# SOUTHERN ARCHITECT

NOVEMBER, 1954

Announcing

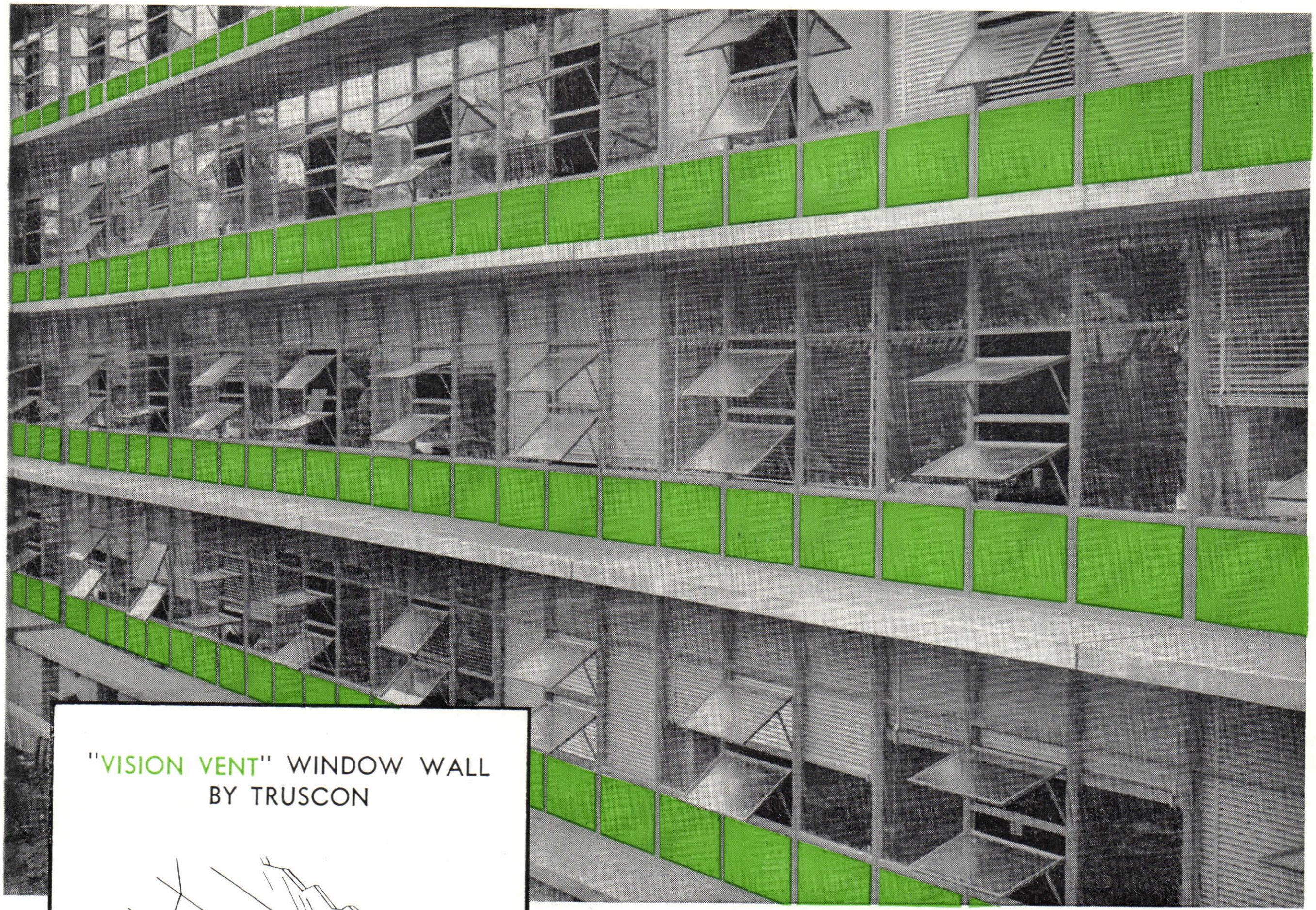
**PROGRAM OF NCAIA HONOR AWARDS IN ARCHITECTURE**

SEAL·OF·THE·AMERICAN·INSTITVTE·OF·ARCHITECTS· MDCCCLVII

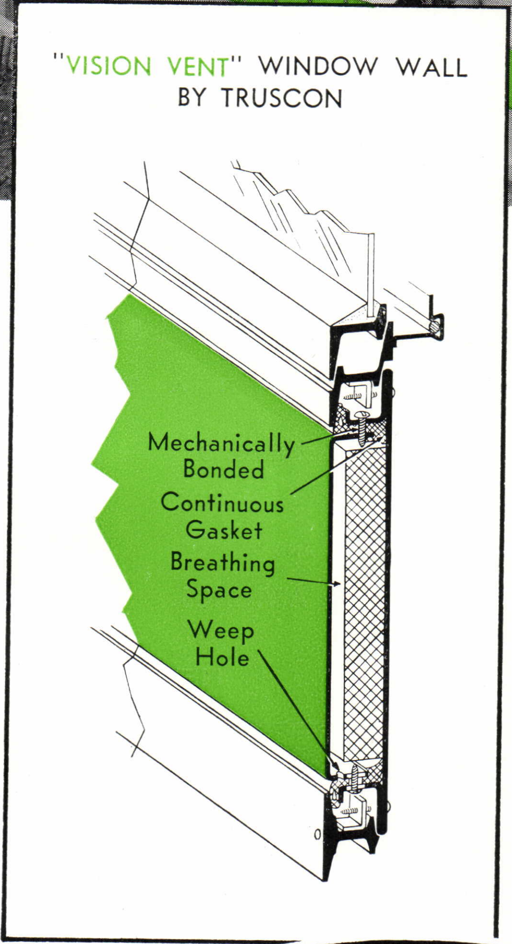
41st ANNUAL MEETING
NORTH CAROLINA CHAPTER • AIA
CHAPEL HILL • JANUARY 1955

Official Publication
North Carolina Chapter
AIA
American Institute
of Architects

---



Clemson College Barracks, Clemson, S. C.
Lyles, Bissett, Carlisle & Wolff — Architects
Photo — Courtesy Republic Steel Corp., Truscon Steel Div.




SPECIFY

# 'DOUBLE WALL'

CONSTRUCTION OF

## DAVIDSON ARCHITECTURAL PORCELAIN

"Double-Wall" construction is fast, simple and economical with Davidson Architectural Porcelain. Because each unit is a double-faced, mechanically bonded panel, interior and exterior walls go up at the same time. Erection time is cut to a minimum because no cutting, trimming or finishing is necessary at job site. Insulation is applied at the factory.

As shown in the Clemson College Barracks, Davidson Architectural Porcelain is distinctive, clean and colorful. There are colors and textures to fit any building need and Architectural Porcelain can be fabricated to most any architectural design. It is easily applied to new buildings or old with few, if any, building modifications. Architectural Porcelain can not fade nor crack . . . maintenance is zero.

Design wise — cost wise — color wise — make sure you consider Davidson Architectural Porcelain . . . first. Write for full information today.

Call or Write BECO Today . . .
Or if you prefer, send preliminary plans for study. Experienced BECO engineers will gladly call on you, or return your plans promptly with helpful suggestions.

SALES • ENGINEERING • DESIGN • ERECTION

Beaman
GREENSBORO BECO RICHMOND
ATLANTA

**ENGINEERING CO., INC.**

1106 BATTLEGROUND AVE GREENSBORO, N. C.

DAVIDSON PORCELAIN ENAMEL

OFFICIAL PUBLICATION

NORTH CAROLINA CHAPTER • THE AMERICAN INSTITUTE OF ARCHITECTS

# Southern Architect

VOLUME 1 NOVEMBER, 1954 NUMBER 7



**A KEY PUBLICATION**

Southern Architect is the official publication of the North Carolina Chapter of the American Institute of Architects and is published monthly by Key Publications, Inc., 121 East Third Street, Charlotte, North Carolina. Telephone EDison 2-7537.

Address all communications to Southern Architect, 121 East Third Street, Charlotte, North Carolina. Advertising rates on request.



Subscription price: One year $3.00; Two years $5.00. Full name and address shall accompany all subscriptions. Kindly notify Southern Architect in the event of change of address.

## CONTENTS

- President's Message 7
- Program of NCAIA Honor Awards 9
- WNC Council of Architects Formed 10
- North Carolina State College Union 11
- Architect Designs Own Home 14
- Architecture And Design 18
  - **Beemer Harrell, AIA**
  - **John J. Rowland, AIA**
  - **Marsh & Hawkins, AIA**
  - **Emory Holroyd, Jr., AIA**
- Soil Investigation For Building Design 22
- Architectural Calendar 28
- New Products And Services 32

M. W. Sloan, AIA, co-chairman; Turner Williams, AIA; J. H. Benton, AIA; Henry Kamphoefner, AIA, John Parker, and Stuart Baesel.

The judges for the honor awards include three of the nation's top leaders in architectural publishing, architectural education, and in architecture itself.

Thomas Hawk Creighton, architect and editor, received his A.B. degree from Harvard in 1926 and studied at the Beaux Arts Institute of Design for three years. He was an architectural designer with Schultz & Weaver and Charles B. Myers of New York City and with Freeman, French and Freeman of Burlington, Vt. He was Senior Architect with the New York City Department of Hospitals for two years and was associated with Alfred Hopkins & Associates for six years. He has been Editor of Progressive Architecture since 1946. He is a member of the American Institute of Architects, the American Hospital Association, the American Institute of Decorators, the Architectural League of New York, the Municipal Art Society of New York, and the Construction Specifications Institute. He is the author of "Planning to Build," "Homes," and "Building for Modern Man." In collaboration with Katherine Morrow Ford, he wrote "The American House Today" and "Quality Budget Houses."

Olindo Grossi is Dean of the School of Architecture of Pratt Institute and a practising architect. He received his A.B., Bachelor of Architecture, and Master of Science in Architecture from Columbia University and won the Rome Prize in Architecture in 1933. He is the author of numerous papers and designs in professional magazines and was awarded the New York Chapter of the American Institute of Architects scholarship in 1949 to execute a study of "Architecture and Planning," which is now touring the New York City high schools. He received first prize for residence design at the convention of the New York State Architects in 1950 and the merit award for the Development House of the Architectural League in 1954.

He is a former member of the Executive Committee of the New York Chapter, AIA, former Trustee of the Beaux Arts Institute of Design, and former Chairman of the Education Committee of the Architectural League. In 1954, he was the recipient of the Sidney L. Strauss Memorial Award given by the New York State Association of Architects for "outstanding achievement for the benefit of the architectural profession during the preceding year."

Richard L. Aeck received his B.S. in Architecture from the Georgia Institute of Technology in 1936. He was Chief Designer for F. T. Ley & Compania, S. A., Bogota, Columbia from 1937 to 1938. He entered private practice in 1939 and then served as Chief Architect for the Brazilian District, Airport Development Program, Recife, Brazil, in 1942-43. He was the designer of the Campus Development Plan for the Georgia Institute of Technology in 1944. He is a member of the firm of Aeck Associates of Atlanta, Ga., and is well-known throughout the south for his outstanding work in architecture and design.

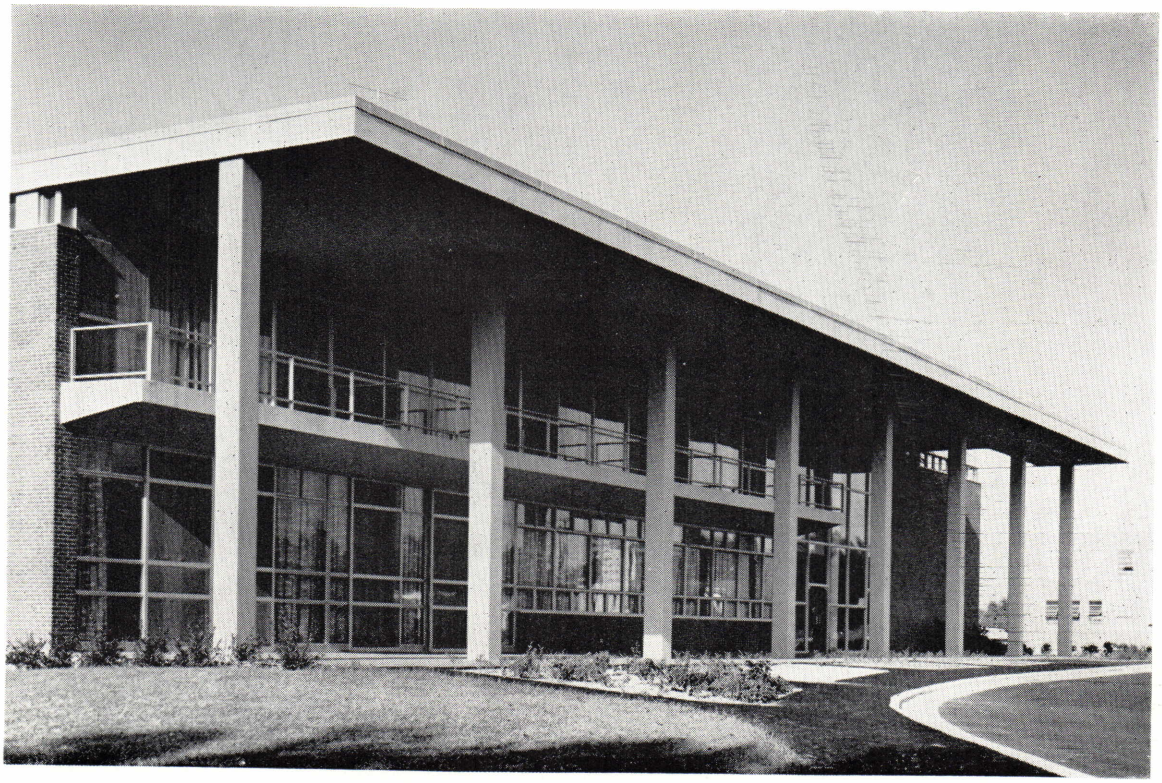
# WNC COUNCIL OF ARCHITECTS HOLDS MEETING

Architects from Gastonia, Shelby, Elkin, Hickory, Cherryville, Statesville, Asheville and other Western North Carolina cities met in Asheville Friday, November 5, for the first meeting of the new Western North Carolina Council of Architects.

James L. Beam, AIA, of Cherryville, was elected President, with Andrew L. Pendleton, AIA, of Statesville, being named Vice-President. J. B. King, AIA, of Asheville, was chosen Secretary-Treasurer.

The purpose of the organization is to serve the western region as a professional advisory group, to promote public recognition of the profession, to advance the standards of professional practice, and to encourage fellowship among its membership.

The Western North Carolina Council of Architects plans for meetings to be held at least once monthly. Officers of the organization will notify the Southern Architect as to time and place of meetings and appropriate announcement will be made in the Architectural Calendar.



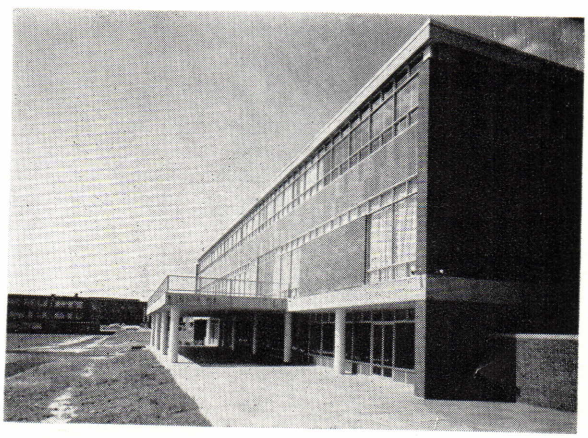
FRONT VIEW, NORTH CAROLINA STATE COLLEGE UNION

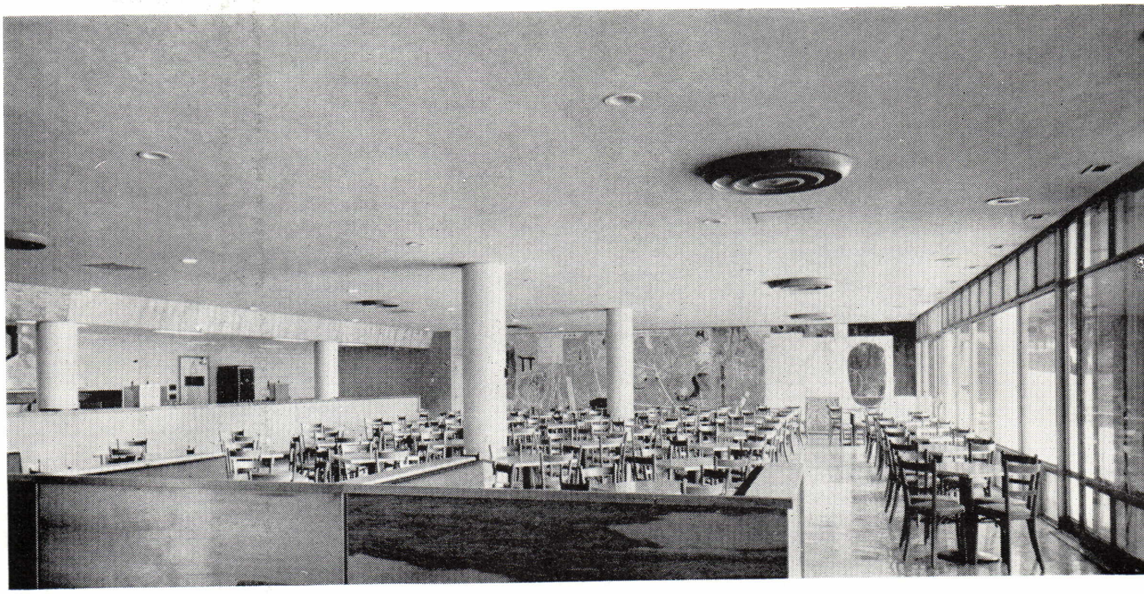
# NORTH CAROLINA STATE COLLEGE UNION

WM. HENLEY DEITRICK, AIA
JOHN C. KNIGHT, AIA, AND ASSOCIATES,
RALEIGH

A phase of youth's education that cannot come from the classroom is provided by North Carolina State College's big new student union building on Raleigh's Hillsboro street.

"The end and achievable purpose of the college is to provide a bonus venture into the art of living," says Gerald Erdahl, director of the student union. "Union activities, in truth, are a finishing course in citizenship."





LOUNGE AND SNACK BAR

The student union program has been in operation at State College for several years, but this is the first time that suitable building facilities have been available. The program itself is operated in general by the students themselves, various student committees having charge of the many activities which have the new structure as a center.

There are many unusual features in the new building. There is, for example, the hanging fireplace in the middle of the south lounge. The shiny metal chimney comes down into the room, and the fire is built on a masonry base under it. Having the fireplace in the middle of the floor permits 360-degree conversation and viewing by loungers sitting around it.

On the walls of the south lounge and extending down the art corner throughout the gallery lounge is 300 feet of gallery display fabric making the walls of the lounge into art galleries.

The south lounge overlooks a beautiful terrace and mall and the dormitories in the distance to the south.

The ballroom, located on the east end of the first floor, will accommodate fourteen hundred couples for dancing, serve 550 for a banquet and seat 700 for a concert. The main ballroom may be opened into five other rooms which are adjacent to the ballroom if additional space is necessary. This flexible reception and dance area includes a variety of colored lights, which wash the ballroom from the ceiling and give the facility a hundred personalities. The ballroom stage may be extended out to accommodate a large orchestra or the extension of the stage may be used in the center of the ballroom for theater-in-the-round.

Six meeting rooms are available for small group sessions, including a kitchenette for groups who wish to stage their own receptions.

The big feature of the snack bar is its own lounge and a 63-foot fountain, with duplicated facilities. Its stock is stored under the counter, saving many steps for its personnel and making it rarely necessary for the clerk to turn his back on a customer.

A mural by Manuel Bromberg, associate professor of the School of Design, is another first. Never before in the history of art has an artist worked in the medium of colored plaster. The mural is designed as a conversation piece, decora-

SOUTH LOUNGE

tion more than mural, a wedding of art and science, and, because of the universal and unchanging character of the symbols used, timeless in its intellectual impact. It contains over 60 of the most widely used formulas and symbols of the college arranged in a pattern.

Other features of the building include a theater and auditorium, music room, television lounge, guest rooms which are living rooms by day and bedrooms at night ,photographic laboratory, hobby and crafts shop, dining room, game room, kitchen, and offices for the administrative staff.

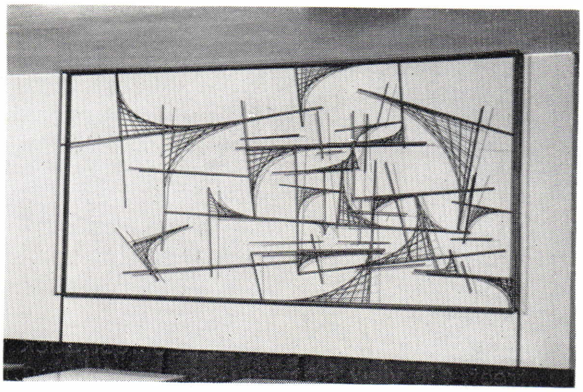
The new building has elements of a game emporium, a hotel, YMCA, restaurant, and community center. It is 170 feet long, 97 feet wide and contains nearly 60,000 square feet of floor space on three and one-half floors.

One of the primary purposes of the College Union is to blend the spokes of divided loyalty of the students by departments and schools into the greater hub of college loyalty.

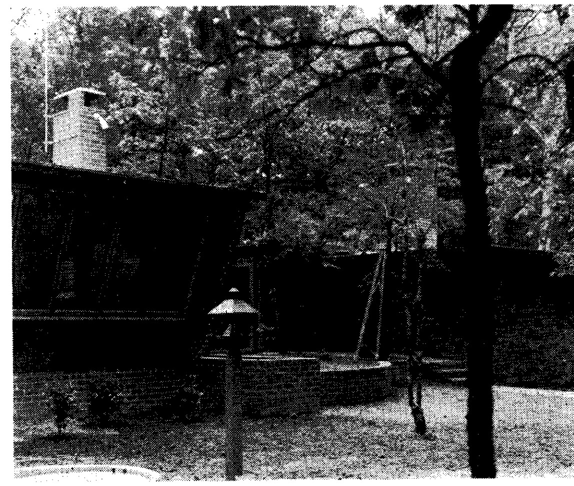
W. Henley Deitrick, AIA, of Raleigh was the architect for the building. Interior decoration was by George Matsumoto, AIA, associate professor of the School of Design, and Cecil Elliott, assistant professor of the School of Design.

Porter Butts, director of the University of Wisconsin Union, serves as educational consultant, with Gerald O. T. Erdahl as programming advisor, and John Hargrave, kitchen consultant.

John W. Tester is president of the North Carolina State College Union.



WALL DESIGN, STATE DINING ROOM



ENTRANCE, LOEWENSTEIN RESIDENCE

# ARCHITECT DESIGNS OWN HOME

Edward Loewenstein, Jr., AIA

Robert A. Atkinson, Jr.. AIA

Loewenstein-Atkinson Associates
Architects

Architects with advanced ideas in contemporary design sometimes find the practice of architecture frustrating in that frequently clients are not ready to accept designs that are considered ultra modern today but whose practicality and feasibility may make their use commonplace in a short space of time.

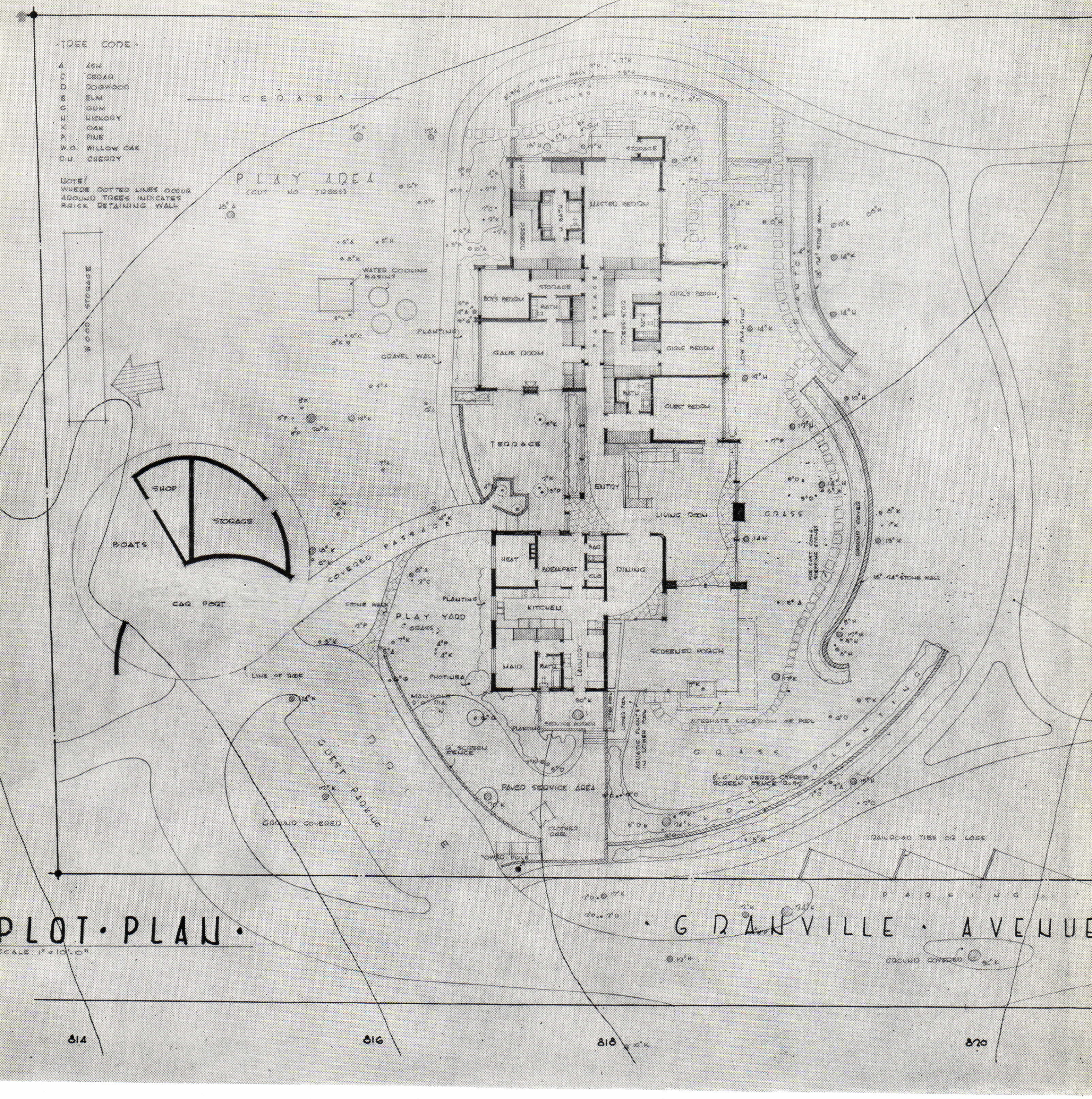
This has been true since the beginning of time as man has developed ways and means of making easier and more pleasant the everyday life of the human race. Since the creation of the universe, designers have sought ways and means of making life easier, but their ideas have more often than not been considered too advanced for their own lifetime. Posterity has accepted these advances and their successors have gone on and on to effect even more advanced changes in time.

The one time that an architect can give free play to his imagination without challenge from anyone (except his wife) is when he designs a home for himself.

Edward Loewenstein, AIA, of Greensboro, has recently completed such an architect's dream in which he threw the book away and designed his home at 444 Cornwallis Drive in Greensboro without watering down a single one of his advanced ideas.

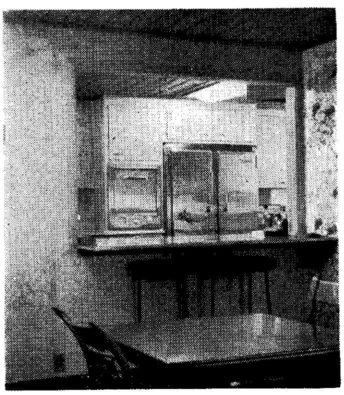
Although the house is one of the most spectacular in North Carolina, the Loewensteins consider it one of the most comfortable and adaptable to today's living.

Located in a grove of trees 300 feet back from the street, the view from the expansive living room

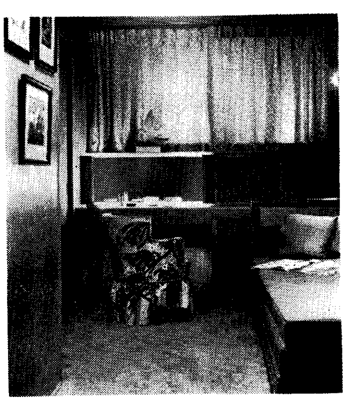



PLOT PLAN AND FLOOR PLAN

STUDY AND DEN



KITCHEN



MASTER BEDROOM

is an attraction in itself. The living room picture window is one of the remarkable aspects of the home because the living room fireplace is right in the middle of the window. This is made possible by eliminating the chimney.

The stainless steel fireplace has double walls. The smoke is sucked down inside the double wall by an exhaust fan, carried through a 20-inch underground pipe and finally is dissipated through an inconspicuous little dome in the front yard 50 feet away from the house.

Many of the outside walls of the house are tilted outward, making most of the rooms larger at the ceiling than they are at the floor. This provides a feeling of unusual spaciousness because you get the impression that the room is the ceiling size, not the floor size.

The angle of the wall tilt is exactly 26 degrees from vertical. This lets in sunny warmth through the windows in winter, when the sun is low in the sky, but permits shady, glareless living in summer when the sun is high on the horizon. This angle of the windows also gives a false impression in that one has the illusion that there is no glass in the windows. The glass is there though, special insulated glass of twin layers with a dead air space in between the layers.

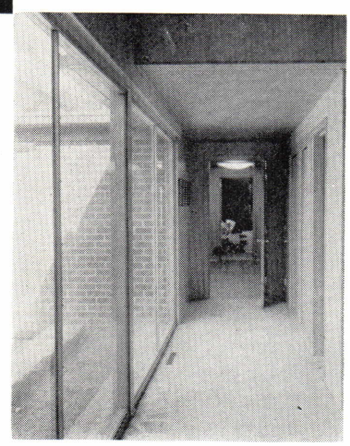
Anytime the unique fireplace is not in use as a fireplace, it has a second purpose. The exhaust fan in the fireplace can be used to draw out stale air or smoke from the living area. However, this will rarely be necessary since the house is completely air-conditioned.

The heating system is gas fired. This heats water which is run through coils. Air is blown over the coils and is then circulated throughout the house. In warm weather, the water is simply chilled by the refrigeration system and circulated in the same way.

The house, which contains 10 rooms and five baths, has five different thermostats which control the five different living areas. These areas include living room-guest room, the master bedroom area, the playroom and the young son's bedroom area, the two little girls' bedrooms area, and the kitchen-maid's room area.

LIVING ROOM

PICTURE WINDOW WITH FIREPLACE



HALL

One of the things of which the Loewensteins are proudest is that the 10 rooms and five baths have been built in only 4,300 square feet of floor space. The average 10-room house occupies 6,000 to 8,000 square feet.

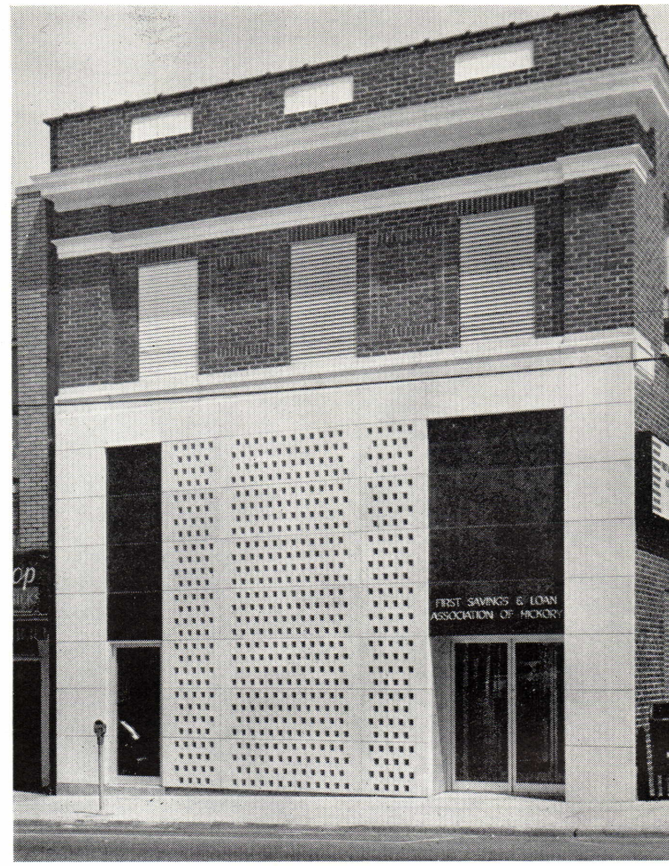
The roof, by the way, slants away from the tilted windows at approximately right angles. This results in a living room ceiling 7½ feet high at the windows, but 10 feet high on the opposite side of the room. The Lowensteins took advantage of these ceiling differentials to install long, narrow windows on the far side of the living room wall and in the high wall of the master bedroom.

To get so much room with such relatively small total floor space, Loewenstein used a central windowless core for connecting hallways, four of the five bathrooms and the functional equipment, including plumbing, heating, piping and the like. This windowless area is neatly lighted with plastic bubble domes in the ceiling. The plastic bubbles are translucent but not transparent. When sunlight strikes the roof they shed bright glareless light into the bathrooms and hallways below.

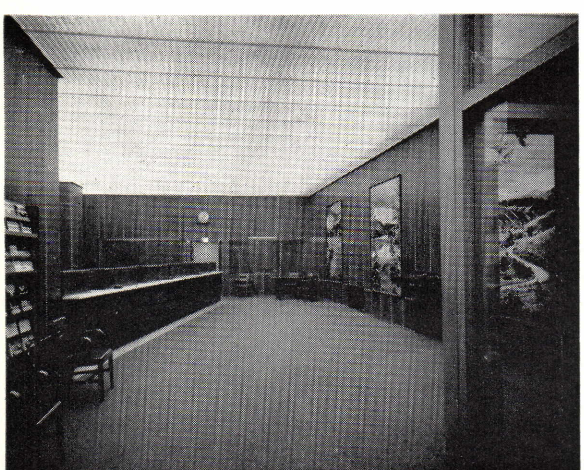
The plastic bubbles have light bulbs built inside them to provide lighting at night. And, in the daytime, you can turn off the sunlight if it gets too bright by closing a shutter arrangement built into the plastic bubbles.

There are enough inovations in the Loewenstein home to fill a book. For the benefit of his fellow architects, he has prepared a detailed description of the techniques used. This fills up seven single-spaced pages.

The garage is like no other garage. From an architectural standpoint, it is one of the most unusual features of the home. It is a circular disc, supported by bridge steel As one workman stated, you could build a federal highway across it. The garage serves as a boathouse, carport, workshop, storage room, and can also be used as an outdoor dance pavilion.

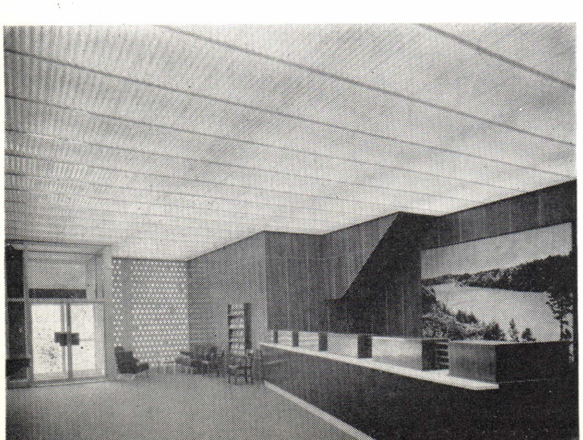



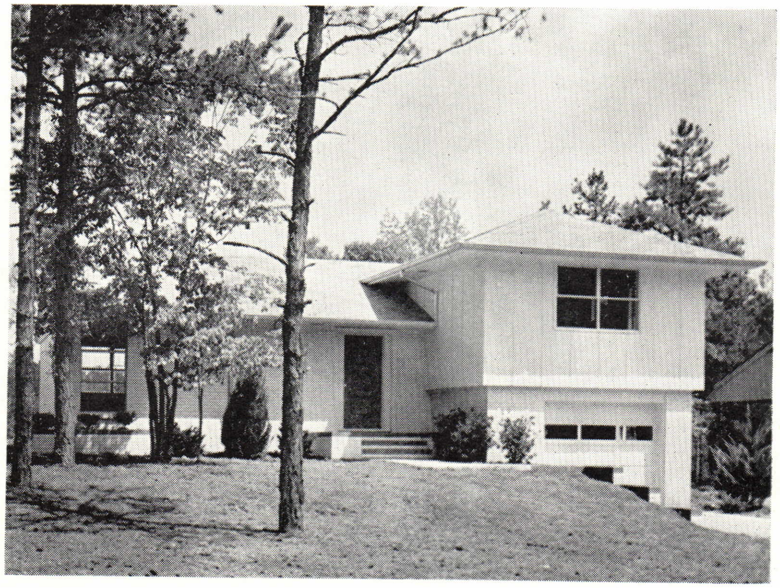

FIRST SAVINGS AND LOAN ASSOCIATION, HICKORY



# Beemer Harrell, AIA

HICKORY, N. C.





REGION V ACAPULCO DERBY WINNER
CHARLES C. LUCAS, BUILDER

# Emory Holroyd, Jr., AIA

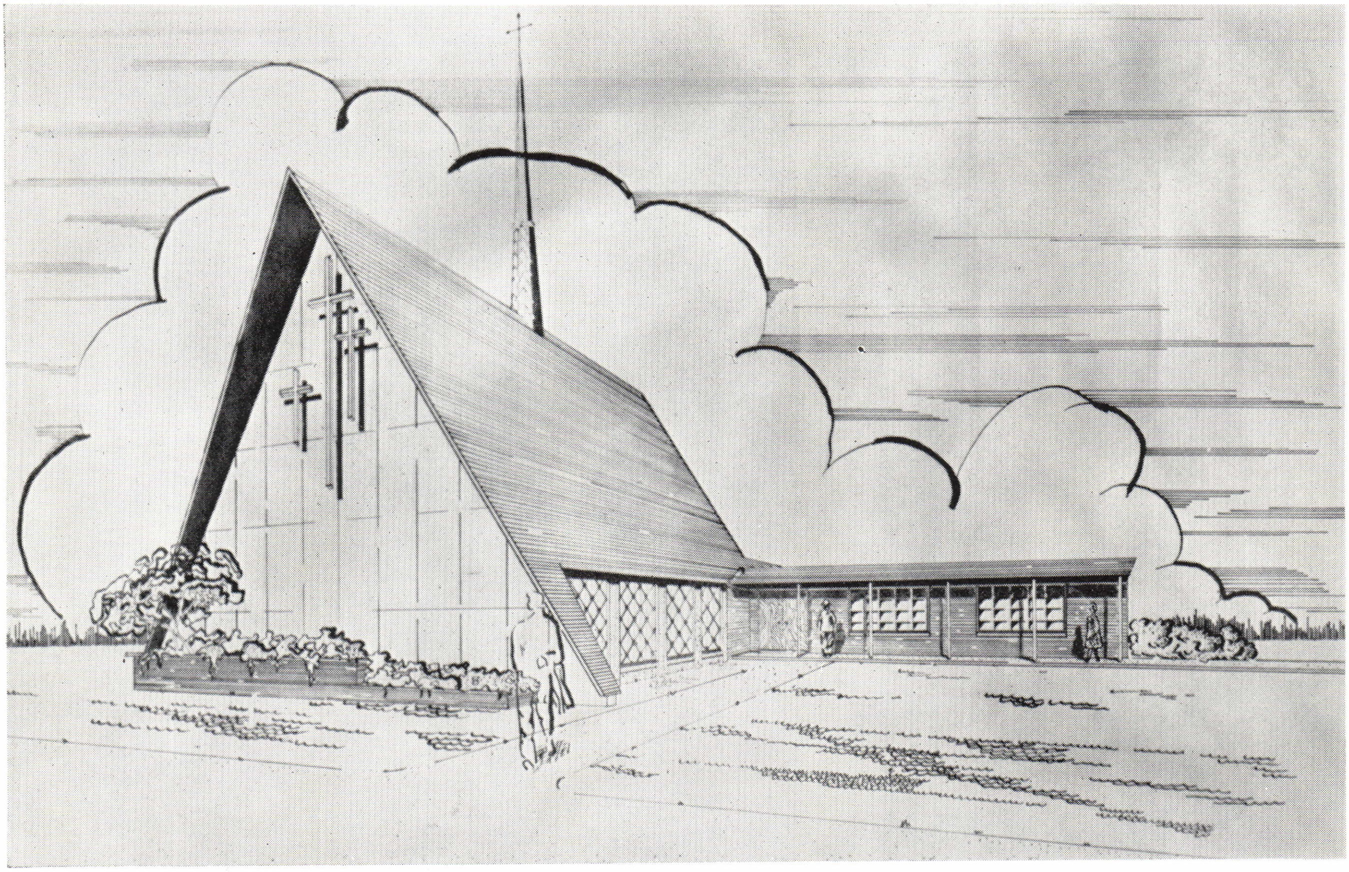
1954 PARADE OF HOMES
HOME BUILDERS ASSOCIATION
OF CHARLOTTE, N. C.

GEORGE S. GOODYEAR, BUILDER

CHARLES B. MARTIN—TED DEL VECCHIO, BUILDERS

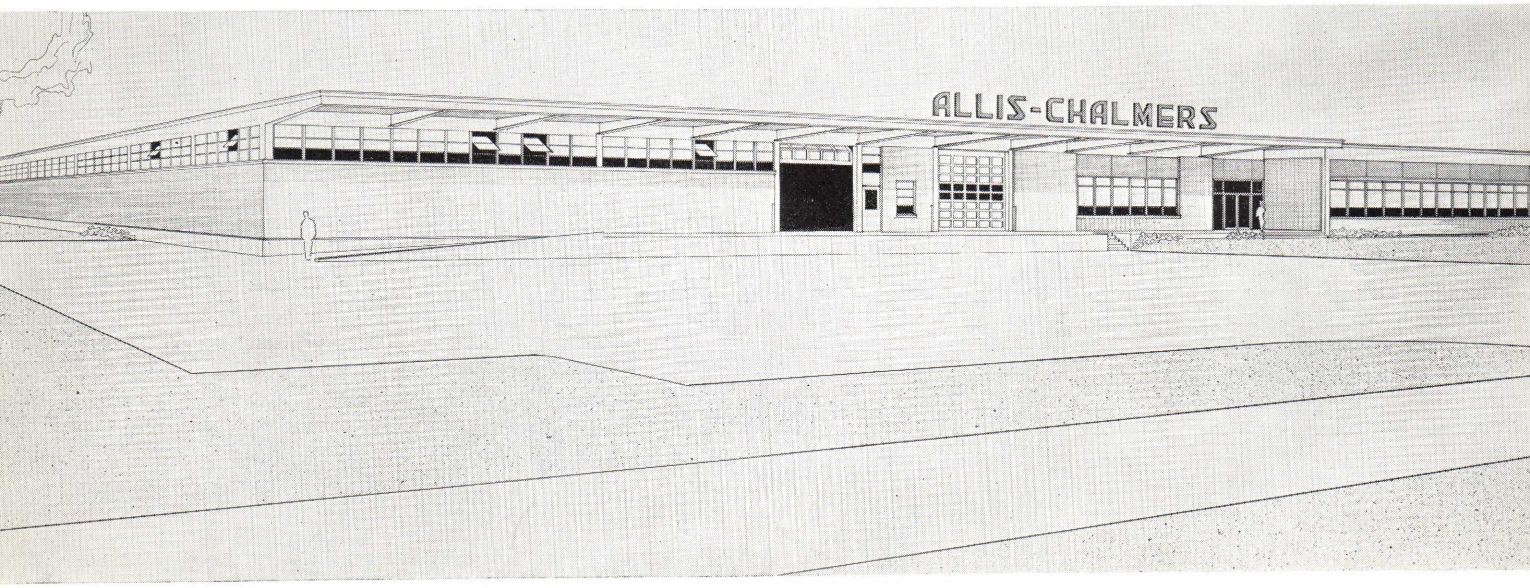
D. C. GIBSON, BUILDER

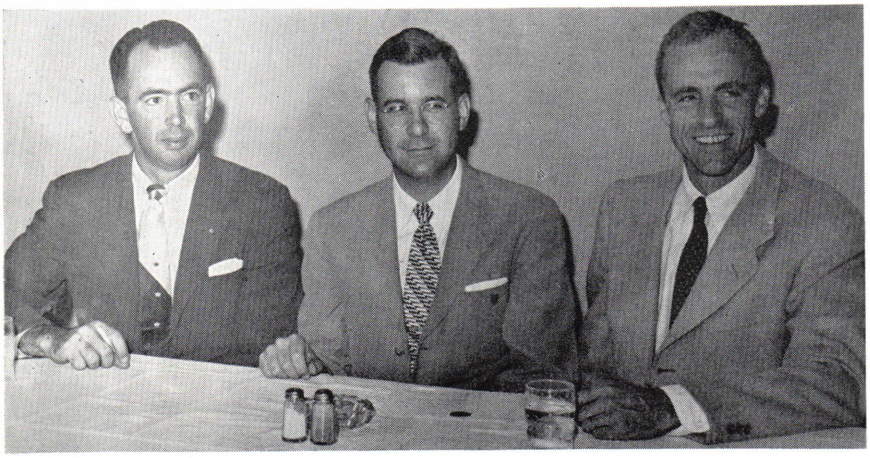
FRED J. WIGGINS, BUILDER



Saint Mark Methodist Church, Kinston. John J. Rowland, AIA, Kinston. Donald Davidson, delineator.

Allis Chalmers Manufacturing Company, Tractor Division, Warehouse and Office Building, Charlotte — Marsh & Hawkins, AIA, Charlotte.





T. P. Hawkins, AIA, President, Charlotte Council of Architects, George F. Sowers, and Hugh E. White are pictured above prior to Mr. Sowers' address to the Charlotte Council.

# SOIL INVESTIGATION FOR BUILDING DESIGN

By GEORGE F. SOWERS
(Professor of Civil Engineering
Georgia Institute of Technology)

A few years ago an industrial firm in the Southeast began construction of an addition to an existing mill. Since the mill had been in operation for fifty years without any sign of foundation difficulties there was no concern felt for the addition. Construction began without any investigation of the soil beneath the addition except for a visual examination of the footing excavations.

By the time two stories of the contemplated four were finished the walls had cracked so badly that all construction was halted. A thorough investigation was then made. It disclosed that three corners of the addition as well as the original building were founded on very hard soil and partially decomposed rock. The fourth corner rested on a hard crust of clay which was underlain by over 9 ft. of soft compressible soil. In this case past experience at the site was not only worthless but expensive for it cost over $50,000 more to underpin the structure than the proper foundations would have cost initially.

Not all foundation difficulties occur on such a large scale. Three years after construction three buildings of a large housing project had to be vacated because of large settlement cracks which had developed. Since the buildings were only two stories and of concrete block construction, it was decided that a soil investigation was un-necessary. But even the light dwelling units had settled on the extremely loose sand which underlay part of the site. The cost of investigating the site would have been a small fraction of the cost of repairing the three buildings.

Even when some tests are made trouble often occurs. A load test made at the proposed foundation level in a three-story manufacturing plant indicated a safe footing pressure of 4000 psf. Before the work was finished the structure had settled over two inches. Borings disclosed that the soil profile consisted of a crust of hard clay underlain by a thick stratum of soft clay. The two foot square plate of the load test had been supported by the hard crust but the six foot wide footing had broken through into the softer soil beneath. In many instances the wrong type of investigation not only can fail to produce the proper data but can actually lead to false confidence in a faulty design.

**The Need For Soil Investigations**

These three examples illustrate the need for making investigations of the soil conditions at building sites. Soils are the most complex materials with which the architect and engineer must deal, and they are the materials over which he has the least control. Steel for a structure is man-made. Careful control is exercised over every step in its manufacture and the user can be reasonably confident that the produce furnished will meet the specification. Even with this control some testing is necessary to insure the quality of the material.

On the other hand soils are irregular accumulations of the complex products of rock weathering plus admixtures of organic matter and all sorts of man-made materials from cinders to rubbish and garbage. Determining the nature of such a material requires imagination, ingenuity and skill. In establishing the need for an investigation three factors should be kept in mind.

First, data is needed in spite of the fact that previous experience has shown that the soil conditions at the site are satisfactory. Soils vary unpredictably with the whims of nature and the variations can lead to trouble such as that experienced with the mill building which required underpinning.

Second, the work is important on even small structures. As a matter of fact it may be more important since construction inspection and supervision (which could disclose poor soil conditions) are often less extensive on small structures. The housing project was a good example of the trouble which can arise when it is assumed that the building is so small that no investigation is justified.

Third, the method of investigation employed must be such that the results can be used for design. A perfectly valid tetst improperly used, such as the plate load test in the third example, can lead to more harm than good. Each step of the investigation should be planned so that the results will develop an accurate picture of the underground conditions and furnish data for safe economical design.

**The Data Required**

Obviously before any investigation can be started it must be decided just what data is needed. For example, on one project the designer's contract stated that the owner would furnish data on the soil conditions. The owner, a shrewd, tight-fisted business man had borings made—with a post hole digger. The data furnished consisted of paper sacks filled with dried-out, chopped up soil which had little value for determining the soil capacity.

The information required for most projects is as follows:

1. The depth, thickness, and nature of the soil strata.
2. The depth, to rock and the character of the rock
3. The location of ground water.
4. The physical properties of the soils which affect foundation design.

**Program For Investigation**

The development of a logical program of investigation is essential if the necessary information is to be secured rapidly and economically. In one case an industrial firm purchased a site and then contracted for an extensive program of boring, sampling ,and laboratory testing. The work took nearly three months. The results indicated that the cost of foundations would be more than the cost of buying a new piece of property. When the site was abandoned much of the detailed soil data secured (and paid for) had served no purpose and construction had been set back three months. The decision of whether the site was usable could have been made from a preliminary investigation taking less than a month and costing but little.

A simple plan to avoid un-necessary work is to divide the investigation into three steps: reconnaissance, exploration, and detailed examination. The reconnaissance sizes up the situation, estimates the usability of a site, and indicates which exploration technicques can be useful. Exploration determines exactly what the soil and rock conditions are at a site and provides preliminary data on their properties. The detailed examination provides accurate engineering data on the critical strata disclosed by the exploration and is the basis for design computations.

Small projects with simple soil conditions may require reconnaissance plus a minimum of exploration. Large complex jobs usually require all three. Since each investigation, large or small, proceeds from an extensive study to an intensive one the designer can stop when sufficient data are available without accumulating large amounts of unnecessary information and without wasting time.

**Reconnaissance**

The reconnaissance step consists of estimating the conditions at the site. Since speed and low cost are primary considerations the engineer must rely on existing data and visual examination.

Data on many areas are to be found in geological reports and agricultural soil surveys. In some cities the building inspector maintains records of soil conditions.

A visual examination of the site may disclose many troublesome conditions. For example, a housing project planned for a gently sloping hillside seemed to present no foundation difficulties since obviously it was well drained. The first few footing excavations disclosed considerable soft wet organic soil far above the level of the creek in the valley below. An inspection of the well-drained hillside showed it to be covered with marsh grass and the home of countless croaking bullfrogs. A peculiar underground rock structure was the cause. The wet condition could have been easily forseen by an inspection.

Inspections from the air, either in person or by the use of aerial photographs can be useful in locating features not obvious from the ground surface. The broad shallow saucer-like depressions that denote a limestone sink may be invisible from the ground, especially in cultivated or wooded land. It shows up readily from an altitude of about 3000 ft., however.

Sometimes old residents of an area can be helpful in recalling old filling, changes in a river bed, and similar drastic changes. Memory is a peculiar thing, however, and locations and dimensions are usually somewhat in error.

**Exploration**

At the start of such work some decision must be made about the number of borings and their depth. Unfortunately a decision cannot be made intelligently until after a few borings have been completed. The boring spacing depends on the uniformity of the soil conditions and the size of the structure. For preliminary estimates the following may be used:

| | Very Uniform Soils | Average Soils |
|---|---|---|
| High Buildings | 100-200 ft. | 50-100 ft. |
| One Story Buildings | 200-300 | 100-200 |

Borings should extend deep enough to disclose all strata which could settle under the building load. A simple rule which is satisfactory for most conditions is 8 to 12 ft. of boring depth for each floor in the building (or its equivalent in loading).

Two methods of boring have proved most useful in exploratory work: Auger boring and test boring. Augur boring is simple and inexpensive and yields accurate information on the depth and thickness of the soil strata. Sometimes this is all that is necessary on the smaller projects. There are serious shortcomings, however. First, the soil samples are all mixed up so it is difficult to determine if a sandy clay is really a sandy clay in the ground or actually alternate seams of sand and clay. Second, the only way to estimate soil hardness is by the resistance offered by the auger. Third, the

auger is not suited to many soil conditions. When ground water, very soft soils, very hard soils, or gravel are encountered, further progress becomes impractical.

The procedure known as test boring provides more data and is suited to a wider variety of conditions. A hole is drilled using any one of a number of methods such as rotary cutting, jetting, chopping, and augering. At each change of strata and at 3 ft. to 10 ft. intervals within each stratum the drilling tools are removed and a 1½ in. I. D. 2 in. O. D. split spoon sampler introduced into the hole. This is driven into the soil with blows from a 140 lb. hammer falling 30 in. The resulting sample preserves the stratification and structure of the soil deposit although it may be too badly distorted for testing purposes.

The number of hammer blows required to drive the sampler one foot is known as the penetration resistance of the soil. This is an indirection of the soils strength and density and is a valuable aid to foundation design.

**Detailed Examination**

The purpose of the detailed examination is to secure accurate data on the critical soil strata. The exploratory borings will bring out which strata are relatively weak and compressible and which are strong and rigid. Obviously it is these weaker compressible strata which will determine the foundation design. The detailed examination is therefore directed to determining their properties accurately so that the most economical safe design can be developed. This is accomplished largely through laboratory tests of undisturbed soil samples although in a few cases field tests of the soils in place in the ground may be helpful.

The art of undisturbed sampling has developed rapidly since 1940. Many special devices have been devised to secure good samples in different soils.

The simplest and at the same time one of the most adaptable samplers is a thin-walled seamless steel tube from 2½ in. to 4 in. in diameter. The cutting edge is sharpened and the other end fitted with a check valve.

The tube is driven into the soil preferably by a steady static pressure. The sample is sealed into the tube with melted wax to preserve its water content and then packed in a shock-absorbing material for shipment to the laboratory.

Three types of tests are performed on the undisturbed soil samples. The first tests determine the weight per cubic foot, water content, porosity, grain size, and plasticity of the soil. Such tests help to identify the soils accurately and make it possible to reduce the amount of testing which may be necessary.

The second type of tests determines the soil strength. The soil sample is cut into cylinders. Each cylinder is encased in a thin rubber membrane and placed in a closed chamber. Lateral confining pressure is developed by air pressure in the chamber. The sample is broken in triaxial shear by gradually increasing the axial load. In the case of soft clays it may be possible to substitute an unconfined compression test for the more intri-

## ARCHITECTURAL CALENDAR

NOV. 19: Guilford Council of Architects, Bliss Restaurant, Greensboro.

NOV. 19: Raleigh Council of Architects. The Reinlyn House, Raleigh.

NOV. 28-REC. 1: American Municipal Association. An annual convention. Bellevue Stratford Hotel, Philadelphia, Pa.

DEC. 1: Charlotte Council of Architects. Thackers Restaurant, Charlotte.

DEC. 3: Guilford Council of Architects. Bliss Restaurant, Greensboro.

DEC. 3: Raleigh Council of Architects. The Reinlyn House, Raleigh.

DEC. 9-10: Market Research and Design Conference. Sponsored by University of Michigan and Boston Institute of Contemporary Art. University of Michigan, Ann Arbor, Mich.

DEC. 17: Guilford Council of Architects. Bliss Restaurant, Greensboro.

DEC. 17: Raleigh Council of Architects. The Reinlyn House, Raleigh.

JAN. 27-28-29: North Carolina Chapter, American Institute of Architects. Winter Meeting. Carolina Inn, Chapel Hill.

catte triaxial shear. In this test the sample is broken like a cylinder of concrete without lateral confinement. In either case the results form the basis for computations of soil bearing capacity and pile strength.

The third type of test determines the compressibility of the soil. The sample is encased in a ring and subjected to pressure on its faces. The amount of settlement for each different pressure is measured with micrometers. Such a consolidation test is the basis of computations to determine the probable settlement of the structurue.

In a few instances field tests such as the plate load test are a valuable supplement to the laboratory tests. Such tests should be used only after exploratory borings have been made to establish the validity of the test. The plate load test in particular can be misleading in many cases. A load test made on a thin hard crust overlaying soft soil can indicate bearing capacity that is too high for safety as the earlier example illustrated. In other cases the load test can underestimate the soil capacity. Proper interpretation of the results requires a knowledge of the soil profile and of the physical properties of the soils. When these data are available the test may be helpful in determining the proper foundation design.

**Conducting A Soil Investigation**

A complete soil investigation consists of many complex operations which much be changed to make them fit the conditions encountered. The execution of such a project requires careful planning to get results at a minimum of cost. Three different approaches are being used. Each has its advantages and disadvantages depending on the architect-engineers organization and on the project itself.

The best method is for the designer to undertake the entire investigation. In that way each step of the work can be integrated with the larger problem of design. Unfortunately only governmental have enough investigation work to justify maintaining staffs of engineers and technicians and the specialized equipment necessary for soil investigations.

The second method involves dividing the work into separate units or contracts such as preliminary exploration, boring and sampling, laboratory testing, and engineering analysis. By breaking the work into small units it may be possible to secure the lowest price for each unit. There are two serious objections to this approach. First, there is usually a lack of integration of the operations unless the architect-engineer spends considerable time in close supervision. Second, there is a lack of flexibility. In order to secure bids and let contracts it is necessary to prepare specifications. It is impossible to prepare specifications for underground investigation work unless the soil conditions are known before hand. If they are known accurately enough to prepare specifications it is doubtful if further exploration is necessary.

The third approach is to utilize the services of one firm to undertake the entire investigation. In this way each step of the work can be fit into the others with a minimum of lost motion. Furthermore procedures can be changed to fit the underground conditions without the need of changes in a contract. Good liaison with the designer is neccessary of course. The information finally given the designed may fall into two categories. If the designer's staff includes men trained in soil mechanics the boring results and laboratory test data may be sufficient. Most designers prefer that the investigating organization also analyze the data and make recommendations for design. The only draw back to this method is that its success depends on the ability and integrity of the investigating firm. Of course this disadvantage is inherent in any job where the client hires an independent consultant, whether it is for soil exploration or design of the structure.

**Cost of Investigations**

Any intelligent program must consider cost. Occasionally, more money is spent on exploration work than the value of the data justifies. In most cases, however, the small amount spent on exploration is saved many times by the reduced margin of safety required in design. For example, an investigation costing $3000 made it possible to reduce the sizes of footings on a large office building by 25 per cent and reduce the footing costs by about $12,000. Of course, when an investigation prevents failure, the savings will probably be much greater. Data collected by the writer on about 800 underground exploration projects indicate that the cost of an adequate investigation is rougly related to the total cost of a project. For typical buildings it will run from 0.05% to 0.2% of the total cost of the structure.

**Summary**

Three methods of conducting investigations are in use. The first, suitable only to very large organizations requires that the designer conduct the entire investigation. The second involves breaking the work into small units each of which is performed under a separate contract. The third, rapidly gaining in favor, places the entire responsibility on a firm specializing in such work.

The most important things in any investigation are first, a clear understanding of what information is required, a knowledge of the different techniques available, and a plan for the work which allows enough flexibility to adopt the procedures to the situations encountered. With all these it is possible to fulfill the objective of securing adequate data quickly and at a minimum cost.

## stenhouse heads historical group

James A. Stenhouse, AIA, of Charlotte, was recently elected president of newly-organized Mecklenburg Historical Association at its organizational meeting.

One of the state's best-known architects, Mr. Stenhouse is an authority on Mecklenburg and North Carolina history. He is Chairman of the North Carolina Historic Sites Commission and State Chairman of the AIA Committee for the Preservation of Historic Building.

## duncan heads printmakers

Charles W. Duncan of Duncan Printmakers, Charlotte, was elected president of the Southeastern Blueprinters Association at the organization's annual convention in Asheville November 1.

Elected to serve with President Duncan were: Pelham Durant, Jr., of Mobile, Ala., first vice-president; Fawdrey Molt of Miami, Fla., second vice-president; and John C. Southerland of Charlotte, secretary-treasurer.

William Blocker of Washington, D. C., president of the International Blueprinters Association, was the principal speaker at the annual banquet.

## jenkins named to planning board

Arthur C. Jenkins, Jr., AIA, of Fayetteville, has been named to the City Planning Board by the Fayetteville city council. Mr. Jenkins is a member of the Editorial Board of Southern Architect and Co-Chairman of the Public Relations Committee of the North Carolina Chapter of the American Institute of Architects.

## meisel heard by charlotte council

Alvin Meisel of Richmond, Va., District Structural Engineer of the Portland Cement Association, was the guest speaker before the Charlotte Council of Architects November 3.

Mr. Meisel discussed prestressed concrete and its application to the field of construction.

An illustrative film was presented as a part of the program.

Hugh Preston of Charlotte, Field Engineer of the Portland Cement Association, was a special guest.

# NEW PRODUCTS

**SUNTROL** is a new series of double-cavity glass blocks designed to overcome high brightness problems resulting from sun and snow. They contain a pale green diffusing screen, which, it is claimed, reduces glare by 35% and instantaneous heat gain by 25%. The new block has a specially toughened exterior face with almost twice the impact of standard blocks. The tinted blocks provide a cooler light and a more relaxed atmosphere. The new block comes in standard 11¾" square and 3⅞" thick dimensions. The manufacturer is Pittsburgh Corning Company, 1 Gateway Center, Pittsburgh 22, Pa.

•

A new easy-to-erect system for building walls and partitions is **CON-WALL.** No skill is required and no tools are used. Two simple sections of aluminum or steel interlock to form a 5" thick wall. The parts nest for shipment and storage. For permanent installation, the interlocking sections can be tack-welded. Otherwise the wall can be easily demounted with full salvage and re-erected elsewhere or stored until needed. **CON-WALL** can also be used as a floor or roof. The manufacturer is Roedter Products, 343 Bryant Avenue, Cincinnati 20, Ohio.

•

Redesigned to cut air leakage to a minimum, the glass jalousie is now available for use in colder climates. The **WIN-DOR** jalousie may be used as a prime window, as well as in porch enclosures, breezeways, and like places. Maximum width is 36 inches, but any height is possible in multiples of 4 feet 1 inch. Jalousies are made in wood or aluminum frames. Casement Hardware Company, 612 North Michigan Avenue, Chicago 11, Ill.

•

The new **SCHOOLMASTER CONTROL** system permits complete control of classroom temperatures and doubles as a fire alarm. One central panel control permits the maintenance of push-button supervision over temperatures in all classroms without leaving the office. By pushing any one of 24 buttons on the monitoring control panel, the temperature in that room registers on the panel dial. Thermostats are equipped with fusible links, and temperatures above 136 degrees F. will sound an alarm and cause a red light to glow under the transparent button for that room on the control panel. Panel box is 9" by 14½" and may be surface-mounted or flush. The manufacturer is Minneapolis-Honeywell Regulator Company, Milwaukee, Wisc.

•

**STYROFOAM** is an insulation of plastic that not only keeps heat in but also keeps heat out. Dow Chemical, Midland, Mich.

Piping in plastic is now supplemented by valves made of a lightweight styrene copalymer called **USCOLITE.** The 3-inch diameter rubber-plastic valve body makes possible corrosion-resistant and non-contaminating piping systems of greater capacity than ever before for handling food products, sensitive chemical solutions and acids. Hills-McCanna Company, Chicago, Ill.

•

LUXTROL is a home light control which permits the setting of light intensity of lamps to any value from darkness to full brightness. Each **LUXTROL** unit, operating on a 120-volt AC source on the dimmer principle used in theaters, can handle any number or combination of lamps, colored or uncolored, up to a load of 360 watts. Superior Electric Company, Bristol, Conn.

•

A black, strippable plastic coating can be brushed onto any enamel surface to protect it against damage during construction. **COAT-A-TUB,** made of liquid vinyl plastic, dries to a strong, flexible film which can be peeled off at the completion of construction. Protectub, Inc., 71 Ludlow Street, New York, N. Y.

•

A new lost-cost folding door is **FOL-BAK.** Doors come in 2 feet 8 inches, 3 feet, and 4 feet widths and are 6 feet 8½ inches high. The vinyl plastic covering is processed to look textured and is non-glossy. A fluted cornice trims the opening and is painted to match the fabric. Holcomb & Hoke Manufacturing Company, Inc., 1545 Van Buren Street, Indianapolis 7, Ind.

•

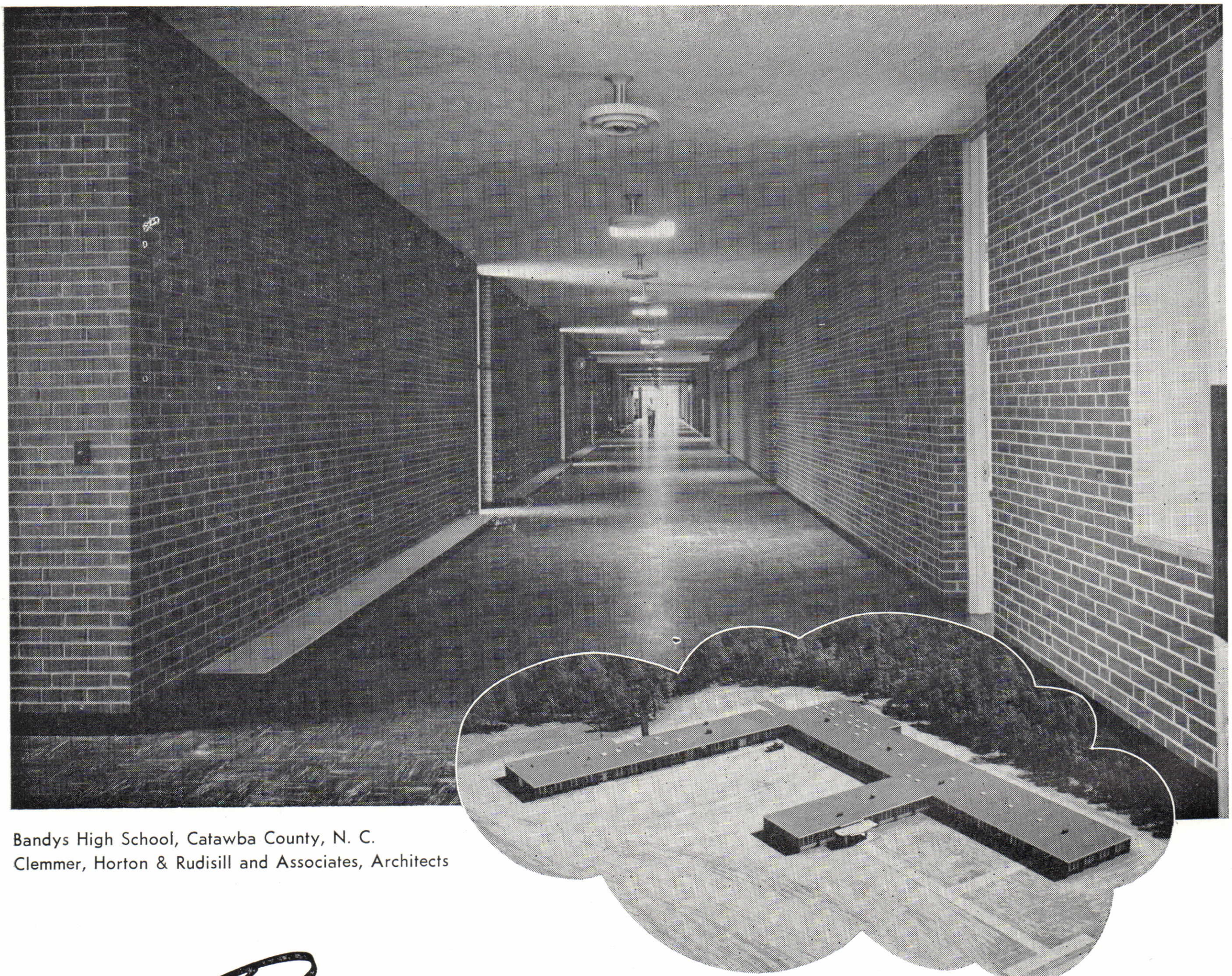
Manufactured for air conditioned buildings, **MODERNAIRE** windows eliminate any need for storm sash. Windows are double-glazed, or if single glazing is used, a stainless-steel framed glazing panel is attached on the inside of the sash. Screening is permanently affixed to the window and may be rolled up or down like a blind. Air infiltration at the perimeter of these awning windows is stopped by a continuous weatherstripping of neoprene-coated sponge rubber, eliminating any wood to wood contact. Builders Products, Inc., Box 374, Station D, Cleveland 27, Ohio.

•

**SELECT-A-VENT,** an awning-type aluminum window, offers selective ventilation. Each vent operates separately by means of an operating bar which folds flush against the window. The window has double toggle action for tight closure. Aluminum screens can be attached to the inside by integral clips. Southern Sash Sales and Supply Company, Sheffield, Ala.



*Exposed Solite units were used throughout the new student apartment building at Union Theological Seminary, Richmond, Va. Two wings of large "U" shape building are pictured above. Architect: Baskerville & Son. General Contractors: Southern Engineering and Construction Corp.*



Bandys High School, Catawba County, N. C.
Clemmer, Horton & Rudisill and Associates, Architects

# *Beauty* . . .
## INSIDE AND OUT

Schools are built to give generations of service to a community. Natural brick interiors and exteriors assure a long life with very little maintenance. Brick walls are also an effective way to insulate against noise penetration from outside the class room.

Give maximum owner satisfaction with handsome, maintenance-free brick interiors. Beautiful when painted, too, and economical to use here in the Brick Capital of the Nation.

**BRICK & TILE SERVICE, INC.**

*A Service of North Carolina's Clay Products Manufacturers*

**Greensboro, North Carolina**