LUNCHEONETTE DESIGN

THESIS PROBLEM IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE PROFESSIONAL DEGREE OF INDUSTRIAL DESIGNER AT THE CALIFORNIA INSTITUTE OF TECHNOLOGY, PASADENA, CALIFORNIA.

ORVILLE S POWELL

1947

TABLE OF CONTENTS

SUMMARY

Architectural design requires a knowledge of materials, their structural properties, and effectual applications. To the Industrial Designer, these are important considerations, but they constitute only the beginning of the problem. A problem of this nature is beset with the necessity for comprehensive research into consumer and merchandising studies. The almost complete lack of usuable information pertaining to restaurant problems adds to the obstacles encountered, such material as is available is either too general in nature or too antiquated for usuage.

The approach and solution of this thesis project incorporated investigation of the restaurant industry, with emphasis on those matters concerning the small luncheonette, study of illumination requirements, compilation of data for solar study, consideration of structural and decorative materials, examination of consumer and potential trade habits and trends, and a correlation of these results into the final design. The use of a specific establishment as a guide elevates the problem beyond the theoretical phase into the practical one, therein the solution is a logical one, and one that with minor adaptions could be applied to problems of a similar nature.

Luncheonette design is in itself a broad field and much further study is necessary, and, though much thorough and painstaking work was involved, the presentation will be offered in a brief and concise manner. The luncheonette is designed to fulfill the requirements of good design while attaining realism through application to a specific problem.

INDUSTRIAL DESIGN in the ARCHITECTURAL FIELD

The profession of Industrial Design comprises an extensive scope of problems and solutions; nevertheless, each case receives individual consideration with detailed analysis on its own merits. Thus, a specialized and personalized service is available to the client. The architect and the engineer, engrossed in their own immediate and pressing problems, are often unable to comprehend and to interpret influencing factors outside their particular fields, and frequently have difficulty in keeping abreast of the latest developments and applications. Consequently, their perspective of the complete picture is, of necessity, often exceedingly narrowed. Merchandising, trade and consumer analysis, and probable future trends are vital background considerations frequently neglected. The Industrial Designer should be qualified to evaluate and to fit these factors into the overall picture.

Bridging the gap between the architect and the designer, as with the engineer and the designer, is essential for necessary cooperation and coordination in the successful production of any product. The two professions should be mutually complemently, not diversely competitive. The massed produced article is a triumphant outcome of the combined efforts of the engineer and the designer - made for the masses of the people, it best serves the masses. Similarly, portions of the architectural work strive to serve the masses, store designs and prefabricated houses are notable examples. In store design, building structure and sales area are salient factors in effective merchandising. The entire establishment must be designed as a unit, including fixtures and

wall treatment. This, the Industrial Designer is qualified to successfully accomplish. The influx of fresh and stimulating ideas and the application of new materials result in an inviting and appealing interest to the ultimate consumer and profitable returns to the owner.

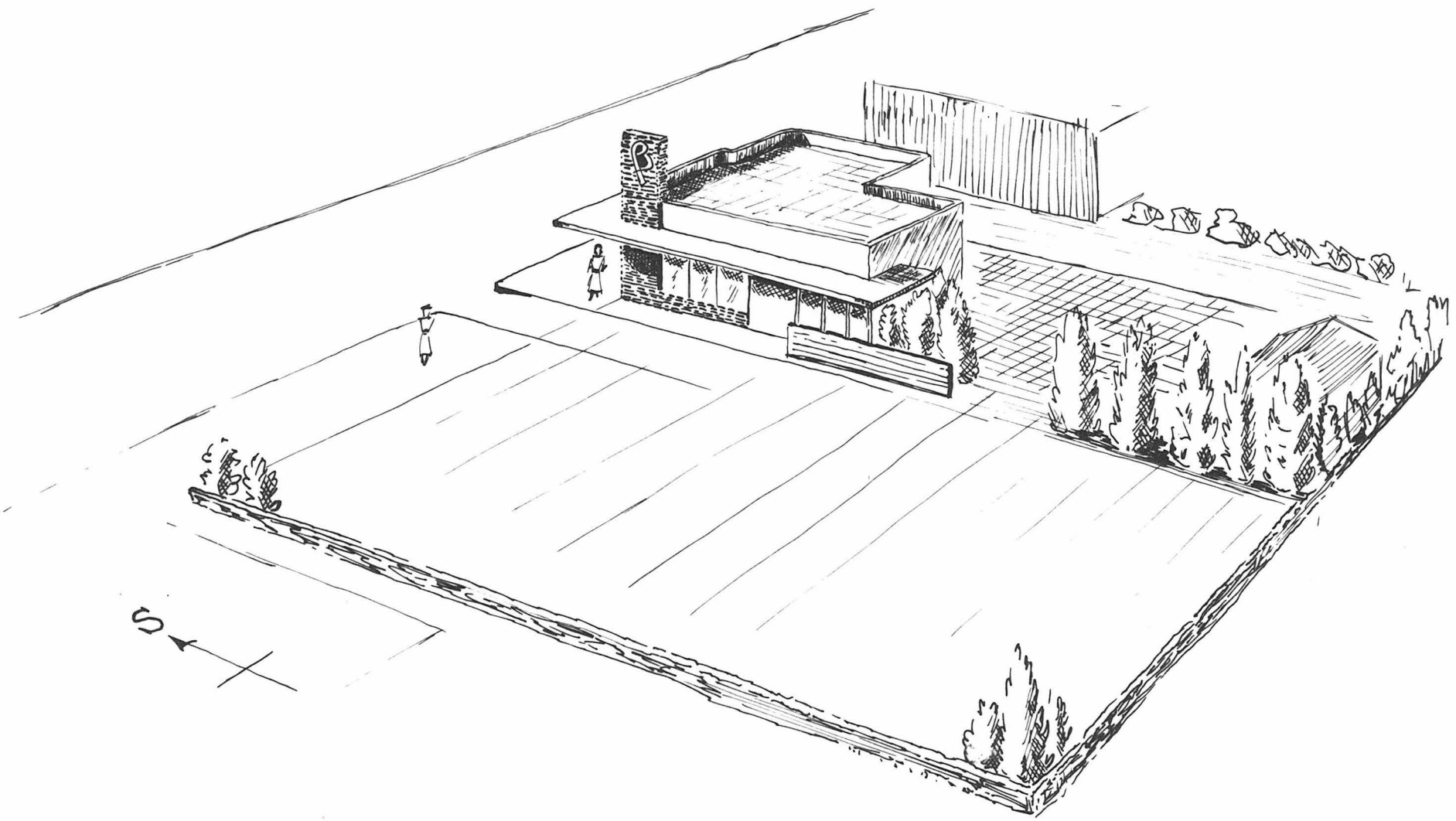
Industrial Design fills a definite need in the architectural field, but complete understanding, on the part of the Industrial Designer, of the problems of the architect is essential to create and to maintain cooperation that will manifest benefit to all concerned. This increasingly important aspect of Industrial Design should be a requisite for the prospective designer.

INTRODUCTION

PROBLEM The design of a quick-service restaurant to conform with limitations imposed by use of building structure of existing establishment and with restricted expenditure - to include only the service area proper, exterior design, and automobile parking facilities.

AIMS To increase profits and prestige of owner and to render a beneficial service to the consumer by distinctive design that results in a reasonable initial expenditure, yet offers an attractive and inviting atmosphere. Engineering, Architectural, and Industrial Design knowledge and experience will be correlated to design the luncheonette.

DESCRIPTION Present luncheonette occupies a floor area of approximately 800 square feet in the east section of a single story, cement stucco, isolated structure. Building line coincides with front property line and borders 16 foot wide pavement along a main, six car lane, thoroughfare. West section of the building, approximately 300 square feet of floor area, is to be remodeled as an ice cream parlor. Adjacent parking area is on the east side of the building and occupies approximately 5000 square feet. Luncheonette capacity, at present, is restricted to a total of nine consumers at the counter; waiting facilities are limited.



PERSPECTIVE SKETCH

PROPOSED SITE PLAN
O. S. POWELL APRIL 47

RESEARCH CONTENTS

TRADE ANALYSIS

The restaurant industry represents a tremendous retail business whose dollar volume sales is rivaled only by staple food stores, motor vehicle dealers, and filling stations. The war years, with the subsequent mass desires of people to eat away from home and the ensuing demands created by increased war industrial employment, produced an all time peak business era. Inability to construct new and additional facilities due to material and labor shortages, to repair and replace worn out and obsolete equipment, and to replenish diminishing stock items, has created a demand sufficient to extend this peak business trend. The present facilities are overtaxed in eating establishments of all types except the more exclusive restaurants and night clubs. But this trend, promising as it may appear, may be short lived, for conservative forecasting indicates a return to the normal period.[1] Nevertheless, outdated buildings and worn out equipment must be replaced, these conditions alone present many perplexing problems for the architect and the industrial designer.

Desired classification breakdowns into various types of eating establishments are not available; complications are encountered where food serving represents only a portion of the total business with such outlets as hotels, department stores, and wayside filling stations. Typical of the retail trade, the restaurant industry is primarily a small unit business in respect to the number of establishments. But approximately 15 percent of the 525,000 commercial eating establishments registered with the

United States Rationing Program[2] conducts 75 percent of the dollar volume sales. Restaurant failure is extremely high, with the majority of discontinuances occuring the first years of operation. Estimates place the mortality rate at the end of the first year of business as high as 50 percent.[3] Failure seems to be confined to the smaller and infant establishments, for once the threshold of the dangerous first years is over, prospects of continuancy are enhanced. Failure may be attributed to lack of experience, insufficient capital, poor management, or inability to cultivate and maintain trade.

A luncheonette of the capacity and type of business as under consideration in this thesis is classified by the United States Department of Commerce under "lunchcounters and stands" - those establishments primarily engaged in selling prepared food for immediate consumption, but do not receive a substantial part of the receipts from the sale of meals at tables. The 1939 United States Department of Commerce Census listed a total of 1436 such establishments in Los Angeles.[1] Estimations obtained directly from offices of the Southern California Restaurant Association place the present total at approximately 1500. Shortages in building materials and food, lack of equipment for replacement purposes, and the displacement of personnel to the services and war industries resulted in an actual decrease in the number of establishments, though dollar sales continued to rise for those able to conduct business. This downward trend in the number of establishments continued in the immediate postwar years, but a slight increase has been noted since 1944.

Food establishemnts of the capacity and type of service as to be considered in this thesis are, for the most part, individually owned, and are operated with a minimum of outside employment. As previously stated, the mortality is extremely high in this group, and the owner must continually recognize the presence of this constant threat. Insight and foresight must be complete and accurate to promise continual success, proper design to offer the necessary attraction factors and to aid in maintaining trade is an important step toward achieving this goal.

NOTES

1: "Establishing and Operating a Restaurant"
United States Department of Commerce

2: Office of Price Administration

3: "Selling to Restaurants and Hotels"
Ahrens Publishing Company

4: Census of Business, 1939
United States Department of Commerce

BACKGROUND

The present establishment is a fairly successful venture; profitable returns were consistent during the war years and in the immediate post war years. However, indications prompt modifications in the building structure and in service capacity. The present space limitations and the particular trade appeal retards progressive desires and prevents securing the maximum volume of potential trade.

The average sale per customer is approximately thirty-nine cents. The bulk of all sales is derived from a source termed "short-order", usually a limited menu or a speciality. This style of menu and serving permits specialization, requires minimum preparation, develops efficient service, and simplifies the ordering and storing of purchased items. Although the available consumer trade is thereby narrowed, such a feature is a great appeal to a certain section of the total trade. Demand for such a menu exists not only during the normal peak business hours when the consumer desires a quick meal, but also during the in-between hours. This factor tends to distribute the business throughout the day.

Studies of the consumer habits and demands respective to this establishment reveal a desire for quick service with the mentioned type menu. The major portion of the consumer trade consists of male employees of the neighborhood offices and businesses. The demand is throughout the day and is sufficient to

warrent a profitable return in conducting a 24 hour service, seven days a week.

Site location may be termed an "in-between" the block location. The restaurant borders a wide pavement of a main thoroughfare classified by the city as a 35,000 passenger car per hour per weekday (twenty four hours) artery[1] and one that also serves as a coach route for the Los Angeles Transit Line. The nearby street intersection is formed with a perpendicular crossing of an artery classified as a 7,000 passenger car per hour per weekday[1] and one that serves as a car line for the Los Angeles Transit Line. This intersection is the nucleus of the neighborhood shopping center. Pedestrian traffic varies throughout the day, but, even at peak hours, little trade is enticed to enter the luncheonette for the first time. The trade that does enter is essentially one of known or friendly customers, not of new consumers. Vehicle traffic past the restaurant, as noted, is high, yet few cars stop. Potential trade possibilities from these neglected sources is considerable.

The establishment is located along the righthand side, North, of the vehicle traffic traveling West to the main intersection and the shopping center. The driveway to the adjacent parking lot, on the East side of the building, is convenient and the location affords ample time for drivers to turn in at the restaurant. Parking is permitted at the curb. The combined facilities for parking are seldom overtaxed.

The immediate neighborhood, excluding the centralized shopping

center, is essentially a residential area. The general area characteristic is of the lower middle income class.[2] The majority of homes are of frame construction, or cement stucco, and are generally single unit dwellings. As previously mentioned, sales are derived substantially from consumers composed of the nearby workers, and not from the residential population.

The illumination aspects of the present luncheonette are inadequate to satisfy requirements. The main light source is a single unit containing four, 48 inch, fluorescent tubes. This unit is suspended from the ceiling at the center of the service area. Two additional 48 inch tubes are attached to the under surface of the fume canopy to aid in illuminating the work area. The resultant light is insufficient in quantity, the light that is obtained is poorly utilized because of improper arrangement and location.

As the building front faces due South and little shade is present, there is an urgent need for solar angle consideration. The present ventilating system consists of two small motor fan units that attempt to remove undesirable air. One fan is located under the fume canopy to remove excess cooking aromas, the other is located on the ceiling above the service area. The system is taxed at midday and the use of an objectionable and unsightly awning is required.

A limited amount of success has always favored this establishment; reasons for this success may be attributed to:

1: Development of goodwill on the part of the owner.

2: Favorable location.

3: Satisfying trade demand for a selected, specialized, quick-service menu.

4: Efficient and cheerful service from employees, possible by selected personnel and minor employment problems.

5: Low operating expenses, with maximum use of seating capacity, resulting in a rapid consumer turnover and a comparatively small payroll.

NOTES

1: Regional Planning Commission, Highway Division, City of Los Angeles

2: Los Angeles Times, Market Control Map, 1946

EVALUTIONS

Continual success is the aim. Deterioration, obsolence, and rising competition are ever present and cardinal problems. To combat the effect of these influencial forces, the owner must constantly be on the alert; and the designer, to accomplish his purpose most satisfactorily, must thoroughly understand the many problems and the extremely competitive business of the restaurant trade. Profits, through rapid turnover, quick and efficient service, and trade retention are sought by the owner.

The following factors are important considerations toward success and pertain directly to this establishment:

1: Rising competition, of utmost concern in this case, presents a constant threat. To enjoy success is to unintentionally invite others to attempt to share that success. Competition thrives on the inability to fully absorb available trade or on the failure on the part of the owner to maintain an interesting and changing atmosphere.

2: Obsolence and general deterioration with the passing of time soon outdates the establishment. The consumer desires an atmosphere that is pleasant, clean, and free of the clatter of dishes, yet luncheonette patrons also desire an occasional change in the atmosphere. Sections of the wall that can be inexpensively altered to present a new texture, or variations in the color

scheme, and the replacement of plant life are simple expedients that offer the consumer the desired change. Maintenance and obsolence replacements of building sections, fixtures, and equipment are required to maintain standards and to meet the demands of the consumer trade.

3: Sufficient seating capacity to satisfactorily serve normal trade is essential. The present capacity is inadequate to accommodate properly the available trade, to estimate loss of trade that refrains from entering because of this factor is difficult, but the existence of such a loss is evident. Capacity must be increased, yet size must not reach an uneconomical stage wherein the employment problem may become unduly involved, or the seating capacity may only be fully utilized at peak times. A certain amount of excess trade, or overflow, is a healthful condition, the implication is that the place must be good. However, waiting facilities must also be provided to entice the overflow at peak hours to remain until service is available.

4: Once enlarged, restaurant identification is necessary to attract new trade, particularly at the off peak hours to insure maximum returns on investments. Oncoming motorists must be attracted in ample time to allow for decision and turning into the parking area, or, at least, an impression for remembrance must be created to insure a future stop. The use of signs and attention factors

is essential, yet these aids must remain in character with the building and the readability, day and night, is a requisite.

5: Peak hour business is relatively easy to obtain in an area where available accommodations are inadequated for the potential trade, but the off peak, or in-between, hours present a new condition that demands attention. For this is the section of trade that must be attracted to smooth out the working conditions of the day, to aid in maintaining a preparation schedule, and to permit employment of sufficient help to compensate for increased demand at the peak hours. Pedestrian traffic varies throughout the day, reaching a maximum at the regular meal hours. Although the vehicle traffic varies also throughout the day, enough cars pass by even at the in-between hours to supply a steady source of consumers.

6: Obtaining and keeping experienced help requires the constant attention of the owner. A survey conducted pertaining to consumer preferences[1] reveals that the least liked aspect of eating establishments is the service. Cheerful and efficient service is indispensable for success.

7: Proper illumination results in benefits to owner, employees, and the customers. Type of restaurant, whether cafeteria, night club, or sandwich shop, usually dictates

lighting scheme. A luncheonette of this nature and location should have sufficient light to make the interior fully visible at night, and to give the interior an open appearance. Selection and installation of indispensable illumination units should be an integral part of the complete design.

8: To permit removal of excess and undesirable restaurant aromas and to maintain constant room temperatures; the ventilation problem of such an establishment must be studied. The selection and installation of a ventilation system, as with the illumination requirements, must be incorporated in the overall design as it progresses. Effects of increased room temperatures because of open exposure to solar rays should be considered. A properly designed solar overhang would prevent entry of objectionable heat rays.

To insure continual success, modifications and improvements are required. Such changes must be of a nature and extent to meet a limited expenditure, and yet these changes must result in increased profitable returns through additional sales and personal satisfaction rendered to the client through pride of ownership and prestige. Time consumed in remodeling and in major structural changes must be so scheduled as to insure minimum close down period. Amortization of development costs is to be met by anticipated increased sales; this will be aided by a lowering of the maintenance cost as the establishment will be free

of repairs and structural alterations for some time.

NOTES

1: "Selling to Restaurants and Hotels"
Ahrens Publishing Company

DESIGN FEATURES CONTENTS

FLOOR AREA ALLOCATION

The total building area includes approximately 1100 square feet of floor space. The present luncheonette occupies about 800 square feet in the east section; the remainder comprises that space utilized by the present beauty shop in the west section. As the result of a satisfactory agreement, the proposed restaurant project was confined to the east section, thereby eliminating costly and questionable expenditures and probable major structural changes to be encountered in the advent of the removal of the dividing wall.

The present beauty shop in the west section is later to be developed as a food or beverage establishment, i.e., an ice cream parlor, or a malt shop. Consequently, the two sections, though individually operated, serve in somewhat relative fields and may be satisfactorily housed in the one structure. Although this division exists, the building facade will appear as a complete unit, yet each shop is to retain its individuality by the proper use of signs, separate entrances, and extended wall sections.

In the east section, the preponderance of the luncheonette area will be devoted to counter service, the following section on "Type of Service" lists the advantages of this selection. Of the many types of service employed in restaurants, the counter and stool service, plus a short order style of menu requires a minimum of preparation area and facilities. The bulk of such work

is performed on griddles and work counters in the back counter service area, additional, large bulk preparation and cooking will be accomplished in the rear area. A little less than 300 square feet will be alloted for the rear areas; this space will be in two sections. One section will be located in the rear of the building, the other will be in an irregular shaped area immediately behind partition at the back of the work counter. The second area, though small, is sufficient for refrigeration units and certain storage to eliminate excess walking to the rear area. A grease trap and other plumbing fixtures are also located in this section. These objects will remain in their present location and thus will not become additional expensive items because of attempts at relocation.

TYPE of SERVICE

A study of consumer habits and trade demands reveals that the counter service style would be the most feasible and the most profitable method in this particular case. A total of eighteen customers can be simultaneously and conveniently accommodated at the counter arrangement selected, and adequate waiting facilities will be provided to encourage any consumer overflow to remain until service is available.

The advantageous aspects of this selection are as follows:

1: Simplified quick-service is offered to the consumer, permitting attainment of efficiency in preparation and in serving. Delays in serving, common in the booths

and table styles, are eliminated, as server, consumer, and work facilites are in a confined area.

2: Rapid customer turnover results in increased sales. As previously mentioned, the unit sale in this type of restaurant is small; thus full potential capacity must be sought. The use of booths or tables encourages lingering on the part of the consumer. This condition exists, but to a minor degree, when only stools and counter are installed.

3: Efficient utilization of space is possible. Other means of seating seldom handle maximum capacity, usually as much as fifty percent of the capacity is idle. The type of menu usually associated with this seating method is limited, therefore the storage space required is also at a minimum.

4: Economy in the employment of fixtures and materials reduces initial cost of fabrication and installation and of future alteration projects. All seating capacity will be fully utilized, yet minimum amount of material and equipment will be necessary.

5: Order changes by the consumer, or mistakes on the part of the server, causes minimum amount of confusion. The nearness of the server and the consumer permits quick changes and eliminates constant walking to the rear areas as is required in booth or table service.

6: Preparation of the food is visible to the consumer. Again, the nearness permits viewing of what is going on. Proper preparation of food is a pleasant sight, the pyschogical effect is apparent.

7: Minimum employment problem confronts the owner in this method of service. Two food servers are sufficient to satisfactorily handle the service at the counter, one additional helper will be necessary for the dishwashing and miscellaneous work in the back areas.

8: As a result of the above factors, operating expenses are greatly reduced. In addition, low maintenance cost will be required as the fixture construction is somewhat simple, stools are easy to replace and the counter top is accessible for ease of resurfacing. These factors, plus the low payroll, materially reduce expenses.

PARKING FACILITIES

The adjacent parking area contains approximately 5,000 square feet of common top soil surface. The lot extends 50 feet along the pavement on the south side of the building and extends rearward a total of 100 feet. Entrance to the parking area is located at the southeast corner of the building, and ample space is thus provided to permit head on parking along the east property line. Departure necessitates backing out from the alloted car space and leaving by the same driveway. Capacity is sufficient to conveniently accommodate the parking of ten cars in line, but seldom has

this space been fully utilized. As mentioned, parking is permitted at the curb. This supplies additional space for the temporary parking of five vehicles.

Pleasing features, to enhance the general appearance and to spotlight the entire establishment, will point out the business as distinctive and appealing and a definite and positive improvement in the neighborhood. These little subtle touches will greatly aid in the creating of an inviting and restful atmosphere. Hard top surfacing will be applied on the parking area to prevent tracking of mire into the building and to permit frequent washdowns. Curb service will not be installed; the additional employment required, small lot capacity, and the single driveway hinder a profitable venture. The parking is a convenience for the consumer but an effort must be made to furnish more than a certain amount of space, for the immediate environment is part of the business.

GENERAL ARCHITECTURAL APPEARANCE

Maximum use of materials and simplicity in construction will be the keynote. The gray cement stucco exterior, red brick pylon with vertical joints butted and horizontal joints mortared, peripheral solar overhang, and open front predominate as conspicuous and salient architectural features. A psychological suggestion of horizontal feeling is obtained by blending the building structure with the outside landscape features and by constructing an extending overhang, and, on the east side, by adding a plank screening wall.

The dominate exterior feature is the red brick pylon that performs the dual purpose of an impressive and substantial building corner and of a vertical sign background above the general roof area. On-coming motorists are readily able to discern the nature of the establishment and to have sufficient time for decision and for turning into the parking lot. A formed large sheet metal letter, supported a short distance out from the side of the pylon surface, will serve as a distinguishable identification sign. The letter "B" is the initial of the owner's name and this mark will also be used on menu cards and letter heads. The open back of the letter permits the installation of a continuous light source in the letter itself. Reflected light from the brick surface will cause the letter to stand out. The contrast of the colors of reflected light from the brick surface and the letter will create an interesting and attractive feature.

Control of direct sun rays is obtained by the designed solar over-hang. Objectionable radiant heat rays are thus unable to affect interior conditions, compensating for the open exposure and lack of shade. The section devoted to solar angle study gives a de-tailed discussion on the method employed and the results obtained.

Open front type stores are most effective in the attempt to attract trade. The interior becomes a show window, and the outdoors and indoors blend. The entry of abundant natural daylight creates the desired pleasant atmosphere and reduces the lighting load and the costs.

INTERIOR DECORATIONS

Pleasant environment is conducive to dining, but intangible elements such as the general atmosphere, color schemes, and interior treatments are frequently neglected or improperly considered. These seemingly little features very often determine the success or failure of the owner in attracting and maintaining the customers. If the location is such that a large population density supplies a constant stream of consumers, the intangible elements are not always so important, but when trade must be attracted and the competition forces such considerations, these become vital factors.

The open front and expansive side glass panels suggests an extension of space and permits full open view of the interior. The interior is thus amply supplied with natural daylight. The solar overhang will continue inside to form a section of the ceiling. This further attempts to combine interior and exterior, and the inside section also serves as the reflector boxes for the fluorescent strip lighting.

Color plays an important part in the creating of an inviting and restful atmosphere. A study of color was made, not only were the physical characteristics considered but also the psychological aspects. The predominate color will be a fleshcolored tint of the Hiler Color System listed as a Peach. This color is comfortable for the eyes and will not easily show the effects of dirt. Yet, as the selected color is a tint, the luncheonette

will appear cheerful and bright and not dingy. The color scheme to be employed is as follows:

1: Walls of rough textured plaster will be of the peach colored tint mentioned. The rear partition wall will be painted this same color.

2: The ceiling will be of fleshcolored acoustical plaster. The extended solar overhang will be of white ribbed plywood undersurface.

3: The floor will be of a dark red asphalt tile.

4: The upholstered seats of the counter stools will be of blue gray leatherette. The stool backs will be of natural finished mahogany plywood.

5: The counter top is to be of a white textured laminated plastic. The remainder of the counter is to be of natural finished mahogany plywood.

LIGHTING

Properly controlled lighting is a necessity for successful merchandising. Physiological and psychological effects of illumination on the consumer and the employees present paramount considerations for the designer. Seeing is a task accomplished by the entire body, inadequate or faulty conditions can cause seemingly remote effects such as fatigue and nervousness. We seldom have "too much" light; eliminate glare, direct viewing of source,

and extreme brightness contrast and the mechanism of the eye adjusts itself properly, resulting in restful and comfortable effects.

Choice of illumination sources, fixture number and arrangements, and installation proceedures requires a comprehensive understanding of light and its uses. In keeping with the open feeling created by the use of expensive glass areas and the resultant abundancy of natural daylight during the day, ample fluorescent light sources are to be installed along the underside of the extended solar overhang on the east side and on the underside of a corresponding ceiling section over the counter area. Circuits are to be arranged so that combinations of units may be turned on as desired.

White fluorescent sources, 40 watt, 48 inch tubes, will be specified. Principle reasons for this selection are:

1: Fluorescent lighting is a large area low brightness source. Direct viewing is not objectionable.

2: Installation requirements for the fluorescent tubes are excellent for trough type fixtures that also permit the use of strip lighting.

3: The loss in initial energy input that is converted to radiant heat is almost negligible in its effect on the room temperature, a factor of considerable importance in computing air conditioning requirements.

Available strip length can accommodate a total of 18 recessed fixtures, each fixture is to contain two 40 watt tubes. Theoretical perfect output of 36 such tubes at approximately 2000 lumens per tube would total 72,000 lumens. This total divided by 600 square feet of luncheonette floor space to be lighted equals 120 lumens per square foot; if we were to obtain 100 percent utilization, this becomes 120 footcandles. But reflection and transmission factors, room utilization factors, and maintenance factors reduce this total to an average of 25 footcandles.

Computations applied to the following formula reveal that this estimate may be checked.

$$\text{Lamp lumens required per outlet} = \frac{\text{footcandles} \times \text{area (sq ft per outlet)}}{\text{coeff of util} \times \text{maint factor}}$$

Room Index (20 x 30) is F

Reflector type, direct, Alzak finish

Coefficient of Utilization is 30%

Maintenance factor is 70%

Area in square feet per outlet is 33

Assuming that 25 footcandles were desired, substitution in the above formula results in an approximate 4000 lumens required per fixture, or two 40 watt tubes, for a total of 36 tubes to furnish the desired amount of illumination.

SOLAR ANGLE STUDY

An open southern and partial eastern exposure of this establishment requires that a comprehensive study be conducted to determine the effect of sunlight angles during the day and throughout

the year. Results of such a study are essential in the designing of a projecting visor to control the direct sun rays and to eliminate the entry of radiant heat energy of the sun if it should be so desired.

The apparent motion of the sun about the earth's axis is a helical motion, not that of a "fixed" star that describes an arc on a plane perpendicular to the earth's axis. The helical motion is the result of the constant tilt of the earth's axis that causes an increase or decrease in declination, the angular distance of the sun from the celestial equator. Maximum declination occurs in the northern latitudes about 22 June; the sun is then highest overhead and the direct sun rays are not desirable. About 22 December, at minimum declination, radiant heat energy of the sun is at the lowest point and its effect is not so objectionable, in fact, radiant heat energy at this time of the year is often desired to offset low winter temperatures. Vernal and autumnal equinox occur on 21 March and 23 September respectively, these are the diametrically opposite points where the elliptic, or the path of the sun, intersects the celestial equator.

These critical dates were selected to compute the azimuth and altitudes of the sun for this particular latitude at various times of the day. A tabulation of the results obtained and the formulas employed are included in the following table. A photostat included in the building plan section of this material shows graphically results of the computed azimuths and altitudes, and the east and south components for the morning hours, the afternoon

components are reversed but are not shown.

The diagram of a partial cross section to scale illustrates graphically that the summer sun is prevented from entry during the hottest times of the day, and at the time of the equinoxes, the direct sunlight strikes the immediate inside floor. An overhang of a width of five feet and at a height of nine feet ten inches conforms with building codes and is not unduly wide to require extensive suspension support. The sun that does enter at certain times of the year will be absorbed by the use of special heat absorbing plate glass that excludes as much as 38 percent of the heat as compared with heat exclusion of only nine percent by regular plate glass.

Formulas employed:

$\sin h = \sin L \times \sin d + \cos L \times \cos d \times \cos t$

$\sin Z = \sin t \times \cos d \times \sec h$

L = latitude of store location, 33 deg, 57 min, 30 sec

d = declination

t = time of day in degrees

Z = azimuth

h = altitude

The following table lists the results of substitution in the above formulas for the critical dates of the year and at the times specified in the second and third columns. Components of the sunlight angles are listed in the last two columns, these are also shown

graphically in the photostat in the building drawings section of this thesis.

Date	AM	PM	azimuth	altitude	normal component	parallel component
22 Dec	noon		180.0	32.5	90.0	32.5
	10	2	149.3	25.9	43.6	29.2
	9	3	136.7	18.3	25.7	24.5
	8	4	126.5	9.1	11.2	15.0
21 Mar	noon		180.0	56.2	90.0	56.2
23 Sept	10	2	134.2	46.0	48.9	49.0
	9	3	118.5	36.5	40.1	57.2
	8	4	108.0	24.5	25.2	55.9
22 June	noon		180.0	79.5	90.0	79.5
	11	1	124.5	73.0	75.9	80.0
	10	2	103.0	62.0	62.6	83.2
	9	3	90.0	49.6	49.6	90.0
	8	4	84.7	36.9	37.0	97.0

MATERIAL SELECTION CONTENTS

MATERIAL SELECTION

The designer is familiar with the properties and the characteristics of many materials, and is always on the alert for new materials and applications of old materials. Characteristic features of each material reveal deficient or superior properties when compared with others; selection for a particular application must compensate for those inferior characteristics and yet utilize the superior points to full advantage. Availability, purchase price, and installation expenditures are influencing factors. Actual determination to employ a particular material for a specific application is the combined result of comparative market factors, thorough understanding of material properties, and, often, experimental studies to evaluate selection.

EXTERIOR WALLS

The exterior walls will be of rough surfaced cement stucco applied over metal lath on convential studding. The present construction is of this nature, however, the color will be a tint of the Hiler Color System listed as a light chicory blue. Alterations will therefore require a comparatively small expenditure. This building material is characteristic of the neighborhood.

Three sections of heat absorbing plate glass form an open wall section along the east wall, and extend down from the underside of the solar overhang to the shrubbery box. This feature permits entry of abundant daylight and allows passing potential consumers to view the interior.

PYLON

The dominant and distinctive red brick pylon forms the southeast building corner and serves as a vertical sign background above the general roof area. A two foot high base forms an attractive shrubbery box that extends 15 feet along the side wall. Bricks will be laid with vertical edges butted and horizontal edges 5/8 inch mortar jointed.

FACADE

Expansive areas of heat absorbing plate glass sections and special heat treated plate glass double entrance doors opens the interior to the passerbys. The installation of the transom glass sections above the plate glass sections permits ventilation when required. The facade area below the solar visor will therefore be entirely of glass, that wall area above the overhang will be of cement stucco finish similar to the side walls.

OVERHANG

As a result of the use of the solar overhang, control of the direct sun rays and of solar radiation prevents unwanted and unfavorable effects such as direct glare and an increase in room temperature at midday. The section on "Solar Angle Study" explains the method and the reasons for the construction of an overhang that is to be five feet wide. The solar visor will extend along the east side and the front of the building. The frame is to be of heavy stock to permit a ribbed plywood undersurface and a

light gauge aluminium sheet top surface. The building contour at the southwest corner describes an arc, this feature will be minimized by constructing the overhang parallel to the building and by adding an additional attractive feature of a screening trellis.

SCREENING FENCE

To obscure restaurant debris accumulation of boxes and of regular disposal containers in the rear of the building, a planked, red wood, fence will serve as a screen and as an additional feature to extend horizontally the appearance of the establishment. The overall desired impression to be created is that of a large but low structure.

SHRUBBERY BOXES

The shrubbery box on the east side of the building, as previously mentioned, is an extension of the base of the pylon and will be constructed of brick laid in the similar manner as that of the pylon. The second shrubbery box, located along the front of the ice cream parlor, or west section, is of brick also and serves as the base for the screening trellis that shields the curved section of the building. As previously mentioned, this feature tends to make the appearance of the building as somewhat more narrow than is desired, hence, this trellis will obscure the rounded corner. The use of the shrubbery box and the trellis are additional methods employed to create an effect of a low, but large, structure.

INTERIOR WALLS

The front section of the east wall will be of plate glass, the remainder will be of acoustical plaster to aid in reducing the effect of extraneous and bothersome noises.

The rear partition wall is to be frame studding with an acoustical composition layer protected by an outer plywood surface.

Front section of the west wall will be an extended brick surface to further carry out the motif of the blending of the interior and exterior. The remainder of the wall section will be of acoustical plaster, and the partition wall between the work area and the small storage area will be of similar construction as the rear partition wall. The fume canopy front will be of mahogany veneered plywood.

Acoustical plaster was specified for use on the walls and ceiling for the following reasons:

1: Acoustical plaster has comparatively high sound absorbing properties (.70 coefficient at 512 cycles).

2: The material is inexpensive to purchase and to apply over an old surface.

3: By a simple process of tinting, a variety of colors are available.

4: The surface may be repainted and cleaning proceedures are simple.

5: Acoustical plaster is both fireproof and fairly permanent.

CEILING

The solar overhang extends into the interior along the east side of the ceiling. The six inch depth of the overhang below the general ceiling level, and the three foot width in from the wall, provides sufficient space for the installation of fluorescent strip lighting. A corresponding ceiling section above the service area also contains fluorescent strip lighting to balance the light lines. The undersurfaces of these sections are to be of ribbed, or fluted, plywood construction, similar to the manner employed in the construction of the outside undersurface. The remainder of the ceiling will be of acoustical plaster.

FLOOR

The present sub floor is at the street level and a portion of the floor surface is covered with asphalt tile. Asphalt tile will be used as the flooring material for the new and larger serving area.

This material was selected for the following reasons:

1: Durability is extremely high as asphalt tile offers good resistance to weak alkalies and acids and will not loosen or disintegrate from dampness.

2: This flooring material has the ability to stay down on sub floors, but is resilient and comfortable to walk on.

3: Tile form permits obtaining attractive patterns due to its easiness of fitting and laying.

4: The good sound absorption ability of asphalt tile aids in reducing luncheonette din.

Asphalt tile will not extend to the front glass facade. A vestibule, or immediate entrance area, will be of stained cement flooring. This flooring will also extend on the outside of the building proper, another feature in attempting to bring the consumers inside by reducing the effect of the physical barrier of the facade. Such a floor section will also serve as an area that will catch dirt that may be tracked in from the outside. This will also eliminate the possibility of a wearing spot that is very noticable around an entrance where the flooring is of material that wears easily.

FIXTURES

The work bench will be of solid stock framing, but drawer fronts and cabinet fronts will be of mahogany veneered plywood. The top surface will be of a material depending upon the operation to be performed, oak tops for sandwich preparation, stainless steel section for under the coffee urns, and a built in griddle plate for the cooking section.

Solid stock will be used in the framing required for the service counter, the top surface will be of a laminated thermosetting plastic. Back sections of the service counter will be exposed for easy access of the shelves; however, those portions of the rear of the counter that will be visible to consumers will be closed off by sliding doors to eliminate viewing of possible unsightly and disorderly shelves.

The stool stands will be of tubular steel with a hard chrome plate finish. The upholstered seats will be of blue gray leatherette. Plywood backs will be of mahogany veneered plywood.

Plywood and plastics were selected in these applications for the following reasons:

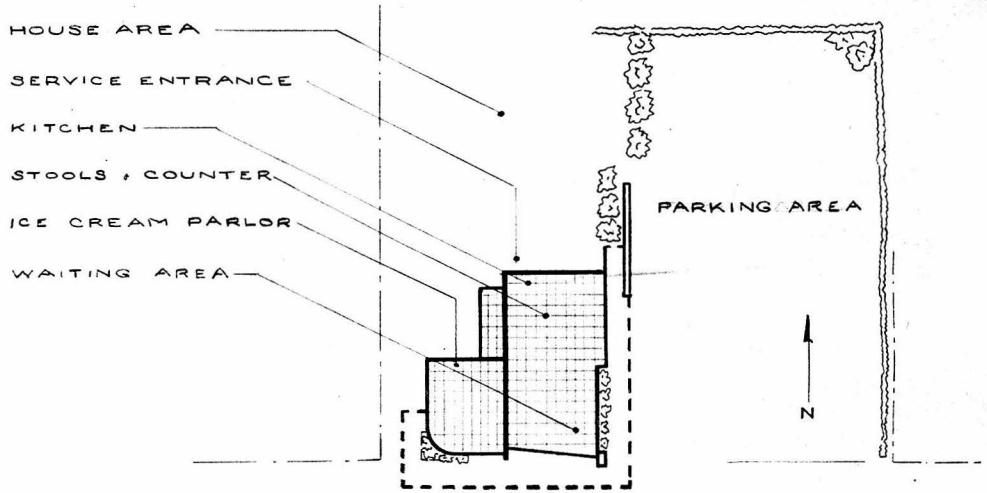
1: Ease of fabrication of both plywood and laminated plastic with a resultant economy in installation and maintenance.

2: Durability of the applied veneer and the plastic surface is high. The use of new glues renders the panels moisture resistant and virtually impervious to atmospheric conditions.

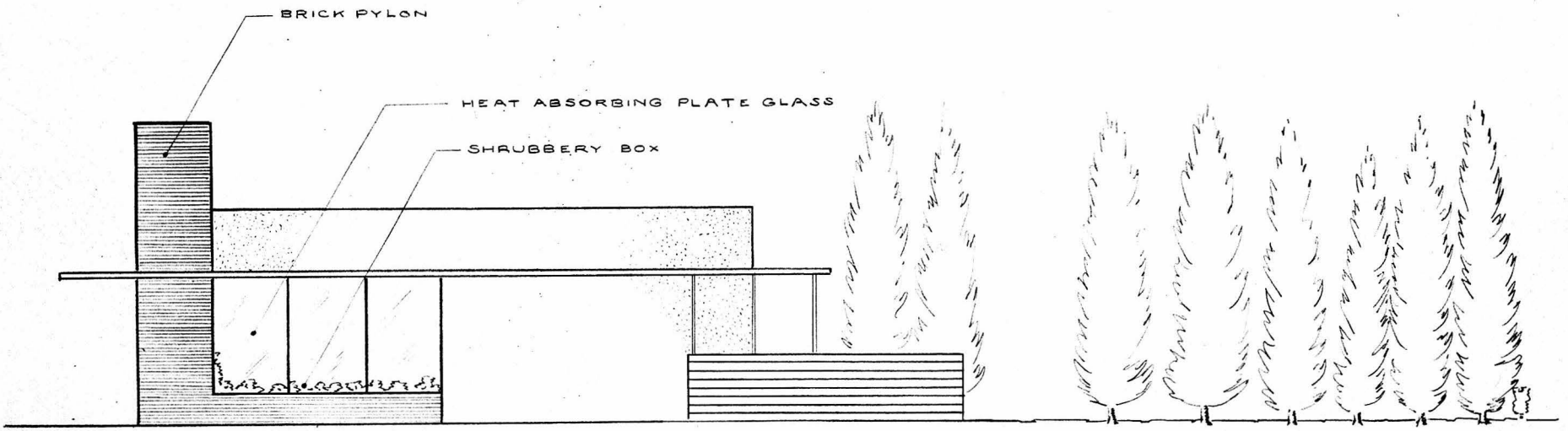
3: The plastic surface does not discolor, stain, or scratch easily, and is colorful and pleasing, yet inexpensive. Resurfacing is possible and inexpensive. The counter top is easy to keep clean and maintains its attractive appearance.

4: The mahogany veneered surface is durable and the beauty of the full grain of the wood is shown.

ILLUSTRATED DRAWING PLANS

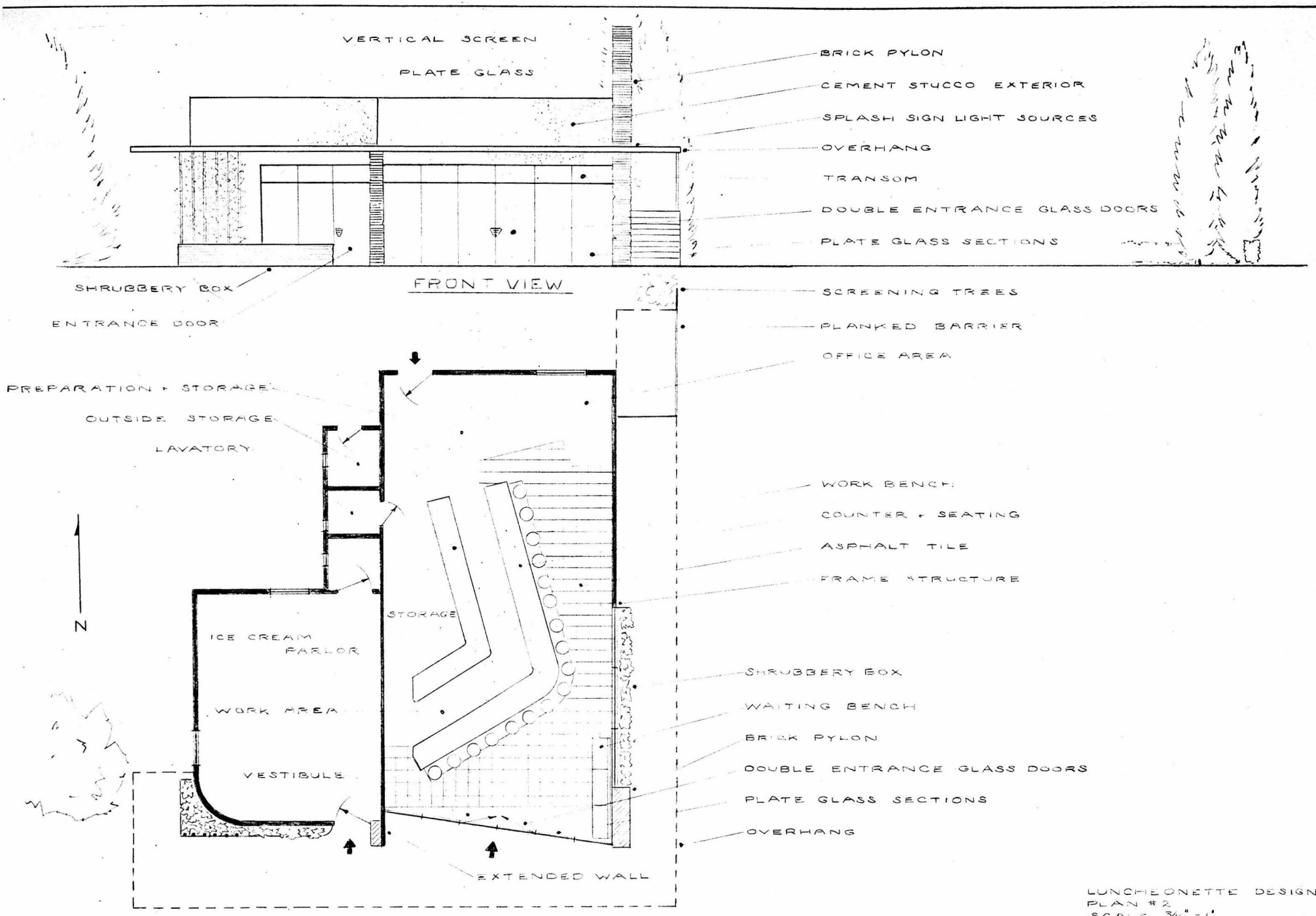


PLAN VIEW, BLDG & LOT SCALE 1"-20'

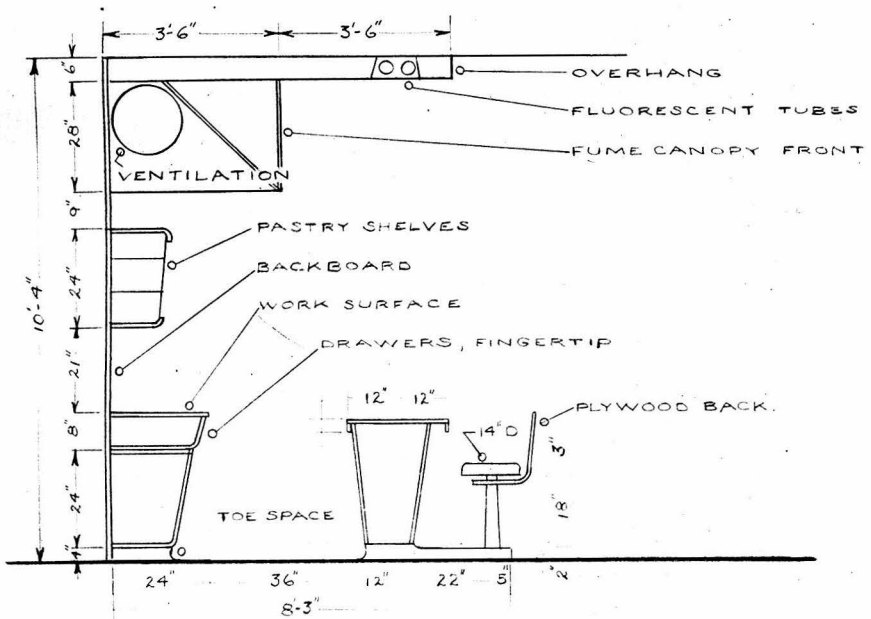


EAST SIDE ELEVATION

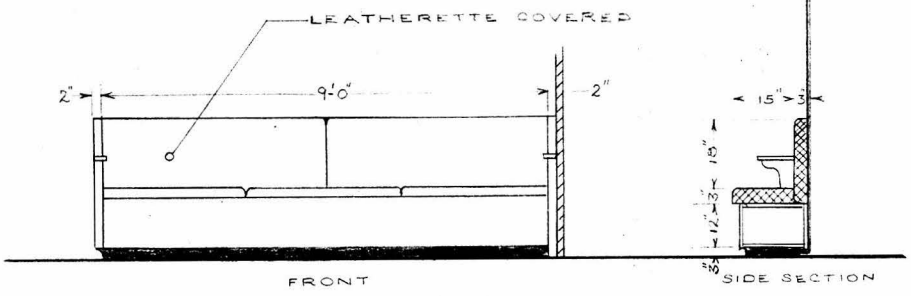
LUNCHEONETTE DESIGN
PLAN #1
SCALE 3/16" - 1'
30 MARCH 1947
O. S. POWELL



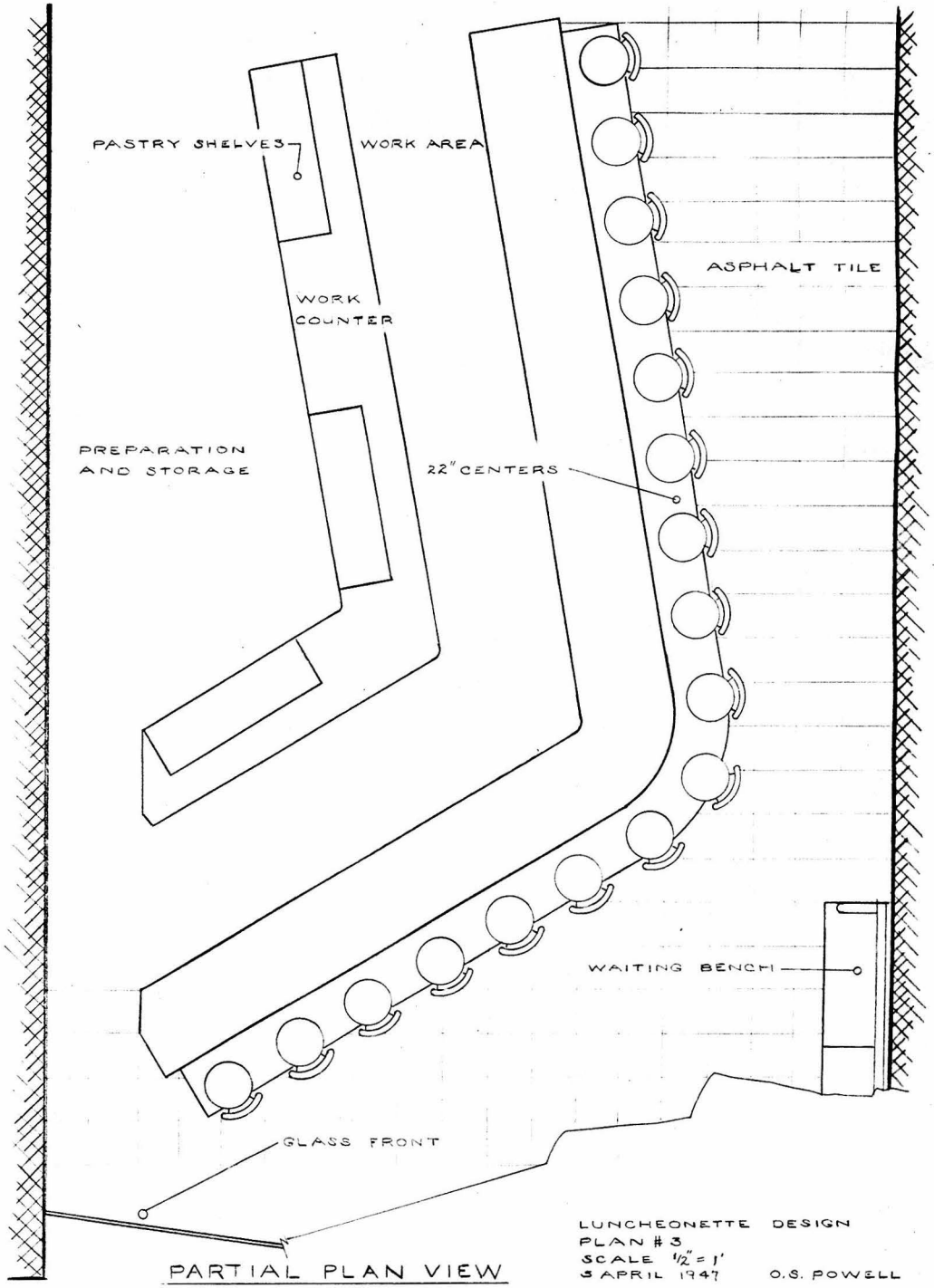
LUNCHEONETTE DESIGN
PLAN # 2
SCALE 3/16" = 1'
2 APRIL 1947
O. S. POWELL



FIXTURES, SECTION A-A

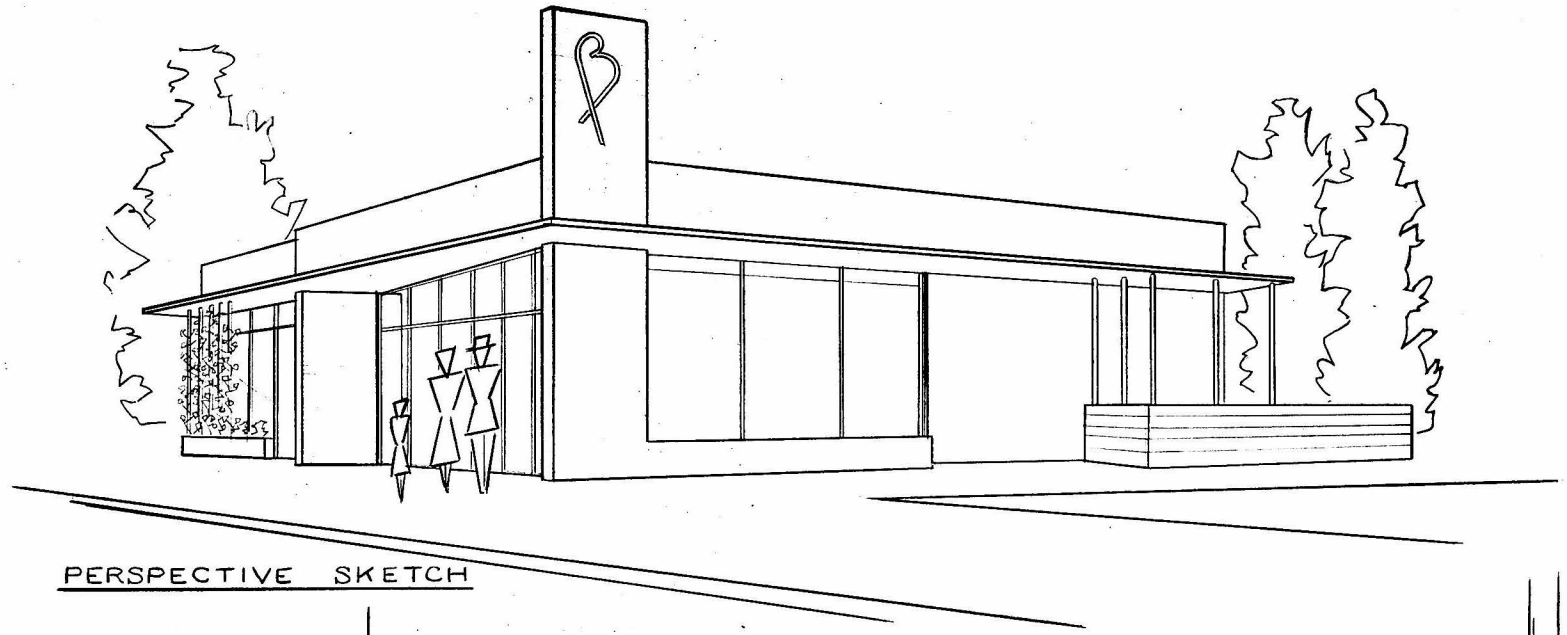


WAITING BENCH

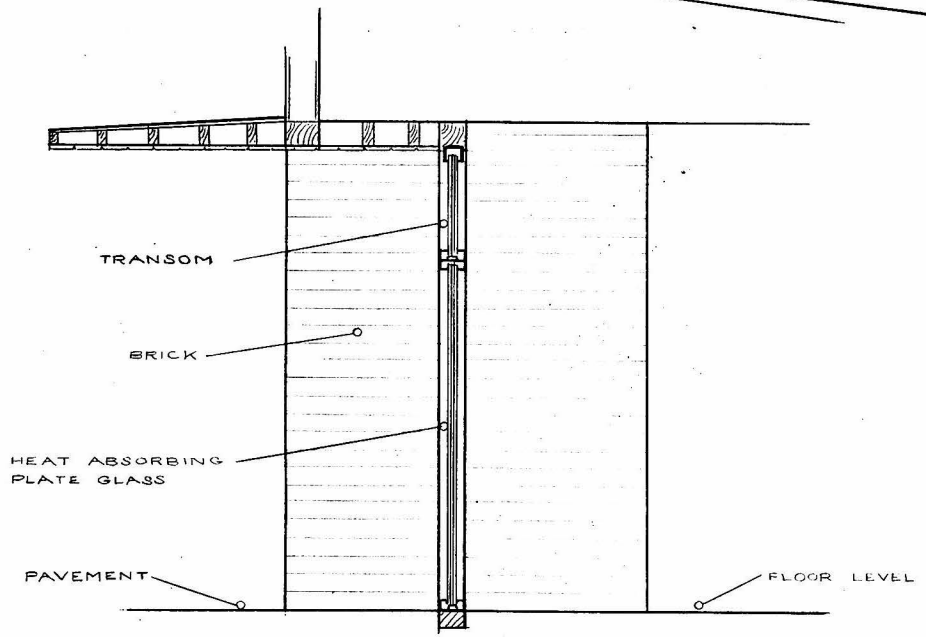


PARTIAL PLAN VIEW

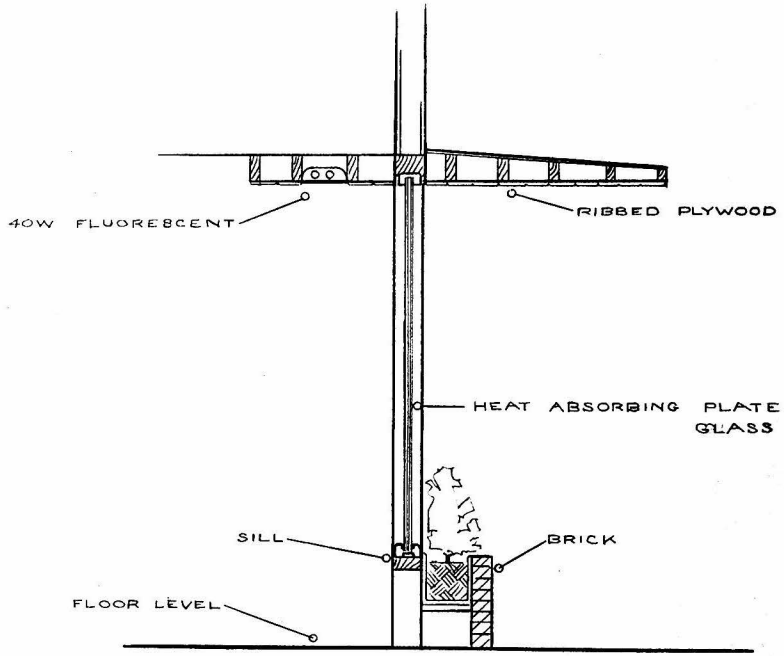
LUNCHEONETTE DESIGN
PLAN #3
SCALE 1/2" = 1'
3 APRIL 1947 O.S. POWELL



PERSPECTIVE SKETCH

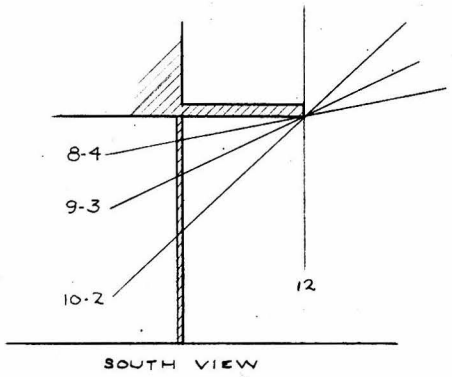


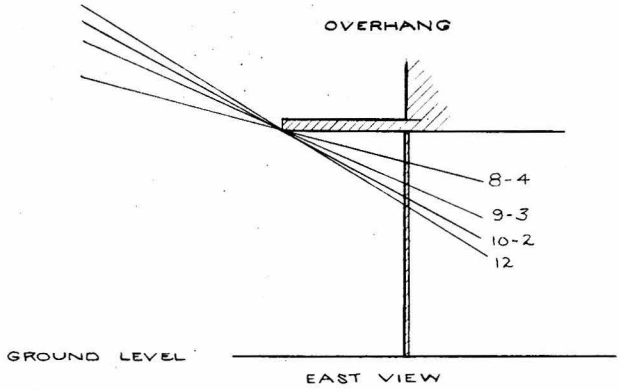
CROSS SECTION - FRONT WALL

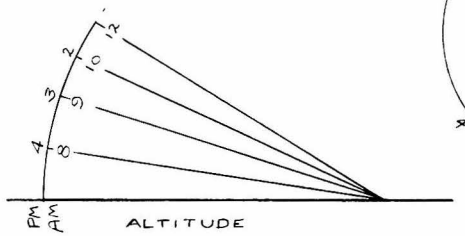


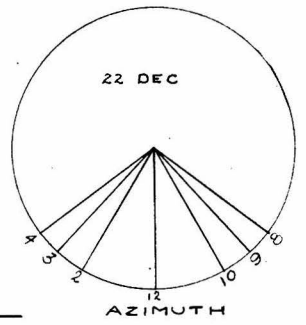
CROSS SECTION - EAST WALL

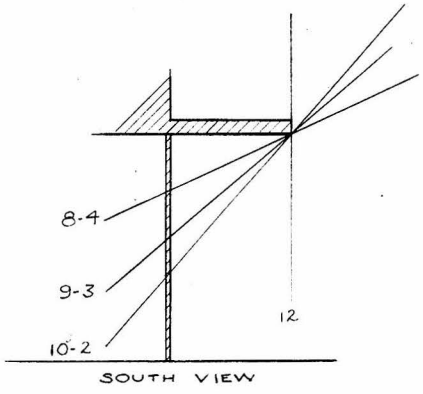
LUNCHEONETTE DESIGN
PLAN # 4
SCALE ½" = 1'
1 MAY 1947
O S POWELL

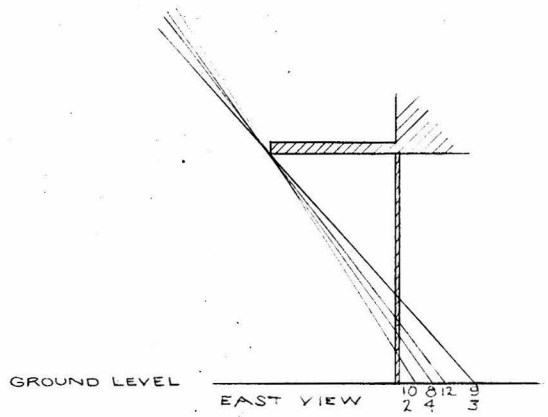


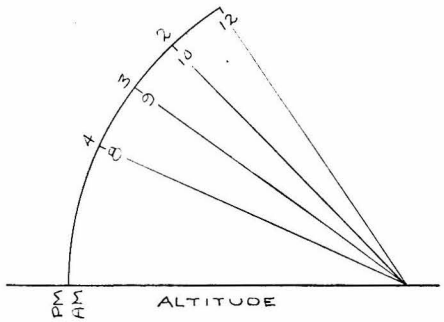


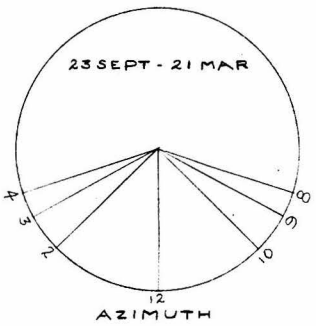


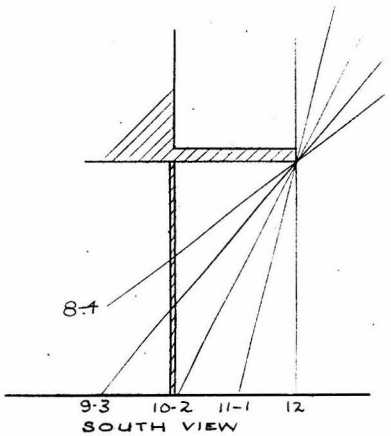


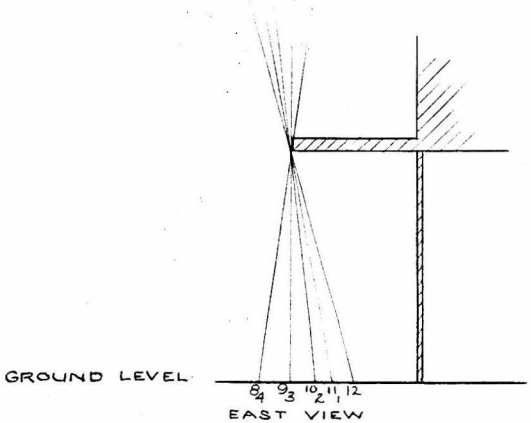


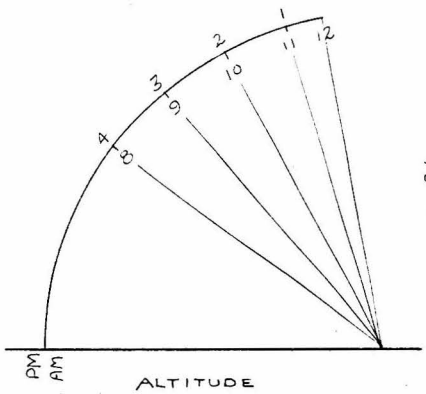


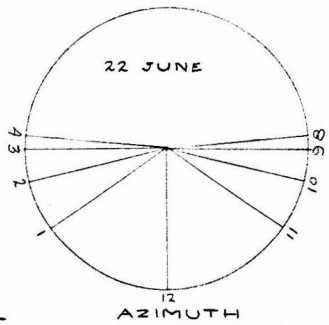












SUNLIGHT ANGLE STUDY

LATITUDE 34° NORTH SCALE ¼" = 1'

O. S. POWELL 17 MAR. 47

APPENDIX CONTENTS

BOOKS and PAMPHLETS

Ahrens Publishing Company, Inc. "Selling to Restaurants and Hotels", 96 pp, 1946

Burke, Gene and Kober, Edgar, "Modern Store Design", 161 pp, 1946, Institute of Product Research (publishers)

Dahl, J. O., "Restaurant Management", 347 pp, 1944, Harper and Brothers, Publishers

Department of Commerce, United States Government
"Selecting a Store Location", 68 pp, 1946
"Establishing and Operating a Restaurant", 287 pp, 1946
"Census of Business, Retail Trade, 1939"
"Retail Store Location, Information Sources", 10 pp, 1946

Esbach, Ovid W., "Handbook of Engineering Fundamentals", Eighth Printing, 1944, section on non-metalic materials.

General Electric Company, "Illumination Design Data", 69 pp, reprinted with modifications in 1939.

Los Angeles Building Codes, 1946-47 Edition, published by Interstate Educational Association.

National Restaurant Furniture Association, "Modern Stores", published by the association.

Nicholson, Enrich, "Contempory Shops in the United States", 189 pp, 1945, Architectural Book Publishing Company, Inc.

Ramsey, Charles G. and Sleeper, Harold R., "Architectural Graphic Standards", 343 pp, Third Edition, 1946, John Wiley and Sons, Inc., publishers.

PERIODICALS

American Builder

August 1945, pp 100-1, "Candlelight Drive-In Restaurant Open Year-Around".

October 1946, pp 116-17, "Advancement in Materials Provides Floors of Lasting Beauty".

Architectural Forum

January 1938, issue devoted to the works of Frank Lloyd Wright.

July 1942, pp 85-90, "Color for Production" by Faber Birren.

August 1946, pp 97-102, "Remodeled Restaurants".

October 1946, p 144, "Two Roadside Drive-Ins Use Light Framing and Lots of Glass" by Arthur T. Brown.

Architectural Record

August 1943, pp 67-84, Restaurants, Building Types, Series #80

April 1944, pp 95-112, Stores, Building Types Study #88

February 1945, p 107, "High Density Lighting for Open Front Windows", Time Saver Standards.

July 1945, p 72, "A Restaurant Plan for a Complete Outpost Inn" by Arthur W. Dana.

October 1945, pp 101, Restaurants, Building Types Study #106

March 1946, pp 125-133, "Short Cuts to Solar Angles" by Henrick P. Maas.

July 1946, pp 107-110, "Reflection Factors in Store Windows" by Kenneth C. Welch.

August 1946, pp 117-20, "New Concepts in Store Lighting" by K. C. Welch.

September 1946, pp 99-114, Drive-In Restaurants and Luncheonettes, Building Types Study #117.

September 1946, pp 115-19, "Black Light and Color Magic"

Aviation

April 1944, pp 130-131, "Metal Plus Plastic Makes New Aircraft Flooring"

Business Week

25 August 1945, pp 52, On the Road Again - Howard Johnson's Chain of Roadside Restaurants.

5 April 1947, pp 30, Restaurant Blues

Consumer Research Bulletin

November 1944, pp 5-9, Linoleums and Enameled Floor Coverings

House and Garden

May 1946, pp 82-85, Flooring Materials

Interiors

July 1944, pp 47-71, Anatomy for Designers

Printers Ink

1 December 1944, pp 25-26
8 December 1944, pp 25-26, "How Establish a Business by the Side of the Road" by C. W. Alexander.

Restaurant Management

July 1946, p 31, "Why We are Using Brighter Lights in Keeping Our Restaurants Up to Date" by John Gonmenis.

September 1946, pp 2, A Portfolio of Drive-Ins and Restaurant Plans.

September 1946, pp 2, "Designing Modern Drive-Ins" by Henry E. Werner.

October 1946, p 46, "Common Mistakes at the Cash Register" by Harold Ziegler.

August, September, October, November, December, 1946, continuous article by E. M. Fleischman, "Modern Luncheonette Management".