of Engineering, for a third time is giving the matter further study. As a member of a Special Curricula Study Committee, should favorable conditions and support be deemed satisfactory, Dean Allen may recommend to the University Senate that a School of Architecture be established. Dean Allen seems convinced that such recommendation should be made and contacted the Chapter for supplementary data and "the Architects' support." The Baltimore Chapter, the Washington-Metropolitan Chapter and our Chapter representatives met with Octagon representatives on several occasions, sometimes with Dean Allen, to prepare a report, specifically requested by the Dean, to be prepared by our Chapter. The report, however, was to show support by the Architects of Maryland. In order to obtain supplementary data for the report the Chapter Education Committee conducted a survey by letter and post cards to A.C.S.A. member colleges and universities.

The survey produced some interesting information:

There are 122 students from Maryland studying Architecture in 22 schools outside of Maryland.

West Virginia and Delaware, with no Architectural schools, have 36 and 17 students respectively.

There are 10 Maryland students at V.P.I., 10 at the University of Virginia, and 19 at Catholic University. Data on size and budgets of various schools was also obtained.

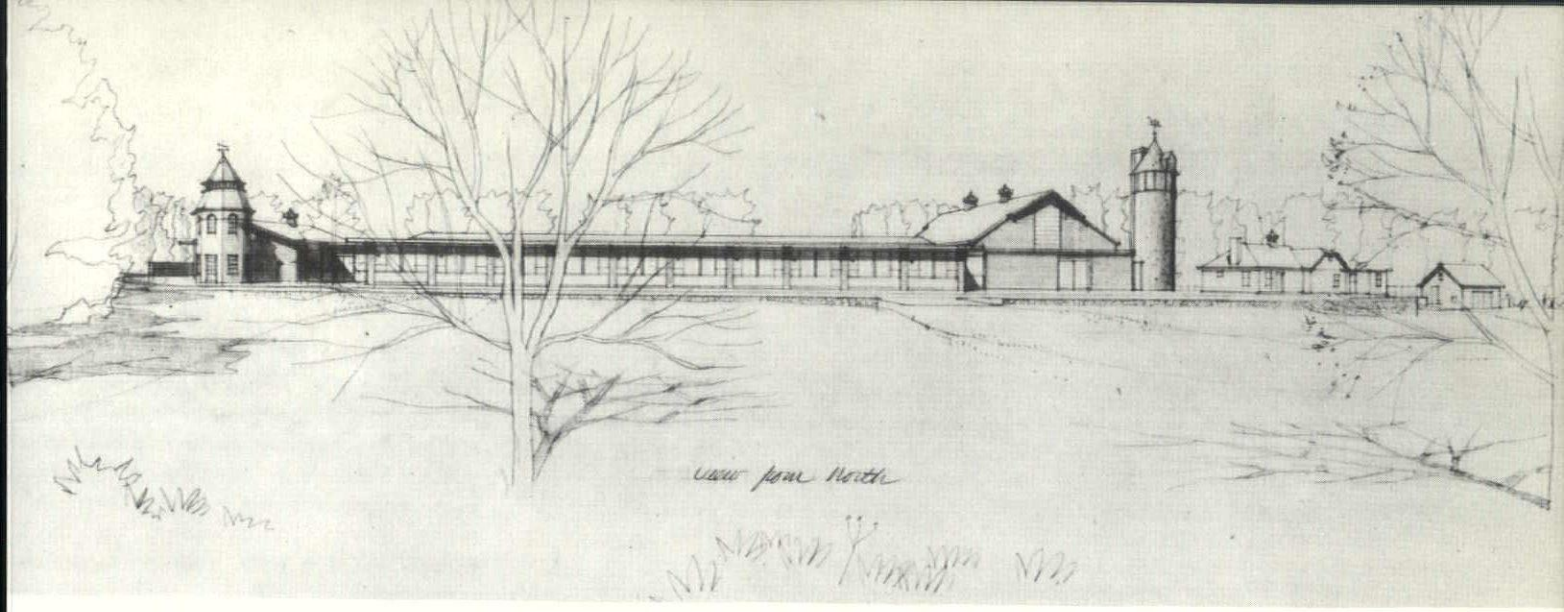
There are 175 Architectural offices in Maryland with an average of 4 persons per office, a total of 700 architectural workers.

There are 348 Registered Architects working and residing in Maryland (this does not include out-of-state registrations). Other survey data indicates that, prudently, 10 to 20 Architects per year are needed in Maryland to replace those who die or retire, and to satisfy increasing manpower need.

A school which could graduate 10 to 20 students per year would require an enrollment of 200 to 250. Potential enrollment initially would appear not unrealistic at 100, with growth anticipation to an ultimate of 200 to 250. Architects educated outside of Maryland tend to practice out of Maryland, a trend which could be curtailed by a School of Architecture in Maryland.

The Chapter's committees in meeting with Dean Allen were delighted to find in him a person who spoke the Architect's language. It was unnecessary to talk "quality school", "autonomous school", "strong Architectural Dean", etc., for we found in him a built-in awareness of what would constitute a good School of Architecture. Previously, in considering this matter of a school, a negative result was reached since a report, "Architects for the South", in 1950, reached a conclusion that no new Architectural Schools were deeded in 16 Southern States (including Maryland), as manpower needs were being met by existing schools. The data tables were updated in 1959 by N.C.A.R.B. and together they show that of the 16 states, Maryland is lagging, showing a decline comparatively in the number of Registered Architects, while almost all the other states show a gain.

Our report, we felt, showed need and potential, that our National Committee stands ready to aid in further study and that the Architects of Maryland were vigorously in favor of the establishment of a School of Architecture and would lend their support. The report is in the hands of the Faculty Study Committee, which we hope will result in a strong recommendation to the University Senate.



AYRLAWN ELEMENTARY SCHOOL, MONTGOMERY COUNTY, MARYLAND

The Ayrlawn Elementary School, now under construction, is located in the northeast corner of the North Bethesda Recreation Center. It is a 3.09 acre site acquired by the Board of Education from the Planning Commission. This "Park-School" is designed to share its facilities with the Park and Planning Commission and the County Recreational Department. The school in turn will use the park playground facilities.

In addition to this requirement for dual use, certain features of the site had a great deal to do with determining the design. The area chosen was the site of a handsome group of farm buildings with many fine trees and landscaped areas. Local citizens were keenly interested in the project and naturally concerned with its effect on the park. They wanted a building that fitted in with its surroundings and which was sited to save the trees. Many of their houses were adjacent to the school site.

In early design studies, an effort was made to use one or more of the larger existing farm buildings as a part of the school plan. This proved to be impractical because of the odd shape and limited area of the site, and expense of remodeling required to meet county requirements. In the final plan, however, two of the small farm structures have been retained and most of the existing trees and shrubbery have not been disturbed.

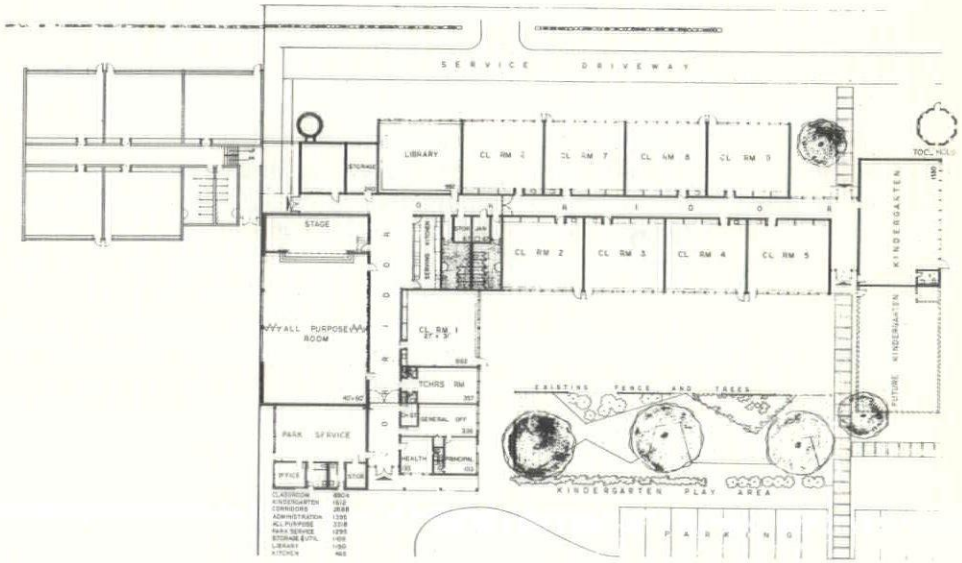
The building now under construction will have 9 class rooms, one kindergarten, an all-purpose room, library, teacher's room and administrative offices. It also includes one room of approximate classroom size with separate toilet facilities which will be available to the general public through the Planning Commission's Park Permit office. It also may be made available for school use.

The existing silo, located on the west end of the building, which is engaged to the boiler room, is used for trash storage. The grain chute will be used for the boiler room chimney. The small octagonal building on the east is used for tool storage. The plan also provides for a future two-level wing at the west end of the site which will provide nine additional classrooms. A second kindergarten will be added adjacent to the present kindergarten on the east.

Construction is masonry bearing walls and piers supporting laminated beams over the classrooms. The pitched roof structure over the kindergarten is a standard light wood truss and the all-purpose room is spanned with tied laminated beams. Two and one half inch "Tectum" supported on bulb tees forms the roof deck. This material also provides the required thermal insulation and serves as an acoustical ceiling.

Finned tube radiation in under window cabinets and centrally conditioned outside air supplied through a corridor ceiling plenum provide heat and ventilation to most of the spaces. Air is returned through corridors. This system is supplemented in the kindergarten by hot water radiant heating in the floor.

The building was scheduled for completion on December 31, 1961. The contract price was $316,496.00.



AN APPROACH TO URBAN DESIGN

by Morton Hoppenfeld, Assoc. AIP, R.A.

Few would deny that we who live in cities generally do so in varying degrees of visual and social squalor. Over the years we have become dulled to the things we see about us, and probably fortunately so. Our innate quest for order, balance and harmony in our environment would leave us ill were it not for the build-up of a protective, selective vision which allows us to unconsciously filter our impressions of the city. Our perception of the world depends not only on sheer optical stimulation, but also upon the interest of the individual observer. Thus, in time we tend to see only what we want to—only what we need in order to subsist in our man-made urban environment. How many of us really see the city? Can we assume that the urban environment is in part a conditioner of urban society? Therefore, must we not all see it in a more positive way?

One of the many reasons our cities are so visually and emotionally unsatisfying is the uniformity and lack of differentiation in the city pattern. The essence of the city lies in the breadth of choice it can provide in all matters of fundamental concern. The urban life alone affords diversity and contrast which permits an anonymity, humane because it is not imposed. These characteristics are basic and exist best in cities of proper size and form. Inappropriate form results in a curtailment of range of choice. Every lack of differentiation in a city's physical pattern means a negation of choice and thus a negation of true urbanity. In a city of quality, each element, as in a mosaic, contributes to the splendor of the whole, without losing any of the luster of the individual tessara. In fact, the single piece can only assert its real significance within the context of the whole.*

How little of today's American city provokes positive response and rests at ease between the extreme conditions of chaos and utter boredom?

If we look for causes in today's plight, we find them numerous and complex. But let the buck stop here for the moment.

Let me suggest that we architects, with few notable exceptions, have ignored the city. We have as a profession tended to develop our concepts of form in an esthetic ether and applied them at random. Think hard and list your favorite twenty architects ('form givers"?). What proportion of their work—real or theoretical—has been truly in the realm of urban environment? Whatever the reasons, and there are many, the leaders of our profession have not had or sought the opportunity to build the city.

Think of your education, of the books and periodicals available. How many design problems addressed themselves to the city then and even today with the "new awareness"; how much has it changed?

I suggest that a part of the responsibility for the ugly American city rests here with us—the architects. I further suggest that if we are to rise to the challenge of the city building and rebuilding which lies before us, we must foster a new breed of designers humbly to address themselves to the problems of urbanity. This is not an easy task, since the problems are extremely complex and require continued thought and research. But only with the recognition of this complexity will progress begin.

In the development of an approach to the design of cities I think it important to call particular attention to two significant aspects of "Urban Design" which have had a substantial influence and will have even greater influence on the quality of newly developing or rebuilt urban America. Although these two aspects are basic, their pertinence remains relatively undiscussed and unrecognized.

They are:

1. The process by which designs are developed and produced; and
2. The concept of appropriateness: the values expressed in and the reasoning of the design.

As part of a multi-faceted problem, the two are intimately related and dependent one upon the other.

Traditionally, any discussion on questions of urban design tends to avoid these two key issues since emphasis is ordinarily given by professional "designers" to the elements of "pure design": the abstract qualities of good or bad spaces, relationship of heights, quality of architecture and materials and the like (provided, of course, the maximum floor space is provided). This is not unusual, since it is in this realm that "designers" are typically trained and it is in this realm that the lay public is educated by mass and professional journals.

This almost singular concern for "pure design" (i.e., forms abstracted to large extent from total urban context) if left to dominate the urban design process has resulted, and will continue to result, in a product of questionable value relative to the great effort made.

I do not contend that a poor design in the abstract sense need or should be tolerated. The purpose of this exploration is not to diminish the quality of the end-product; on the contrary, it is to improve quality by extending the basis from which it is conceived and by which it is judged.

1. Process: A basic criteria of good urban design is the "likelihood of accomplishment": is the design such that it has in it the seeds of fulfillment? A good urban design must be consistent with the urban forces at work — the forces of social and political action and urban land economics. In short, a good solution demands a clear, precise and profound statement of the problem itself, and from that will the ideas emerge. This is not to suggest that such designs are therefore manifestant for easy completion: often quite the opposite, a good design requires a good fight for its acceptance or dominance among competitors. But I do suggest that its "natural" situation will win out once it has been given the chance. It is here that the process by which the design was created and is promulgated comes into play.

If the problems have been clearly defined, needs and desires realistically and clearly appraised and a hierarchy of value established, then the design will have some chance of widespread acceptance. Nothing is more discouraging than the performance of a designer who expects his sensitive "arrangements of masses in space" and his exquisite arrangement of window mullions to carry the day against the hard facts of human needs and city function.

Acceptance of the criteria of naturalness and harmony in the hierarchy of urban requirements and forces, necessitates a process for developing designs which puts the designer in a position to understand and translate these forces. This requires that the designers seek the means and processes to put themselves in a position to understand the complex requirements of an urban design situation. Only few designs are prepared by a

team of urban planners with varied backgrounds working together with developers and designers exposed to the problems and potentials of the total city. Consequently, only a few designs are effectively used, and of those few only part represent a net gain in terms of the basic problem. The process of design formulation has a profound effect on the kind and quality of end-product as well as on likelihood or desirability of accomplishment.

The usual method of approach to many of today's typical urban design problems has its roots in the theories and process of architectural education, abetted by the visiting jury system of judgment. Where there is lacking a true understanding of the problem or a really adequate guide program, most designs are focused toward a quick response; a single bold statement often symmetrical or at least two dimensionally balanced, susceptible to rapid visual cognition and generally photogenic. These are the criteria which govern, in the one-shot design venture. How different this approach to the one which would attempt to recognize organic growth patterns and systems which may not be readily perceptible in the traditional concept of purely visual order. This design approach would consider total context and the infinite (as opposed to the finite nature of a building) nature of urban pattern, the man's eye level views from every point in preference to the bird's, the processes of fragmentary city building, the necessity for staged development and occasional (sometimes even desirable) compromise from design idea along the way, and the attempt at expression of true community values. It is true that these two approaches do not always conflict but usually they do.

In summary, it is the processes of design development which are basic to good design as well as the individual skill of a talented designer, the latter of which should be an accepted constant. The extent to which the design process reflects real community objectives; the extent to which the designers attempt to clarify and state these objectives both in verbal and design terms; the extent to which the designers and the design are flexible enough to adjust to inevitable compromise and program change; and the extent to which the design promulgated can withstand the natural democratic forces of conflicting interests and still be a work of urban vitality; these are the measures of successful urban design.

2. Appropriateness: Much has been written lately by a few sensitive urbanites who decry the lack-lustre of recent renewal efforts. In most cases, life was in effect "designed" out of the city. Those very elements of vitality, activity and variety which constitute the essence of the city were the least considered. In the strenuous quest for "architectonic form" (compositional), the content tends generally to diminish in importance and in the end meaningless (out of context) form becomes hollow. In earlier times and often in the natural "undesigned" city building process, the shape of the container evolved slowly to reflect and satisfy the organic content of the city. The nature of urban content (life) and resulting urban form in kind and quality was an expression of the values of the people involved, whereas, in the case of "abstract urban design," values are either consciously or unconsciously imposed upon a public not yet on the scene. This is not always a conscious case of architectural purity vs. social requisites. Often social goals are masked in architectural terms. It is not unusual to find, upon putting a given plan into its larger social and physical context, that elements which seem logical unto themselves take on a different meaning in the larger relationship. When design reflects a clear social attitude and objective, it is on this basis that the design should be resolved before a qualitative judgment can be made on the dimensional aspects of urban design. Urban designs express important social and cultural values, but "design" discussion usually revolves about "function" (scale of the street, traffic noise, open space, etc.) or 'formalism" (proportions, symmetry or asymmetry, "interesting shapes," etc.). Thus, confused or conflicting values result as a by-product of misplaced emphasis.

It is extremely important that urban design be recognized as an important, though often obscured, expression of urban values and as such will take on a greater significance in city building. Real community values can become the shaper of the container in this age of complex social order only by conscious effort.

We have generally thought of urban design only in terms of relatively small and defined project areas (an easy extension of the design of a building). It must be recognized that the design process need include a simultaneous concern for the urban qualities of whole metropolitan areas and city sectors as well. This is not to suggest that we can or should attempt to fix a "design" for such areas which by their very scale and complex nature defy a formalistic or architectonic approach. The designer is by training and nature a "visualizer," one who can see the product before it is consummated. In the countless daily enactment of urban building processes (such as highway and road construction, street widening, sewer location, zoning and building code enforcement and public housing locations) there must be design considerations. Our cities have reached an order so complex that few such decisions can be made without far-reaching effect. In each decision to build or tear down, the question should be asked, "How does this affect the quality of the city?" The urban designer is a critical link in the feedback process between physical elements of the city and the city's basic civilizing function and quality is his guide stick.

Who is an urban designer?

Which designers deserve or should seek such a title? The basic requirement is to be committed to the prospect that the city is a positive expression of civilized man and as such should be among his greatest achievements. To be an urban designer he must have a clear understanding of and a positive philosophical attitude toward the values of urban life and most important, the relationship between urban form and these values.

Good urban design results from a constant search for "meaningful form" and comes only through continuous involvement and study of the highly complex organism we call "city". Through a concert of "urban studies" we are rapidly learning more about the city, but no amount of formal training alone will suffice. Qualification is the reward of commitment and concern.

How do we distinguish an authentic urban designer from one self-proclaimed? In many ways:

He is learned and sophisticated but still retains an open mind.

He is equally at home with the problems of traffic and real estate as those of group living patterns.

He is sympathetic to all human needs however mundane they seem, and relies on available scientific knowledge and techniques as well as a keen common sense.

He recognizes the necessity of team effort and perseverance.

He knows the historic nature of cities and

(continued on page 8)

SUBSOIL & FOUNDATION PROBLEMS IN THE METROPOLITAN WASHINGTON AREA

by James J. Schnabel

In the metropolitan Washington area it is not unusual for the excavation of a building foundation to be cause of alarm for the architect, engineer and builder. The digging may have revealed a number of subsoil problems including soft and loose soil, fill ground, water, or hard rock. These latent conditions can produce headaches and increased costs for proper corrective action.

It is a widely known fact that there is a great variation in subsoil conditions in the Washington area over relatively short distances. There are geologic reasons for these great variations. Washington is situated at the border of the oldest rock of the earth's crust and sedimentary soils of the coastal plain. Rock Creek and the Montgomery County-Prince Georges County boundary may be considered the dividing line between the disintegrated rock soils and the coastal plain soils.

Soils to the west or in lower Montgomery County and Northwest Washington are generally formed by the disintegration of various extremely old rock formations. These soils are all underlain by rock at depths varying from the surface to as much as 77 feet at the National Institutes of Health. In some areas — and Wheaton is a typical example — these disintegrated soils are extremely soft. The presence of soft soils in Montgomery County is usually coupled with high groundwater, or stream valley deposits washed in from surrounding higher ground.

Wheaton Plaza Shopping Center is a good example of subsoil variation in the area of one shopping center. The Woodward & Lothrop store was constructed first and required a mat foundation due to underlying soft sandy silt and clayey silt soils. Montgomery Ward, at the opposite end of the mall, is founded on solid rock at the basement floor level. The recently opened 8-story office building is founded on caissons drilled to rock at an average depth of 12 feet below grade.

Prince Georges County can also produce some surprising variations and extremely soft soils. The general geologic pattern in this County covers about 110 million years and consists of various layers of clay, sand, and gravel deposited mainly by the ocean, or great rivers from the west. Below these layers the rock of Montgomery County is present. Several strata formed in geologically recent times (15 million years ago) are generally soft and should be avoided for building foundations. One sandy silt strata at the proposed Suitland High School site was drilled to a depth of 130 feet without locating appreciably denser soil. The school was relocated to a nearby sand and gravel strata to avoid extremely costly special foundations.

Large areas of Prince Georges County are also within river and stream valleys that are underlain by silt, sand and gravel alluvial deposits. These soils are generally irregular but possess one similar characteristic — water. Sites in these areas should be carefully checked to avoid soft soils and water problems.

Downtown Washington affords an excellent example of non-uniformity in subsoil conditions. The recently completed office building at 808 17th Street is founded on 14-inch bearing piles driven to rock about 48 feet below street grade. A new office building under construction one half block north is founded on spread footings designed for 8000 pounds per square foot soil bearing pressure. The Hill Building directly across the street is also founded on spread footings designed for the same bearing pressure. These variations are caused by geologic factors and streams that ran through downtown Washington many years ago.

Certain clays found from Alexandria, Virginia to Laurel, Maryland create special problems for the designer. These clays are subject to substantial shrinkage upon loss of moisture and have been the cause of settlement and movement of hundreds of buildings in Northeast Washington. A two-story masonry apartment on Trinidad Avenue, N.E., moved laterally with openings as much as 1¾ inches in width in front and rear walls. With the proper investigation and analysis of subsoil conditions the engineer can prevent or limit damage due to clay shrinkage.

Landslides can also plague the architect, and ruin the cost feasibility of certain projects. It is a characteristic of certain clays in this area to lose strength when the weight of overlying soils are removed, and when exposed to moisture. These soils can be cut at relatively steep slopes but after several years, and generally heavy rains, landslides will occur. The landslides found along the Baltimore-Washington Parkway are in this category. Other slides occur due to cuts being made too steep coupled generally with clay soil and water at the toe of the slope. The spectacular slide of July 1958 which dropped the backyards of three homes on Longview Drive, Alexandria, is believed due to these causes.

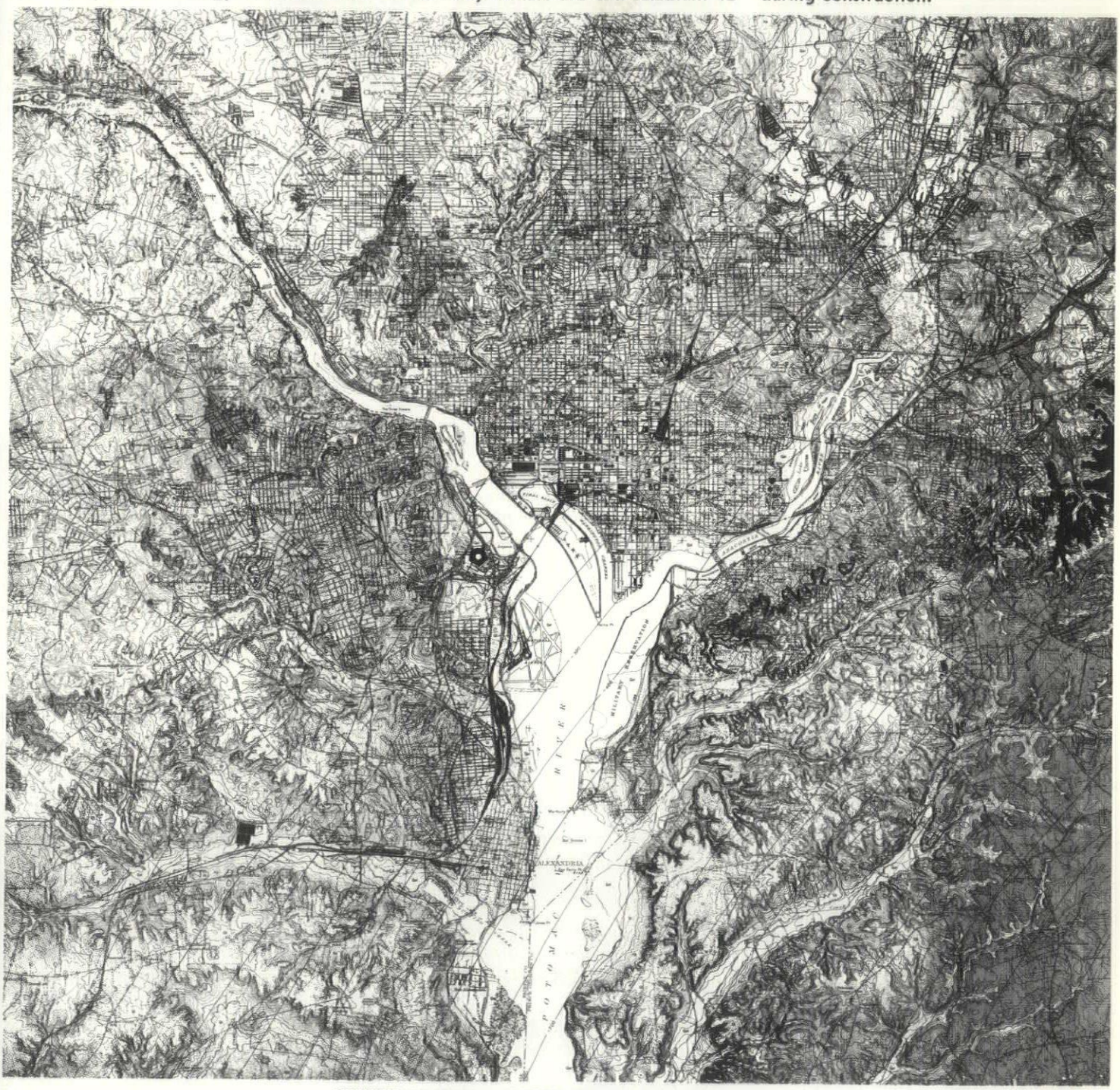
Recent foundation engineering and construction techniques have allowed the construction of special foundations at moderate cost, and on occasion at less cost than conventional foundations. The drilled pier or caisson foundation is a recent development in foundation construction. The drilled pier is a mechanically drilled hole into the earth which is enlarged at the bottom to satisfactory bearing area, and concreted. These piers are ideally suited for certain soil conditions in this area as the soil at the bottom of the pier must be capable of standing unsupported while being enlarged. The use of drilled piers to rock and stiff clays is common practice in foundation construction in the Washington area. Treated creosoted timber piles are also becoming frequently used for small structures requiring special foundations. These piles are usually driven in areas in which drilled piers are impractical due to subsoil conditions.

The development of earth-moving and compaction equipment has made the construction of buildings on controlled fills possible. Compaction of sand and gravel soils in earth fills with modern equipment can produce a denser mixture than is usually found in nature, providing little or no silt or clay is present. This technique has been used at New Haven, Connecticut to produce over 180 acres of industrial property from swamp waste land. Buildings constructed on the fill at New Haven will be on conventional spread footings designed for 4000 pounds per square foot bearing pressure. The same method is being applied at the Capitol Gateway Plaza Shopping Center under development at the Baltimore-Washington Parkway and Defense Highway, except that a maximum allowable soil pressure of 3000 pounds per square foot is being used.

Improved methods of sampling and testing soils and the use of soil mechanics has removed much of the guess work from foundation engineering. Strength and settlement characteristics can be determined in the laboratory from undisturbed tube samples of the

natural strata. Shrinkage potential and estimates of total shrinkage can be determined from tests on samples from suspected clays. The possibility of landslides and corrective action can be determined by test borings and strength tests on undisturbed samples. Natural density of soils under proposed foundations may be measured by undisturbed sampling techniques instead of being estimated by the usual sampler blow method. Recent developments in nuclear and photographic technology will make the measurement of soil density and actual strip photographs of subsoil strata possible. Observations of settlement of finished structures are also being made by forward thinking firms to increase our knowledge of the reaction of soils to building foundation loads.

The architect, engineer, and builder generally recognize the need for a proper subsoil investigation and foundation analysis for major building structures. However, many owners are still reluctant to spend additional funds for a subsoil investigation, or the special soil analysis that may be required for the particular site. In this way building foundations will progress from the realm of guess work to sound engineering practice. This is a dangerous approach that can result in one or more latent subsoil problems. We should insist that proper subsoil investigation data be provided by a reliable firm for use by the architect and structural engineer in design, and the builder during construction.



SEDIMENTARY FORMATIONS OF WASHINGTON, D. C., AND VICINITY

For those interested in detailed study of soil characteristics of the area, or those who appreciate beautiful cartography, this map is available from the U.S. Geological Survey. It is approximately 40" x 40" in size.

AN APPROACH TO URBAN DESIGN

(continued from page 5)

their lessons and respects the values of previous generations without being servile to antiquity.

With each assignment, he intellectually and emotionally extends his given site to seek out and comprehend the vital inter-relationship between his site and all its effects.

He understands the kinesthetic nature of experiencing a city and its parts.

He will reach for that delicate balance between internal programmatic needs and the needs of a larger environment.

This designer recognizes that the city is not made of buildings alone, but that they are an integral part of generally more important open spaces that often long outlive the structures about them.

He can sense the many systems of open spaces, the kinds and hierarchies of street, square, circle, and park.

The urban designer has the sense of humility to design appropriate buildings that will blend to become background to one more deserving of the foreground.

He does not shoot his cannon to kill the fly. This designer understands that buildings only seldom appear in a space—but more often join with others to create a space.

Finally, the truly great urban designer can rise to that wonderfully rare opportunity of building on the special site, that special building which demands all his creative resources to make significant architectural and urban form.

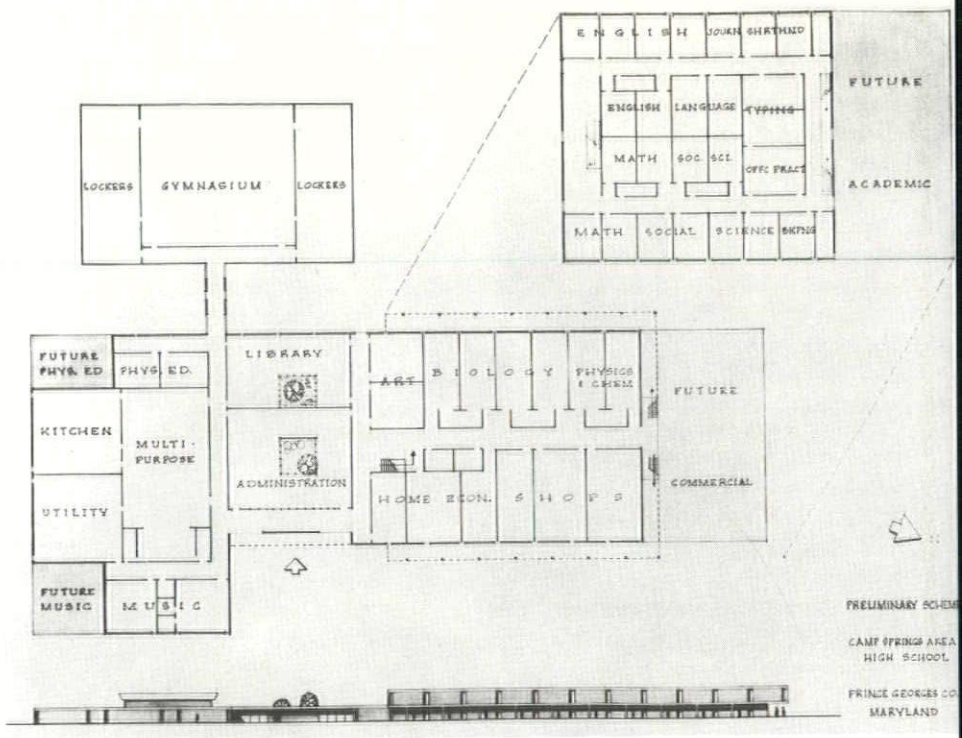
When we as a culture produce more such designers, then we will have more beautiful and livable cities. It is not necessary or probable that all designers become urban designers. But for those who so choose, let them begin with the same desire to learn that distinguished the youthful approach to their basic design discipline.

*For a provocative discussion of this theme see "The City and the Arts" by Edward Sekler Daedalus. Winter 1960.

Edwin Bateman Morris, FAIA

Norwood, built in 1783, is now the residence of architect George Riggs, AIA, of Clas and Riggs.

CAMP SPRINGS AREA HIGH SCHOOL



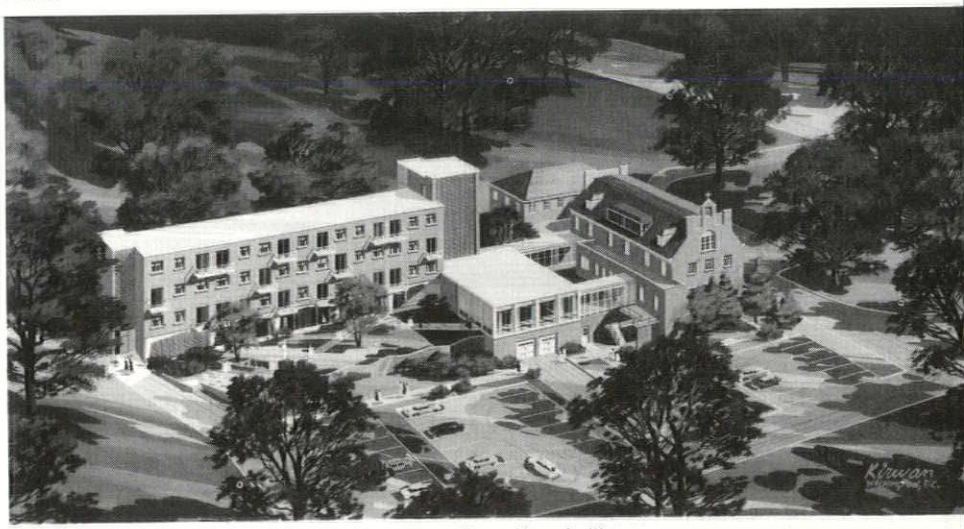
PAUL H. KEA, DAVID SHAW & ASSOCIATES, ARCHITECTS

The Camp Springs area High School is being designed for the Prince Georges County Board of Education. It is the first air conditioned school being planned in this county. The program calls for the design of the first forty-three (43) classroom unit of a sixty-seven (67) classroom high school. All rooms are to be air conditioned except gymnasium facilities.

Rectangular shaped classrooms have been oriented with the short wall on the exterior. Classroom fenestration has been reduced to provide narrow vertical strips of glass at each end of exterior walls.

To provide relief from the large areas of solid exterior surfaces the lobby, entrances and exterior circulation areas are designed to be as open as possible. In addition certain areas of the building will be pierced to provide small landscaped interior courts.

It is expected that the economies inherent in compact design will offset the cost of air conditioning equipment and that reduction of exterior wall surface and fenestrated areas will reduce operating expenses when compared with conventional non - air - conditioned open plan schemes.



Washington Retreat House for Women
DUANE & LAWRENCE, ASSOCIATE ARCHITECTS

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