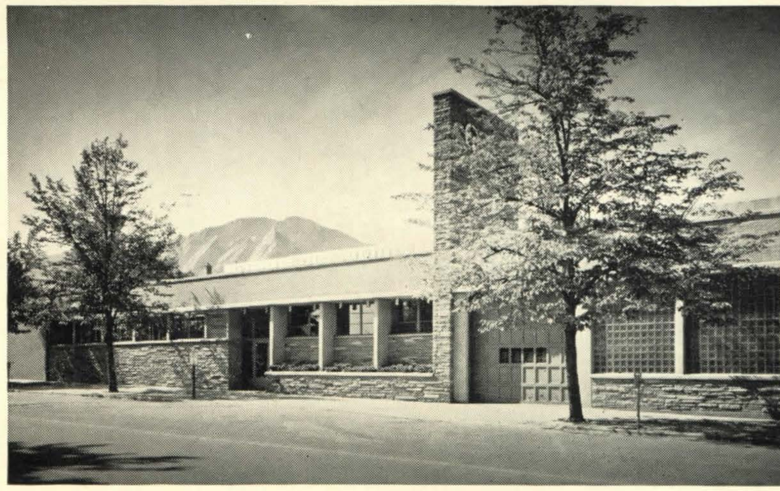
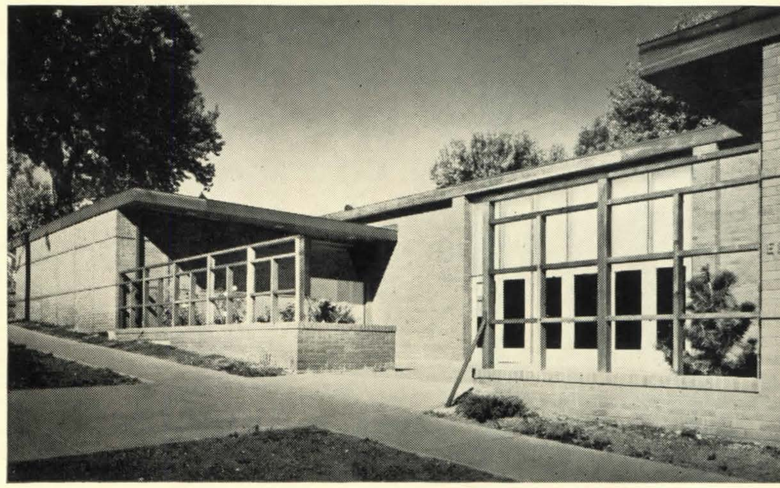
# ROGRESSIVE ARCHITECTURE



## architect and his community

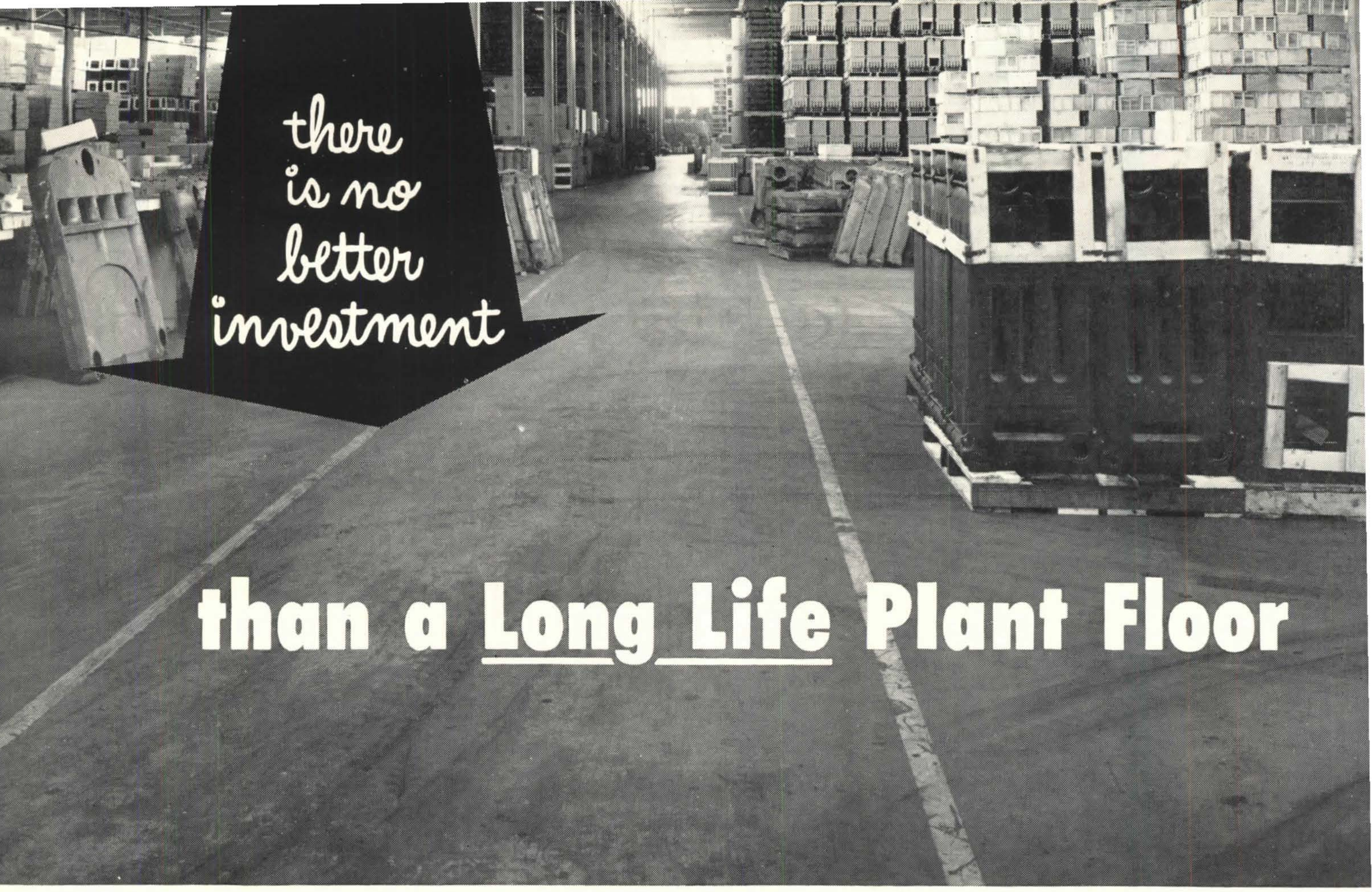


## housing projects

12

december 1953

largest architectural circulation in the world




View of Masterplate Floor in the American Radiator & Standard Sanitary Co. plant, Buffalo, New York. Archt.—Prack & Prack, Pittsburgh, Pa.; Contr.—Shirley Herman Co., Buffalo, New York; Floor Contr.—The Vannier Co., Buffalo, New York.

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**hold down costs**

**improve safety**


**Section of Masterplate Floor. Note Thickness of Armored Surface.**

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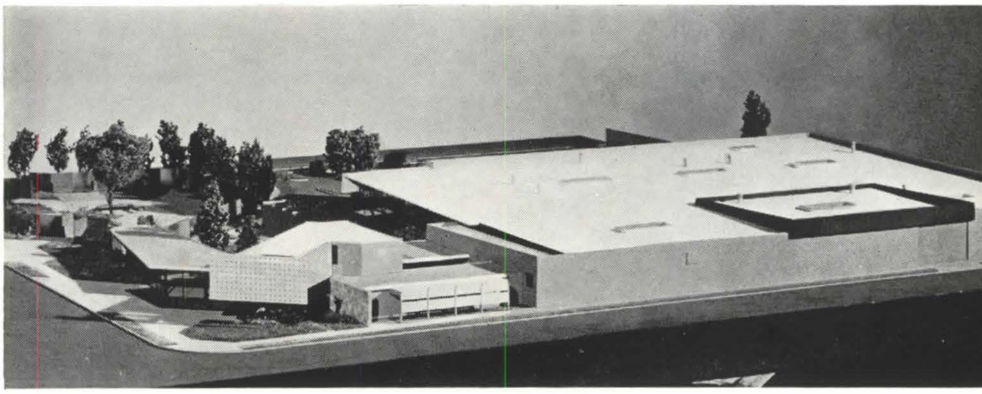
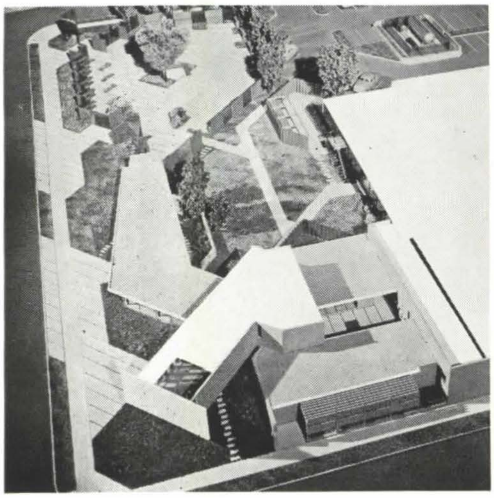
p a
PROGRESSIVE ARCHITECTURE

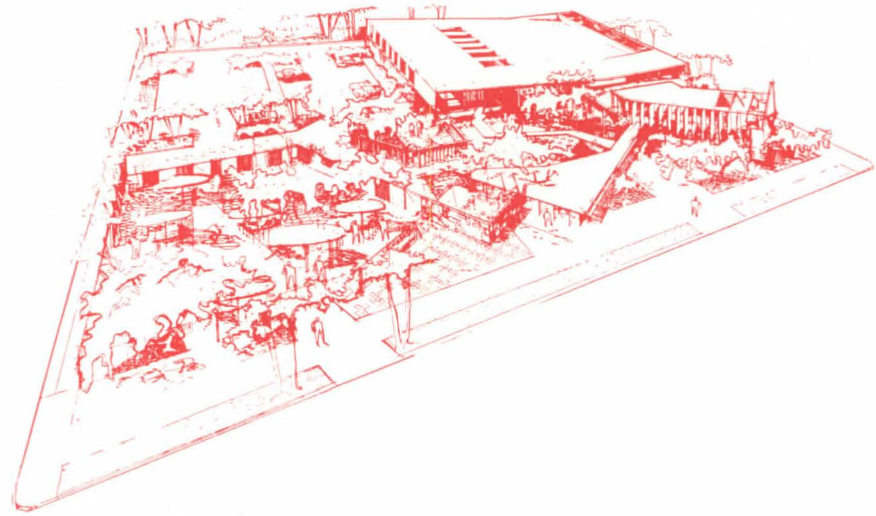
December 1953

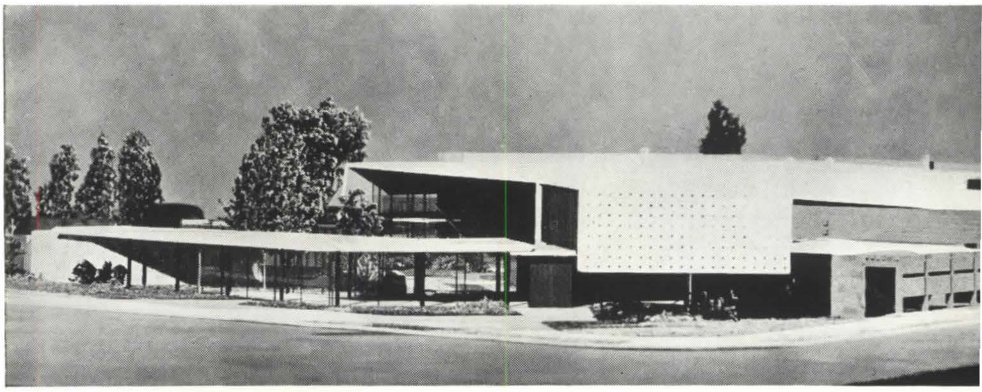
## ceramics studio and factory, offices and display area

*A tree-shaded garden which is also an outdoor display area, and an attractive studio-office wing lend distinction to this Los Angeles factory.*





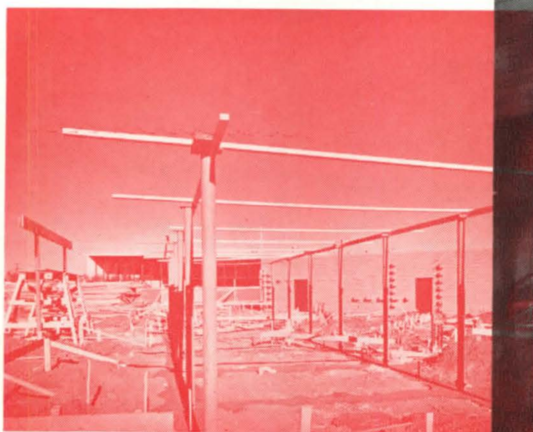


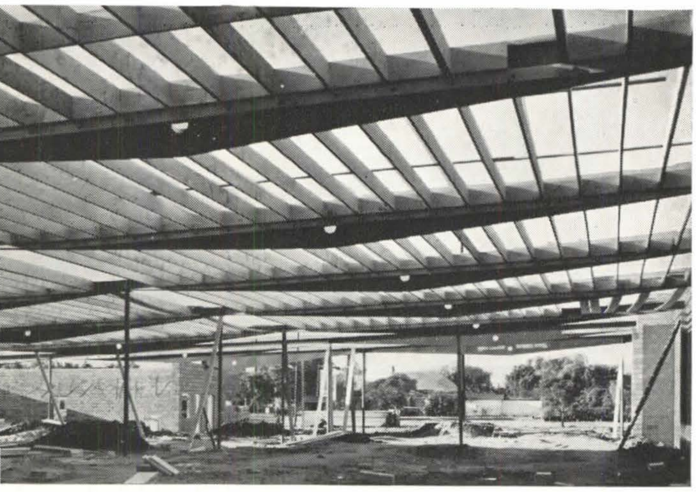


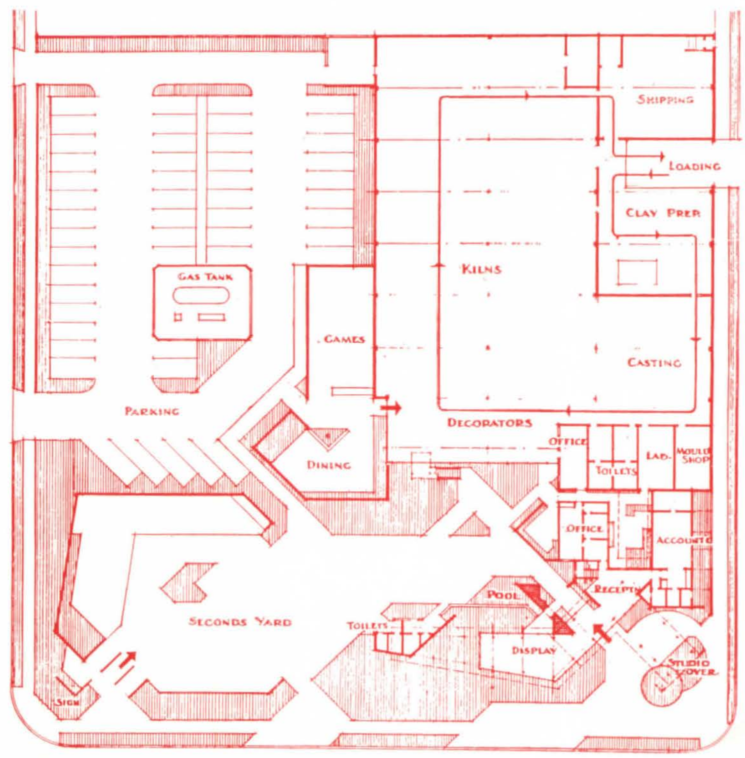
The expertly detailed model and the perspective (*above*) emphasize the eye-catching elements of the ceramics plant just completed in Los Angeles for Sascha Brastoff Products, Inc., by A. Quincy Jones, Jr., & Frederick E. Emmons, architects-site planners. The landscaping, so essential to the solution, now is underway.

The client approached the architects with an exceptionally complete program and a budget that required expert planning and design to meet the requirements: a design studio, a factory for ceramic products, offices, and an attractive display area for sale of "seconds." The factory occupies a full city block on Olympic Boulevard, a prominent location in an expensive industrial area, and it was decided to devote the front (about 20% of the site) to a landscaped garden for outdoor display of "seconds" as the sale of these is important to potential income. Taking further advantage of this scheme, the offices and studio also were placed to look into the garden area and to lend, by their effective architectural treatment, additional interest to the front of the factory. About 30% of the site is devoted to parking area and the remainder is enclosed for the manufacturing processes (26,000 sq ft).

Exterior walls of the factory are of painted concrete block and the composition roof is white. The office and studio wing is of frame and plaster, with natural stone facing. Roofs are of green gravel.





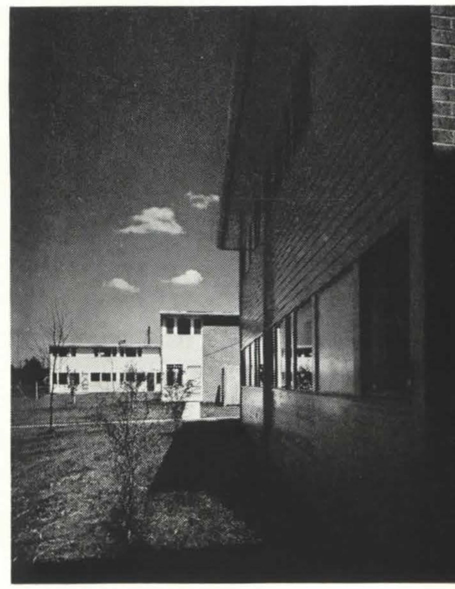



The display *room* is glazed from floor to ceiling, on all sides, affording views through this area from street to factory. Here ceiling tracks are provided on a 6'-grid pattern to give flexibility to various drapery arrangements and creation of changing displays. Lighting, both interior and exterior, was calculated to eliminate reflections on the glass walls.

Although the main shop area was originally designed with a clear span of 99 feet, it was decided to use pipe columns down the center and design for a double span—at a saving of some $5000. Key to the framing design was use of Ross-Carter tapered beams (inverted) with the wood roof joists framing into the webs. For daylighting of the factory area, skylights over work spaces are supplemented by a glass wall on the north side, affording the workers a view of the landscaped area.

The studio, above the corner entrance and reception unit, is for the use of Brastoff himself, who may work continuously for several days. A small kitchen unit and bath and sleeping facilities were therefore included. Adjacent to the studio, behind the perforated screen, is a deck floored with fire-brick, where small objects and models can be fired. The perforated screen can also be used for support of objects that the owner may wish to display on this prominent corner.

*Veterans Housing: Taunton, Mass.*



*Public-Housing Project: Benton Harbor, Mich.*

# two housing projects

The balancing that most architects go through in attempting to square the client's hopes with the available budget has a good deal in common with tight-rope walking. Too many concessions to dream stuff, and the budget goes by the board, and the client may find himself owning a mortgage instead of a home. Too much paring, and the house becomes a sorry thing, and no one is pleased.

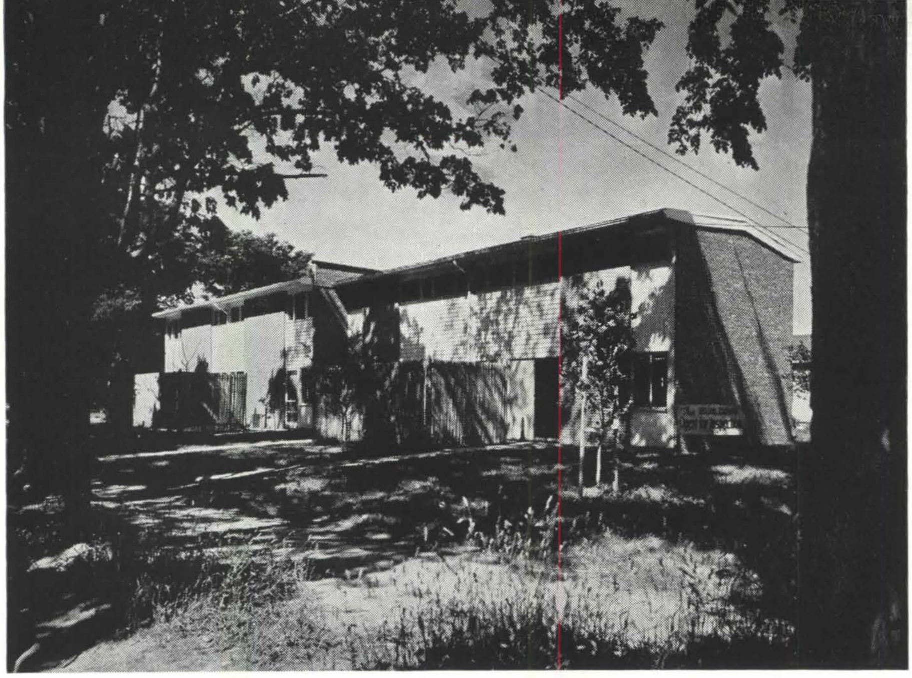
This delicate business, especially aggravated in the residential field, is raised to the highest nth power in the case of low-cost housing, whether public-housing projects or state-aided groups for war veterans. Minimum standards set for such work tend to become maximums, and the dexterity of a magician is required to make of the allowable square feet anything better than a series of cramped, little boxes—let alone providing anything that falls under the heading of amenity.

In the two housing groups shown on following pages—one, a public-housing project, the other, a group for veterans—the architects have gone far beyond the routine performance. In addition to providing the required number and size of family units within the budget—no mean achievement in itself—both groups give the tenants a surprising degree of privacy, livability, and sense of spaciousness.

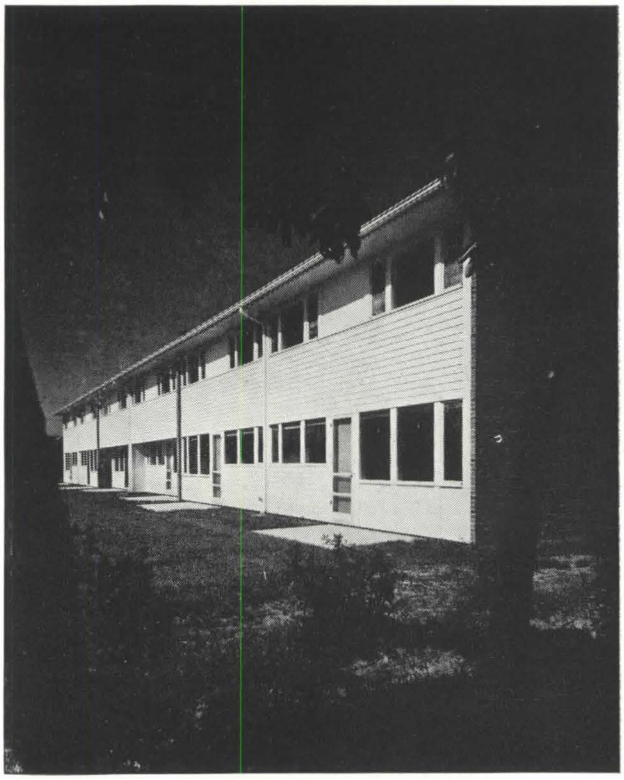
Though the problems and situations in the two cases were quite different, it is worth more than passing notice that the "secret" in both instances revolves around an ingenious, basic, unit plan that lends itself to a varied and humanized site layout. In both cases, the family living space—sitting, dining, cooking—is subdivided as little as possible, to take fullest advantage of the available space. In one instance, the only division is a see-through screen of expanded metal; in the other, a flexible unit consisting of a wing-wall screen and a coat closet. And in both schemes, the sunny sides of the units are opened with broad expanses of windows, the sites are carefully landscaped, and every family has provision for outdoor living.

The project had its full share of difficulties in being realized. When first submitted for bids, an unfavorable market condition put the cost somewhat in excess of the governmental limitation of $1750 per room. And, of course, PHA officials felt that the "radical" design was the caterpillar in the salad. However, the architects stuck by their convictions, and with the assistance of William Wilson Wurster, then head of the Architectural Advisory Committee for PHA, the project was eventually made possible by a slight increase in density. Final bids came to $1716 per room, or $8500 per unit, including buildings, site improvement, streets, and landscaping.

Each unit has an individual forced-air heating system served by a gas furnace. Thermal insulation is governed by wool-type batts. Sash are steel, residential casements glazed with either plate or double-strength window glass. Doors are hollow-core, flush, wood units. Lighting is incandescent throughout.



*Concealed behind cedar-stake fences on the buildings' entrance fronts* (above) *are laundry-drying yards and sunken garbage receptacles for each pair of units. This leaves the lawn sides* (right) *entirely free of encumbrances. Each unit has its own paved terrace.*
Photos: Lens-Art



*At the southeastern corner of the project* (below), *paired buildings contain 4 one-bedroom units each. Though the photographs were made before landscaping had progressed far, the site plan shows the detailed attention given to this aspect of the design. A more recent report says that "flowers and landscaping make it a most pleasant place to live."*

# veterans housing

| | |
|---|---|
| location | Taunton, Massachusetts |
| architects | Smith & Sellew |
| landscape architect | Dan Kiley |
| engineers | Gordon E. MacNeill Associates |
| general contractor | Jefferson Construction Co. |

Design and size of the 40-family units in Highland Heights Veterans Housing, a low-cost, state-aided, rental housing project, were governed by standards based on PBA minimum standards. Half of the units have two bedrooms; the other 20 have three bedrooms.

The site planning is excellent—two pleasantly spaced groups of buildings organized on neighboring hills of the 10-acre site, with lower land between, and each group having a traffic entrance from existing roads. The design seems to meet the requirement that it "reflect the New England environment," while making no banal compromises. But undoubtedly the most noteworthy element is the remarkably flexible—and remarkably simple—basic plan, used variously to meet all site conditions.

To understand the basic plan's flexibility, first consider the following facts, against the drawing of the first floor of the two-bedroom unit (*acrosspage*).

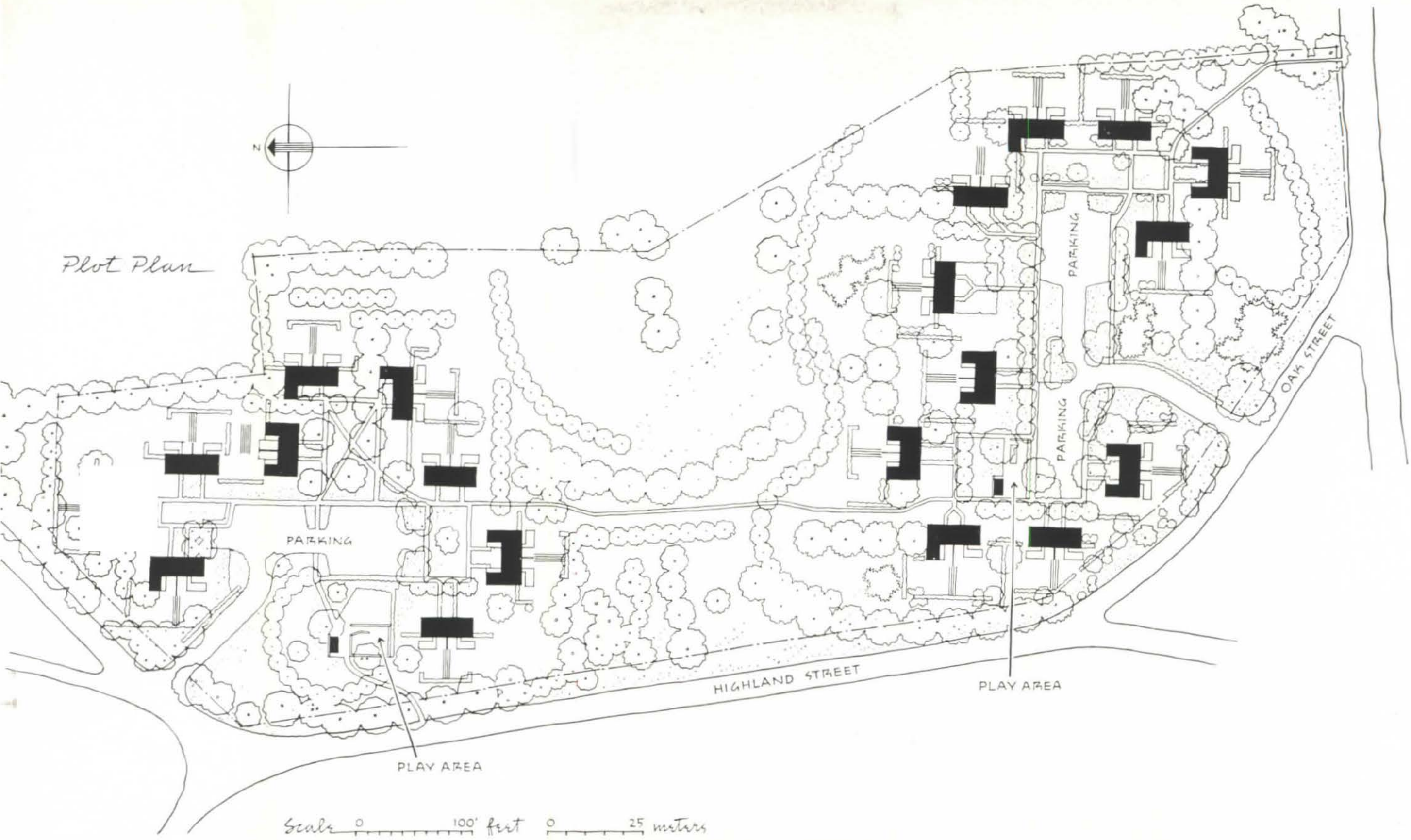
1. The plan of each unit is a simple rectangle, with one long side opened by many windows and a door; the service side containing a single window, a door, and —in the corner—the staircase.

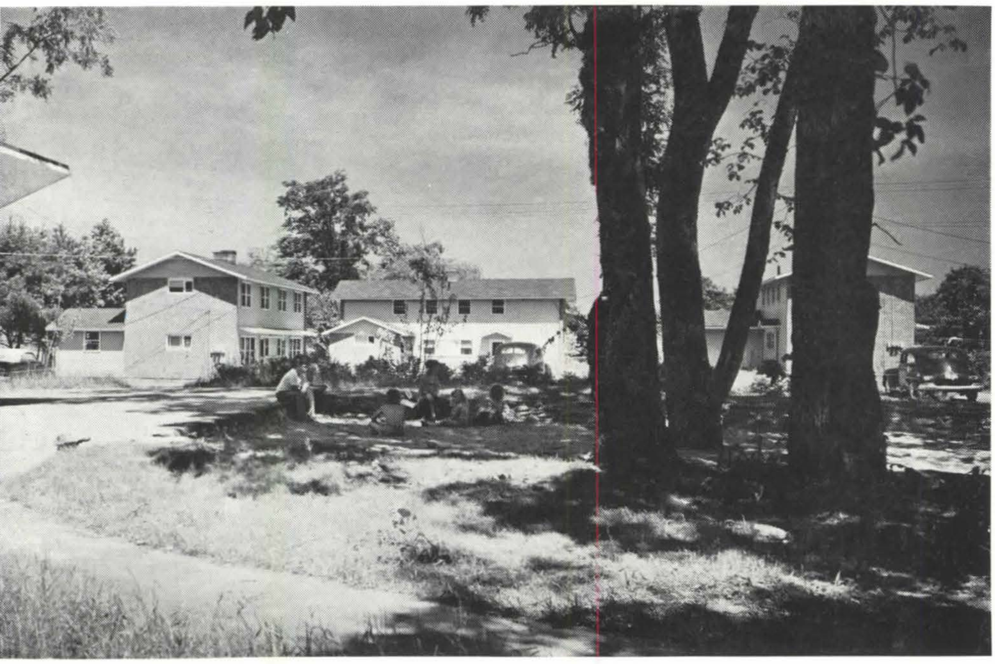
2. The only division in the living space is a combined closet and wood screen, that separates kitchen-dining from sitting area.

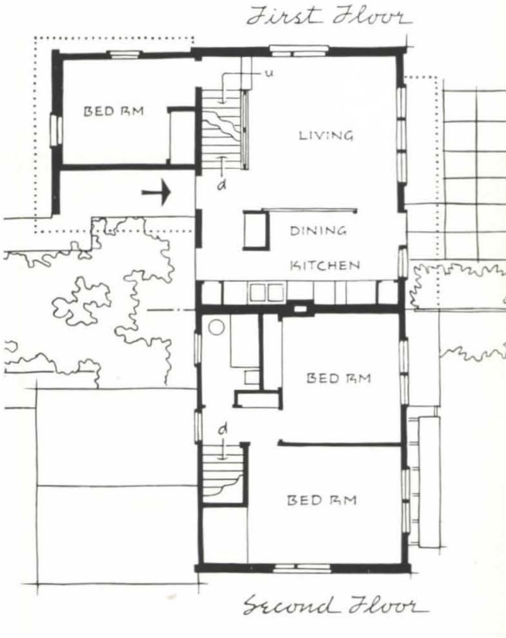
3. The plan is used as shown here—with main entrances on the windowed side of the house—wherever the building is sited so that approach is from south or east.

The alternate plan—accomplished by reversing the placement of the coat closet and screen—is shown in the first-floor plan of the three-bedroom unit. This reverse-arrangement plan is used—with main entrance on the service side—wherever the building is sited so that approach is from the north or west.

Thus, although the buildings occur on all sides of approach walkways, the windowed, living sides of the houses always face south or east. Where a third bedroom is desired, it is always simply a ground-floor addition, opening off the stair landing.






PAIRED 3 BED ROOM UNITS

BASIC 2 BED ROOM UNITS

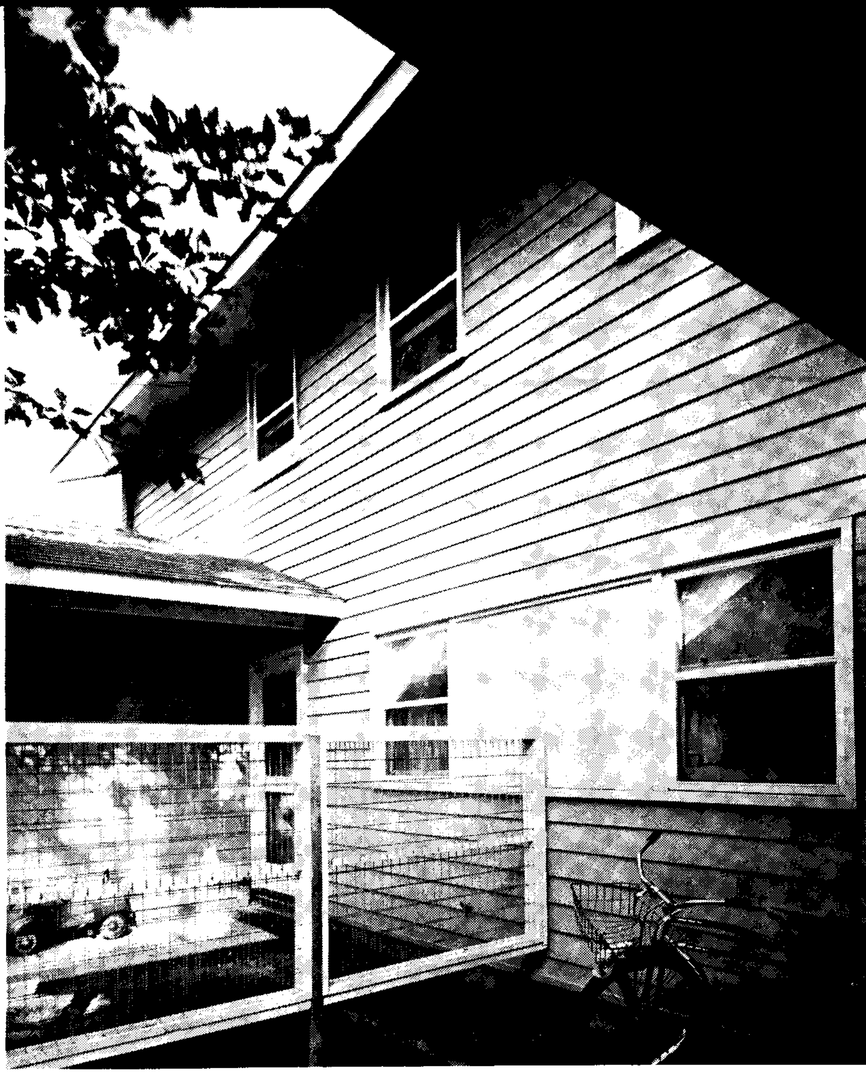
Where buildings are approached from the south or east (*photo below:* looking west, at the extreme north end of the property, is an example—the unit at right faces south; the one in the background, east), the buildings are set well back from approach walkways for greater privacy on the living sides. Where the houses are approached from the north or west—hence, to the service sides of the units—the buildings are relatively close to the walks so that the widest possible outlook is gained for the living sides, at the rear in these instances.

The groups of houses on the two hills are further broken down into small courtyards, generally detached from streets and parking areas, creating long views and intimate vistas, from walks about the site or from the houses. "The major point in this project," say the architects, "is the relation of a single, basic house plan to its site. The theme of the plan can be played on with many variations. Because it may be approached from any side without sacrificing individual exposure, we gain control of the site and may design or change groups, vistas, and directions of streets or houses with great freedom."

Variety is further achieved, in spite of the single basic plan, by the fact that some houses have two third-bedroom ells; some have one; and some have none. Moreover, houses variously present their glassy sides, their closed sides, or their ends toward public walks or streets.

Construction is standard wood frame, with end walls of brick veneer and party walls of 8-in. concrete block. Exterior clapboarding is painted red cedar, and interior wall surfaces are of plaster or hemlock boarding. Asphalt shingles are used for roofing: sash are wood, double-hung and transom. Units are heated with oil-fired, hot-water systems using baseboard convectors.

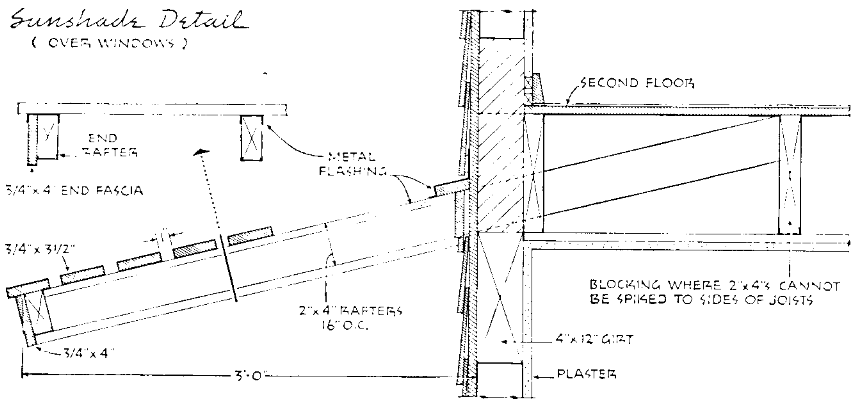
Cost came to $11 per sq ft, including half sq ft for finished basements. This price includes utilities, site work, and planting. Total project cost: $500,000.

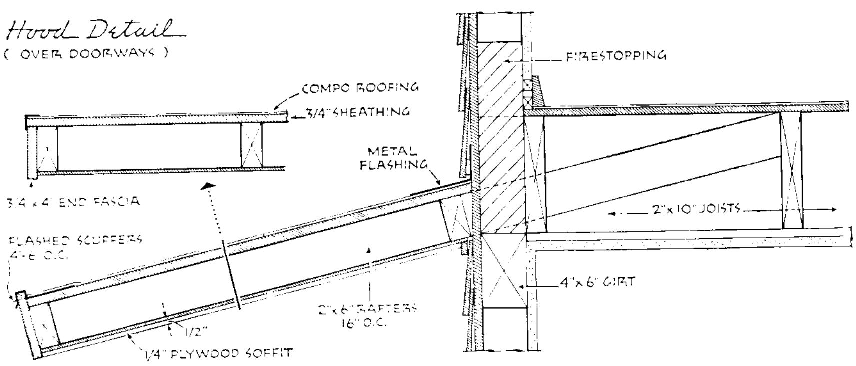


*Where the third-bedroom ell is added* (left) *the door —entrance or rear, as the case may be—is incorporated with the design by an overhanging roof, forming a sheltered porch.*

*Two photos* (below) ***illustrate the coat closet-screen** combination that divides living **from eating-cooking** areas of all units and that, in **reverse placement**, provides the chief element of **flexibility**.*

*The Taunton Housing Authority **required that** clotheslines be placed away from the **street**: hence, front yards* (acrosspage) ***always** are **toward the street** whether the service or main living side of the house occurs on that front.* Photos: Ezra Stoller



# *the architect and his community:*

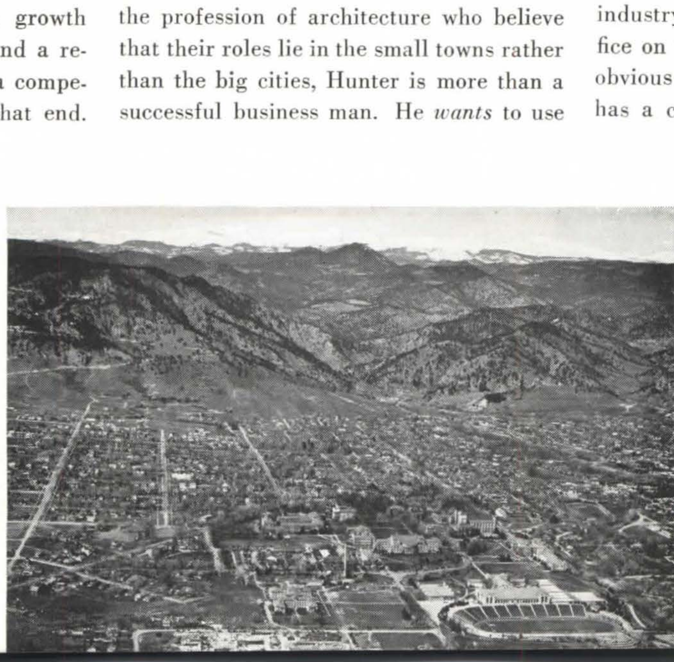
*Office staff of James M. Hunter, architect. Seated (left to right): Hunter; Kenneth Einhorn, chief draftsman; Margaret Read, draftsman. Standing (left to right): Victor Langhart, designer; George Thorson, draftsman; Donald Teegarden, draftsman; Robert O. Roy, designer. Not shown are, Olyn L. Price and Carl Knoettge, field superintendents; Thora McClary, secretary; Dorothy Wallace, receptionist; Chuck Gathers, junior draftsman.*

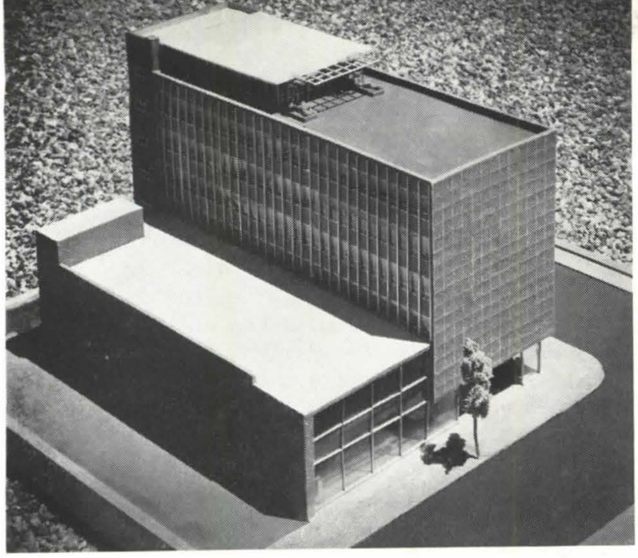
# *James M. Hunter: Boulder, Colorado*

Located along that irregular line where the Rocky Mountains come down to meet the Great Plains—25 miles northwest of Denver—Boulder, Colorado, is a city of 25,000 population that offers every physical advantage: sunny year-round climate, scenic setting, convenient transportation, and pleasant community living. Gold-seeking white men moved here in 1858, into the territory of the Arapahoe Indians, and stayed. In 1860 Colorado's first schoolhouse was built in Boulder; in 1871 the "Town of Boulder" was incorporated. Since then its growth has been placid and orderly. A new toll road to Denver increases its accessibility, but Boulder citizens, with good advice, are determined that future growth will be planned and organized; and a regional planning board, retaining a competent city planner, is working to that end.

For some years now, the architectural scene in Boulder and adjacent communities has been dominated by the office of James M. Hunter—a vigorous, conscientious, and capable architect, who feels strongly the responsibility of a professional man to keep the standards of his community at as high a level as possible; to serve, to advise, to lead through participation. Hunter's work extends through the state, but he prefers it to be close enough for full supervision, and the bulk of his practice is in Boulder itself. In this city, in his own words, "We do everything from remodeling Mrs. Zilch's kitchen cabinet to designing the City Hall." Like others in the profession of architecture who believe that their roles lie in the small towns rather than the big cities, Hunter is more than a successful business man. He *wants* to use his knowledge and training and abilities to improve the physical aspect of his town; he is realistic enough to believe that this can be done, and that he has an important part to play. "The basic premise on which the office was founded," he says, "was that of proving that an architect could function in a small community and could be an influencing and bettering force in the esthetic environment of that community."

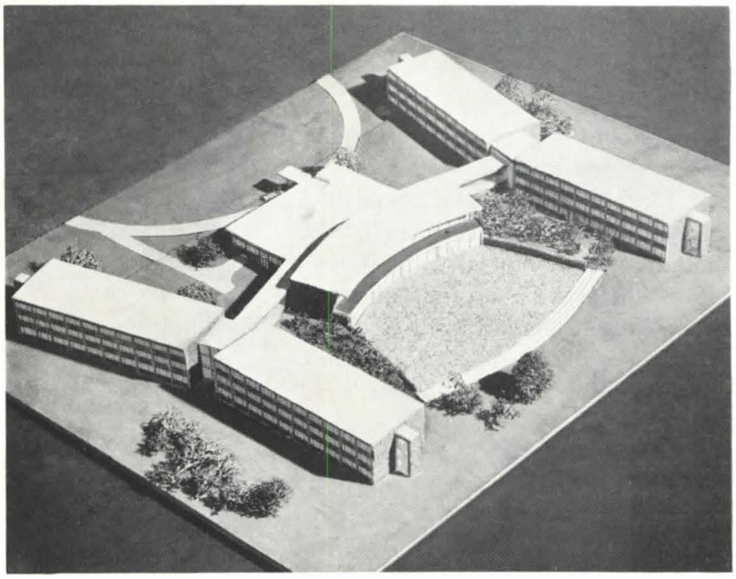
The completed buildings and projects which illustrate this article indicate how successfully that premise has been carried out. James Hunter likes his community—"so far it has suffered a minimum of desecration at the hands of the construction industry" (the influence of the Hunter office on the operative builder in the area is obvious to a visitor)—and he believes it has a certain unity of physical character.





*Project for the Boulder Industrial Bank* (above) *is the third and final phase in an expansion program for this institution, now housed in remodeled quarters* (see page 87). *The six-story bank and office building will go ahead within the next few years.*
Photos: Reynolds, Photography, Inc.

*Dormitory for Colorado A.&M. College* (below) *is being built with HHFA assistance. To reduce "chain reaction" noise, and provide smaller social units, plan breaks 400-man housing into 100-bed units, with central area containing administrative, recreational, and dining facilities.*

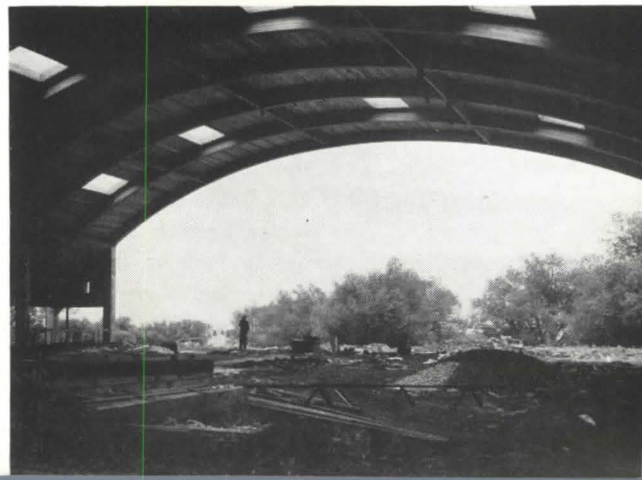


Some of the members of the Hunter architectural staff are shown acrosspage. The office believes in teamwork—"each of us has much to learn and much to contribute. What we are doing is continually evaluated at 'chowder and philosophy' meetings at which everyone speaks his piece." James Hunter believes in the development of the individual in the team—even though this has meant the growth in professional stature of some of his men to the point where he has lost them to their own practices. "When a man attains professional status by being licensed, he may become a part of the firm, and every effort is made for him to become known as a professional associated with the firm, if he so desires."

Hunter believes firmly that an architect interested in his community must participate in community affairs. His own extracurricular activities are extensive: since the founding of the office in 1940 he has served on the Mayor's Building Code Committee; he was instrumental in the founding of a Regional Planning Commission; he has been active in the preparation of a uniform Building Code for Colorado; he is now serving on the State Department of Education's Committee on School Planning Facilities, and on the Advisory Committee of University of Colorado's Department of Architecture. In a professional sense, his activities have been equally extensive; for five years he was president of the State Board of Examiners of Architects; and he has just completed a term as president of the Colorado Chapter of the AIA.

It is obvious, in examining the work of James Hunter's office, that a definite philosophy of design underlies the work that is produced. "I feel—and I am sure that those associated with me share the conviction—that architecture must do more than create an efficient and articulate structure in terms of this generation's technical abilities. I believe that somehow the esthetic perception of John Q. Public must be satisfied—not through historical clecticism, but by the simple premise that a building must create a warm, intimate atmosphere to be satisfying." He experiments with techniques and their expression, but beyond that "we have no qualms about texture, pattern, and design devices by which the observer can be afforded 'delight' in his atmosphere." He believes: "The esthetics must be far enough above the public standards that the citizen of the community can grow to appreciate it, and find his culture broadened."

*Gymnasium for the University Hill Junior High School is designed with glued, laminated arches spanning the long way, with end wall open for expansion to double present size. The school, under construction, is planned now for 400 students, with an ultimate 800 capacity anticipated. Structure is prestressed concrete.*

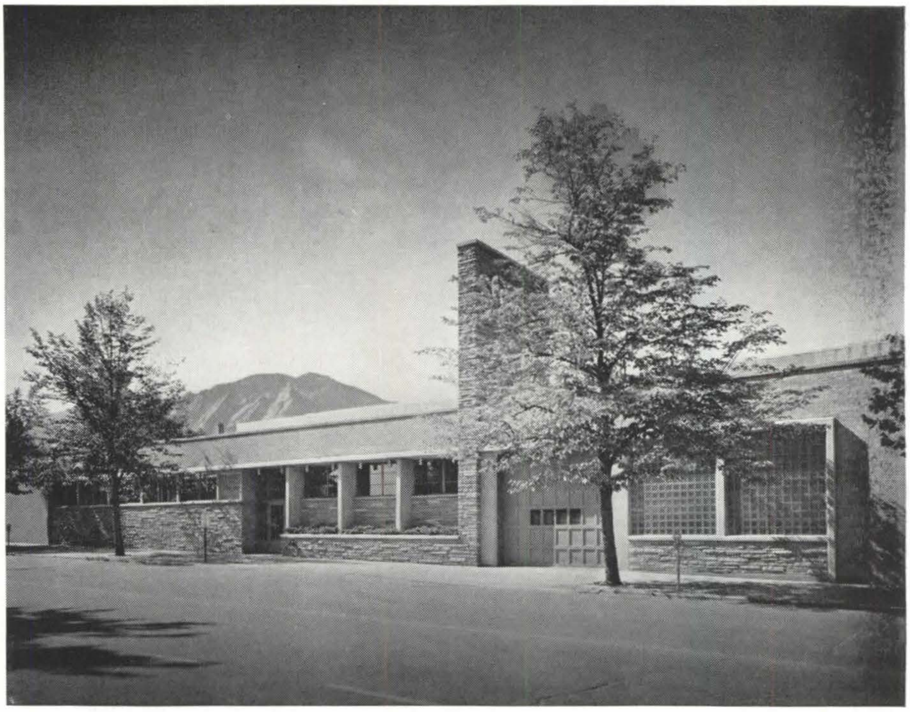


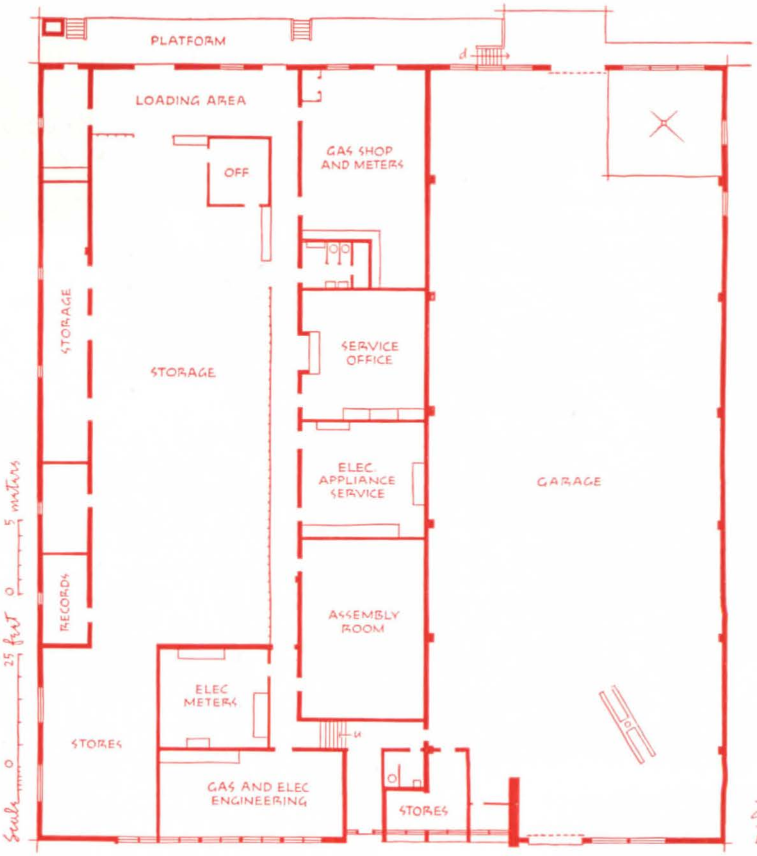
P.S. On a hot day this past summer I got off the Denver bus at the combined railroad and bus station in the town of Boulder, and waited for Jim Hunter to pick me up. I looked out at the community—not very pretty from this aspect—sprawling at the foot of the mountains—and wondered what sort of a practice an architect might find here; close enough to Denver, and yet fairly isolated; not far removed in time from the prospectors who pitched tents and watched for Indians—certainly with no long cultural background such as the East has. I had seen some pictures of Hunter's buildings, and they looked good. Were these a few sparse examples? And what was his run-of-the-mill work like? I left that night convinced that here was a man with convictions, and the strength to carry them out; a man who recognizes and admits his own limitations, but is growing constantly because of his strong desire to use architecture as a means of improving his community.

Hunter is most proud of the fact that he is a respected member of his community. During the course of that day we visited the City Manager's office in the Hunter-designed Municipal Building (*see pages* 000 *to* 000) and that official said to me, "We are very proud of Jim Hunter in Boulder—both as an architect and as a citizen." We visited the offices of the Regional Planning Commission, and it was obvious that there was respect here for Hunter's opinion. We stopped in at the houses of a doctor, a scientist, a business man; we chatted, visited, had a drink or two. It was clear that these people were friends, as well as satisfied clients. We made stops at jobs under construction, and the contractors and workmen showed their respect and affection for Hunter. We spent a pleasant evening at his own house, and we talked shop, and we just talked. Through the day ran the thread of personal and professional satisfaction. And through the projects that we visited ran the obvious fact of design and professional growth. Each year's output is an advance over the one before, and, as Hunter himself says, "The best job is always the one on the boards." One feels here accomplishment, progress, purpose. What more could a devoted architect ask his practice to give him?

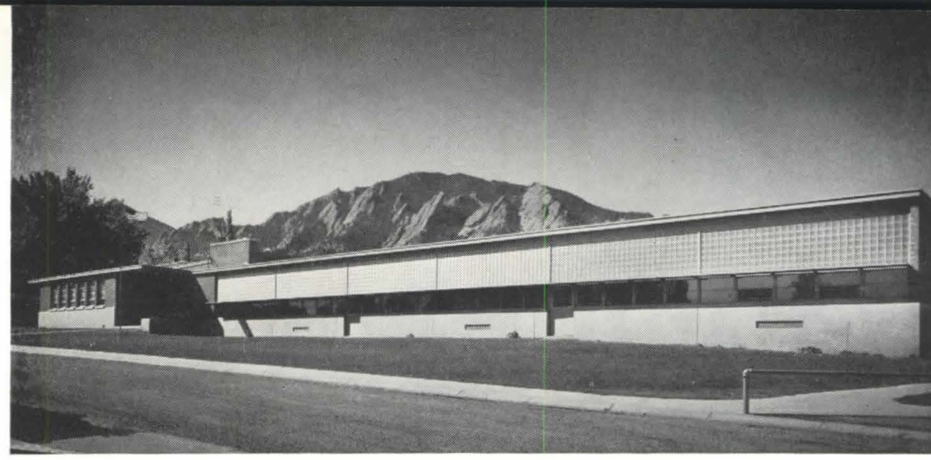
T.H.C.

*Public Service Company Warehouse and Office Building (below) fronts a "heterogeneous collection of warehouses" and pulls them together into a functioning whole. Space is provided for bus storage and maintenance, for offices, drafting facilities, and for receiving and storage areas. Company wanted a dignified building, which would add to rather than detract from the appearance of the street, which is in the heart of town.*

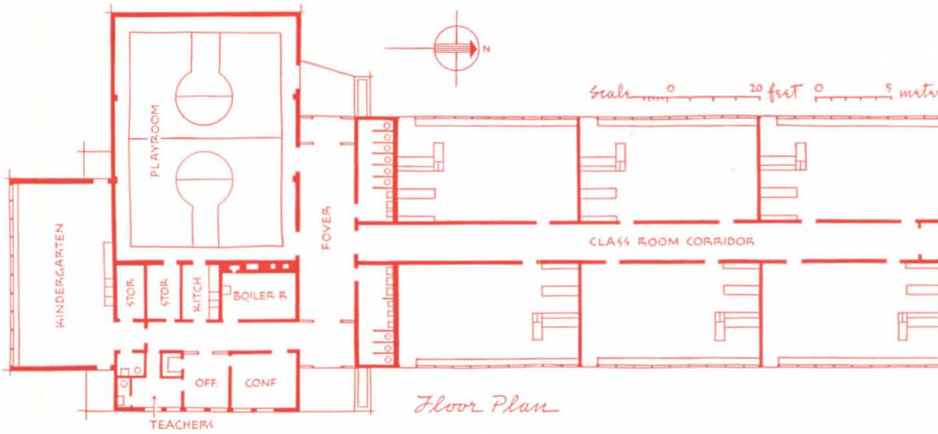


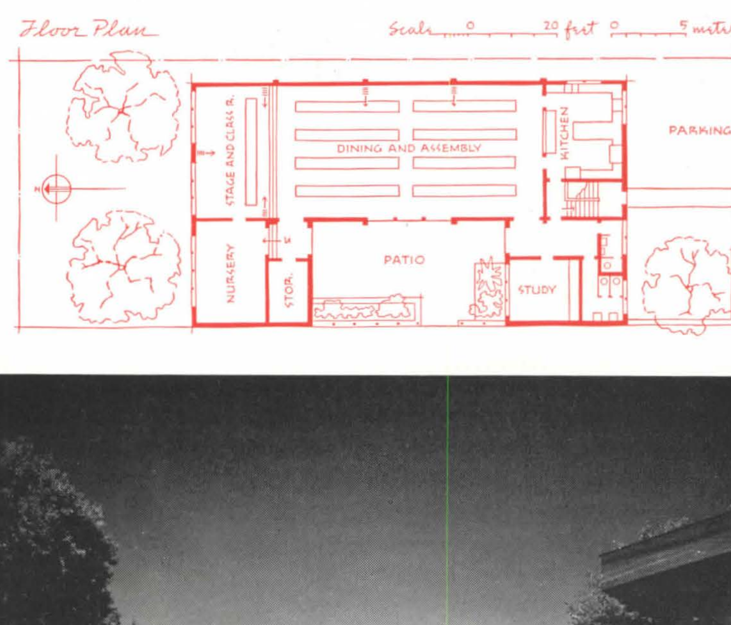


Floor Plan



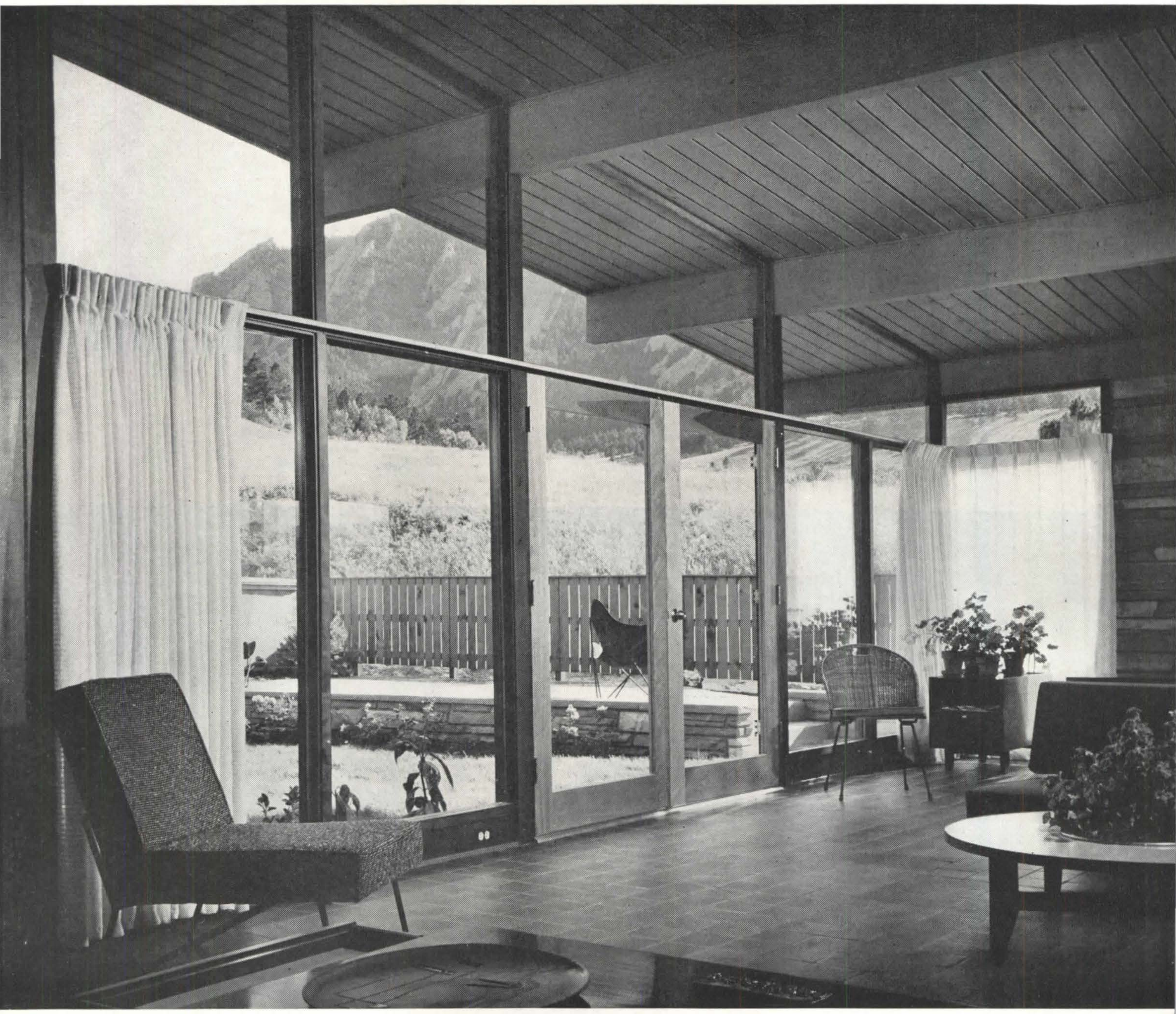
*Two classes each of first through third grades and a kindergarten are accommodated in Boulder's University Hill Elementary School. Scale is kept small throughout. Room daylighting derives from upper bands of directional glass block with clear-glass vision strips below. Classroom ceilings follow the slope of a center-drain butterfly roof. Classroom wing may be closed off when playroom is used for community activities in the evening.*




*Parish House for St. John's Episcopal Church, a unit badly needed for Sunday School activities and group and club meetings and activities, was accomplished on a very small budget. Rather than try to imitate the "reasonably good Gothic" of the church building, a contemporary expression was agreed to, largely because of the economies produced, and the space which could be gained.*

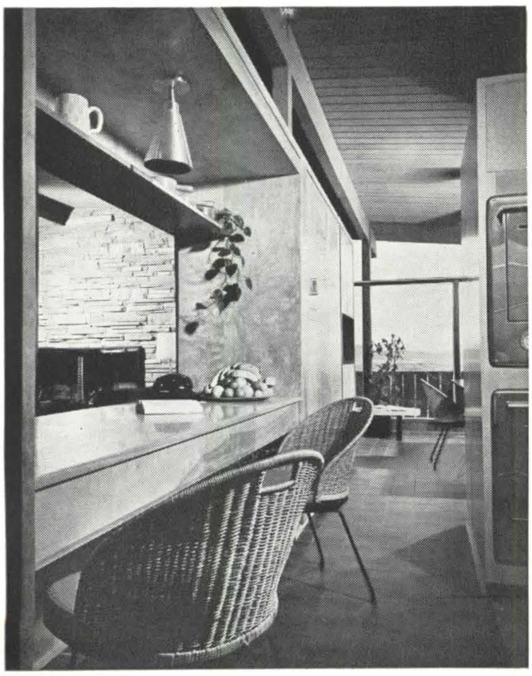
the architect and his community: James M. Hunter

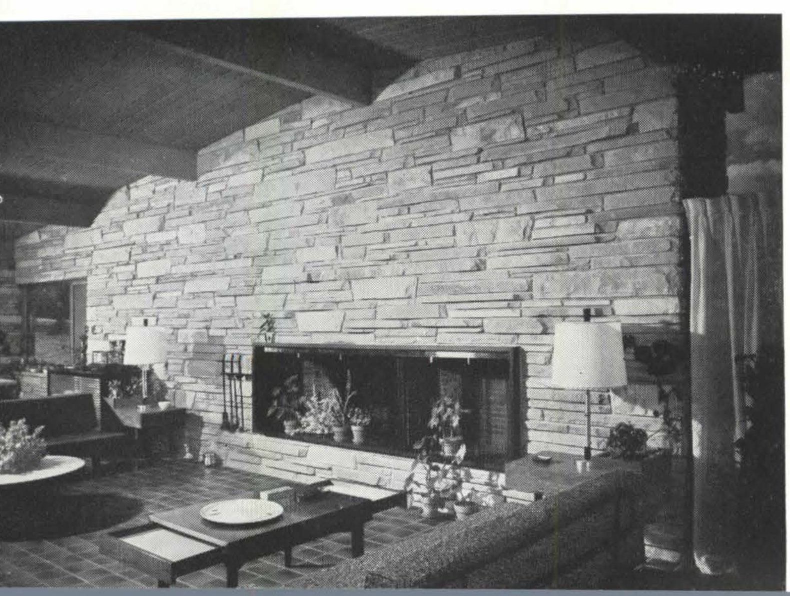


*Living room of the Norton house looks principally toward the mountains, and opens on the partially protected court. The structural module is clearly evident here, as well as the muted finishes of the exposed tongue-and-groove ceiling planks and the quarry-tile floor. Colors are consistent with the warm, earth tones of the landscape.*

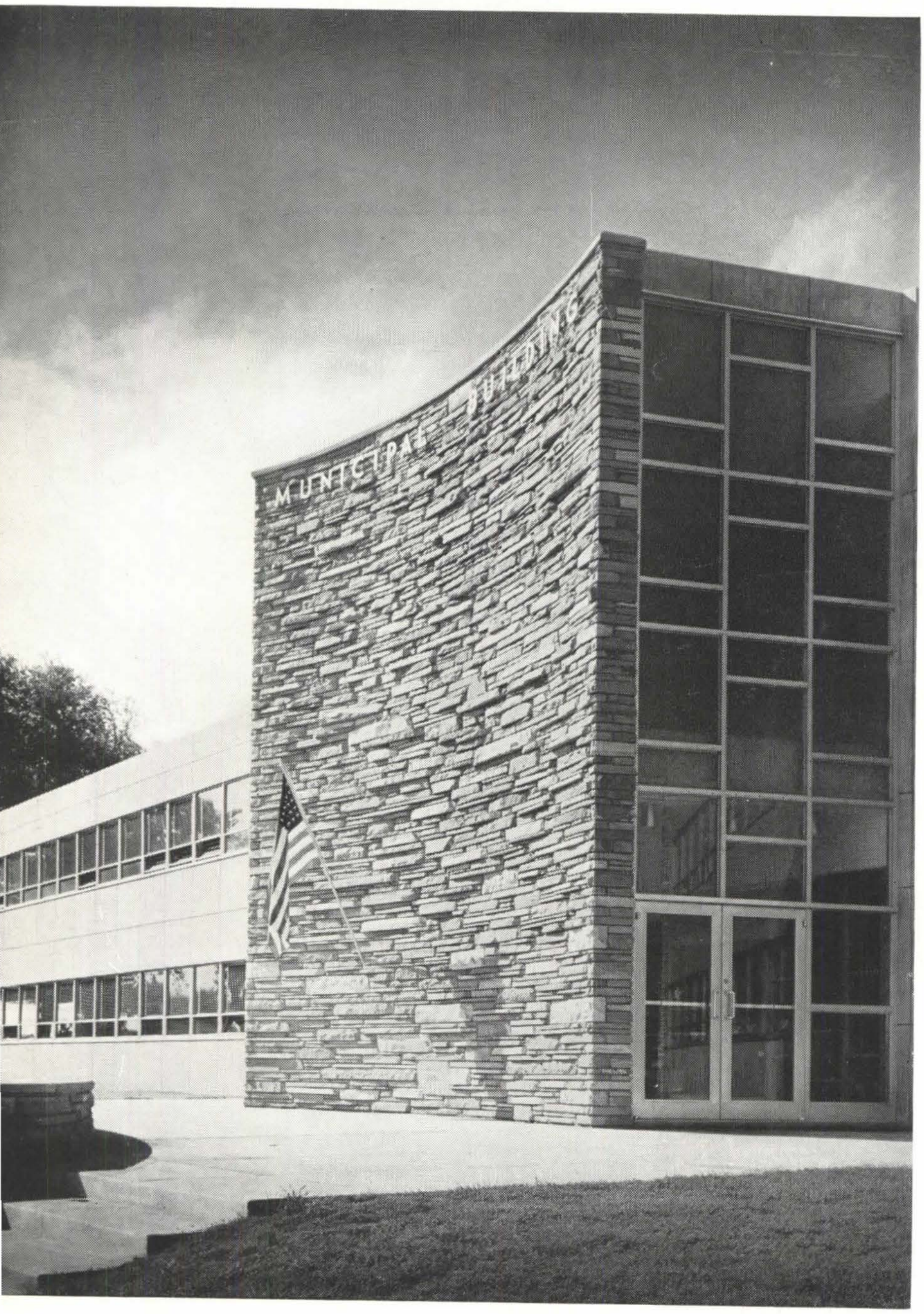
residence

*Counter between kitchen and entry* (below) *can be left open, as the photograph indicates, or can be closed by a sliding screen. Thus it provides through ventilation and a sense of openness, as well as service space for buffet meals—or can be shut off for privacy when guests arrive. Dining space is beyond, opening onto the porch. Master bedroom* (right) *is at the end of the house, looking toward the rolling foothills which surround the house.*



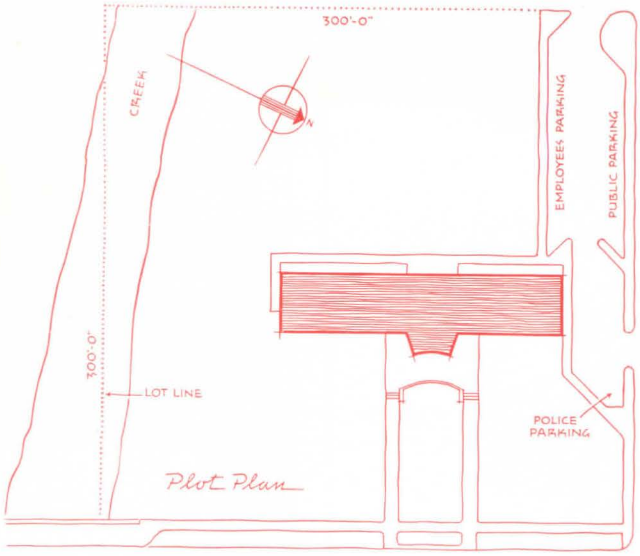


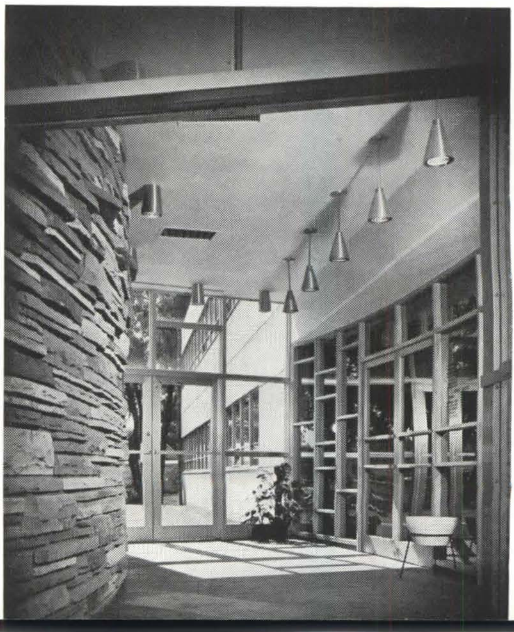
*One large open space encompasses study and living room* (left) *at one end, and dining room* (above) *at the other. Separation of functions is accomplished by furniture, and marked further by use of materials —the stone texture of the living room fireplace wall ends at the dining space, and a vista opens there to north and east, toward the town itself.*

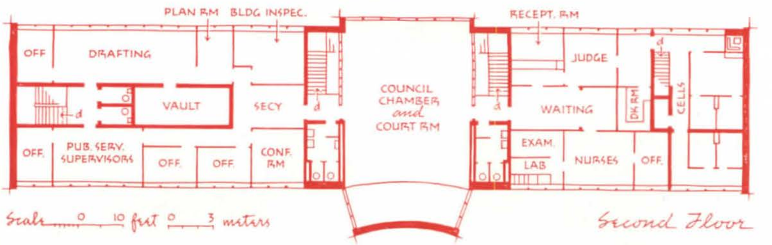


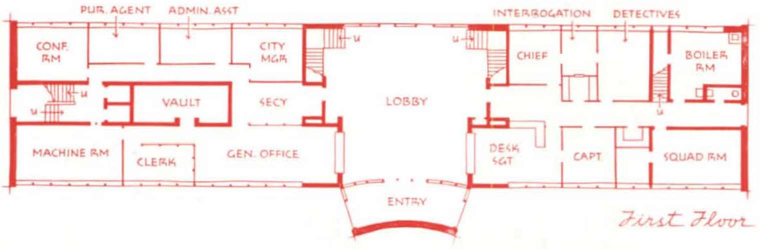

# municipal building

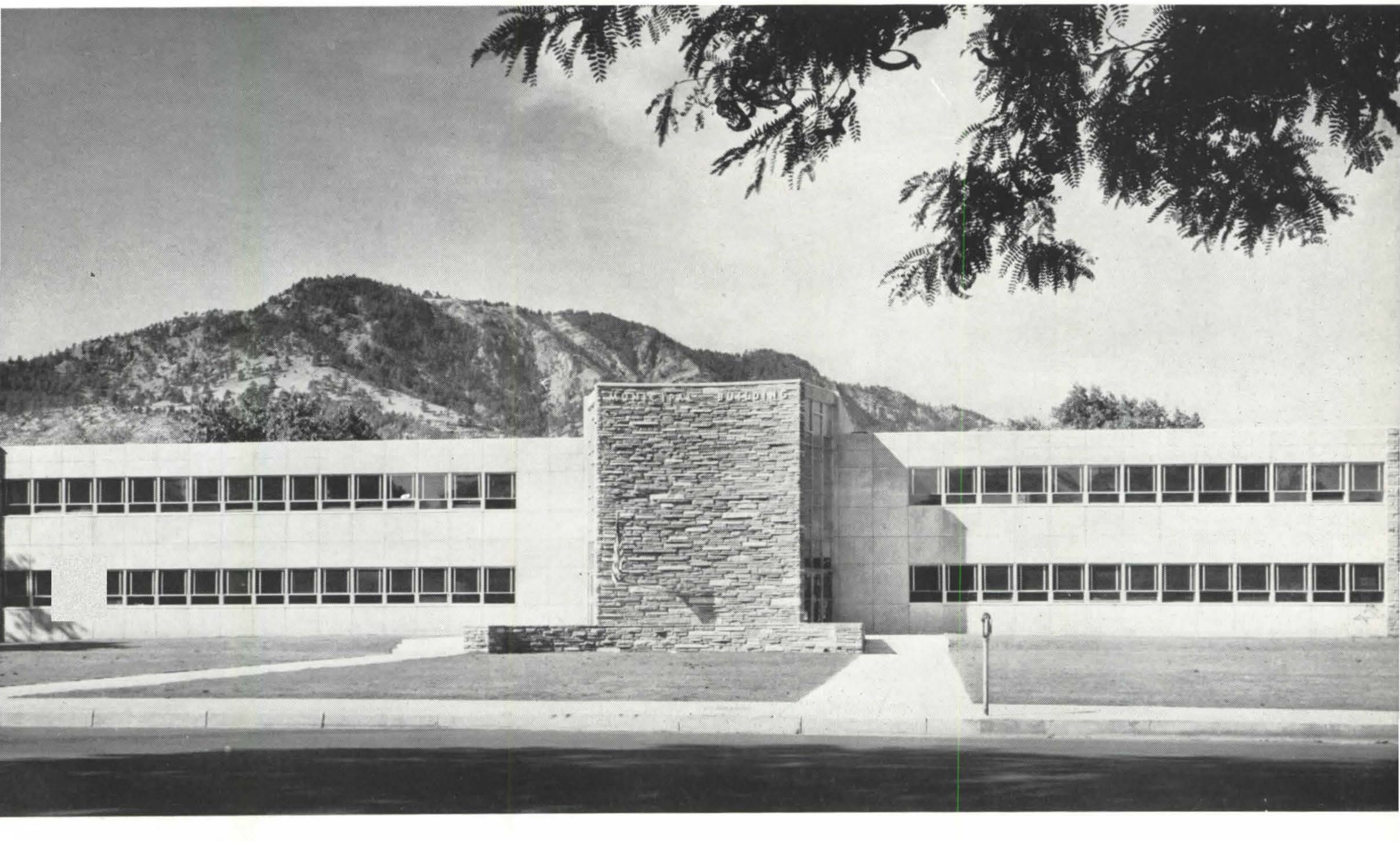
*Entrance to the Municipal Building is at either side of a curving stone wall—"an effort to gain the maximum monumentality with the minimum mass . . . to toy with the light across the jagged projections of the ledge-stone surface . . . to form a definite termination to a vista from the park beyond." Visually, from the entrance lobby* (see plan acrosspage) *the stone wall is a "room wall," with light coming in at both sides through the vestibule* (below).





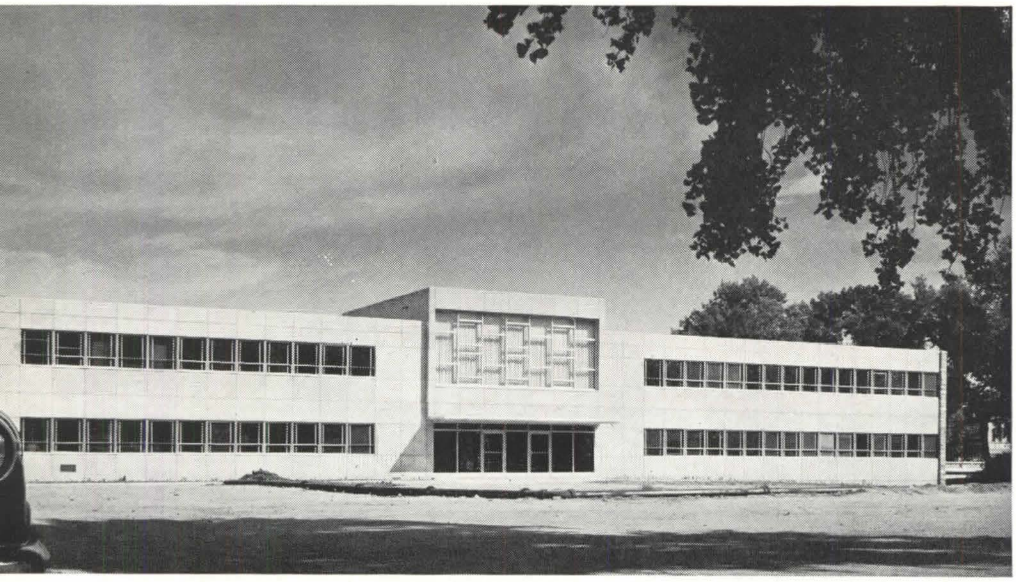



Boulder's Municipal Building is a dominant structure in the community, and one of which the community is proud. It was singled out at a recent Conference of City Managers for seminar discussion, and its occupants, from the City Manager to the porters, are anxious to assure the visitor that it is not only a handsome building but one which works well in every detail.

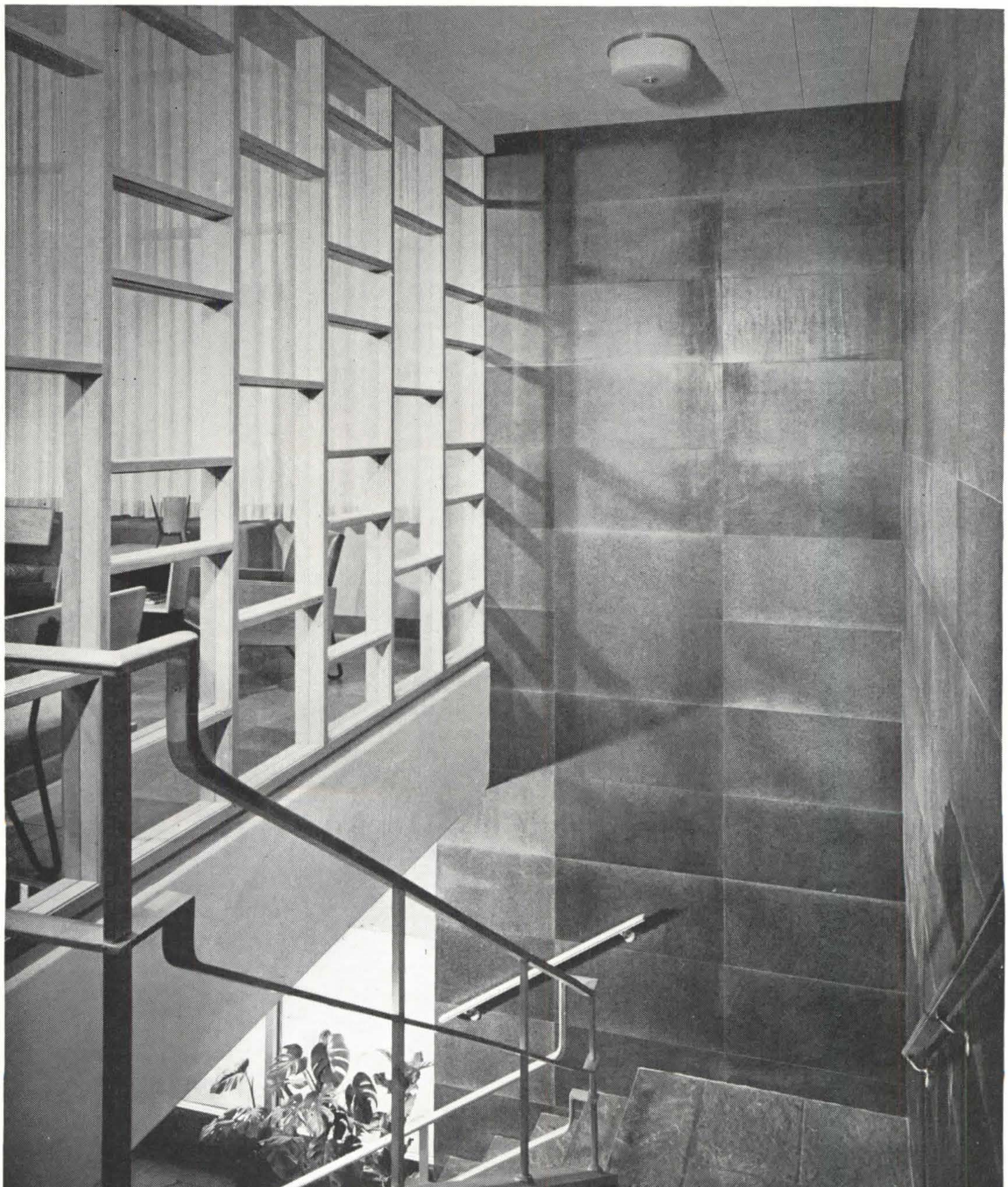
Boulder has been fortunate—and far-sighted—in acquiring a "green belt" along the creek which meanders through town, for ultimate development as a civic center. The Municipal Building is the beginning of a civic development which will ultimately include a museum, a library, and a civic auditorium, all informally organized along the banks of the creek.

Program for the building was complicated by the need to consider present requirements, and to look for a fast-growing future of the community, which will surely require fast-growing municipal activities. (The advent of a large research laboratory, a large publishing house, and expansion of the university have increased the town's population in recent months.) The plan is one with few corridors, flexible partitions, and a large public space in the oversized lobby. The public (except for those unfortunate members who are visiting traffic court or even, perchance, the jail) does not go beyond this lobby. Office partitions are movable (metal, modular units); heating is a flexible, baseboard system, utilizing hot water, gas fueled.

Structure of the Municipal Building is reinforced concrete, with "flexicore" floors and roof. Exterior surfacing, aside from the stone walls, is precast concrete. Interior finishes are largely brick; floors are stone and cork (public spaces) and asphalt tile (work areas). The over-all aspect of the building, with its bright, open outlook, its simple, flexible plan, and its well-chosen finishes (and furniture) is one of cheerfulness and friendliness—as a city's municipal building should look to its citizens.



*Rear of the Municipal Building* (left) *looks out on what now is a parking lot but will be a park and a part of the ultimate civic-center development. Finishes and details of the building give it a monumental character inside and out (as in the stairhall,* below) *without destroying a feeling of intimacy.*



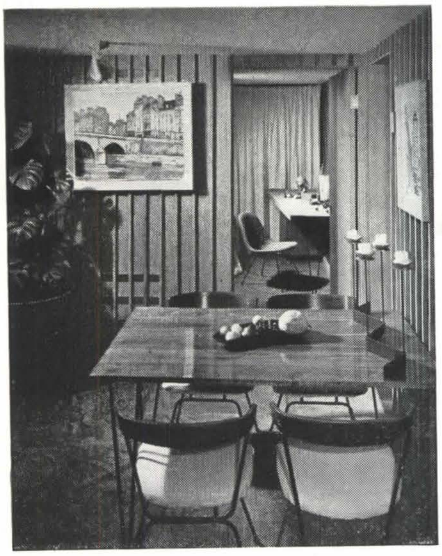
## municipal building

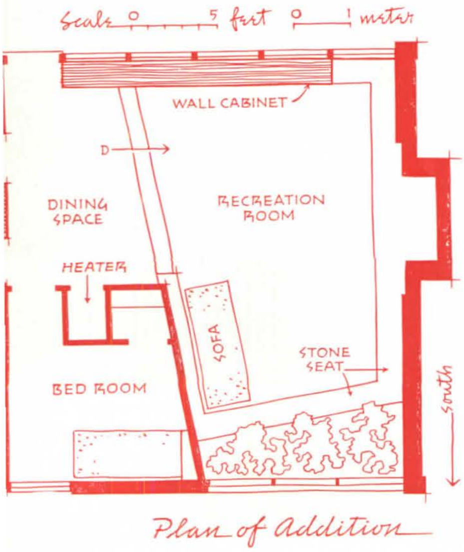
The photograph above is typical of the interior finishes and appointments of the Boulder Municipal Building. The precast reinforced concrete walls (*shown here from the inside*) are a particular interest of the Hunter office. "The area abounds in good aggregates, and cement is manufactured locally," Hunter explains. "We use it both cast-in-place and precast, and we are very interested in prestressed, precast units, as well as wall units cast as a sandwich."

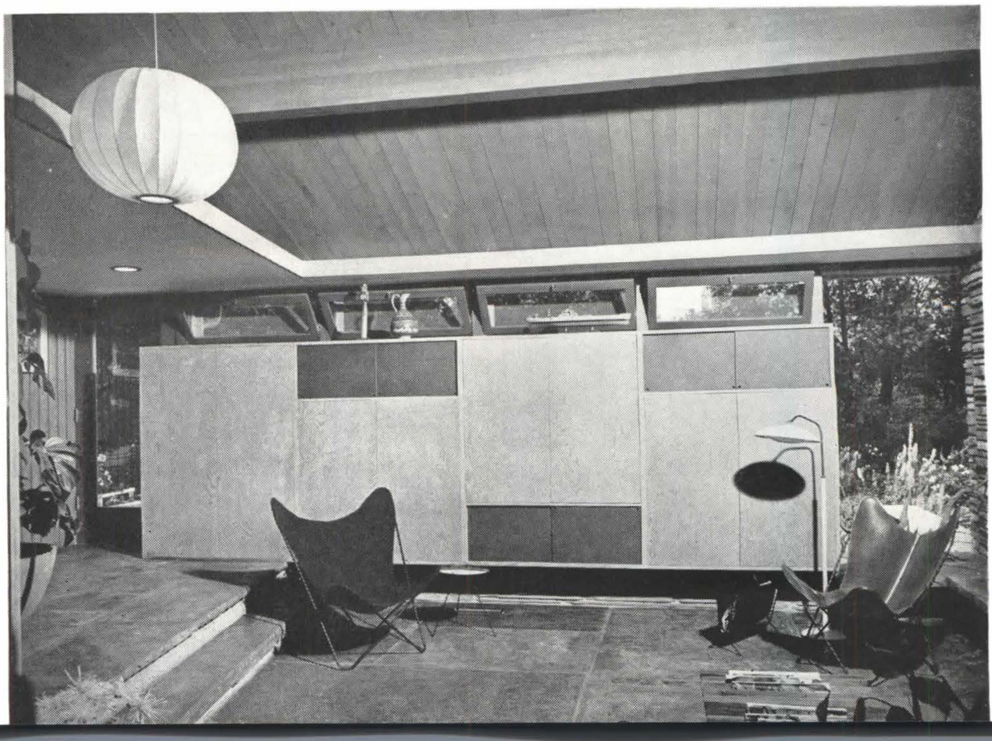
In the Municipal Building, as well as in smaller and residential work, Hunter believes in using simple color schemes, related to textures. "Restraints and disciplines in color—using the coloring of natural, growing things—automatically eliminates arbitrary, personal approaches—it is dependable, and the client will usually agree to it."

# addition to residence

*James Hunter's interest in color and texture has been given free play in a recent addition to his own house. He calls it a "studio," but much of the family living and hobby activity goes on here. Flagstone floors; stone fireplace wall and redwood plywood surfacing on the other walls, with batten strips; laminated wood beams; exposed plank ceiling; and a lavish use of planting give great warmth to the space. Picture* (bottom of page) *shows "hobby storage" wall, which is presented as a* SELECTED DETAIL *later on in this issue.*

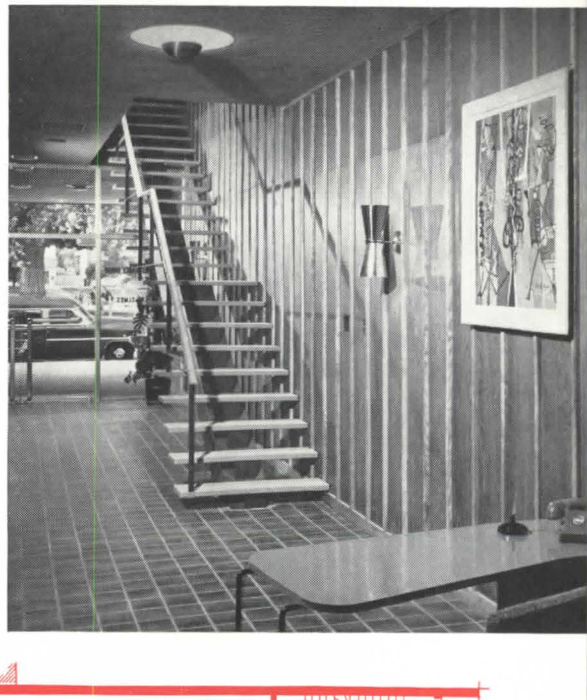


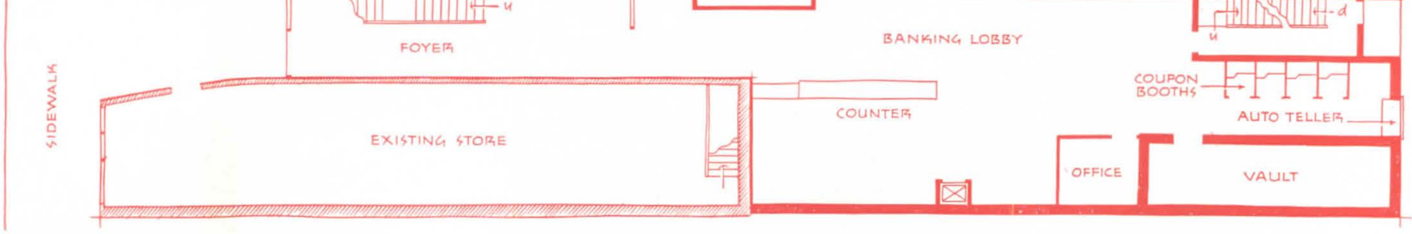


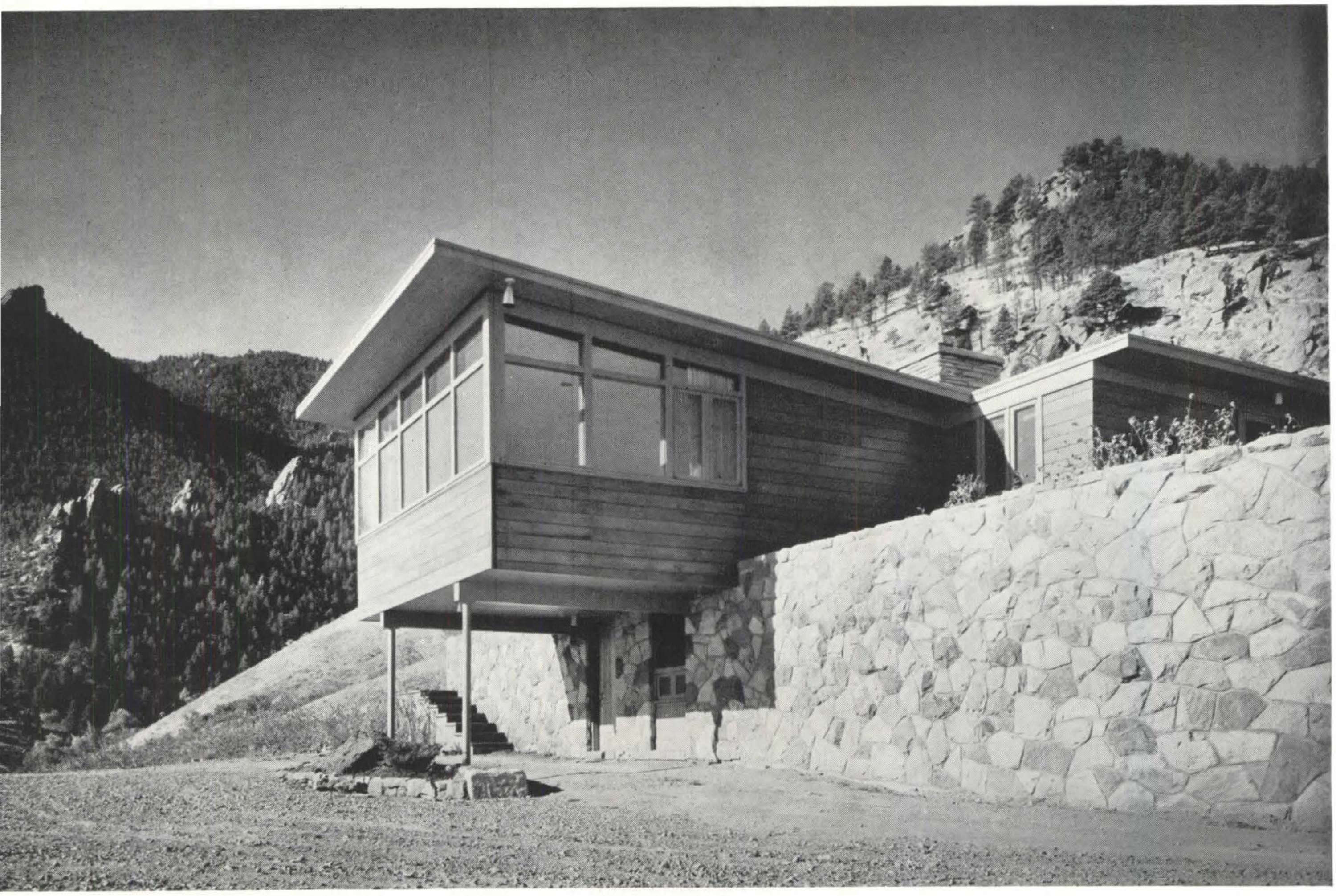



# bank

*Present quarters of the Boulder Industrial Bank (the projected six-story building for which has already been shown) are in a remodeled commercial building, above and behind a shoe store. What might have been a mean "tunnel" to the banking space has been made gay and inviting, with an open stair* (see SELECTED DETAIL in this issue), *and the receptionist's desk. The banking space behind is completely open-planned, and intimate. Space on the floor is office work area.*



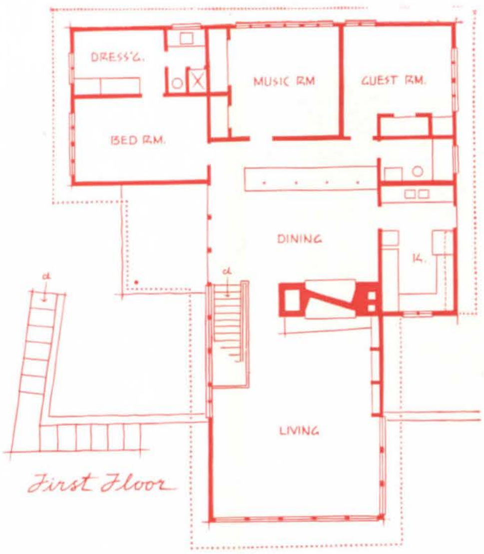




# residence

The Spackman house, another recent residential accomplishment of the Hunter office, is dominated by a shed-roofed living room which hangs out over the driveway to shelter the car approach. On the lower floor, tucked into the hillside behind a retaining wall, there is an entrance, with a bold cantilevered stair leading to the main floor above, and a study. The stair (*right*) consists of stone slabs pegged into a stone wall, with the rail an iron pipe wrapped in rawhide. On the upper floor, the stair lands near the space-dividing fireplace and leads gracefully to living and reading areas. Much space is given to bookshelves—used as screening devices as well as book storage. Floor here is cork tile; walls, where not lined with books, are redwood plywood. The Spackman house looks out from a high elevation toward the east and the town below; and backs up against the foothills of the mountains. Recognizing the advantages of the unusual site, the plan takes advantage of views in three directions (valley, mountains, and *along* the hills) and provides sheltered outdoor space within an L formed by living room and kitchen wing.

In residential work, as in other projects, the underlying design aim of James Hunter is to "find the better way of living and the better way of accomplishing it." Much time is spent on programing and education—"we can do little for a client who sets a definite program at the first interview; frankly, we don't want him." Hunter wants to please and satisfy, but at the same time to lead, and to make each of his jobs mark progress.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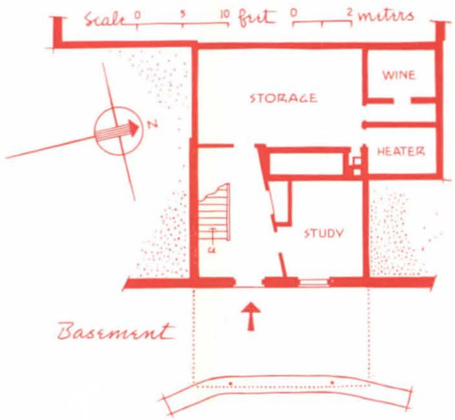
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WINE
STORAGE
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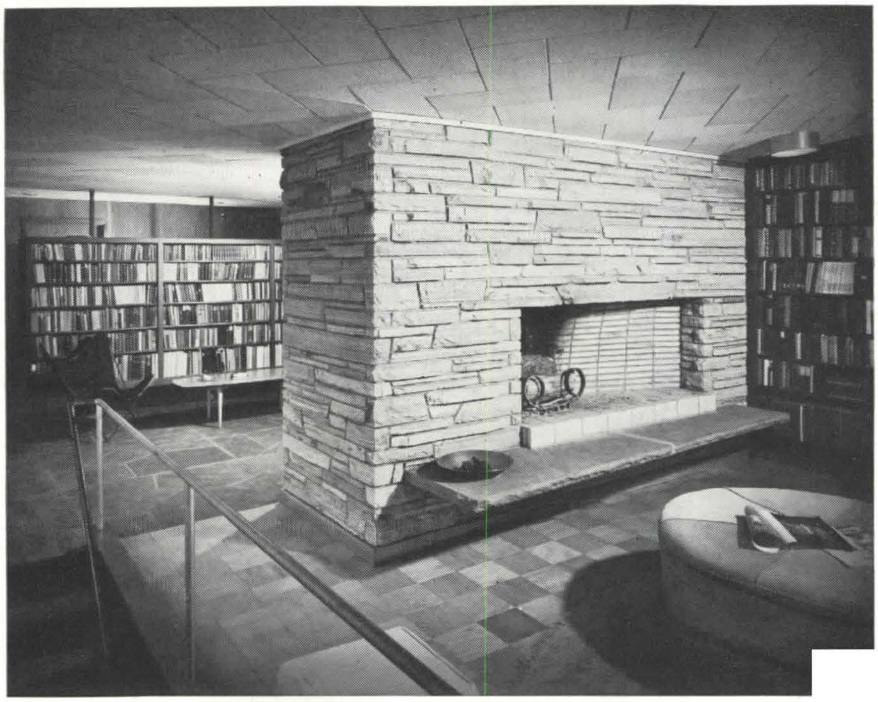
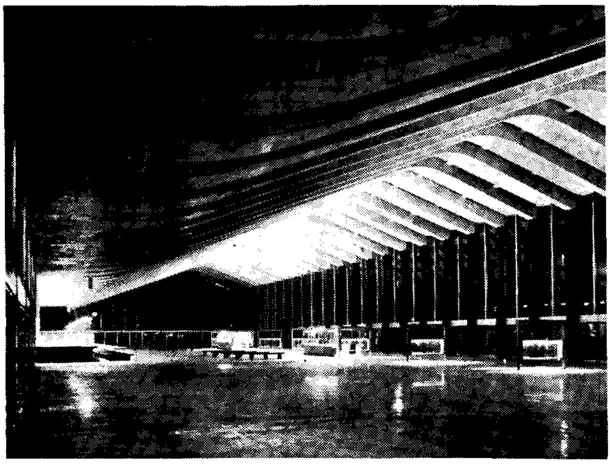
HEATER
STUDY
Basement

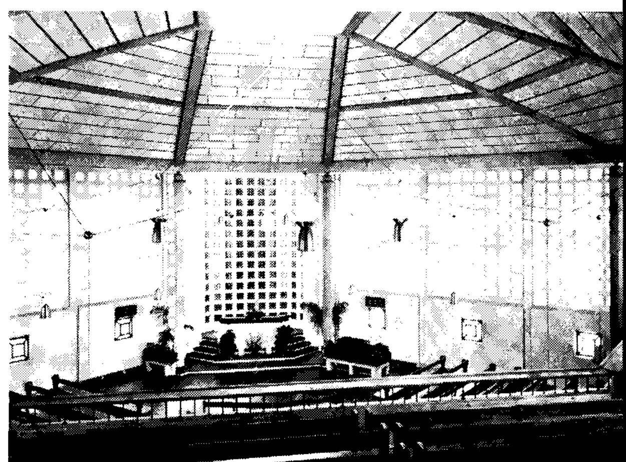


## Italy



ITALY *takes justifiable pride in the Termini Railway Station. Rome, with its impressive concourse* (above). *Much residential work is like the villa* (top right) *at Gallarate by L. Ghidini & G. Mozzoni.*
Photos: Official Photograph
The Museum of Modern Art

SWITZERLAND *treasures continuity of tradition. Housing has charm, as in the Horgen group* (right) *by H. Escher & R. Weilenmann. Church plans, such as New Apostolic Church* (far right) *by Haefeli, Moser, Steiger, of Zürich, and F. Quétant, of Geneva, are "frequently unconventional."*
Photos: Bernard Moosbrugger
Michael Wolgensinger



## Switzerland

Paul Zucker

# *European Notes*

Returning from postwar Europe, one needs a certain distance in time and space to bring some order into the multitude of impressions and variety of vistas. General notions of building activities and architectural trends were crystallized by successive trips. from 1950 to 1953, into more definite opinions. Quite naturally, the mere perusal of professional periodicals—the Italian *Domus*, the French *l'architecture d'aujourd'hui*. the Dutch *Forum*, the Swiss *Werk*, etc.—does not tell how exceptional or how typical a specific structure is for any country. Observation on the spot changes and corrects opinions gained from even the most subtle descriptions and photographs.

The idea of a European architecture in contrast to American architecture does not hold. It just isn't so! Italian architecture, for instance, is closer to building in California than to anything done in Germany; and the attitude towards functionalism is entirely different in Switzerland and in Holland. And yet, fully aware how dangerous and sometimes misleading all generalizations are, one must summarize recollections under the heading of individual countries.

Let's report from SWITZERLAND first. Her continuity of tradition stems from three factors: the singular chance of her neutrality during the World Wars: a tremendous wealth distributed more democratically than anywhere else in Europe; and the high level of her architecture previous to 1940. The over-all impression is primarily that of utter solidity of construction and of a subtle feeling for natural surroundings and the specific qualities of materials employed. There is no subjective expressionism or emotional exaggeration in individual forms—not even in so-called monumental architecture. This simplicity strikes us in theaters, like the Kurtheater in Baden, with its construction visible through large glass walls. Understatement also characterizes the appearance of churches, frequently unconventional in their layout, closely connected with surrounding buildings, even with apartment houses (*e.g.*, New Apostolic Church, Geneva; St. Mark's Church, Zürich; St. Michael's Church, Basel). Schools are mostly composed of one- or two-story classroom units, with large glass areas of the outer walls set in slender frames (*e.g.*, Primarschulhaus, Felsberg, Lucerne; Bachtobel School, near Zürich). Even urban schools are always embedded in more or less expanded landscaped areas (*e.g.*, School of Arts and Crafts, Berne).

In contrast to the variances in taste between our Main Street and Broadway, the Swiss office buildings, department stores, and shops, hardly differ in their architectural expression in small towns, middle-size towns, and large cities. Even in Zürich, Basel, and Berne, there is never a pretention to bigness! Everywhere the same, somewhat sober, solidity (*e.g.*, Bleicherhof Department Store, Bureauhaus zum Gruener, Administration Building of the Swiss Fruit Dealers, all Zürich; Office Building, St.

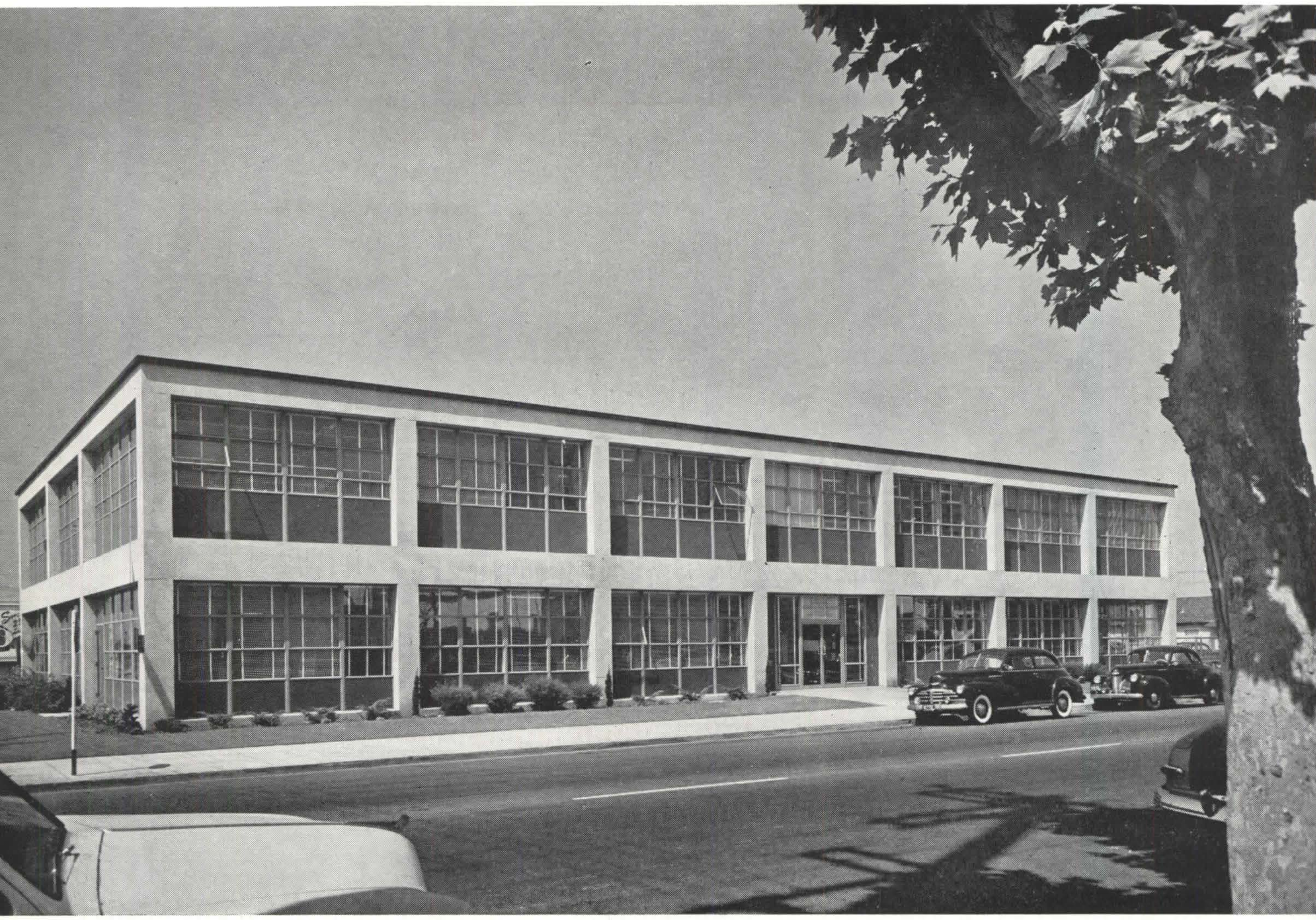
(Continued on page 174)

**Germany**

GERMANY *is building many large structures for business and industry. Administration building of General Electricity Association* (far left) *at Frankfurt-am-Main is by Assmann-Bartolmes Associates. The office building* (left) *by Johannes Krahn in Bad Godesberg (French High Commission Headquarters) shows a return to decorative embellishment.* Photos: Sepp Jaeger Mannheim Pfau

THE NETHERLANDS *have been forced to "strict economy in rebuilding." The elementary school* (far left) *at Brielle is by van den Broek & Bakema. The same firm, with Brinkman, designed the H. Ter Meulen department store* (below) *in Rotterdam.* Photos: J. A. Vrijhof

**The Netherlands**



| | |
|---|---|
| location | Berkeley, California |
| architects | Wurster, Bernardi & Emmons |
| structural engineer | A. V. Saph, Jr. |
| mechanical-electrical engineer | James Gayner |

# research laboratories

After the architects convinced the western canners of the merits of erecting a new building, rather than remodeling an old one, they gave their clients a research center, a school for canning technicians, and a meeting place which is the focal point and symbol of the industry. Located on a corner plot in a semi-industrial area close to the University of California campus, the building faces east on a quiet, uncrowded side street; a main traffic artery borders the south end of the property. Ample off-street parking space is provided for personnel and visitors.

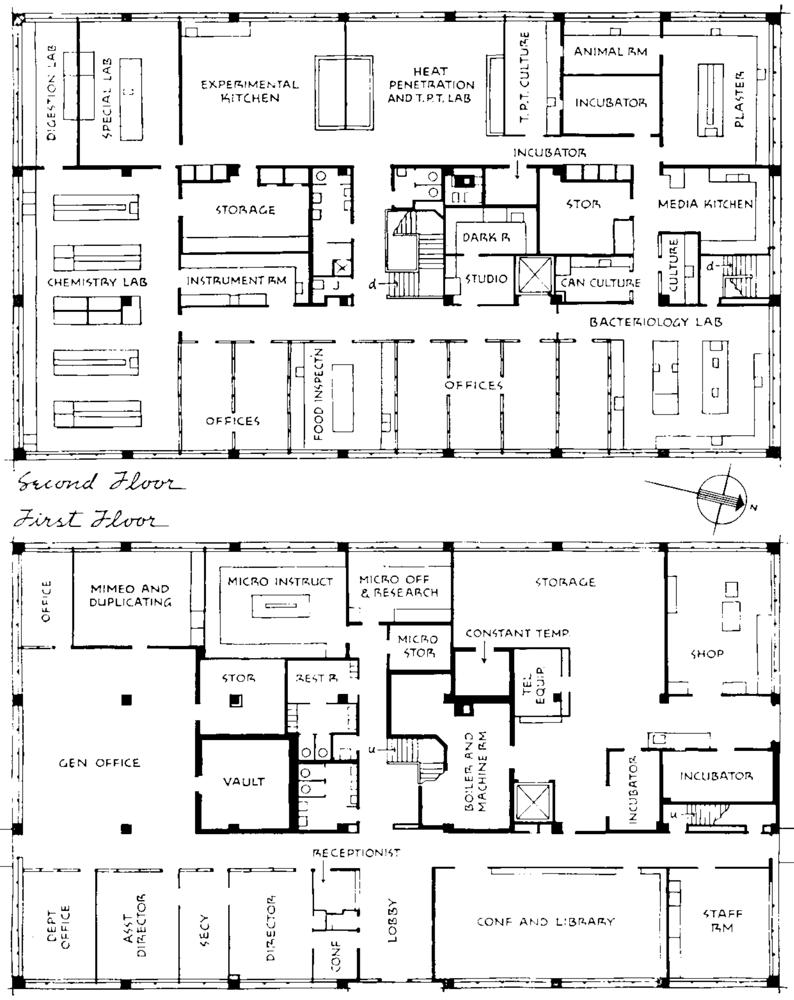
Basically, the building is planned with offices and laboratories surrounding a central utility core, on both levels. The reinforced-concrete structure is immediately apparent and expressed uniformly throughout in the columns, the floor slabs, and the

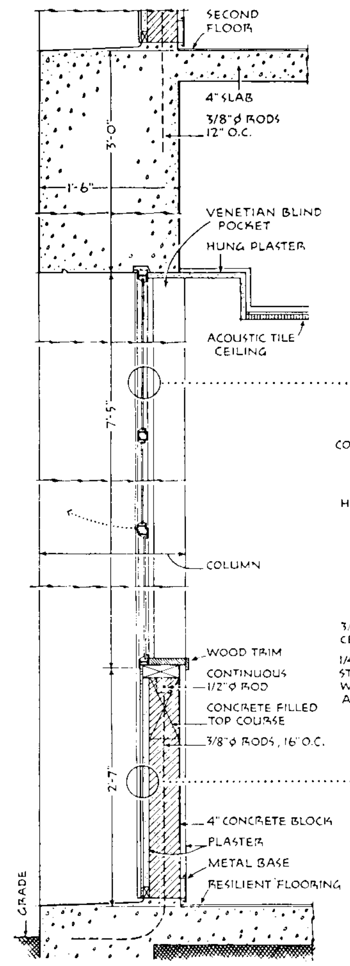
The panels between exterior structural roof slab. This method of fireproof construction proved to be more economical here than fireproofed steel.
members are of concrete block, flush with the interior wall (*section acrosspage*). They are faced on the exterior with dark-green cement-asbestos sheeting set in red steel-sash frames; plastered on the interior and painted various shades of green. Structural members are plastered inside, but left raw outside except for clear waterproofing.

The result is an exterior which is bold and simple and which does not appear excessively heavy—the objection to so many reinforced-concrete structures. The interior is clean, quite flexible, and well lighted, reflecting the same straightforward approach to the problem that the exterior does.

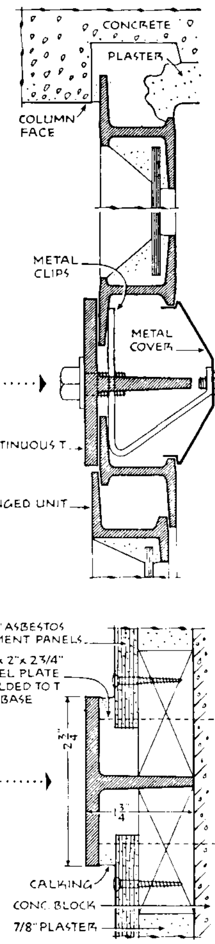
A 6-foot brick wall to surround the building at the property line was omitted by the owners as an unnecessary expense, even though it would have spared the first floor some traffic noise and cost of Venetian blinds. All of the landscaping was done by the owners, to save further expenses.

The total cost, including architects' fee, was $339,744.56, which was $14.17 per sq ft.




Section thru Wall

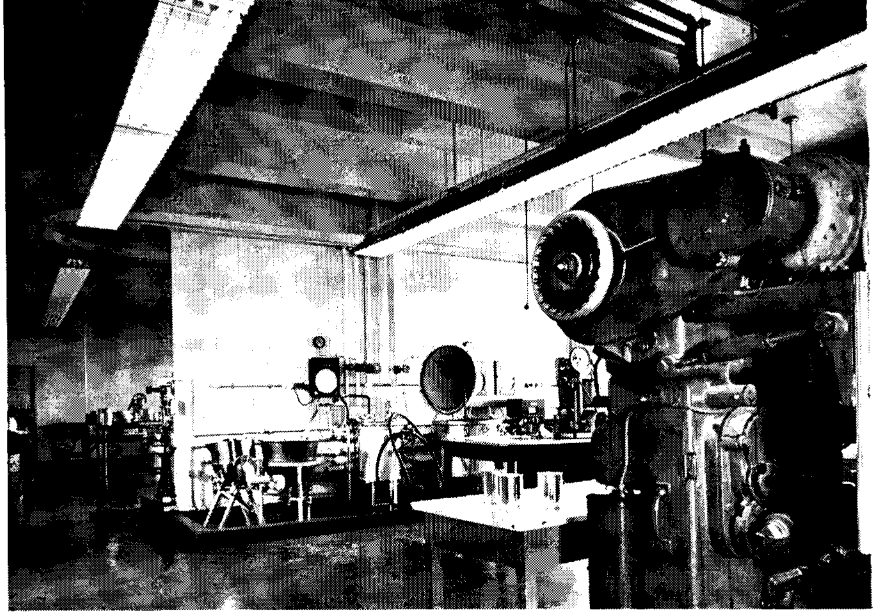



Plans thru Mullion

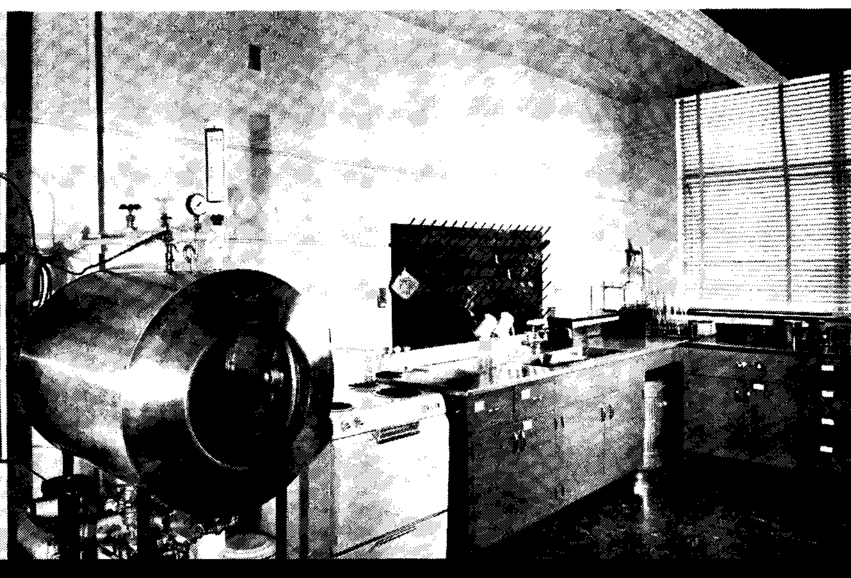

*Detail of entrance* (left) *shows the rough texture and joinery of the concrete structure, and the refinement of paneling and fenestration.*

*Glass partitions* (above) *preserve the feeling of continuity and lightness.* Photos: Roger Sturtevant

## research laboratories



*Much of the laboratory work can be carried on without the aid of artificial light, as a result of open planning. Interior flexibility is apparent in the arrangement of special equipment: experimental kitchen* (above); *chemistry laboratory* (left); *and media kitchen* (below).



# FOUNDATION ENGINEERING

## footings on typical sandy and clayey soils

by Ralph B. Peck, Walter E. Hanson, and Thomas H. Thornburn*

The construction of foundations is one of the oldest arts of mankind and, until the last decade, one of the least influenced by scientific methods. The last few years, however, have brought about a major revolution. The impact of science, now that it has finally made itself felt, has been almost overwhelming. The literature concerning foundations has tended to become highly technical, even to the point of discouraging the practicing architect or engineer. Fortunately, there has recently been a serious effort to evaluate the contributions of science and to formulate practical procedures embodying the benefits to the scientific development. Soil mechanics is the name given to that branch of science applicable to foundation engineering.

Probably the most important single decision to be made in connection with the design of any foundation is whether the structure should be supported at a shallow depth on footings or a raft, or at greater depth on piles or piers. If this decision is correctly and intelligently made, it is very unlikely that any disastrous or even undesirable consequences will develop. But if this decision is incorrectly made, little can thereafter be done to produce an adequate design. If a structure is placed upon a shallow foundation which should have been a deep one, no refinements in connection with the design of the footings themselves, their layout, or the distribution of loads among them can prevent settlements that might have their origin in deep-seated layers. If the structure is established on piles when footing foundations would have been adequate, no refinements in the choice of the type of pile or in the selection of the load per pile can mitigate the inherent lack of economy of the design. There are, of course, borderline cases for which foundations of either type are acceptable.

The logical way to choose between a shallow and a deep foundation is to predict the behavior of the structure assuming it to be established upon a shallow foundation. If footings of reasonable size which exert reasonable pressures on the subsurface materials can successfully be used, they are generally the proper choice. If the forecast of the behavior of the structure indicates that the settlement will be too great, or that the soil will be seriously overstressed, even when large footings or rafts are used, then deep foundations are indicated.

Experience has indicated that shallow foundations may exhibit two quite different types of unsatisfactory performance. The soil beneath the footings or rafts may be overloaded to the point that it actually fails by slipping, one part on another. Such a rupture of the soil beneath a foundation is known as a bearing-capacity failure. The structure resting on a soil that fails in this manner either experiences sudden and disastrous settlements, or overturns completely. The second type of unsatisfactory performance may not be so disastrous, but it is far more prevalent and in the long run accounts for far greater economic losses. This type is the excessive differential settlement of a structure due to the compression of the soil beneath the various parts of the foundation. In this case, the stresses in the soil are not large enough to cause rupture; indeed, they may be quite mild compared to the ultimate bearing capacity of the ground. Nevertheless, they may be sufficient to cause appreciable changes in the volume of the soil beneath the footings. If these changes are not equal beneath all the footings, important differential settlements may develop and cause structural or architectural damage to the superstructure.

It has been found that the two types of failure are virtually independent of each other and that separate investigations may be conducted to determine the relative safety. Soil mechanics also indicate that there are basic differences in the physical properties and the stress-strain characteristics that determine the behavior of sandy soils and clayey soils. Therefore, each type of failure must be studied in connection with each of these two major classes of foundation soils.

Before discussing methods of predicting the ultimate bearing capacity of footings on these two types of materials, it is necessary to say a word about the exploration and the determination of the physical properties of the soil deposits upon which the structures are to be erected.

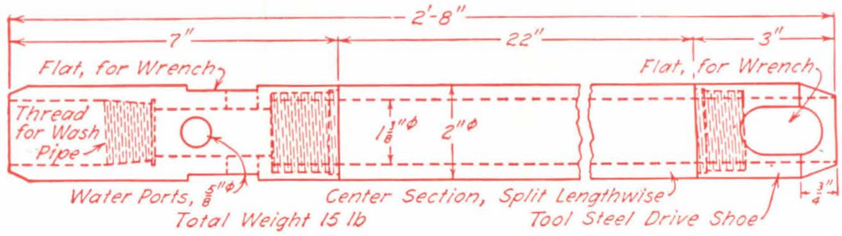
One of the major contributions of science to foundation engineering has been the realization that the typical properties of soils must be described in quantitative or semiquantitative terms, rather than in terms of words whose meaning often may be misunderstood. In most instances, the necessary quantitative information can be obtained at relatively low cost, although for a few problems refined and somewhat expensive procedures may be necessary.

Test borings are still the most common method for exploring the subsoil and are generally preferable to test pits or other types of exploration. It is of little impor-

*Research Professors of Soil Mechanics, University of Illinois, College of Engineering, Urbana, Ill.*

*Much of this article, including most of the illustrations, condensed from the authors' recent book,* Foundation Engineering, *published by John Wiley & Sons, Inc. For more complete treatment, and for discussions of more difficult conditions, the reader is referred to this volume.*

*Figure 1—split-spoon sampler used in standard penetration test.*




**Penetration Resistance and Soil Properties on Basis of the Standard Penetration Test**

| Sands (Fairly reliable) | | Clays (Rather unreliable) | |
|---|---|---|---|
| No. of blows per ft, N | Relative density | No. of blows per ft, N | Consistency |
| | | Below 2 | Very soft |
| 0– 4 | Very loose | 2– 4 | Soft |
| 4–10 | Loose | 4– 8 | Medium |
| 10–30 | Medium | 8–15 | Stiff |
| 30–50 | Dense | 15–30 | Very stiff |
| Over 50 | Very dense | Over 30 | Hard |

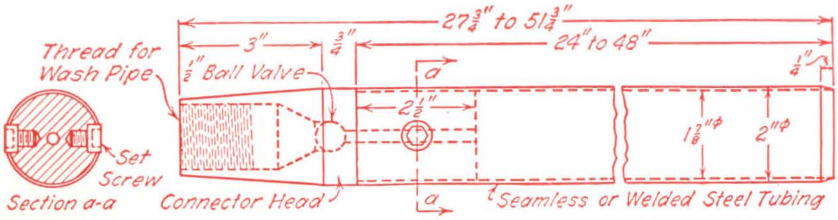



*Figure 2—two-in. tube sampler.*

tance whether the hole is made in the ground by wash boring, rotary drilling, or hand augering. The important considerations are that truly representative samples should be obtained for inspection and description, and that numerical values, at least approximately indicative of the physical properties of the materials, should be determined.

During recent years in the United States and in many other parts of the world, it has become the custom to make exploratory borings of 2½ to 3 in. diameter. Samples are obtained by inserting into the hole a standard sampling spoon *(Figure 1)* which has an outside diameter of 2 in. and an inside diameter of 1⅜ in. A weight of 140 lb is dropped through a distance of 30 in. on the upper end of the rods, and the number of blows required to advance the sampling spoon 1 ft into the ground is recorded. This number of blows, N, is referred to as the standard penetration resistance. Samples from the sampling spoon, although appreciably disturbed, *usually* contain all the materials representative of the undisturbed soil.

N-values indicate, in a general way, whether the sand is in a loose or dense state, or whether a clay is soft, medium, or hard. In connection with sands, in particular, a knowledge of the looseness or denseness is of the greatest practical importance; and the N-value constitutes the basis for the procedures of forecasting behavior that will be described subsequently. The meaning of the various ranges of N-values in terms of verbal descriptions of the relative density or consistency of sandy or clayey soils is indicated *(see table).*

Standard penetration tests should be made in connection with the preliminary exploration at the site of almost any project. In sands, the penetration tests should be made at intervals of 2½ to 5 ft in the vertical direction for a distance of 10 to 20 ft below the anticipated footing level and at 5 ft intervals thereafter, until it is certain that all soft or loose layers that would have an influence on the design of the foundation have been penetrated. At least one boring, possibly two or more, should be carried to a considerable depth, often as much as 50 or 100 ft for all but the most insignificant structures, to make sure that no soft materials, particularly soft silts or clays, are present at considerable depths below the foundation level. Such layers, as will be seen later, may be sources of difficulty. Moreover, if piles or piers should be found necessary, the deep borings will be necessary for estimating the length of the piles or the depth of the piers.

If the soil encountered by the sampling spoon is a soft or medium clay, the standard penetration resistance may not be a sufficiently accurate measure of the consistency for use in design. A considerably better measure is the unconfined compressive strength of the clay. This value is determined by means of a simple compression test such as that made on a concrete test cylinder: it is the axial stress on the cross section of a cylindrical sample at the time the sample fails, or at the time the sample has shortened by 20 percent of its original length if outright failure does not occur. Instead of the standard sampler, a thin-walled sampler is often used. This device is commonly known as a Shelby-tube sampler *(Figure 2).* The samples obtained in thin-walled tubes are relatively undisturbed and their strengths can usually be considered a satisfactory representation of the strengths of the soil in the ground. No special boring equipment is required to obtain Shelby-tube samples, because the tube has the same external diameter as the standard split spoon and may be used interchangeably with it whenever soft clayey soils are noticed by the boring foreman.

The water content, liquid limit (determined in the laboratory), and plastic limit are useful in estimating the compressibility of the clays in order to make a computation of the settlement due to the weight of the proposed structure.

The equipment for performing the unconfined compressive-strength test is relatively simple and the determination of the moisture content requires no special equipment. The apparatus and procedures for determining the liquid and plastic limit tests are ASTM standards.

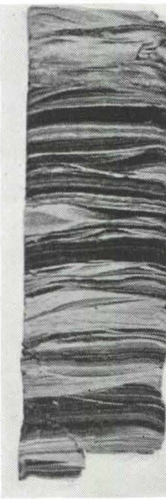


*Figure 5*

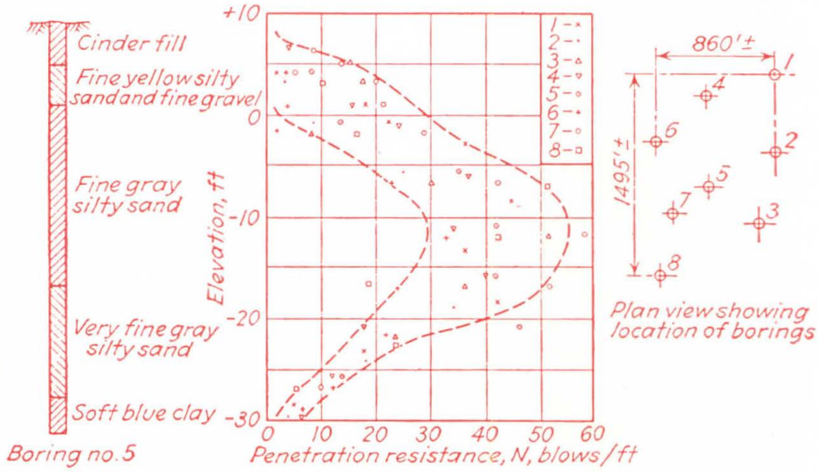



*Figure 5—a typical boring log, the results of standard penetration tests in eight borings, and a plan showing the locations of the borings on a building site in northern Indiana near the south end of Lake Michigan. The penetration resistance profile shows very clearly that the density of the sand deposit from about El. -10 ft to El. -15 ft is considerably greater than it is at elevations either above or below. The materials at this site are probably a combination of beach sands and dune sands. The various borings show a better agreement among the values of penetration resistance at various depths than would ordinarily be expected if the sands were alluvial in nature.*

Regardless of the method of drilling or sampling, the position of the ground-water level should be determined as accurately as possible, especially if the subsoil contains any permeable strata.

The cost of Shelby-tube sampling is somewhat greater than the cost of spoon sampling. In addition, the cost of the necessary laboratory tests must be added to the cost of the exploration. As a rule, standard penetration-test borings cost from $3.00 to $6.00 per lineal foot, depending on the consistency of the material, whereas the taking and testing of continuous 2-in. Shelby-tube samples ordinarily costs between $7.00 and $12.00 per ft.

When test borings have been made at a site and the results of the standard penetration test or the laboratory tests are available, the engineer must first summarize the results, usually in graphical form, in such a manner as to give him a clear concept of the engineering characteristics of the subsoil. The most suitable method of summarizing and plotting depends upon the character of the structure, the geology of the site, and the nature of the exploratory program. A few examples are probably the best indicators of the methods that can be used. The results of explorations made by means of the standard penetration test in deposits of sand or sand in combination with silt and organic matter are shown *(Figures 3 and 4)*.

The preceding examples indicate the type

*Figure 4—a geological cross-section including penetration resistance values of a deposit near the mouth of the Milwaukee River in Wisconsin. The materials represent a composite alluvial and shore deposit. Its complexity is partly the result of variations in the level of Lake Michigan during the glacial period. The penetration resistance profile shows very definitely that the deposit consists of predominantly loose and soft materials to a depth of at least 40 ft. There are several large zones of peat and soft organic silts which are highly compressible and, therefore, unsuitable foundation materials. This cross section leaves little doubt that any suitable foundation must extend through all the compressible materials to the firm base at a depth of about 50 ft.*

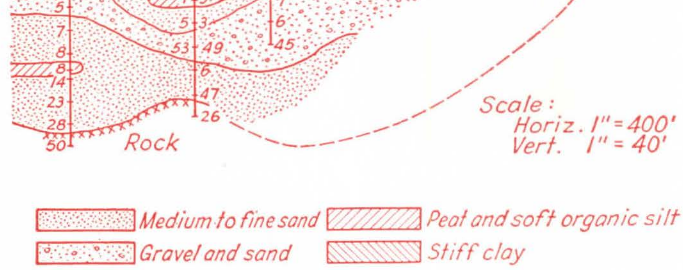
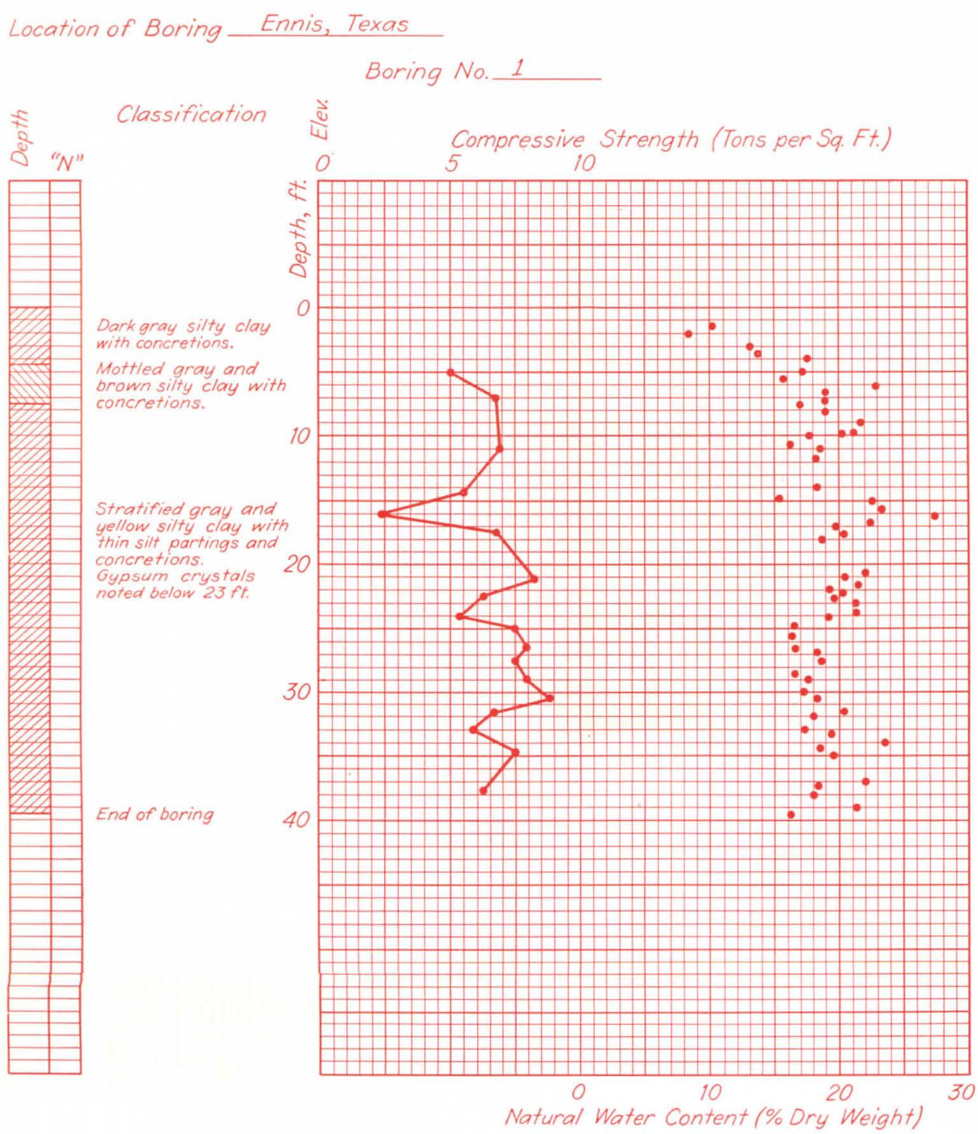


*Figure 6—a boring log showing the water content and unconfined compressive strength profiles for a silty clay soil from the Coastal Plain region about 40 miles south of Dallas, Texas. The figure shows the material to have the characteristics of a very stiff clay below a depth of 5 ft. The minimum unconfined compressive strength value is about 2½ tons/sq ft. However, throughout most of the depth of the boring, extending nearly to 40 ft, the strength ranges between 5 and 8 tons/sq ft. The moisture content varies between 15 and 25 percent. Although the strength of the material is certainly great enough to support nearly any structure on footing foundations, local experience has shown that the greatest engineering problems are the result of changes in moisture content in the soil. In this semiarid region the moisture content of the upper portion of the soil increases considerably during certain times of the year, whereupon the soil tends to expand and to exert very high swelling pressures. The movements and pressures often disrupt structures resting on the clay. Thus, this example may be considered an illustration of the importance of knowing more about the behavior of foundations in a locality than ordinary borings and routine tests can disclose.*




of information that can be obtained from standard penetration tests alone. The character of sampling that can be done by means of commercial 2-in. Shelby-tube samplers is shown in a photograph *(Figure 5)* of a sample taken from the bed of glacial Lake Agassiz, near Fargo, North Dakota. The intricate nature of the banding of the subsoil is apparent, and it is also apparent that the degree of disturbance during sampling has been very moderate. The results of sampling where the subsoil consists essentially of clay are shown *(Figure 6)*.

The mere presentation of the results of a simple program of borings and soil tests in forms such as those shown *(Figures 3 to 6)* is often sufficient to point out where the subsoil contains the establishment of foundations. Thus, the quantitative subsurface exploration, even without further analytical study, serves an extremely useful purpose and may prevent serious errors.

If footings would be underlaid directly by sand, an investigation should be made to determine the maximum soil pressure that could be used without excessive differential settlement, and a separate investigation carried out to determine the maximum soil pressure corresponding to adequate safety against a bearing-capacity failure. Both these investigations can be made on the basis of the N-values determined from the standard penetration test.

The first step is to make a rough estimate of the size of the largest footing in the structure. This can be done by assuming a conservative soil pressure and dividing it into the maximum column load. The average N-value for each of the borings on the site is then determined for a depth equal to the width of the assumed largest footing. The smallest of these average N-values is regarded as the basis for design because sandy subsoils have a generally erratic structure and it must be assumed that the poorest conditions disclosed by any one boring might occur beneath one of the largest footings.

After the average N-value has been determined, the chart *(Figure 7)* may be utilized to determine the soil pressure that will lead to reasonable settlement of the footing. This chart should be entered with a width equal to that assumed for the largest footing in the structure. The soil pressure so determined, or corrected if the initial assumption of the width of the footing was appreciably in error, should not lead to a settlement of that footing greater than 1 in. Such a settlement is generally considered tolerable in almost any structure of modern design. The soil pressure determined for the largest footing is used for proportioning the areas of all the other footings beneath the structure.

After the soil pressure for settlement has been determined, the two charts *(Figure 8)* are entered to determine the soil pressure at which the factor of safety against a bearing-capacity failure will be equal to three. The first of the two diagrams gives that portion of the safe soil pressure due to the weight and strength of the soil beneath the level of the footing. The second part gives that portion of the safe soil pressure due to the weight of any surchange that exists around the footing above the level of its base. The sum of these two soil pressures is the safe pressure that will provide an adequate margin of safety against a bearing-capacity failure. This value should be determined for each footing.

If the soil pressure corresponding to a 1 in. settlement is less than that required to provide a factor of safety of three against a bearing-capacity failure, then the soil pressure is governed by settlement. On the other hand, if for any footing the allowable pressure for settlement is greater than that permitted for bearing capacity, then the value for bearing capacity should be used as the basis for design of that footing. Usually only narrow shallow footings are governed by considerations of bearing capacity rather than settlements.

The soil pressures determined by these procedures are based on the assumption that the ground-water table is located at a greater depth below the base of the footing than the width of the footing. If the ground water is higher than this depth, a reduction in the allowable pressure must be made. If the water table is at the elevation of the base of the footing, the values given by the settlement chart *(Figure 7)* should be divided by 2. If the water table is at some depth intermediate between the base level and the width of the footing below base level, a linear interpolation can be utilized to obtain the correction factor. In connection with bearing-capacity computation, a similar correction is made *(for Figure 8a)*. Moreover, if the water table is above the base level of the footing but be-

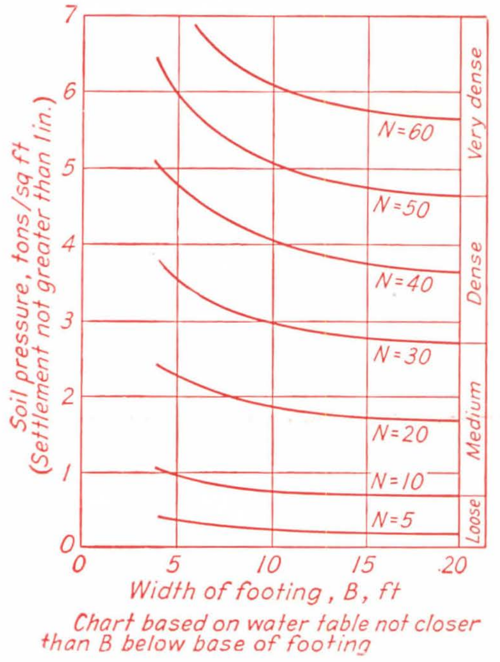
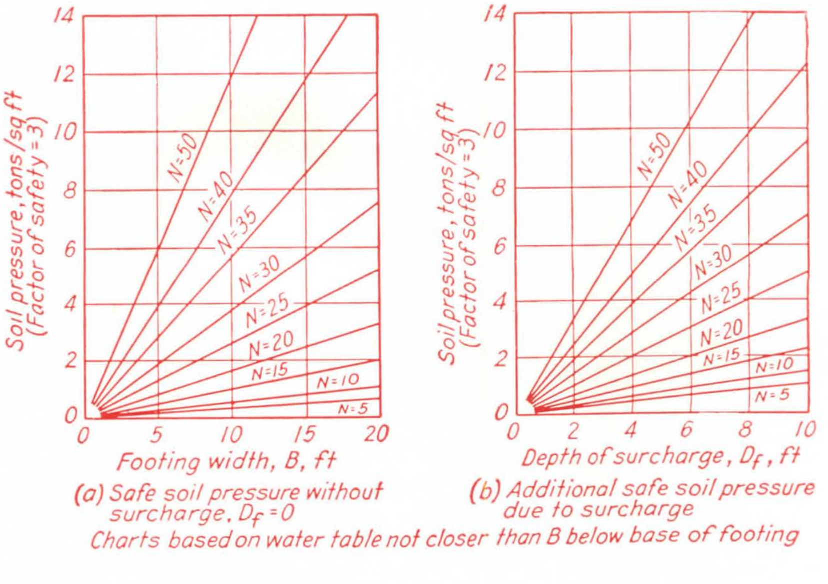



*Figure 7—soil pressure corresponding to 1-in. settlement of footings on sand.*

*Figure 8—safe soil pressures beneath footings on sand as determined by bearing capacity.*



*Footing Design. Required Areas.*

Borings carried to a depth of 50' within the building area give the following information:

(1) Medium to coarse sand from ground surface to bottom of hole.
(2) Water table at a depth of 34 ft.
(3) Minimum average N value from base of footings to a depth of 20' = 35 blows/ft.

No soft stratum exists below the sand.

*Interior*: $249^T$

@ say 3.5 = 71 sq ft

*Try 8'-6"x8'-6"*: A = 72.3 sq ft Assume depth = 2'-6"

*Column load* = $249^T$

$\div 72.3 = 3.45\ ^T/\text{sq ft}$

*Additional load:*

$$\left.\begin{array}{l}\text{Floor slab} = 0.5 \times \frac{0.15}{2}\\ \text{Footing} = 2.5 \times \frac{0.15}{2}\end{array}\right\}\ 0.22$$

3.67

*Surcharge load:*

$$\left.\begin{array}{l}\text{Floor slab} = 0.5 \times \frac{0.15}{2}\\ \text{Soil} = 2.5 \times \frac{0.10}{2}\end{array}\right\}\ 0.16$$

$3.51\ ^T/\text{sq ft}$

From Fig. 7 allow $3.6\ ^T/\text{sq ft}$

From Fig. 8 allow $4.8 + 2.9^{*} = 7.7\ ^T/\text{sq ft}$

*Use 8'-6"x8'-6" for interior footings*

*Footing Design. Required Areas. Effect of Water Table*

The following computations illustrate the effect of the water table on footing areas. The water table is located approximately 5 ft below the base of the footings. Hence, a decrease of 25 per cent must be made in the allowable soil pressures given in Fig. 7 and Fig. 8.

*Interior*: $249^T$

@ say 3.4 x 0.75 = 98 sq ft

*Try 10'-0"x10'-0"*: A = 100 sq ft Assume depth = 2'-6"

*Column load* = $249^T$

$\div 100 = 2.49\ ^T/\text{sq ft}$

*Additional load minus surcharge* $\Big\}\ 2.5\left(\frac{0.15-0.10}{2}\right) = 0.06$

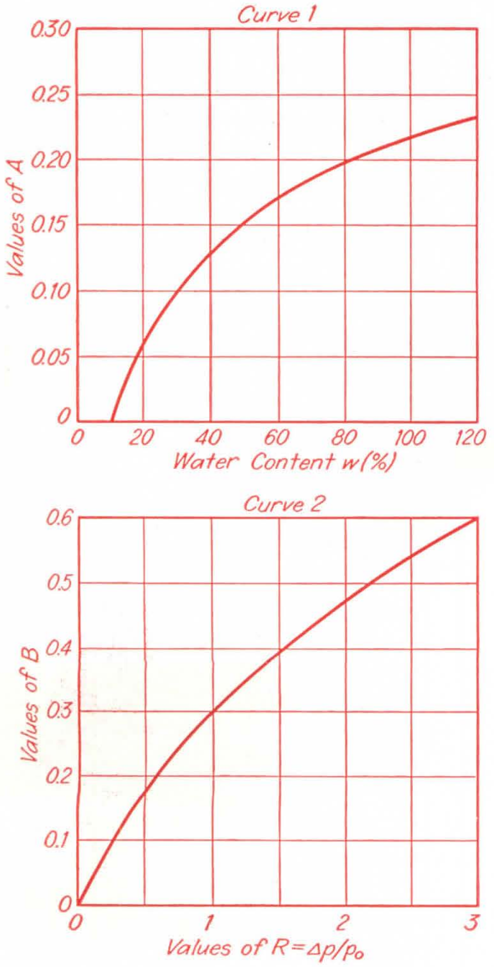
$2.55\ ^T/\text{sq ft}$

Fig. 7 allow $3.5 \times 0.75 = 2.6\ ^T/\text{sq ft}$

Fig. 8 allow $(5.6 \times 0.75) + 2.9 = 7.2\ ^T/\text{sq ft}$

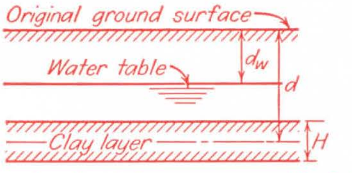
*Use 10'-0"x10'-0" for interior footings*

*Figure 9*




SETTLEMENT OF NORMALLY LOADED SOFT CLAY LAYER

1. Determine natural water content $w$ of clay (% of dry weight)
2. Determine increase of pressure $\Delta p$ (lb/sq ft) at mid-height of clay layer
3. Determine existing effective overburden pressure $p_o$ (lb/sq ft):




If water table is above ℄ of clay layer $p_o = 62d_w + 53d$

If water table is below ℄ of clay layer $p_o = 115d$

$d_w$, $d$ and $H$ are expressed in feet

4. Determine $R = \Delta p / p_o$
5. Determine A from Curve 1 and value of $w$
6. Determine B from Curve 2 and value of R
7. Compute Settlement $S(ft) = H \cdot A \cdot B$

*Figure 10*

low the top of the surcharge, that part of the safe soil pressure due to the weight of the surcharge *(Figure 8b)* should also be reduced. The reduction should be 50 percent if the water level is at the top of the surcharge and a linear interpolation can be made to obtain the correction factor for water levels between the base of the footing and the top of the surcharge.

The soil pressures computed by these procedures are those that can be applied at the base of the footing in excess of the weight of the surrounding surcharge. Therefore, they may be regarded as net soil pressures. The illustrative example *(Figure 9)* will clarify the details of the computations.

If the footings rest directly upon clay, the average. unconfined. compressive strength should be determined for a depth beneath the footings equal to the width of the largest footing. The pressure $q_a$ (tons per sq ft) at which the factor of safety against a bearing-capacity failure will be equal to three may then be computed by means of the equation

$$q_a = 0.95\ q_u\ (1 + 0.3\ \frac{B}{L})$$

in which $q_u$ is equal to the unconfined compressive strength in tons per sq ft. B is the width of the footing in feet, and L is the length of the footing in feet. Inspection of this equation indicates that the safe load is approximately equal to the unconfined compressive strength.

If the safe load is less than about 1 ton per sq ft. it is probable that excessive settlements will develop even if the safety against a bearing-capacity failure is adequate. Therefore, footings on clays having an unconfined compressive strength less than about 1 ton per sq ft are not generally used. and some type of deep foundation is preferable. In some instances a raft may be suitable, provided the weight of the excavated soil compensates for most of the load added by the structure.

The principal source of settlement beneath a structure is likely to be one or more layers of relatively soft clay or other compressible soil at some depth below the footing level. Such a layer may lead to excessive settlement even if the footings or raft above it are established on dense sand or firm clay. Therefore, it is of the utmost importance to be able to predict the settlements that may occur if a structure is established above a stratum of compressible soil. The computation of the settlement requires the determination of the stresses at mid-height of each clay layer, due to the weight of the structure reduced by the weight of any excavated material. The computation of the stresses can be made accurately only by means of somewhat refined procedures but often a sufficiently accurate estimate can be made by assuming that the load is distributed from the level of the foundation through the subsoil at an angle of about 60 degrees with the horizontal. On the basis of this assumption, at least the average pressure at midheight of each clay layer beneath buildings of ordinary dimensions can be estimated. In making such an estimate, only the dead load and that part of the live load that is likely to act upon the foundation most of the time should be considered. Loads that act only occasionally on the surface of the ground have little influence upon the settlement of clay sub-soils.

After the increase in stress at midheight of the clay layer has been determined, an estimate of the upper limit of the settlement can be made (*Figure 10*). The procedures are based on average values for the physical properties of soils; therefore, the diagram should not be relied upon to give precise results for all types of soil. Nevertheless, in most instances, the actual settlement of the structure will not exceed that estimated (*on the basis of Figure 10*).

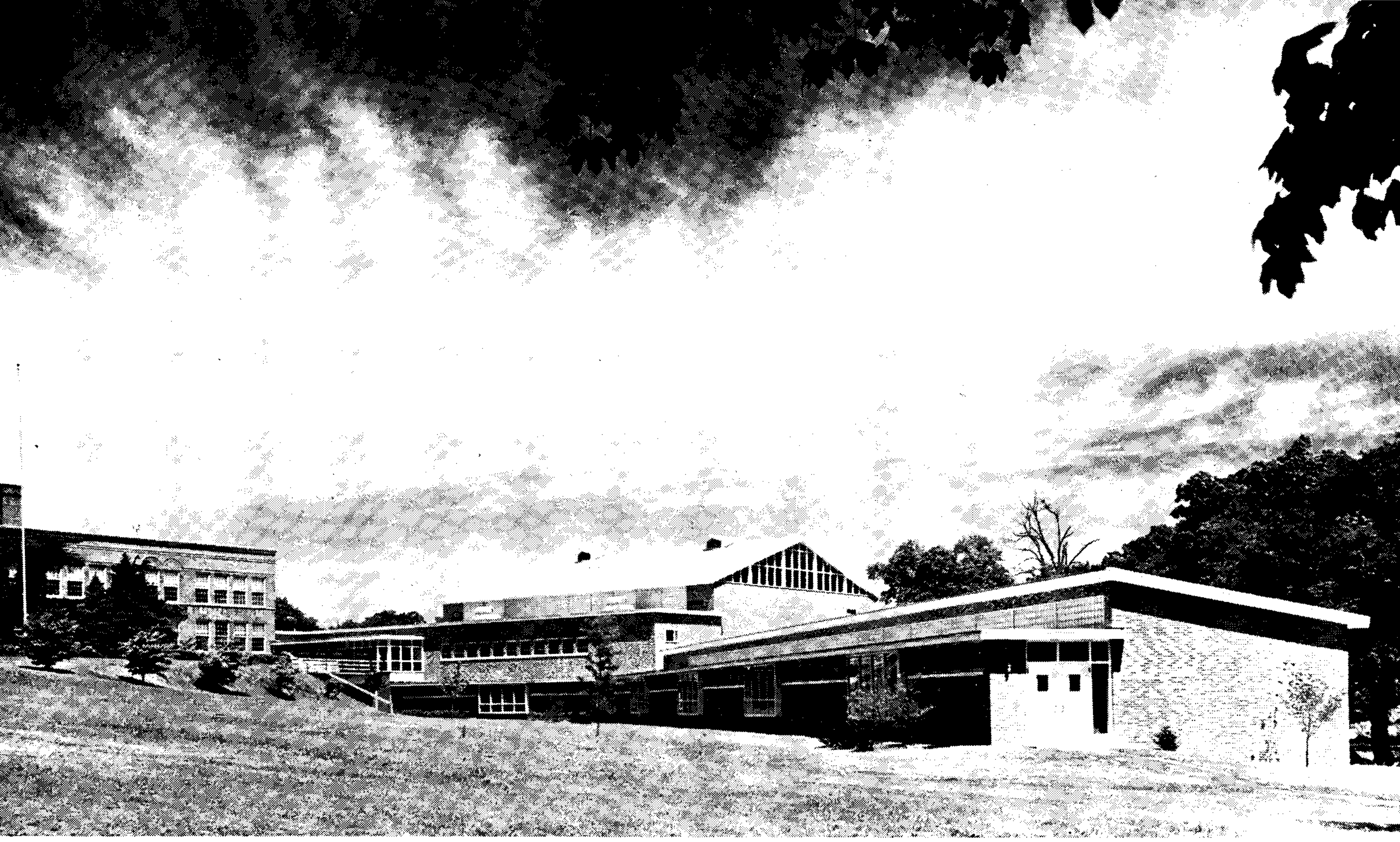
If, after the appropriate computation has been made, it is found that a raft or footings of reasonable size cannot be used without danger of rupture of the subsoil or without danger of excessive settlement, then a deep foundation is indicated. The soil profiles will suggest that there are certain strong elements in the subsoil where it will be appropriate to establish foundations on piles or piers. Further studies may be required to determine the most appropriate type of a deep foundation, but the recognition of the necessity for such a foundation is the first and most important step in its design.

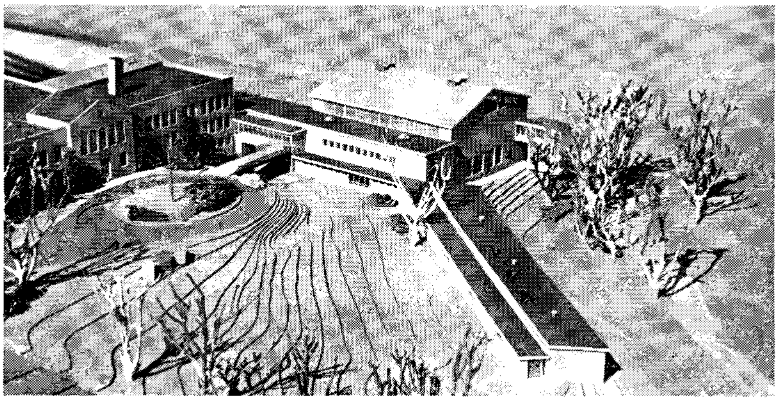
In this article, only subsoils consisting of sand, or of essentially saturated clays, or of layers of uniform clay have been considered. There are many materials such as partly saturated clays, partly saturated silts, and even saturated silts that do not follow the rules for either sand or clay. Therefore, the procedures outlined in this article must be regarded only as introductions to the scientific aspects of foundation design.

The foundation engineer must also regard subsurface conditions to a certain extent with the eye of the geologist. He must imagine what the characteristics of the materials are between the points where he has borings or samples. He must never assume that conditions are better than the poorest ones disclosed by any of the borings, unless geological conditions warrant such an unusual assumption. It represents sound judgment and economy to be a pessimist regarding the uniformity of soil conditions.

Finally the reader should appreciate that factors other than those considered in this article may be the controlling ones in selecting the type of foundations under certain conditions. In northern latitudes, for example, considerations of frost penetration and frost heave may be paramount. In the semiarid southwest, on the other hand, the volume changes in the soils due to shrinking and swelling with moisture-content changes during the seasons may be of far greater importance than the bearing capacity of the subsoil at any given moment. Hence the foundation engineer should always make an effort to acquaint himself with local peculiarities.

Indeed, one of the most important areas for research in the field of foundation engineering at the present time is the collection of data concerning the properties of soils and the behavior of foundations in various localities. The regional approach to foundation engineering is beginning to pay dividends and it is hoped that in the not too distant future there will be an atlas of information concerning subsurface conditions for various parts of the country in which the geological conditions are essentially uniform and where foundation problems are essentially similar. As information of this type accumulates, through the collection of quantitative data, the ability to design economical and safe foundations will also increase.





# high school addition

The problem consisted of (1) providing approximately 300 additional spaces for Darien Senior High School students and (2) adding a number of new facilities required for a thoroughly up-to-date educational program. (For a study of the way this fast-growing suburb of New York coped with its Junior High School needs, see July 1953 P/A.)

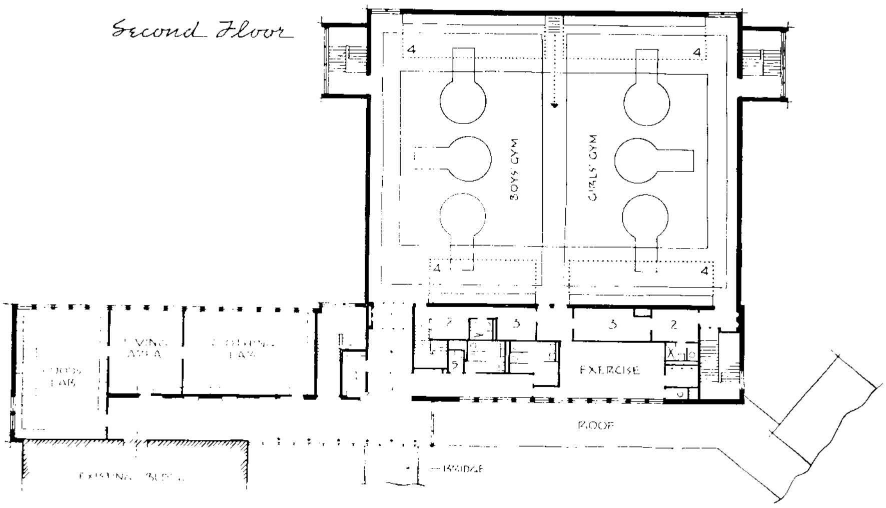
The solution includes both the extensive new addition shown here and alterations *within the old school.* A careful check of total requirements and analysis of those elements that would most benefit by being housed in a completely new structure preceded decisions as to which went into the addition, which *into the old building.*

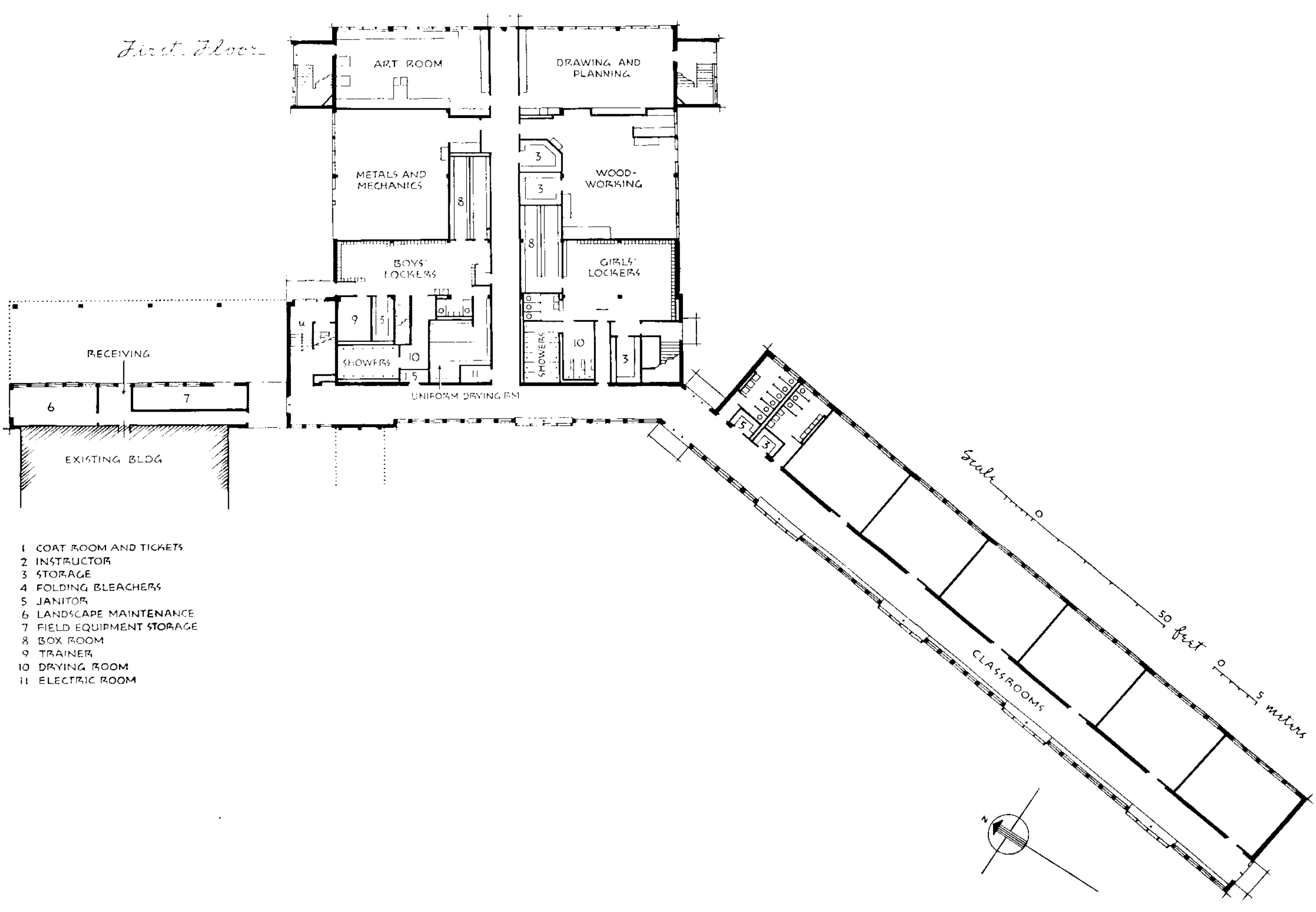
In the existing building, the former gym became a combined music room and dining room; the library was enlarged and improved; stage facilities in the auditorium were modernized; five classrooms underwent major conversion; and space was found for business-education rooms, science laboratories, and offices for the Board of Education. Existing lighting and heating were modernized.

Major units in the new addition are a one-story wing containing six standard classrooms and a large gymnasium block. A folding partition provides separate gym areas for girls and boys. On the lower floor of the gym structure, in addition to locker rooms, shower rooms, and other facilities for physical education and athletics, there are laboratories for automotive and metal study, woodworking, mechanical drawing, and art. In the wing that links the addition to the old building is a homemaking-instruction suite, including foods and clothing labs and a living area.

Shape and disposition of elements of the new wing were considerably conditioned by the site peculiarities. Roughly L-shaped, the site falls off abruptly from its high point, at the level of the old building, down to the low point, toward the east, where the property is bordered by a brook. Because of the site slope, the public entrance to the gym is via a footbridge. The angling of the wing of bilaterally lighted classrooms follows the angle of the site boundary on this side. Room remains for expansion of this wing when the need arises. The construction outline at the end of this presentation details the structural system.

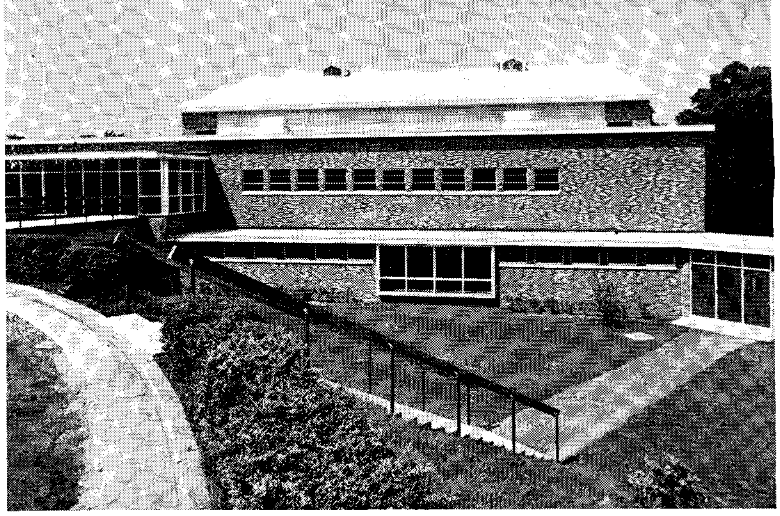
| | |
|---|---|
| location | Darien, Connecticut |
| architects | R. B. O'Connor & W. H. Kilham, Jr. |
| landscape architect | Wolcott E. Andrews |
| structural engineers | Weiskopf & Pickworth |
| mechanical engineers | Wohlpart & Hart |
| color design | Teresa Kilham |
| general contractor | James Romeo & Associates |

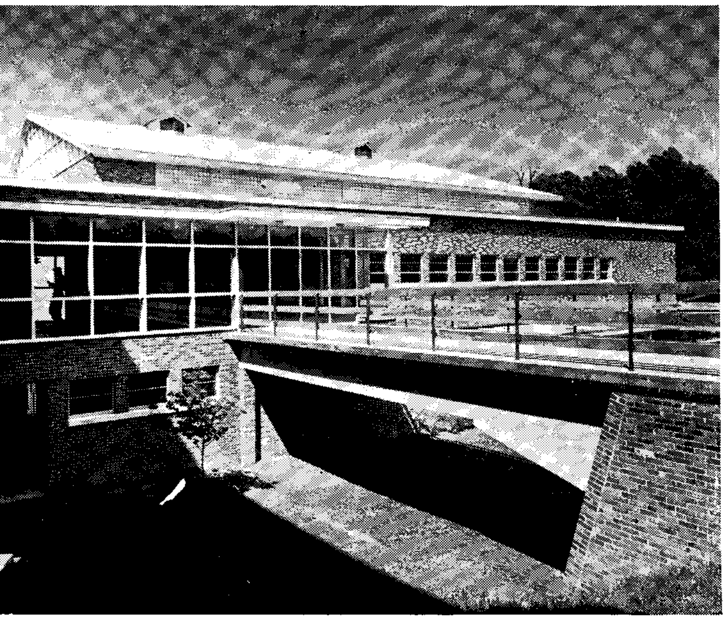



1 COAT ROOM AND TICKETS
2 INSTRUCTOR
3 STORAGE
4 FOLDING BLEACHERS
5 JANITOR
6 LANDSCAPE MAINTENANCE
7 FIELD EQUIPMENT STORAGE
8 BOX ROOM
9 TRAINER
10 DRYING ROOM
11 ELECTRIC ROOM

## high school addition





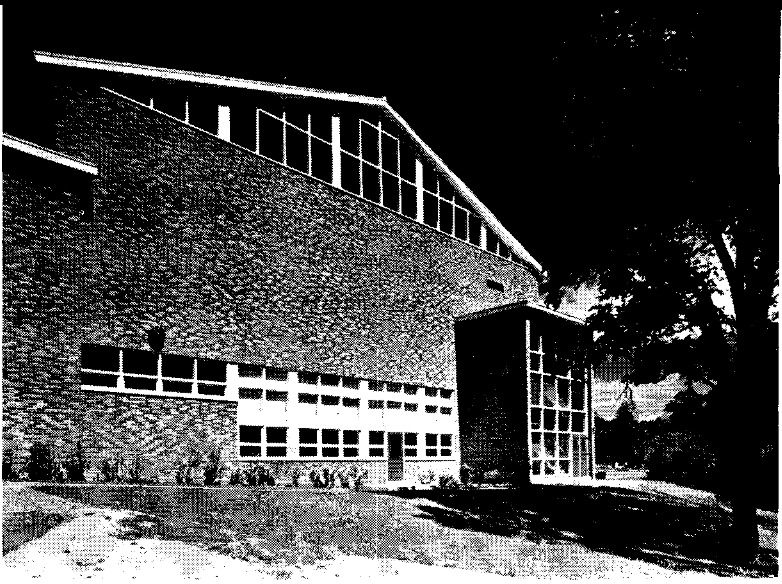
*A pedestrian bridge leads from the driveway turnaround in front of the old building to the glass-walled entrance lobby of the gym-homemaking block. The one-story wing of classrooms occurs on the level below, at the south corner of this unit.*

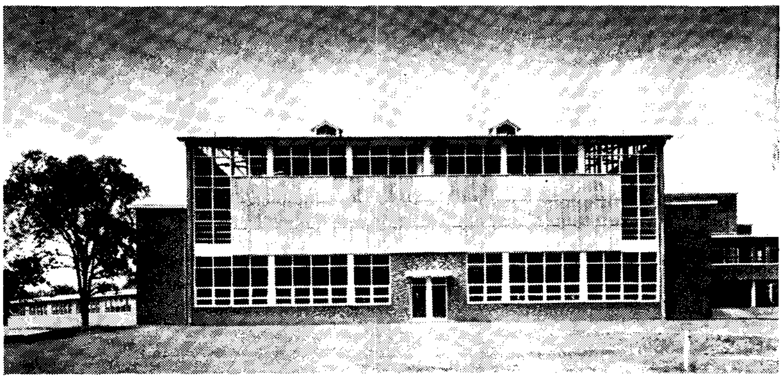
Photos: Lionel Freedman

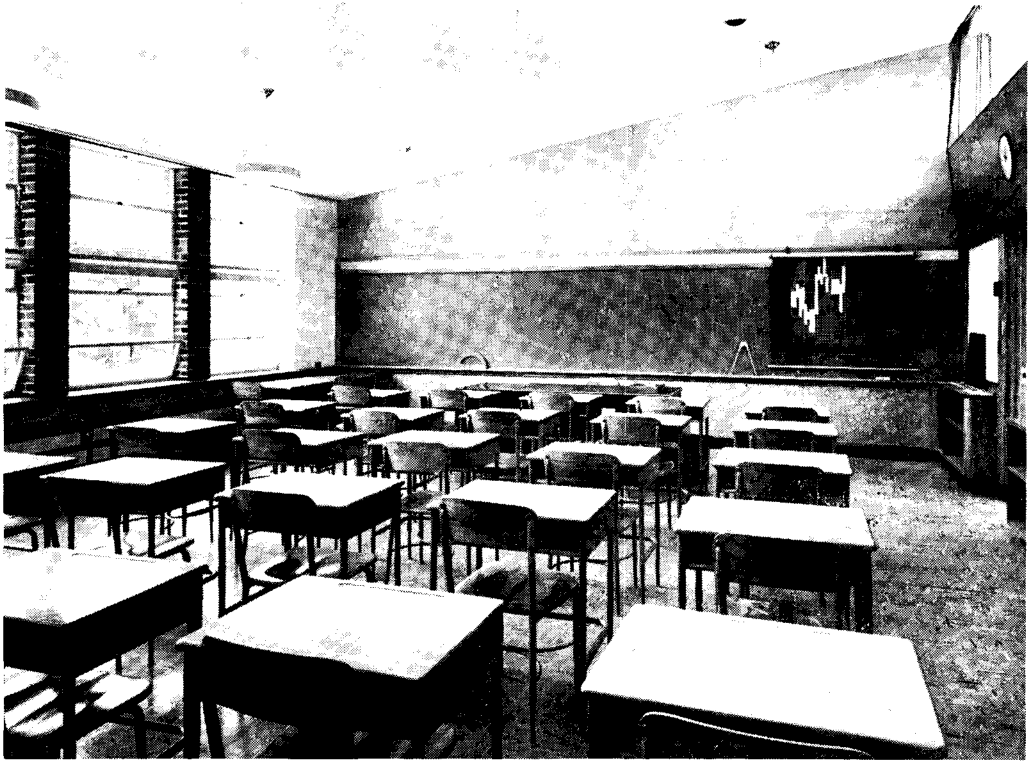
*From the gym entrance bridge* (below) *a birdseye view is gained of the west or corridor side of the classroom wing, extending in a southerly direction; glassblock clerestories provide bilateral lighting for each room.*

*On the ground floor of the southeast wall of the gym building* (top, right) *are* (left to right) *windows of the girls' locker room, woodworking shop, and stairhall.*

*A central entrance on the ground floor at rear of the gymnasium block* (below, right) *separates the drafting room* (left) *and art department* (right).







*The typical classroom has main* (east-facing) *windows of clear glass, with glass-block clerestory on the facing wall above the access corridor. Artificial lighting comes from concentric-ring, incandescent fixtures.*

## equipment

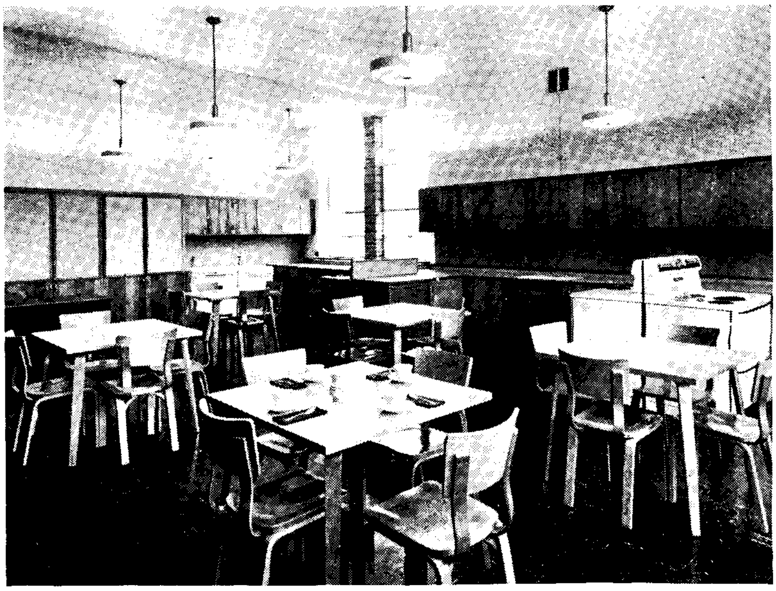
**Kitchen equipment:** counters—Federal Manufacturing Company; oven—G. S. Blodgett Company, Inc.; mixer—The Hobart Manufacturing Company. **Public-address system:** Radio Corporation of America. **Public seating:** gymnasium: folding stands—Wayne Iron Works. **Lighting fixtures:** classrooms: concentric-ring incandescent and double-tube direct-indirect fluorescent fixtures—Gill Glass & Fixture Company; lobby area: shallow prismatic-glass drums—The Art Metal Company. **Electrical distribution:** enclosed fuse-and-toggle switch-type panelboard—Sprague Electric Company; copper multibreaker—Triangle Conduit & Cable Company, Inc. **Plumbing and sanitation:** wall-hung lavatories and floor-mounted water closets—Crane Co.; toilet seats—C. F. Church Manufacturing Company; flush valves—Sloan Valve Company; copper tubing—American Brass Company; shower controls—Speakman Company; public utility water supply; hot-water tank—The Patterson-Kelley Co., Inc. **Heating:** two-pipe steam heating system with vacuum return; boiler—The Bigelow Company; oil—Petroleum Heat & Power Company; copper-finned convectors—Warren Webster & Co.; finned-tube radiators, unit ventilators—The Trane Company; black-steel ducts—National Tube Company; controls—Johnson Service Company; roof fans—Century Fan & Ventilator Company.

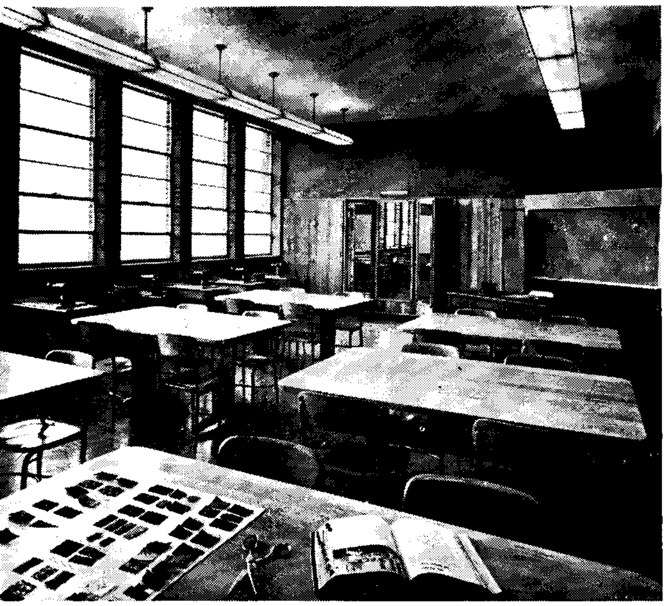
## construction

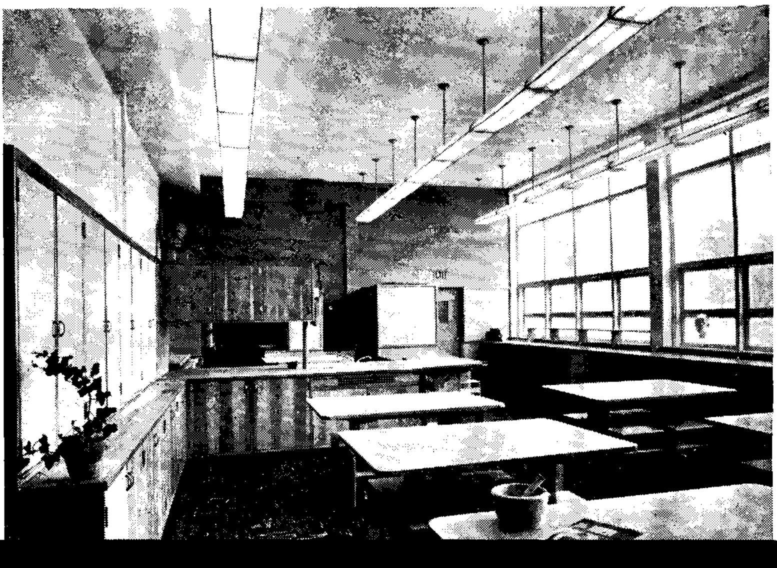
**Foundation, frame, floors, roof:** reinforced-concrete foundation and frame; floor slabs—The Dextone Company; gymnasium: steel frame—Bethlehem Steel Company; floor lath—Pittsburgh Steel Products Company; roof and floors: concrete joists; roof plank—Durisol, Inc. **Walls:** exterior: brick—I. L. Stiles & Son Company; smooth-faced terra cotta—National Fireproofing Corporation; rest rooms, toilets: glazed-tile wainscots—The Mosaic Tile Company. **Floor surfacing:** asphalt tile—Kentile Inc., The Flintkote Company; gymnasium: floating wood—York Flooring Mills; shops: wood block—Storm Flooring Company, Inc.; rest rooms, toilets: ceramic tile—The Mosaic Tile Company. **Ceiling surfacing:** acoustical-tile and plaster—The Kelley Island Lime & Transport Company. **Roof surfacing:** built-up asphalt-and-felt roofing—The Philip Carey Manufacturing Company; gravel—A. V. Jones; gymnasium: corrugated asbestos cement—Keasbey & Mattison Company. **Waterproofing and dampproofing:** liquid agent in concrete—Anti-Hydro Waterproofing Company. **Insulation:** thermal roof insulation—Owens-Corning Fiberglas Corporation; rock-wool batts—National Gypsum Company; gymnasium: sprayed-on fiber insulation—Asbestospray Corporation. **Roof drainage:** zinc-alloy gutters and downspouts—Illinois Zinc Company; cast-iron drains—Josam Manufacturing Company. **Partitions:** interior: cinder block—Plasticrete Corporation, terra cotta—National Fireproofing Corporation; hollow-metal toilet partitions—The Mills Company. **Windows:** steel architectural-projected sash—Michael Flynn Manufacturing Company; wood architectural-projected sash—James A. Haggerty Lumber & Millwork Inc.; sheet, obscure, wired, tempered-plate, and insulating glass—Libbey-Owens-Ford Glass Company. **Doors:** flush solid-core doors with birch face veneer, flush wood entrance doors with glass panels on solid core—Hardwood Products Corporation; wood and glass overhead doors—Overhead Door Corporation. **Hardware:** polished-bronze lock sets, overhead exposed door closers—Norwalk Lock Company; brass-and-steel ball-bearing hinges—McKinney Manufacturing Company; casement hardware—Dalmo Continental Inc.; overhead-track hardware—Grant Pulley & Hardware Company; polished-bronze panic exit—Vonnegut Hardware Company. **Paint and stain:** lead-and-oil exterior paint—The Sherwin-Williams Company; interior: resin base finish—United States Gypsum Company; lacquer and enamel—E. I. du Pont de Nemours & Co., (Inc.); rubber-base paint—Perry Austin Manufacturing Company.

*The homemaking suite, in the link that joins the old school and the gymnasium building, contains a clothing laboratory* (below) *and foods lab* (top, right) *in addition to a living area.*

*The art room* (below, right) *occurs on the ground floor of the gym building and faces northeast.*







## high school addition

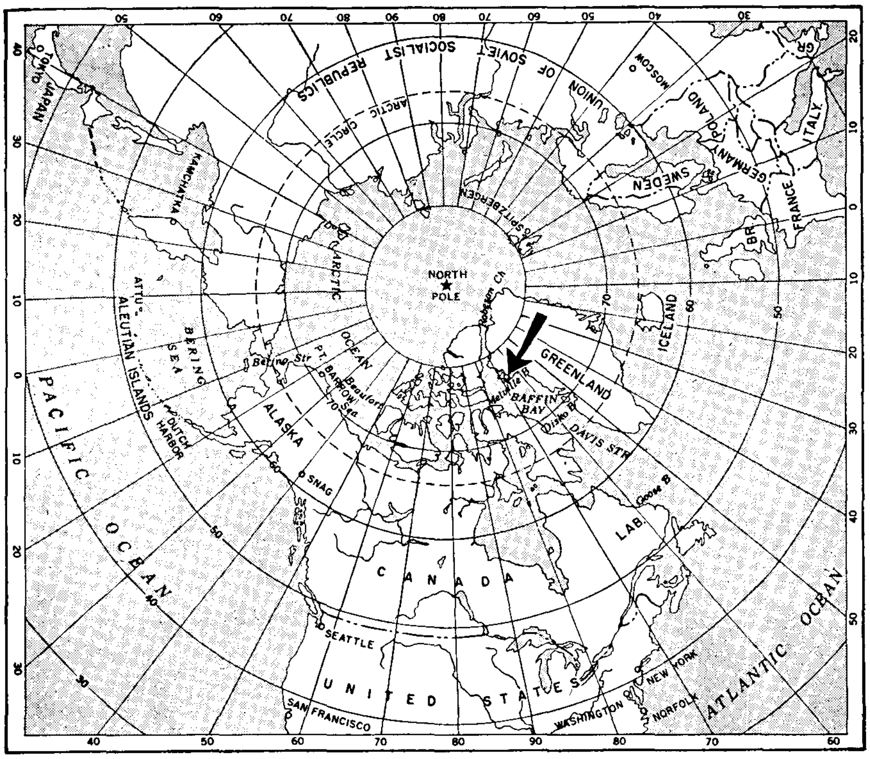



*Figure 1—the north polar regions* (arrow indicates location of Thule).

# THULE AIR FORCE BASE

During the past three years, Alfred Hopkins & Associates and Metcalf & Eddy (New York architects and Boston engineers, respectively) have made an unheralded, yet vital, contribution to the security of the Western Hemisphere. In this period, these firms have developed the architectural and engineering plans for, and witnessed the completion of, the Thule Air Force Base in Greenland.

## background data

Thule (pronounced Toolee) was founded by Danish Explorer Knud Rasmussen in 1910 (*Figure 1*). Whoever in his party gave Thule its name must have enjoyed a classical background, for to the ancients *ultima thule* meant the most northern land in the world. In any event, the connotation of this name is inordinately accurate, as the site is only 910 miles from the North Pole. Its strategic importance to the United States today can be emphasized by a consideration of the distances in miles to various European capitals: Paris, 2660; Berlin, 2570; Warsaw, 2730; and Moscow, 2780.

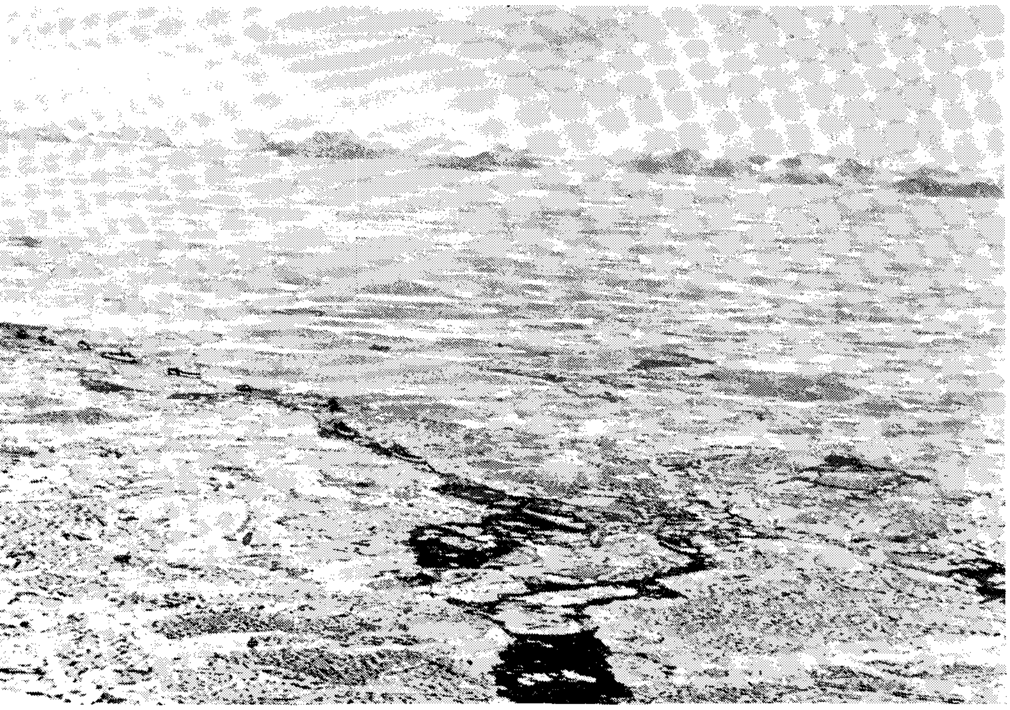
At this faraway location, approximately 90,000 acres of relatively level land, winds of 125 mph are not uncommon—some have been recorded as high as 150. During the winter months, the temperature drops to -50 F, or so, and there are more than two months of continuous darkness. Although located well within the Arctic Circle, there is actually less moisture present in the air than at the Sahara Desert. Little snow falls, but the wind carries a curtain of powdered ice as it blows down from the ice cap behind the base. During the summer months, heavy fogs envelope the site about one day in five; open weather usually is enjoyed for the remaining time. For about nine months each year the port of Thule is frozen over; by September or October ships must leave or be ice-locked for the winter.

Beneath a thin upper layer of soil there lies a great depth of earth called permafrost, that has been frozen for centuries. The permafrost lies about four feet below the surface and is known to extend for at least another 1000 feet.

Prior to 1951, Thule's only inhabitants were a handful of Eskimos and 18 white men manning a weather station operated jointly by the United States and Denmark.

## origin of operation blue jay

During Christmas week, 1950, the UN forces in Korea were being pushed toward the sea, the threat of a Chinese Red Army building up along the border in South Yunnan province existed, and the Middle East was seething internally. In such an uncertain situation, this strategically invaluable base was conceived. Col. Bernt Balchen, Air Force officer and authority on arctic flying, persuaded Thomas Finletter, then Air Secretary, to consider the feasibility of erecting an air base at Thule. Years before, Col. Balchen had learned of Thule from his old friend Rasmussen and during World War II, when he supervised the construction of the Bluie West airfields in Southern Greenland, he had taken oblique photos of Thule while scouting possible locations for other bases. To Lt. Gen. Lewis A. Pick, then Chief of USA Engineers, Finletter outlined an imaginative plan for a base to handle large bombers, that would be operational by November 1, 1951. The



U. S. Army Photos; courtesy The Military Engineer

*Figure 2—supply ships enroute to Thule are shown forcing the Melville Pack.*

*Figure 3—various types of military vehicles to be used in the construction of the air base, being unloaded from an LST.*

project was to be called Operation Blue Jay. At that time there were no topographical maps of the area, no air-photo analyses of the soils, and not even daylight in which to reconnoiter the site. Relying heavily upon the faith, vision, and leadership of the Corps of Engineers, plus the technological potential of U.S. designers, builders, and manufacturers, General Pick accepted the challenge with the provision that $66 millions could be allocated for planning and procurement by the first of June. (Ultimately the project will cost approximately $222 millions.)

Although the Corps of Engineers' magnificent solutions for the over-all planning and logistics for this project are of great interest (*Figures 2 and 3*), the main objective of this article will be to describe the functions of the architects and engineers in solving the architectural problems within the exceptionally tight timetable imposed upon them.

## architectural planning

When the architects and engineers accepted their commissions to develop the architectural drawings for Thule, January 2, 1951, they immediately realized that all planning, designing, and prefabrication would have to be accomplished at breakneck speed, as the first consignment of material had to be ready for shipment by the first of the following June. Further, in all of their planning and designing, the work would have to be gaged to the abilities of the workmen that could be mustered (90 percent unskilled laborers). Similarly, throughout the construction of the project there would have to be a general education of the workmen and improvement of method.

When the architectural team began considering structural solutions that might be acceptable, temperature and soil conditions were not precisely known. At best, these men were in possession of a few incomplete weather reports—extremes of temperature and winds—and they had been advised that the base was permafrost (*Figure 4*). The few individuals who had previously visited Thule and who could be contacted, could not assess their experiences with sufficient accuracy to provide any knowledge that would be of value for architectural planning. Well into February, however, a group did manage to inspect Thule and to return with preliminary data consisting of photos, snow-pack data, and reports on the status of existing structures made by white men. As a result of the meagerness of this first information, there was a tendency toward overdesign on the part of the planners, in their early work. This might have been easily justified, as the first reports were probably extravagant because of the severity of the winter of 1950-1951 which turned out to be one of the bitterest in the memory of any Eskimo living near Thule.

## foundations and orientation

One very significant fact, however, was known: even the simplest structures that had been built as a part of the existing weather station had heaved, due to the nature of the permafrost soil. After considering this phenomenon, it was realized that the heat from these buildings had evidently melted the permafrost so that the buildings sank into it. It was decided that the most logical way to prevent buildings from heaving would be to insulate the permafrost

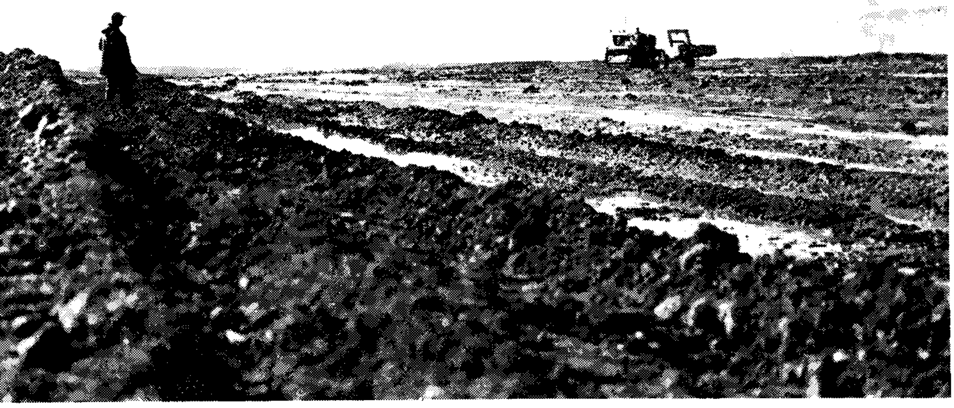


*Figure 4—running a cut through half-thawed arctic soil for future runway. Coarse cracked-stone gravel was later placed over this permafrost, to insulate it from the summer sun.*

*Figure 5—section of base shows barracks in rows parallel with prevailing winds, to provide "automatic" snow clearance.*

from the heat of the man-made structures and also the sun, then build on top of the insulation. The insulation material specified was coarse cracked-stone gravel that could be obtained from nearby creekbeds. By employing stone in this manner, both insulation and reverse excavation were accomplished, as the stone not only insulated the ground but also leveled it for future construction.

Because of the extremely short season in which building could take place, the general use of reinforced concrete for foundations was judged impractical. The only exceptions were hangar foundations, which required piles and reinforced-concrete caps in order to carry the heavy loading of the large aircraft. For most structures, however, a simple system of timber-crib foundations answered the dictates of the soil by providing an air space between the undersides of the floors and the insulation over the permafrost. Air spaces are necessary because integral floor insulations are inadequate to allow the floors to be placed directly over the permafrost insulation.

The constant winds existing at Thule provide a continual movement of air over.

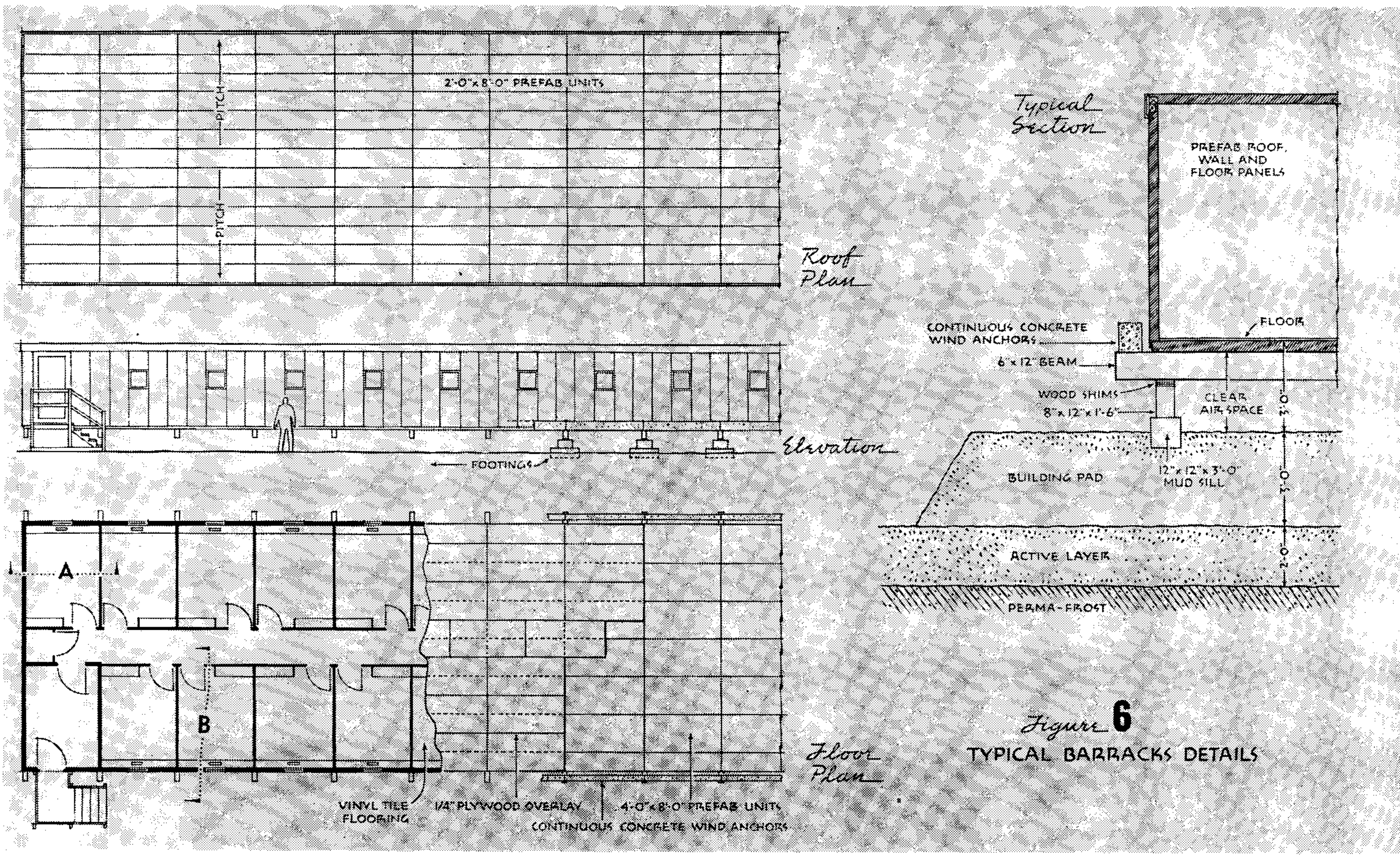



Figure 6
TYPICAL BARRACKS DETAILS

around, and under all structures. By proper orientation (placing longitudinal axes of buildings parallel to the prevailing winds), air blowing under a structure keeps snow from piling up around its sides. Letting nature provide this snow clearance also determined the over-all planning of the building and main roads: all are placed in rows parallel to the prevailing winds (*Figure 5*).

It was found that flat-roof buildings would not accumulate snow on top, while all pitched roofs did. While this phenomenon supported the use of flat roofs wherever possible, there were other concurrent advantages: minimum cubage of air to be heated within the building, integral roof and ceiling members, and simple construction. Where pitched roofs were required (hangars, for example), the gable ends of such structures were faced directly into the wind. For similar reasons, all entrances were placed on the wind-swept sides of the buildings.

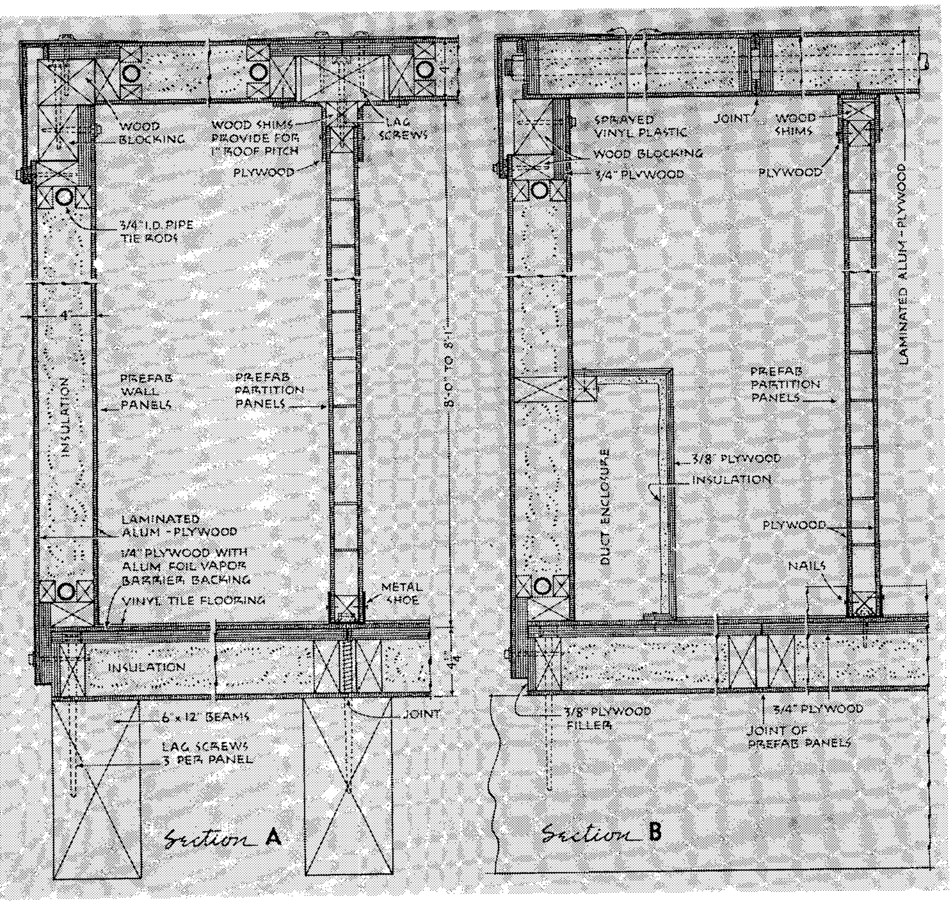
## enclosing walls and roofs

What structural systems were the buildings to have and how were they to be enclosed? Obviously, the various building elements had to be prefabricated in the United States, then shipped to the site for assembly and erection. But what materials were best suited for the arctic? How were the intricate problems of vapor barrier to be solved and what insulation materials would perform most efficiently? These questions and countless others had to be solved independently as Army and Air Force experience in prefabrication was not available to the architects.

Several commercially-available prefabrication systems were considered, only to be discarded as incapable of withstanding the severe winters, too inflammable, or otherwise unsuitable. One prefab system, however, was of intense interest to the architects, although until that time it had only been used for a small number of walk-in coolers, and observations were still being made on a test installation located at Nantucket, Massachusetts. At the time, the manufacturer of this method, the Clements Panel Company, was actively seeking a good market for its product. As this panel system offered an immediate solution for many of the vexing problems related to the erection and enclosure of arctic structures, it was accepted for development by the architects and engineers. Within a matter of weeks a city of barracks, mess halls, automotive maintenance shops, hangars, etc., was made of these panels.

In the Clements panel (*Figure 6*), one has a relatively non-ignitable construction material with integral vapor barrier (provided by metal laminated to plywood) and insulation—all in a 4" wide package. Although these panels have a remarkably low U-factor (0.10), the need to conserve fuel was so serious that their resistance to heat transmission was considered barely sufficient.

Because of metal shortages, the necessity of using a metal-covered panel system was a blow to the Army and the Air Force. As a metal vapor barrier was indispensable, however, aluminum was made available for the panels' exterior faces. Metal was also necessary to turn the corners of the panels and to provide a folded edge—the essence of the system's success. Aluminum strips, 26" wide and .015" thick, were used to form 24" panel facings with 1" folds on either edge; glass-fiber insulation separates



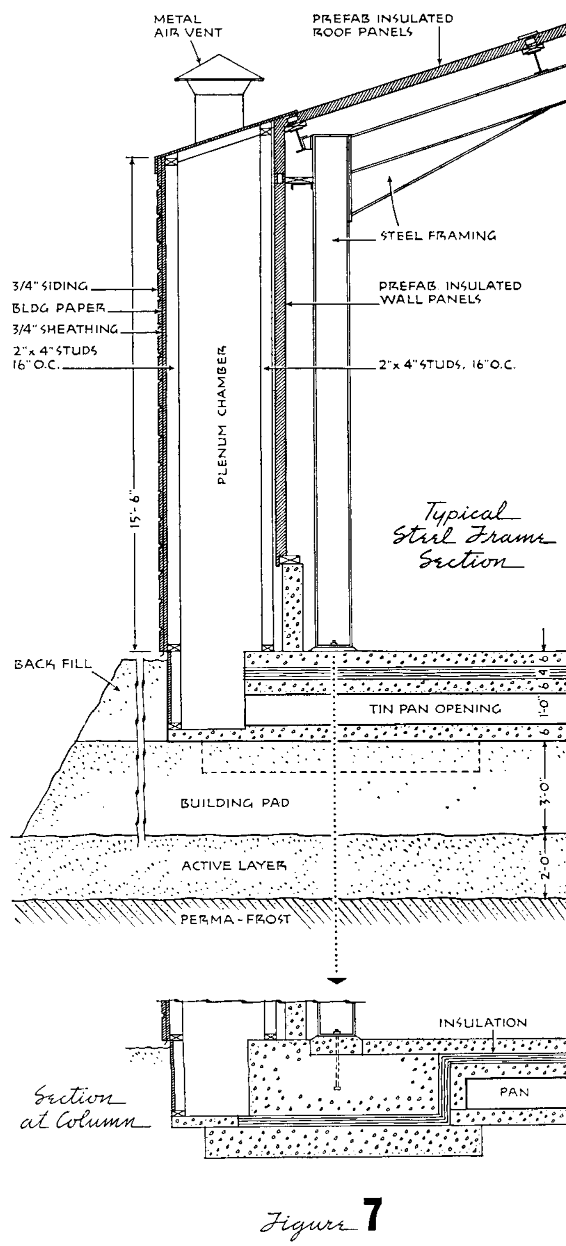




Figure 7

the laminated aluminum-plywood sheets. In effect, each panel is a structural channel with a protected edge. A system of "opposed-offsets" at panel ends solved the problem of joining side panels to roof and floor panels (*Figure 6*). Most panels are 2′ x 8′, easily handled by one man, ideally suited for the roof span on 8′ module. Few woodworking tools are required for installation and rapid enclosure is a prime advantage of the method. In the barracks, the wall panels and interior partition panels are not only self-supporting but also support the roof (*Figure 6*). Small clear-span buildings have wood frames. In larger installations (gymnasiums, automotive-maintenance buildings, hangars, etc., where large spans are required), structural-steel bents make up the structural system which, in turn, is enclosed by the prefab-panel system (*Figure 7*).

By nature of their construction, these panels are thermally nonconductive—a required property for an exterior wall at Thule, since any *conductivity* causes ice to form immediately on interior surfaces. To prevent the formation of "ice walnuts" on through-wall metal fastenings, all panels were fastened with power-driven lag screws which do not pass through the girt or roof beam.

A great deal of thought went into the protection of the joints. For example, in a relatively short time, air-borne powdered ice could fill an entire room through an opening no larger than a keyhole. At first, calking compounds were used between the joints, but these dropped off during erection and their use was discontinued. Eventually, a vinyl-plastic spray over the exterior joints offered the best solution for joint protection. The plastic was sprayed to a thickness of 40 mils for 3″ on either side of each joint, with a 3″ fade-off on both sides (*Figure 6*). The splines between the vertical joints of the side panels provided adequate protection.

The prefab floor panels are glued-plywood assemblies of unusual strength. They are similar to the wall and roof panels, except that they have no aluminum facings. The top plywood sheet is thicker and an additional plywood leveling-sheet with an aluminum-foil vapor barrier acts as underlayment for the vinyl-plastic tile flooring (*Figure 6*).

# p/a products

## steel, splayed-arch bridge

This 250-ft long, all-welded steel, splayed-arch highway bridge accommodating three lanes of traffic spans the Rio Blanco near Vera Cruz, Mexico. Based on a new design conception by Dr. Thomas C. Kavanagh, chairman of the department of civil engineering at New York University's College of Engineering, Mexican Engineer Camilo Piccone has applied welding techniques to produce a span with slender arch ribs, free of cumbersome bracing. In this structure a freedom of form previously available only with concrete has been achieved with steel materials. The arch ribs are inclined and joined at the center of the span and the resulting space framework provides a "basket-handle" effect. The curved ribs have been painted orange and the horizontal tie-girders red. Unconventional design has also been extended to the flooring where a diagonal gridwork of floor beams has proved far more economical than more typical bridge floor systems. The Rio Blanco span, part of the Mexican federal highway system, was constructed under the direction of the Papaloapan Commission. Dr. Kavanagh's original design conception won an award in the 1951 professional bridge design competition sponsored by the Lincoln Arc Welding Foundation, Cleveland, Ohio.

### air and temperature control

**Unit Heaters:** new eight-model line of gas-fired unit heaters for automatic, direct-fired heating of industrial and commercial areas can be used with natural, manufactured, mixed, or L. P. gases; capacities from 20,000 to 160,000 Btu/hr. Heaters equipped with automatic safety pilots, individually adjustable louvers, and motor-driven fans ranging from 1-40th to 1-6th hp. Grinnell Co., Inc., 260 W. Exchange St., Providence, R. I.

**Brown Air Conditioner:** new air-conditioning unit for residential use utilizes cold water for summer cooling and hot water for winter heating. Cabinet designed by industrial designer Carl Otto. Unit is installed in room in same manner as a convector; adjustable grill permits deflection of conditioned air to suit individual taste. Available sizes: 1½ tons, 1 ton, and ⅝ ton. The Powerad Co., 79 Madison Ave., New York 17, N. Y.

**Sunwarm System:** radiant heating system consists of thermoplastic insulated cable applied before ceiling is plastered and thermostat for control of individual room temperatures. Particularly adapted to motels, cables have also been used in basements, under driveways and walks, and for soil heating in hotbeds and greenhouses. Endorsed by fire insurance companies, Underwriters' Laboratories, FHA, and VA. Sunwarm, Inc., Kingsport, Tenn.

**Gas Fired Lo-Boy Series 531:** five new winter air conditioners, available in size range from 55,000 to 158,000 Btu output at register; first three sizes shipped assembled and prewired, requiring only thermostat, electrical, and gas connections. All conditioners of 12-gage steel with casings painted in maroon and gray enamel. Approved by AGA for city gas. Thatcher Furnace Co., Garwood, N. J.

**Year-Round Air Conditioners:** new vertical and horizontal models for both cooling and heating. For summer cooling, chilled water compressor located at remote source. For winter heating, hot water is pumped through same pipes from boiler. Free-standing vertical unit, equipped with floor cabinet, for nonrecessed installation; horizontal unit designed for either recessed or nonrecessed installation. Self-contained fans, diffusing grills, cleanable air filters, copper coils with aluminum fins. U. S. Radiator Corp., 300 Buhl Bldg., Detroit 26, Mich.

**G-50 Unit Heater:** compact gas-fired unit heater with input of 50,000 Btu/hr designed for low ceiling and small space applications. Aluminized steel heat exchanger, die-formed casing finished in gray baked enamel, resiliently mounted motor, draft diverter with built-in side relief openings, high temperature limit control, pressure regulator, four-blade aluminum fan. Unit is 23″ high. Young Radiator Co., 724 Marquette St., Racine, Wis.

### construction

**Hollow Brick:** new structural clay through-wall unit, designed for one-story residential construction, requires no masonry back-up material. Unit is 2⅝″ high, 11⅝″ long, 5⅝″ thick, vertically cored to lighten its weight, and provided with jamb slot at one end. Appearance and face size very similar to Norman brick. Clay Products Assn. of the Southwest, 109 Perry-Brooks Bldg., Austin, Tex.

**Forest Board Forall:** new warp-resistant hardboard panels, smooth on both sides and up to ¾″ thick, are engineered for such applications as wardrobe doors, cabinet doors and shelves, and furniture. Light stains, paints, and enamel easy to apply; no sanding required before finishing. No patching on edges or edge mold necessary. Thicknesses: ⅜″, ½″, ⅝″, and ¾″. Forest Fiber Products Co., Forest Grove, Ore.

**Ornamental Iron and Aluminum:** seven newly-introduced contemporary designs in ornamental iron and aluminum are produced in predrilled units that are easily assembled. Firm will continue to produce present line of S-Scroll type of ornamental metal which has been used for all types of domestic rails and columns. Keesons, Inc., 500 W. Main St., Robertsville, Ohio.

**Uniwall:** new line of load-bearing facing tile makes possible single-unit wall construction with finished facing inside and out. Ceramic-glazed interior surfaces. Vertical-cell tile made of hard-burned de-aired fire clay; complete line of shapes available to supplement standard units. With allowance for ⅜″ mortar joints, facing tile has 8″ wall thicknesses, 4″ x 12″ face size. Natco Corp., 327-29 5 Ave., Pittsburgh 22, Pa.

### doors and windows

**Donley Steel Doors:** steel doors for ash-pits and flue cleanouts are sized to fit masonry without cutting. Wide-frame flange supports brick, close fitting to prevent air leakage. Corrosion-resisting steel used is 7/64″ thick. Doors anchor firmly in wall. Sizes: 8″ x 8″, 12″ x 8″, and 12″ x 12″. The Donley Bros. Co., 13902 Miles Ave., Cleveland 5, Ohio.

**Peek-O Door Viewer:** one-way door viewer of rust-proof metal construction, features 170° visibility, patented revolving mechanism, dual-molded optical lens, easy installation, and simple design. Available in all standard finishes; door thickness 1″ to 2″. Home Protector Mfg. Co., 5315 W. Pico Blvd., Los Angeles 19, Calif.

**Moderncall System:** new line of residential door chimes composed of flush-in-wall chime units located at key locations and operated from single master controller and transformer in basement. Different signals provided for as many as three entrances, plus family paging. Single-wire, series circuit. Chime grills finished in neutral brown undercoat. The Rittenhouse Co., Inc., Lloyd Rd., Honeoye Falls, N. Y.

**Duo Trim:** inside-outside trim for steel casement windows includes window stool, sill, inside and outside moldings and trim, Page Beauchamp: **showrooms**

Contrasted in our presentation this month are three entirely different showooms—varied in their types of merchandise, their methods of display, and their handling of space division according to size and requirements of the areas. Similarity occurs in the interior designers' attention to variation of textures, understanding of functions, and masterful handling of renovation of existing spaces. Each, in its own right, is a sympathetic background for the products.

The carpet showroom, for instance, is fascinating to study because the problem of limited space has been solved with a most attractive display circle around the administrative offices—thus giving the display space an individual appearance and yet keeping the offices immediately in touch with all operations. The shoe showroom changes functions: the display case being especially designed so that the shoes are out of sight when the area is increased for fashion shows by means of folding doors (which normally seclude office space). The furniture showroom is worthy of consideration because of its arrangement—dividers define settings yet do not hamper the open plan. There is an ease and grace which simulate arrangement in the home and aid tremendously in showing how furniture will look in use. Backgrounds are simple, yet varied and sympathetic.

In any showroom considerations must include:

1. Size and scale of product to be shown, which determine display media.

2. Methods used in selling various items and space required for this operation.

3. Functions to be housed in combination with merchandising the product.

4. Requirements of display change, in terms of change in models. (Generally, it is desirable to have flexible fixtures, so that a variation in arrangement may be effected to accomplish a new look, if product does not change often.)

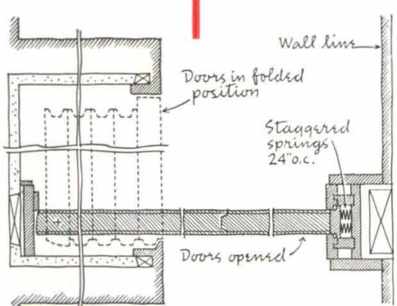
5. Logical floor plan for most efficient operation with minimum effort.

No matter what the product it must be shown to best advantage. Lighting and color, of course, contribute most to creation of the proper setting. Then, if the comfort of the client is carefully handled, the showroom cannot fail to be successful.

# showrooms

acoustic tile

folding wall



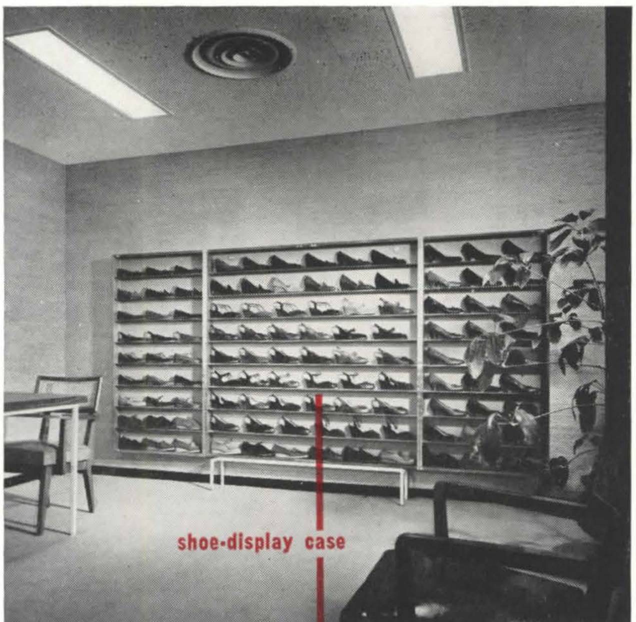

PLAN THRU DOORS

Two main activities had to be accommodated in this area. Normal requirement is for two offices, separate from the showroom area, but several times a year the entire space has to be used for fashion shows, attended by about fifty people, and the display case then must be closed.

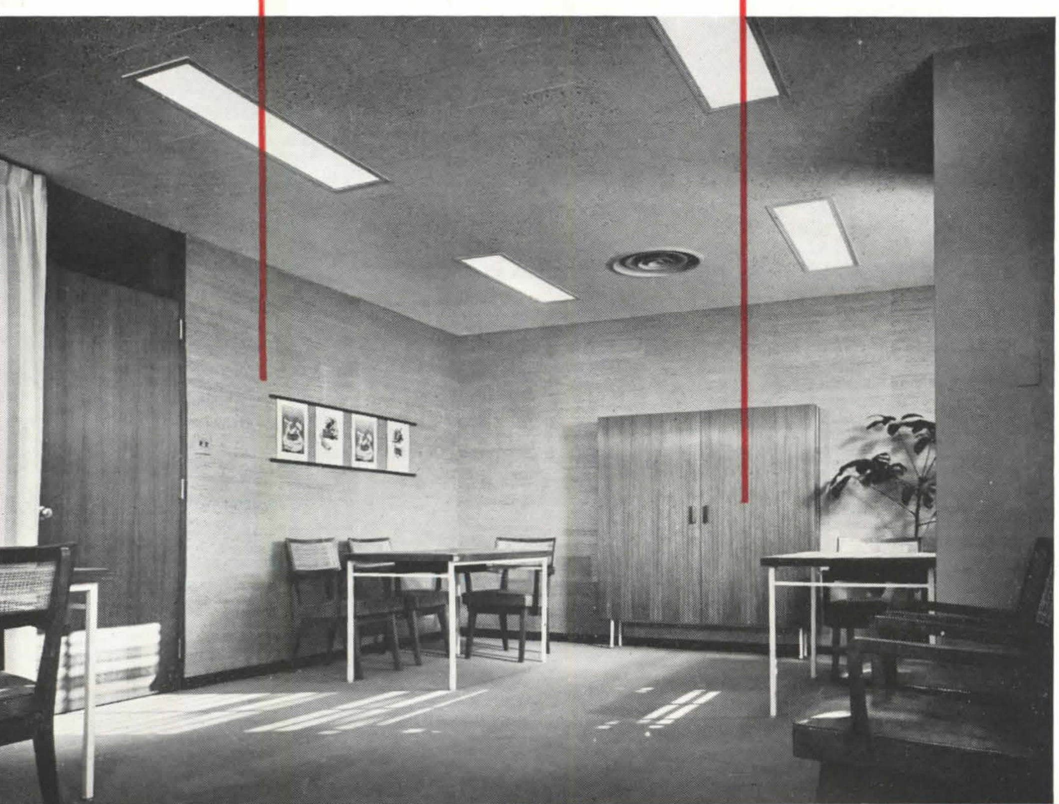
Folding doors permit opening of the entire space, and collapsible platforms accommodate the show. The display cabinet has shelved doors, so that when opened it presents three units of shelves. Closed, it is an attractive piece of furniture.

Natural-walnut cases and furniture are accented by white Formica tops on the desks and vermilion lacquer of the interior of the shoe display cabinet. Draperies, grass cloth on the walls, and wood paneling combine to offer a quiet, gracious setting. *Photos: Richard Garrison*

| | |
|---|---|
| location | Town & Country Shoes, Inc., Empire State Building, New York, New York |
| interior designers | Beeston-Stott-Patterson |




grass cloth



## data

### cabinetwork

**Shoe-Display Cabinet:** natural walnut/ vermilion-lacquered interior/ custom-designed/ Hinzmann & Waldmann, Inc., 80 Third St., Brooklyn, N. Y.

**Showroom Tables:** natural walnut/ gray felt top/ steel legs, white-lacquered/ Hinzmann & Waldmann, Inc.

### doors

**Entrance Door:** City Steel Door Corp., 820 Whittier St., Bronx, N. Y.

**Folding Walls:** "Unit-Fold"/ natural walnut/ John T. Fairhurst Co., Inc., 45 W. 45 St., New York, N. Y.

### equipment

**Air Conditioning:** Tiltz Air Conditioning Corp., 70 E. 45 St., New York, N. Y.

**Venetian Blinds:** Bronx Window Shade & Awning Co., 372 E. 162 St., Bronx, N. Y.

### furnishings and fabrics

**Sofas:** #MS-603/ natural-walnut frame/ Edgewood Furniture Co., Inc., 208 E. 27 St., New York, N. Y.

**Chairs:** #MS-601/white-lacquered metal legs/ Edgewood Furniture Co., Inc.

**Lamp Table:** #LT-82-M/ Edgewood Furniture Co., Inc.

**Armchairs and Swivel Chairs:** J. G. Furniture Co., 102 Kane St., Brooklyn, N. Y.

**Secretarial Desks:** David Kramer, Inc., 237 Park Ave., New York, N. Y.

**Upholstery Fabrics:** Functional Textures, 451 E. 164th St., New York, N. Y./ Janet Rosenblum, 602 Madison Ave., New York, N. Y./ McKay Davis & McLane, 210 E. Olympic Blvd., Los Angeles 15, Calif.

**Drapery:** Davis Decorators, 215½ E. 22 St., New York, N. Y.

### lighting

**Fluorescent Recessed Fixtures:** #303 48 H G/ Frink Corp., 27-01 Bridge Plaza North, Long Island City, N. Y.

**Incandescent Recessed Fixtures:** #608F/ Modern Metal Mfg. Co., 217 Grand St., New York, N. Y.

### walls, ceiling, flooring

**Walls:** plaster covered with grass cloth/ A .H. Jacobs Co., 509 Madison Ave., New York, N. Y.

**Ceiling:** acoustic tile/ Acoustone "F"/ Armstrong Cork Co., Lancaster, Pa.

**Flooring:** wool carpeting/ Magee "Adherence Beige"/ rubber backing/ William Gold, Inc., 17 W. 17 St., New York, N. Y.

# showrooms

| | |
|---|---|
| location | C. H. Masland & Sons, 295 Fifth Ave., New York, New York |
| interior designers | Maurice and Joseph Mogulescu & Gerald Luss: Designs for Business, Inc. |

## data

### cabinetwork

**Circular Display Fixture, Storage Fixtures:** custom design by Designs for Business, Inc./ executed by Ezra Blank, 117 Lombardy St., Brooklyn, N. Y.

### furnishings and fabrics

**Sofa, Lounge Chairs:** Lehigh Furniture Co., 16 E. 53 St., New York, N. Y.

**Showroom Chairs:** Jens Risom Design, Inc., 49 E. 53 St., New York, N. Y.

**Fabrics:** Isabell Scott Fabrics, 17 E. 53 St., New York, N. Y./ Arundell Clarke, 25 E. 73 St., New York, N. Y.

### lighting

**Fluorescent Lighting:** Lightolier Corp., 11 E. 36 St., New York, N. Y.

**Recessed and Directional Lights:** Century Lighting Co., 521 W. 43 St., New York, N. Y.

### walls, ceiling, flooring

**Walls:** painted plaster.

**Ceiling:** acoustic tile/ "Acoustone"/ U. S. Gypsum Co., 488 Madison Ave., New York, N. Y.

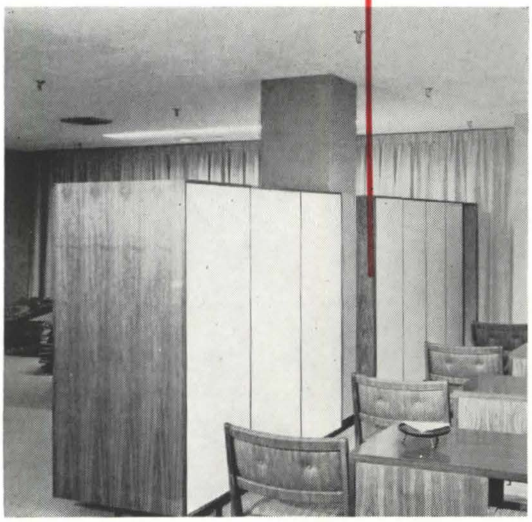
**Flooring:** carpeting by C. H. Masland & Sons, 295 Fifth Ave., New York, N. Y.

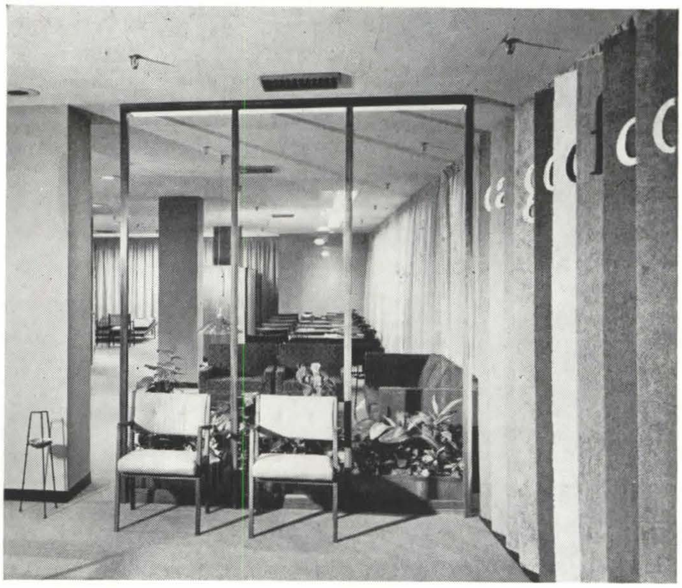
If customary provision for office space had been made along one wall of this showroom, it would have destroyed about a quarter more display space, drastically reduced showroom area, and resulted in a routine room with little character. But the circular display screen which encloses the sales manager's office, executive office and conference room, executive secretary pool, and the sample room is a most successful solution. The central location for offices is convenient and workable, and furniture has been custom-designed to fit inside the curved walls of the offices.

Sales staff is located along one wall, which is conveniently adjacent to the secretarial pool and sample room.

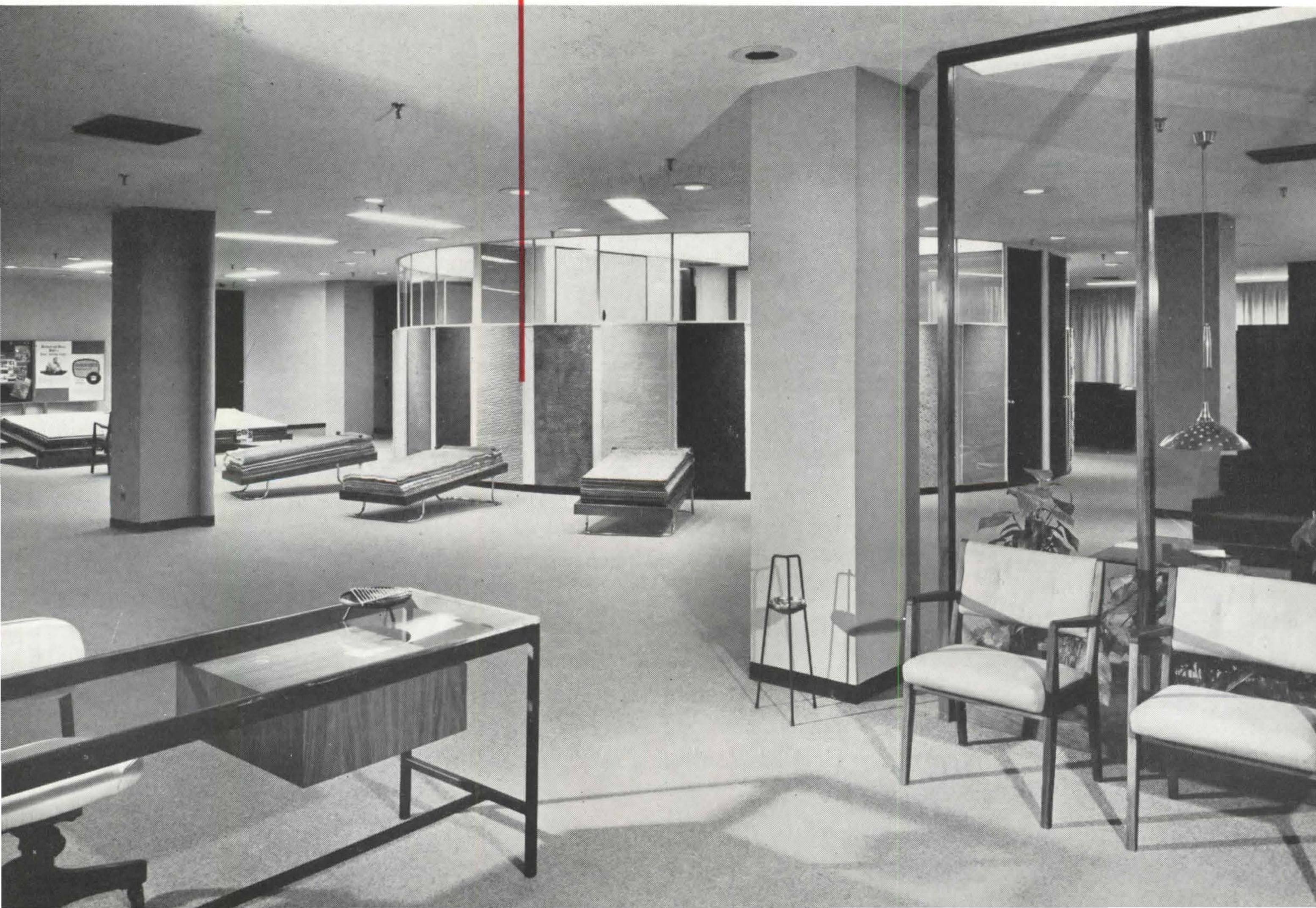
All furniture, carpeting, and fabrics are in earth tones and rich, tweedy textures—to form a luxurious background and enhance the carpet samples on display.

Display area is so central and compact that it simplifies selling, yet still permits great activity. This one structure meets all the requirements of space, workability, beauty, and convenience. *Photos: Ben Schnall* room divider-cabinets



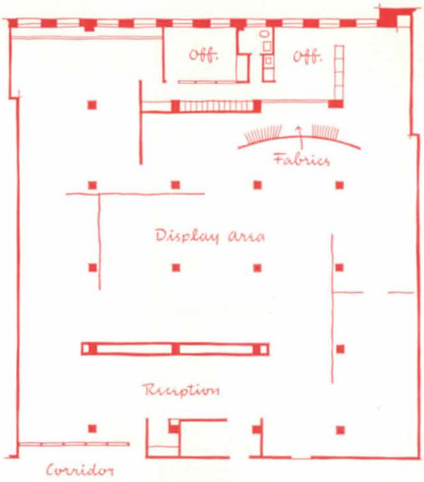


circular office space-carpet display



# showrooms

concave wall for fabric display




Naugahyde-covered columns

Although displaying furniture in typical settings, there are no closed-in rooms in this display area. Long, unbroken, wall planes or translucent fabric curtains suggest divisions without interrupting traffic flow or destroying the exceptional effect of space. There is absolutely no look of clutter—a real accomplishment in a room where so *much furniture* is displayed. Either a carpet defines a grouping, or just masterful handling of space division and furniture arrangement create the desired effect.

Quiet background colors—cream, black-brown, tan, robin's egg blue, periwinkle blue, and white—help to create an atmosphere of permanence and solidarity. A feeling for textures and the beauty of materials has made this showroom one of simple elegance. Having also de-

| | |
|---|---|
| location | Dunbar Furniture Corp. of Indiana, Merchandise Mart, Chicago, Illinois |
| interior designer | Edward Wormley |
| associate | Edward Crouse |
| architectural consultant | James Speyer |

shoji panels

burnt-cork squares

recessed lighting fixtures

glass front

random-width-walnut paneling

signed the furniture on display, the designer knew the proper setting for it.

This showroom was designed for an existing space. The entire ceiling was furred down, to eliminate beams and permit recessed lighting fixtures. The entrance is softly illuminated with pinhole downlights and the rest of the space has a combination of larger downlights, hanging fixtures, and floor lamps for accenting certain groupings. The flooring is burnt-cork squares, columns have been covered with Naugahyde for a softening effect, and walls vary in finish to aid the space division. Air conditioning, of course, makes the area comfortable, but also reduces the housekeeping and maintenance requirements. In all, a thoroughly successful job. *Photos: Dunbar Furniture Corp. of Indiana*

## data

#### cabinetwork

**All Cabinetwork:** Dunbar Corporation, Berne, Ind.

#### furnishings and fabrics

**All Furniture:** Dunbar Corporation

**Fabrics:** designed by Edward Wormley/ Boris Kroll Fabrics, Inc., 515 Madison Ave., New York, N. Y.

#### lighting

**Adjustable Hanging Fixtures:** designed by Paavo Tynell/ Finnish American Trading Corp., 41 E. 50 St., New York, N. Y.

**Recessed Downlights:** #9200/ General Lighting Co., Inc., 1527 Charlotte St., New York, N. Y.

**Pin-point Spotlights:** (at entrance)/ Rambusch Decorating Co., 40 W. 13 St., New York, N. Y.

#### walls, ceiling, flooring

**Walls:** random-width walnut paneling/ executed and finished by Dunbar Furniture Corp./ painted plaster/ paint; Martin-Senour Co., 9 E. 56 St., New York, N. Y.

**Room-dividers:** Travertine marble/ Italian Marble Company, 1730 Carroll Ave., Chicago, Ill./ lacquered panels/ nylon fishnet/ Arundell Clarke, 25 E. 73 St., New York, N. Y./ transluscent fabrics/ Boris Kroll Fabrics, Inc.

**Columns:** brown-black pinseal Naugahyde/ U. S. Rubber Company, 1230 Sixth Ave., New York, N. Y.

**Shoji Screens:** United Enterprises, San Francisco, Calif.

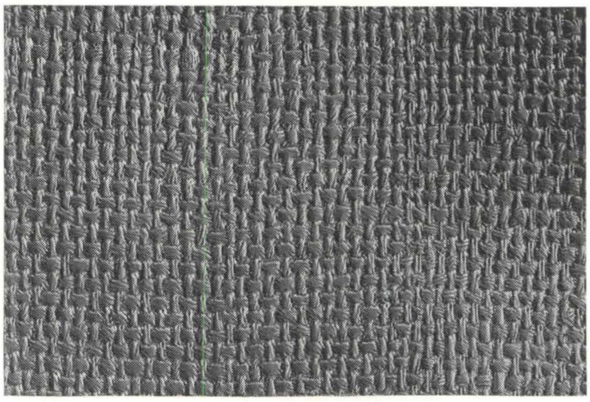
**Ceiling:** painted plaster

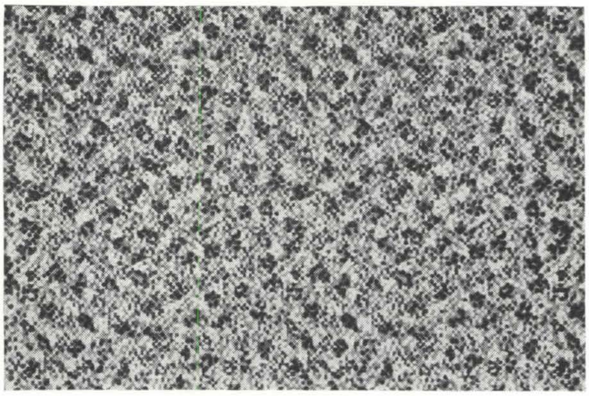
**Flooring:** 18'' squares/ burnt cork/ Armstrong Cork Co., Lancaster, Pa.

# p/a interior design products

**Wall Covering:** "Wall-Tex"/ Pine pattern/ available in three color combinations/ pretrimmed/ 24" rolls/ fabric texture/ waterproof/ **Columbus Coated Fabrics Corporation, E. Seventh Ave. & Big Four R.R., Columbus 3, Ohio**

**Plastic Wall Covering:** "Kalitex"/ resembles burlap/ color applied to back of transparent vinyl-resin sheeting/ colors: blue-green, gray-green, wine, tan, sunshine yellow, gray, light coral/ 54" width/ **United States Plywood Corporation, 55 W. 44 St., New York 36, N. Y.**

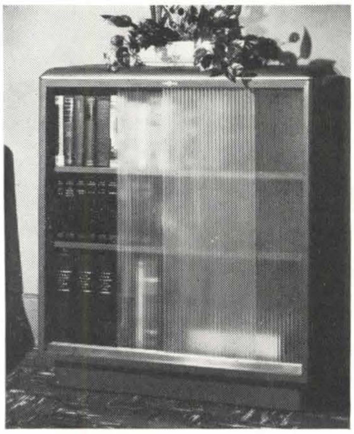


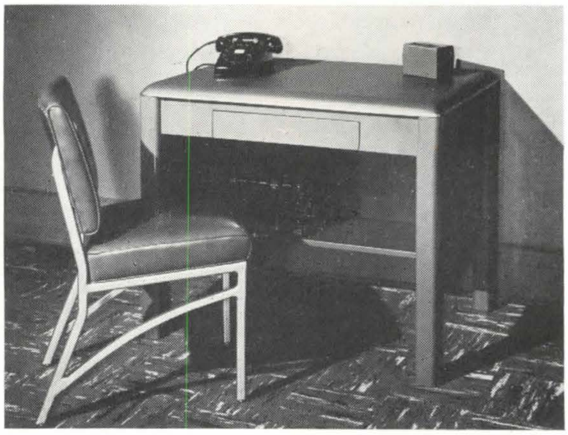


**Carpet:** "Caladium"/ large-scale leaf pattern/ imported virgin-wool yarn/ made to order in any two colors desired/ **retail:** $50 a sq yd/ **V'Soske Inc., 43 W. 54 St., New York 19, N. Y.**

**Vinyl-Plastic Flooring Material:** "Vinoflor"/ twist-textured effect/ available in three colors—shades of gray, green, and rose/ **Armstrong Cork Company, Lancaster, Pa.**

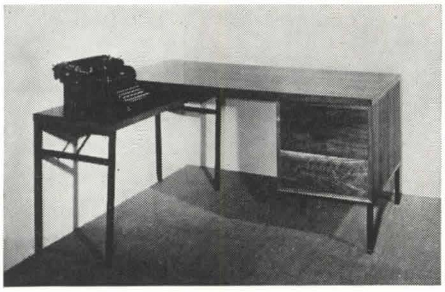
**Bookcase** and **Salesman's Desk:** "Streamliner"/ solid-end bookcase has two adjustable shelves, available with or without two sliding glass doors/ desk, 36" wide, 24" deep with center drawer and 10" shelf/ steel/ **The Globe-Wernicke Co., Ross & Carthage Aves., Cincinnati 12, Ohio**

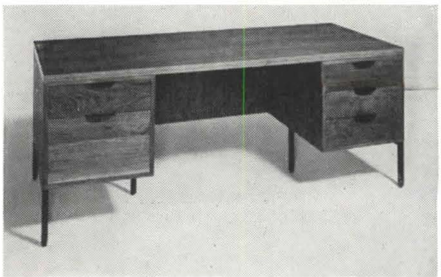


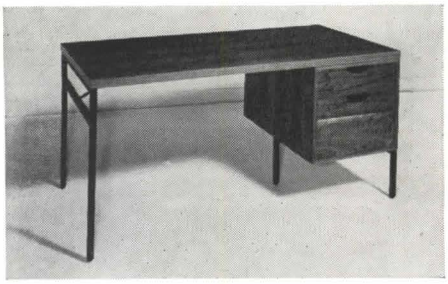


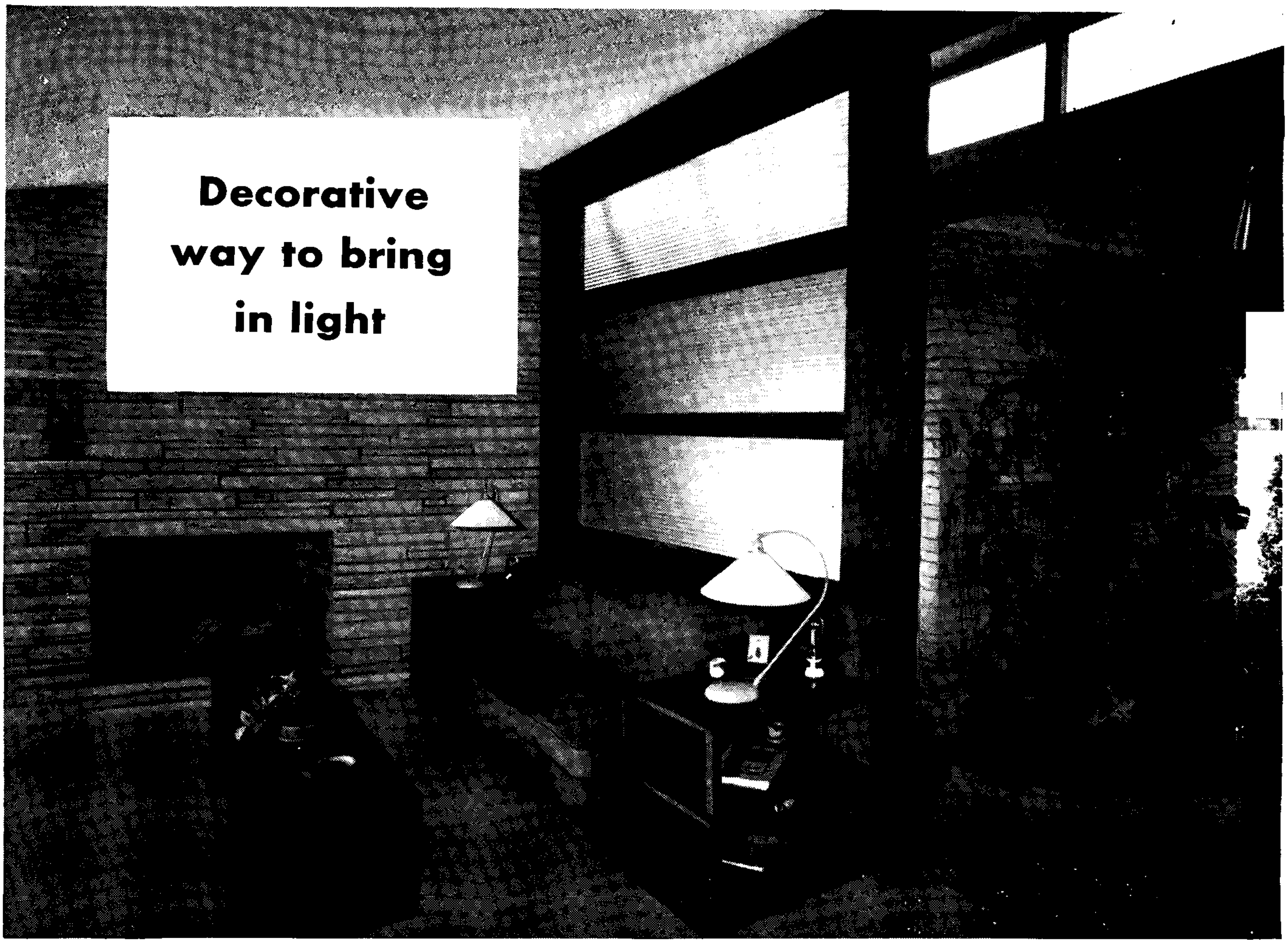
**Radio-Phonograph Unit:** #124/ wall cabinet/ AM-FM radio tuner and amplifier and three-speed automatic player/ birch case with pull-out doors and Pandanus (grass) cloth covering speaker unit/ chassis by Custom Television/ 15" x 72" x 18" high/ **retail:** $845/ **Knoll Associates, Inc., 575 Madison Ave., New York, N. Y.**

**Office Desks:** Modular Group/ small top, single pedestal on stock leg frame, with two pedestals and additional small top and leg frame for corner work area; and with floor cabinets and hanging wall cabinets/ 10 top sizes, 30" x 48" to 36" x 96"/ four desk pedestals/ surfaces Realwood Formica in walnut or birch/ steel legs and hardware finished with triple-baked black lacquer/ drawers have stock partitions/ **Lehigh Furniture Company, 16 E. 53 St., New York, N. Y.**










Architect: W. Hamilton Wallace, Kingsport, Tenn.

# ...through a wall of horizontal lines

This fireplace corner is made brighter and more decorative—by intelligent use of Blue Ridge Flutex Glass. This lovely fluted glass brings light in—and it complements the style, accents the horizontal lines of the walls on both sides.

Imagine yourself out in the hall while a fire crackles in the fireplace! Flickering light extends a warm welcome through the translucent wall.

Blue Ridge *Patterned Glass* has real purpose for many types of rooms, many types of buildings—wherever light, decorative beauty and privacy are desired. You'll find many suggested uses for patterned glass in our books of decorating ideas.

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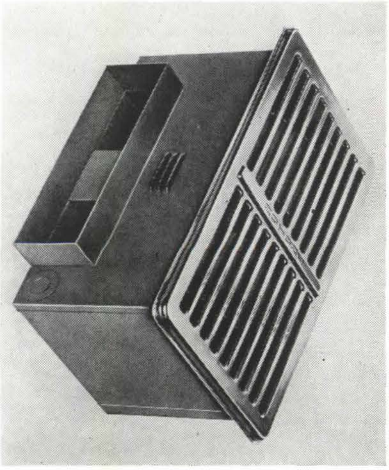
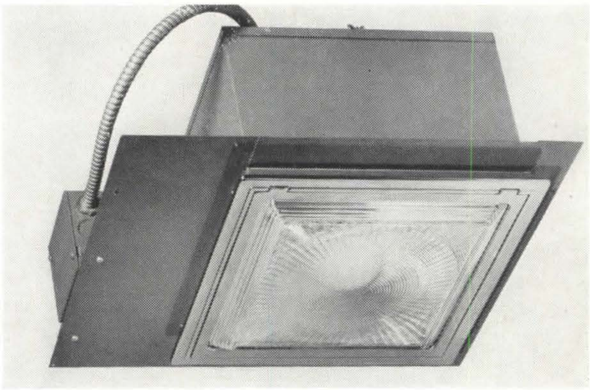
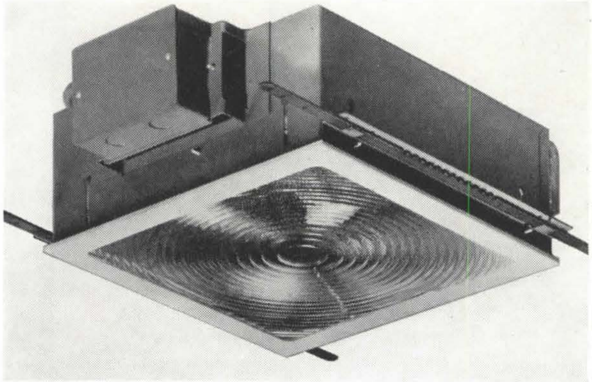
**Radiant Electric Ceiling Heater:** 1000-watt heating element/ wire grill protects heating element and reflector/ air-circulation system in housing prevents dangerous accumulation of heat/ 15-1/4" diameter/ **retail:** $29.95/ **Nutone, Inc., Cincinnati, Ohio**

**Kitchen Ventilating Fan:** "Twin-Blower"/ for cabinet or ceiling/ "Snap-In" assembly/ mechanism under spring tension to reduce vibrating noises/ used with standard ductwork/ **retail:** $38.50/ **Nutone, Incorporated, Cincinnati, Ohio**



**Lens:** "Strato-Ray"/ designed for use with Pry-Lite recessed fixtures/ prisms at outer edges of lens bend light rays to illuminate ceiling/ oval shaped center deflects light/ fronts finished in chrome and baked-enamel/ **Pryne Company, Inc., 140 N. Towne Ave., Pomona, Calif.**





**Recessed Lighting Fixture:** Marco Acoustical Tile Unit/ 12" square, size of acoustical tile/ adjustable plaster frame, hinged/ Eggshell finish/ may be had 13" square to overlap tile joints/ **Marvin Manufacturing Company, 3071 E. 12 St., Los Angeles 23, Calif.**

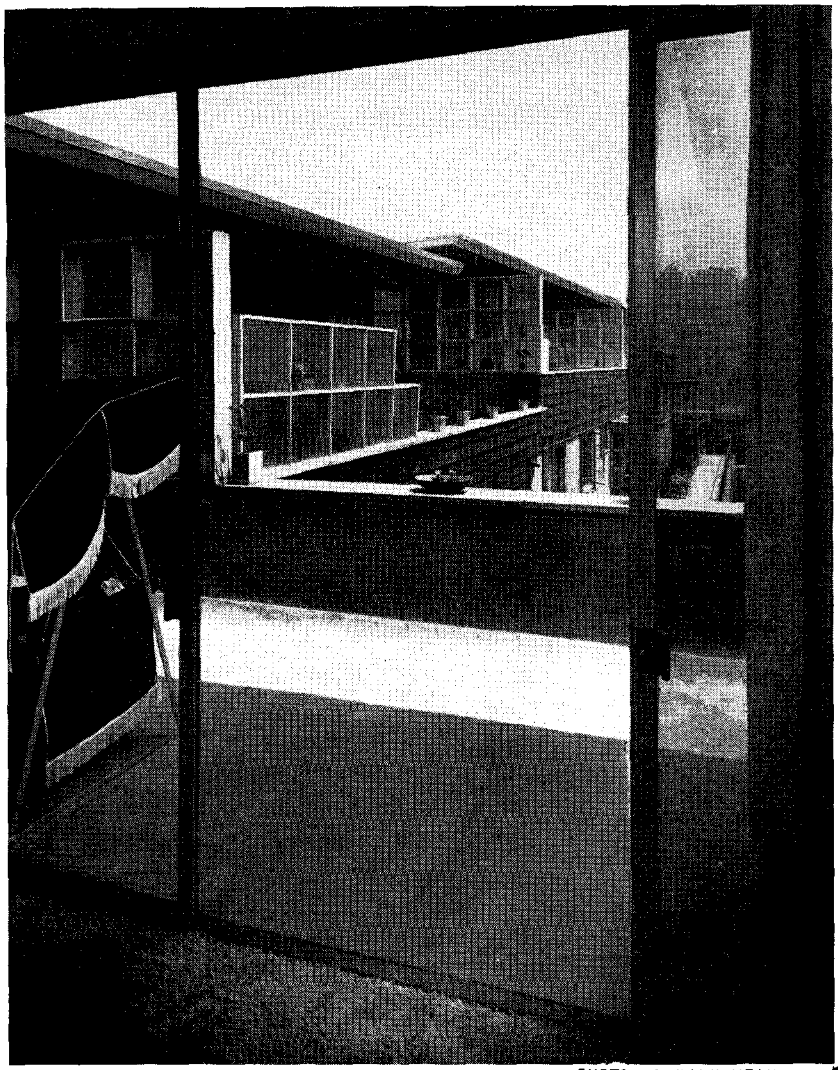
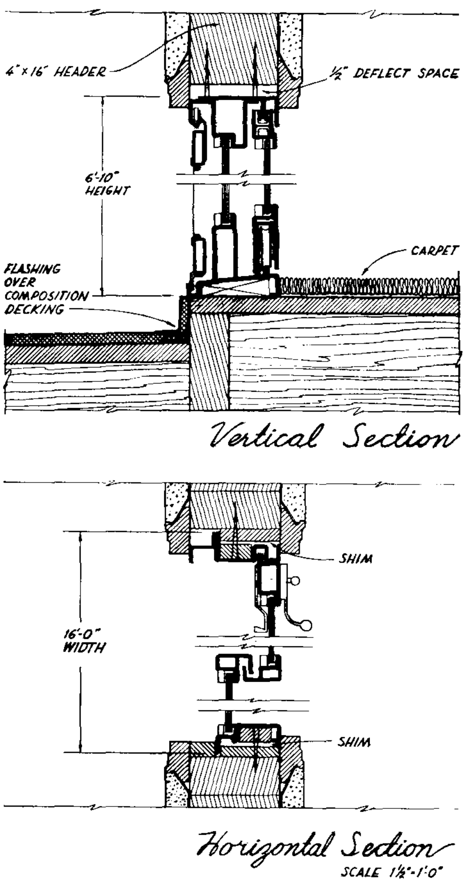
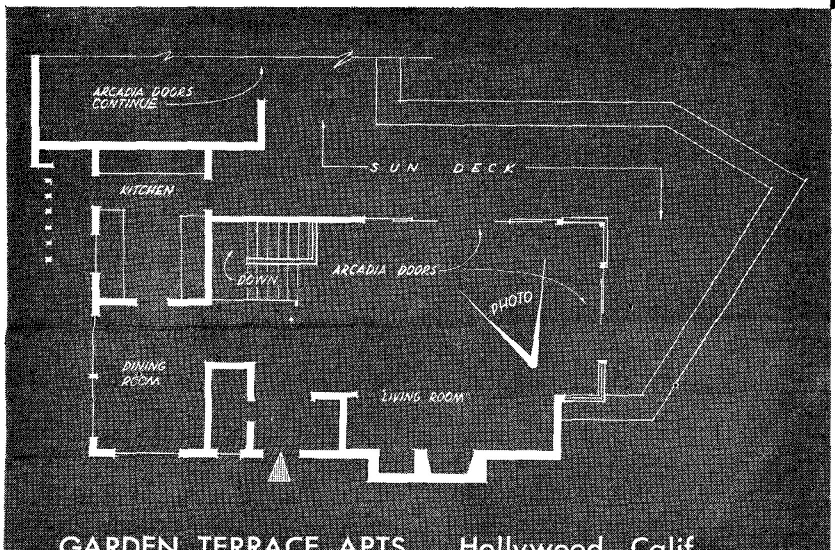


PHOTO- J. DALE HEALY

## arcadia details
No. 6 of a series




# *sliding glass doors by Arcadia*




GARDEN TERRACE APTS., Hollywood, Calif.
Ayres & Fiege, Architects

Arcadia doors opening onto private sun decks bring the freedom and spaciousness of a private home into these modern apartments. Wide openings promote indoor-outdoor living and the compact sliding action simplifies furniture arranging.

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**ARCADIA, CALIFORNIA**

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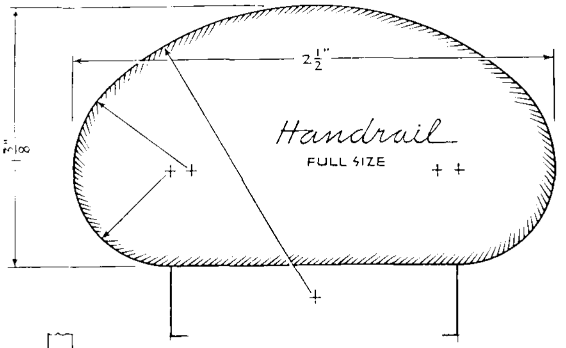
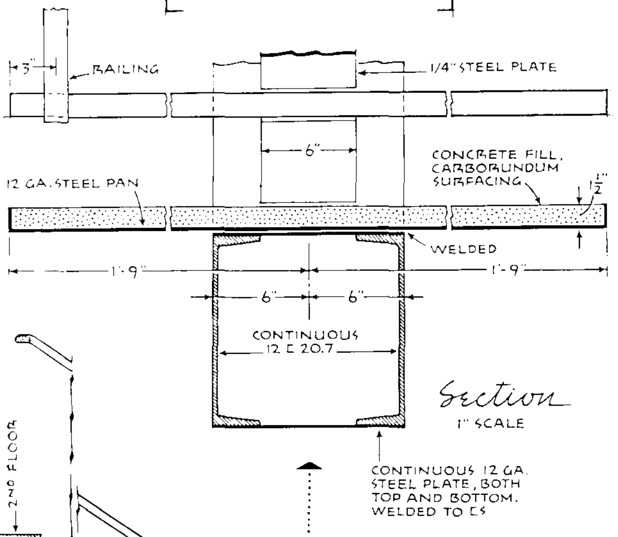
# bank: stairs

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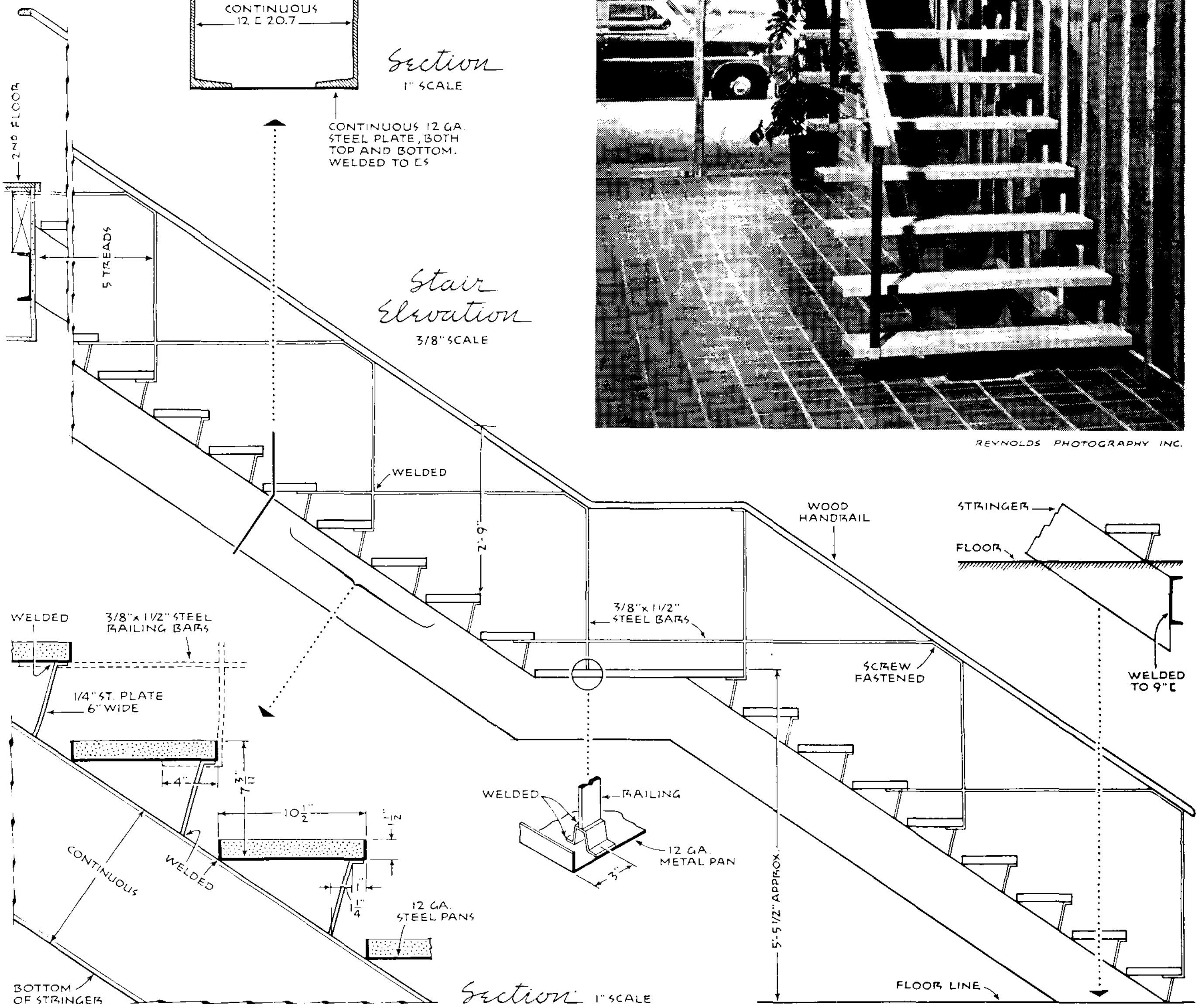
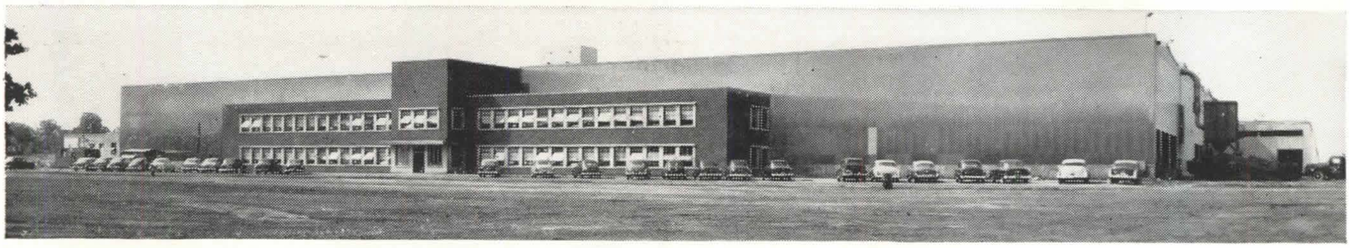


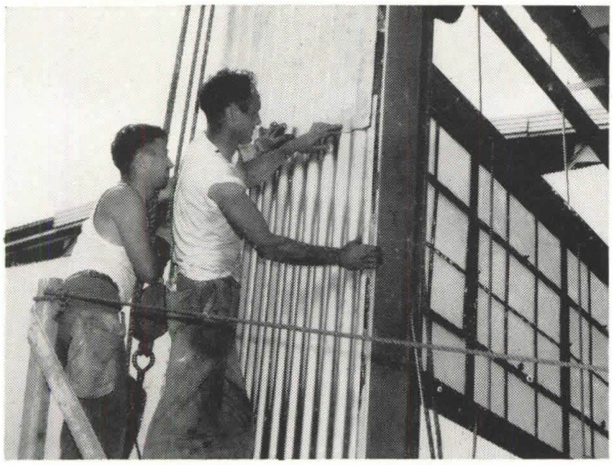

BOULDER INDUSTRIAL BANK, Boulder, Colo.

James M. Hunter, Architect

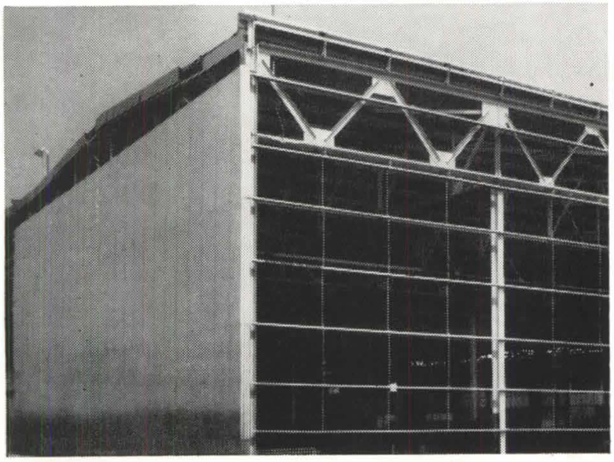
**SHEETS OF STAINLESS STEEL** enclose the 34 to 36 foot walls of the new plant of United States Steel Homes, Inc. near Harrisburg, Pa. Stainless sheets were fabricated and erected by American Bridge Division of United States Steel Corporation, and the general contractor was Ritter Brothers, Harrisburg.



# Walls of Stainless Steel will keep maintenance costs low in this new plant of United States Steel Homes, Inc.



**HERE WORKMEN** are bolting the 30″ corrugated Stainless Steel sheets to the structural steel frame. Erection is fast and simple; it requires a minimum crew and can be carried out in any type of weather.



**THIS VIEW** shows Stainless Steel sheets attached to the structural steel framework of the plant. All flashing and trim is Stainless Steel, too.

HERE is one of the largest industrial structures to emerge from the growing trend toward use of Stainless Steel for exterior walls. It's the new plant of United States Steel Homes, Inc.—formerly Gunnison Homes, Inc.—located near Harrisburg, Pa.

The plant is an "L"-shaped structure with approximately 310,000 square feet of floor space. The entire exterior is covered with sheets of 26-gage corrugated Stainless Steel, used in 30″ widths. Approximately 55 tons of Stainless Steel were used.

Reduction of maintenance costs was the primary reason for selection of Stainless Steel sheets. The walls will not require painting and a long, trouble-free life is anticipated. And, in addition, Stainless Steel gives the plant an attractive over-all appearance.

Stainless Steel sheets and panels offer so many advantages, both in construction and through the life of the building, that their cost-per-year is lower than almost any other material. They are considered outstanding developments in architectural circles today.

Panels are available uninsulated or with filler-type insulation between the exterior Stainless sheet and the interior sheet of carbon steel. This makes them suitable for the widest range of building types—plants, warehouses, power plants, office buildings and many others.

If you would like more information on Stainless Steel sheet and panel construction, mail the coupon below.

United States Steel Corporation
525 William Penn Place, Room 2819-F
Pittsburgh 30, Pa.

☐ Please send me your new booklet on U·S·S 17 Stainless Steel for industrial buildings.

☐ Please arrange to have fabricators of Stainless Steel wall panels send me literature on their particular type of construction.

Name ................................ Title ..................

Address ..................................................

City ................................ State ..................

United States Steel produces only the Stainless Steel sheet and strip from which panels of this type are made; the panels themselves are fabricated by a number of our customers.

UNITED STATES STEEL CORPORATION, PITTSBURGH · AMERICAN STEEL & WIRE DIVISION, CLEVELAND · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH · TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. · UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

## U·S·S STAINLESS STEEL

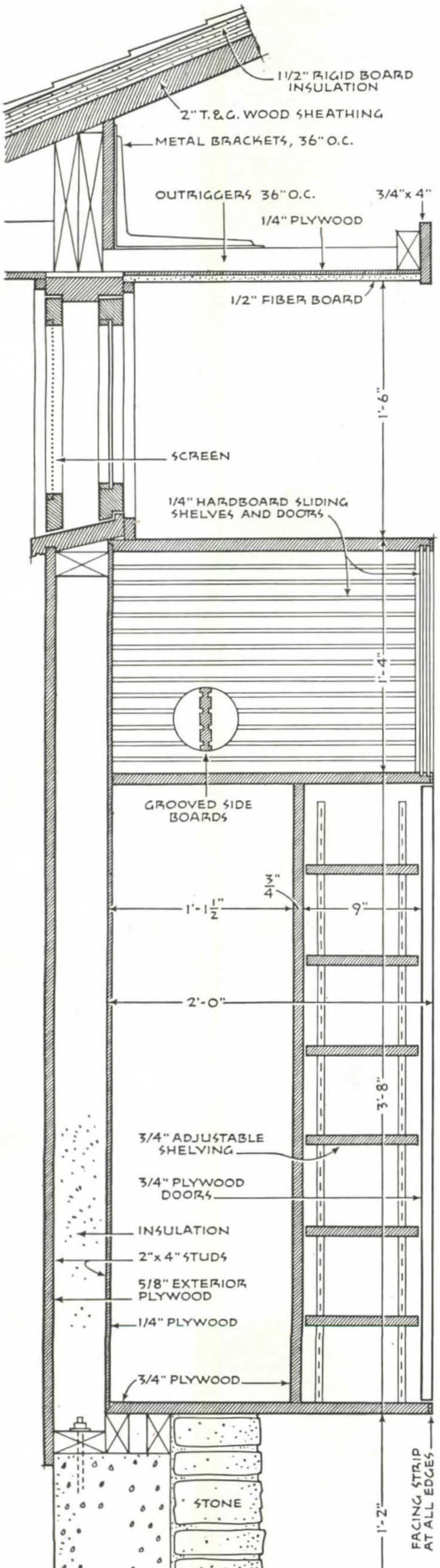
SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

3-2084

UNITED STATES STEEL

# house: storage wall

Section at A 1" SCALE

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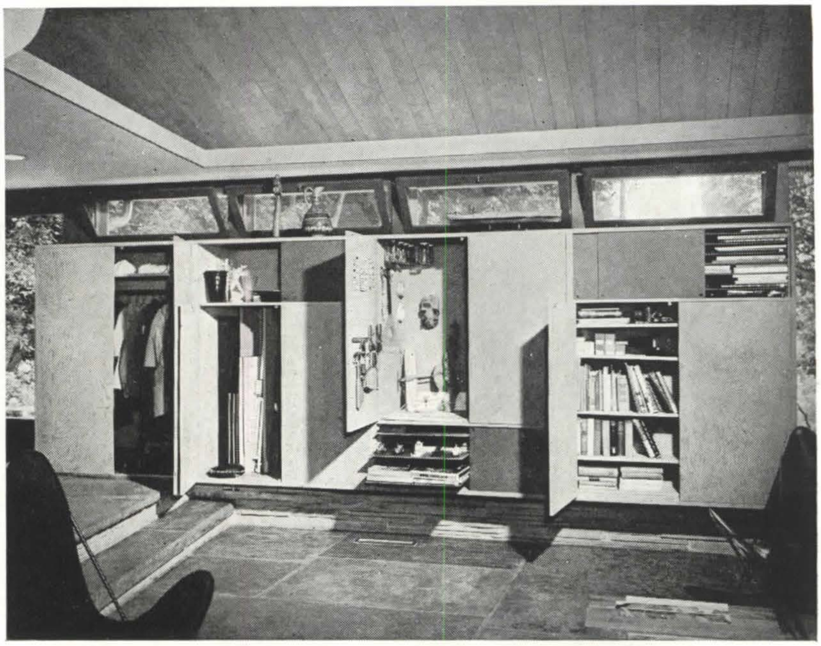
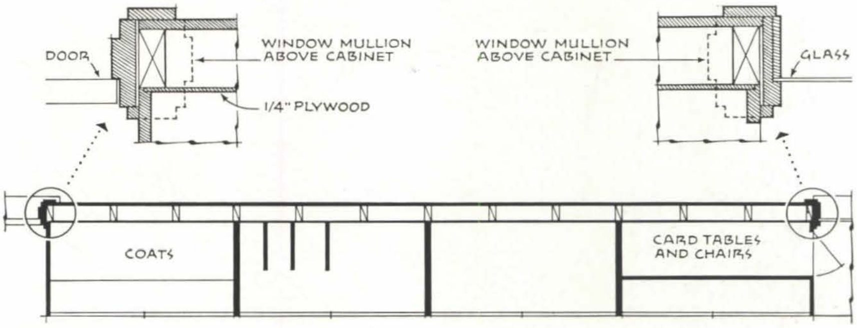
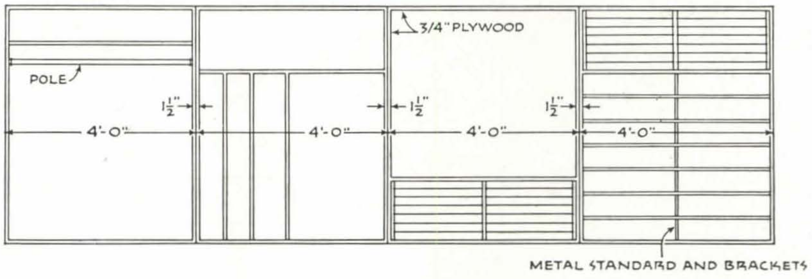
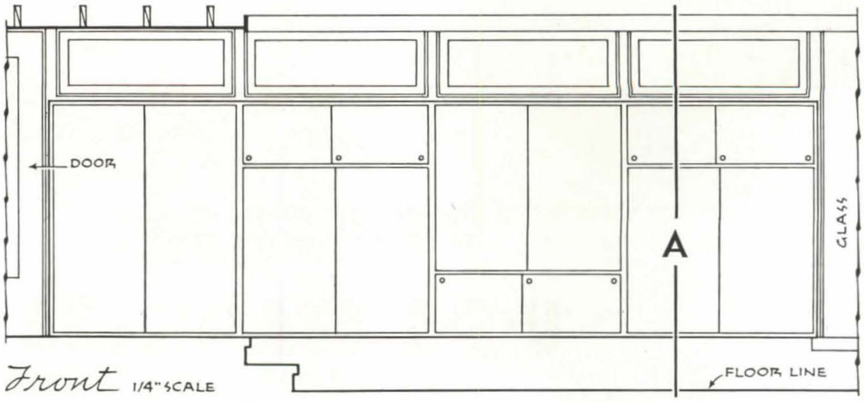





Plan 1/4" SCALE

Doors removed




Front 1/4" SCALE

**ARCHITECT'S OWN HOUSE, Boulder, Colo.**

**James M. Hunter, Architect**

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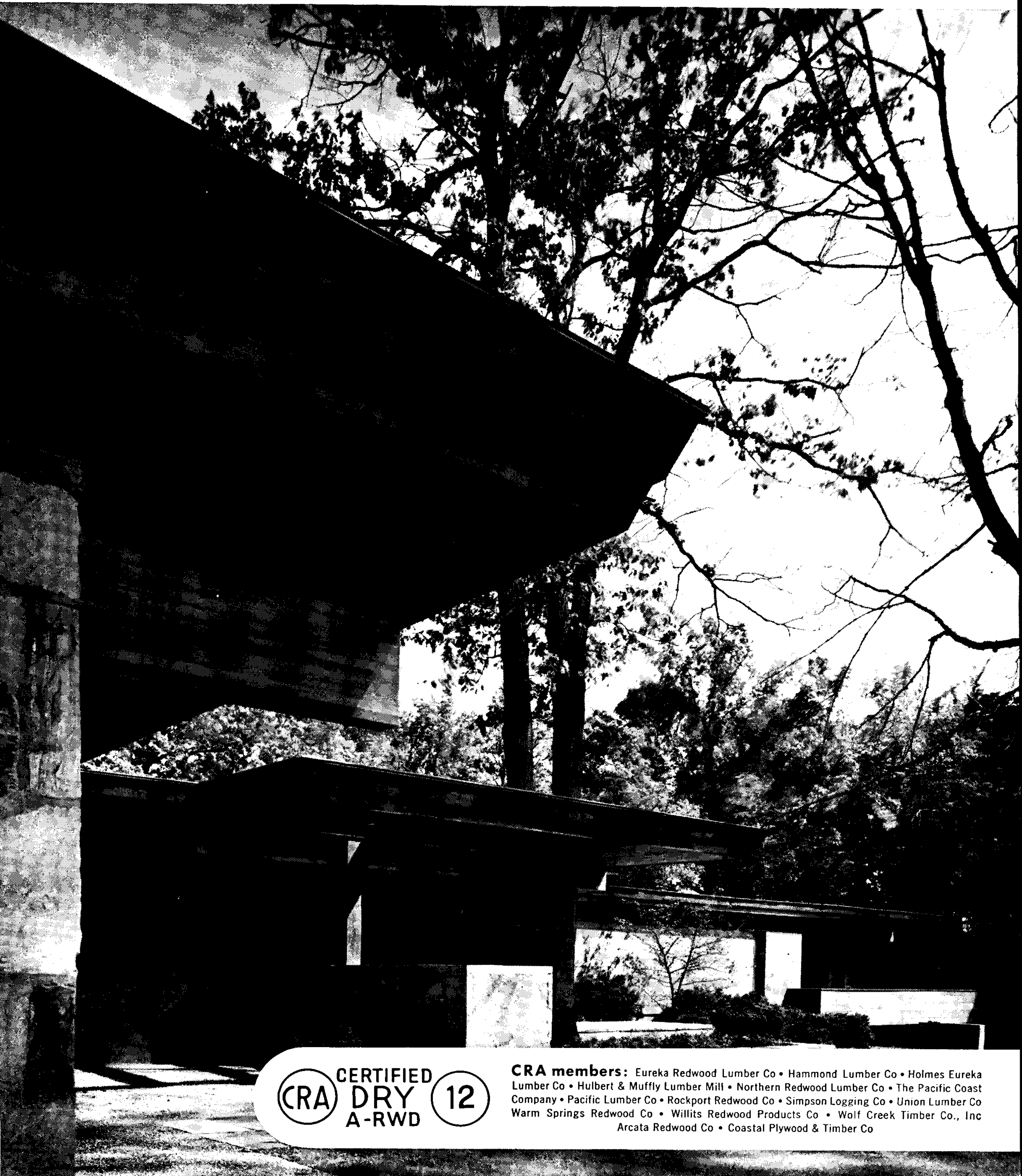

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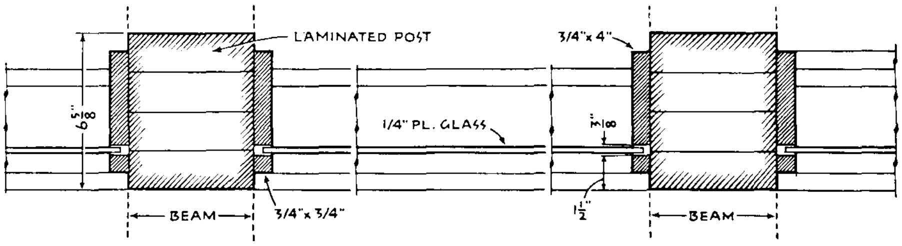
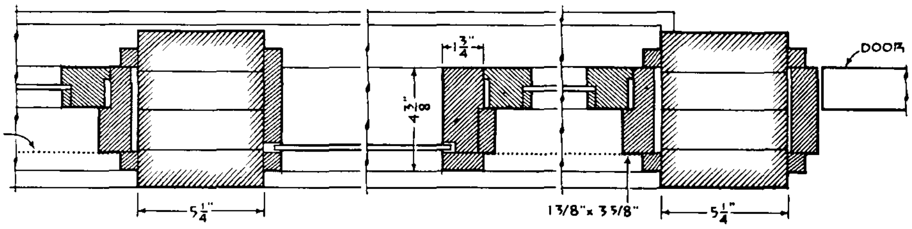
# city hall: window wall

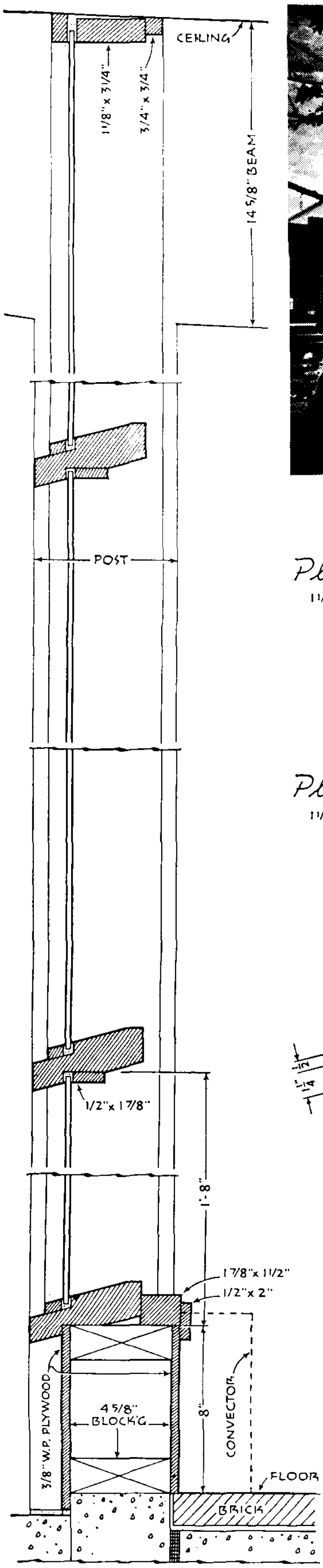
REYNOLDS, PHOTOGRAP...

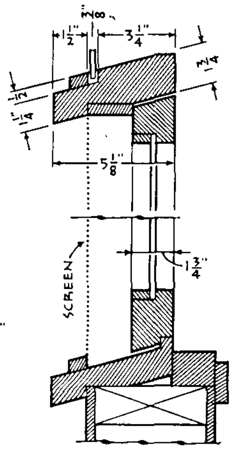



*Plan* **C**
1/2" SCALE

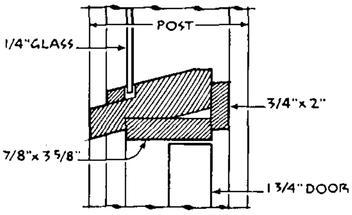



*Plan* **D**
1/2" SCALE



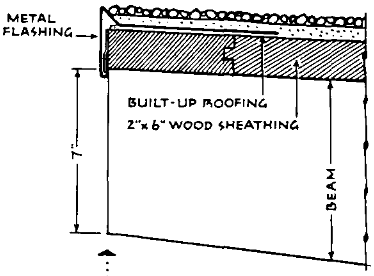



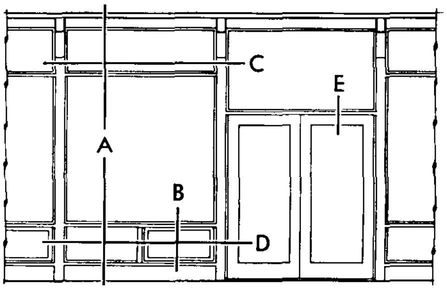

*Section* **B**
1/2" SCALE

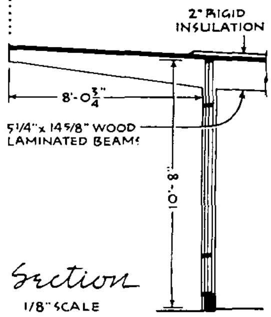



*Section* **E**
1/2" SCALE

*Section* 1/2" SCALE




*Section* **A** 1/2" SCALE

*Elevation* 1/8" SCALE

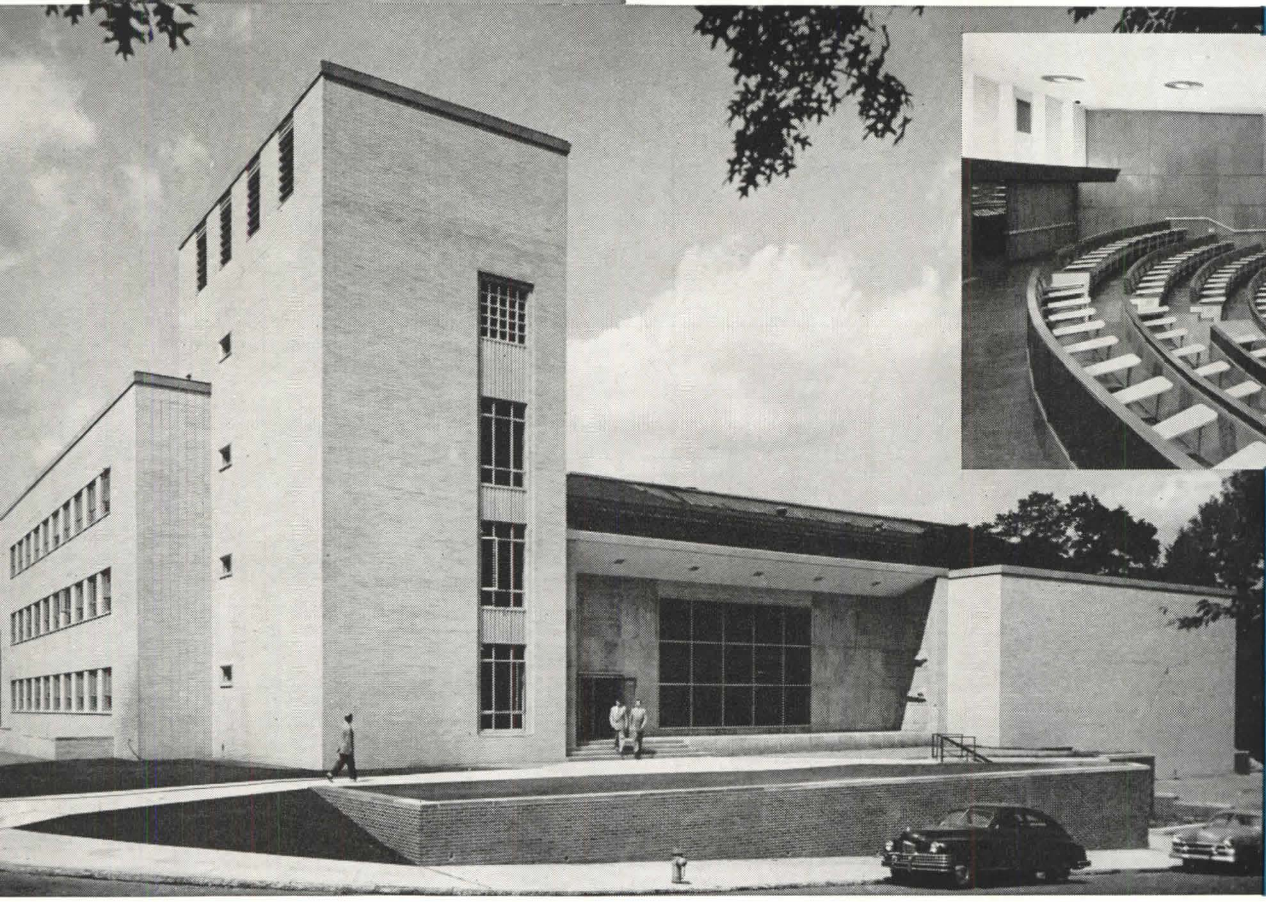
*Section* 1/8" SCALE

BRIGHTON CITY HALL, Brighton, Colo.

James M. Hunter, Architect

# CARNEGIE INSTITUTE OF TECHNOLOGY
# GRADUATE SCHOOL OF INDUSTRIAL ADMINISTRATION, Pittsburgh, Pa.

W. L. MELLON, FOUNDER



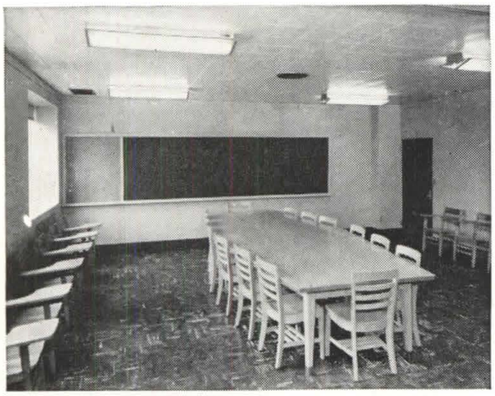
**Architects—** Marlier and Johnstone

**Engineer—** Charles S. Leopold

**Contractor—** Dravo Corporation

POWERS TEMPERATURE AND HUMIDITY CONTROL

Below: Conference Type Classroom

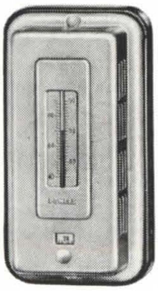


Below: Reading Room and Interconnecting Lounge

## POWERS

*Pneumatic System of*

## TEMPERATURE CONTROL



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(b41)

"Fraud by silence" forms the basis of a decision against the New York City Board of Education in a unique case recently decided by the highest court in New York State. In *Meyer Bank* v. *Board of Education*, 305 N.Y. 119, 111 N.E. 2d 238, the New York Court of Appeals awarded an electrical contractor damages covering his additional costs for labor and material caused by a five-months delay in awarding other contracts. The contractor claimed that the failure of the Board of Education to notify him that two other contracts represented as being awarded at the same time had *not* been given out, constituted "fraud by silence."

The Board of Estimate of the City of New York, at the request of the defendant, approved plans for an addition to a public school in Brooklyn. The Board of Education, pursuant to statutory requirements, divided the work of the project into four separate contracts to be performed in the construction of the addition to the Public School: (1) general construction work; (2) plumbing and drainage; (3) heating and ventilating; and (4) electric work and lighting fixtures.

The total of the lowest bids received on the four contracts exceeded the amount approved by the Board of Estimate. The higher amount, therefore, had to be submitted for approval. In a letter to the Board of Estimate, the Board of Education proposed that the contracts be awarded for general construction and electric work and lighting fixtures. The letter took cognizance of the fact that "while the proposal to let only general construction and electric work at this time is not considered best practice for building construction, which is a highly integrated process, there appears to be no alternative to such procedure except deferment of the entire work until conditions are more favorable."

Approval by the Board of Estimate of the two contracts was granted "with the understanding that an increased aggregate estimate of cost will be approved at a later date as funds are made available."

The contractor was not informed by the defendant either prior to or at the time of the signing of the contract, that the award of the contracts for plumbing and drainage and for heating and ventilating was to be delayed for an indefinite period, until sufficient funds were made available to cover their cost. The contract bore the endorsements of the Comptroller, certifying that there "remains unapplied and unexpended" a balance of the appropriated fund applicable to the contract, sufficient to pay the estimated cost of executing the same, *viz.*, $83,500. "Such endorsement," according to the statute cited by the Comptroller as authority for his certificate, "shall be sufficient evidence of such appropriation or fund in any action."

Suit was instituted after complete performance of the contract. The complainant sought fair and reasonable value of the work performed, deducting the contract price of $83,500 already received. The contractor contended it had relied upon the implied representation of the Board of Education that all four contracts would be awarded at once and that its failure to inform the contractor of such delay in the award of the remaining two contracts was in effect fraud. There resulted serious interruptions and long delay in carrying out the plan of work, which had, in turn, caused increased cost for labor and materials furnished to the finished project.

The Court took judicial notice of the following provision in the contract:

"'29. Cooperation with other contractors (a) inasmuch as *the completion of the building within the prescribed limit of time is dependent very largely upon the close and active cooperation of all those engaged therein*, it is therefore expressly understood and agreed that the Contractor shall lay out and install his work at such time or times and in such manner as not to delay or interfere with the carrying forward of the work of the Contractors for *General Construction, Plumbing and Drainage, and Heating and Ventilating*.'"

The contractor was held to be justified in having assumed that there had been no delay in the award of the contracts to those three contractors with whom he was required to co-ordinate his work. The Court declared:

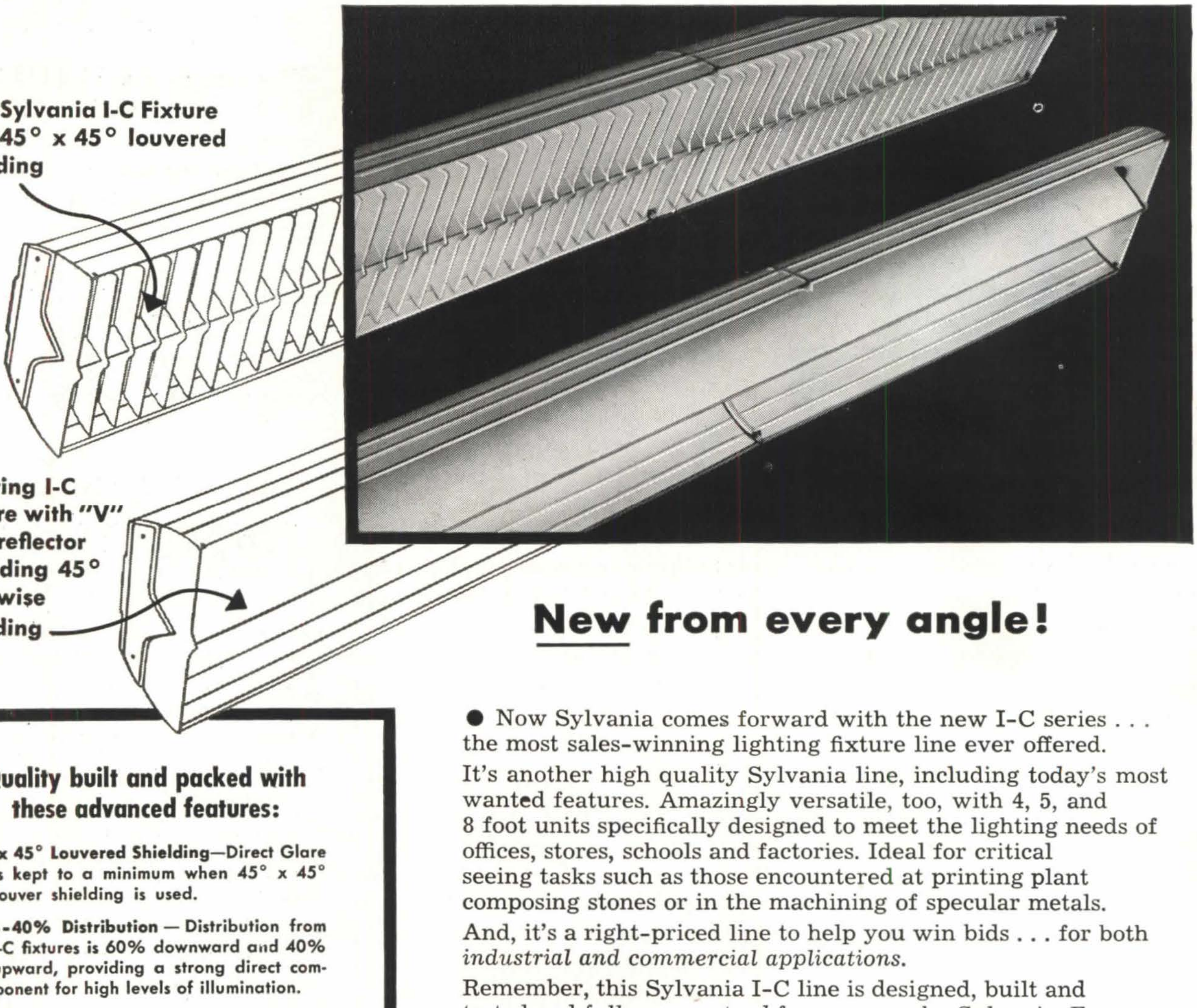
"Mindful, as we are, that 'men must turn square corners when they deal with the government', . . . we do not think the plaintiffs were required to look beyond the comptroller's certificate, endorsed upon their contract to ascertain whether sufficient funds were then legally available to meet the cost of work to be done under the other three contracts..."

The Court further found, as follows:

"Knowing, as did the defendant, before the plaintiffs' contract was executed, that funds were then lacking sufficient to meet the known cost of constructing the addition to Public School 35 and having then concluded to change its plans and to delay indefinitely the award of two of the four contracts, each of which called for integrated work and coordination by the plaintiffs, the defendant should not have withheld from plaintiffs information as to a change in plan so vital as to make inappropriate the basis of plaintiffs' bid. Silence by the defendant as to a change in plans so important to the timely performance of the work plaintiffs were about to undertake served to mislead them into a false assurance that the work contemplated by their bid would progress according to plan along with the integrated work of the other three contracts. True, no duty rests upon a party to a contract to speak where silence does not constitute deception. Silence may, however, constitute fraud where one of two parties to a contract has notice that the other '. . . is acting upon a mistaken belief as to a material fact.'"

Though the principles expressed by the Court of Appeals are not new, the application to the facts here can have a profound effect on the actions of government agencies, contractors, and courts. Certainly it would be foolhardy for any owner, private or public, to disregard the determination in this case, when faced by similar (*not uncommon*) facts.

# Sylvania Announces! A New Industrial-Commercial Fluorescent Fixture Line.




## New from every angle!

● Now Sylvania comes forward with the new I-C series . . . the most sales-winning lighting fixture line ever offered.

It's another high quality Sylvania line, including today's most wanted features. Amazingly versatile, too, with 4, 5, and 8 foot units specifically designed to meet the lighting needs of offices, stores, schools and factories. Ideal for critical seeing tasks such as those encountered at printing plant composing stones or in the machining of specular metals.

And, it's a right-priced line to help you win bids . . . for both *industrial and commercial applications.*

Remember, this Sylvania I-C line is designed, built and tested and *fully guaranteed* for one year by Sylvania. For detailed information see your Sylvania representative or write directly to: Sylvania Electric Products Inc., Dept. 3X-2012, 1740 Broadway, New York 19, N. Y.

### Quality built and packed with these advanced features:

**45° x 45° Louvered Shielding**—Direct Glare is kept to a minimum when 45° x 45° louver shielding is used.

**60%-40% Distribution** — Distribution from I-C fixtures is 60% downward and 40% upward, providing a strong direct component for high levels of illumination.

**Versatile and rugged, too!** — Channels are die-formed of 20-gauge steel. Made with extra knockouts to provide flexibility of installation. Designed for individual or continuous-row installations, pendant or surface mounting. Metal parts Bonderite treated to resist deterioration. Channels, louvers and steel panels finished in Sylvania's high-temperature baked Miracoat, providing 86% reflectivity.

**T-17 Low Brightness Unit** — The I-C line has been designed to accommodate the 40-watt 60-inch T-17 low-brightness lamp, meeting the need for a unit with minimum shielding. Combines low brightness, comfortable illumination with high efficiency and easy maintenance.

# SYLVANIA

**LIGHTING · RADIO · ELECTRONICS · TELEVISION**

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"Miss Randall said, 'I'm interested in Planners. What makes them take up such an unpopular trade? What gets into them? And why, when they start planning, does it get such a hold on them? Such a hold that they just run riot, trying to plan every bit of our lives from the womb to the tomb!'

" 'I wouldn't know,' I said, 'but I think you're confusing economic planning with physical planning.'

" 'Are you planning anything physical at the moment?'

" 'I'm not a Planner in the wider sense, Miss Randall, I'm a *Town* Planner, interested in the proper construction and layout of towns and cities. A beautiful building can move me as much as a beautiful woman.'

" 'And supposing there's only a beautiful woman around and no beautiful building?'

" 'As now, for instance?' "

•

I closed the book, a detective story called *None Shall Sleep Tonight* by the English mystery novelist, Hugh McCutcheon. It had been lent to me by my friend, the Dean of Architecture and Planning at the University of Theleme, with the comment, "It looks like comprehensive architecture has really made good—here's a poor, handsome but honest architect-planner, well-trained in his profession and embodying also the best in the Kinsey reports. I am considering using this book as a text in our Theory and Practice course. What do you think? Come to Theleme just before Christmas and we can talk it over around the Yule Log."

The plane was now circling low over the University. The many-styled towers and roofs pointed stalagmite fingers through the gray haze of the bare-branched elms. The long shadows of an early morning in winter were black against the bright snow, and long feathers of smoke rose vertically from the University chimneys (they have not yet been able to settle on a central- or dispersed-heating system, but you know trustees when it comes to making technical determinations).

As I sat over breakfast with the Dean at his home we discussed the design program for the remainder of the school year.

"I had thought," the Dean told me, "to begin the New Year with something cheerful, but the more I read the headlines in the morning papers, the more it seems that the future architect should be matured quickly in an educational program which faces head-on the unpleasant facts of modern life. The architect may build cloisters for others to live in but he should keep out of them himself. As

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# out of school

(Continued from page 141)

text books for the coming year we are therefore concentrating on the *East River Reports*[1]. They give the first salient facts about architecture and planning in a world of nuclear fission. In fact we have delayed much too long in taking up this vital and inevitable study because of you.

Back two years or more ago you suggested in OUT OF SCHOOL that educators prepare themselves for the report of the 1950 Commission for the Survey of Education and Registration of Architects. In May 1952 you lent me a copy of the Semi-Final Draft of this report, which I still have kicking around somewhere. At that time it weighed exactly 4¾ pounds. Can it be that the Final Draft has doubled in weight in the 19 months since the Semi-Final was prepared? Here we are, nearly four years from the time the Survey got started and I haven't even seen a Final Draft, let alone a published copy. (October 15, time of writing.) There is only one conclusion, which is that the report is purely imaginary. So many things have and are happening that there is no point in waiting any longer."

I blushed and hung my head.

"Anyway," the Dean continued, "I am not sure that the Survey Commission's report would have contained in it the findings which are made in the East River Reports and which are bound to affect both the education and practice of architects and planners—even though National Defense may mean only military defense measures to many people. It is clear to me that one does not have to know how to make an H-bomb or even just an ordinary pint-size atom bomb—domestic variety. I leave that to the experts working in camera. We do have to know what these bombs can do to people and cities. The *Bulletin of Atomic Scientists*[2] and other scientific papers are constantly filled with such information. So are the magazines on the newsstands. While some of the architectural journals have discussed the problems created by bomb threat, the magnitude of the problem seems to create a kind of technical aphasia—there seems to be a tacit agreement that the problem is so big that we had better not talk about it. Further, I get the reaction: 'Let's not get panicky—there's nothing to be done about H-Bombs anyway. It's too expensive to protect ourselves, so let's go about our business.'

"Well, I have questioned these attitudes and so I called the faculty and students together at a couple of evening bull sessions and put the problem to them directly. I said that we could go on as before ignoring the situation, that one could not blame people for not being Christians before the birth of Christ; but that August 12, 1953 marked H, that we live no longer in BH but AH, and that we had better get thinking about it. Of

[1] Project East River Reports; *Associated Universities, Inc., New York, N. Y., October 1952.*

[2] *See September 1953 issue:* Bulletin of the Atomic Scientists.

(Continued on page 146)

# A distinguished new St. Louis office building

## Another Day-Brite lighted architectural achievement

This is the new home of the Brown Shoe Company.

It stands in Clayton, Missouri, a suburb of St. Louis. The Brown Shoe Company is one of the pioneers in the movement toward decentralization of manufacturing headquarters in the St. Louis area. Company officials feel there are invaluable advantages in a less distracting, more comfortable environment for their executive, sales and office people. A $3 million investment in the building and grounds speaks for the courage of their convictions.

The building design is contemporary but in keeping with the trend of architecture in the community, there is a skillful blend of Colonial.

From the dominant entrance rotunda throughout the office space inside, there is everywhere evidence of far-sighted planning and sound *specifying.*

Extreme flexibility of interior design permits easy and quick rearrangement of offices, if and when needed. The whole building is air-filtered and air-conditioned. More than a mile of glass enclosed Day-Brite troffers provide one of the finest office lighting installations you've ever seen.

Ten years from now . . . yes, twenty years from now . . . the Brown Shoe Company headquarters will still rank with the best lighted office buildings in the nation. That's one of the reasons for Day-Brite's selection. There's a premium of *extra years of trouble-free service* that comes with Day-Brite.

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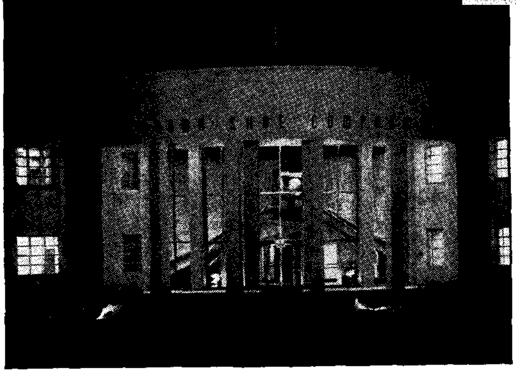
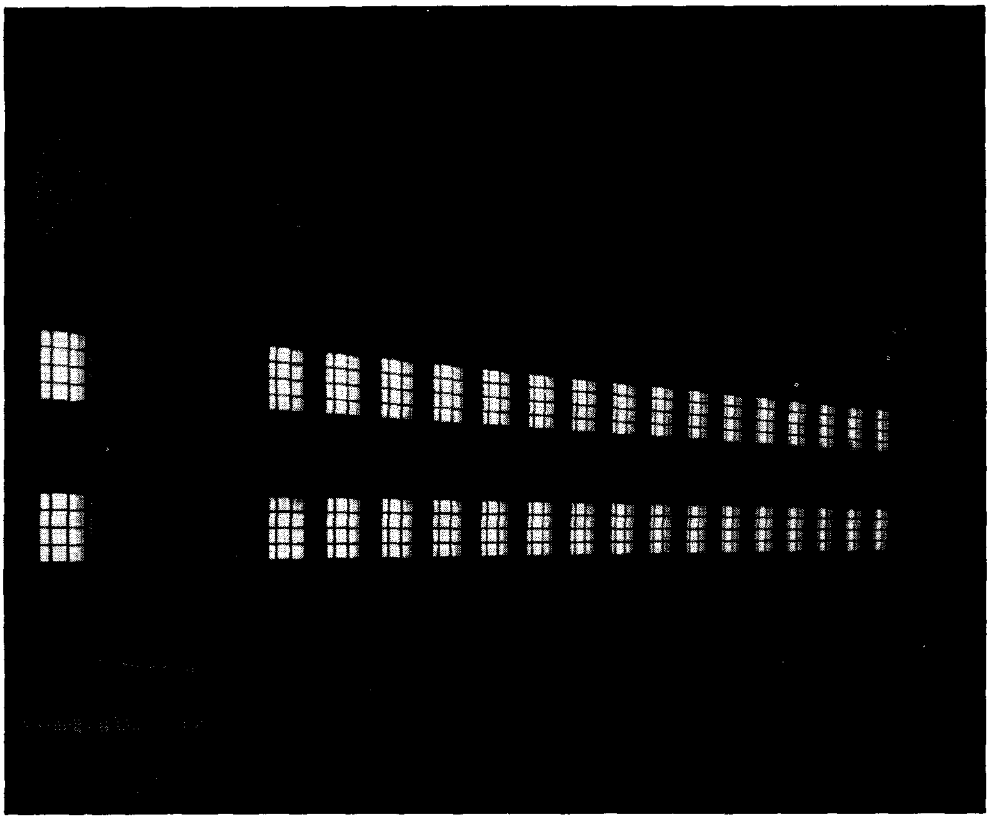


*Architects:*
*Russell Mullgardt Schwarz Van Hoefen*
*Consulting Engineers:*
*Ferris & Hamig*



The handsomely appointed Board Room is featured by an interesting lighting layout, as are all executive offices. Here, an area of recessed panels is fitted into the beamed ceiling for general illumination. Cove lighting adds luxurious richness.

In the large office areas, Day-Brite glass enclosed troffers produce excellent visual comfort for the Brown staff as well as plenty of light for close work (40 footcandles maintained). Notice the flexibility of the lighting layout, too. Bays may be partitioned from floor to ceiling without rearrangement of the fixtures.

**DAY-BRITE TROFFER DATA:** Troffer line available in Slimline and Rapid-Start 40.W Fluorescent, flange or snap-in type. Die-formed steel construction. HOT-BONDED SUPER-WHITE enamel finish, rust inhibited. Interchangeable series of shielding units includes BOXCO (®) louvered, egg-crate louvered, glass enclosed, low-brightness No. 9015-DB Controlens*, and curved 11" Controlens*. Safety fused and UL approved.

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Sample show rooms merchandise the Brown shoe line through good display and good lighting. A combination of troffer illumination and incandescent spots is used. This sample room features "Buster Brown," one of Brown Shoe's nationally famous lines.

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*Lighting Fixtures*

# out of school

(Continued from page 142)

course, if folks want to hide their heads in the sand, O.K., but they're going to get their bottoms blown off.

"We have set up a design and construction shop known as the Division of Nuclear Arts. I like to take a positive approach in such a situation. Your advice and criticism are welcome as we visit the Division drafting rooms and design labs."

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The winter morning, crisp and peaceful, seemed inviolable. Here in a little college town far from targetal areas, with no vulnerability count, it seemed impossible to consider seriously the new world of AH. How could it be done within this context—or for that matter, in any context? I realized that I too had been afflicted with the aphasia of which the good Dean had been speaking.

We approached a large, Mieasmic building—all glass and steel. The photo-electric doors swung open on a gigantic photo mural of the big splash at Bikini, reaching to the full height of a four-story lobby. All about us were labeled exhibits of fragments of buildings and people from Hiroshima and Nagasaki. The cold winter light through thermal glass from the curtain wall chilled the unpleasant disarray that littered the floor, and through which, in a planned obstacle race, we had to step gingerly.

"We never dust here," said the Dean. "Total death could be just as dusty with no one left to push the vacuum cleaners from then to the end of time." His voice was a sepulchral whisper without echo, as though there was no one to hear. A door silently opened on a room labeled with a quotation from President Eisenhower's Atlantic City speech, "This titanic force must be reduced to the fruitful service of mankind." I took a deep breath and realized of a sudden how numb my hands had become. The room was warm and pleasant. Students around a roaring fire were quietly talking. "This is our UNESCO room where we search for the peaceful role of the architect and planner in world affairs," said the Dean. "The students are discussing the UNESCO report on the reconstruction of the town and restoration of the monuments of Cuzco, Peru[3] after the great earthquake of May 21, 1950. They are studying the role which the architect should take in world affairs. We have decided that while the H-Bomb could bring lasting peace, that peace can be either a peace of fear and suspicion or a peace of permanent oblivion. We want neither. We want to find somehow a peace of mutuality and humanism. We know that the world needs technical help in housing its unfortunate, in building better cities, in repairing the damage of catastrophe. We hope that by the study

[3] Cuzco-Museum and Monuments Report No. III, *United Nations Educational, Scientific and Cultural Organization, 19 Ave. Kléber, Paris 16, 1952.*

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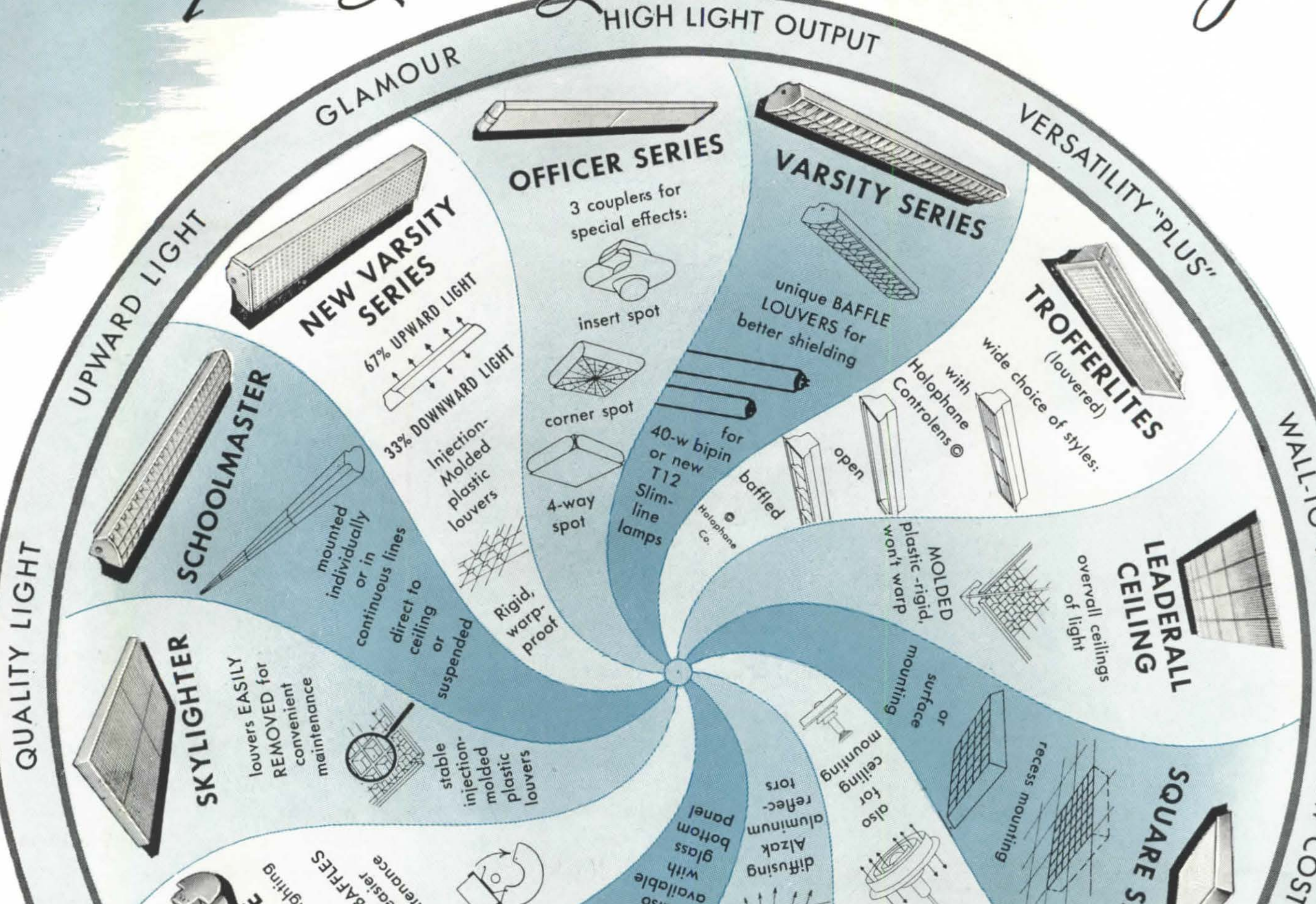
# the Benjamin Leader Line...First in Versatility

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7-Gallon, Plain Top, Air Cooled

**WWP13**
13-Gallon, Plain Top, Water Cooled

**WBC1**
Compartment Bottle Cooler

## out of school

(Continued from page 146)

of the methods used by the United Nations, by study of student and faculty travel systems and exchanges, we can better play our role as peacemongers in a world of tension, distrust, fear, and hatred. We are not pacifists. We believe in the survival of humanity as an obvious objective but also in the furtherance of civilization as the concomitant to such survival. If we are to survive only as savages, fighting and hating each other, living in holes in the ground and constantly watching the sky, prairie dogs scuttling into our burrows as each hawk circles, then let the H-Bombs fall, and quickly. Mankind must not return to the cave."

The Dean paused from his vehemence, and lit his pipe. I noticed that his hands were trembling. The students had been listening quietly. "As you notice," continued the Dean, "we have a number of foreign students, and their opposite numbers are to be found in other schools. Foreign languages are required, of course. We have succeeded in obtaining satisfactory foundation support for foreign travel under supervision. Because of world tension and the hypersensitive nationalisms of every country, all students are schooled carefully in non-American comportment, eating and drinking rituals, religious customs, historical resentments, cultural mythologies, amatory customs, and architecture. Our students are working on housing problems in India, on the building of new colonies in the Matto Grosso, on slum clearance in Africa. They are learning freedoms in architectural intellectualism in Brazil, Mexico, and Scandinavia. I feel that they in their work and in their associations are helping to cement world fellowship, and perhaps by so doing will permit the perpetual extension of the era AH."

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"But what are you doing in the Design Lab?" I asked. "This long range idea of staving off O, the moment of Oblivion, by assisting in the United Nations and other efforts at world fellowship, is ob-

(Continued on page 154)