shopping centers

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Multiple accordion aluminum is commercially available as Infra Insulation, Types 6, 4, and 4 Jr. For a complete discussion of the subject, ask us to send at our expense, Schwartz's "Simplified Physics of Vapor and Thermal Insulation," and the Government booklet, "Insulation and Weather-Proofing" (Div. Farm Bldgs. & Rural Housing).
under construction at Agra, Italy, on a slope that commands a superb view across Lake Maggiore and the surrounding ranges of mountains, this is a remarkable combination of a TB sanatorium and university. The architect for the complex is Richard J. Neutra of Los Angeles; his chief collaborators are Dr. Attilio Quaroni, Frederick Reichl, Sidney H. Brisker, Edgardo Contini, and Neutra.

His latter-day “magic mountain” is being built for the Associazione Sanatorio e Universitario Italiano, from the last three initials of which the project derives its name, SUI. This organization, headed by leading Italian physicians, has cordial relations with the administrations of all Italian universities and is supported by the Ministry of Health of the Republic. It requests that special credit be given to Dr. Attilio Zorini, SUI’s president, and Dr. Pietro Buscaglione, the secretary, for “their untiring efforts to the authorities in Rome.”

The incidence of TB in Italy was considerably aggravated during the war years, and the customary disposition of the afflicted was to relegate them to comparative inactivity at their homes—a lonely, degrading existence that doctors considered a psychosomatic error. The combined sanatorium-

combined sanatorium and university

chapel opens to the southern terrace.
Typical two-patient room, facing south; sun balcony beyond.

(Continued on page 23)

Una typical two-patient room, facing south; sun balcony beyond.

University is to set up a health-care facility in ideal surroundings, where the patients can stay and receive expert treatment but where they also will have an educational goal, the stimulation of friends, and the encouragement of preparing for future careers. Thus, it is hoped, the stumbling block of the admission may be turned into a stepping stone with the curative process speeded. The educational portion of the group will be affiliated with all Italian universities, and it will have an accredited teaching and visiting-lecturers' staff.

In the design of the project, the emphasis was to avoid an institutional aura as much as possible, with emphasis, both in and visually, on the cultural aspects—auditorium, lounges, music rooms, libraries, etc.

Each of the nine upper stories of the main block has facilities for 33 patients in either single or double rooms, with joining south-facing balconies large enough to accommodate beds, a dressing room, and a living room. On the lower floors are the college classrooms, library, cultural director's suite, and main kitchen, laundry, locker rooms, and service rooms. The chapel is on the roof of the main block, with southern walls that can be fully opened to a roof terrace; also, this are two small apartments for members.

At the front of the group is a two-story curved element with the main entrance, lounges, smoking room, billiard room, music rooms and auditorium; as well as laboratories, medical director's offices, examination rooms, etc. At the south corner is a multi-story residence for nurses.

In dealing with his client at long distance, Neutra went into the analysis...
SHOPPING CENTERS

the new building type

a study
written and arranged
by
or Gruen, Architect and Lawrence P. Smith, Real Estate Consultant

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The next building type

written and presented

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This issue of PROGRESSIVE ARCHITECTURE, devoted to a study of the planning of shopping centers, was prepared very much in the same manner in which shopping centers are created—by team work. An architect and a real-estate economist are responsible for the basic concept. Much of the writing and the co-ordination of the material was also done by them. However, their associates have contributed materially, by writing chapters, by preparing drawings and sketches, and by taking part in round-table discussions held on many occasions over many months.

The cumulative experience of the contributors is tremendous. Since he came to New York, in 1939, Victor Gruen, architect with offices in Los Angeles, Detroit, and New York, has been active in store design. In this field he has been a pioneer; many aspects of modern store design have been introduced by him in projects which range all the way from intimate shops to department stores. Gruen early turned to shopping center design as a potentially new field of architectural expression, and in recent years he has designed many neighborhood centers, suburban centers, and regional centers. Larry Smith, real-estate economist and consultant, has a background of real-estate experience going back to 1917, as well as private business experience; working in recent years in a professional capacity as consultant for shopping center projects, for investment companies, insurance companies, department store organizations, and private investors. He is regarded as one of the outstanding authorities in the shopping center field.

what is a shopping center?

A shopping center must be more than a mere collection of stores and shops. A shopping center must be even more than its name implies—a center for shopping. The regional shopping center must, besides performing its commercial function, fill the vacuum created by the absence of social, cultural, and civic crystallization points in our vast suburban areas.

The centers of our big cities are shrinking, not only as far as the size of their populations is concerned, much more in their importance to the social life of the metropolitan inhabitants. During working hours, the downtown centers still represent great concentrations of trade, banking, office work activities. For 40 hours a week, most of them teem with life. But for the 128 hours a week over which the metropolite is master of his fate—the 128 hours a which are devoted to his or her private life, those 128 hours and the many hundreds of hours a year which holidays unchain him from his duties—the core areas of our cities are deserted and might as not exist.

This is true for the working part of the population. For the non-working part, downtown is even less tant. Our children, our youth, the aged, and the housewives are groups which together represent a city of the population. For them, a trip “downtown” occurs sometimes only once or twice a year and a trip into another city or country.

True, there are exceptions. Manhattan, Chicago, San Francisco, and a few other cities still have attract of sufficient magnetic power to draw the suburbanite into the downtown area from time to time. But there, magnetism decreases as the centrifugal forces grow.

The reasons for this phenomenon are many-fold. The mass migration from the country to the city took place in the past has now been reversed by a new, still more powerful wave of migration from city to the suburbs. The automobile has made this migration possible. And now the metropolite finds himself in the on of the Sorcerer's Apprentice—the spirits he conjured up he cannot exorcise. The millions of gaso-driven “spirits” get into each others' way and choke the highways, roads, and parking areas.

The metropolite is willing to find his way into town in order to make a living, but he protests nently against the idea of repeating this nerve-racking routine for purposes of pleasure, relaxation, ral enrichment, or education.

This condition will exist, and become even worse, as long as the pressures to which downtown are exposed are not lightened, and as long as the ring of blighted and slum areas which surrounds
so many of our downtown districts is not broken. Movements are underway to do something about both. Slum clearance and rehabilitation sections of the Housing Act of 1949 might very well open the way to eliminate the slums which choke the downtown areas; and large regional shopping centers will absorb a part of the buying power of the suburban areas to ease traffic and parking conditions downtown.

If and when this happens, downtown will again be able to serve satisfactorily its original trade function for the size of city for which it was originally built; and in addition it will become more desirable as a principal center for social and cultural activities.

Regional shopping centers may well be regarded as satellite downtown areas, offering much of what the metropolitan centers give and adding the decisive advantage that, if they are designed correctly and scientifically, they will take care of today's needs and today's living. They will welcome the hordes of automobiles which approach them, providing easy access and ample free parking space. They will become places where suburbanites will visit for a shopping trip, and also centers where they will want to congregate for many hours—both days and evenings.

The need for social and cultural activity has by no means disappeared in our times. It has been artificially stifled by the price tag attached—a price tag that spells exhaustion, loss of time, high transportation and parking costs—all efforts out of proportion to the gain.

With the advent of the large shopping center there will be a new outlet for that primary human instinct to mingle with other humans—to have social meetings, to relax together, to enjoy art, music, activities, the theater, films, good food, and entertainment in the company of others.

What are the requisites to the fulfillment of this function of a social and cultural center? First, to include, from the inception of the general plan, attributes which go beyond the commercial

Credits for all illustrations on page 160.
Second, to take advantage of the existence of public areas—such as garden courts, malls, arcades, covered walkways—for relaxation and amusement. If such areas are properly planned, they will provide opportunities for outdoor activities. There will be greenhouses, play areas, band shells, outdoor theaters, or fashion shows, miniature zoos, outdoor shows of painting and sculpture, flower shows, picnic grounds.

Third, to realize an architectural concept and treatment which offer variety without confusion, colorful allure without garishness, gaiety without vulgarity; a concept which creates an atmosphere in which the act of shopping becomes restful and fun; an architectural treatment which, by application of scientific design, eliminates what appears as an ugly rash on the body of our cities—the countless smoke stacks, telephone poles, dangling wires, air conditioning and ventilating ducts—treatment which pays design attention to that ugly duckling of our urban civilization called “street furniture.” The myriad warning signs, posts, bus-stop signs, directional signs, hydrants, waste baskets, letter boxes—all must be redesigned, eliminated, and brought into a disciplined pattern.

Here, at least, is an opportunity for contemporary art to find a place as part of a new architectural context. Here is space for sculptures, murals, fountains, mosaics on floors, and mosaics on walls.

That this is a thoroughly practical concept becomes obvious if one considers that a shopping center is a civic, cultural, and social center will develop magnetic powers to attract more people and hold them longer time than if it were only a commercial center. More people—for more hours—mean cash ringing more often and for longer periods.
In the anarchistic wilderness of our cities there have existed up to now only a few cases of organic architectural development: civic centers, public parks, college campuses, industrial centers. Now a new opportunity for the creation of co-ordinated, planned, and spirited architectural units exists in the large shopping centers. This new architectural design category is different in one very important aspect from the others; it is neither publicly owned nor completely controlled by one institution.

The shopping center is a conscious and conscientious co-operative effort by many private commercial enterprises to achieve a specific purpose: more and better business. This co-operation, in order to be effective, must be enlightened and wholehearted. Individual wishes and needs must be secondary to the needs and wishes of the center as a whole. This does not mean subjugation of individual wishes and desires for the individual needs of the tenant stores. The design problem of the shopping center is the co-ordination of these needs and wishes with each other, and with the whole. Conformity, but not uniformity, must be the keynote. In addition, if it is planned to integrate with the community, the new shopping center can be a boon, i.e., a help, rather than a threat to the privacy and the stability of residential areas.

The achievement of complete co-ordination becomes the mainspring of the architect’s work. It influences his work through the entire project, from the moment the search for a site starts, through the stages of usage planning, traffic planning, merchandising of the center, to the selection of colors and materials.

In creating this new architectural design category, we will be wise to observe what has been done in the past and in other parts of the world. During many ages and in many lands, such combinations of cultural, social, and trade centers have existed. Today’s shopping center has an opportunity to give us again a desirable gathering place, planned in a co-ordinated fashion, for the automobile age. In the first excitement of the industrial revolution we temporarily lost our feeling for planning, organization, and architectural beauty. The modern shopping center is a clear expression of the desire to regain these advantages, transforming past experiments into forms suitable for our mechanized life.

Because shopping-center planning is in our era a young and new category, it is impossible to make judgment or make final statements about any phase of the subject. The contributors to this issue have worked actively for many years on problems of shopping-center planning. This experience has had a sobering effect on us; we have learned enough to realize how little we know. Therefore we decided in early in the discussion this issue of Progressive Architecture would not be a recipe for cooking up the shopping center. It will be a complete history of shopping centers, nor a critical review of existing or projected ones, nor a handbook of procedures. It will, rather, attempt to present and spotlight the problems involved. It will mention and means that have been found practical, without any claims that they are necessarily the best ones. And we will, we hope, provoke thinking and discussion.

Northgate, at Seattle, Washington—designed by John Graham & Co., architects and engineers—recognizes community needs by providing a children’s playground with a carnival atmosphere. It fosters community pride with “the largest Christmas tree in the region,” thus emphasizing the fact that commerce thrives where social gathering is made easy and pleasant.
the definitions

A shopping center is different things to different people. To the customer it means a group of stores with parking, no traffic worries, minimum walking distances, variety of merchandise, and a pleasant atmosphere in which to shop.

To the merchant it means a business location with adequate parking, tremendous drawing power, all customer conveniences, protection against irresponsible competition, stable rental value, efficient facilities, flexibility in floor space, substantial and well-designed buildings, landscaping—in short, a location wherein all merchants band together to furnish services none could afford singly and, in turn, to receive sales and trade which could not be given to them singly.

Modern shopping centers are relatively new, the concepts are changing, new solutions are constantly sought, new problems arise. There is no tradition for the auto-age regional shopping center, no set of rules, set concepts, and a great deal of misunderstanding and misinterpretation, due mainly to the lack of a common shopping-center language. In the interest of clarifying some of the most commonly misunderstood terms, our interpretation follows:

the center

**Neighborhood Shopping Center:** Serves 10,000 to 20,000 people. Has a core of foods and drugs. Sells mostly convenience goods.

**District or Suburban Center:** Serves 20,000 to 100,000 people. Has a core of large supermarket or small department store. In addition to convenience goods, sells apparel, hardware. Adds depth to merchandise.

**Regional Shopping Center:** Serves a population of 100,000 or more. Has one or more major department stores as a core. Has great depth and variety in merchandise.

the building areas

**Gross Area:** Total floor space of all buildings in a project. This figure should be the basis for quoting building costs.

**Rentable Areas:** That part of gross area within buildings which is used exclusively by individual tenants, and on which rent can be obtained, usually the difference between gross area and common areas within buildings.

**Common Areas:** Areas, such as the mall, corridors, tunnels, public stairs and elevators, ducts, truck routes, loading docks, public and employee rest rooms not in individual stores. These are not rentable but their maintenance charges are levied *pro rata* against tenants.

**Sales Area:** Rentable area minus storage space.

**Service Areas:** Part of common areas used for servicing, such as truck tunnels, delivery docks, access corridors, etc.

the site areas

**Building Area:** The ground area of the enclosed building or buildings.

**Covered Area:** The ground area of the enclosed buildings plus all roofed areas, such as covered walks, shelters, etc.

**Road Area:** The area of all main private roads not directly serving parking stalls. Road area includes all feeder roads, perimeter roads, truck roads, ramps, etc., but does not include parking aisles or public streets.

**Service Yard:** The area devoted to servicing the center which is not enclosed or roofed. It includes rubbish collection and disposal stations, truck-loading spaces, maintenance yards, etc.

**Parking Area:** All space devoted to parking, including aisles, minor walks, islands, minor landscaping, and other features incidental to parking. Parking area is sometimes subdivided into customer parking, employee parking, and overflow or reserve parking.

**Reserve Area:** Area undeveloped or temporarily developed, intended for future use coincident with the shopping center. Such use may be expansion of buildings, parking, or both.
Parking Ratio: The relationship of parking area to gross area.

Single-Level Parking: All parking on grade and at the same level. Ordinarily this level coincides with the major shopping level.

Landscaped and Incidental Area: Major landscaped areas, such as courts, groves, park strips, and buffer areas. Incidental areas include major walks, free playgrounds, and other recreational features of the shopping center.

Site Area: The gross area of the property. Includes all space within the property lines.

Split-Level Parking: All parking on grade, but at two levels. Ordinarily used with two sales floors, each level of parking coinciding with a shopping level.

Double-Deck Parking: Two levels of parking with one level at grade, the other elevated or depressed. Used where area is insufficient for single-level parking.

One-Side Parking: Peripheral parking on one side of the building, single or split-level or double-deck.

Two-Side Parking: Parking on both sides, as used with a single-store depth. Either single, or split-level, or double-deck.

Economic Analysis: The process of analyzing and interpreting all economic data relating to the shopping center, including patronage expected, volume of business, expense of operation, probable rents by stores, net income of the project, financing requirements, and economic feasibility in general.

Trade-Area Pattern: The final delineation of the boundaries of the trade area as affected by distance, arterial highways, obstructions caused by extensive land use by large institutions, golf courses, etc., and the limitations placed by relationship to rivers, railroads, and the downtown area itself.
Gross Population: The total population of the trade area.

Net Population: The population which can be expected to trade in the proposed project after discounting for distance and other factors, such as access, character of the population, etc., all of which can affect the degree of patronage.

Primary and Secondary Trade Areas: The primary area is the more immediate area within which the center can expect to do a substantial proportion of the volume of food and drug business. The secondary trade area is the more remote area whose patronage of the center will be largely for apparel, furniture, general department store sales, etc.

Trade Habits: The existing pattern of trade, prior to the establishment of the center, that has developed over a period of years, and is influenced by the location of existing stores, including the effectiveness of leading downtown department stores.

Disposable Income: Same as Department of Commerce definition.

Consumption Expenditures: Same as Department of Commerce definition.

Retail Expenditures: The portion of disposable income which is spent in retail stores.

Gross Potential Sales: Total retail sales made to all residents in the trade area, regardless of where the purchase was made.

Net Potential Sales: Total retail sales that could be expected to be made to the net population tributary to the proposed shopping center.

Per Capita Retail Sales: Total retail sales in a given area, divided by the population of that area.

Store Integration (Pre-merchandising): Analysis of the proper relationship of stores of various categories, with the purpose of developing their highest volume of sales.

Fallacy: "The buildings are incidental; only the trade potential counts."

When Victor Gruen and Larry Smith started to work on this issue, the members of their organization were asked the question: who is more important and who, therefore, should co-ordinate all work for center planning—the economist or the architect?

One of the economists answered, "The ultimate goal of the owner is to build a satisfactory financial statement—and, only incidentally, some buildings. Therefore, the economist should be in full charge."

One of the architects answered: "A poorly planned center, uninviting in appearance, erected in a dance with no matter how brilliant an economic analysis, would be a failure. Therefore, the over-all visibility should be the architect's."

They both have a point. It is unquestionable, as the economist has stated, that the primary aim of commercial project is realized profit. To arrive at such realization, two factors must be present: the market potential and the correct tapping device. The analyst will detect, forecast, evaluate the potential. The architect will design the most efficient organic and economically sound environment for marketing—the most effective device he can achieve for the given potential.

A competently designed group of buildings located in an area of poor economic potential will much a failure as an oil well sunk where no oil-bearing strata exist; and no amount of architectural skill will save it. On the other hand, once the potential is established, a poor handling of the architectural design will represent an economic waste, bring lower profits and will, in time, hasten failure against the competition.

So there is no single point where analysis can be divorced from design. Analysis without design is,
Fallacy: "The decisive factor in design is the structural system."

at best, a theoretical exercise. Design without analysis is altogether unrealistic. A building constructed either basis alone faces intolerable risks.

Since analysis cannot be separated from design, it is useless to argue who and which is more important. Shopping-center design is teamwork and the ideal team consists of the architect who is fully aware of the business of our economy, and who has wide knowledge of city planning and the problems of the retail trade; an economist who is fully aware of the tenets of contemporary architectural and structural design, whose experience with problems of financing, analysis of trade potentials and merchandising is great, and who has enough imagination to project into future trends his charts and statistics drawn from the past.

These two central figures of the team should be associated with a large number of teammates: structural, mechanical, and electrical engineers; traffic planners; merchandising analysts; landscape designers; leasing experts, and many more. All these team members must exhibit infinite patience, straightforward thinking, and comprehensive understanding in co-operating with each other, with the owner, with city and authority, financing institutions, highway commissions and, last but not least, with the tenants.

Such a team should be able to avoid the human but dangerous tendencies to overestimate the importance of certain links in the chain of analysis and design. It will never subscribe, for instance, to any of the pernicious dogmas which are illustrated here by Karl Van Leuven’s cartoons. It will recognize that the process of planning a shopping center is one of fitting together, co-ordinating, revising, judging ideas, views, prejudices, statistics, and facts. The problems will stem from all the individuals involved in the design, in the financing, the use and the maintenance of the completed center. The solutions will come from teamwork, with the architect and the economist acting closely together as co-ordinators.
PHOTOGRAPHS of shopping as shown on this and the following as well as the illustrations else­in this issue, have been selected by authors and the editors to illus­specific points made in the articles; re not intended to represent the or the “most beautiful” examples could be chosen. The pictures on age show admirably the value of aping in achieving the integration and the benefit to a community well-planned shopping center can le.

landscaping

Lido Shops (above), Newport Harbor, California, designed by Dwight Gibbs, architect. Entrance to the super-market is inviting because of its rich planting. Bullock's Pasadena (left), California, Wurdeman & Becket, architects. Land­scaping within parking-area dividers is both functional and attractive.

& Country Center (right), Palm­gs, California, by A. Quincy Jones, architect. Landscaping and build­ave been planned together to draw ers to first- and second-floor shops.
Baldwin Hills Shopping Center, Los Angeles, California, by Robert E. Alexander, architect. This project is an excellent example of the point made by the authors in the opening section that shopping centers offer a new opportunity for unified design and planned architectural organization. It also illustrates the point (stressed later in the section on Storefronts and Signs) that the basic architectural concept must be strong—and capable handled—to achieve that unity within the competitive economy that controls merchandising. Here, show-window lines, roof lines, canopy lines, carry through a sense of scale and co-ordination, without limiting use of materials or display techniques.
The earliest examples and the most recent, in our own time, have made use of the age-old device of an arcade or one of its modern equivalents to protect shoppers and shelter store fronts. Bellevue Shopping Square (above), Bellevue, Washington; Bliss Moore, Jr. & Associates, architects: overhang shading walk past the restaurant. Colonnaded walk at shop center (left), Greenhills, Ohio; planned by the U. S. Resettlement Administration in 1939.
Merchants have learned that amenities will “attract more people and hold them longer,” which means, as pointed out in the opening section, “cash registers ringing more often for longer periods.” Here (left) is a resting place at the sheltered entrance to Halle Brothers branch store in Shaker Square shopping center, Cleveland, Ohio. Robert A. Little and F. Hays, Simpson & Ruth, architects.

resting spots

At Bullock’s-Pasadena, near Los Angeles, California, a spot is provided for chairs; the entrance portico for chairs is comfortable and agreeable surroundings. Architects Wurdeman & Bums planned here a two-level parking area; the upper section of which is adjacent to this resting spot.
THE STEPS IN SHOPPING CENTER PLANNING

The planning procedure for a shopping center will go through the following stages:

1. Economic Analysis. Planning must start with an economic analysis of the prospective trade area, based on the seven points which are discussed in the section which follows:

2. Decision on Site. In most instances, the builder is already in possession of a piece of property which considers adaptable for shopping-center purposes. If the economic study was undertaken for the purpose of selecting a shopping-center site, then the actual purchase of the property should be the next step. This subject is discussed on page 80.

3. Preliminary Architectural Studies. Certain architectural work should proceed before the economic analysis is complete. As soon as a site of proper location and adequate size is available, preliminary architectural studies should be undertaken simultaneously with the economic investigations such as: soil tests; study of drainage conditions; study of such site problems as contours, shape, improvements of adjoining property; preliminary engineering and traffic studies. As soon as the site is approved, the architect should proceed with land-use studies and develop a land-use plan that is adaptable to the site and that is capable of accommodating a project that can fully exploit the potential of the trade area (see chart at right).

4. Joint Study and Agreement upon Land-Usage and Merchandising Plan and Traffic Planning. At this point, the land-use plan (discussed on page 84) should be the subject of a joint study by (a) the owner, (b) the economic consultant and the architect, (c) the prospective major tenant, (d) the mortgagee or finance source. It should be modified to whatever extent necessary to bring about a meeting of the minds, at which point detailed architectural plans should proceed.

5. Detailed Architectural and Engineering Studies. Architectural, mechanical, and engineering design should go ahead, along with traffic planning (see page 87), land-use and site planning, utilities planning, the planning for services.

6. Tenant Selection. Determination of the ideal tenants to the type of center decided upon and the preparation of material for examination by those tenants.

7. Major Department Store. At this point, it is highly desirable to complete negotiations with the major department store tenant. The result of such negotiations will have important bearing on the success of subsequent negotiations with other major tenants and financial institutions.

8. Other Major Tenants. Active lease negotiations for other major tenants can be undertaken at any point, either by the project manager in the employment of the owner, or by brokers, or by a combination of both.

9. Financing. Application for mortgage financing should be made during the initial stages, in order to secure the necessary and guidance from these institutions. At this stage, negotiations should have progressed to the point where at least a conditional financing commitment can be lined.

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<td>Size</td>
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<td>Location in Relation to Stores</td>
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<td>Access to Parking Lot</td>
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<td>2. Store Accessibility</td>
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<td>To Pedestrian Traffic</td>
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<td>To Parking Lot</td>
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<td>To Public Transportation</td>
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<td>3. Pedestrian Traffic</td>
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<td>Induced by Project</td>
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<td>Exposure of Stores</td>
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<td>Lack of Interruption</td>
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<td>4. Advertising Value</td>
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<td>Individual Stores</td>
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<td>Project as a Whole</td>
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<td>5. Location of Tenants</td>
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<td>By Type of Store</td>
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<td>By Class of Store</td>
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<td>6. Efficient Layout of Stores</td>
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<td>7. Flexibility</td>
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<td>For Individual Stores</td>
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<td>For Project as a Whole</td>
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<td>8. Comfort &amp; Convenience of Customers</td>
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<td>9. Economy of Operation for Tenants</td>
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<td>Interior</td>
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<td>Deliveries</td>
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<td>10. Efficient Use of Ground</td>
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<td>11. Maximum Rents</td>
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<td>12. Minimum Cost</td>
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<td>Operating</td>
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**Chart (right) for point-by-point evaluation of land usage, at time land-use plan is made. Percentages assigned may vary from project to project depending on specific conditions.**
10. Public Agencies. Approval by public agencies, such as planning commissions, zoning commissions, city and county engineering staffs, and the city council will be required at different stages of the development. The actual circumstances in each case will dictate the timing.

11. Construction. When the above ten steps have been taken, actual construction can begin.

The time table indicates the approximate amount of time that should be allowed for various stages of work. It assumes the most favorable circumstances.

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**the economic study**

If one were asked to point to the most important economic aspects of a shopping center, he would certainly name the following:

(a) Single ownership, which gives to the owners a measure of control not enjoyed in any other type of retail-store grouping.

(b) Co-ordinated planning, which makes it possible to plan all aspects of the center, including architectural and engineering design, economic studies, traffic, finance, etc.

(c) Complete representation of all stores and services in a single integrated area allowing for one-stop shopping.

There are many other distinguishing features of a shopping center but the above three points, in the opinion of the authors, represent the basic factors that distinguish a planned shopping center from an ordinary group of retail stores.

Two factors, characteristic of modern urban areas, tend to favor the success of regional centers:

1. Population Growth. One of the outstanding features of population growth during the last decade is the continued concentration of people in large metropolitan areas and the strong tendency for that population to disperse into the suburban sections of these areas. Generally speaking, the growth of retail trade facilities has not kept pace with this growth.

2. Existing Facilities Unsatisfactory. The effect of the automobile is just beginning to hit us with full force. It is forcing a complete rearrangement of arterial patterns. It is forcing a redevelopment of downtown areas, and also forcing a complete redesigning of merchandising techniques. The one-stop regional shopping center appears to be one of the principal results of increased automobile use and, by comparison, existing facilities now appear to the customer to be completely inadequate and unsatisfactory. As a result, new shopping centers have not experienced too much difficulty in transferring the allegiance of customers from the use of inconvenient retail facilities to the new, streamlined shopping center.

**economic dangers**

In spite of the inherent advantages that tend to favor decentralization of facilities generally, there is ample opportunity for serious mistakes on the part of the developer. Here are some of the penalties if he fails to plan his center to fit the exact character of his trade area:

(a) If he builds his center too large, construction costs and operating costs will blot out his rental returns. He will have a poor investment opportunity on his hands, making financing difficult if not impossible.

(b) If, on the other hand, he builds his center too small, he will be inviting competition which, if it takes the form of a competitive shopping center as is likely, will be most destructive.

(c) If he fails to diagnose accurately the character of the trade area, and hence the character of the shopping center that should be built to serve that area, he will find himself in possession of a center that never exactly clicks; and his set of inappropriate tenants will provide years of low rents before the situation can be remedied.

(d) If his stores are not skillfully arranged in order to capitalize on possibilities of pedestrian traffic by the...
rangement of small shops in relation to her stores, he can easily lose the top % to 50% of his bonus rent potential.

(e) If he has not made a proper allocation of operating costs, parking maintenance, utility expenses, etc., he may be carrying the burden of any increase in operating expenses that will eliminate any opportunity for surplus rent.

There are many other pitfalls in the planning of a project of this size, but those mentioned above are the most serious and, a matter of fact, the most typical. Most shopping centers, because of weaknesses that might have been avoided in the planning process, will have to be satisfied with in 60% to 90% of the full potential of their location. The ability of the project to earn the last 10% to 40% of potential income distinguishes the well planned center from the ordinary, and the added value that comes from careful planning can easily amount to several times the cost of planning process.

**economic analysis**

beginning of the planning process is economic analysis. It must be based on seven points of study, some of which are purely market analysis, and others call for a background of architectural and land planning with a knowledge of the relationship between these physical factors and merchandising.

Population. Standard procedure based on the use of the Bureau of Census data, en down by small enumeration districts, so that groups of population can be related in relationship to physical factors. Data must be secured for a broad area that can later be curtailed as the trade area is gradually evolved.

*Income and Purchasing Power.* This information still has to be secured primarily on the basis of observation in the field through the medium of specialists. Data from the 1950 Census are readily available and, for most projects, the information is not sufficiently detailed to be adequate.

**Competition.** Here again it is necessary to depend on studies of the particular area since census information is rarely in a form that is capable of being adjusted for any particular trade area. Furthermore, the purpose of the study of competition in any trade area is more to define the capacity of existing facilities rather than the amount of business

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Study indicating that rapid anticipated growth is greatest in the primary trade area for J. L. Hudson's Northland project near Detroit, planned by Victor Gruen Associated Architects & Engineers, with Larry Smith as economist.

Study showing that proposed Northland Center will tap rapidly growing section of city, and even more rapidly growing suburban area.

**Estimate of increasing retail expenditures due to population growth, based on statistics obtained for present per capita spending.**

The nature of the competition is also important.
being done in those facilities. Of equal importance is the location of the competition in relation to the proposed site.

4. **Accessibility.** Involved here is the question of accessibility to the center by automobile, public transportation, and foot traffic. (This is discussed on pages 87-89.) It is hard for many builders to realize that, with the completion of their project, they themselves will have created a very sizable traffic problem which should be completely visualized and planned for from the beginning.

5. **Physical Characteristics.** This is primarily an architectural question, which is discussed in detail later. Certain physical features may dictate a two-level structure or double-deck parking, or an unusual arrangement of the department store in relation to the rest of the shops, or a completely different treatment of parking areas. Any and all of these can have an important effect on sales and therefore must be regarded from the economic, as well as from the architectural standpoint.

6. **Character of the Project.** Most of the success of the center depends upon the ability of the builder to judge accurately the trade area and therefore, by a proper selection of tenants and proper provision of services, to exploit fully his merchandising potential.

7. **Tenant Selection.** There are very few things that are more important in the establishment of a successful center than the selection of ideal tenants. The aggressiveness of the tenants can influence the limits of the trade area, and the volume of business, as much as any other single factor.

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**the shopping-center site**

Unfortunately, the site for a proposed shopping center has often been chosen before the architect and the real-estate economist are consulted. If this has not been done, the site selection should follow, and be greatly influenced by, the economic analysis. The preliminary economic survey should have determined whether a demand for additional shopping facilities exists, the extent of that demand and its nature, the areas of most rapid growth, the nature and extent of existing competitive facilities. On these findings, architect and economist will make recommendations.

From the dollar-volume estimate of demand, the architect and economist can determine in a preliminary way the store types and the approximate square footage of building necessary. Parking and traffic needs can also be determined (by methods discussed in a later section). With the number of cars and the total store area established, the architect is able to project the approximate total area required for the center, and the search for the site can begin.

What are we to look for in selecting a shopping-center site? In an effort to answer this question, the essential features and characteristics of the ideal site are listed in the order of their importance:

**Accessibility.** This is, in our opinion, the most important consideration for either a district or a regional center. A shopping center is designed for the customer behind the wheel and, if free and easy access from the highways to the perimeter roads and into the parking lots is not achieved, most of the convenience advantages the center can offer are lost. To achieve this maximum convenience, the site should be at, near, or readily accessible to at least two major highways. These highways and access roads should have considerable reserve capacity, over and above their present and projected needs, because the traffic movement to and from a regional shopping district (parking 5000 to 10,000 cars, and increasing previous traffic two or three times) will completely alter the existing traffic pattern.

It is important to recognize the basic differences that distinguish the planning of a shopping center from ordinary commercial construction. Ordinarily, the construction of a single store building represents a small addition to the total retail floor space of the business community. In many cases, it means no addition at all but simply a replacement. As a result, the sales activity of the new tenant brings about little or no disturbance to the existing equilibrium.

A shopping center, on the other hand, is equivalent to adding the retail space of a small city to existing facilities which, presumably, were fairly adequate up to the opening date of the new project. In such a situation, new facilities must be located, well planned, and well timed.
Analysis of a proposed center in Tennessee by Larry Smith & Company shows the location of present retail stores. A study of their capacities will help evaluate the nature of the competition to be expected in the area of the site under consideration.

Typical uncontrolled strip commercial development: proper zoning could cure this.

The site immediately surrounding it—and in a congested, disorganized, uncontrolled commercial slum.

The site under consideration should be a piece, and not divided by major or minor highways that cannot be realigned or rerouted. Nor should it be divided into pieces, subject to subdivision control which would make replatting difficult, force artificial divisions or restrictions on the development of the center.

In addition to the minimum acreage needed for the shopping center itself, an ample amount of land should be readily available around the center so that buffer zones and uses can be introduced to protect surrounding property and prevent un-economic development of the areas surrounding the center. This buffer space, which is devoted to landscaping, parkways, and non-commercial uses, or multi-tenant use buildings, will not only give the shopping center the opportunity to expand the present shopping requirements, but protect the values of the residential areas which now, or will in the future, surround the project.

Nearness to Utilities. Usually the only large parcels of undeveloped land available or desirable for shopping-center projects are on the fringe of the city where water, power, and sewers are limited or nonexistent. The power requirements for a shopping center are heavy and (in addition to the normal sewerage requirements) the large areas of impervious material necessary to provide adequate parking create a new storm drainage problem. Hence the architect must be satisfied that, if these utilities are not on hand, the program for their development is sufficiently advanced to guarantee their availability by the time construction is completed.

Favorable Zoning Conditions. In general...
eral, sites suitable for shopping centers do not occur in areas already commercially zoned. Usually they are undeveloped farmland, ripe for residential development, or areas which have been reserved for speculative purposes and are already surrounded by well built-up, protected, residential sections. Present city planning sets aside large areas of organized space for potential commercial development but, in the past, the practice has been to zone for commerce in strip fashion along the highways or streets.

Because of the unfortunate history and experiences of extensive strip-commercial developments in residential areas, any attempts to re-zone usually encounter intense local opposition which must be met by a carefully organized educational program. The owner must be warned to weigh the political temper in the area before he embarks on an extensive program which may not be realized because of community opposition. A new zoning category for planned shopping centers is possible, and has been adopted in some instances. If it is carefully drawn, it will grant certain new rights and impose certain new restrictions.

**Comparative Excellence.** It is essential that the project be in an impregnable economic position; hence the site must be, from all points of view, the best in the entire area. It must be impossible for another project similar in size and scope, but better located, more convenient, and protected, to be introduced and, because of its improved services, to compete successfully with the center. A few minutes additional driving time, or the acquisition of another piece or two to complete the parcel, may be all that is required; but the economist and the architect must take a strong position in this matter, since the future success or failure depends largely on the center's ability to completely dominate the area.

**Nearness to Homes.** The site should be in or near an already established and well-developed residential area or in an area so ripe for development that, by the time the shopping center is constructed, the residential growth around the center will be well advanced. Certain types of activities necessary to make a complete and well rounded one-stop shopping center, such as drug and food stores, need for their healthy growth the day-to-day pull of neighborhood shopping requirements.

**Reasonableness of Price.** This factor must be carefully considered. The cost of the large areas of parking required must not be disproportionate to their value. If the site is truly the best in the area, it may sometimes be advisable to pay a premium to secure the economic position of the project.

Sometimes, unfortunately, the exact right spot can't be found, and it is then that the reports, studies, and analyses of the architect and economist are of the greatest value and importance. Even though accessibility seems to be the most important single consideration, it may be that in a particular site all of the other factors are so importantly solved and satisfied that the considerations of accessibility are secondary. The problem then becomes a mechanical one of providing the best possible scheme for the distribution of traffic that can be achieved with the limited means at the architect's disposal. Northgate, near Seattle, reaches out by secondary roads to the main highway. Framingham, near Boston, with a relatively short frontage along the major limited-access highway, provides an independent circulatory road around the entire project. At Northland, planned for Detroit, the center was pushed well back from the two major highways which intersect at one of its corners, and divided road systems were introduced within the site to tap and increase the importance of the secondary roads which surround the area.

There are many cases where the only available site has been smaller than the economic survey indicated necessary because it was good in other ways selected by the owner. At Ba planning for Oakland, California, the smallness of the area was solved by level shopping, making space available for split-level parking. At Skokie, for Chicago, the problem of extra shopping facilities on a limited site has been solved by multi-level parking.

Sometimes it is necessary to select a site with such a difficult terrain that it, perhaps, does not have all on one level, it, in the same way, that community opposition, economic setbacks, and unforeseen circumstances have been solved by multi-level parking. Such a project was the example of the Company and the Broadway store near Crenshaw Boulevard in Los Angeles. It indicates that almost any expense is fixed that reroute such a highway, either or under the project, at Montclair, Houston, the major freeway which the property will be rerouted over to serve the extensive roof-deck parking which the irregularities of the site made necessary.

Sometimes (too often!) the architect confronted by a site optioned or purc by the owner without the benefit of an economic survey. In this case, the architect should always remember that the property will be rerouted over to serve the extensive roof-deck parking which the irregularities of the site made necessary.

In attempting to approach as possible to the ideal site, we find that the architect, the economist, and the user should always remember that the customer in the automobile is the center around which the entire concept of a shopping center has grown; that it is difficult to persuade him to drive a farther if this will lead to shopping atmosphere of maximum convenience and comfort, and uncomplicated surrounding.
schemes are tried and discarded in arch for the one meeting most of the
to provide the greatest interplay
in stores.
minimum walking distances, both
elimination of all poor store locations
of all service facilities
in stores.
center efficient to operate.
unified building group which will
ke a shopping center, not an assem-
and all this must be beautiful, invit-
have a "shopping at-

often the land available is not suffi-
to meet the ground requirement for
level center. In such a case, it
ecessary to double-use parts or
site, with double-deck parking,
or two-level merchandising, or perhaps
both. A site which requires intensive use
of the land can lead to very interesting
solutions, once the obstacles of double-
level planning—vertical circulation and
parking accessibility at each level—are
solved. Two centers now on the boards
required a very high coverage of the land
—too high to allow single-level planning.
Double-deck parking was considered and
discarded in favor of two-level merchand-
sising. Both sites were nearly level but,
by grading, split-level parking was intro-
duced, which made parking directly availa-
to each sales level. Vertical circulation
is by ramps, stairs, and escalators.

In other cases, the site is more than
ample for the shopping center proper.
This is true of the J. L. Hudson North-
land Center where it was possible to
provide adequate buffers, place land in
reserve for future expansion of buildings
and parking, and devote other land to high
income subsidiary uses, both commercial
and residential—a city in itself with all
land planned for its highest use, providing
the most pleasant and efficient living,
shopping, and business surroundings pos-

Two-level merchandising (above), combined with
split-level parking, allows high land coverage at
a center planned by Victor Gruen architect. A
roofed-over mall permits some concessions to be
planned without store fronts—true "open-front" shops.

Northland Center, Detroit (above), is planned by
Victor Gruen's firm with buffer strips which can
shrink as the parking areas expand (below).
After the economic analysis has been made and the land-usage plan developed, the center is "merchandised" and the merchandising plan is made. Its purpose is to create, by proper store location, the highest over-all sales per square foot. If merchandising studies indicate that it is advisable, the land-usage plan must be changed—but changed in such a way that it does not lose any of its attributes.

Determination of the size, number, and arrangement of tenants in a shopping center is not an exact science. It takes a certain amount of "playing by ear." Experience of the authors indicates, however, that the key is set by a number of factors, primarily by existing business districts on conventional street patterns. This is because existing business districts are the result of competition. They were born in competition, have lived in competition, and still exist there. Consequently, the fact that they have operated successfully in their present relative locations has, we believe, a decided significance and, it is reasonable to conclude, the same relationship should be maintained to a certain degree when placing these tenants in an integrated shopping center.

This past experience, when tempered with the results and findings of the economic analysis, provides the basis for establishing the size, number, and type of tenants for a shopping center.

**the traffic generators**

Assuming that the size and number of stores have been determined previously, the arrangement of those stores in a plan becomes first an architectural problem. The architectural design must lend itself to the arrangement of stores in such a manner as to locate "traffic generators"—which are the major department stores, food stores, and other major tenants—in such a manner as to direct the flow of traffic by the doorways of smaller tenants. The importance of creating traffic for the smaller tenants is pointed up when a study is made of the rents per square foot which can be realized from small tenants, in comparison with the larger tenants.

For instance, we know of no case in recent years where a major department store has executed a shopping-center lease to pay a percentage in excess of 4% of its sales. When that percentage rent is applied to what is considered a good merchandising job, namely sales of $60 to $70 per square foot of gross building area, it indicates that the maximum department store rent will be approximately $2.50 per square foot. For a good market in a location, a good lease with a tenant strong credit may call for a rent of 5% of sales, and a top operator will reach off from $100 to $150 per square foot gross area, which indicates a maximum rent of somewhere between $2 and 5% per square foot.

**the small shops are of equal importance**

Small shops, besides paying excellent rents, add interest for the customer shopping center and actually contribute to higher sales by the major tenants. They are not uncommon for shops for candy, hosiery, millinery, etc., whose area requirements in most cases do not exceed 1500 square feet per store, to offer 10% leases and, even if their sales approach $70 or $80 per square foot, they would pay as high as that paid by the major tenants.

In most cases, the sales of those small shops approach $70 or $80 per square foot, which would indicate a rental return over $7 per square foot. Between small stores and the big stores, the whole range of others whose importance should not be lost due to the fact that they are not so-called "name" tenants.

If the owner expects to receive 15% to 20% rental return in his shop
we believe he cannot overempha-
ize importance of placing the small
in a location that will allow them
talize on the pedestrian traffic cre-
y the major tenants. We believe
is impossible for a regional center
give without a major department-
ant and other major tenants, such
 variety stores, food stores, etc. It
vertising effort of these large ten-
ich generates the customer accep-
f the center and actually establishes
its of the trade area.
portance of balance
therefore, our conclusion that a
center of all "big names" may be success-
ful, but will fall short of obtaining the
last 15% or 20% of revenue possible from
a shopping-center development. Likewise,
a center consisting of all small stores with
high-rent-paying capacity might fail, due
to the lack of sufficient traffic which would
be provided by the larger tenants. Con-
sequently, a proper balance is necessary
between traffic generators and the high-
rent-paying smaller tenants. An architec-
tural plan capable of placing the small
 tenants in the path of the pedestrian traf-
 fic generated by the larger tenants is of
utmost importance.

It might be taken from the above argu-
ment that the ideal center would be one
having just enough "name" traffic genera-
tors to bring customers to the center, with
the rest of the project devoted to high-
rent-paying small tenants. This is very
far from the truth, since there is one more
condition which must be fulfilled and that
is completeness. In addition to traffic
generators and high rent producers, there
must be an adequate selection of tenants
who do not, themselves, generate traffic
or pay high rent but who do provide the
necessary facilities to insure a complete
selection of merchandise and make the
center a true "one-stop" shopping center.
In this category, we would include furni-
ture stores, hardware and appliance stores,
and stores for miscellaneous services.

**traffic and parking**

Traffic-and-parking plan must define a
flow of traffic into and out of the
t must balance parking demand
parking facilities. It must answer
requirements of land usage and mer-
ning. To do all these things, it
be based on a thorough analysis of
icular traffic and parking situation.
ably, there is no more controversial
lized aspect of shopping-center
or than the matter of parking. Just
ntart, but generally overlooked, is
-center traffic. Together, these
ctions pose the twin problems:
any parking spaces will be required
given shopping center? and what
ilities will be required to handle
w of traffic to and from these?
swers to these questions are gov-
y a set of factors which varies for
opping center and most of these
are indeterminate in the planning
The various ratios 1:1, 2:1, 3:1 are
approximate to apply to a project
of a regional shopping center and,
they were exact, they apply only to
leaving the traffic problem un-

eral years ago, the Smith and Gruen
decided to undertake a series of
ations of existing regional centers,
hoping that a pattern of operations might
exist between centers on which the opera-
tions of a proposed center might be pre-
dicted. Three such surveys were conducted
different sized centers in different loca-
tions. The number of cars in, out, and
parked was tabulated each half-hour for
a full shopping week. Also observed were
passengers per car, truck traffic, and
boundary road conditions.

The statistics were reduced to a common
denominator—the number of cars perform-
ing a given operation per 1000 sq. ft. of
rentable area—and curves were then con-
structed from the three sets of figures.
These curves proved that, although shop-
ping centers do vary in their parking and
traffic requirements, there is an amazing
similarity as to volumes, peak hours, and
the general pattern of operations. From
the three curves, it was possible to con-
struct a mean curve, representing the
operations of a hypothetical shopping cen-
ter, which could be used as a norm with
which to compare proposed shopping
centers.

Eventually, a technique was evolved for
estimating not only the parking needs, but
traffic requirements as well. Whereas this
technique by no means results in a down-
to-the-last-car prediction, based as it is on
actual operations, the chance for error is
reduced to the minimum. Mainly, such
possibility of error as does exist is limited
to the estimate of expected trade, and this
estimate is probably the most carefully
considered figure in the entire shopping-
center analysis.

In order to project the figures obtained
by observation to the operations of an un-
built shopping center, a comparison must
first be made. Will the proposed center
do more or less business than those ob-
served? Are the trade-area economic lev-
els and car registrations similar? Are they
comparable in size? Is public transporta-
tion of the same or similar quality? Once
these questions are answered, the observed
operations are adjusted up or down and
applied to the proposed center. For ex-
ample, assume that a regional shopping
center of 800,000 sq. ft. of rental area is
being planned for a medium income area,
in a city with a high ratio of cars per capita.
It is compared with an observed center of
650,000 sq. ft., located in a similar area,
and doing a moderate volume of business.

The economic analysis indicates the pro-
posed center has an excellent net poten-
tial—nearly 20% greater than that of the
operating center. Other considerations
being equal or nearly so, we judge that
the proposed center will enjoy a 20%
Table 1. Observed traffic volume in existing center.

Table 2. Estimated volume for 800,000 sq. ft center with assumed 20% greater business than existing one.

Table 3. Hourly traffic estimate for a Friday in proposed center, based on collated observations.
...r volume of business per square foot the existing one whose operations we Armed with this estimated overage, next possible to consider shopping from its point of origin to its des­ on, and back again—incoming traffic, ing, and outgoing traffic. existing center was observed to the weekly volume (Table 1). estimated 20% increase for the ed 800,000 sq. ft. center results in ekly volume (Table 2). e the daily over-all volumes have estimated, in order to determine the distribution on the major access and the time and intensity of the periods, the following analysis is Origin of Trade. The number and m of expected customers and the ion of the trade area, can ordinarily tained from the economic analysis. actors which tend to reduce auto—such as walk-in trade and trade ible transit systems—should be in· ted and the proper deductions made he net expected customers to arrive net auto-borne population. It some· simplifies the procedure if the vari· groupings of net auto-borne population erted to percentages of the total. traffic Volumes. The net auto-borne urs can now be traced to the center over the most logical trade routes. The figures used can be either percentages of the total net trade, or these percentages can be converted to actual cars per day by applying them to the expected total cars for any given day. Traffic volumes are computed by distributing the population among the various roads and then, start­ ing at the outer limits of the trade area, totaling them cumulatively until the site is reached.

Since there is a wide hour-to-hour variation in traffic volumes, it is next necessary to break down the daily total into hourly or half-hourly subtotals. The Smith and Gruen offices found it possible to plot the number of cars “in,” cars “parked,” and cars “out” from curves based on the operations of existing centers which show a definite similarity in these operations. From these charts, a “mean” curve can be constructed and then, working from the total traffic expected each day, a tabula­ tion of the operation can be computed. Considering Friday, when approximately 18,300 cars are anticipated at the proposed center, the day’s operation would be as shown (Table 3).

This tabulation forms the basis for establishing the required number of entrances (maximum “in” load=3412 cars per hour), exits (maximum “out” load= 3596 cars per hour), and parking stalls (maximum “parked”=4042 cars per hour). To these minimum requirements should be added reserves for pre-holiday selling, sales days, and unforeseen happenings which might throw an additional load on the shopping traffic and parking.

Once the shopping traffic has been es­ tablished, it is possible to study the load which will be imposed on the critical boundary or access streets and intersec· tions. Here shopping traffic is added to non-shopping or through traffic to produce a combined load which must be handled smoothly if the shopping center is to operate efficiently. A car count is taken of the existing traffic on all boundary roads, tabulating volumes for each half-hour of the shopping week. This is pro· jected forward to the date the proposed center is expected to open, and adjusted for population increase, new highway facilities, etc. The shopping traffic is then broken into half-hour totals for each day and added to the non-shopping traffic, producing a combined load which the roads must be designed to handle. The boundary roads will carry the most critical loads and the locations of exits and en· trance to the shopping center can have a great effect on these loads. The en· trances and exits must be located as strate· gically as possible in order to balance the traffic flow about the center.
the site plan

This plan is the culmination of land-usage studies, merchandising plans, and parking and traffic analyses. It is here that the refinements are made. The basic requirements have been determined and fulfilled. But, faced with the complexity of area requirements, rents, car counts, intersection studies, truck traffic, drainage conditions, tenant demands, etc., architecture though not forgotten, is sometimes temporarily moved to the background.

The architect designing a regional shopping center faces one of the great opportunities of his day. Projects of this scale have been rare since the Renaissance and what is lacking in experience must be made up for by skill in mastering the spatial relationships, the landscaping, the walks, the vistas, the atmosphere to produce a beautiful and harmonious whole.

shopping-center type plans

Basically, there are five types of shopping-center plans. These types are often used in combination, and each has many variations.

1. The Strip. Most store groupings stem from this "line of stores." It is efficient and economical to place stores side by side with common end walls, a united front, and service concentrated in the rear. The strip can be adapted to neighborhood and even, at times, to district centers. But, as the size of the center increases, the advantages of the strip are outweighed by the disadvantages. It becomes too elongated, difficult to merchandise, foot traffic is diluted, and walking distances are increased.

2. The Court. By shaping the strip into a court or series of courts, its basic advantages are retained while new ones are added—visual distances are decreased, walking distances can be lessened, and foot traffic improved since more key store locations are created. The court is adaptable to neighborhood and district centers and, by double-use of the site, to regional centers.

3. The Ring. A closed court. This basic type shapes the strip into a ring and in so doing creates equal trade locations and, consequently, increases foot traffic. Walking distances are reduced since almost all retraced steps are saved. If the court in addition to the periphery is used for parking, the stores enjoy excellent contact with the parking areas. This type can be used for neighborhood and district centers, although, in this case, the inner court will not be large enough to use efficiently for parking. A regional center, however, develops sufficient diameter to devote the inner court to parking.

4. The Mall. The mall is essentially two strips, face to face. This simple shift in grouping has tremendous advantages which increase as the size of the center is increased. First, it is possible to double the building area with no increase in walking distances. Second, the volume of foot traffic is greatly increased. Third, more strong store locations are created. And fourth, if the center is large enough to warrant the expense of underground delivery, a single service road below the mall will serve the stores on both sides. Inherent in the mall scheme is the possibility of covering and closing the mall to air-conditioned walks, complete weather protection for the building area, and, by double-use of the site, to provide air-conditioned parking areas. The mall型 is adaptable to any size center from neighborhood arcade to the huge regional mall.

5. The Cluster. The cluster plan is a carefully plotted informal group of stores, can range in size from the "farmers' market" with a dining co-op in its core, to the huge regional center with a major department store for its nucleus. In its small form, the cluster is akin to early bazaars and market places, the regional size, the cluster can combine four of the basic types—strip, court, and mall—to produce a tightly integrated store grouping with a maximum in volume and traffic between stores. Extreme care is taken with this plan type to maintain the contact between the parking area and stores, and to avoid "lost" store locations. Although very difficult to plan, the scheme has great possibilities.
basic shopping center types
Northgate Shopping Center, Seattle, Washington; John Graham & Company, architects and engineers. A mall development with the large department store, Bon Marche (right), which connects the two arms, entered either from the parking area or from the mall.

Lakewood Center, Los Angeles, California; Albert C. Martin & Associates, architects and engineers. The center, now under construction, will grow to the extent indicated by the site plan including many community facilities.

Completed store for May Company is shown (above) with aerial view looking east to new sub-divisions this center will serve. Rows and rows of houses; rows and rows of cars—each creating new problems (left).
Shore Mart, Great Neck, Long Island; Lathrop Douglass, architect. Nineteen-acre shopping center with John amaker store as main unit. Single curved around parking area, on corner site.

Evista Shopping Center, Bellevue, Washington; Bliss Moore, Jr. & Associates, architects. Growing since it was started in 1946, this has lost the rawness of projects started more recently. Lessons might be drawn from saving of the tree, to which plans of restaurant were adapted. Result: successful, well-ventilated eating place which has been boon to other tenants.

Swiftton Shopping Center, Cincinnati, Ohio; Ketchum, Gina & Sharp, architects.

Park West Center, Mansfield, Ohio; Raymond Loewy Corp., designers. Twenty-acre center for rapidly growing area.
Shoppers’ World, Framingham, Massachusetts; Ketchum, Gina & Sharp, architects; Kenneth C. Welch, economic survey. Among contemporary shopping centers, this is an example of the mall-type development. In contrast to others, such as Northgate in Seattle, the principal department store is at one end of the mall, with another major store planned ultimately to close the opposite end of the mall. The planning and merchandising theory here is that for such a great development there must be two principal “pullers.” Site has a rather narrow frontage; parking area surrounds the stores.

Picture above shows a busy day at Shoppers’ World in rather mild weather, with the two-story pedestrian arcades open to the landscaped central mall, which is eight feet below the level of the parking space. The same arcades are shown (left) glazed against winter weather. Note the discipline in the use of signs—here the management controls size and placement, both on the outside of the arcades and on the walkways themselves (in comparison to the greater freedom suggested later on in this issue).
Owner-Architect Contracts

Standard forms of agreement as issued by the A. I. A. provide basically for two types of agree­
ments: Forms a-102 and b-102, in which a percentage of the cost of the work forms the basis of pay­
to the architect; and Form 103, which is based on the fee-plus-cost system.

Experience seems to indicate that the first-mentioned type of agreement, the percentage type, is
not all practical for shopping-center contracts. The reasons are many: the long pre-preliminary
period and the number of people involved as consultants and tenants are among them. The fee­
cost system would seem, on the basis of some experience, to be much more adaptable to shop­
center design. However, even this agreement should be used only with considerable changes.

First, a special arrangement should be made for the period of exploratory work which precedes
service referred to in standard architectural projects as preliminary work. As we have attempted
plain step by step in this issue, many studies have to be made before, what are commonly re­
ferred to as, architectural preliminaries can be started—and the architect should be involved in all
pre-preliminary matters. At various stages, he will be called on to present studies for leasing
financing purposes. This exploratory period may last anywhere from a few months to a few
years. Only when the basic land-usage plan has been agreed upon by owner, economist, and financ­
institution and when the main tenant or tenants have in principle agreed on the terms of a lease,
the architect start to undertake the work which is usually referred to as “preliminary.”

It seems to be obvious that, for the entire exploratory period, only a highly flexible arrangement
will be practical. Victor Gruen’s office, for this period, an arrangement by which it is reim­
paid for actual drafting cost, for overhead in the form of a percentage of these drafting costs, and
all other out-of-pocket expenses; it uses a fee which is expressed as a function of the drafting
work. In such a preliminary agreement, the typical Gruen contract provides that the project can be
leased by either side on proper notice (60 or 90 days), and that neither side shall have any obliga­
tion toward the other if the project should not be executed at all, or if the owner does not desire to
continue to employ the services of the architect—with the proviso that, in that case, he shall not use
architect’s plans, ideas, or any part thereof.

Once the exploratory work is concluded, the A. I. A. Form 103 could well be used. However,
Victor Gruen offices find the following changes and additions practical:

1. At this time, the size and nature of the project can be documented by photostats of the site
    plan and basic program which has been agreed upon in the exploratory stage.
2. Clear provisions concerning changes of the fee in case changes in the program should be
    made. (They could, for example, refer to changes in the square footage of building area, or to extra
    charges for changes which make completed drawings obsolete.)
3. Paragraph 3B of the agreement—which deals with sums paid to structural, mechanical, elec­
trical, sanitary, or other engineers—should be enlarged in scope to include consultants for lighting,
    landscaping, graphic work, land planning, etc.

Because of the complex nature of shopping-center planning, the architectural cost is consider­
ably higher than that for projects of similar size in the housing or office-building field. The repetitive
factors which occur in the other fields are not as prominent in shopping-center planning, and many
of the factors which do not occur in other fields are present in shopping-center design. If it is neces­
sary to give an estimate of architectural cost (which should never be guaranteed) or to submit a
projected minimum cost (which is not desirable), these facts should be borne in mind. Architectic­
costs, even for very large shopping center projects, should probably be estimated to run be­
tween 5% and 7% of the total construction cost.
If signs and lettering are considered a part of the total design problem, there can be a much better co-ordination without loss of merchandising appeal. An instance is the picture (right) of the Shopping Center for the Palo Alto Consumers Co-operative Society in California; Bolton White and Jack Hermann, architects.

Sketches of storefront and sign treatments, from the office of Victor Gruen, indicates what can be done within the terms of a reasonable lease arrangement such as the one outlined in the following article.

What can happen when intentions are good but control is lacking is indicated by the sad case of real-estate signs, directional signs, and ads pasted on show windows of the shopping center in Tarzana, California (left). It was designed by the architects, Palmer & Krisel, with the restraint which the rendering (left, below) indicates.
Storefronts and Signs in Shopping Centers

orces, that seem to be hostile to one or another, influence shopping-center design, to pull it in different directions. There is the desire for architectural unity; there is the desire for full expression of individual character of tenant stores.

Theear victory of the second tendency is seen in the strip developments along main roads and highways. Here stores differ in different depths and various heights. The zigzag toward the parking area, other zigzag toward the sky. Colors and materials of neighboring stores clash, and signs try to outdo each other in size, garishness, and light intensity. The absurdity of the competitive effort of neighboring stores was most effectively illustrated in an old Chaplin comedy. Charlie, the store owner, caught middle between two "gorgeously" red neighboring stores, saved his business by affixing a large sign on his shop that said "Main Entrance."

much less easy to find examples of the uniformity of storefront treatment—at least, they are hard to find in shopping areas. Very often,螵提供 for the strictest standardization are started with great courage, only to experience defeat after defeat during the leasing period, the final construction period and (worst of all) during the years following the opening of the center. This is not surprising, if one remembers that a shopping center is by no means an institutional enterprise, but a voluntary cooperation of individual tenants.

Shopping centers are constitutionally organized along the lines of a federal republic: the owner, or shopping-center management, represents the federal government; the tenants, the different states. Certain laws and institutions serving the overall interest will be administered by the management; others can be, and should be, left to the tenants. In most instances, the division of authority is a pretty clear one. There is usually full agreement that the store interiors shall be individually shaped by the tenant in accordance with his needs. There is mostly agreement that parking, landscaping, utilities, general upkeep, and maintenance should be taken care of by shopping-center management. But there is one area of conflict—storefronts and signs.

Architects who have worked on store design will always stress the point that each individual store needs an individual expression on the outside. Some merchandise calls for open fronts, other products for big show windows, still others for small show windows. Some stores need vestibules or so-called arcades; others, just a straight glass wall separating exterior from interior.

There is no doubt that when each store is given the exterior treatment which best expresses its individuality and its merchandising methods, it will function best and, therefore, be of the greatest value to the shopping center as a whole. Individual storefront treatment should be encouraged, but this does not have to result in a disorganized appearance if a number of measures are taken to protect architectural unity.

One of these measures is the creation of the basic architectural elements which form part of the over-all design of the center. Uniform roof lines, parapet walls, canopies, colonnades, exposed columns, and color schemes must be strong and clearly defined. The more strongly the over-all character is stressed by architec-
tural means, the more liberal can be the policy concerning individual expression in store exteriors.

For instance, the Victor Gruen organization has used the colonnade instead of a cantilevering canopy in many cases, because it seems to offer two advantages: It provides a strong rhythmic architectural element which gives character to the shopping center itself; and, it permits the establishment of the storefront line in an area where no columns occur, so that complete freedom concerning store sizes and storefront treatments is achieved.

Another measure is architectural control of tenant storefront design. This control should be anchored in the lease and should not only provide a clause requiring all plans to be approved by the owner, but should also give the tenant a clear indication of the requirements which the owner will consider desirable and on which approval or disapproval will hinge.

A similar policy should prevail concerning tenant signs. It seems to us of utmost importance to keep tenant signs rest to the storefront areas of the individualants themselves. On the other hand, est freedom, within the bounds of good and sound construction, should be given the tenant signs which are attached directly to the storefront. They should be subject to architectural control, but here too, the tenant should be told in the lease, not only that the owner’s permission is required, but also the considerations on which granting or refusal of such permission be based.

**Typical Lease Clauses Governing Architectural and Construction Standards**

**General Principles.** In establishing architectural and construction standards, the management is guided in this matter by the belief:

That a shopping center is basically an expression of the effort of many individuals to co-operate with each other to achieve the highest degree of service for their customers and, from this, the most profitable operation for themselves.

That this co-operation will find its clearest expression in the public services provided by the shopping center, and in the exterior appearance of the individual stores.

That the individual stores contribute most to the total visual effect of the center if they, on one hand, maintain individual expression and thus add interest, variety, and color to the total project and, on the other hand, relate harmoniously to the general character of the center and to their immediate neighbors.

That an integrated shopping center is a place to which prospective shoppers come with the express purpose and intention of shopping; therefore, the large flashy signs, loud color scheme, noisy designs, deep arcades (which are necessary in downtown areas) can be forgotten.

That the shopping center itself, by virtue of its size, public features, and general advertising value, offers each tenant the opportunity to keep his storefronts and, especially, signs simple and in good taste.

The management believes that these principles are not only in the best interest of the shopping center as a whole, but will provide the greatest benefits for the individual tenant, and that the guiding motive in the development of the tenant storefront should be conformity, but not uniformity.

**Therefore:**

1. All entrance doors must be recessed in such manner that the door openings to the outside will not cross the general storefront line.

2. Arcade fronts are to be considered undesirable and unnecessary; however, if in some special cases, an arcade front shall be held necessary by the lessee, then the depth of the arcade will be limited to its width.

3. To secure a clear separation of one tenant store from the other, and to avoid possible clashing in materials and treatments, there will be a neutral strip between each store of a minimum of 12 inches in width. The center line of this neutral strip will coincide with the line defining the leased spaces.

4. To avoid areas which will not provide points of interest to pedestrian customers, blind walls more than 20 feet in length will not be permitted. The break separating blind wall areas must of a major character, such as a glass-wall view into the store or a large-scale show window.

5. Signs should be regulated as follows:
   a. All designs for signs shall be subject to approval by the owner.
   b. Signs shall be of substantial, easily maintainable construction and conform with all regulations of the Building Code.
   c. No sign or any part thereof shall be higher than 4 feet.
   d. The location of signs is restricted to the storefront proper.

6. No storefront or any part thereof shall project beyond the lines described on the leased premises, with the exception that signs may project beyond the general storefront line not more than 6 inches.

7. The center provides general storm and weather protection by covered color to the total project and, on the other hand, the installation of awnings furnished by the owner for each store located before the center. In such cases, the awning must carry a standard, uniform sign panel, bearing the name of the store located behind the awning. Individual awnings will not be permitted; however, the installation of different colors, and materials used, to the greatest extent possible, and shall be consistent with the general scheme of the center.

8. It is the desire of the management to give the tenants the greatest possible freedom in the choice of colors; however, materials must be fireproof and lend themselves to easy upkeep and maintenance, and must be available in pleasant, orderly and convenient colors.

9. It is the desire of the management to give the tenant the greatest possible freedom in the choice of colors. However:
   a. Colors must harmonize with the general scheme of the center itself and, especially, with the columns of the colonnade.
   b. Colors must harmonize with the general scheme of the surrounding stores. To this end, a general color range developed, with a sufficiently large setting to permit a wide latitude of individual expression.

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THE SHOPPING-CENTER STRUCTURE

lection of the structural framing for shopping center project is affected by factors. Some of these are constant; however, vary greatly in relative importance from project to project. A general study of the problem will lead to a recommendation for one presystem, but will help to establish basic relationships characteristic of the project. Such a study will also indicate the most recent developments in structural design promises most for development and application to shopping-center framing.

We shall list the most important factors affecting structural framing and briefly examine their influence on the selection and development of framing schemes.

size of project

A small shopping center, especially if located far from a large city, will probably be best framed by the conventional methods prevalent in the region where the center is located. Imagination in applying such common systems as trussed rafters, open-web steel joists, or beam-and-slab concrete framing can bring entirely satisfactory results. On the other hand, a regional shopping center, located where competitive, aggressive, and experienced contracting firms are available—covering several hundred thousand square feet of floor area, and designed so that a repetition of typical elements will occur on a large scale—offers an excellent chance for an investigation of the most ad-

Figure 1—domed roof 222' in diameter for Jordan Marsh Store, Shoppers' World, Framingham, Massachusetts; Ketcham, Gina & Sharp, architects; Severud-Elstad-Krueger, engineers. Impressive, column-free area.
advanced design techniques and for original developments conceived to most satisfactorily answer the requirements of the largest number of effecting factors. In such a case, the investment in design and construction experimentation will be well justified by the possible economies and advantages achieved.

**location of project**

Location will effect structural design in several ways. Differences in building codes (particularly the reluctance of some building departments to accept new techniques of analysis or tests, or of departing from obsolete and arbitrary restrictive rules) may penalize the use of certain materials. Climatic differences evidently bring complex and controversial influences. The supply of some materials is also affected by geographic location. The economical availability of good quality lightweight aggregate for reinforced concrete is, for one example, geographically limited for the present by the high cost of transportation for a material of such bulk. Further, established habits of local contractors have to be accounted for. There are still several areas where precasting techniques are frowned upon as something very daring and experimental.

**physical characteristics of site**

These characteristics are likely to govern the selection of the foundation system. Where unusual soil conditions are encountered, site characteristics represent an important secondary factor effecting the selection of the framing for the superstructure.

The foregoing factors, of course, are not peculiar to shopping centers; however, they combine with the more specific ones (which follow) in effecting the final selection.

**selection of column spacing**

There are three primary types of buildings generally present in a large shopping center:

1. The typical row-type building. These are one or two stories high, 100' to 150' in depth, and will accommodate tenant stores of different widths.
2. The special-purpose-type building. Accommodating major department stores, these may be multistory and, in general, have a compact plan shape.
3. The supermarket-type building. Usually one story high.

All of these, from a merchandising point, will benefit from complete elimination or, at least, reduction to a minimum of interior bearing supports. On the other hand, long unobstructed spans, if feasible from an engineering standpoint, undoubtedly conflict (especially for floor framing) with the primary underlying factor of cost of construction. Cost has not been mentioned simply because, with economic framework representing the presence of a shopping center, it effects others.

At present, very large clear spans economically feasible for roof framing. Large spans, up to 200' or 300', are achieved by means of trusses, arches, frames, and, more dramatically, by means of domed structures of thin concrete or structural steel framing (Figure 1). On the other hand, it is very likely that existing concepts in department store planning enabling great framing depths without
'ul space, or new structural develop-
such as the practical application
osition techniques for concrete,
low an increase of economically
column spacing beyond the present
rs. It is unquestionable that the
challenge facing engineers concerned
hopping-center framing is the de-
ent of economical as well as struc-
sound larger spans. In general, it
found that merchandising layout
artment-store-type buildings sug-
n even spacing in both directions.
concrete construction (for which
ly interesting optical methods of
etermination have recently been de-
lends itself for column spacing up
30'. For larger spacings (or,
present restrictions, for maximum
y of reinforcing steel) concrete-
type flat slabs are very satisfactory
2). Were it not for the present
ions, however, structural steel would
vide a very competitive type of
especially with an increased use 
welding to create continuity of both
and horizontal members. The re-
cently completed Robinson's Store in Be-
verly Hills achieves a remarkably light steel 
framing on a 32' x 32' typical column spac-
ing (Figure 3). In fact, it is likely that ad-
anced structural steel design, exploiting
continuity in a multi-directional way rather
than as the obvious linear extension of the
traditional two-way simple-span riveted 
framing, will soon find successful applica-
and allow lighter framing for longer 
spans (Figure 4).

For the typical, row-type buildings that
are sub-divided into leasable units of nar-
row frontage and considerable depth, it will
be found preferable to minimize the num-
ber of interior supports by maintaining a
longer column spacing in a transverse di-
rection and a narrower spacing in a longi-
tudinal direction. This solution suggests a
two-way framing which, if less economical
than flat-slab construction, offers another
advantage—that of framing flexibility.

For the supermarket-type building, if
present in the project as a separate unit, it
is desirable to span the roof as a clear span,
if for nothing more than to meet the de-
mand of the supermarket operator who
often objects to having his counter layout
dictated by column spacing. Wood trusses,
lamella framing, or glued laminated-wood
arches offer reasonably inexpensive solu-
tions for clear-span roofs.

framing flexibility

Of all the factors effecting the selection of
a structural framing method, its adapt-
ability to alterations is perhaps the most
specific consideration. Maximum flexibility
is required for the typical row-type build-
ging for the following reasons: (1) not all
of the space may have been leased by the
time the center is under construction or
completed; (2) changes of tenancy will
undoubtedly occur, in time. It is often de-
sirable to provide for future vertical expan-
sion, rather than by the addition of new
ings or buildings. In this manner, the
delicately balanced plan pattern of the
shopping center need not be disturbed.
Thus, it becomes important that the floor
framing and the roof framing, if designed
for possible floor use, allow for the future
openings of shafts for stairs, escalators,
ducts, elevators, etc., without creating ma-

Figure 3—continuous field-welded steel
frame for Robinson's new Beverly Hills
store in California (right); Pereira &
Luckman, architects.

Figure 4—detail (left) of welded connection
for columns and girders in field-welded
steel frame of Robinson's Beverly Hills store.
Figure 5—all-precast framing system for the J. L. Hudson Company's tenant buildings at Eastland Center, Detroit, Michigan; Victor Gruen Associated Architects & Engineers.

Figure 6—design for tenant buildings of project in Detroit (same owners, architects, and engineers as design above) which is a compromise between cast-in-place and precast elements, in order to conserve steel.
ructural difficulties. Changes of this nature will not occur frequently enough, or, to warrant an excessive investment to achieve absolute flexibility. An absolute framing flexibility is to be sought; too much flexibility is not suitable for alterations.

reinforced concrete does impose limitations on flexibility. Flat-slab con-
struction does not lend itself successfully to the sitting of openings after construction. This technique seems to present possible economies as well as excellent qualities of flexibility. In the first project (Eastland), the framing for the typical row-type building has been detailed for all-precast construction—entirely eliminating scaffolding and formwork. The framing consists of 18" x 18" precast columns, spaced 36' on center, which support 18" wide double-cantilever girders spaced 20' on center (Figure 5). A specially designed connection detail allows for ease of erection and at the same time re-establishes a high degree of rigidity between girders and column. Spanning the girders are typical precast 4' wide channel panels of 21/2" slab thickness. The two bays between the end of the girders' cantilevers are also framed with typical channel panels; however, they span in a transverse direction. With this system, it is possible to provide at any time for stair or other openings, in either direction, by simply removing one or more typical panels. An all-precast system, though offering the most satisfactory solution for such a large site project, does not achieve the highest economy of reinforced steel—the price is paid for flexibility at the expense of continuity!

For the project presently being detailed (Northland), a compromise solution was adopted in an effort to achieve the maximum saving in steel tonnage. The framing will consist of cast-in-place, continuous, deep-ribbed pan construction throughout, except on the two interior, center bays where most of the foreseeable future openings may be located. These are framed by means of precast concrete joists, supporting a 21/2" cast-in-place slab (Figure 6).

During the preliminary studies, the feasibility of using prestressed elements was investigated. It was found, however, that the high ratio of live to dead load for floor construction penalized the design of continuous elements. It was also felt that the absolute lack of flexibility of a framing system employing prestressed elements would prevent its adoption. Even if additional supports were added to such a framing system, it would be impossible to cut through a prestressed girder. It is possible, however (especially for roof framing where flexibility is not demanded), that prestressing large-size, precast units and applying the strands to the full length of the building, to minimize the cost of anchoring devices and stressing operations, may lend itself to very significant developments in the search for economical long-span framing.
For department store buildings where large, undivided floor areas are demanded, Class I construction will be required for all but the smallest projects. Either reinforced concrete or fireproofed structural steel can be used. Developments in lightweight fireproofing and in lightweight aggregates for concrete topping are in favor of structural steel framing. On the other hand, the need for flexibility on store ceilings—where lighting fixtures, air-conditioning outlets, and other inserts may need relocations and additions—makes it almost mandatory to divorce the fireproofing ceiling from the finished ceiling. It may, therefore, often be more economical to adopt a basic reinforced concrete structure with finished ceiling suspended directly.

For the typical row buildings, where the total floor area can be divided into smaller units by using firewalls or separations between tenants, the selection of framing systems becomes more complex. This is because differences in fire ratings and consequent insurance costs have to be projected against differences in initial construction costs. Furthermore, the introduction of sprinklers—a reasonable enough investment—will considerably reduce the insurance cost of systems with otherwise high rates. Thus it becomes impossible to give any rule of thumb. In case an exhaustive comparative analysis will have to be made to determine the most economical solution. It is possible that, under certain circumstances, wood framing—in the form of arches, trusses, glued-plywood-box girders for roofs used in combination with structural steel or concrete girders for floors—may well prove to offer an entirely satisfactory solution.

owner's or tenant's specific requirements

These, of course, are highly unpredictable. It has been mentioned that some supermarket tenants will not consider anything but a clear-span roof. The clear-span domed roof over the main department store at the Framingham center has also been cited. It is unquestionably a desirable luxury to have an uncluttered area of such size within which to develop the merchandising layout. Yet, other major stores have been successfully planned on the basis of conventional open-column spacing. The conclusion: that the asset of clear span is evaluated with different factors by different tenants.

After having thus surveyed the influence of general factors on the selection of a structural system, a brief mention can be made of some specific framing problems that are characteristic of shopping center projects. It is accepted almost mandatory that a covered pedestrian sidewalk be provided at the periphery of the store buildings. It is also very desirable to eliminate all columns from the storefront line of typical row-type buildings in order to allow for maximum flexibility in the subdivision of tenants' space and in the design of storefronts. This problem can be solved either by recessing the columns a reasonable distance inside of the store space and cantilevering the horizontal framing, or by providing colonnade columns at the outer edge of the sidewalk. Aside from architectural considerations that may influence the choice, it can be noted that the first solution, involving cantilevers of considerable span, is more appropriate where the typical interior transverse column spacing is also very wide. The second solution, on the other hand, lends itself satisfactorily to any selected column spacing.

If the shopping-center plan is developed around a covered mall, there arises the problem of how to roof (elegantly) the public promenade. The use of long-span, precast elements—possibly prestressed—having integral—glass inserts, so that natural light will not be excluded, may lead to interesting solutions.

If truck tunnels for underground service delivery are a part of the project, special framing problems will unavoidably occur. It should be noted that often a large portion of the structure's total cost is represented by special conditions of this type. As a thorough analysis of the typical Investigating system is necessary to the selection of the most satisfactory and economical structure, so ingenuity and sustained effort applied to the design and detailing of subsidiary elements, is needed to avoid the disadvantage of some features of the project, otherwise very desirable, may become excessive economic burdens.

In view of the fact that so many concepts are still at a fluid and form stage, the creative collaboration of architect and engineer is vital in the design of shopping centers. Inventiveness of daring are as must bound by consideration of economic necessity as spurred by the magnitude and the extraordinary potency of the problem. The shopping center, again, to modern man, the values of the old-time plaza or the country mall order, well-scaled environment and relaxed activity that were characteristic of our downtown civic experience! To make such a place efficient and effective yet aesthetically pleasing, the combined, interplaying imagination of architects and engineers is a challenging task.
special problems introduced in the selection of materials for a shopping center related principally to those portions of the building directly affected by tenant occupancy, which would be sensitive to alteration with a change of tenant and, more or less, as the criteria for selecting certain materials are concerned—unaffected by the consideration of flexibility—are not significantly different from other building types.

familiar problems exist—some of which are becoming more important because of the special use of the buildings—and are by the same analysis that the architecturally makes of existing conditions or any building. Cost, appearance, utility, size of project, adaptability for the various structural systems, duration of erection, climatic conditions, and maintenance factors—these considerations must be recognized in varying importance for all buildings, shopping centers the maintenance, in particular of those materials exposed to contact with the public, are more significant because of the intensity of traffic at certain hours every day. In the selection of interior materials, the color and texture should be used but not garishly and materials offer a wide range of color and tessellation should be sought.

selection of materials for a shopping center presents possibilities which are almost unlimited, we shall make this study of a specific center—the J. L. Company's Northland, in Detroit, Michigan, which materials have been selected considering all of the factors previously mentioned.

1st architectural-concrete facing have been specified for the large wall areas of the major department stores as well as for the fascia on the covered walkway canopies, decorative panels in storefronts, and panels in the pavement of courts and malls. This precast architectural-concrete material was found particularly adaptable for the exterior wall panels of the department store. A sandwich panel 6" thick, consisting of two 2" layers of concrete enclosing a 2" layer of cellular glass is being used. Any desired color or texture is possible for the exterior and the interior side will be finished smooth, ready for painting. The panels are 4'-6" x 24'-0", reducing the number of troublesome joints to a minimum.

The exterior free-standing columns supporting the canopies and covered walks will be of reinforced concrete faced with a vitreous cement-enamel finish. Here, a variation of color was required in a material easily maintained and durable. The colonnade surrounding each court or mall area is in a distinctive color, identifying that area and establishing a unifying framework for the varying treatments of the storefronts which face it. The edge of the colonnade roof will be precast panel-facing throughout the center helping to knit all the elements into an integrated composition.

Splashes of bright color will be introduced into the permanent features of the court areas by ceramic-mosaic tile walls for orientation maps and directory panels in strategic locations.

In the selection of interior materials, the concept of flexibility assumes an important role, and those permitting relatively quick and economical alterations to the tenant spaces should, when practical, be selected. It is customary for the owner to provide the tenant with finished floor, finished ceiling, and finished walls enclosing his space, in addition to the necessary stairways, toilet facilities and access directly from his space to shipping and receiving services provided for the center, whether at basement or grade level. Within this space, the tenant then provides any additional walls, curtain walls, fixtures, and any finish materials which deviate from those furnished by the owner.

A mastic-tile finish floor is the best type for the owner to provide consistent with economy, durability, and good appearance and one which many tenants will regard as acceptable without further expenditure on their part. It offers as much flexibility as is possible in a floor finish, and is easily replaced or matched to suit the changing requirements of the tenant.

Ceilings should be of acoustical tile on a suspension system designed to provide maximum adaptability to change. Recessed light fixtures and air diffusers demand this flexibility and it should be possible to provide new openings and close old ones quickly and easily.

The importance of a dry-built ceiling installation in a shopping center cannot be stressed too strongly. Constant changes are being made in fixture layout and curtain-wall location; these changes reflect themselves in new lighting, air diffuser, and sprinkler layouts. Changes in the ceiling must be made quickly and cleanly so that the merchandising operations can proceed without the mess and bother attendant when plaster is torn down, patched, and painted.

In Northland Center the owner will provide an asphalt-tile floor through the merchandised areas and a cement finish on concrete slab in storage and utility areas. The ceilings in selling areas will be a standard acoustic tile applied with mastic to rock lath on a standard metal suspension system. Since the buildings at Northland are of reinforced concrete construction, a fire-resistant ceiling is not necessary. Walls installed by the owner, separating the leased spaces, will be of gypsum-tile construction, plastered and painted. The employees' toilet rooms for each tenant (which are part of the owner's work) will have terrazzo floors, ceramic-tile walls, suspended plaster ceilings, and flush-type metal stalls. Stairs will be standard pan type with channel stringers and abrasive finished-cement treads.
Provision of a central heating and air-conditioning plant will eliminate a multitude of scattered stacks and superstructures. The single plant can be unified in design with the total. Eastland Center (below) by Victor Gruen.

The heating, ventilating, and air conditioning of a preplanned, integrated shopping center is actually one of the most challenging aspects of the project. It is challenging because the possibilities for efficiency in installation and operation, which are inherent in a co-ordinated project, can not be realized without a complete change in the traditional owner-tenant relationship and division of responsibility.

Historically, the problem of heating and air conditioning store buildings has been managed in a haphazard way largely through expediency rather than upon a logical basis. The owner generally built his building with a particular tenant in mind. It was his responsibility to provide the heating plant—the tenant provided the maintenance and operation. If a tenant wanted air conditioning, the owner sometimes, and sometimes not, provided the duct work and the enclosures or supports for the air-conditioning equipment. The compressors, the air-handling equipment, fans, evaporative condensers, etc., were supplied by the tenant. Mechanically, this wasn’t too bad a situation and it was possible to have a fairly efficient installation, if the tenant and the owner got together before the building was quite complete.

Architecturally, the results have not been so happy. The typical one-story development store carries asuperstructure almost as impressive as the building ducts run all over the roof and even stacks, boiler flues, air intakes, evaporative condensers, or water towers are arranged in a totally haphazard and disorganized fashion.

So long as each store in a group is to be the property of a separate owner, the only relationship between stores was by party wall; the problems of expansion, alteration, and change were considered as horrors to be faced, or there was no incentive or real reason to change this not too efficient pattern.

But the preplanned regional or shopping center has introduced a number of new factors. In the shopping center, the typical tenant building is not a little building all strung together
one large building, sometimes 400’ long, uniformly designed, con-
ded for maximum efficiency, and cap-
be built in many ways to suit
requirement of a multitude of
This element of being built
once, and the ability to adjust to a
of occupancy shapes and require-
suggests the possibility that the heat-
air conditioning might be conceived
same basis—that there might be ad-
es in cost of installation, operation, ainta
ance to be achieved by pre-
gr this part of the center.
ourse, it would be possible to wait
le building was rented and, as each
s requirements were established, to
the heating plant and the duct work
traditional basis—modifying the
; adding superstructures on the
recting a scattered pattern of chim-
But the only reason for doing this
be to maintain the tradition, to fol-
he pattern, without establishing
r the old pattern is right for the new
of the shopping center.
y aspects of the old system are not
ible with the aims of the planners
ners of the modern, integrated shop-
center. Their desire is not only to
convenient shopping, but shopping
most pleasant and attractive atmos-
possible. The integrated, preplanned
building achieves order and uniform-
s a disciplined shape to house the
ality of each tenant as expressed
storefronts and signs. As these
gs are set back from the street, sur-
ed by parking, and therefore visible
stance, a disorganized array of roof-
ent would not enhance the appear-
or would smoke and fumes from
chimneys improve the shopping

an alternate to this traditional, expe-
approach to heating and ventilating,
planned building offers the opportu-
provide a central heating plant and
air-conditioning plant of sufficient
ly to accommodate the needs of all
s within the building. However, as
cept of the central plant departs
completely from the historical owner-tenant relationship of cost and responsibility, it must be compared carefully with standard procedures and practices so that its advantages are clearly established.

This examination and comparison should be carried out from four points of view:
initial cost, operating cost, flexibility, and the effect on the architectural design.

To determine the initial cost is relatively simple. Take a typical tenant building, fill it with a theoretical occupancy of stores and:
(1) design a central system with the necessary distribution lines and ducts to serve the occupancy; (2) design an individual local system for each tenant in accordance with standard practice; (3) estimate the cost of each. Our experience has indicated that the central steam plant, serving a large group of tenants is, from a capital-cost point of view, more expensive than the sum of the individual plants in spite of the multiplicity of units, stacks, etc., involved in the local units. This appears to be due largely to the special character of central equipment as compared with the mass-produced individual units; and to the complex character of a central installation as compared with the simplicity of the installation of individual units.

An examination of operating costs, however, yields very different results. The maintenance, supervision, and fuel consumption of 10 to 12 individual units total approximately twice those of a central plant serving the same number of tenants. This engineering evaluation is borne out by the experiences of industrial plants, apartment house groups, etc., which have been converted from multiple to central installations.

To date, it has been impossible to confirm these operational estimates by figures from stores or chains that operate and maintain individual units, because the common practice of lumping electrical costs, service, and maintenance into the store operation, and of using either sales or management personnel for the operation and supervision of the boiler units.

As far as flexibility is concerned, there is no question that the central plant has advantages for the owner that the scattered individual tenant plants cannot hope to match. Changes in occupancy requirements, due to changes in merchandising activity or to the introduction of new units, can be met without structural change, and with only a minimum of mechanical alteration.

From a architectural point of view, the central system has many advantages: the elimination of a multitude of stacks, the localizing of the mechanical installation in one area, the opportunity of effective smoke control, and the simplification of framing by elimination of stacks. And for the tenants there is a distinct advantage in the actual saving of space—the area which would be occupied by boilers, fuel storage, and related equipment is released for merchandising or the processes necessary for merchandising.

For the landlord, the weighing of these four factors poses an interesting choice. The central plant costs more to install than the individual systems. The maintenance and operating expenses, which were formerly the burden of the tenant, must now be assumed by the management and distributed to the tenant on some equitable basis, such as the metering of the steam. The typical tenant has to be satisfied that the metered rate he is paying for the steam represents a lower heating cost than he would pay with an individual system. Yet there is difficulty in establishing what the tenant’s cost would be with the individual plant because there are no clear records of this cost. The tenant must realize, however, that the diversion of man hours from the operation of the equipment to the actual management and selling operations of his store cannot be ignored, and that hidden maintenance and operating expenses are bound to be eliminated if shopping-center management assumes this responsibility.

The case for air conditioning is similar, but perhaps more complicated.

Air conditioning is not as simple a matter as the provision of steam. Tempered air can be produced in a number of ways. The central refrigeration and air-handling plant could easily supply the required volumes.

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materials and methods
of tempered air to all the tenants in a building. But it is difficult, from a central plant, to adjust to individual requirements in any fashion other than by increasing or decreasing the volume of air in each space. If booster coils are provided, the system immediately becomes special. Tempered air can be provided by supplying chilled water from a central refrigeration plant to zoned, air-handling equipment units, each of which will serve a limited area. The chilled water can be metered on a thermal basis, and the air-handling equipment will be operated by the individual tenant as he requires. Or the central plant could produce only condenser water, which would be piped to zoned compressor locations. There are others, but these are the basic central-plant variations.

Each of these three must be completely laid out with their related duct work, electrical installation, etc., in order to establish a fair basis of comparison. And in making the examination and comparison, again the four factors involved are: initial cost, operating cost, flexibility, and the effect on architectural design.

Initial cost can be determined by laying out individual systems in accordance with standard practice for a theoretical pattern of individual tenants, and three central system variations designed to serve them all.

Our surveys have indicated that, from a total cost point of view and considering a group of approximately 12 stores, the initial cost is almost a toss-up with the central plant, providing tempered air adjusted on a volume basis, having a slight edge.

Our examination of the projected operating costs of the four possible situations shows the central refrigeration and air-handling plant providing total tempered air to be by far the most efficient. One of the principal reasons for low-operating cost of the central plant is that, while it is no longer unusual for a typical one-store installation to require and use more than 20 tons of refrigeration, local ordinances and controls now generally require the continuous presence of a first-class engineer for any installation of 20 tons or more. This means that six to eight engineers would be required continuously if the regulations are adhered to, whereas only one engineer with a helper would be necessary at the central plant.

Here, again, cost figures on individual installations are hard to check: condenser water is generally thrown away and lumped into the water bill; electrical consumption is buried in the total; most operating stores ignore the regulation requiring a registered engineer, and the same manager who operates the steam plant fiddles with the air-conditioning unit.

There is also the problem of distributing costs. Steam consumption can be easily metered—air flow, only with difficulty. And to distribute the cost simply on a square footage basis can result in inequalities because of differing hours of operation.

In considering flexibility, there is no question that the central plant has great advantages. Changes in merchandising techniques often introduce increased lighting loads in an individual store and require brand-new or additional cooling equipment; with a central plant system, however, the extra cooling can be supplied without additional equipment. Changes in store occupancy also can be accomplished with little or no structural or mechanical problems.

Architecturally, the central plant is a boon. The superstructures are gone from the top of the building. There are no exposed ducts crawling over the roof. Intake and exhaust stacks can be centrally located and specially treated. And, for the tenant, the space advantage gained from the elimination of the individual boiler plant is repeated by the elimination of the space required for the compressors, condenser fans, etc., thus increasing his usable area and giving him a larger net area available for actual merchandising.

In addition to these purely theoretical considerations of cost and flexibility are limiting factors that may be dictated by local facilities or conditions special to the location of the project. It is possible, even probable, that the sewer capacity available to a suburban shopping center will be sufficient to permit total discharge of condenser water into the system. These circumstances, evaporative coolers or cooling towers which permit evaporation of condenser water, are limiting factors that may be imperative. Or the supply may be limited in the general area, and, for conservation reasons, the condenser water restricted.

Where these conditions exist, our findings have indicated that the capital cost of a central plant is considerably less than the capital costs of a series of individual boilers each requiring its own water supply, evaporative condenser; further, the multiplied space lost where each tenant satisfies these special requirements is expensive and imposes a burden on the one who must rent this space. (It also decreases the opportunities of profit to the owner, because this space is totally lost to him and so must affect the percentage payment.)

The decision on the method of handling air conditioning on an integrated basis is obviously a complicated one both for the owner and the tenant. If a central plant is introduced, a large item of capital normally borne by the tenant, is completely eliminated and must be expressed as a change in the rental structure or cost to the tenant on some fair and equitable basis. Either of these alternatives will result in a major departure from the rental pattern.
enced in other kinds of store location and may be difficult to negotiate—particularly if the tenant may not be satisfied that the central plant means savings.

Then, there is the question of the operation costs normally borne by the tenant must, in a central plant, be carried by management and distributed to the tenant on the basis of his consumption. With central cooling and air-handling plant, the individual tenant's consumption by volume of air is, at present, unequally distributed. The distribution of costs on a per-footage basis has many inequities since the volumes required by different degrees of occupancy will vary greatly.

Operation costs of a central, chilled-water plant can be fairly and equitably divided where the zoned consumption of water by the individual tenants can be metered on a thermal basis. But the heating and maintenance costs are increased because of the necessity of zoned air-handling equipment. It is also possible to meter the consumption of condenser water. But in this installation, the increased number of compressor units vastly increases the rational and maintenance costs and, to a large extent, fails to realize the advancement space saving, etc., offered by the plant.

Northland and Eastland Regional Shopping Centers in Detroit are being developed with central-heating and central-ratio plants. In making their decisions, the owners agreed with the architects and engineers that the advantages in utility, efficiency of operation, improved appearance and shopping comfort, and the saleable space made available for merging, more than compensated for increase in cost. These advantages are passed on to the tenant.

in conclusion

We—the Authors and the Editors—hope that this issue of Progressive Architecture has offered something helpful and useful in understanding the problems raised by that new building type, the shopping center. In conclusion, we would like to re-emphasize three points:

First, there has seriously been a desire to avoid definite "instructions" and dogmatic statements. If there is anywhere an appearance of such, it should be taken as a case study of one or more projects, rather than a general rule to be followed.

Second, interrelationships of factors are so important, especially in the economic aspects of shopping centers, that one can easily change another. For example, even the "trade area" cannot be defined except in relation to the physical design, and the selection of tenants.

Finally, the point made in the opening pages of the issue—that a modern shopping center can be a cultural and social center as well—may have been lost in the technical discussion through the study. This important aim should not be lost sight of: if it has not yet been attained in any completed center, it remains a possibility and a goal to work for.
interchangeable over-all lighting

Smithcraft's Area Illumination, a complete fluorescent system, represents an entirely flexible approach to over-all lighting. The method gives the architect, designer, and engineer full freedom in lighting design for areas of any size or shape, with a limitless choice of pattern, shielding, and intensity.

In principle, the system consists of two sets of grids of flexible dimensions, one positioned directly above the other. The upper set of grids forms the lighting panel and contains all the electrical components. Parallel electrical housings are furnished with as many lamp holders as needed to create the desired lighting level. While the lamp spacing can vary every 3", the manufacturer believes that 12", 18", 24", and 36" spacing will meet most demands. The installed or completed lengths of these housings can be any dimension from 2' to 200' or more.

The lighting panel may be fastened directly to, or suspended from, the building structure by movable support brackets which can be adjusted by as much as 4" in each direction—a total of 8" for the variations, discrepancies, and constructions found in almost every building.

air and temperature control

Vaporizing Oil Burner Wall and Floor Furnaces: complete new line provides full automatic heating for small houses; each unit equipped with electric ignition system that controls combustion and temperature without need for pilot light, eliminating extra fuel consumption. Available in models suitable for shallow pit, basement, or wall-recessed installations; units may be set safely against wood. Capacities range from 50,000 to 85,000 Btu. Iron Fireman Mfg. Co., 3170 W. 106 St., Cleveland 11, Ohio.

Power Exhauster: up Blast-type, ready for installation, with exceptionally low silhouette designed to cut down danger of overturning; largest model, rated at 22,000 cfm, stands only 54" high. High-tensile cast aluminum fan blades follow latest development in airfoil design. Totally enclosed motor. Gallaher Co., 4106 Dodge St., Omaha 3, Neb.

Automatic Heating Plant: designed for low-priced, small homes. Interchangeable unit is designed to accommodate oil or gas burners; in spite of compact size—22" square—furnace will heat, humidify, filter, and circulate warm air to every room. Rated capacity of 80,000 Btu with .75 gph oil input, and 65,000 Btu with 82,000 Btu gas input. Majestic Co., Huntington, Ind.

Model 2000 Thermobloc: gas- or oil-fired industrial heating plant, capable of 2 million Btu per hour, with normal air output of 22,000 cfm. Equipped with twin heat exchangers, four diffusers that can be rotated a full 360° to any position desired, and blower fan powered by 10 hp motor. Unit requires less floor space and head room than most conventional space heaters. Prat-Daniel Corp., Thermobloc Div., 2 Meadow St., South Norwalk, Conn.

"Water-Saving" Air Conditioners: new line of medium-tonnage, self-contained units designed to meet most municipal regulations on water consumption and disposal; completely wired, piped, dehydrated, charged, and tested for operating conditions specified for each individual job. Produced in 15 and 20 ton capacity ranges to serve offices, super markets, banks, restaurants, and other commercial and industrial applications. Trane Co., La Crosse, Wis.

Unitaire Air Conditioner: 10 hp, self-contained unit, encased in thermally and acoustically insulated cabinet, is 91" high when top mounted, and 61" x 32" at base, making it ideal for fitting into recesses to save floor space. Two double-inlet, 12" fans deliver 4000 cu. ft. of air per minute; adaptability for heating is provided. Unit is suitable for offices, stores, and other applications calling for economical air conditioning. Westinghouse Electric Corp., 200 Readville St., Hyde Park, Boston 36, Mass.

construction

Sti-Color Shingles: asbestos-cement siding with striated, embossed surface, available in brown, gray, or green. Special "Durah-Shield" factory finish helps to repel water and resist staining. Flintkote Co., 36 Rockefeller Plaza, New York 20, N. Y.

Adjustable Welding Connector: new, adjustable clip offers ¼" adjustment which facilitates erection of welded-steel, multiple-story building construction; is claimed to save steel, produce fabrication economies, and speed erection. J. H. Williams 400 Vulcom St., Buffalo 7, N. Y.

doors and windows

Full-Vision Rolling Door: rolling door now furnished with windows, 12 20", or 24" in height and 20" in made of aeroplane plastic lights shaped to assemble with coil door. Windmits clear, unobstructed view of e and interior, admits light to aid in co ing truck movements; may be installed existing rolling doors as well as in Cornell Iron Works, Inc., 36 Ave. & Long Island City, N. Y.

Marmet Window-Wall Sash: welded inum sash, ready to install in frame, able in single sash width and height multiplets of 3 sash wide or additions tipes of 1, 2, or 3 sash and 1, 2, or high. Glass opening takes stock size mopane; equipped with operating hard Marmet Corp., Wausau, Wis.

Carrara Glass Plates: structural glass plates for doors, furnished in any re size in full range of colors. Permanent needs no polishing; can be kept merely with damp cloth. Pittsburgh Glass Co., 632 Duquesne Way, Pitts Pa.

electrical equipment, lighting

"Grid-Light": lighting system uses grid-like arrangement of precircled single-pin T12 slimline lamps, and Lielent plastic shields, designed for smooth mounting installations against flat ce of any material. System is said to im lighting efficiency, facilitate mainte
important advantage of these adjustments is that any adjustment, whether it is sidewise or lengthwise, up or down, is made after the erecting of the panel; which means that no exact dimensioning is required when attaching the supports into a poured-concrete ceiling structure. They also have the advantage of economy, since it is only necessary to secure them at dimensions of 8' x 3' to 4' specification, and make installation Recommended for classrooms, stores, drafting rooms, and similar localities. Benjamin Electric Mfg. Co., Des Plaines, Ill., Master Stand-by Light: automatic equipped with glass jar rechargeable and visible ball-foal hydrometer, s emergency light instantly when failures occur. Electrical components efficiently engineered for constantly energized duty. Choice of floodlights ed beam lamp heads. Unit can be for permanent location or supplied and plug for semi-portable installation Carpenter Mfg. Co., Somerville, N.J., PRM Lighting Fixture: fully d, luminous indirect fixture, develop M.I.T. engineers, reduces mainte-to minimum and assures long life usable-free operation. May be installed vidual unit or in continuous runs, le for two 40w fluorescent lamps, or 40w and two 60w dimline lamps. te Lighting, Inc., 3455 Bulver Ave., is 7, Mo. Spot Adapter: portable spot or flood-lighting, involving no installation ed for use in any porcelain receptacle and with swiveling des-11 suitable to wide variety of display cent lighting in stores, restaurants, nilar commercial interiors. Consists 1 housing, porcelain adapter recept-aluminum reflector, and concentric Silvray Lighting, Inc., Bound Brook, N.J., Circline Fluorescent Fixture: two-lighting fixture, of hard-baked enamel, has 8", 22w preheat type, standard-start lamp mounted inside 12", 32w instant-start lamp, both arranged so as to form concentric circles of light; decorative glass centerpiece fastened to fixture by knurled thumb nut. Suitable for applications in residential kitchens, bedrooms, hallways, bathrooms, as well as for commercial applications (small offices, waiting rooms, etc.) Sylvania Electric Products, Inc., Ipswich, Mass.

Finishers and protectors
Flow Kote: rubber-based flat wall paint, easily applied, durable, thoroughly washable, is thinned with water, acts as its own primer, and resists chipping. May be applied with brush or roller-coater without causing lap marks or streaks. Du Pont Co., 350 Fifth Ave., New York 1, N.Y.

Mason-Coat 310: one-coat, oil-based paint designed for decoration and protection against moisture infiltration, is applicable to interior and exterior surfaces of concrete block, cement, brick, stucco, and similar masonry surfaces. Available in white and several tints. United Laboratories, Inc., 16801 Euclid Ave., Cleveland 12, Ohio.

Insulation (thermal, acoustic)

Sanitation, water-supply drainage
Ideal Distributing Box: prefab, hexagonal distributing box of heavy welded steel, for sewage disposal systems; insures uniform distribution to entire drain field and is easily inspected at heart of system. When one line becomes clogged, remaining lines share load; one inlet and five outlets are sized for tight seal within standard field tile. Ideal Sanitation Co., 8552-A Montgomery Rd., Cincinnati 27, Ohio.

Specialized equipment
Meteorological Equipment for Industrial Site Location: newly-developed electronic wind-speed and -direction recording system provides means of accurate investigation into meteorological conditions affecting projected plant sites so that later corrections to plant waste-discharge operating procedure can be minimized. System makes recordings from threshold below one mph up to 30 mph, on standard pen-type, strip paper recorders. Unit is energized by its own ho-tency supply, weighs only 100 lbs. Beckman & Whitley, Inc., 1031 San Carlos Ave., San Carlos, Calif.

Surfacing materials
Colorbestos: large-sized asbestos-cement sheet, in random-ribbed pattern, for ex-terior siding of houses, comes in 32" x 96" x 3/16", covers large areas quickly, yet is convenient size for handling. Manufactured in strong colors of red, yellow, brown, green, and three tones of gray. Johns-Manville Corp., 22 E. 40 St., New York, N.Y.

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Editors’ Note: Items starred are particularly noteworthy, due to immediate and widespread interest in their contents, to the conciseness and clarity with which information is presented, to announcement of a new, important product, or to some other factor which makes them especially valuable.


3-149. You Can Build Schools Now, 12-p. booklet, on methods of using proven clay-masonry construction in schools to reduce use of steel to absolute minimum. Typical examples, photos. Structural Clay Products Institute, 1520 18 St., N.W., Washington 6, D.C.

3-150. Specifications for Vermiculite Concrete Floors, AIA 4-E-13, 12-p. booklet. Concise data given on use of vermiculite-sand concrete as fill over structural floors, as floor slab over supports on relatively close spacing, and as slab laid on ground. Specifications for vermiculite concrete floors on ground (with and without radiant heating units) that are topped with sand concrete. Drawings. Vermiculite Institute, 208 S. La Salle St., Chicago 4, Ill.

doors and windows


3-145. Architectural Uses of the Stainless Steels, AIA 15-E1. Photographic example of architectural applications of stainless steel and basic information about properties, availability, parts and sections, drawings. American Iron and Steel Institute, 350 Fifth Ave., New York 1, N.Y.

3-147. Window Magic, 16-p. booklet, including rotating color selector, illustrating many examples of drab window areas converted into decorative wall areas by color integration of Venetian blinds, draperies, and walls. Full photos, construction features of Venetian blinds, suggested color combinations for blinds. Levolor Lbr Co., 391 W. Broadway, New York 1, N.Y.

1-173. June-Aire, 4-p. folder illustrating operation of completely automatic winter air-conditioning system, available for light- or heavy-oil fuel, gas, or hand- or stoker-fired coal. Components, cross-section of heater room, system designs. American Foundry & Furnace Co., Dept. CV, Bloomington, Ill.

1-174. Anemostat Air Diffusers, AIA 30-J (Selection Manual 40), 64-p. revised booklet containing full technical data on selection of proper air diffusers for air-conditioning systems; complete new section on high-pressure units for high-pressure, high-velocity systems. Types, accessories, typical specifications, installation data, list prices, weights, contents table, photos, drawings. Anemostat Corporation of America, 10 E. 59 St., New York, N. Y.

1-175. How to Have a Carrier Weathermaker Home, 31-p. booklet outlining new way of planning homes, with freedom from many old technological restrictions, by means of installing air-conditioning system that cleans air, cools or heats it, and circulates it throughout house. Economic advantages, plans and other drawings, photos. Carrier Corp., 300 S. Geddes St., Syracuse, N.Y.


1-177. How to Have Comfort from Moving Air (1952), 200-p. revised and enlarged catalog providing data on heating, cooling, and ventilating equipment made by various manufacturers; includes air circulators and dehumidifiers, fans for all requirements, heating systems, oil burners, unit heaters, floor furnaces, clothes dryers, farm ventilators, etc. Illustrations, contents table, manufacturers' index. Torrington Mfg. Co., Torrington, Conn.


1-173. June-Aire, 4-p. folder illustrating operation of completely automatic winter air-conditioning system, available for light- or heavy-oil fuel, gas, or hand- or stoker-fired coal. Components, cross-section of heater room, system designs. American Foundry & Furnace Co., Dept. CV, Bloomington, Ill.

1-174. Anemostat Air Diffusers, AIA 30-J (Selection Manual 40), 64-p. revised booklet containing full technical data on selection of proper air diffusers for air-conditioning systems; complete new section on high-pressure units for high-pressure, high-velocity systems. Types, accessories, typical specifications, installation data, list prices, weights, contents table, photos, drawings. Anemostat Corporation of America, 10 E. 59 St., New York, N. Y.

1-175. How to Have a Carrier Weathermaker Home, 31-p. booklet outlining new way of planning homes, with freedom from many old technological restrictions, by means of installing air-conditioning system that cleans air, cools or heats it, and circulates it throughout house. Economic advantages, plans and other drawings, photos. Carrier Corp., 300 S. Geddes St., Syracuse, N.Y.


1-177. How to Have Comfort from Moving Air (1952), 200-p. revised and enlarged catalog providing data on heating, cooling, and ventilating equipment made by various manufacturers; includes air circulators and dehumidifiers, fans for all requirements, heating systems, oil burners, unit heaters, floor furnaces, clothes dryers, farm ventilators, etc. Illustrations, contents table, manufacturers' index. Torrington Mfg. Co., Torrington, Conn.
specialized equipment
19-245. P.A.X Business Telephone System (1735), 16-p. circular describing intercommunication system, composed of standard automatic equipment: required number of telephones, wiring, and switchboard (with associated power supply unit); suitable for all types of small and large organizations. Switchboard models, diagrams, photos, installation data, special services. Automatic Electric Sales Corp., 1033 W. Van Buren St., Chicago, Ill.

19-246. Acousti-Booths, AIA 35-R, (A-107), 4-p. bulletin. Full information on 4 types of floor and wall telephone booths, of steel and wood, with patented acoustical construction that reduces sound by 50%; suitable for any noisy location, such as bus terminals, power stations, railway stations, hotels, airports, drug stores, etc. Construction features, advantages, specifications, prices. Burgess-Manning Co., 5970 North-west Highway, Chicago 31, Ill.


surfacing materials


19-251. Formfree Decorated Wall Tiles (151), 8-p. booklet. Illustrations of glazed mosaic tile, 6" x 6", patterned with free, flexible designs, for use as decorative panels or large, continuous wall surfaces. Patterns, full-color plates, typical applications. Mosaic Tile Co., Zanesville, Ohio.
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(SEATTLE, WASHINGTON)
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Owner: NORTHGATE COMPANY
Architects and Engineers: JOHN GRAHAM AND CO.
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Front elevation of the central Bon Marche Store. Arrows indicate location of decorative inlet grilles which provide fresh air to the “YAC” Units.

Interior view of the largest building of the group showing outlet grilles and recirculated air inlet grille. Horizontal “YAC” Units are concealed within the ceiling.

Young sectional-design means greater ease in handling, installing, servicing . . . permits partial or complete air conditioning service from compact, economical units. Eight sizes, horizontal or vertical types, are designed for right or left hand installation. Catalog 7550 gladly sent upon request.
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interior design data

Restaurants

By Abraham W. Geller *

There must be a reason, other than a predominance of bad cooking, why the percentage of fail­
in the restaurant world is higher than in any other business enterprise. One suspects that the
muted reappearance of mock-Colonial and rococo settings; the inept combinations of materials,
'spurious; the wide use of banal murals and garish mosaics—all help maintain this percentage.
Exceptionally fine cooking will, in rare cases, draw patrons into strange surroundings. I have
for a number of years in a Chinese restaurant esteemed by some as one of the finest in the
try and where, because I know one of the owner’s closest friends, I am permitted to eat in the
room. I am thankful that this resourceful move on the part of the owner to provide space is
genuine a universal solution.
The charm of a mellowed establishment, well-maintained over the years, combined with a long
lion of good cooking, will undoubtedly draw continued patronage. Here the warm and gracious
sphere has been carefully nurtured for many years and any accelerated aging will appear false.
What then should be the approach of an owner and architect in planning a restaurant that
lourish? They can best insure their success by a contemporary solution which, if sensitively
ived, will become a favored dining place of the present and future.
The experienced restaurateur is worth his weight in magazine articles on restaurant planning.
itect with a respectful ear can gather valuable fundamental information from a sagacious
r on his particular methods of management and the level of standards between the ideal and
real. How important is the headwaiter’s pivotal position between bar and dining areas and is
ned bottleneck at this point necessary? How much area should be given to patrons waiting
ables and how near to the bar should the space be located? What importance should be given
rent standards on seating? How far can the kitchen be from the farthest table and still permit
ble service? What are the spheres of authority of the head chef, the headwaiter, the manager,
he owner; and what physical provisions are to be made for carrying out their several responsi
es. All the above questions, and many others, are best answered by the restaurateur.
The owner is, of course, not infallible. He may be over-optimistic about the potential number
patrons and should be advised against building too large a restaurant (much better an over­
ed, than a sparsely filled one). Also, his desire to pack the house may lead him to crowd the
ig. I recall an owner of a chain of fine restaurants who insisted that the standard booth width
de appreciably narrower and who, wedging himself into the model booth, had to be forcibly
ated.
Depending on the size of the project, the architect may call on the expert aid of lighting, acous
and kitchen-planning consultants. It is the designer’s task to co-ordinate and sometimes temper
recommendations. It may be wise to eschew a too-perfect sound treatment so that the result is a
hubbub rather than an acoustical deadness, a condition to be reckoned with as much in the
rant as in the theater or concert hall. Standard lighting recommendations of 10-foot-candle
r for dining areas should be accepted with reservations. More often, a lesser intensity of lighting
produce a more cordial atmosphere and prove more flattering to the patrons.
The restaurateur and his architect may, in the near future, be challenged by higher standards,
ere is in America a lively new interest in fine food and fine cooking. A continued interest in
ior cuisine may result in the renaissance of more gracious manners and surroundings for din
A restaurant may then become an integral part of our culture—a meeting place closely related
gaiety and activity of the street, square, or park, where one can dine leisurely and repair
pirit as well as his hunger.

* New York, N. Y.

June 1952
Carpet: special/uncut-wool pile/three shades of blue/A. & M. Karagheusian Inc., 295 Fifth Ave., New York, N. Y.
Ceiling: "Acousti-Celotex"/Celotex Corp., 120 LaSalle St., Chicago, Ill.
Chair: #71 USB/Saarinen design/molded plastic shell covered in foam rubber/tubular steel legs in brushed chrome or dull-black enamel finish/list: $138.00/Knoll.
Chair Fabric: (outside) "Apples"/Stig Lindberg design/cotton 53" wide/17'/4" repeat/red, green, or dark gray on white; brown-on-rust, charcoal-on-brown, and black-on-blue/list: $4.80/Knoll.
Chair Fabric: (inside) "Naugahyde"/vinyl plastic on cotton backing/50" or 54" wide/U. S. Rubber Co., 1230 Sixth Ave., New York 19, N. Y.
Lighting Fixture: (bracket) architect-designed/brass/M. A. Van Eso, 134 W. Erie St., Chicago, Ill.
Lighting Fixture: (recessed) #206 A/pin point/list: $23.00/ledlin Lighting Inc., 49 Elizabeth St., New York 13, N. Y.
Lighting Fixture: (suspended) #FH 252/special/Paavo Tynell design/brass/price on request/Finland House, 41 East 50 St., New York 22, N. Y.
Mural: Karin and Ernest van Leyden, Brentwood, Calif.
Table: (chrome pedestal and wood top) Charles Tuteur, Merch Mart, Chicago, Ill.
Table Base: black crackle finish/Products Corp., 210 Spring St., New York, N. Y.
Waiter's Station: architect-designed/Equipment Mfg. Co.
Waiter's Station: (top) "Texlaminated plastic/General Co., Pittsfield, Mass.
Walls: plaster painted white/"Weldtex"/striated-plywood gray/U. S. Plywood Corp., 44 St., New York, N. Y.
This room takes its name from the mural which depicts a harlequinade, the comic episode of the 16th Century Italian commedia dell’arte. The theme is played with restraint. Only harlequin paintings by Degas, Dufy, and Picasso are further interpretations of the name.

The assignment was to design for the Harvey chain a restaurant of leisurely pace, spaciousness, and a touch of elegance. The architects have successfully fused a delicate atmosphere with the plain duties of maintenance. In happy combination here are the materials chosen for durability but sensitively contrasted for texture, kind, and color.

The vulnerable surfaces of the chairs, for instance, are covered with tough plastic, but the outer sides, which escape hard wear, are in a colorful print. For the banquets, a textured fabric is used to contrast with the smooth plastic and cotton of the chairs. But, again, there is no sacrifice of toughness, because the choice is a closely woven fabric of hard viscose fiber, designed for heavy duty.

One of the perpetual problems of contemporary interior design is the conflict between the desire for plain surfaces and the need for stain and soil camouflage. For the carpet in this room, the architects have specified one woven with three shades of blue. The impression is one strong color but the variation minimizes stain and soil.

We like the nice transition between areas by change of ceiling height, the variety of seating, and the lighting fixtures astutely chosen to suit. Banquets are covered in red, chairs in gray plastic and black-blue print, and carpet is dark blue. Striated plywood is painted light gray, walls and ceiling are white.

Photos: Hedrich-Blessing
**data**

Banquette: architect-designed/ S & S Woodworking Corp., 457 West Broadway, New York, N. Y.


Ceiling: acoustical plaster.

Chair: architect-designed/ unavailable.

Curtain: "Chinese Coins"/ designed by Noemi Raymond/ 50" wide/ 18" repeat/ red, black, gray, or green-on-white, brown-on-gray, black-on-blue, black-on-red/ list: $4.50 per yard/ Knoll Associates, 575 Madison Ave., New York 22, N. Y.

Curtain Hardware: Gould-Mersereau Co., Inc., 35 West 44 St., New York, N. Y.

Doors: (entrance) bronze frame/ Englecraft, 370 West St., New York, N. Y.

Door Hardware: (pulls) architect-designed/ polished brass/ Elmer T. Hobert Inc., 211 East 37 St., New York, N. Y.

Door Hardware: Sargent & Co., New Haven, Conn.

Exit Sign: special design/ Green-Lite Sign & Sales Inc., 305-307 West 140 St., New York, N. Y.


Lighting Fixture: (recessed) #207/ Ledlin Lighting Inc., 49 Elizabeth St., New York 13, N. Y.

Lighting Fixtures: (suspended) architect-designed/ special/ Ledlin.

Mosaic Panel: Max Spivak, 175 Madison Ave., New York, N. Y.

Paint: Pratt & Lambert Inc., 79 Tonawanda St., Buffalo 7, N. Y.

Stair: oak risers and treads/ brass posts/ birch handrail/ A. Messel Stair Building Corp., 24 Dodworth St., Brooklyn, N. Y.

Wall Covering: (south wall) "Fabricona"/ burlap painted brown-black/ 36" wide/ list: approx. $1.50 per yard/ H. B. Wiggins Sons Co., Bloomfield, N. J.

Walls: fieldstone, brick, and 12"-wide Douglas fir paneling.
The visual quality of this steak house suggests substantial food, hearty eating. The rough natural materials, the generous chairs, the glistening brass speak of the sizzling platter. These architects are practical planners, but they are showmen too. And this is important in restaurant design, where atmosphere invites as well as food. The mechanical copy of a style is dreary fare but nostalgia is human stuff. Here it is creatively employed to evoke a sense of warmth and substantialness associated with the pub.

Materials used are the kind that require little upkeep and, in fact, improve with age. The existing brick wall was peeled of plaster, tin, and paper. The opposite wall is paneled with 12"-wide Douglas fir, and the wall between dining and kitchen is warm-colored fieldstone with wide mortar joints.

Lighting is subdued and frankly meant to flatter. At the wood wall, coved lighting is directed to the arched ceiling and down on photographs of famous patrons. The floor is pegged, random-width oak. Lighting fixtures, entrance doors, and balustrade are all polished brass. The only applied colors are the brown-black paint on the burlap wall covering at entrance, blue-plastic covering for banquettes, and the red-and-white cotton curtain at the stair.

Photos: Ezra Stoller
The use of few materials and a simple color scheme give a sense of largeness and calm to this quick-order restaurant. Large areas of cypress and oak make a good background for the special murals and the playful touches. Use of materials is architectural—the dramatic lighting for cakes, the choice of chimney lamps and wire chairs— with an awareness for mood and display. The old "ice cream parlor" chairs bought from second-hand shops are painted white. (One first-hand source for the sturdy reliables is included in our data listing and a photograph of the model is shown.) Because of a low budget, architects saved an existing front, the recessed lighting fixtures, and the acoustical-tile ceiling, which they painted green. Counters are comfortably wide and low—the scrubbed wood tops in effective contrast with the glossy black floor.

Photos: Lionel Freedman

Chair: (metal) "ice cream parlor"/plywood or "Masonite" seat/ net: (unfinished) $7.45/brown, green, black, or aluminum: $7.80/custom colors: $8.55/National Chair Co., 412 N. 4 St., St. Louis 2, Mo.

Chair: (wood) #6090 S1/maple/ list: $12.20/Thonet Bros. Inc., One Park Ave., New York 16, N. Y.

Ceiling: existing acoustical tile, painted green.

Counter: oak/Accurate Construction Co., 330 West 42 St., New York, N. Y.

Floor Covering: #209/"Verde Antique"/ Kentile, Inc., 58 Second Ave., Brooklyn, N. Y.

Lighting Fixture: (recessed) existing.

Lighting Fixture: (suspended) #97/"Lykta"/ chrome tubular frame, milk-glass globe, red-enamedled holder, chain, and globe, red-enamedled reflector with white underside/ list: $30.00/Bonniers, 605 Madison Ave., New York 22, N. Y.

Mural: Anton Refregier, Glascos Turnpike, Woodstock, N. Y.

Restaurant Equipment: Barh Equipment Co., 390 Fourth Ave., New York, N. Y.

Table Base: "ice cream parlor"/National Chair Co.

Table Top: oak/Accurate Construction.

Walls and Fascia: cypress.
Two rooms were thrown open to each other as much as structural requirements would permit. Then, since this was a headquarters for smorgasbord, treated in the domestic scale and spirit associated with Scandinavia. The large room with windows on either side was respected for its rigid symmetry. A high ceiling was coved on window sides and covered with a gay-patterned paper, which is the dominating color in the room. It brings the vertical dimension into more friendly scale; also drawing attention away from the irregular walls. Oak fascias terminate the coved ceiling and are baffles for fluorescent strips that filter light above; curtains hang below. At central points, the architects mounted specially designed chandeliers. These are of black iron, capped with crisply pleated shades of Scandinavian design. Lighting can be dramatic and focal, gently diffused from the coves, or a combination of both. Alternate lighting and choice of opaque linen or open-net curtains changes the mood for day or evening dining. To relate the two rooms, carpet and wall color are one. Painted plaster walls are cocoa, carpet blue with small white squares, ceiling paper predominately orange. In the bar section, there is also some whitewashed brick and random oak. All furniture was left by previous tenant.

Photos: Wheaton Galentine
The versatility of Micarta® laminated plastic surfaces helped inspire the dramatic interiors of the home exhibit in the Museum of Modern Art. The room divider and storage wall, shown below, has a light gray Micarta top. This surface was chosen because it blends discreet beauty with the ability to withstand all the known hazards and inconvenience of household wear.

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Members' Penthouse at the Museum of Modern Art was recently renovated under direction of Philip Johnson. Lighting is by Richard Kelly, New York lighting consultant. Eames chairs are from Herman Miller Furniture Company, Zeeland, Mich., and tables are by Darrell Landrum for Avard, Inc., 66 W. 55th St., New York 19, N. Y.

Photo: Ezra Stoller

Dining Table: $220/ designed by Darrell Landrum/ wrought-iron frame with solid-ash top/ 30" x 30" x 29" high/ approx. retail: $96.00/ quantity and contract prices on request/ also available: rectangular table 30" x 68" x 29" high with walnut "Realwood Formica" top. retail: $232.00/ other sizes to special order/ Avard Inc., 66 W. 55th St., New York 19, N. Y.

Koroseal Tile "Supreme" as used in the penthouse of the Museum of Modern Art, New York. Tile is 9" x 9" x 1/8" solid vinyl plastic, with a nonporous glossy surface said to resist indentation and to be unaffected by grease, oils, and alkalies. Only an occasional coating of wax is required for maintenance. Flecked or marbled patterns in a variety of colors/ approx. retail: $1.35 per sq. ft./ also available are "De Luxe" and "Special," thinner gauge tiles with felt backing/ approx. retail: $.85 and $.25 per sq. ft., respectively/ Sloane-Blabon Corp., 295 Fifth Ave., New York, N. Y.

Associates introduced a new line of woven fabrics at the recent A.I.D. exhibit. Handsome collection combines wool, raw mohair, hemp, linen, jute, cotton, and synthetics such as nylon, plastic, Orlon, and rayon. A wide range of textures is offered for upholstery, but includes some suitable for curtain fabric. Bold vibrant colors are used, such as green with turquoise, cobalt and black, or Mexican pink wool with navy; reds; orange; and blue. Retail prices: $18.00 to $30.00 per yard. Eszter Haraszty, head of the Textile Division is responsible for color coordination. Evelyn Hill designed the line for Knoll Associates, 575 Madison Ave., New York, N. Y.

Nessen Studio Inc., lamp manufacturers, have added a Contract Division to produce portable lamps for hotels, schools, hospitals, and other institutions. Any of the standard lamps may be ordered in quantity or adapted to suit specific needs. The use of materials other than the standard metal is now also possible. The design staff headed by Greta Von Nessen is available for consultation and special design.

Stanley Wolf heads the new Contract Division of Nessen Studio Inc., 5 University Place, New York, N. Y.

The Herman Miller Furniture Company, Zeeland, Mich., has issued a new comprehensive price list illustrated with drawings of every item in the line. Complete facts and figures are systematically and clearly presented in a booklet that is a visual delight. Included is a cross reference which co-ordinates the price list with the forthcoming revised edition of "The Herman Miller Collection." The 40-page price list, 8½" x 11" with cardboard cover is available to architects and designers on request.
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*KenRubber should not be installed on concrete in contact with the earth.

THESE “K” FACTORS ARE YOUR GUIDE TO THE CHOICE OF RESILIENT TILE FLOORING FOR USE OVER RADIANT HEATED CONCRETE

<table>
<thead>
<tr>
<th>KENTILE</th>
<th>KENCORK</th>
<th>KENRUBBER</th>
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<td>4.5 BTU/sq. ft./hr./°F/in. thick</td>
<td>0.7 BTU/sq. ft./hr./°F/in. thick</td>
<td>4.5 BTU/sq. ft./hr./°F/in. thick</td>
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<td>1/8” 36 BTU/sq. ft./hr./°F</td>
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<td>1/8” 36 BTU/sq. ft./hr./°F</td>
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<td>3/16” 24 BTU/sq. ft./hr./°F</td>
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<td>1/2” 1.4 BTU/sq. ft./hr./°F</td>
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In your plans for new industrial buildings or the modernization of existing ones, it will pay you to find out how Coolite can provide increased efficiency and economy. The cool, blue-green color of Coolite adds a modern note to any exterior. Coolite’s filtered light boosts employee morale, reduces rejects. See your nearby Mississippi Glass distributor today.

Translucent, light diffusing figured and wired glass by Mississippi is “visioneered” for better daylight illumination. Available in a variety of patterns and surface finishes, all scientifically designed to distribute light to best advantage.

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WORLD’S LARGEST MANUFACTURER OF ROLLED, FIGURED AND WIRED GLASS

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SELECTED DETAIL

Section 3/4" Scale

3/4" plywood throughout

Continuous tube lights

Continuous frosted glass

1/2" slat

2'-0"

SLIDING PANELS

HINGED DOORS

Section 3" Scale

1/4" plywood throughout

Continuous tube lights

Continuous frosted glass

1/2" slat

2'-0"

SLIDING PANELS

HINGED DOORS

Elevation 1/4" Scale

End

LTON SCHOOL, Rye, N. Y.

E. Hornbostel, Architect

June 1952 131
A welcome relief from flat monotony... delighting the eye with balanced lines, clean hi-lites, deep soft shadows. Here is the door of depth... the third dimension, to inspire the Architect, to brighten the Dealer's line, to help the Builder close the sale. Write today for full details on Morgan Tri-Panel, the Door of Dimension... of today... of tomorrow.

**TRI-PANEL**

blends with every architectural trend

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Thickness: 1 11/16", with 1 3/8" hip-raised panels, true ovelo sticking, smoothly sanded overall.

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Tri-Panel relieves the wall-like flatness and makes the entrance to a room or a house the focal point, with a changing picture of correctly proportioned, sharply defined panels, ever changing with the source of light and the viewer's angle. Tri-Panel is the "Picture Door."

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A great name in woodwork for 97 years • Doors • Entrances • Stairwork
Mantels • Corner Cases • Kitchen Cabinets • Morganwalls • Sash • Trim
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The best way to assure comfort in any building is to insist on Honeywell controls.

If you have a control problem, Honeywell can help provide the proper thermal environment for any client—anywhere—in any kind of structure.

A large staff of well-informed control engineers—in 91 different Honeywell offices across the nation—are experienced in doing just that. Or—there’s a lot of literature that’s yours for the asking—on the automatic control of heating, ventilating and air conditioning.

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Automatic-Reset
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Stop temperature see-sawing and lagging

This magically accurate relay, made only by Honeywell, sets new standards of performance for pneumatic temperature controls. By using it, you can give clients closer temperature control, regardless of weather variations.

This remarkable Honeywell mechanism virtually eliminates see-sawing temperatures because it goes to work the instant the temperature deviates from the thermostat setting.

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and when I heard (your firm name) signed that building, I decided to live in."

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Gentlemen:

☐ Please send me information on your Gradutrol System of pneumatic controls.

☐ Please send me a free, personalized reproduction of the Hoff cartoon, inscribed with this name:

Name________________________
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June 1952
Wheeling

For the Federal Reserve Bank of San Francisco's newest branch in Portland, Oregon, it's a solid concrete vault reinforced with Steelcrete ExM Vault Reinforcing. Nor woven, not welded, but pierced and stretched from a single plate of solid steel, ExM proves the most easily placed and most highly resistant reinforcing known for modern bank vaults. Vault Reinforcing is but one of many materials for which architects, engineers and builders turn to Wheeling. The Wheeling line of building materials includes: Steelcrete Reinforcing Mesh, Expanded Metal, Metal Lath and Metal Lath Accessories, Tri-Rib Steel Roof Deck, ExM Angle Framing, Wheeling Steelcrete Vault Reinforcing supplied and erected by SOULE STEEL COMPANY. Architect: PIETRO BELLUSCHI; Consulting Engineer: MILES KAY COOPER; General Contractor: ROSS B. HAMMOND.

WHEELING CORRUGATING COMPANY - BUILDING MATERIAL DIVISION
ATLANTA  BOSTON  BUFFALO  CHICAGO  COLUMBUS  DETROIT  KANSAS CITY  LOUISVILLE  MINNEAPOLIS  NEW ORLEANS
this close-up is seen the sturdy interlaced arrangement that Steelcrete gives to concrete walls.

In this photograph the simplicity of Steelcrete assembly is readily seen.

In the roof view, note the relatively long spans made possible by Steelcrete's lateral stiffness.
These TRANE products fit air conditioning results you want:

TRANE ControVac... Hermetic Centrifugal Refrigeration Unit. Completely self-contained. For chilled water systems. Six models from 45 to 200 tons. Lightweight, vibration free. Efficient operation down to 10% of capacity, through automatic throttling controls. Power consumption very closely proportionate to load through entire range.

TRANE Climate Changers... basic air conditioning units, built for widest range of requirements. Combine coils, fans, humidifiers, filters, dampers. 450 to 22,000 cfm.

TRANE Evaporative Condenser... for condensing refrigerant in the air conditioning system where water is scarce or expensive. Cuts water consumption as much as 90%.

TRANE Multi-Zone Climate Changer... A single air conditioner that provides heat or cooling or both simultaneously to as many as 8 different zones.
together to give you the
want!

What air conditioning results do you want? Have you a
simple cooling problem—or a complex one? Is it small or
large? Does the job require only cooling or does it involve
the related problems of heating and ventilating?

Regardless of the nature or scope of your next air condi-
tioning project, the complete line of Trane matched air
conditioning products contains exactly the equipment
needed to do a superlative job.

Consider these advantages:

1. UNDIVIDED RESPONSIBILITY The
completeness of the Trane line makes
it possible to get the undivided respon-
sibility of one manufacturer.

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time by dealing with one competent
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—instead of many.

3. ONE SET OF CATALOGS From one
handy and complete set of catalogs you
can select all the equipment you need.

4. COMPLETE FLEXIBILITY There's a
wide range of sizes and models. So flex-
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create 10 different 50-ton air condition-
ing systems.

Why not join the many
architects, engineers and
contractors who specify and
install Trane Equip-
ment? Call or see your
nearest Trane sales en-
gineer when you plan your
next air conditioning project.

TRANE Cooling Coils . . . Efficient fin-
and-tube extended surface. For use
with chilled water, well water, or
direct expansion refrigerants.

TRANE Centrifugal Fans . . . Class I
and II construction with backwardly
inclined or forward-curved wheel de-
sign. Ruggedly built. Quiet operation.

TRANE Reciprocating Compressor . .
Capacities up to 50 tons. New, auto-
matic cylinder unloading saves power
through multi-step reduction.

TRANE Self-Contained Units . . . all-
in-one package. 3- to 20-ton capacity.
Heating coil optional. 15- and 20-ton
available with built-in evaporative
condenser.

TRANE UniTrane and Custom-Air Sys-
tems . . . Multi-room air conditioning.
Individual room control of heating,
cooling, humidifying.
"Off-ceiling" lighting is attractive

Creative design added spaciousness and beauty to this confined building interior with an unusually high ceiling. Modern, flexible lighting systems and more freedom in architectural design techniques are the basic ingredients.

In the Anglo California National Bank’s office at Hayward, California, the architect cleverly planned a second working level to minimize the high ceiling. An off-ceiling (or suspended) lighting system became an integral part of this design. Individual working areas are more than adequately lighted (over 40 footcandles) with good, comfortable lighting.

Open office spaces and carefully selected decorating colors help provide "spill-over" light for the main area; a device that might be used in many office buildings where the problem is one of high ceilings and limited space.

Westinghouse Type CC, 8-foot slimline fixtures with plastic sides were selected. Low in first cost, they are economical to install and maintain, since a minimum number of fixtures are needed. This is only one of a wide variety of lighting systems designed by Westinghouse for flexibility in planning. Send for B-5254, "Lighting Sets the Stage" and see an analysis of our complete commercial line. Westinghouse Electric Corporation, P. O. Box 868, Pittsburgh 30, Pennsylvania.
YOU CAN BE SURE...IF IT'S

Westinghouse

LIGHTING DIVISION

Edgewater Park, Cleveland, Ohio
combined sanatorium and university

(Continued from page 24)

each functional element in the most detailed sort of way, for all areas firmly established and approved before incor-
working drawings.

Indicative of Neutra's exhaustive preliminary study of a
project is the series of work sheets made for every type of
for by the program, for each specialized room, and for such
the rest balconies provided for most of the rooms, utility roo-
etc. Grouped together as "Study of Organization," these

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ARCHITECTS' SPECIFICATIONS

All Popular Functions

Knob Styles . .
in wrought or cast
bronze or brass

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to reverse
the hand
on the
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heavy-duty lock

In 4 simple operations, the
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reversed for a different hand of
door. It takes less than a
minute. No serious installation
delays if hand of door
has been changed.

When time is at a premium,
this and other advantages of
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heavily in the architects' favor.

Ask your Russwin Distributor
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LEGEND:
1. BED 5'0" X 6'3";
2. NIGHT STAND;
3. CABINET 2'-6"HIGH;
4. CLOSET 2'-0" DEEP;
5. DESK WITH DRAW. 24" DP;
6. BOOK SHELVES 12" DP;
7. LAVATORY;
8. VENT & INSTALL SHAFT;
literally as units of the plans and insured inclusion of all pro-
in the right place on the right floor.

Architectural records for the area of the site were reviewed. And
course of analyzing the impact of the new institution on the

ter communication services, snow removal in winter, economies and

ment of transportation facilities. Possible creation of a new
for the district also was foreseen, with the addition of the

uum population to the community.
To solve your "WALL-OF-ICE" problem... this NESBITT THERMAL BLANKET:

Architects who design and school officials who approve large window areas in the modern classroom may delight in their choice if thermal comfort has been considered.

Unit ventilators could be selected by conventional standards if thermal comfort depended alone upon the classroom air temperature.

But today we know that low-temperature exposures and cold window downdrafts may remain the robbers of pupil comfort, even in classrooms with close control of room-air temperature. The practical solution to the chilling effect of window downdraft is to release heat upward over the exposure.

For conditions of large glass area and cold outdoor temperature, Nesbitt provides Wind-o-line Radiation for integration with the Syncretizer.

Wind-o-line consists of fin-and-tube radiation in a grilled wall-hung casing to extend from both ends of the ventilating unit for the full window length—and continued, if required, along cold outside walls. (Or it may be had as a component of the storage cabinets forming The Nesbitt Package.)

Wind-o-line solves the problem of heat loss logically with a heat gain where and when needed. Convected currents of warm air temper the window downdraft and divert its flow upward and above the heads of the room occupants.


Nesbitt Syncretizer WITH WIND-O-LINE

Wind-o-line Radiation may be integrated as part of The Nesbitt Package of Syncretizer and storage cabinets.
BOOKS RECEIVED


(Continued on page 146)
R-W Garage Door Operators

- Convenient
- Practical
- Efficient

For every need — two R-W controls, designed and engineered for smooth sure performance

No. 1251 Standard control
— operates from drive-side key-switch

No. 1504 Radio control
— battery operated radio with dash control button opens and closes doors within 75 feet.

And ... R-W 999 Garage Door Hardware
Complete overhead garage door hardware conveniently packed in one box! For single doors up to 200 lbs.; double doors up to 375 lbs. Write for folder giving full details.

Check these important R-W features!

✓ Easy to install — Completely assembled, including track, in a single carton at the factory.

✓ Easy to service — Simple adjustments, requiring no special tools, keep the doors working smoothly.

✓ Safe — A large friction clutch prevents operational failures with resulting damage to property. In power failure, doors may be operated manually.

For complete information on R-W AuT-a-DoR line see your nearest dealer or write for catalog number A-87

Richardson-Wilcox Mfg. Co.

1880-1952
OVER 72 YEARS

REVIEWS

(Continued from page 145)

divisions are made geographically or subject. All other articles are indexed by subject and not by article.

furniture characteristics

Written by the outstanding authority on American decorative arts, this handsome book makes an important and highly significant contribution to the field, that will be welcomed by everyone who derives pleasure in beautiful period pieces and the historical and architectural backgrounds for which they were made. There is probably no one better qualified nor more conversant with the subject than Joseph Downs. Before becoming curator of the recently opened Winterthur Museum, near Wilmington, Delaware, he was curator of the American Wing of the Metropolitan Museum of New York, and previous to that was associated with the Philadelphia Museum of Art and the Museum of Fine Arts, Boston.

The author shows how social and economic changes in the 18th Century brought about transitions to new styles and the manner in which they were reflected in homes of that time. Here are pictured more than 400 example Queen Anne and Chippendale pieces from Winterthur collection, so the reader has a wonderful opportunity to study the characteristics of the different types of furniture made in the countryside during that time. There is a painstaking description of each piece shown, including place of origin, approximate date of construction, maker’s name and many other pertinent facts.

Not the least important in this comprehensive volume are the 10 exquisite color plates of period rooms at Winterthur, with the furniture in its authentic environment.

FRANK A. WREN

bank mortgages

As may be implied from the title, this volume deals with the role of commercial banks as mortgage loan companies, lending on a short-term basis for finance construction, financing intermediary situations such as mortgage loan companies.

(Continued on page...)

FRANK A. WREN
Here's a new idea in factory lighting to lift the eyestraining gloom off the ceiling:

ALL WHITE INSIDE—to reflect maximum light down and outward onto the working area.

ALL WHITE OUTSIDE—to reflect room light upward, brighten the ceiling and soften brightness contrast.

Easier to clean—reduces maintenance. Air-flow Channel circulates air currents for longer ballast life.

GUTH Wyte-Liners are made in 2 and 3 lamp sizes for conventional 40-watt lamps and for 4- and 8-ft. Slimline. May we send you our 16-page Catalog 48-BB with complete details?
A shower unit designed for Built-in installation in bathrooms...

At last...a moderately priced shower unit expressly created for recessed installation...the only prefabricated metal shower cabinet that provides for continuity of the bathroom wall material. By the elimination of all apparent cracks or joints it becomes an integral part of the structure rather than merely a fixture.

The result is a rich, ultra-smart, custom-built appearance. Yet, the installed cost is considerably less than that of a built-up tile shower. It makes a permanently watertight installation, will not crack and develop leaks with settling of the building, as often occurs when mortar joints are depended upon for water-tightness.

Reversible side panels, valves can be installed on either side without drilling on the job.

Size 36" x 36" x 80"—Bonderized galvanized steel walls with baked-on synthetic white enamel—will not rust. Precast terrazzo receptor. Clean interior, no screws or projecting fastenings to mar the bright white smooth enamel finish.

FIAT METAL MANUFACTURING COMPANY
Three complete plants
9201 Belmont Ave., Franklin Park, Ill.
Los Angeles 33, Calif.
Long Island City 1, N. Y.

REVIEWS

(Continued from page 146)

making long-term mortgage loans on residential and commercial properties. Technical data were given on the legal aspects and scope of mortgage lending and bank experience with type of lending, covering acquisition and servicing costs, foreclosure and loss experience yields. Findings in this report were based primarily on a sample study of 170 commercial banks and tabulations supplied by the Federal Deposit Insurance Corporation.

radioactive contamination


This handbook is one of several authoritative reports on radiation hazards, prepared under the auspices of the National Committee on Radiation Protection. While it is concerned primarily with operating procedures, it also contains considerable material of value to architects designing hospital or research radio-isotope laboratories, of particular interest to the architect is the "Introduction" and the chapter on "Specific Materials." The Introduction outlines the general problem of radioactive contamination and how it may be minimized. Chapter 5, "Specific Materials," gives a brief analysis of the most common surfaces in use in radio-isotope laboratories from the point of view of contamination.

CARL B. BREA

revised guide


The newest A.S.H.V.E. Guide contains revised and increased technical data on 50 subject areas related to the heating, ventilating, and air-conditioning industries. Chapter arrangement is still grouped under the familiar sections: Fundamentals; Human Reactions; Heating and Cooling Loads; Combustion and Consumption of Fuels; Systems and Equipment; Special Items; Instruments and Codes. Names and addresses of organizations which can supply codes and standards are listed in the last chapter. One of the special features in the Guide is the larger Catalog Data section giving detailed information and specifications on the equipment produced by 277 national manufacturers. A 32-page index simplifies the job for products and manufacturers, and an index is provided for both the Catalog and Technical Data sections.
Here's a hinge you can specify for heavy doors, exterior doors, and doors receiving high frequency service — with complete confidence that it will last as long as the building.

The ball bearing construction of the Stanley Full-Jeweled® Hinge is designed to take lateral as well as vertical wear. With the load supported both ways on ball bearings, it is practically impossible to wear out this hinge.

Whenever there are heavy or busy doors in any building you design, you will insure your client's investment by specifying Stanley Full-Jeweled Extra Heavy Ball Bearing Butt Hinges.

† All Stanley Extra Heavy Ball Bearing Hinges are equipped with Full-Jeweled Bearings.
The following editorial from The Architect's Journal of March 6, 1952, should be read by student and teacher alike and then followed by reading (on page 296 of that issue) the letter from Tony Moore, an R.I.B.A. student, called "Theory and Practice in Education."

"Two talks followed by discussions, which were attended by architectural students last week showed that students (in London, at any rate) are becoming anxious and worried about their training and their future prospects. They have good reason to be so. The postwar building boom on which both architects and students have staked so much has never amounted to a great deal and is now fast coming to an end. Students, on qualifying, are at last finding it difficult to get a job. The reason for worrying about their training, however, is not so obvious for those who remember the struggles to form schools, have lectures, qualification by exams, for 'live' practice and for freedom to design in one's metier. The student of a recognized school has, on paper, got everything. He has, in fact, got too much, including title of 'architect' at the end of a five-year's course with year's practical experience. The average year school course is over-crowded and balanced."

"He attempts a superficial study, backed up by sparetime reading, of more separate and different subjects than any other profession in the world. He also attempts to apply knowledge by designing (on paper) as many buildings in five years as he alone, can design, detail, and supervise the construction of, in fifty years. His position, leaving school is akin to that of Barrie's little sillies who don't know what they are—he is competent neither as an assistant nor as an architect."

"Our plea is for the formation of a group who, now the battle for sound architectural schools is won, will look afresh at the problems of education and qualification. R.I.B.A. is heavily overworked but the Architectural Association—that self-professed university institution—has a precedent in these matters."

I wonder what is meant by "the battle for sound architectural schools is won." It certainly isn't won here and I can't conceive of finishing in such a battle.

There is a bitter tinge to this editorial. Disappointment in postwar events, along with that constant frustration which seems to attend the analysis of architectural training, these do not help in this country, we have little cause to be unhappy about postwar building. Despite some slowdowns and material shortages, the recession is not too bad. We've done only fairly well in office buildings but there has been a spurt of good churches. Design trends have been upward in the medium-sized but high single house, but row houses and large apartment groups have reached a new low in taste and discernment. In fact, we have now reached a point where we are accepting as standards what less than a generation ago were considered substandard. I think some of the factories we've been designing and we've
Intermediates that last like photographs

...produced at low cost

A case history based on the experience of the Hyster Company, Portland, Oregon

By reproducing its engineering drawings on Kodagraph Autopositive Paper, the Hyster Company gets intermediates which have dense black photographic lines on a translucent, highly durable paper base. Intermediates which will remain intact in the files year after year... and produce sharp, legible blueprints and direct-process prints whenever needed.

And the cost is surprisingly low because Kodagraph autopositive Paper boasts unique photographic properties which cut production costs substantially. It can be handled in ordinary room light... and it produces positive copies directly—without a negative step.

Furthermore, existing equipment can be utilized—Autopositive can be exposed in any blueprint or direct-process machine... and processed in standard photographic solutions. Hyster uses a blueprint machine which has also been designed to produce autopositive intermediates in a continuous flow.

How The Hyster Company Uses Autopositive

For All Print Production. Autopositive intermediates are used instead of valuable and perishable original drawings. Producing sharp, legible blueprints and direct-process prints time after time, they greatly reduce the possibility of reading errors in the shop.

For "Permanent" Files in its home office... and branches in the United States and abroad. "Photo lasting" Autopositive intermediates eliminate the costly delays experienced in the past when intermediates faded, turned yellow, or became brittle.

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Kodak TRADE-MARK
These unique Adams-Rite Deadlocks, built to the highest quality of design and workmanship, provide deadlocking security for doors with the narrowest stiles. Available to take any standard dial diameter cylinder with a backset as small as 1/8" and a depth of only 1 1/8" or with a 7/8" diameter cylinder with a 1 1/4" backset which will avoid a 3/4" stop.

These Deadlocks give you a four-fold advantage:
- They are designed for template installation.
- They are made of rugged stamped steel and extruded brass. No delicate hand fitted parts.
- They conform to N.P.A. material regulations and are available from stock.
- Where desired, these Deadlocks are interchangeable with Adams-Rite Series 1451 Deadlatches.

Write for complete information
ADAMS-RITE MANUFACTURING CO.
SPECIALIZED LOCKS AND BUILDERS' HARDWARE

out of school

(Continued from page 150)

one interesting plan for a new town, but not very exciting building to go along with it. The last five or six years have been good years—not great years—for architects in the United States.

Our British friends, although frustrated by shortages in money, men, and materials have no cause to be ashamed of the quality of their small production. In mass housing they have done some fine things. Their new town plans are way ahead of our thinking and their public buildings are, on the whole, of greater dignity and taste than what we have been turning out.

Much of the matter of spirit in today's design rests on the quality emphasis to be found in our training systems. In the general subjects I have mentioned above, there has been little or no debate. We have no forum for discussion adequate to do justice to the merits of the issues to be discussed, or of sufficient stature to attract our attention. Debate on architectural design could be a television dream. I'll expand that idea sometime soon. I understand that one architectural educator, at least, is working on TV ideas. But I'm still going to look for great debates on architecture, on planning, and on the training for whatever systems of design, construction, and initiative develop. Perhaps the students will do it yet.

As I write this, the first issue of LINE magazine is on my desk. Some of you may remember that I put quite a plug in for the publication of this student architect's magazine, back in the September, 1951, OUT OF SCHOOL. I am happy to see the first issue and congratulate the editors on the fruition of their obviously arduous task. Frankly, I am sorry the issue may be in format. As Tony Moore's letter in The Architect's Journal mentioned above raises the kind of questions students should be asking, but LINE, in its first issue, starts with a gentle and slightly patronizing first editorial by Vi Hudnut, who was talking to boys, not men. This is followed by several high-school themes on the subject, "Why My School is Best." There are also some reproductions of student problems, without explanation, comment, or criticism.

Come on, men, get mad! Take a poke at something if you feel like it! Take a poke at me or any handy object, but get going! I want to see a student magazine that howls. You've published your first issue—now get rolling!
In the industrial plant shown above 43 Herman Nelson Propeller Fans insure comfort cooling for employees working at heat-producing, high speed machines.

No matter what type or size of ventilating fan you need for industrial, commercial and institutional use Herman Nelson makes it. Our designers and engineers are leaders in the fan field and in our laboratories and test rooms all the latest findings of aerodynamic science are put to work in fan design. Herman Nelson fans are noted for low initial, operating and maintenance costs. They are designed to operate with minimum air turbulence, thus permitting the delivery of more air with less noise.

The Herman Nelson line includes Propeller Fans, Unit Blowers and Class I and II Centrifugal Fans. All Herman Nelson fans are tested and rated according to Standard Code of the National Association of Fan Manufacturers and the American Society of Heating and Ventilating Engineers.

The blades have an "air-foil" cross section which results in greater efficiency and quieter operation. The tendency toward over-loading, common in propeller fans, is minimized by advanced Herman Nelson design. Lower initial, operating and maintenance costs are assured.

Fan blades of all Herman Nelson Propeller Fans are fabricated of aluminum and are formed by the hydraulic pressure method for extreme precision. The outer edge of each blade is flanged to increase strength and rigidity.
And remember what I asked last September? "What is the program for LINE? What are some of the issues and principles it hopes to develop?"

The other day, I was walking down the elm-shaded walks of the University of Theleme, lost in the architectural nostalgias for which the university is famous. The warm June sun beat brightly on the library's ivy-covered walls and, between the buttresses, the lancet windows glowed with the pale blue of the cold cathode lights in the reading rooms behind little leaded panes. By a flight of steps to handsome Georgian portico of what was obviously either a classroom building or dormitory I paused to question a blue-jeaned co-ed and her two drooling escorts.

"Where," I asked, "is the School of Architecture?"

"The which?" she languished, and one of her pals dropped one of her books.

"Agriculture?" the other pal asked, his gaze wandering reluctantly to me.

"What team are they on?" asked the first pal, having recovered his stance.

I explained gently that it was where they taught people to design buildings like those around us.

"Never heard of it," says the second pal.

"Do they actually teach things like that?" she cooed, her eyes obviously seeing for the first time the buildings around us. "How cute!" and she giggled.

I left them to their more important affair and plucking my long, grey beard, fixed with a glittering eye one out of every three students I could corral, as I continued my search. The mystery thickened as my random sampling turned up no more than shrugged shoulders and an occasional misdirection. Finally an elderly professor told me that he was walking that way, just by chance, and would escort me to the door. As we strolled along, I asked him about the School of Architecture.

"Frankly," he said, "Although I have been on the campus 30 years, I have never visited it. I have heard that it does have a good reputation. Some of us occasionally meet the Dean at a President's reception, or at Commencement. He is said to be an excellent conversationalist, and to have traveled widely. I am an urban sociologist myself, so I would have nothing in common with architects, nor they with me. I do have a friend in engineering, who tells me that the construction courses in the architectural school are below par. I have heard, although this is mere hearsay, mind you, that the school is an expensive one to run, and that there is some feeling that it is a luxury, which, in these days of inflation, the University can ill afford. However, I am of the old school and I feel that in these days of materialism a university should indulge itself occasionally with a few educational frivolities."
If it deserves fine architecture, it deserves "The Finest Floor that Grows--" NORTHERN HARD MAPLE

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√ bright
√ smooth
√ tight
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not always just the necessities, if you know what I mean."

I did.

"Of course," my friend the urban sociologist went on to say, "A truly educated man is always interested in architecture. Every time I go to Europe I visit the Cathedrals and really the main reason most people travel is to see buildings, or scenery, or historic spots. I have a large collection of postal cards from my various trips abroad. Most of them are on architectural subjects and I have thought of willing them to the architectural school library, which I have heard (although this is just a rumor), refuses to catalogue its collection by the Dewey Decimal system—and the librarian is being threatened with excommunication by the joint chiefs of staff. Under circumstances, I may will my postal card: Harvard."

We had been walking for some time passing at a leisurely pace from quad to quad. Since the fronts and backs of buildings did not match, following the tradition, I suppose, (where a Gothic facade has as its opposite, or rear, a Georgian facade), the variety of effects was stimulating if not pleasing. Turning to my companion asked, "Do you know whether or not faculty of architecture designed the buildings?"

"Why, I don't believe so," said my friend in some surprise. "I don't think it would—"

We were now approaching an undistinguished and drab structure with three-story limestone fluted pilasters flanking an entrance much too small for this frame. Before this grandiloquish decalcomania we paused to say goodbye.

"I can always recognize the School of Architecture at night; its lights are on later than in any other building. Sometimes I wonder why." And with these remarks we parted ways.

Seated later in the Dean's office, I mentioned my recent experience. He put his pipe in his bulging pocket of his tweed jacket and looked at me sternly.

"I would not dream," said he, "of risk the political future of the school by permitting my faculty to work on the design of university buildings. There are two dangers; first that they might get into a stylistic debate on the campus and the second that the students might question the competencies of the faculty. The perils are much too great. We rely on our reputation. Best to leave well enough alone."

"Of course, it is regrettable, to some extent that we are not better known on the campus I can assure you that you were anyone from another college of the university to visit us would receive a cordial welcome. Our problem, of course, is time. We are just busy to curry friendships, which would make very little to us. Besides, looking at it fairly..."
Records show that during the next twenty-four hours fire will strike more than 1600 buildings in the United States. Among these will be 140 stores, 80 factories, 6 churches, 3 hospitals, 6 schools. A staggering daily total of property destroyed...far worse, when measured by lives lost.

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(Continued from page 156)

the vantage of the student, what conceivable benefit would such contacts be to him?

"After all, the architectural school can considered as an exclusive club. We are training professionals. Now, if our men were sent out into the world to earn a living as objective, it might be different. But prime they are designers in a profession of a degree of specialty. It is impossible that men, with all the charettes and everyth should fritter away useful time trying to make the university the benefit of their experience, training, and character. Yes, I use the words 'character' advisedly, as our men are, course, of a higher type than is to be found anywhere else on the campus."

The Dean paused and looked sentiment at a handsome photograph of Chartres on wall. I found my gaze wandering around office. The furniture was adequately temporary to satisfy the demands of the study without disturbing the more conservative alumno The atmosphere of decorum, proper to a Dec dignity, was disturbed only by the tweed trousers It should at least have been a pin-stripe b
game.

I asked, "Haven't I heard that there is an excellent English faculty on the campus. Doesn't it serve your school?"

"Oh, no!" cried the Dean, letting his gaze wonder to another fine picture, this time Falling Water. "We have our own Engi
courses, exclusively for architects. After all, boys do not need to read too much. They are designers. They should be able to read copies of "Mont St. Michel and Chartres" by Henry Adams and OUT OF SCHOOL in P, but beyond these they should not be expected to go. An architect, it is true, should be liberal intellectual. He should know when to enjoy art, music, and literature. But, becam of the many exacting tasks confronting the profession, I believe that it is the duty of school to teach its students the maximal amount of culture necessary for this particular profession to retain its reputation. To develop an intellectual curiosity beyond these limits would be indicative of overbreeding."

The Dean leaned back in his chair, his finger tips together, and staring through the tops of the elm trees at the tall ivory tow of Theleme, added, "We tolerate this university as a necessary adjunct to the School of Architecure. My task, to which I have devoted many years, has been to see that at no time does the university intrude on our activities I modestly pride myself on the complete success of this undertaking."

I could not argue the point.
500 Families
Get Added Fire Protection with Steeltex for Masonry Veneer

One very good reason for specifying Steeltex for Masonry Veneer on the extensive row-type Oglethorpe Apartments in Atlanta, Georgia was the added fire protection it offered, according to James C. Wise, architect for the development. Said architect Wise, "A highly fire-resistant wall was achieved by the solid, steel-reinforced, mortar slab.

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the illustrations

All illustrations from Gruen and Smith offices, with exception of those listed below.

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Nuremberg Market Place, 1599. Courtesy: Metropolitan Opera Guild.

Page 68 & 69

Agora of Assos. N.Y.P.L. Picture Collection.

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Page 70

Northgate Shopping Center, Seattle, Wash. Photos: Martin Mayer. (through owners).

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Christmas Tree, Northgate. Photo: no credit (th owners).

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Richards Market, Newport Beach, Calif. Photo: S. Becher.

Town & Country Center, Palm Springs, Calif. Julius Shulman.

Bullock’s Pasadena, Pasadena, Calif. Photo: Shulman.

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Baldwin Hills Shopping Center, Los Angeles. Photo: Julius Shulman. Same as above.

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Bellevue Shopping Center, Bellevue, Wash. Dearborn-Massar.

Community Shops, Greenhills, Ohio. Photo: Resettlement Administration.

Page 78

Halle Brothers Store, Cleveland, Ohio. Photo: Marvin Wilson.

Bullock’s Pasadena, Pasadena, Calif. Photo: J. Shulman.

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Pavement market, Mexico City, D. F. Photos: World Photos, Inc.

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(Belmont Race Track) Parking. Photo: Wide World Photos, Inc.

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Lakeview Center, Long Beach, Calif. Photo: Wil A. Garnett, (through owners).

Aerial view of Northgate Center, Seattle, W. Photo: Martin Mayer, (through owners).

Northgate Center (Bon Marche), Seattle, W. (through owners—no photo credit).

Lakeview Center—May Company building. (through owners—no photo credit).

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North Shore Mall, Great Neck, N. Y. Photo: J. Longley. (through publicity firm).

Bellevue Shopping Center, Bellevue, Wash. Photo: Dearborn-Massar.

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Torrance California Shopping Center. Photo: Joe P.

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How much does it cost to shut down for finishing or repairs...?

It doesn't happen with Facing Tile

In a broad sense, size and use of a building determine the cost of a shut-down for refinishing or redecorating walls.

There are specific factors which must be considered, too.

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1949 Grand Central Terminal, New York 17, N. Y.
This column has previously discussed zoning law as it applied to esthetics and related matters: (May 1950 P/A—Extent to which a municipality may limit the minimum area upon which a dwelling may be constructed; November 1950 P/A—Extent to which a municipality may restrict construction of homes that “look alike”; December 1950 P/A—Extent to which a municipality may restrict area for construction of one-family homes). The tendency has been to incorporate in a building or zoning ordinance a rigid set of rules intended to be applicable to all building projects. Lately, an interesting variation has begun to appear. Under these zoning laws a commission, or similar body, has been set up to determine, among other things, the esthetics of a building project at the time the building project is contemplated.

An excellent example of this device is found in New York City, where the problem of finding industrial sites has directed companies into residential areas. An additional advantage in such a site stems from the fact that a project in such an area is immediately available a ready pool of labor. The difficulties inherent in placing an industrial plant in a residential area are not apparent. How New York City solves this problem is intriguing.

**esthetic zoning**

**part I: industrial**

In 1943, New York City adopted a resolution permitting the erection of certain types of industrial plants in residential areas. Art. 2, Sec. 3 (10) of the resolution provides for the submission to the New York City Planning Commission of a site plan, and for the approval of the site plan, building plans showing design, location, structures and open spaces of the project. The resolution listed the type of project permitted (administrative offices and industrial laboratory projects), and restricted the size of the height of buildings, the distance between buildings and required conformity to applicable laws and regulations relating to structure, operation and maintenance.*

*(Continued on page...*
“Gold Bond Walls” Take Load Off Architects!

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100% GOLD BOND GYPSUM LATH. Bill Baker (left) of Cox & Baker and Robert Dickson (center) Robert Dickson Lathing Co., watch as Gold Bond Gypsum Lath and Stripite are applied in a Cox & Baker Colonial Farms home.

100% GOLD BOND PLASTER AND LIME. Frank L. DeGrendel (second from left), DeGrendel Fuel and Supply Co. and National Gypsum Company representatives look on as Kaye and John Bruggeman (right), Bruggeman Bros. plaster one of Cox & Baker’s Colonial Farms houses with Gold Bond Plaster.

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classic entrance porticoes and varying treatment of the fenestration together with low connecting colonnades and arcades will create an intimate college campus effect, suitable to a highly restricted residential neighborhood."

The project was to contain complete facilities for research and development in lighting, communication and electronics, as well as general administration and sales offices for the concern. Manufacturing was strictly limited and the ultimate number of employees upon completion of the project was not to exceed 2000. The City Planning Commission, after considering the merits of this application by Sylvania, by resolution dated September 20, approved the contemplated project.

It will be noted that the original resolution made no provision for the erection of an industrial plant. In 1950 this was corrected by the insertion of the words "an Industrial Plant" into Art. 2, Sec. 3(10), and the City Planning Commission, Inc., filed an application for the erection of a light industrial plant in a residential area.

The Bulova project, in Jackson Heights, Queens, was prepared with the problem of aesthetics kept foremost in mind. The resolution provided for the erection of a four-story building on a site area of approximately 24 acres, a plot coverage of 15%. Some 20% were reserved for landscaped park and a public use. The floor area of the building was to be 390,000 square feet. There were provisions for a parking area to accommodate not less than 500 cars. The entire area, including the plant building, interior roads, parking lots, walks, park areas and automobile deck.

(Continued on page 166)
New Bayley SAF-T-GARD Window
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area was to be landscaped, developed and maintained, “in such a way as to create a suitable and attractive appearance.” The application further stated that the three-story building would be used as central headquarters and plant for Bulova Watch Company. More specifically the activities would include administration and sales officers, advertising, personnel administration, product research and development, general engineering, quality control and metallurgical development, production of watch parts, assembly of watch movements, shipping, and the production of tools and dies for watch parts manufacturing. This light manufacturing would be permitted under amended resolution. It was also estimated the number of employees to be accommodate on this project would not exceed 2000. A were also provisions for the building of new streets, the widening of existing and the deeding of these to the city.

The City Planning Commission, in its resolution approving the Bulova application December 27, 1950, stated:

“The Commission was impressed by the municipality Campus plan, but the effectual any such plan is not practical at this time cause of the numerous interests and ag involved. It is obvious that the purpose would require expenditures far in excess sums now available for such purposes, ever, development of the Bulova project not preclude the subsequent use of others in the vicinity for public purposes. It appear that the Bulova project could be integrated with a larger community plan adversely affecting the over-all objectives of the latter. The Commission is hopeful that, as practical, schools, parks and other facilities in this area may be provided formity with such an integrated plan.”

The results of these two projects alone are listed as follows:
1. New York City gathered increased revenue by their real estate tax on the greater valuation of these two large projects, posed to lower assessed residences.
2. Employment was provided for residents of the neighboring communities close to their homes.
3. The City was given a large area for parks—the Bulova site provides play areas, swimming pool, comfort station, baseball and football fields available for public use.

(Continued on page 168)

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VIEWS

(Continued from page 20)

examinations, appreciate the fact that shortcomings were thereby made apparent. Architectural teachers listen to the tales of their students and are sure that examinations are at fault, rather than the own teaching. Practicing architects, have
THE LARGE GLASS AREAS in the combination market and restaurant in Wilkes-Barre, Pa., take on added beauty from the use of Pittco Premier No. 82-A Division Bars. Sash is Pittco Premier No. 70-A. Architect: Thomas A. Foster, Wilkes-Barre.

Distinctive design in divided glass areas

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(Continued from page 170)

registered, often give little thought to the problem until they need registration in a new state. What is needed is continuous education on the part of every architect to the end that registration procedures will be improved, registration laws will be strengthened and weakened, and that such laws be enforced.

An encouraging sign has been the increasing number of architects who are not members of registration boards, who have attended meetings of the N.C.A.R.B. Possibly a seminar on registration should have a place on the program.

In general, I agree heartily with Taft. Among the flaws in the new Georgia law are (1) requiring only one member of an architectural firm to qualify, (2) providing for the acceptance of "a diploma... from an architectural... school... in lieu of the examination, and (3) no specific provision for enforcement of the laws.

C. H. COWGILL,
Department of Architecture,
Virginia Polytechnic Institute

the intelligent way

Dear Editor:

Exceedingly timely

I have read the article very carefully and find that it is exceedingly timely. I believe that the stature of the profession would be greatly raised if registration laws were used to the fullest extent throughout the country.

IRVING G. SMITH, D.W.
Northwest District,
Portland,
Oregon

(Continued on page)
Gregson & Ellis schools do not skimp to achieve low cost. They have the de luxe features—finest lighting, ventilation, P. A. system and such equipment—that earmark today's best schools. The economy derives from the architects' ingenuity in organizing the job; using materials functionally without disguise, and from their intelligent approach to design and budget problems. The other source of Gregson Ellis' low cost is the economy inherent in oberton materials. Contractor for this job was Central Construction Co., of Atlanta, Georgia.

ROBERTSON STEEL ROOF DECK
forms a flat, attractive ceiling requiring only a paint finish. By sloping, the ceiling has good acoustical qualities. On the Roof Deck is 2" of insulation and a twenty-year bonded built-up roofing. The insert shows one detail of efficient job organization—workmen placing insulation and waterproofing on roof. The long-span deck is welded to steel members imbedded in the masonry walls.

ROBERTSON CORRUGATED WIRE GLASS SKYLIGHTS,
used to daylight corridors, are a feature of all Gregson & Ellis schools. This scene is in the Jim Cherry School, Brookhaven, Ga., pictured above. This school with 16 classrooms, auditorium-dining hall, kitchen, offices, auxiliary rooms, public address system and other modern equipment was completed for $6.25 per sq. ft.

16 ROBERTSON SHEETLITES,
set in a GALBESTOS roof, light this clean-cut auditorium. The structure is made entirely from noncombustible materials. This school at Manchester, Ga., has 27 classrooms, 3 offices, storage, toilet rooms and the 116' x 111' gymnasium-auditorium. It was built for $4.60 per sq. ft. The $217,000 total was $3,000 less than the budget.

H. H. ROBERTSON COMPANY
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June 1952
professional values they will gain, and deserve, more public appreciation. May lessons hard learned stay with us.

Bernard Tomson strikes at the heart of our professional troubles in seeking to develop, common to all states, the public values inherent in adequate registration laws. I hope his article stirs a real urgency among architects everywhere to demand a united front through national A.I.A. guidance, and to work unceasingly to bring this about. Its accomplishment would be the finest public relations gesture the profession could ever hope to make. It is the intelligent way to a public appreciation of the architect's contribution.

More power to Bernard Tomson and his for adequate registration laws common to states.

C. E. SILLING, Di
Middle Atlantic District,
Charleston, W

more than a law

Dear Editor: It is certainly time to attempt to get some reasonable uniformity in registration legislation. However, more than a law is needed. The whole examination procedure in states with strong laws as required “internship” period needs revision.

Among the questions that should be answered:
1. The reasonableness of the required time of three years of experience in New York, or some other states before any part of the examination may be attempted. The exam period is completely without control by any professional or public agency.
2. The justification for examining in subjects as the history of architecture. No one has yet convinced me that a knowledge of what building in 16th Century has any reasonable relationship to the problems of the public health, safety, or general welfare in 20th Century America.
3. The examination in design, as given in some states, lends itself to subjective evaluation on the part of the examining board and result can be that the design judgements have little to do with the protection of persons and property.

THOMAS W. MACKESEY,
College of Architecture
Cornell University
agrees wholeheartedly

Dear Editor: My comments relative to Tomson have to say are: I agree wholeheartedly with his premise that some uniform law should be advocated for the entire country.

You are probably aware that the Inspecial Committee for Surveying Architecture Education and Registration, has one section of their report devoted to regist
No kitchen is complete or modern without a Blo-Fan electric exhaust ventilator. Its patented blade combines the volume of a breeze fan with the power of a blower. Its attractive grille is removable without tools and the motor assembly merely lifts out for easy cleaning. A Pry-Lite modern recessed lighting fixture completes the picture.

Easy to clean or relamp, Pry-Lites have snap-on fronts. No screws, no hinges, no nuts—and no tools needed. Pry-Lites (1000 series) have a built-in pull box, adjustable mounting straps that eliminate framing-in time, a plaster flange which fits any finish, and they are U.L. approved for any standard building wire.

In the bath... Pry-Lites and Blo-Fan go together—Pry-Lite recessed lights give perfect illumination without glare—and elimination of offensive odors and steam-streaked walls is assured with a Blo-Fan exhaust ventilator.

**SPEED SWITCH**

This exclusive Blo-Fan feature makes it as easy to regulate the rate of ventilation as it is to control the speed of a car. Standard equipment on De Luxe Model 210 Blo-Fan only.

**PRYNE AND COMPANY,** Box P-62, Pomona, California

Eastern Factory: 124 Adams St., Newark, New Jersey
Warehouses: Los Angeles, San Francisco, Chicago, Atlanta

Stocked by more than 650 wholesalers in over 350 cities.
Having attended but one of the many sessions of this commission, I am, however, aware that the members recognize the worth of a uniform licensing law; but also realize that states' rights and many local conditions, together with local interests are working against such over-all simplification.

I am also very familiar with many cases and problems that come before the Board of Directors of the Institute relative to our inadequate licensing laws. The fact that all 48 states now have laws means a step in the right direction, but a step which will have to be supplemented over the years to get the proper teeth incorporated, as was only recently done in the state of Georgia. Even when such a good act put into force, there are always groups of individuals making an effort to weaken purpose, as is the case in Tennessee at the moment.

To be very practical about the whole matter I feel that all groups with the interest of the profession at heart, including our Board Directors, should keep up a constant pressure within the states and nationally to consummate some sort of a uniform registration law. It will take time but it is none too soon to initiate a pressure of this type.

The futility of working with local legislative groups, who usually are satisfying local interests and pressures, has been the chief stumbling block in the past, but by the proper public relations, with emphasis placed on safety, health and welfare of the public, more than on the resulting interests of the architectural profession, would ultimately bring about such a progressive and all-inclusive registration law.

I have heard Bernard Tomson speak before the Institute groups and I compliment you both on the excellent job he does.

KENNETH E. WISCHMEY
First Vice President, A.I.A.
St. Louis, Mo.

Dear Editor: I am wondering if you or Tomson are aware of the activities of the National Council of Architectural Registration Boards. This organization now has under study the unification of state registration laws. It met each year during the A.I.A. Convention and will meet this year in New York, Sunday and Monday prior to the Convention. I understand the committee is working and will probably report on their activities along the line of Tomson's suggestions.

There is no question but what there is a need for some unification. I find in my visits to various chapters in my region that it is one of the topics most discussed with emphasis on a hope that some national standard could be set up for use in securing local legislative action which would be strengthened by a national pattern. I also find that there is a hesitancy on the part of state groups to ask their respective legislatures to make drastic change.
l of Chicago's large downtown theaters have **RIXSON concealed door closers** control these heavily used doors.

Only embedded... CONCEALED in the RIGID FLOOR...

RIXSON Closers are controlling the closing action of these theater doors (some for over 30 years).

For modern appearance, convenience, safety and long trouble-free service...

ECIFY precision-made RIXSON.

**THE OSCAR C. RIXSON COMPANY**

4450 west carroll ave. - chicago 24, ill.
in their registration laws because of the fear
that they may end with legislative opposition
that might result in damage to their existing
registration laws. This feeling has been a
most deterrent factor in overcoming the in­
adequacies of existing state registration acts.
Therefore, they feel that some national pattern
would be of great benefit in selling the
respective state lawmakers.

HOWARD EICHENBAUM, Director
Gulf States District, A.I.A.
Little Rock, Ark.

Balance
your ventilation;
get ample fresh air intake capacity
with Swartwout Airlouver

Custom-made for each job without premium cost, this
weatherproof system provides unusual advantages — has
better-than-average free opening area. The wide range of
odd-size units available through our unique manufacturing
procedure makes easy and economical the filling of any size
opening. Overlapping blades are mounted in sturdy formed
channel frame. Adjustable style features positive closing and
quick change of blade position to any variation between
open and closed. Airlouver is made in fixed-blade style also.
Write for Bulletin 339G.

18511 Euclid Avenue, Cleveland 12, Ohio

The Swartwout Co.
Roof Ventilators and Ventilating Louvers

POWER PLANT EQUIPMENT • PROCESS INDUSTRY CONTROLS

appeasement chant

Dear Editor: My office has just delivered c
plete Contract Documents to the Public Hou
Administration for three Housing Projects
Fresno County, and, being an interested wit
all the strenuous effort of satisfying
well known host of requirements, my v
has recapitulated in rhyme her impression
the operation, which is enclosed.
I thought it might strike a responsive ch
in some of the readers of your good magaz
JOHN P. MIL
Archi
Fresno, Ci

public housing

So much confusion in the air
Little men run now here now there
Catching plurals, commas, quotes,
Thrashing windmills, nany goats.
When at last the dust will settle,
Temper calmed and eyes half shut 'till
Slowly they become aware
Of something growing over there ...
A spreading out—a pushing higher
And here and there a rubbish fire,
By light of which one just makes out
The flow of living space throughout
Soon to be filled with living things,
Flowers, trees, a bird that sings.
People too will soon rush in
With crates and boxes, children,—gin,
Leaving dirt and dark behind
For fresh paint, sun, venetian blind.
For this, dear sirs, is what evolves
From taxes, red tape, dedication
Of Housing Projects across the nation.

the guest speaks

Dear Editor: Having designed a half do
resort hotels in the last three years, I re
with avid interest the section devoted
INTERIOR DESIGN DATA which concerns its
with resort hotel rooms (April 1952 P/A). Since
spent some time in the Caribe Hilton and
hotels similar to El Panama, I was most in
terested in seeing what was said about bo
of these hotels. Never having learned the
gentle art of polite criticism, I am afraid t
what I have to say will seem like rather be
bold statements. I intend no criticism of
architects and their views, but I do feel t
something should be said about this subje
est other architects absorb everything in t
section as gospel truth. Paraphrasing the se
wrenching outcry of Hamlet, I cannot help
This office was planned for livability—not limitation

- Future expansion plans of this small but progressive company call for these executive offices to be a part of the production floor. And when that time arrives—next year or five years from now—these offices including the walls will be moved and re-erected in a new location without muss, fuss or even one day of lost time.

With modern Hauserman Movable Interiors, thousands of American businesses—commercial, industrial and institutional—are experiencing this same freedom from limitation... permanent livability despite changing floor space requirements.

Although present demand for Hauserman Movable Interiors is the greatest in our almost 40-year history, recent expansion of production facilities makes it possible to meet delivery schedules with earlier on-time erection by Hauserman's own nation-wide service organization.

Now, before you remodel or expand, is the time to plan for the many space-saving, time-saving, money-saving advantages of Hauserman Movable Interiors. Your nearby Hauserman Representative will gladly furnish you with complete information... or write today to The E. F. Hauserman Company, 7218 Grant Avenue, Cleveland 5, Ohio.

Korweld—the non-metallic panel construction which combines the best features of all types of interior partitions—is an exclusive Hauserman development. Ask your Hauserman Representative for facts about this revolutionary new product.
beautiful terrazzo
An aristocrat that works in supermarkets

Does a Terrazzo floor in a supermarket surprise you? It shouldn’t, because not only is Terrazzo beautiful, but also its low annual cost prompts the choice.

The designer reasoned: heavy foot-traffic grinds the life and beauty out of most market floors. Terrazzo floors are known for long service life. They require virtually no maintenance and are easy to clean. What’s more,Terrazzo stays beautiful throughout its long, long life.

All this made “dollars and sense” to management...and also made Food Fair Market floors, such as the one above, an important part of their attractive interiors.

Terrazzo offers the architect a spectrum of color, unlimited design possibilities. Made with a true white cement, like Atlas White, any desired color and shading can be produced. In short, Terrazzo gives practical beauty for commercial-building floors or any other.

For more information see SWEET’S Catalog, Section 4G/Uni and 13f/Un, or write Atlas White Bureau, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

FOR BEAUTY AND UTILITY
ATLAS WHITE CEMENT
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"THEATRE GUILD ON THE AIR" Sponsored by U. S. Steel Subsidiaries
Sunday Evenings—NBC Network
Another prominent UNIT VENTILATOR CONTROL installation by POWERS

Comfortable Classrooms under severe weather conditions are assured in Bloomington's modern school. No expense has been spared in giving children and teachers the best of heating and ventilating equipment for classrooms and gymnasium.

Greater Simplicity and dependable operation of Powers controls for Unit Ventilators in classrooms appeal especially to operating personnel.

Because of its superior design a Powers Low Limit Thermostat requires no auxiliary devices to supplement its accurate control of unit ventilator discharge temperature. Once set for the proper temperature it requires no readjustment—there are no fine restrictions to be serviced. Contact our nearest office for further information about its superior features. There's no obligation.

Established in 1891 • THE POWERS REGULATOR COMPANY • SKOKIE, ILL • Offices in Over 50 Cities

Architect: Eugene D. Corwin • Consulting Engineers: Gausman & Moore
Heating Contractor: E. R. Johnson Plbg. & Heating Co. (all of St. Paul, Minn.)

75 Powers Day-Night Thermostats here control 117 Diaphragm Valves in Unit Ventilators and Convector.
One of the largest single units for grinding machine manufacture is this 6½ acre Norton plant nearing completion. It embodies both the most modern machine tool design techniques and the last word in straight-line production methods. Practical consideration is given to the comfort and safety of employees and visitors. In the attractive lobby permanent protection against slipping is provided by wear-resistant Norton Non-slip Floor Tile. Terrazzo floors in kitchen and washrooms . . . wherever water, grease, etc. might be present . . . make use of other Norton non-slip floor products. For helpful information as to colors, types and suggested specifications write for catalog #1935-FAC.

NORTON COMPANY
7 NEW BOND STREET • WORCESTER 6, MASS.

MAKING BETTER PRODUCTS
TO MAKE OTHER PRODUCTS BETTER

VIEWS

(Continued from page 180)

She felt that the room and the furnish-
were closing in on her. To avert hysteria,
went out on the terrace while I reasoned
her to see why this sense of claustrophobia
taken such complete control of her. She c
not explain in particular, except that she
could not spend another night in
room. (The truth of the matter is that
checked out the next day.) After a
phenobarbitol, she finally dozed off, 
sofa bed with a vista of efficient metal
supporting functional modern furniture. I
were no soft lines—nothing that human emo-
could find pleasure in. A sleepy mind in
environment like this immediately forms assi-
ations and if you will look carefully at
photographs of these rooms, as I have loo-
at the room itself, you may also underst-
the feeling that it is efficiency and mel-
ousness such as this, that the average per-
would associate with hospitals and public
stitions. A lone reaction, you say. Oh,
After this disquieting experience at the Ca-
Hilton, I made it my business to interro-
gave people a vague feeling of unrest
and dissatisfaction and I know of one case wh-
the woman refused to
in the room any longer.
The sofa-bed or daybed arrangement
spoken of as "the coming thing" in hot-
I have attempted to introduce this type
furniture arrangement in the resort hotel
have done in Florida. And, in each case, m-
of these rooms have been furnished beca-
the average guest prefers a bedroom arran-
ment. I have tried arguing with my die-
but one cannot argue against good busi-
In Florida, at any rate, a living-bedroom
arrangement is a drug on the market. If I r
indulge in personal tastes, I am getting th-
of checking into a hotel that has this arran-
ment and deciding with my wife whether
would sleep head to head, feet to feet, h
or, what have you. I am old-fashi

(Continued on page
Designed for appearance, performance and a lifetime of trouble-free operation.

The beautiful, modern Grayton Arms Apartments, Savannah, Georgia
Architects: Cletus W. and P. P. Bergen, A.I.A., Savannah, Georgia

Auto-Lok Aluminum WINDOWS

BINE THE BEST FEATURES OF ALL WINDOW TYPES
THE FIRST WINDOW TO MAKE WARMER IN WINTER... because it seals itself like a refrigerator. Keeps heat in, cold out.

COOLER IN SUMMER... because it opens wide... scoops air in and up... luxurious ventilation, but no drafts.

PERFORMANCE FACTS

of aluminum awning-type windows

Every day, more and more architects and contractors are turning toward aluminum type windows. Here's why:

- These new, more rigid and exhaustively tested windows are being specified for all types of construction, including factories, commercial buildings, apartments, hotels, schools, and homes. Over a period of years, the Ludman awning-type window has been subjected to rigid and exhaustive tests to determine its performance characteristics and operating ability under every known weather condition.

- The Ludman Auto-Lok leads the world in window engineering.

- Performance facts:
  - Because of their outward projection, aluminum awning windows provide the possibility of attaining 100% ventilation and limited ventilation, even when it is raining or snowing.
  - In their wide-open position awning-type windows can be completely cleaned from the inside, unlike many other types, where vents are pivoted on a point, the top vent cannot be cleaned from the inside.
  - The Ludman Auto-Lok window can be cleaned completely... all from the inside.

- Better ventilation... easier to clean.

Because of their outward projection, aluminum awning windows provide the possibility of attaining 100% ventilation and limited ventilation, even when it is raining or snowing.

Ludman Corp.

BOX 4541, MIAMI, FLORIDA

Sales Offices in all Principal Cities

Ludman leads the world in window engineering.
This unit is Auto-Lok, developed by an Corporation after many years of research. Tight closing performance is made possible by patented hardware, a self-locking device automatically seals the window tight when closed. Auto-Lok hardware provides a closure many times tighter than the popular establishedords for casement windows and projected Pittsburgh Testing Laboratory tests reveal infiltration through a standard, assembly Auto-Lok window amounts to only 0.095 feet per minute... a degree of weatherlessness heretofore thought impossible in any window. Though the Auto-Lok locking action is live with Ludman, other manufacturers are using to use a vinyl plastic weatherstripping al similar to that which Ludman uses to weatherstrip the Auto-Lok unit.

A study of the operating hardware of all awning-type windows reveals the fact that Ludman, maker of the Auto-Lok Window, has the most efficient mechanism from the standpoint of easy operation and trouble-free service. A study of the operating hardware of all awning-type windows reveals the fact that Ludman, maker of the Auto-Lok Window, has the most efficient mechanism from the standpoint of easy operation and trouble-free service. The Auto-Lok operating device eliminates strain required to force the hinges in to pull individual sash in tight against the frame of the window sill into the room. have removable cranks and extension handles.

AMOUNT AND QUALITY OF VENTILATION?
AUTO-LOK checks: 100% ventilation, draft-free! Vents open almost 90°, entering air is scooped in and up.

POSSIBILITY OF VENTILATION CONTROL?
AUTO-LOK checks: You make your own weather! Perfect control in all positions from a slight crack of one vent to full opening of all vents.

WEATHER PROTECTION WHEN WINDOW IS OPEN?
AUTO-LOK checks: Awning-type design provides the luxury of healthful, refreshing ventilation even when it's raining.

WEATHER-TIGHTNESS WHEN WINDOW IS CLOSED?
AUTO-LOK checks: AUTO-LOK is the tightest closing window ever made! Closes many times tighter than any other window. Patented weatherproofing design isolates weather to a degree heretofore believed impossible.

WHAT OBSTRUCTIONS TO VIEW (RAILS AND MUNTINS)?
AUTO-LOK checks: Extremely narrow yet strong rails and muntins are made possible through the use of adeptly engineered extruded aluminum sections.

FIRST COST?
AUTO-LOK checks: Initial cost compares favorably with competing products providing many less advantages. You cannot buy better window performance at any price.

MAINTENANCE COSTS?
AUTO-LOK checks: Simplified operation eliminates wearing parts. No periodic adjustments necessary. Ludman engineering leadership combines the best in design, materials and workmanship to produce a window that will give no-wear operational ease with a minimum of maintenance.

CAN ALL WINDOW GLASS BE CLEANED FROM INSIDE?
AUTO-LOK checks: Window can be completely, comfortably and easily cleaned entirely from inside, including top vent, too. No gadgets to disengage.

HOW DOES THE WINDOW FIT IN WITH PLANS FOR SCREENS, STORM SASH, BLINDS, ETC.?
AUTO-LOK checks: Interchangeable inside screens and storm sash can be placed or removed easily... just flip the clips, no tools required.

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SALES OFFICES IN ALL PRINCIPAL CITIES
WIDE RANGE OF STOCK SIZES AND ARCHITECTURAL TYPES TO FIT EVERY REQUIREMENT... 

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Please send me complete information regarding:

☐ Auto-Lok Aluminum Windows
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☐ Ludman Jalousie Doors
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Also, send your free booklet, "What Is Important In A Window."

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THE WINDOW THAT SETS A NEW STANDARD FOR WINDOW PERFORMANCE

The design of AUTO-LOK Aluminum Windows and the development of their patented, self-locking operating device, are the results of years of research by men who know windows and window problems. The materials that go into manufacture of AUTO-LOK are the finest produced. The exacting workmanship is your final guarantee of windows that will meet the broadest specifications. Many features to spare!

Only Auto-Lok gives you all these features...

FRESH AIR WHILE IT'S RAINING
No more running to close windows...rain can't enter through slanting sash!

WARMER IN WINTER...
Seals itself shut like the door of your refrigerator...keeps heat in...cold out!

COOLER IN SUMMER...
Opens widest...scoops air inward and upward...luxurious ventilation, but no drafts!

PRACTICAL BEAUTY...
Narrow horizontal lines and graceful tilt of sash in every open position add distinction to any home...lend themselves to a wider variety of architectural arrangements.

EASIEST TO CLEAN...
Nothing to lift out...no sash to remove...no gadgets to disengage. Simply open wide and clean all glass from the inside...top sash, too!

INTERCHANGEABLE SCREEN AND STORM SASH...
Can be handled all from inside. Just flip the clips and tools required. Reduce work to an hour!

FRESH AIR NITE-VENT...
Bottom sash opens silently night ventilation, while sash remain securely...fresh air circulation even in the worst weather, too!

FINGER-TIP CONTROL...
for a lifetime. Perfection, friction-free mechanism operates window at the touch of a finger. No adjustments ever necessary...never rattles!

CONCEALED HARDWARE...
No unsafe, unsightly hardware exposed to cold. Compact, rotatable or handle does not interfere with drapes, blinds, etc.

LUDMAN Corporation, Box 4541, Miami, Florida
World's Largest Manufacturer of Awning Windows and...
NOW YOU CAN OFFER AT NEW LOW PRICES

IMPROVED PERFORMANCE

ALL-AROUND LIGHTING IMPROVEMENTS

LOW MAINTENANCE COSTS

IMPROVED DESIGN

with Sylvania's New Industrial Fixtures

Announcing 222 New Industrial Fluorescent Fixtures at an amazingly new low cost. All are engineered to meet every lighting need in any type plant for any level of illumination. Customers make additional savings since new design also cuts maintenance costs.

Reasons for Sylvania's flexibility and lower cost

Simplified designing is the basic reason for the success of this new line. With one skillfully engineered reflector and two top housings, Sylvania lighting experts have developed 6 interlocking "family" groups of 24 standard fixtures each. These, with optional variations, making up 222 different types, offer a variety and flexibility never before possible.

And, because this line requires comparatively few different parts, die costs and assembly costs are held way down. These savings are now passed along to you in lower prices.

You'll want all the facts about this splendid new fixture line. The coupon brings you new folder and data sheets for your file.

MAIL THE COUPON NOW!

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FLUORESCENT TUBES, FIXTURES, SIGN TUBING, WIRING DEVICES; LIGHT BULBS;
RADIO TUBES, TELEVISION PICTURE TUBES; ELECTRONIC PRODUCTS; ELECTRONIC
TEST EQUIPMENT; PHOTOLAMPS; TELEVISION SETS

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enough to want to retire in a more conventional position. Those wonderful tile floors—so clean, so efficient. But if anyone moves a piece of furniture, 10 rooms down, the squeal of the furniture leg on the tile is enough to rouse you out of the deepest slumber and send shivers down your spine. It was one of the most uncomfortable sounds that I had to live with while in this type of hotel. But that's not all. In one of my stays, a young lady (I assumed she was young although I never saw her) had a way of returning to her room at about three o'clock in the morning. The lady in question wore high heels and the sound of high heels tapping along those lovely floors, from closet to dressing table, from dressing table to bathroom, from bathroom dressing table, until finally she was ready to retire, was another thing that kept us awake every night. Her nocturnal habits and her high heels are something I will never forget, well I think of clean efficient tile floors.

And now to talk of “Nature’s own cooling system.” Ah, yes! The tradewinds wonderful—much better than draughty air conditioning, but—how can you get air and off light and sound! I have tried and I could not find the answer. If you kept the jalousies on the hallway side open, then at approximately eight o'clock in the morning the staff (to work) housemen and maids with their r and pails and their stories of how they slept the previous evening. Sound travels unhindered through the jalousies and, aided and abet by smooth walls and tile floors, even a whisper could be heard. Try and sleep! Close jalousies you will say—well, no sound—but air. Try that in the tropics. That’s not possible. On the outside windows, the rooms are usually furnished with a drape over the jalousies, but you cannot draw drapery, because you cut off the flow of air through the room, so you leave the drapery open when you retire at night. At five-six o'clock in the morning, the sun “cups up like thunder” and floods the room with light. Some people, of course, can sleep spite of noise and light. I, for one, cannot. So I get up and close and draw the drapes to shut out the brilliant tropical morning. Do I go back to sleep? No. Within 10 minutes I am lying in a pool of perspiration. No body and you really suffer!

I did not mean and do not mean criticisms to be harsh or offensive. If my ideas are not sound quite political, then you will attribute it to the fact, as I said before, I have never learned the gentle art of criticism but the facts do remain. I think that there should be made to live in their own region and find that some of those things looked so good in photographs and so good in text are actually detrimental pediments which should not be encouraged promulgated.

MORRIS LA
New York, NY

(Continued on pag...
Only Armstrong's Asphalt Tile offers you this choice

Now you can specify Armstrong quality in two types of asphalt tile graining. The swirl marbleizing of Armstrong's De Luxe Asphalt Tile creates beautiful allover effects that cannot be achieved with any other type of graining. This tile also has superior strength and flexibility. Exclusive manufacturing processes interlock fibers and binders in two directions for greater strength, much as alternating the grain adds strength to plywood. The swirl marbleizing of Armstrong's De Luxe Asphalt Tile also speeds installation because it doesn't require twisting and turning to match grains.

For decorative effects requiring floors with directional graining, the Armstrong Line now includes Standard Asphalt Tile. You can design floors to suit any decorative scheme in which a straight-grained asphalt tile is preferred. Where price is the most important factor, Armstrong's Standard Asphalt Tile offers Armstrong quality at minimum cost.

Armstrong's De Luxe Greaseproof Asphalt Tile is available with swirl marbleizing. Armstrong's Standard Grease-Resistant Asphalt Tile is made with directional graining. For samples and complete specifications, write Armstrong Cork Company, 8906 State Street, Lancaster, Pennsylvania.

ARMSTRONG CORK COMPANY
GRANT SLIDING DOOR HARDWARE

of Course!

You couldn't ask for a more complete line of sliding door hardware! Over 55 years of experience lie behind every Grant Hanger — experience shown in the quality of Grant Sliding Door Hardware.

GRANT HARDWARE FEATURES

- Nylon ball bearing rollers — no metal to metal contact!
- Center Hung Hardware — completely plumb installation!
- Affords three adjustments — horizontal, vertical and exclusive aligning feature!
- For all door sizes — up to 50 lbs. per door!

The foremost name in Sliding Devices

GRANT PULLEY & HARDWARE CO.
31-81 Whitestone Pkwy.
Flushing, N. Y.

Please and satisfied

Dear Editor: I admire your magazine and appreciate all that you are doing. I study every issue from front to back. However, because of my intensive reading of the P/A and of my other periodicals, not to mention my social activities and studies, I find I get further behind in my reading, and magazines are crowding my desk, my files, and my book case.

It was my intention to let my subscription lapse and get up to date and then at that time consider renewing. I just glanced through the January issue to see what was doing and how and was pleased and quite satisfied with the issue. In fact, I decided that I couldn't afford to miss any of the forthcoming issues. I know I can't show my enthusiasm any better than to renew my subscription.

ALBERT H. TEBBS
Pittsburgh, Pa.

high level

Dear Editor: Each issue of P/A is getting better. You have reached a pretty high level, and we only hope you can keep it up.

THOMAS H. IRION

PLASTIMENT-CONCRETE SATISFIES ALL FOUR BECAUSE

- MIXES BETTER
- HANDLES EASIER
- PLACES FASTER
- STAYS DURABLE

PLASTIMENT is the chemically Retarding Densifier especially developed for concrete work which requires your guarantee. Related, sets, densifies mix to provide controlled properties for superior to reference concrete. Designed for use with all types of aggregates and all methods of mixing and placing, PLASTIMENT-Concrete's ease of handling and superior results find ready on-the-job acceptance in every phase of construction. For full details, write or call.

APPROVED: PLASTIMENT and other Sika Products have been tested and approved on Federal, State and Municipal projects, and are approved under Building Codes of principal cities.

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TELEPHONE Prescott 7-6920

A new four page bulletin is now available

Sola Slimline Instant-Starting Fluorescent Lamps Ballasts. This bulletin gives complete electrical and mechanical specifications for two-lamp and single-lamp ballasts for slimline fluorescent lamps. This information is tabulated along with lamp size, lamp current and lamp watts for each particular lamp and its associated ballast. The bulletin also illustrates the Sola pressed-in core construction with an exploded drawing, and a patented Sola ventilated capacitor component with a cut-away photograph.

Write for a copy of this informative bulletin your letterhead. Ask for bulletin H-PFL-1.

SOLA ELECTRIC CO.
4633 N. 16th St., Chicago 50, Ill.