

REPRESENTATIVE PHOTOGRAPH



Model 70 Rider

Model 80 Rider

Model FM-5

Model GT-S

Model 70 Rider Lift Dump

Model FM-10

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I don't want to create the false impression that we can ignore our irrigation and just let the machinery take care of it. This is no more true than saying that every inch of the course needs water every day. What our setup does do for us is to give us a norm we can depart from in various orderly ways. It takes care of most situations for us automatically, so we can concentrate on finding and correcting the trouble spots.

#### Emergency measures

There are two quick couplers on every green, one on every tee, and additional ones every 150 to 200 feet down the fairways. These are under pressure and even if something happened to the system, they could be used. The Bermuda grass on the fairways could miss watering a few days during a dry spell but, of course, the greens and tees are more critical.

If we were at the far end of the golf course and saw a green that needed a little watering, we could hook up a quick coupler. But there is an easier way. We have underground control boxes to which we can connect portable units. If the manual override button has been pushed before we left the central programmers, the portable units can be used to set off groups of sprinkler heads for time periods of up to a half-hour. We can set them and go about other business.

Bel Air has obtained a new piece of equipment which permits us to override the central programmers without setting the manual button ahead of time. This takes power from the battery terminals or cigarette lighter of a truck or other vehicle to run the portable units.

Bel Air put in all new sprinkler heads and valves, and virtually all new piping: it is a new system from underground up. We were looking for dependability, important when you can go seven months with little more than a half-inch of rain, as we did recently.

The course has more than 1,300 sprinkler heads. More than 1,100 are full-coverage heads. The other 200 or so are part-circle sprinkler heads for placement near adjoining property and roads, where it is vital not to let water go outside our boundaries.

We installed 135,200 feet — more

than 25 miles — of new pipe. We put in 72,000 feet of 200-pounds-per-square-inch PVC solvent-weld pipe ranging from 1¼ to 2½ inches in diameter; 63,200 feet of 160-psi Ring-tite PVC pipe ranging from 1½ to 6 inches; and 1,100 feet of 10-inch Transite asbestos cement pipe to supplement existing Transite pipe on the number 4, 7, and 14 fairways. We put in 90,000 feet of Binar cable for the control system.

Los Angeles city water comes in to the course at three points: a six-inch meter by the number 3 hole; a four-inch meter between 11 and 14; and a three-inch meter near the suspension bridge by the clubhouse. In our old system, the four-inch meter, which irrigated the number 11 through 16 holes, was isolated from the rest of the irrigation system. If something happened to it, we were in deep trouble — there was no other way to get water there. But now they are all tied together. If the six-inch and the four-inch were both out we would still have enough water in the line to take care of our greens. As long as we still have the six-inch, we can irrigate the whole course.

Bel Air also kept dependability in mind while installing the irrigation system. The very first thing put in was the Binar control system. By running the control system 24 hours a day before the pipes were in, we were able to make sure there were no problems. There were none, so when the piping was finished for any portion of the system we were able to use it immediately. This was generally none too soon; each portion would have been without water for a few days during the transition.

Part of the Bel Air grounds crew was always available to help with the installation, which took five months, from November to April. This way, I think we got a better job — and when we were finished we had three or four men who knew where every valve was.

Construction would have been faster except we determined to keep the course open throughout construction. Friday afternoons we tried to clean up as much as possible for the weekends, but we let people play weekdays as well. Nine holes had to be closed one day, but that was all.



Before we started, people told us that this kind of automated irrigation would never work in Southern California: "You'll never be able to get as much water as you need." We did have to be careful. Instead of the 40 decoders on each central programmer allowed by the manufacturer's design, which would probably be fine for New England or the middle West, we only put on 26 to 28. Since we have to give each location a half-hour per night frequently, 40 locations on a programmer would take 20 hours to go through.

But we have found that the automatic system will do anything we want it to do, providing it is installed properly and we don't ask it to do too much. Having just gone through a seven-month drought, we can safely say we've proved it will operate in California. □



TOP PHOTO shows typical difficulty encountered in trenching coral rock in the Florida Keys. It's not hard to imagine the work necessary to turn that rock pile into a lush looking golf course. BOTTOM PHOTO gives a look at the results of all that hard work, as well as illustrating one of the main reasons for the courses' beautiful appearance: automatically controlled sprinkler rotors. Turf gets very thirsty off the tip of Florida, but automatic irrigation takes good care of its needs.



ABOVE: Getting enough water to feed a golf course — let alone three of them — can be even a bigger problem than distributing it. The Ocean Reef Club had plenty of water available, but it all had salt in it. So a desalinization plant was built, complete with the million-gallon-capacity holding pond shown.

## Irrigation conquers coral on the Keys

On the Ocean Reef Club's golf courses on Key Largo, the northern-most of the Florida Keys, golfers play on coral — but they would never know it from the way the ball behaves. The gently undulating fairways are lush with grass, and the greens are smooth and true.

All of which took pioneer planning and landscape engineering to retain the special beauty of the coral country — with its white rocky texture, lagoons, and lush mangrove swamps — and at the same time develop and maintain courses that pass the muster of the discriminating golfer.

Creating a golf environment on Florida coral requires overcoming a

variety of rather unique problems. Coral itself can be a formidable base for growing grass, and the Keys have more than their share of lightning which can damage automatically controlled irrigation systems.

Fortunately, these unusual difficulties have been mastered at Ocean Reef, as has an additional one that is common to golf establishments — that of acquiring plenty of good water. Golf courses have tremendous thirsts off the south tip of Florida, where temperatures are in the 70's and 80's in winter and in the 80's and 90's during summer. Although humidity averages 75 to 90 percent year-round, the rainfall of about 30 inches a year isn't nearly enough. That, of course, is because of the consistently high temperatures.

### Why build on the northern Keys?

Because nature has made them a beautiful, remote setting which is ideal for the kind of living demanded by members of the exclusive Ocean Reef Club.

The club has two courses in operation now and is laying out a third. The original 18 holes are called the Dolphin Course. It is built on solid coral rock, the prevalent soil of the Keys. The fact that there's no topsoil on the fairways has put the hybrid bermuda to a severe test. However, coral has advantages as a medium on which to grow plant life. It is a fine absorber of

organic material and particulates that are good plant food, and it provides unexcelled drainage.

At one time the bermuda was maintained by Ocean Reef Superintendent Tom Grondski on only 50,000 gallons of water a week. The one water source was a main line from the city of Homestead, which also supplied the resort's homes, condominiums, clubhouses, and other facilities — as well as cities all the way down to and including Key West.

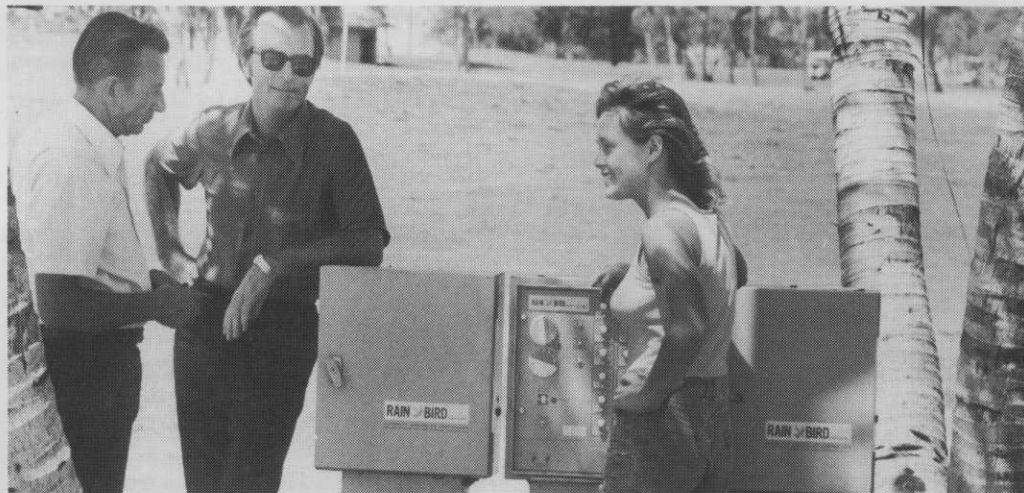
When construction began in 1973 on the second 18 holes, the 6,600-yard Barracuda Golf Course, a seep well was drilled and a desalinization plant was built that has a capacity of 900,000 gallons a day. A million-gallon water tank was assembled beside it. The desalted water is mixed in the big tank with fresh water from Homestead. The combination provides the entire Ocean Reef complex, not alone the Barracuda Golf Course. The well water contains up to 15,000 parts per million of salt, but the reverse-osmosis desalinization plant takes this salt content way down.

Incidentally, some land plants do well in ocean water which averages 30,000 parts per million of salt. The mangrove trees that are native to the Florida Keys grow in it. University of Arizona plant scientists have found an alfalfa seed that tolerates 16,000 ppm of salt. And some other plants can tolerate salinity up to 15,000 ppm.

Water may not be plentiful at ground level in the Keys, but it is abundant in the depth of the coral reefs. The difficulty lies in the fact that it is ocean water. However, paleoecologist Heinz Lowenstam of Caltech points out that the rain water which percolates through the coral forms a lens on top of the subterranean ocean water. Salt water, being heavier, will remain beneath the fresh water unless a disturbance mixes them. Careful extraction of water in the lens area could further reduce the salt problem.

#### Irrigation helps

The Barracuda Course, designed by golf course architects Von Hagge & Devlin, Inc, also was laid out on solid coral rock. However, Karl Litten, the chief designer of Barracuda and the third course — the Harbour Course, which is under construction — put in a



Ocean Reef Superintendent Tom Grondski, course designer Karl Litten, and maintenance crew foreman Kathy Austin discuss operation of the programmable sprinkler controller.

mixture of native muck and imported sand as a topsoil mix for the tees, greens, and fairways.

A fully automatic, electric, double-row Rain Bird sprinkler system was installed on the Barracuda Course by Camstaff Construction Co., the general contractors for all construction at Ocean Reef. Superintendent Grondski described the job as excellent, even though it was the first installation of a golf course irrigation system ever attempted by the firm. The 12-inch, cement-asbestos mains were laid in sand to prevent the coral from scratching or cutting them. The sprinklers are all pop-ups, located 65 to 75 feet apart. The close spacing virtually eliminates dry spots which might otherwise develop due to the prevailing winds typical of Florida's Keys.

The irrigation equipment is completely protected from lightning, which is common in the Keys. Arrestors and other devices have been developed by the manufacturer to do that job. The equipment never has been damaged by lightning.

Superintendent Grondski finds that because of the versatility of the controllers and the uniformity of distribution of water by the rotary pop-up sprinklers, he is able to make maximum use of his limited water supply. In addition, his assistant finds the system easy to understand and simple to program. The sprinklers are all operated automatically and electrically from field controllers located strategically throughout the course.

This, plus the very low upkeep and maintenance costs incurred with the sprinkler system on the Barracuda Course, is the reason Grondski chose the same kind of system for his third course — the Harbour Course.

The new Harbour Course will have Tifgreen bermuda grass on the greens and No. 419 bermuda on the tees and fairways. The roughs will be common bermuda. It will also use some 100,000 cubic yards of imported marl for turf-grass topsoil to prevent drainage into the surrounding mangrove swamps. The greens will have 12 inches of marl; the tees and fairways, three to four inches. The mangrove trees, 30 to 50 feet high, border parts of the course and are so dense that you can't penetrate a grove of them. Ecologists want to preserve the groves to keep the balance of native wildlife undisturbed. Ocean Reef and Camstaff Construction are cooperating fully in that program.

With the help of irrigation and desalinization, the coral reefs will stay green for golfers. □

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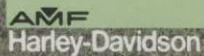
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The major costs in the operation of a club foodservice establishment are food and staff, and these operating expenses will continue to rise. The planning and development of a kitchen layout for the club are vital, so that food and staff costs will be controlled and the patron will receive the best possible food and service.

To achieve these goals, the club manager must give special consideration to the designing or redesigning of his kitchen facilities. Poor kitchen layout will cause excessive costs, confusion, and an unhappy foodservice staff.

Unfortunately, the kitchen area

usually does not receive the priority it should when the club is being planned. Some kitchens in club foodservice today have had little advance planning. In other cases, either through lack of knowledge or in an effort to skimp on costs, the kitchen is allocated too little space and the arrangement is poor. The result is frequently a club foodservice establishment with excellent dining facilities but with a kitchen that is a hodgepodge of equipment, randomly located.

It is possible for club managers to improve their foodservice facilities, but careful planning is obligatory.

#### Practical guidelines for planning

Planning a club kitchen for efficient operation involves the following:

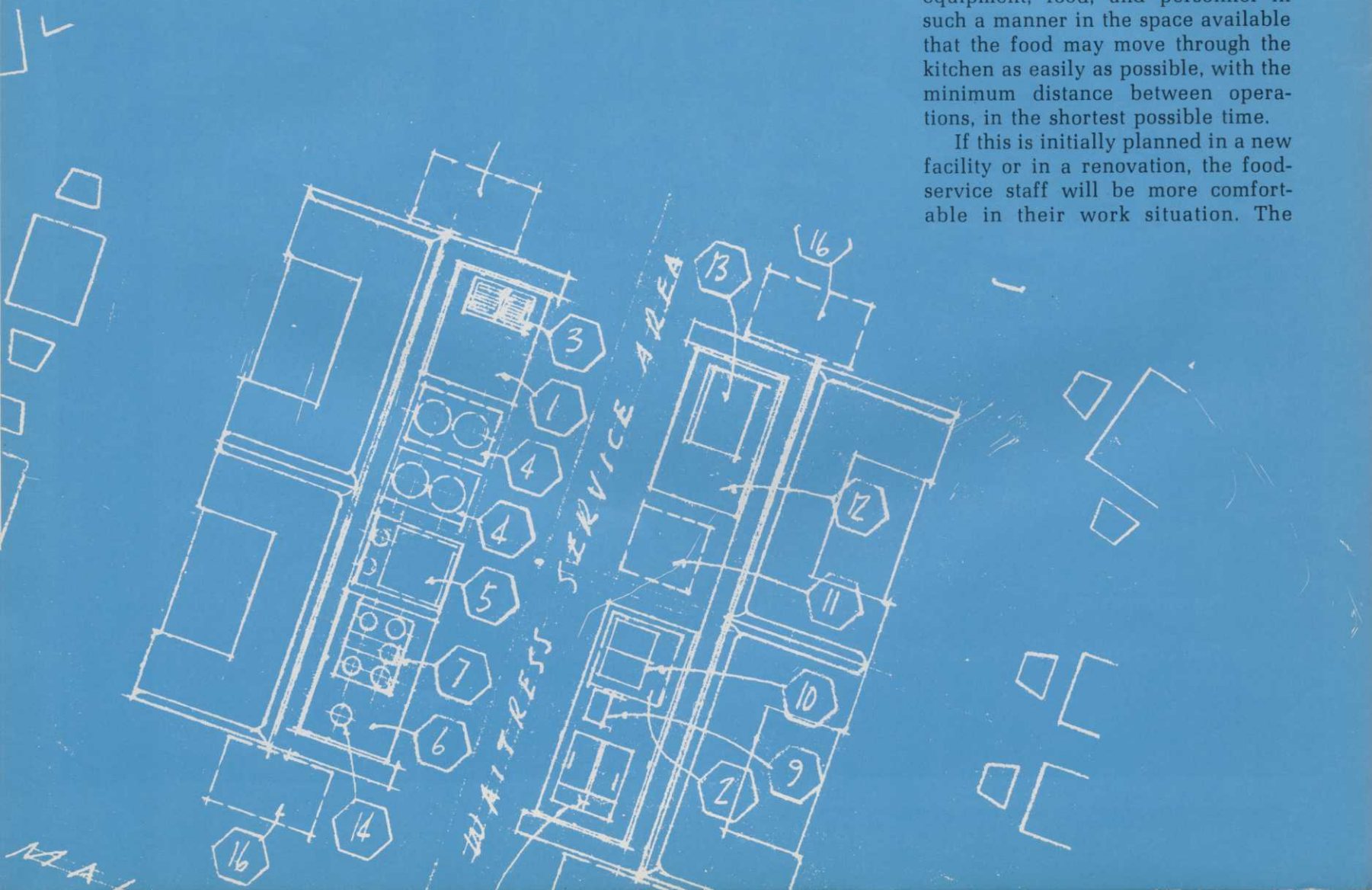
- 1) Proper placement of foodservice equipment to facilitate time, distance, and ease of movement for personnel.
- 2) Serving quality food.
- 3) Proper placement of personnel.

The objective is to coordinate the equipment, food, and personnel in such a manner in the space available that the food may move through the kitchen as easily as possible, with the minimum distance between operations, in the shortest possible time.

If this is initially planned in a new facility or in a renovation, the foodservice staff will be more comfortable in their work situation. The

## Blueprint for club kitchen planning

by Herman Zaccarelli, contributing editor



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result, of course, will mean reduced food cost with better quality food served.

The efficient kitchen makes the best use of space available.

There are complications in club foodservice planning which must be considered. Unlike most businesses — where the functions of manufacturing, distributing, and selling are performed separately in different places — foodservice combines all of the functions at the same location, with the kitchen the major focus of activity. In club foodservice, there are special needs to maintain quality in preparing food and to provide sanitation safeguards. A well-planned kitchen layout will result in the following positive aspects of the club foodservice facility:

- >Greater customer satisfaction.
- >Improvement in handling of the materials.
- >Improvement in employees' working conditions.
- >Reduction in operation expenses.
- >Better overall control of the entire kitchen operation.

**Expert consultants pay for themselves**

Consultants and architects have a place in planning a kitchen layout. In most cases, the manager can benefit from employing a consultant when planning a new kitchen. Foodservice consultants can be utilized on a part-

time basis, or the entire job can be turned over.

Such outside assistance from a reliable and capable foodservice consultant can provide guidance on the layout of the kitchen and on the equipment needed and its costs — with a saving in money and time for the manager.

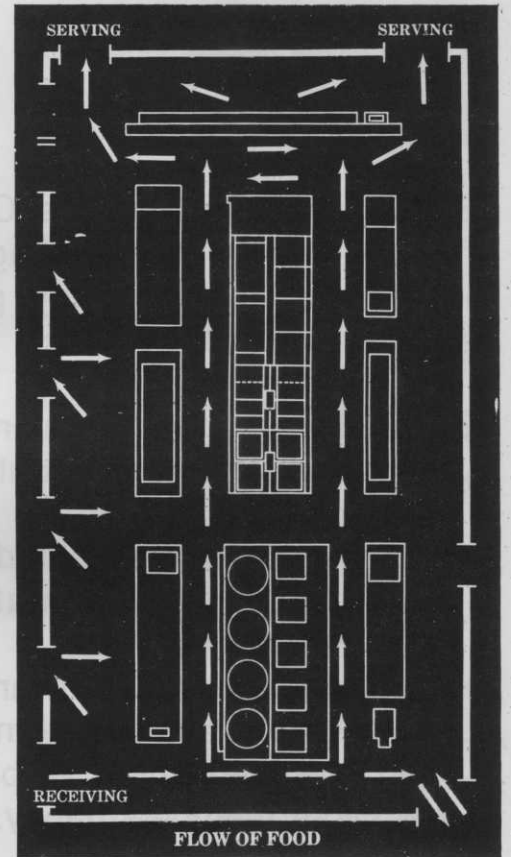
An architect who is familiar with planning foodservice kitchens can provide guidance in selecting the types of construction needed, with a considerable cost savings as a result. He can also provide valuable advice on such vital subjects as compliance with building plans and specifications, and making changes in building construction.

It is essential that the consultant and the architect be qualified to deal with problems of club foodservice kitchen planning and layout, if the plans are to meet the needs of the operation.

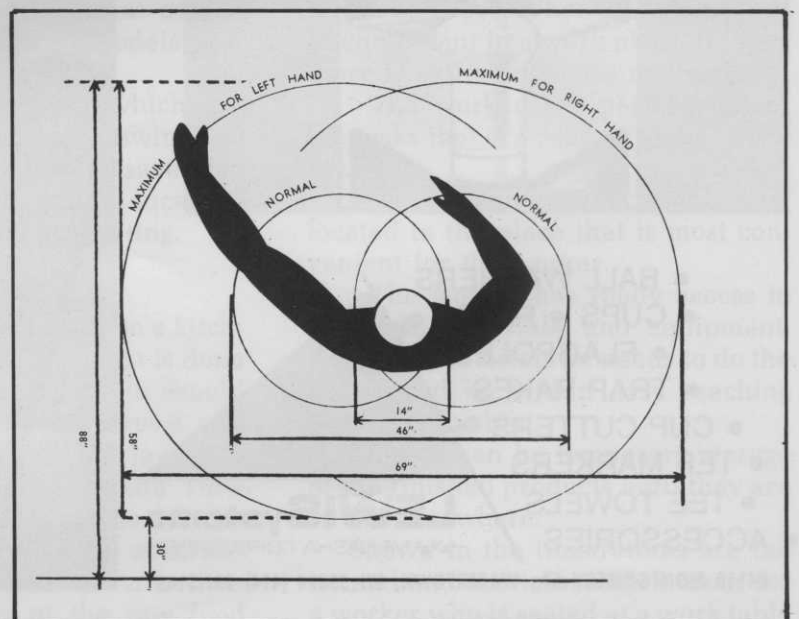
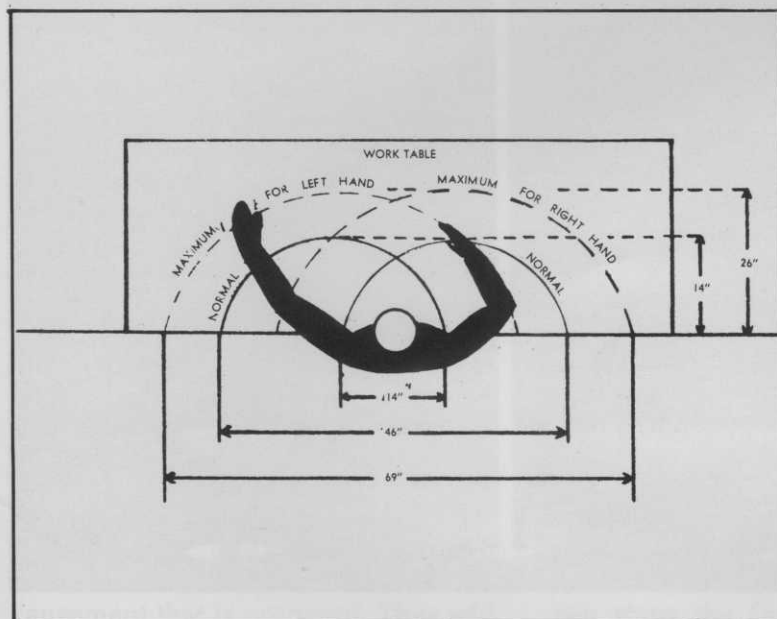
So, employment of a consultant and an architect is suggested for kitchen changes of any substantial nature; and plans should be approved by a qualified foodservice consultant and an architect.

**Preparation of preliminary layout**

In planning a kitchen, it is necessary first to plan the kitchen on paper. Make accurate drawings of the kitchen area. If the original construction plans are available, they can provide



Flow diagram above shows movement of food through typical kitchen. Drawing a layout like this can help you better plan your own kitchen before actually building it. Diagram below left illustrates normal and maximum working distances for person at a kitchen worktable. Diagram directly below shows similar information for a kitchen worker standing. Use these as a guide in arranging kitchen elements for most efficient use of space and manpower.



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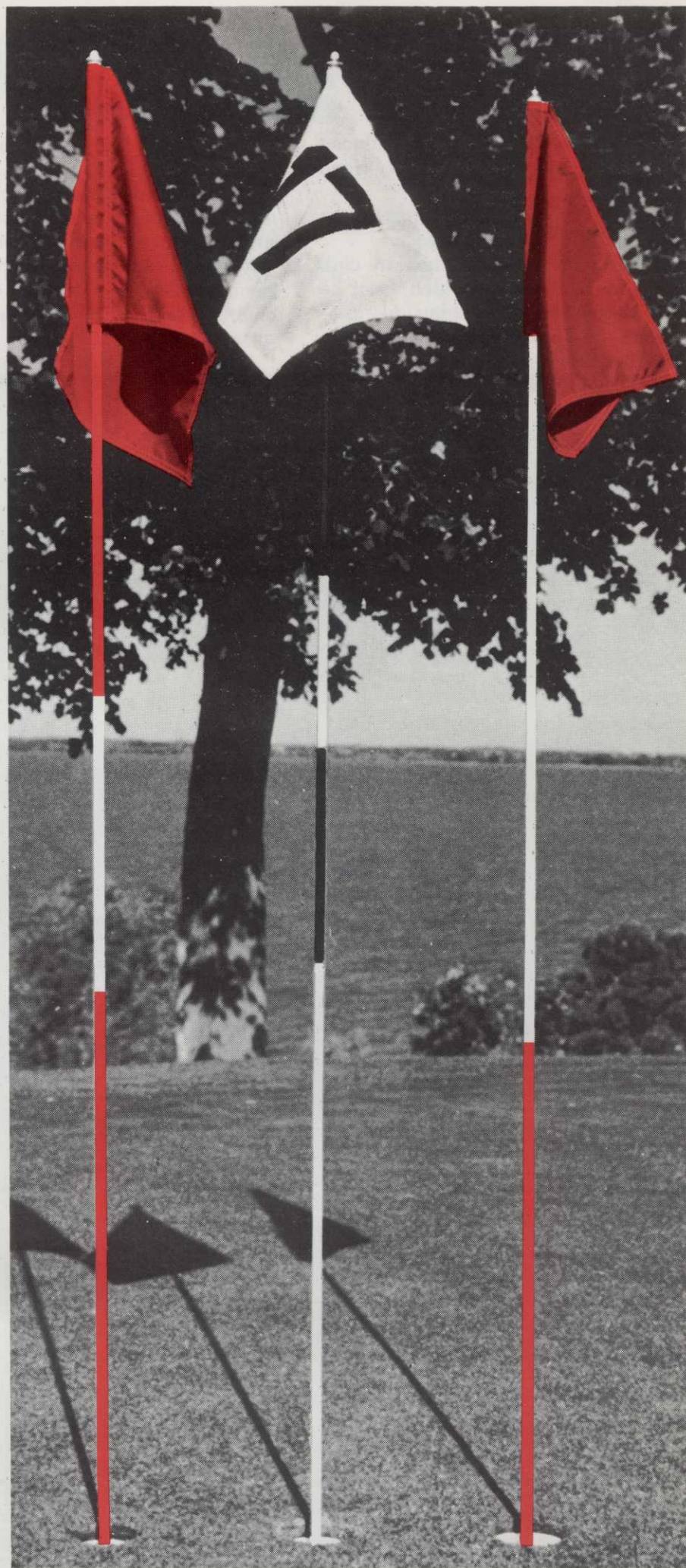
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substantial savings in both cost and time. If they cannot be obtained, then a new plan of the kitchen can be drawn to scale, using  $\frac{1}{4}$  inch to represent each foot.

The layout is a plan for placing equipment and locating other elements of the kitchen. It offers a way in which ideas on what should be done in a new or improved kitchen can be developed and changed before the final plans are made. It is a visual translation of those ideas into arrangements of the parts of the kitchen and the kitchen equipment. It offers a picture of the total results of changes in a total kitchen, rather than a view of just parts of the total.

By using a layout, it is possible to determine the most efficient locations for equipment. Models or templates of the equipment can be used to try various combinations to determine which are the most efficient. These arrangements show whether the needed equipment is going to fit into the available space, whether there is enough aisle space, and whether workers in the kitchen can do their jobs without interfering with one another.

Work centers are the basic parts of the layout. Operations of the same type are performed in one work center. For example, there can be a work center for mixing operations, and another for slicing meat. The work centers that are closely related to one another in terms of the kind of work performed, or the kind of workers who perform the work, are grouped together into sections. Then these sections are linked to each other according to the flow of the work.

The work flow is the sequence of operations that takes place when food materials are processed and the other tasks performed in the kitchen are done.

**Use of models, templates, and overlays**  
The use of templates or models of equipment and fixtures makes it easier to do good planning of kitchens.

Models provide a 3-dimensional effect that makes it easier to visualize the plan. They show the relationships of the equipment and fixtures on a reduced scale, and they provide a chance to see and evaluate the arrangement that is proposed. They add

## SOME REMINDERS

To attain maximum efficiency in producing a layout and so accomplish the goals, these basic requirements are essential:

Know the present and future requirements of the club foodservice operation.

Know the potential for growth of the establishment.

Draw a preliminary plan for the kitchen on paper.

Analyze each operation that occurs in the kitchen.

Relate the various operations and determine the efficient flow of work.

Estimate in detail the cost of the project for which the layout is being made.

Relate the projected changes to the needs and goals and evaluate how well the proposed changes meet those needs and goals.

Have a qualified consultant or architect help develop the final plans and do the final drawings.

the important concept of height to the consideration. This helps to detect poor arrangements and to avoid serious mistakes in the final plans. Scale models add to cost, but that cost is more than repaid if the models prevent planning mistakes.

Overlays are tracings which are made over the original drawings or plans. Use of overlays will save considerable time and will reduce the possibilities of error in drafting.

### The flow of food

The sequence of operations in a kitchen is related to food and what is done to it and with it, so the layout should show the flow of food. Arrows and lines can be drawn on the layout to show in what direction the flow moves. Different color lines can be used to show the movement of different kinds of materials. One color line can show the flow of the raw food

materials, and another color line can show the movement of the prepared food.

Determining how the food flows is related to the specific kitchen, since kitchen layout differs so much from one foodservice operation to another. The flow that is best in one kitchen may not be at all satisfactory in another.

In determining where the lines and arrows should go on the layout, the following should be done:

>List the various kitchen operations.

>Use a process chart to show the sequences.

>Use flow diagrams to show travel.

>Adapt the flow lines to the kitchen plan.

The flow lines integrate people, equipment, food, and the supporting activities. Through this kind of integration, it is possible to move the food to the various locations necessary in the shortest possible distances between the different operations.

### Layout of the work space

Space must get considerable attention in the making of the layout. Wherever a worker performs an operation, there should be enough space for him to do his job efficiently. It pays to plan carefully the location of tools, materials, and supplies which the worker needs to perform his particular tasks.

When equipment is involved in the operation, there are some other factors to consider. When there is a piece of equipment in a work place, be sure there is sufficient space so that:

>The worker can perform all of the tasks that are related to that work space.

>The tools the worker uses can be located in the place that is most convenient for the worker.

>The worker has ready access to his tools, materials, and equipment. All of the materials he needs to do the job should be within easy reaching distances for him.

>There can be temporary storage of the finished products until they are moved elsewhere.

Shown in the illustrations are the normal and maximum work areas for a worker who is seated at a work table



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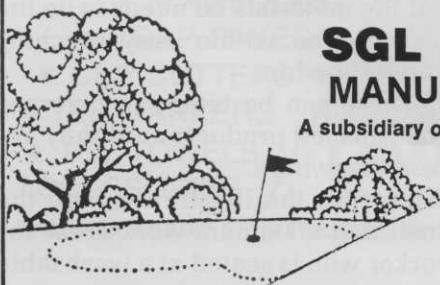
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and for one who is standing while performing his job. The distances are for a medium-sized man. A medium-sized woman would have about 10 percent less normal work area.

The idea is that workers should not have to reach or travel farther than the maximum work areas, and most of their motions should be within the normal work areas. The work areas are determined by the limitations of the human body.

In making the layout, there is value in drawing the work space to scale and being sure that there is enough space for all that is required in that particular work space. Remember that too much space is as bad as not having enough space. But be certain that enough space is being provided for servicing the equipment, cleaning the equipment, and loading the equipment — and for the worker himself.

**An operations analysis chart**

The operations analysis chart used by industrial engineers to analyze the work done by an employee is of value here. If the overall operation is to be done efficiently, then the working methods of the individual worker must be efficient. So, observation of those working methods is important. Notice that the chart calls for observation of both hands of the employee. If both hands do equal amounts of work, the total time of the operation can be reduced.

**The final check**

When all of the ideas and recommendations have been considered and evaluated, and what will be the layout is agreed upon, it is well to review carefully the materials for the proposed layout to see if it provides all of the objectives that were in mind when the planning started.

Also it is well to check at this point to be sure that the proposed layout is justified from the cost point of view. Generally, a new layout will result in increased savings, since it eliminates some of the known inefficiencies that were in the old layout. But find out if:

- >The kitchen as laid out is within the proposed budget.

- >The anticipated savings in labor and equipment justify the proposed layout.

- >The capital required and the return on investment justify the new layout.

- >The overall profit of the club will increase if the new layout is used.

Remember that the purpose of preparing a kitchen layout is to provide an efficient arrangement of equipment and workers so that production can be streamlined and the kitchen area can be used most effectively. □