SUMMARY

The Tri-County Country Club thesis project began with a definite commitment in early May. Through the description of the problem, the client, the functions, and the site analysis, many positive points may be presented at this time.

The location of the existing Tri-County Golf Club could definitely support a club as has been described. Population, interest, money and need are within the area and awaiting a project with this potential for business as well as social gain.

Through the use of an equity club, members are investing their money in a business venture that they can promote.

Functions presented in this project are aimed not only toward the total family unit, but also toward the array of interests supported by the majority of potential club members. Through the wide use of many activities and the clientele range, the club facility would be a successful venture. A wide variety of activities couples with a workable clientele range promise to make this a successful business venture.

The site analysis has indicated the building location which would enhance the structure the most as well as enhancing the landscape. Wind protection, drainage, land use, sun angles, traffic patterns, and precipitation averages will all be considerations in building design.

The building study has shown what is the norm for country club facilities. Existing clubs have very definite separations of athletic activities and social activities. The majority of the clubs are geared to residential scales of building. Short spans are commonplace in most all of the clubs.
Materials used range from frame construction, to masonry construction, to poured in place concrete. Interiors are finished with wood, brick, or plasterboard, and/or any other suitable material.

With the programming phase nearly complete, one must concede that the design of Tri-County Country Club for a thesis project will be most challenging.
CONCEPTS

In conceptual development, three schemes were developed. The first consisted of the following critical issues:

1. Two story building vertically divided by function—social facilities above, athletic facilities below

2. Viewed as one story from front and two story from the rear

3. Opaque from the west, translucent from the east.

The second scheme consisted of the following:

1. Low linear building.

2. Total separation of social facilities and athletic facilities both revolving around their own nucleus, connected by circulation only.

3. Elongation and emphasis of horizontal movement.

The third scheme:

1. Building as one nucleus

2. Low one level building

3. Close tie between social facilities and athletic facilities.
DESIGN DEVELOPMENT

The design development phase began with zeroing in on a concept. The project concept was determined to be a combination of the following ideas: Tri-County Country Club would be a two story building. The building would be developed in two manners--social facilities interacting with athletic facilities and maintenance and service areas would be below social and athletic areas. The building would emphasize the circulation within it as well as the overall horizontal appearance on the exterior.
FINAL DESIGN

The final design is a cohesive building offering a multitude of services and activities which are directed toward the family network. The club will stimulate family participation, encourage social and community interaction, and provide resources for individual and group activities.

The building is a low linear facility that is very open in design. It relates to the surrounding environment through the selected use of natural interiors. The facility is centered around a skeletal circulation spine that has various activities shooting off of it. The building is opaque from the west and translucent from the east. Tri-County Country Club blends with the surrounding site and creates a feeling of repose and harmony with its surroundings.
BIBLIOGRAPHY


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GOLF COURSES

Many golf courses are designed to be permanent golf courses with little change. However, even the most permanent golf courses can be revised and improved. The selection of property that has been well kept up as pasture land is highly advisable. Much money is saved in putting the course into excellent condition. Frequently the scenic attractions of a site are such that to the susceptible and uninformed occupants of a golf club, they totally outweigh soil conditions. A happy balance should be maintained between both factors. Pick a site which will offer no serious handicaps to the attempts of the club to grow a stand of grass and maintain it thereafter.

Power and Water Availability

Water and power are absolute necessities for any modern golf course. Even in the smallest communities, grass green courses with a clubhouse are being built to water only greens and tees, or the whole course, and operate a clubhouse, you must have power and water.

The source of water should be close to the site, reliable and pure enough to drink and irrigate fine turf. It may be a city system, wells, lakes, river or some combination. The cost of connecting to water and power supplies must be included in your plans.

How Much Clearing?

Consider next the amount of clearing that will have to be done in building the course. Will it be necessary to remove large growing trees and grub out many stumps? Will it be an expensive proposition removing stones from the soil? Are these large swamp areas that will have to be filled in or drained? Do not misunderstand the statement above relative to clearing out trees. A golf course should, if possible, have patches of woodlands, as trees offer one of the best natural hazards if properly placed with reference to the course. However, it is an expensive matter to remove large growing trees, and the site selected should not have too many of these in those portions of the plot which will be fairways in the final picture.

Natural Golf Features

The last consideration in selecting the site is whether or not it possesses natural golf features. This may seem to the uninitiated to be the first and most important thing to look for, but, as a matter of fact, natural golf features, while extremely desirable, are not nearly as important as the character of the soil and site location. Rolling terrain, creek valleys, woodlands, ravines, ponds and the like, of course, make the job of designing an interesting course just so much easier, but all of these features or a substitute for them can be secured through artificial hazards. For this reason the presence or absence of natural golf features is perhaps less important than any of the factors that have been mentioned above.

Clubhouse Location

Location of the clubhouse, entrance drive, parking spaces, tennis courts, swimming pools, golf practice and lesson tees, fairways and traps and practice greens, is another job.
Recreation and Entertainment

GOLF COURSES AND CLUBHOUSES

Fig. 1 An irregular tract of ground lends itself to especially interesting architecture. Note how the architect has taken advantage of the rolling nature of the land to produce a most varied and picturesque set of golf holes that require a great deal of thought. The best location for the clubhouse generally is convenient to the highway. Road construction and maintenance costs must be kept in mind when locating the clubhouse.

Often the clubhouse site is a prominent hilltop, although also a view and a view of the clubhouse site is a prominent hilltop, although also a view and a view

that requires a great deal of thought. The best location for the clubhouse generally is convenient to the highway. Road construction and maintenance costs must be kept in mind when locating the clubhouse.

Figures shows the following:

1. The distance between the green of one hole and the tee of the next should never be more than 75 yd, and a distance of 20 to 30 yd is recommended. Tees should be not closer than 20 yd to a green because of the danger of being hit by an approaching golf ball.

2. The first tee and the ninth green of the course should be located as far as possible from the clubhouse. This is practical without sacrificing other factors, bringing the green of the sixth hole also near to the clubhouse. This is a feature appreciated by the golfer with only an hour to devote to his game, as six holes can comfortably be played in that time and at the finish of his available time he is once more back at the clubhouse.

3. As far as practical, no holes should be laid out in an east-west direction. The reason for this is that a considerable volume of play on any golf course is in the afternoon and a player not only finds it difficult and disagreeable to follow the ball's flight into the setting sun, but it also presents a safety problem to other golfers. If an east-west hole is unavoidable, locate it among the first two or three holes of the layout so that a player will strike it as early in his round as possible. Southwest direction of holes is particularly bad.

4. The first hole of the course should be a relatively easy par-4 hole of no more than 350 to 400 yd in length. It should be comparatively free of hazards or heavy rough where a ball might be lost, and should have no features that will delay the player. This is for the obvious reason of getting the golfer started off on their game as expeditiously as possible.

Mapping the Course

Authorities are well agreed on what makes the "ideal" nine-hole course in the matter of distance. All agree that such a course should measure over 3,000 yd, preferably around 3,200 yd. These authorities likewise agree that the par of the course should be 35, 36, or 37, with the first mentioned most general. Just how should these 3,200 yd be apportioned among the nine holes? Most experts suggest two par-3 holes, two par-5 holes, the remaining five holes to be par-4's. Par-6 holes should be avoided. (See Fig. 1.)

Considering first the two par-3 holes, they should vary, for obvious reasons, in length; the shorter one should measure 130 to 160 yd,

Par is an arbitrary measure of the difficulty of a hole. It is the number of strokes an "expert golfer" would take to play the hole, allowing him two strokes after his ball is on the green. A par-3 hole, therefore, is one the "expert golfer" can reach in one shot, or a par-4 hole, in two shots; a par-5, in three shots. Par figures for men and women is established by the United States Golf Association, as follows:

- Men: Par-3 holes up to 250 yd., inclusive; par-4, 251 to 340 yd.; par-5, 341 yd.
- Women: Par-3, holes up to 210 yd., inclusive; par-4, 211 to 340 yd.; par-5, 341 yd.

thus requiring an exacting four-iron or five-iron from the tee; the other short hole should have the green a full long iron or wood shot away, say 180 yd. or more.

The par-5 holes also should vary in length, one being on the short side for a par-5 (about 450 yd.) and the other 420 to 550 yd. Both types of par-5 holes call for two full wood shots and a full-length approach shot.

It is advisable to provide a mixture of par-4's, par-5's, and par-6's, for the amateur golfer is most skilled at the short iron shots. The shorter par-4 holes should come after the longer par-5 holes.

Course Planning

Certain standard practices should be observed in making a course layout, among which the important ones are:

1. The distance between the green of one hole and the tee of the next should never be more than 75 yd, and a distance of 20 to 30 yd is recommended. Tees should be not closer than 20 yd to a green because of the danger of being hit by an approaching golf ball.

2. The first tee and the ninth green of the course should be located as far as possible from the clubhouse. This is practical without sacrificing other factors, bringing the green of the sixth hole also near to the clubhouse. This is a feature appreciated by the golfer with only an hour to devote to his game, as six holes can comfortably be played in that time and at the finish of his available time he is once more back at the clubhouse.

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Golf Courses and Clubhouses

Generally speaking, the holes should be increasingly difficult to play as the round increases. It takes a golfer about three holes to get well warmed up, and asking him to acutely difficult shots while he is still "cold" is a demand that he will appreciate.

1. Whenever practical, greens should be fairly visible, and the location of sand traps or other hazards obviously apparent from the approach area, which is that portion of the fairway extending to the left for approximately 50 yards from the green.

2. Generally speaking, fairways sloping directly up or down a hillside are bad for several reasons: (a) steep sloping fairways make the shot of the shot by the majority of players matter of luck rather than skill; (b) the uphill-downhill climb is fatigueing to the golfer; (c) it is difficult to maintain on such an area.

3. If there are ravines or abrupt creek walls on the property, a splendid short golf course could consist of a tee located on one edge of the ravine and the green on the other, with the number of yards down or up the ravine is called for perfect control in carrying the drive, permits the golfer to "chase" as much of the ravine as he thinks he can carry, and as not unduly penalize the beginner, who can aim across the ravine and then push down against on the other side.

4. The par-3 holes should be arranged so that the first of the two is not easier in the mind than the third hole and the other one is later than the eighth hole. Par-3 holes should be not too consecutive.

5. The old days of golf courses that punished shorts-tomplings of the club so severely that fun was taken from the round have passed into extinction. Along with this panel design, all holes are going unnatural-looking knobby bunkers, geometrically designed traps and tiny, miserably conditioned tees. Trees, slopes, crevices, lakes and other natural details will provide ultimate enough for the average well-designed small-town course. If sand traps around the greens can be well maintained, their use provides the course with a feature that is of metropolitan course character. But if the construction or maintenance cost rules out such traps, turf hollows in which the grass is allowed to grow several inches high and of a design that fits in the natural conditions will do well (Fig. 2).

6. An eminent American golf architect sets forth points that are generally agreed upon by members of the American Society of Golf Course Architects:

   "The backbone holes of the modern golf course are the two-shotters, of 400 yards or over. The length of the two-shot hole offers plenty of opportunity to develop good strategy. Unfortunately, these holes are a little long for the average golfer to be able to reach in two, but this can be remedied by having sets of alternate tees.

   The short holes should be kept under 200 yards in length so that the golfer has an opportunity to reach the green with a good shot and thereby obtain his par or birdie. These holes should be attractive and tantalizing in appearance, with the greens designed so that they will become extremely formidable or relatively easy depending upon the position of the pin and the angle of the tee in use.

   There should be as little walking as possible between greens and tees, but under certain circumstances it is more expedient to break this rule than to adhere to it. For instance, when the property is rugged in type, a longer walk between the green and the tee makes it possible to obtain a good golf hole rather than a poor one.

   The holes should be so different in length, character, and architectural type, that there is no feeling of duplication.

   The three types of golf architecture—panel, strategic and heroic—should be used in good proportion. In panel type construction, the traps guard the greens in bottleneck or island fashion. Here the average golfer must either hit the shot accurately or choose a club to play short in order to avoid the trouble which he would ordinarily find at his normal range. One or two holes of this type are usually sufficient in the composition of an 18-hole golf course, and should be the "short" or "drive-and-pitch" holes.

   The strategic type utilizes fewer traps, already placed, so that any golfer can hit with his full power but must place his shots to obtain the most favorable results. This type of golf course is designed with about 50 or 60 per cent of the holes strategic in type. This architecture adapts itself best to holes of 400 yards or over, the par-4 holes.

   The heroic is a blend of strategic and panel design. The traps or natural hazards, such as creeks, rivets, and lakes, are not placed on the diagonal so that the player can hit off as much as he feels he can chew. The more he is able to carry, the more advantageous will be his position for the next shot. This type of architecture is adaptable to all length holes, and should be utilized on 50 to 50 per cent of the holes of the course. There should be no blind shots for ap-
Fig. 5: Double tees add greatly to the variety with little expense. This plan suggests interesting use of two tees on all holes except the first and eighth, to give unusual variety to a nine-hole course. The ninth hole allows the choice of two distinctly different tees. This sort of arrangement calls for planning that usually is beyond the capacity of any but the experienced golf architect. The 12 rectangular areas at the bottom border of the plan are prospective homesites that make especially desirable residential property when the adjacent golf hole is so laid out that golfers won't be coming into a yard for out-of-bounds balls.

Fig. 6: Typical grading plan.

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Fig. 5: Double tees add greatly to the variety with little expense. This plan suggests interesting use of two tees on all holes except the first and eighth, to give unusual variety to a nine-hole course. The ninth hole allows the choice of two distinctly different tees. This sort of arrangement calls for planning that usually is beyond the capacity of any but the experienced golf architect. The 12 rectangular areas at the bottom border of the plan are prospective homesites that make especially desirable residential property when the adjacent golf hole is so laid out that golfers won't be coming into a yard for out-of-bounds balls.

Fig. 6: Typical grading plan.

There should be a sufficient number of heroic carries from the tee, but the routing should be so arranged that the player, with the loss of a stroke, should always have an alternate route to the green.

The character of the course should be so designed that during one round every club in the bag should be used.

No stereotypic design can be used, but the principles of the design have to be applied in accordance with the natural terrain and the location of the proposed green.

On level or flat land a nine-hole course of 3100–3400 yards can be laid out in approximately 50 acres but it will be cramped. An 18-hole course of 6200–6900 yards or more would require at least 110 acres. This is a minimum, making the routing of the course extremely tight. Gently rolling land requires approximately 60 acres for 9 holes and 120 acres for 18. Hilly or rugged land will require considerably more because of the waste land where the contours are severe; at least 75 acres will be needed for 9 holes and 140–180 acres for 18 holes.

Before starting the routing of the course all the natural green and tee sites on the property should be examined, and as many of these as possible incorporated in the routing of the course. Natural sites should not be passed over in routing the course in order to obtain a hole of predetermined length, unless the hole would fall within the undesirable length of 250 to 350 yards.

The minimum length for a standard 18-hole golf course is 6,200 yards. A good average is 6,500 yards, and championship length is 6,700 yards and up. The short holes should range from 130–200 yards (par 3) and there...
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Main areas:
- Lounge
- Cocktail lounge
- Main dining room
- Men's and women's restrooms and showers
- Private dining and party rooms
- Card rooms
- Porches and terraces
- Storage
- Checkroom

Supplementary areas:
- Gym
- Vestibule
- Lobby
- Men's and women's restrooms
- Powder room
- Porches and terraces

Practice Putting Greens

If at all possible, there should be a practice putting green of considerable area near the clubhouse. This green should be surfaced with the same turf as the greens on the course, should be gently undulating, and be arranged with nine or eighteen putting cups spotted about the green and numbered so that a player can putt from cup to cup in regular order.

Tennis Courts

Tennis courts get a good play at most country clubs. An area of at least 120 by 50 ft should be reserved for tennis, or larger space if survey of tennis possibilities among users of the club indicates greater need of space.

Children's Playground

Whether a club decides to operate strictly as a golfing proposition or to include the social aspects of country club life, it is a good idea to plan on a children's playground somewhere near the clubhouse.

By HAROLD J. CLIFFER, AIA

PRIVATE CLUBHOUSES

In private clubhouses functions break down as follows: social, golf and other sports, food service, storage, clerical and administrative offices, maintenance facilities, and on-site member, management and employee quarters. The individual components of these functions will vary from club to club, depending upon the size and class of operation involved. Components marked with an asterisk indicate those which are not absolutely necessary to a minimum operation.

Social Functions

In the organization of clubhouses the social activities are normally accommodated in the following main and supplementary areas:


Lounge

The club lounge is really the stopping-off place for persons or groups waiting to participate in other activities as well as a passive recreation area. It is seldom occupied for long periods and should not be designed to provide seating for large groups gathering for affairs.

As a matter of club economics, the space should be relatively small, not too sparsely furnished and accessible to the cocktail lounge. This acts as an inducement for people not able to find seating in the lounge to gather in the cocktail lounge and have a before-dinner or before-luncheon cocktail. Activity in the cocktail lounge is much more profitable from the standpoint of the management than having the lounge furniture warmed by nonparticipating members or guests.

In addition to giving access to the cocktail lounge, the lounge should provide entrance to the dining rooms, men's and women's restrooms and powder room, rest room and from deck, as well as to connecting circulation to locker rooms.

If there is a demand among the club members for provision of passive recreational activities, a library, museum, trophy room, card rooms, etc., may be provided off the lounge proper.

There has been some tendency in recent years to combine the lounge with the dining room. This has the unfortunate result of making the lounge into a dining room most of the time, and in creating the problem of constantly shifting furniture or in the accretion of lounge space by the dining operation, thereby reducing or eliminating the effectiveness of such a space. These spaces may well be contiguous, but some permanent full or partial division should be made between them to preserve the status of the lounge.

The provision of a fireplace in the lounge usually generates the feeling of what has been termed a more homelike atmosphere. Further a television set should be included in the lounge is a matter of club discretion. If a certain amount of quiet recreation is to take place in the lounge, then it would certainly be better for the television set to be placed elsewhere, preferably in the cocktail lounge or TV room, where it is an attraction and not a distraction.

Bars and Cocktail Lounge

The bar and cocktail lounge are almost consistently the profit makers for the club. The main cocktail lounge should be provided in the social end of the building. A secondary and smaller bar should be located with the "Nineteenth Hole" and/or the mixed foursome's grill. Portable bars should be avail-

*Not necessary to a minimum operation.
able for large parties and receptions as the occasion warrants. As mentioned before, the main cocktail lounge should be accessible directly from the main lounge for those who wish to enjoy a beverage or two in the main lounge. There have been some complaints made that the bar is not convenient for some. All the bars have been improved, and the bar staff has been trained to handle the rush. However, there is no guarantee that the bar staff will always be able to handle the rush.

Dining Rooms

The main dining room should be designed to take care of the day-to-day service of the members and their guests. It is also designed to be a central location for social events. The main dining room should be large enough to accommodate a large number of people at one time. It should also be designed to accommodate a variety of events, from small parties to large gatherings. The main dining room should be located in a central location, and it should be easily accessible from other parts of the club.

Supplementary Functions

Ordinarily, very little needs to be said about the supplementary functions of entries and vestibules. The main entrance and vestibule should be designed to accommodate a large number of people at one time. The main entrance should be located in a central location, and it should be easily accessible from other parts of the club. The main entrance should be designed to accommodate a variety of events, from small parties to large gatherings.

Clubhouse Circulation

The natural division of social and athletic activities into club operation is the key to clubroom circulation patterns. This division can be provided by a system of rooms for social and athletic activities. Social activities are divided into three categories: social activities for members, social activities for guests, and social activities for members and guests.

Golf Facilities

With a little imagination, the golf facilities section of the clubhouse can be made considerably more attractive than they have been in the past. To say that some of the accommodations have been treated as afterthought in clubhouse design would be an understatement. Locker rooms have been placed in dank, poorly ventilated basements, with exposed piping and ductwork overhead.
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Golfers & Swimmers Parking

Interior Clubhouse Circulation

Exterior Clubhouse Circulation

Lower Level Clubhouse Circulation

Two-floor scheme with intermediate floor kitchen facilities.

Could be as short and as easily negotiated as possible for the tired golfer. On the return trip to the clubhouse from the course, the "Hangry Hole", man's grill or mixed foursome's grill should be immediately accessible to the thirsty or hungry golfer. Circulation should be provided between the locker rooms and the social end of the house.

Access to teen-age facilities should be direct from the parking area without passage through the clubhouse proper.

Shown in Figs. 6 and 7, in diagrammatic form, are three basic types of clubhouse schemes. They are intended to show functional organization only. Topography, space and budgetary limitations will dictate which scheme is the most feasible in any given case. There may be times when a combination of these types is indicated.

From these diagrams, the close correlation necessary between the course and site design and the building design should be apparent.

Public Clubhouses

Clubhouse buildings for the municipal golf course or the privately owned public fee course are so different in operation and accommodations from the clubhouse for private clubs that they really constitute almost a separate building type. While it is true that many public course clubhouses serve as the focal point for the operation of a local golf club, it is rare that accommodations of these structures approach the scope and quality of those of the private club.

Vision of Private and Public Course Uses

Where the private club attempts to make provision for every conceivable social and athletic need its members can afford, the public course owner or operator, whether a municipality or a private individual, has only one objective in mind: to provide adequate and accessible golf facilities for as many persons as possible at popular prices. This means that all frills and extra services are reduced to a minimum, consistent with a profitable operation. In short, golf is a business and a means of livelihood to the private owner of a public course and a combination business and public recreation service for the municipality, where the private club is usually a cooperatively owned and subsidized social and recreational facility for the exclusive use of the owner-members. In the case of the public course, maximum turnover of play is of utmost importance from the standpoint of service to the clientele and profit to the owner, while at the private club, controlled play on the course is the objective, to assure the members available playing time without wait or reservations.

Moreover, social activities at the public course are primarily limited to socializing on the course and at the snack bar and generally little if any attempt is made, except under the rare and at time management of an occasional private entrepreneur, to provide social activities or dining facilities on or near a country-club level.

Another difference between the municipal and the privately owned public course operation is in the nature of the management. Of necessity the municipal operation must rest totally upon hired personnel or concessionaires, whereas the privately owned operation rests in the hands of the owner and his family and perhaps a minimum number of hired personnel. Fundamentally, this difference has no important implications in the design of these facilities, since it should be the objective of both types of operation to design and construct buildings which can be staffed with as few persons as possible.

Profits from public course operation are derived largely from green fees. However, most public course operators recognize the revenue producing possibilities of a snack bar, cocktail bar and golf shop. If properly designed and attended, these auxiliary operations can and do produce consistently good returns. The question facing most municipal and individual course owners is: what facilities should be provided, how big should they be and how should they be related?

Methods and Criteria for Planning the Public Course Clubhouse

Basically, the public course operator must proceed in much the same fashion as the private club to arrive at the proper site and type of building to suit his needs. The number of factors to consider are few but no less complex to analyze than in the case of the private club. Preliminary planning must be thorough, design must be attractive and efficient and construction must be economical.

Elements of Clubhouse Design

In a municipal course clubhouse, the essential elements of the design are the starter's booth, golf shop, food concession, lounge and public toilet. Locker and shower rooms may be incorporated into the design, although they are not necessary in all instances, and their use will depend upon local conditions. At privately owned public courses, the owner, in seeking to capitalize on his food operation, may actually increase the proportions of this accommodation to the extent that he has separate kitchen and dining facilities as well as a liquor bar or cocktail lounge.

In privately owned operations, where the owner decides to go into an extensive food
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service operation. It is advisable for him, as suggested for private clubs, to call on the services of competent food service consultants as well as an architect. Before anticipating a large scale food service operation, however, the private operator would do well to assure himself that he is well acquainted with the intricacies and pitfalls of food service, or that he can obtain the service of competent personnel, confectionaire or catering service.

One of the prime considerations in the design of public clubhouse facilities is that the functions be arranged in such a way as to allow for the multi-use of employees, or so that the owner himself may attend to several operations at once.

Thus it should be possible for the starter to pin a hit in other operations, such as selling merchandise or food in slack periods. Or it should be possible for the golf professional to double as starter on slow days.

Building maintenance is handled in a number of ways in municipal operations, but the most usual manner is that city maintenance personnel handle it. The private operator, on the other hand, either has to do it himself or hire personnel to do it for him.

The more compact the facilities, the less overhead. As a general principle, the building should be designed so that as little labor as possible is required to operate and maintain the premises.

Clubhouse Functions

In the case of the public course clubhouse, the functions break down in a manner similar to those of the private clubhouse, namely into golf and social functions, in which the social function is reduced to the simple elements of a snack bar and lounge. The golf functions are mainly the golf shop, starter's room and, in some cases, locker and shower rooms.

Normandy, the public course golfer will arrive at the course dressed to play with the possible exception of his shoes, which generally will be changed in his car. The question which often confronts municipalities constructing golf facilities is whether to provide showers, locker and lounge facilities, and if so, to what degree and in what manner they should be related to other activities. To establish what has been common practice along these lines, a study was conducted in which 38 communities throughout the country came up with some of the answers.

Clubhouse Relation to Other Recreational Facilities

Very often, to combine all municipal recreation facilities in one central location, municipalities will integrate the golf operation with other recreational activities.

Fig. 7 One-floor schema with (a) grade-level service entrance and (b) lower-level service entrance.
Commercial

RESTAURANTS AND EATING PLACES

By LENDAL H. KOTCHEVAR and MARGARET E. TERRELL

SPACE REQUIREMENTS

Adequacy of space will influence building and operating costs and efficiency. When space is too small, labor time and effort are likely to increase and the volume and quality of output decrease. When it is too large, building and maintenance costs are excessive.

Decisions pertaining to space allowances may be strongly affected by the limitations of investment funds and available space. Adequate space is sometimes provided by means of low-cost materials and equipment of such inferior quality that they have short and unsatisfactory service life. In other instances, space is restricted to a point where it prohibits profitable volume or the best utilization of labor.

Space allowances in relation to investment should be balanced in terms of (1) proposed permanence of the facility, (2) costliness of need for the specific operation, (3) essentials for operating efficiency, (4) desirable standards in terms of appearance, sanitation, and good quality of production and service, and (5) immediate and future costs, depreciation, upkeep, and maintenance.

Facts peculiar to the particular establishment should be used as the basis for determining space needs. Requirements will vary for facilities of a given type and volume. Location; type of operation; clientele; frequency of deliveries of supplies; kind of food used, such as fresh, frozen, or canned; and the completeness of processing to be done will cause variations in production and storage requirements. The policies of those in charge will have an influence. Certain general information, such as numbers to be served, turnover, arrival rate, and type of service, will be helpful in deciding dining area needs.

Study is required to clarify immediate and future needs in food production. Choices should be made between most cutting or portion-ready meats, a baking section or use of commercially baked products, and the use of unprocessed versus processed foods. If enlargement is probable, studies made before the building is planned as to how space may be added and how the initial plan should be designed to minimize ultimate cost, will be helpful.

It is well to block out space allowances according to functions that the facility is to perform. Calculate area requirements in terms of: (1) volume and type of service, (2) amount and size of equipment to be used, (3) number of workers required, (4) space for food supplies, and (5) suitable traffic area.

The dining area location and space allowance are usually determined first, the production areas next in terms of specific relationship to the dining area, and the other sections as required to these. Planners should be careful in accepting general space recommendations. There are many variations.

Dining Area

Space for dining areas is usually based on the number of square feet per person seated times the number of persons seated at one time.

Space Requirements: The patron's size and the type and quality of seats for should be considered. Small children may require only 8 sq ft for a type of service in which an adult would require 10 sq ft. The amount of serving equipment, the food service areas and line-up space will influence needs. Lost space must be considered.

The diner's comfort should govern allowance. Crowding is distasteful to many people. It is likely to be tolerated more readily by youngsters than by adults. It is more acceptable in low-cost, quick-service units than in those featuring leisurely dining. Both young and old enjoy having sufficient elbow room and enough space so that dishes of food and beverage supplies are accessible. Place setting for adults usually allow 24 in. and for children 18 to 20 in. (Table 1).

<table>
<thead>
<tr>
<th>Type of operation</th>
<th>Square feet per seat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cafeteria, commercial</td>
<td>16-18</td>
</tr>
<tr>
<td>Cafeteria, college and industrial</td>
<td>12-15</td>
</tr>
<tr>
<td>Cafeteria, school lunchroom</td>
<td>9-12</td>
</tr>
<tr>
<td>College residence</td>
<td>12-15</td>
</tr>
<tr>
<td>Table service</td>
<td>18-20</td>
</tr>
<tr>
<td>Table service, hotel</td>
<td>15-18</td>
</tr>
<tr>
<td>Table service, minimum seating</td>
<td>11-14</td>
</tr>
<tr>
<td>Banquet, minimum</td>
<td>10-11</td>
</tr>
</tbody>
</table>

All of the areas in a dining room used for purposes other than seating are a part of the "square footage allowed for seating." This area not include waiting areas, guest facilities, distribution, and other similar areas. Excessive loss of use of space for other than seating in the dining area will, however, increase needs. Structural features of the room should be considered. Width and length of the room, table and chair size, and seating arrangements affect capacity.

Service stations may be estimated in the proportion of one passenger to every 20 seats or a large central one for every 50 to 60 places.

The advisability of having a central serving station will be influenced by the distance of the dining areas from the serving area. It is of special value when production and dining are on different floors. Plumbing and wiring and other supply areas should be located to influence location of the stations. Small substation for silver, dishes, napery, beverage, ice, butter, and condiments may measure 20 to 24 in. square and 36 to 38 in. high. The size of central stations varies from that for a small enclosed room to that of a screened section measuring approximately 8 to 10 ft long by 27 to 30 in. wide by 6 to 7 ft high.

Table size will influence patron comfort and efficient utilization of space. In a cafeteria, for example, where patrons may dine on their trays, it is important that the table be of adequate size to accommodate the number of trays likely to be there. Four trays 14 by 18 in. fit better on a table 48 in. square than on a table 36 or 42 in. square. Small tables, such as 24 or 30 in. square, are economical for seating but are uncomfortable for large people. They are only suitable in crowded areas for fast turnover and light meals. Tables having common width and height allowing them to be fitted together will give flexibility in seating arrangements. These are particularly good for the banquet or cocktail-type bench seating along a wall. Tables for booths are difficult for waitresses to serve if they are longer than 4 ft. The width of booths including seats and table is common 5 ft. A lunch counter will have a minimum width of 16 in. and a maximum width of 24 to 30 in. The linear feet are calculated on the basis of 29 to 24 in. per seat. The maximum area best served by one waitress is generally 16 ft of counter. This will give eight to ten seats. Uniformed counters make maximum use of space and reduce traffic. Space in depth of 8 to 11 ft will be required for every linear foot of counter; approximately 3 to 4 ft of public aisle, 2 ft for aisle space for employees. A width of 4 ft is desirable where employees must pass.

Calculate aisle space between tables and chairs to include passage area and that occupied by the person seated at the table. A minimum passage area is 18 in. between chairs and, including chair area, tables should be spaced 4 to 5 ft apart. Aisle on which bus cars or other mobile equipment is to be moved should be sized according to the width of such equipment.

The best utilization of space can often be arrived at through the use of templates or scaled models. Diagonal arrangements of square tables utilizes space better than square arrangements and yields a more trouble-free traffic lane. Lanes that pass between backs of chairs are likely to be blocked when guests arise or are being seated.

Table heights in schools should be chosen for the comfort of children. In units patronized by many grades a compromise height will be needed between the 30 in. normally used for adults and the 24 in. suitable for children. Or two sizes may be used in different sections of the room. A table length to seat four, six, or eight is preferable to longer ones.

Number of Persons Allowance: The number of persons to be seated at one time is the second point of information needed for calculation of the dining room size. The total number of seats required at one time, multiplied by the space required for each seat, will give the total number of square feet needed in the

area. The number of times a seat is used depends on the given period and is commonly referred to as "turnover." The turnover per

time, the number of seats available, gives the total number of persons who can be seated in an hour. If peak loads, or number to be

served at one time, are known, the number of seats required can be estimated.

Therefore, tend to vary, for they are influenced by such factors as the amount of

food eaten, the elaborateness of the service, and the diner's time allowance. A breakfast

meal of few foods may be eaten more quickly than dinner, and a simple fare faster than a

meat-course meal. Turnover is quickest in dining rooms where food has been prepared

in advance for fast service and where patrons serve themselves and eat their soiled dishes.

The turnover per hour is speeded up 10 percent by patrons removing their soiled dishes so that

tables are quickly available for other guests. Value service for leisure dining, involving

removal and placement of several courses, takes the longest time. Although specific turnover

may vary from 10 minutes to 2 hours, actual seating time is normally 10 to 15 minutes for

breakfast, 15 to 20 minutes for lunch, and 30 minutes to dinner.

The calculation of occupancy of seats in a dining room must take into consideration a

certain percentage of vacancy, except where it is an operating consideration, such as

lor a particular seating plan. In table-service dining rooms this has been estimated as 20 percent

of normal seating capacity for seating of two people. Such seating, irregular rate of turnover, and reluctance

is shared with strangers.

The table size used in the dining room will

affect occupancy. It is often desirable to provide for groups varying from two to eight,

with a predominance in most dining rooms of those for two people. The "deuces" may be

ible and shape that can be put together to

form tables for larger groups. In metropolitan areas where many tend to dine alone, meals for single people are necessarily offered.

At these rates, 240 to 480 patrons will need to be seated within an hour. If the
turnover rate is two per hour, then from 120 to 240 seats will be used. However, if 15 percent of the total capacity at the peak period remains unfilled, then between 140 and 280 seats will be required. An additional 14 to 28 seats at 10 percent would be needed if the patrons do not use their soiled dishes.

Patronage estimates for facilities of different types may be estimated by the number of persons in residence, enrollments in a school, an

industry's payroll, the membership of a club, the amount of traffic in an office building, or the number of persons who can be seated in a certain percentage may normally be expected to dine in the facility provided. The percentage will be influenced by such factors as its location in relation to other facilities, the patron's buying power, the price plan (or the balance of subsidy or profit), patrons' mealtime allowance, and conven-

ience of the location.

The patronage estimate for a college cafeteria should take into consideration the number of students who live at home, are members of a

live-in group, such as an organized house, and the number of ambitions, faculties available on or near the campus. A college student

residence providing table service may have to allow seating capacity that is 110 percent of occupancy if a policy exists for having "special guest" occasions and seating all at one time.

An industrial lunchroom may serve as few as 25 percent and as many as 90 percent of the payroll. Close to probable patronage may be drawn from such factors as nearness to other

eating facilities, wage rates, type of work, prices to be charged, convenience, quality, and attractiveness. The attitude of manage-

ment toward the lunchroom may affect patronage also. Pride in providing a good service for

the industrial family as opposed to a take-out attitude tends to win favorable

response.

The size of a dining room in a hospital should be determined whether it is to be used for employees, patients, or guests, or any combination of these. The type of hospital and the number of ambulatory patients should also be considered. The type of hospital will also influence the number of personnel employed.

is generally from 1 to 3 percent, depending on how much hospital food service is charged to patients and how much teaching and research are done. Good food and reason-

able prices will attract a high percentage of those eligible to eat in the facility.

School lunch participation varies 25 to 75 percent and a good percentage for planning is 60 to 75 percent of enrollment. Where

prices are low, the food good, meals appeal, and the food service carefully integrated with the educational program, the

percentage will be high.

Banquet services planning because maximum seating potential means maximum

profit. Folding tables 30 in. wide are popular. These are obtained in varying lengths such as 6, 8, and 10 ft. The spacing for the legs should be such as to allow for

comfortable seating when the tables are joined end to end and place settings are laid on

24-in. centers.

Restaurant operators should consider space in relation to patronage volume essential for a profitable business. Labor, food, and operating

costs must be met and a profit realized that covers risk-bearing effort expended and

return on investment. Essential income is weighed in the light of probable patronage and

probable average check. The number of seats provided in planning must cover this need.

Flexibility in seating capacity is often desir-

able. People do not like to be crowded nor do they enjoy the lonely experience of being

served in a huge area occupied by only a few.

Spare patronage creates an impression of

poor popularity. Separate rooms, folding
doors, screens, or other attractive devices can

be used to reduce size of an area during slack periods. Sections left open should be those easiest to clean, such as back rooms, or other less desirable space can often be used for overflow numbers that occasionally require service.

A common experience in many dining room operations is the need for more seating at one meal than at others. This may be done more or less by increased numbers or different

turnover rates. A restaurant cafeteria serving

600 men has an overflow room seating 100,

which it uses only at dinner. The night meal

is not only larger but the men dine in a more

legitimate fashion. The room is available to

serving other groups at breakfast and lunch.

Commercial restaurants located in shopping or office areas often have facilities at

no noon to serve at the dinner hour. Rooms used

general patronage at noon may be closed at night or provide space for private dinner

parties. Entrance to these rooms should not require passage through the main dining

room. Convenience for special service is important.

Production Area

A frequently used rule for allotting space for the kitchen is that it should be one-third to one-half the area of the dining room. It has been found unsatisfactory, however, to go by a set space allowance for this area. Detailed study of space allocations leads to the conclusion that percentage in relation to the dining area are "completely unrealistic and unreliable." An analysis of specific needs is required. Many factors influence space requirements, such as:

1. Type of preparation and service

2. Amount of the total production done in the unit

3. Volume in terms of the number of meals served

4. Variety of foods offered in the menu

5. Elaborateness of preparation and service

6. Amount of individual service, as in a hospital tray service

Second and service plans, whether on one

floor or many

The cost of providing space, equipment, and labor is sufficient to merit careful calculation of the best type of operation before planning.

flow products on the market, new cooking methods, and new equipment available should be evaluated. The use of preprocessed prod-

ucts in many metropolitan areas has made a pronounced change in the amount of space allotted for bake shop, meat cutting, and vegetable preparation areas. Where portion-cut meats are readily available, it is questionable whether large cuts are necessary. It is wise to equip and provide skilled labor for a butcher shop. The use of large quantities of frozen foods also affects storage requirements, quality of market products, their availability, and the frequency of deliveries are all to be considered.

Variety in menu selection and elaboration of foods tend to increase space needs in work areas and storage. Small amounts of numer-

ous items do not permit stacking and bulk packaging. Elaboration of food often involves individual portion treatment, with individual
casseroleas, for example, as compared to bulk

steam table pans. A hospital food service requiring many special diets serves as a com-

mon example of menu variety and individual portion treatment imposing special space

requirements.

The equipment provided will affect the space needs. Garbage and refuse, for example, may require a sizable area for storage awaiting pickup. Disposal units for food garbage, incin-

erator for burned refuse for which there is no market, reduce the amount to be

hauled. Frequency of garbage collection will mini-

mize the space needs.

Structural features of the building may

influence the utilization of space. The shape of the kitchen, location of ventilation and ele-

vators, service shafts, and other utilities should be considered in relation to an efficient

layout for work. The location of entrances and

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Existing for a good flow of traffic, window placement, suitable space, and relationship of sections need consideration. Eliminate partitions whenever possible; this will reduce space needs and will permit easier supervision of production areas.

Kitchens serving a smaller number require a larger square foot per meal than those serving a larger number. The following data used for industrial cafeterias show the rate at which space needs per meal tend to decrease as the number served increases (Table 2).

<table>
<thead>
<tr>
<th>TABLE 2 Variation in Space Needs in Relation to Numbers Served</th>
</tr>
</thead>
<tbody>
<tr>
<td>Meal load</td>
</tr>
<tr>
<td>-----------</td>
</tr>
<tr>
<td>100-200</td>
</tr>
<tr>
<td>200-400</td>
</tr>
<tr>
<td>400-800</td>
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<tr>
<td>800-1,200</td>
</tr>
<tr>
<td>1,200-2,000</td>
</tr>
<tr>
<td>2,000-3,000</td>
</tr>
<tr>
<td>3,000-5,000</td>
</tr>
</tbody>
</table>

Planners are often asked to make estimates of space needs before having an opportunity to make policies or detailed plans for operations. Figures will be found useful in making such estimates are given in Table 3. These figures pertain to average kitchen areas found in different types of food facilities. Their use is to be regarded as tentative and to be measured carefully in terms of specific needs. The square footage given is to be multiplied by the maximum number of meals estimated per hour of service, in order to find the total space requirement.

After production policies have been established, work areas may be blocked out in terms of the equipment needs and the number of workers required to do the work in a section. Linear space, depths, and heights for work centers should be controlled in terms of average human measurements. This will include the reach to and grasp of material or equipment used in working. The length and width of the work table is adjusted in terms of the amount and size of equipment that will rest on it during the progress of work. The linear measurement will vary in terms of the number of workers using it at one time.

The width of the table may be 24 to 30 in. unless dishes or food containers are to rest at the back of the table. Tables 36 in. wide are preferable when the back of the area is used for such storage. Where two workers work opposite each other, a table 42 in. wide may be used. A work area of 4 to 6 in. will be within convenient reach of the average person. Tables 8 to 10 ft long are used if two people are working side by side. A height of 34 in., commonly used as a working height, should be evaluated in terms of specific work done and equipment used.

A kitchen space should permit easy movement of essential traffic. The minimum width for a lane between equipment where one person works alone is 42 in. where more than one is employed and where workers must pass each other in progress of work. Where mobile equipment is used, 48 to 54 in. are recommended. At least 60 in. are needed for main traffic lanes where workers regularly pass each other with mobile equipment. If workers or equipment must stand in the lane while working, appropriate space should be allowed for this. Thought should be given to space for doors opening into an aisle and for handling large pieces of equipment, such as roasting pans, baking sheets, and stock pots.

Main thoroughfares should not pass through work centers. Compactness is essential for step-saving. It is well for the work centers to be in close proximity to main traffic lanes, with easy access to them. It is important both to avoid distraction from outsiders passing through work centers and to conserve space. Word centers at right angles to traffic lanes are efficient (Fig. 1).

The percentage of floor area covered by equipment varies according to production needs and the type of equipment used. A satisfactory layout may claim less than 30 percent of total space for equipment while work areas, traffic lanes, and clear space and equipment operation and cleaning may require 70 percent or more.

For hospital production and service areas, 20 to 30 sq ft per bed is suggested. The need is reduced as the number of beds increases—approximately 30 sq ft per bed for a 50-bed, and 20 sq ft per bed for a 200-bed hospital. This allowance does not include major storage areas, dining rooms, employees facilities, or floor serving pantries.

Serving Areas

Space allowance for serving areas should be adapted to the needs of the specific facility. The number of workers, organization of work, and number served will influence size. The type of service will also be influential in dictating space needs.

In cafeterias the counter length should be regulated by the variety and volume. Excess space partially filled is unattractive, but crowding is also undesirable. An estimate that may be used for allowing width is 14 ft. This allows for 4 ft as patron lane space, 1 ft tray slide, 2 ft counter width, 4 ft for workers, and 2 ft for back bar. The size of the tray should dictate the width of the tray slide. The average length of counters in college residence halls and hospitals is found to be 30 to 40 ft, while those

<table>
<thead>
<tr>
<th>TABLE 3 Square Feet of Kitchen Space per Meal for Food Facilities of Different Type and Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of facility</td>
</tr>
<tr>
<td>------------------</td>
</tr>
<tr>
<td>Cafeterias</td>
</tr>
<tr>
<td>Hospitals</td>
</tr>
<tr>
<td>Hotels</td>
</tr>
<tr>
<td>Industrial lunchrooms</td>
</tr>
<tr>
<td>Lunch counters</td>
</tr>
<tr>
<td>Railroad dining car</td>
</tr>
<tr>
<td>Restaurants (tavern)</td>
</tr>
<tr>
<td>School lunchrooms</td>
</tr>
</tbody>
</table>

in school lunchrooms average around 15 to 20 ft. Some commercial cafeteria counters may be 70 to 80 ft long, but counters over 50 ft long are frequently considered inefficient. Twenty feet is usually thought of as a minimum but, under special conditions and where a limited menu is served, 6 to 8 ft may be sufficient. The trend is toward shorter counters with mobile serving units or dish holders set at right angles to the counter. Smoother service and greater speed are achieved. Counter height may be set at comfortable levels for workers and patrons. Schools may have lower counters so that children may see the food and push their trays along a slide as they are served.

For little folk, 28 to 30 in. is desirable, with counters narrow so that servers may reach over to assist a child. A solid tray slide tends to result in fewer accidents than those made of bars or tubing. Plastic trays measuring 9 by 12 in., compartmented, and of pastel colors are popular. Slides for these may be on the servers' counter for ease of service and to eliminate spills or accidents. The child picks up the completed service at the end of the line.

Some planners use, as a rough guide, one counter or line for every 250 to 300 patrons served, but arrival rate, speed of service, and turnover are more reliable factors to consider in establishing the number of lines required.

Hospital service centers will depend upon whether central or floor service is used, trays are set up in serving pantries, and modified bars are set up in line or over the counter.

Space must be allowed for bulk food trucks, tray trucks, small tray carts, or special dispensing units.

Short-order units where food moves directly from production to the consumer require the least service space. The need for an intermediate station is eliminated. Step-saving compactness saves space. The units requiring the most space are those furnishing elaborates or highly individualized service.

Receiving and Storage Areas

Space allocation for receiving and storage must be based on specific needs. The volume and type of items received and stored should be considered. Although the average operation may find a dock 8 ft deep and 12 ft long sufficient for receiving items, this would not be sufficient for a large one. Storage in square feet for food storage for 30 days has been calculated by some as approximately one half the total served or, if 1,000 are served, 500 sq ft may be used as a tentative figure for total food storage needs. Cases of 6/10's stacked 6 cases high on flat trucks will have a bearing weight of approximately 250 to 300 lb per sq ft. Skid sizes should be 3 by 2 ft by 8 to 12 in. high. Where heavy items, such as 10-gal cans of milk, are stored, bearing weight may be increased. One case of 6/10's, 24/2's, or 24/2's weighs approximately 50 lb and occupies 1 cu ft.

Concess Storage

The volume of canned food needed to serve 100 persons three meals daily for one month is estimated to be approximately 45 cases of 6/10's or equivalent. The maximum stack height will be 8 or 9 cases or approximately 72 in. Accessibility to this stock, as well as volume, will govern the number of stacks needed. A total of 3 cu ft per stack is estimated to include floor space covered by a case of canned food, plus a share of aisle space. One thousand cases piled eight high in 125 stacks will require 375 sq ft or a storage area approximately 20 by 20. 5-person aisles may be as narrow as 36 in., but 42 or 48
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Refrigerated and Low-Temperature Storage. There are many factors affecting space needs for refrigerated and low-temperature foods. Across-the-board figures generally should be used only in preliminary estimates. The quantity stored at one time will dictate the storage needs. Variation in the type of storage also will be indicated by the types of items to be stored. Allocation in preliminary planning may be as follows: 20 to 35 percent for meat (portion-ready means require 1/2 to 1/3 less space than carcasses or wholesale cuts); 30 to 35 percent for fruits and vegetables; 20 to 25 percent for dairy products, including those in serving areas; 10 to 20 percent for frozen foods; and 5 to 10 percent for carry-over foods, salads, sandwich material, and bakery products. A requirement of 13 to 20 cu. ft. of refrigeration per 100 complete meals has also been used by some planners. Others state 1 to 1 1/2 cu. ft. of usable refrigerator space should be provided for every three meals served. Analysis of a number of award-winning installations indicated that approximately 0.25 to 0.50 cu. ft. of refrigerated walk-in space was provided per meal served, and frozen walk-in space approximated 0.1 to 0.3 cu. ft. per meal served. Additionally low-temperature or refrigerated space in terms of reach-ins was not calculated. In some climates, refrigerated space must be provided for dried fruits, nuts, cereals, and other foods to prevent wasp and insect infestation. Walk-ins become feasible for an establishment serving 300 to 400 meals per day, and refrigerated pass-throughs can be added when from 400 to 500 meals are served per day. A walk-in 5 to 6 ft wide does not permit storage on both sides with adequate aisle space. Storage space of 1/4 to 2 ft should be allowed on either side of the aisle. If crates or cases are stored, this may have to be increased. Aisles of 30 in. are usually too narrow, 42 in. are desirable. If mobile equipment is moved in and out, aisles may have to be wider. Walk-ins that 8 to 9 ft wide and about 10 ft long are minimum size. This allows for two storage areas 30 in. wide with a 3 ft to 4 ft aisle. If added width is desired for storage space in the center, allowance for storage areas of about 3 ft wide and 42 in. minimum aisles should be provided. Large walk-ins may be designed for lift truck operation, with doors opening from the receiving dock on one side and into the kitchen on the other. If done and lift trucks are used, space must be provided in storage aisles for their working and turning around. Doors should be a minimum of 42 in. wide to admit large boxes and containers or be suited to mobile equipment. Doors to low-temperature areas are most often planned to open into a refrigerated area. If this is not done a heating device may have to be installed on a door opening into a warm area to prevent its freezing from condensation. About 12 to 15 sq ft must be kept free for every door opening. About 45 lb of frozen food, if stacked in cases, can be stored per cubic foot. About 30 to 35 lb of refrigerated food can be stored per cubic foot.

Sanitation Areas

Dishwashing Area. The space required for the dishwashing operation depends on the methods and equipment used. In all instances there must be adequate room to receive the volume of soiled dishes likely to arrive at any one time, plus space for drying, stacking, and placing in baskets on a conveyor of a machine or into a prewashing operation. The dimensions may be

Pot and Pan Sections. Provide a soiled utensil collection area adequate for the largest volume that normally arrives in the busiest period of each day. The equipment is likely to occur when the preparation containers are emptied for service.
### Table of Dimensions

<table>
<thead>
<tr>
<th></th>
<th>Abs. Min.</th>
<th>Des. Min.</th>
<th>Comfortable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Ap</strong> Public circ’n</td>
<td>3-0 to 4-6</td>
<td>1-6 to 5-0</td>
<td>3-9 to 5-0</td>
</tr>
<tr>
<td><strong>As</strong> Service aisle</td>
<td>3-6 to 4-6</td>
<td>4-0 to 5-0</td>
<td>4-0 to 5-6</td>
</tr>
<tr>
<td><strong>B</strong> To wall</td>
<td>1-8 to 2-0</td>
<td>2-0 to 2-4</td>
<td>2-0 to 2-6</td>
</tr>
<tr>
<td><strong>C</strong> Between units</td>
<td>0 to 8</td>
<td>1-0 to 2-0</td>
<td>1-0 to 2-4</td>
</tr>
<tr>
<td><strong>Length</strong></td>
<td>1-8 to 2-0</td>
<td>2-0 to 2-3</td>
<td>2-0 to 2-6</td>
</tr>
<tr>
<td><strong>Width</strong></td>
<td>1-8 to 2-0</td>
<td>2-0 to 2-3</td>
<td>2-0 to 2-6</td>
</tr>
</tbody>
</table>

All dimensions in feet and inches.

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Fig. 2 Table and chair units.
Commercial

RESTAURANTS AND EATING PLACES

<table>
<thead>
<tr>
<th></th>
<th>Abs. Min.</th>
<th>Des. Min.</th>
<th>Comfortable</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Service or pub. circ’n</td>
<td>3.6 to 4.6</td>
<td>4.6 to 5.0</td>
<td>5.0 to 5.6</td>
</tr>
<tr>
<td>B To Wall</td>
<td>2.0</td>
<td>2.0 to 2.6</td>
<td>2.0 to 3.0</td>
</tr>
<tr>
<td>C Between units</td>
<td>0 to 1.0</td>
<td>1.0</td>
<td>1.6</td>
</tr>
<tr>
<td>Length</td>
<td>3.6</td>
<td>3.10 to 4.0</td>
<td>4.0</td>
</tr>
<tr>
<td>Width</td>
<td>1.8 to 2.0</td>
<td>2.0 to 2.3</td>
<td>2.4 to 2.6</td>
</tr>
</tbody>
</table>

*For seating units for more than 4 persons, round tables are usually recommended; diameter depending on perimeter necessary to seat required number.

all dimensions in feet and inches

Fig. 3 Table and chair units.
COMMERCIAL
RESTAURANTS AND EATING PLACES

2 PERSONS SIDE BY SIDE

<table>
<thead>
<tr>
<th></th>
<th>Abs. Min.</th>
<th>Des. Min.</th>
<th>Comfortable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service A and pub. circ’n</td>
<td>2-6</td>
<td>3-0</td>
<td>3-6</td>
</tr>
<tr>
<td>Length</td>
<td>3-6</td>
<td>3-9</td>
<td>4-0</td>
</tr>
<tr>
<td>Width</td>
<td>3-0</td>
<td>3-3</td>
<td>3-6</td>
</tr>
</tbody>
</table>

Note: This type not ordinarily recommended.

2 PERSONS FACE TO FACE

<table>
<thead>
<tr>
<th></th>
<th>Abs. Min.</th>
<th>Des. Min.</th>
<th>Comfortable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service A and pub. circ’n</td>
<td>to 3-0</td>
<td>to 4-0</td>
<td>to 5-0</td>
</tr>
<tr>
<td>Length</td>
<td>2-0</td>
<td>2-2</td>
<td>2-6</td>
</tr>
<tr>
<td>Width</td>
<td>4-10</td>
<td>5-2</td>
<td>5-8</td>
</tr>
</tbody>
</table>

Dimensions in feet and inches

4 PERSONS

<table>
<thead>
<tr>
<th></th>
<th>Abs. Min.</th>
<th>Des. Min.</th>
<th>Comfortable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service A and pub. circ’n</td>
<td>2-6</td>
<td>3-0</td>
<td>3-6</td>
</tr>
<tr>
<td>Length</td>
<td>3-6</td>
<td>3-9</td>
<td>4-0</td>
</tr>
<tr>
<td>Width</td>
<td>4-10</td>
<td>5-2</td>
<td>5-8</td>
</tr>
</tbody>
</table>

BOOTH FURNITURE HEIGHTS

<table>
<thead>
<tr>
<th></th>
<th>Abs. Min.</th>
<th>Des. Min.</th>
<th>Comfortable</th>
</tr>
</thead>
<tbody>
<tr>
<td>H</td>
<td>3-0 to 3-6</td>
<td>3-6</td>
<td>4-0</td>
</tr>
<tr>
<td>S</td>
<td>1-5 to 1-6</td>
<td>1-5 to 1-6</td>
<td>1-6</td>
</tr>
<tr>
<td>T</td>
<td>2-5</td>
<td>2-5 to 2-6</td>
<td>2-6</td>
</tr>
<tr>
<td>W</td>
<td>1-8 to 2-0</td>
<td>2-0 to 2-2</td>
<td>2-4 to 2-6</td>
</tr>
<tr>
<td>Seat</td>
<td>1-4 to 1-5</td>
<td>1-5 to 1-6</td>
<td>1-6 to 1-8</td>
</tr>
<tr>
<td>Splay</td>
<td>0 to 0-3</td>
<td>0-2 to 0-3</td>
<td>0-3 1/2 to 0-4</td>
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</tbody>
</table>

Fig. 4 Booths.
STANDARD (straight) TYPE

<table>
<thead>
<tr>
<th></th>
<th>Abs. Min.</th>
<th>Desirable Min.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>1.2</td>
<td>2.0</td>
</tr>
<tr>
<td>With cooking equip.</td>
<td>2.0</td>
<td>2.6</td>
</tr>
<tr>
<td>1 person</td>
<td>2.5</td>
<td>3.5</td>
</tr>
<tr>
<td>Y 2 or more persons</td>
<td>2.9</td>
<td>2.9</td>
</tr>
<tr>
<td>Z</td>
<td>1.10</td>
<td>2.0</td>
</tr>
<tr>
<td>E</td>
<td>1.2</td>
<td>1.2</td>
</tr>
<tr>
<td>Ap</td>
<td>3.6</td>
<td>4.6</td>
</tr>
<tr>
<td>S</td>
<td>1.0</td>
<td>1.2</td>
</tr>
<tr>
<td>CC</td>
<td>1.10</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Variations in Shape

<table>
<thead>
<tr>
<th></th>
<th>Usual Minimum</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>2.5 to 3.5</td>
</tr>
<tr>
<td>B</td>
<td>2.6 to 4.6</td>
</tr>
<tr>
<td>C</td>
<td>2.9 to 5.6</td>
</tr>
</tbody>
</table>

dimensions in feet and inches

HEIGHTS

LEVEL FLOOR

<table>
<thead>
<tr>
<th></th>
<th>Range of Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>2.5 to 3.5</td>
</tr>
<tr>
<td>B</td>
<td>3.0 to 3.6</td>
</tr>
<tr>
<td>H</td>
<td>7 to 10</td>
</tr>
<tr>
<td>X</td>
<td>2.4 to 2.8</td>
</tr>
</tbody>
</table>

DROPPED FLOOR

<table>
<thead>
<tr>
<th></th>
<th>Range of Dimensions</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>3.0 to 3.6</td>
</tr>
<tr>
<td>K</td>
<td>2.4 to 2.10</td>
</tr>
<tr>
<td>S</td>
<td>1.6 to 2.1</td>
</tr>
<tr>
<td>X</td>
<td>1.2 to 1.3</td>
</tr>
<tr>
<td>Work</td>
<td>2.4 to 2.8</td>
</tr>
</tbody>
</table>

Fig. 5 Food bars.
Commercial

RESTAURANTS AND EATING PLACES

Tabulations are divided into three groups. The most luxurious establishments ordinarily use as minimum the largest figures given, and vice-versa.

BOOTHs

There are, in some localities, code and other restrictions on booth furniture dimensions. Authorities having local jurisdiction should be consulted. One designer consulted regarded the 2-person booth (side-by-side) as a waste of space; others recognize that conditions may arise when no other type of furniture will suffice. Booths for more than four persons are not commonly encountered.

NONDINING SPACES

Diagrams, tables, and other data given in Fig. 8 and below illustrate only a few of the many types of nondining spaces and clearances required. Data included here may, however, suggest methods of solving most problems.

Cashier

Preferred location for the cashier’s desk or counter, according to the Albert Pick Co., is on the right hand side of the door when entering, in order to avoid cross-traffic and resulting congestion. Dimensions vary from those given in the table according to what merchandise is sold by the cashier and can best be determined in conjunction with each job. If quantities of tobacco, etc., are sold, a back wall case may be necessary.

Coat Checking

Figure 8 illustrates only one type of check room layout; selection of type and size depends on the job under consideration. It is generally considered uneconomical, except in the most luxurious restaurants, to provide check rooms capable of accommodating garments for the peak load of patrons, for the following reasons: (1) Women usually do not check coats; (2) not all male patrons check coats; (3) space required can usually be used otherwise to greater advantage. The Albert Pick Co. estimates that approximately 5 garments can be hung per linear foot on each side of the type of racks diagrammed.

Use of coat trees in dining areas is termed “necessary but not desirable.” These occupy approximately 20 by 20 in., are 72 in. high, and can accommodate 8 garments per customer. Overshoe racks are considered undesirable; umbrella racks, desirable in check rooms.

Telephone Facilities

Booths are usually preferred to telephone jacks, probably because of costs of installation and of relocating wiring when redecorating or replanning. Booths should be out of direct vision yet convenient to dining and lounge areas. One booth per 50 seats is the usual ratio or one phone jack per dining booth.
and immediately following service when service equipment is brought from the serving areas. A disposal or a removable strainer above a drain is desirable for waste removal.

When allowing space for the pot and pan section, 50 sq ft is generally regarded as a minimum for the smallest unit. The free work aisle between the sinks and other equipment should be 4 ft wide. The space allowance above the minimum will vary widely depending upon type equipment used and the volume of pots and pans handled. Less space in relation to the maximum load may be required where a mechanical washer is used and fewer labor hours will be spent in handling a large volume per unit handled.

Miscellaneous Sanitation Areas. For washing mobile equipment, space is needed where splash water can be confined and that has satisfactory drainage. This area may be adjacent to the dishwashing section or to the place where the water is done. The size and type of equipment to be handled will govern the space needed.

A storage area for emergency cleanup equipment is needed in convenient relationship to dining rooms and work sections. Spillage and breakage create unsightliness and are accident hazards. Immediate care usually does not require heavy or large equipment but may be handled by a small broom, dustpan, small mop, and bucket not used for major cleaning. A mobile unit may be designed to carry these things, or a small chest may be provided.

Major cleaning equipment required will depend on the floor space, finishes, and furniture to be cleaned. Determine whether a power sweeper, scrubber, and wiper are to be used. Space may be required for storage of janitor supply carts and for miscellaneous replacement items, such as light bulbs. Provision will be needed for storing, emptying, cleaning, and filling mop trucks and for cleaning and air-drying wet mops.

Employee Facilities

Facilities for employees may include locker and lounge area, toilets, showers, time-recording equipment, hand basins near work areas, and dining rooms. An employee entrance should be so located that the employees may go directly to the dressing rooms without passing through the dining room or production area.

Loober and Lounge Area. Employee possessions should be protected in a suitably safe and sanitary condition while the employees are at work. Whether individual lockers or common cupboard, sufficient space should be allowed for personal clothing to hang without wrinkling or wrinkling. If cupboards are used for clothing, a separate space should be afforded for street clothing and for uniforms, and individual parcel lockers should be provided for storage of purses and other valuables. The height of the space for clothing should permit the longest garment to hang straight without wrinkling. The depth from front to back should be a minimum of 20 in.

Suitable size for an employee lounge depends largely on the scheduling of workers and the policies of individual establishments. Many operators discourage lounging in the dressing room and recommend the employees' dining area for this. Others having broken shifts on their schedules favor an extra room for lounging. In all cases benches or chairs are to be provided upon which workers may sit while changing clothes and shoes. A cot or daybed, 36 in. by 6 ft, should be provided in the women's room.

Toilets and Showers. The location of toilet facilities near work areas is preferred over a remote location in promoting good health habits, lessening loss of labor time, and permitting closer employee supervision. Separate facilities should be provided for men and women. They should be separated from food areas by a hallway or double entrance. Supply one wash bowl for every 8 to 10 workers; one toilet stool for every 12 to 15 women, and one urinal and one toilet stool for every 15 men. Toilet compartments measure approximately 3 by 4½ to 5 ft.

The type of employees, the climate, kind of work, and conditions of work will influence the need for shower facilities. Showers will be appreciated and used by employees working in hot, humid kitchens. Experience has demonstrated that they are little used in localities where the weather is cool most of the year, the work areas well ventilated, and workers drawn from an income group who have good facilities at home.

Time-recording Equipment. Provide space for a clock recorder approximately 18 in. wide by 12¾ in. deep and 18 in. high, and a rack of 50 cards approximately 1½ by 2½ by 34½ in.

General Considerations. The size of employee facilities has been found to vary widely. Small operations may not supply lockers and may have only a toilet and lavatory for workers. Some do not provide separate dining areas. Efficiency in allowing ample space may be tempered by cost of space, available room, and the accuracy of need. Total space used...