PROPOSAL FOR A GOLF COURSE AND RELATED RESIDENTIAL SUBDIVISION FOR A MEDIUM-SIZED CITY

by

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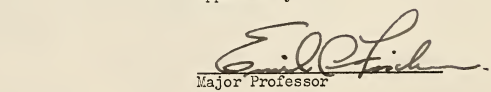

Major Professor

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INTRODUCTION

The final development of any residential subdivision incorporates the solutions to many complex problems and utilizes the skills of many individuals. The major effort of investigation included in this thesis was devoted to the areas of design and feasibility. The design study included the interrelation of a golf course with the subdivision, with emphasis on the facilities of a country club. The feasibility investigation was directed toward the existing or potential metropolitan area considered necessary for the support of such a project, and the establishment of an economical development schedule.

The interrelation of a golf course with a subdivision was chosen because of the compatibility which exists between the two, and the many characteristics possessed by a golf course which are also desirable in a residential development. The inherent openness, natural landscape, and variety of plant material may be blended with the architectural features in an orderly but unrestricted manner to create vistas and a freedom of space which is sensed throughout the entire development. Recreational and social facilities are readily available and each serves to promote an atmosphere of neighborhood unity. Many of these features are often relegated to secondary importance by the typical land developer whose principal goal is to plat the maximum number of building sites on the minimum acreage.

Basically, the idea of homes bordering a golf course is not new. However, there are relatively few developments of this type in the midwest or away from major population centers. The dominant scheme of these existing developments is one in which the home sites surround a golf course with only the innermost circle of homes abutting the course. This represents a relatively small percentage of the total homes. One of the most significant features of

this design program and one which sets this development apart from similar schemes is that the maximum number of home sites is adjacent to the golf course. This was made economically possible by absorbing the land and development costs of the golf course in the cost of each home site.

In addition to the increased land and golf course development costs absorbed by each individual home site, there was also the cost of the clubhouse to be defrayed. The accumulation of these costs placed the price of each lot in the upper price range. Because of the price range of the building sites the buyer may justly expect rigid zoning regulations. Building sites which carry rigid zoning regulations provide ample guarantee for the buyer's investment in the form of a stable property valuation.

There is a somewhat indefinable aura of social desirability implied with a development of this type. The inducement to join a country club development is the exclusiveness of the plan. Only residents of the development may belong to the country club and use its facilities.

These were the goals, the ideals, and the justification for such a project. However, feasibility of the establishment of a development such as this is contingent upon one simple premise - can the developer make a profit? Generally speaking, a subdivision is executed because of the return which the investor expects to realize. A home or a group of homes is no different from any other commodity in this respect. There is a need, consequently a market, and therefore, a profit to be expected by the seller offering this commodity to the buyer.

Competition exists in the marketing of homes just as it exists in all marketing fields, and there is a wide price range which covers all types of subdivisions. Each subdivision will have its special features which serve to make it unique by comparison and will establish its price range. This partic-

ular development falls in the upper price range and this, in turn, establishes the type and income level of potential customers.

The special features which this development has to offer are those of the golf course, private club, and marina. The feeling of spaciousness exists on the great majority of lots due to the bordering golf course, the lake and small ponds. The rear boundaries of each individual lot reach out over the fairways or the water, enhancing the feeling of open space. The natural land form has been left unchanged and blends with the home sites; the plantings and landscaping emphasize the beauty of nature.

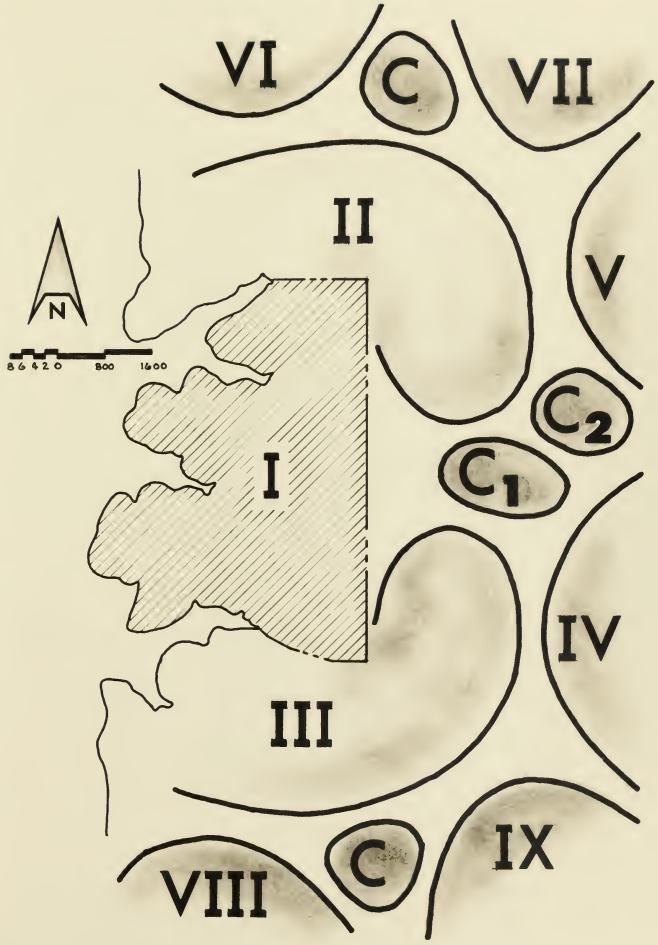
Adequate semi-public areas are available for community services such as schools, parks, playgrounds, churches and buildings of a community nature. The road system offers an orderly pattern of movement and affords maximum safety. While no retail shopping facilities were incorporated with this development it is reasonable to assume that these facilities would become available as the community grows and generates this need. This would be an extremely desirable venture in a short period of time and would begin to grow as soon as the homes start to spring up. See Plate I, page 6. Space was provided for churches and community buildings and until such time as the need arises this is left as open space.

As the entire area develops, the functions of government will become necessary and physical facilities will be provided. These facilities should add that important aspect of community identification, which is so desirable, although sometimes felt more subconsciously than in any other way. Because of the importance of this feature, space for these physical facilities was allowed to penetrate the boundaries of the otherwise restricted residential area. It was thought that this facility blending judiciously with a commercial

area would, in effect, become the identifying entrance to the country club subdivision.

EXPLANATION OF PLATE I
AREA GROWTH PROJECTION

Area map indicating projected growth. Area I is proposed country club development. Area C_1 is a shopping area which will develop simultaneously with Area I. As residential Areas II and III develop the shopping area may expand as indicated by Area C_2. When entire area grows with the addition of residential Areas IV, V, VI, VII, VIII and IX, auxiliary commercial areas C will supplement facilities included in C_1 and C_2.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SITE SELECTION

The approach to this thesis was restricted to the field of architecture and the related areas of planning and landscape design. Of major importance is the feasibility study, the approach which determines under what existing or potential conditions this type of residential development can be considered a possibility. In order to pursue a thorough and meaningful investigation in these areas the basis for the selection of a site is primarily the inclusion of desirable and necessary features rather than the choice of an exact and specific location. Due to the broad scope of the feasibility investigation the final site design was that of a generalization rather than a specific solution.

The desirable features of a site for this form of development would include an interesting and changing terrain with views and vistas which may be exploited, good surface drainage, an adequate water supply and sub-surface conditions conducive to economical construction procedures. Native plant material and conditions necessary for maintaining plant life, such as sufficient rainfall and fertile soil, is important. The physical size of the site must be adequate and there must be additional acreage adjacent to provide for the growth and expansion of related facilities. Initial cost is critical as this affects the eventual selling price of the home sites and establishes the potential market. A remoteness from the nearby metropolitan population center is desirable so as to maintain a somewhat rural atmosphere, but adequate highway access nearby is extremely important.

A site which fulfills most of this criteria was chosen from topographic surveys of the land along the east shore of Tuttle Creek Reservoir. This area is about ten miles from the city of Manhattan and is readily accessible by

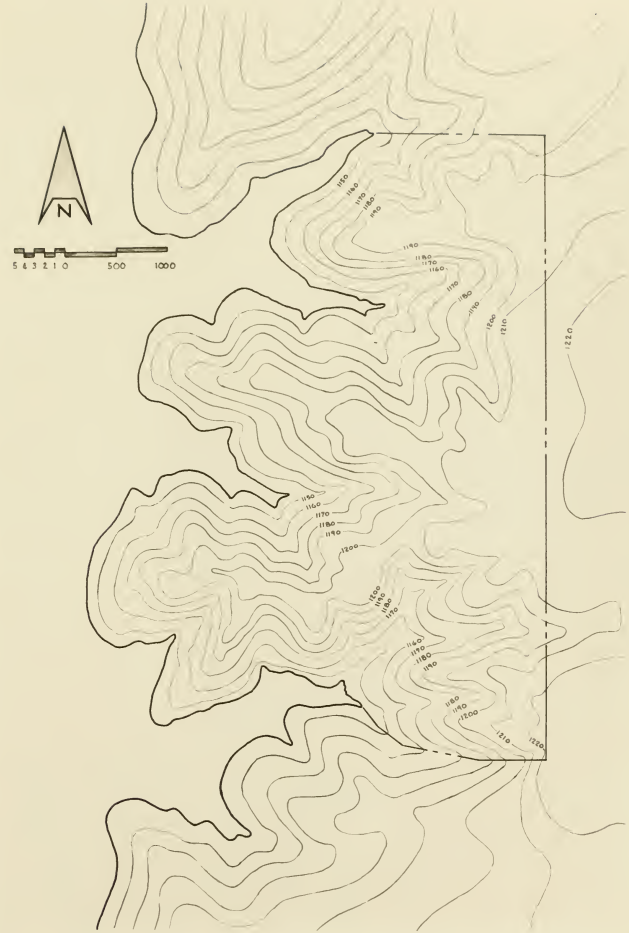
means of a major highway which passes within a mile of the east boundary of the site. Right-of-way for an access road can be secured and there is ample space for expansion. As the area develops it is reasonable to assume that other access roads will become available. There is a minimum of tree growth but visual inspection indicates lush native grasses and very little rock and rock outcropping.

In addition to the desirable features previously mentioned, this site borders the reservoir on the west. By assuming a constant lake level of elevation 1140 feet, the site possesses an interesting shore line as its west boundary. This was felt justifiable as the fluctuating level of the reservoir presents a myriad of problems of lesser importance than the primary objectives of this thesis. The presence of this large body of water complicates the program but adds an interesting feature for design consideration. The north and south boundaries are established by coves formed by the lake and the east boundary is a north-south line which closes the site and establishes an area of 466 acres.

A topographic plan of the site is shown by Plate II.

EXPLANATION OF PLATE II
TOPOGRAPHIC MAP

Topographic plan of site and adjacent area. The lake level is 1,140 feet, contours are at 10 foot intervals.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UTILITIES INVESTIGATION

In developing an area such as this one which is some distance from an established city, the provision for utilities service becomes a major problem with a direct effect upon design consideration. While most residential subdivisions are close to the city border and can plan to use city utilities, this subdivision must provide these services within its own area. It was not the intention to design all the component parts of each service, but only to investigate alternatives and make a determination as to the general type of service based upon economic and physical considerations.

Problems presented by power supply in the form of gas and electric service were the most easily overcome. Electric service is readily available throughout the state and there is no evidence that this would present major problems of supply. From the central power source, or transformer station, the distribution system will be underground. This is by far the most satisfying method as there are no unsightly poles or wires to interfere with the view or compete with trees and other plant life.

Gas service presents a somewhat different situation. At the present time the nearest gas main is some six miles to the south. The present policy of the Kansas Power and Light Company is to extend a main 100 feet to a new customer at no charge. Any distance beyond this is paid for by the customer. This policy applies only to established residential areas. Evidently there is some maximum distance involved because there are some small towns in the area which have requested gas service and have been denied. We must assume that no gas service will be available throughout this development program. This service must be provided by each individual home owner as he desires. Propane, butane or fuel oil is available as the individual chooses.

Water and sewage utilities present an entirely different problem. Water supply is not as critical in relation to slope as sewage collection, inasmuch as water is supplied under pressure from a central source while sewage is normally collected by gravity flow and up-hill flow must be pumped. The major consideration, therefore, in water supply is its adequacy, both in quality and quantity. In the absence of actual tests, it is assumed that there is an abundance of potable water available at a reasonable depth. This seems logical when reviewing the existing conditions in the immediate vicinity. There are presently a number of homes on the upper areas surrounding the reservoir with individual wells which provide an adequate supply of water for which the minimum treatment is required.

Three main methods of water supply were considered: 1) individual wells, 2) central plant, and, 3) three or four large wells. Of these three, the individual wells present the most expense to the residents. While this would be no cost to the developer, he must be concerned about the total cost to each buyer. Additional costs after the initial purchase tend to discourage buyers, whereas complete services included in the original cost is a much more desirable method of operation. A central supply and plant is more expensive than a series of large wells. Both of these plans would require an elevated storage tank so this cost would remain constant as would the cost of the distribution system; but a series of large wells fits the scheme of development better than one large plant. The final development will include almost 2,000 people. The peak demand for a city of this size would be 400,000 gallons per day, or about 280 gallons per minute. Four large wells supplying 100 gallons per minute per well should prove adequate and are installed individually as the development grows. This is an important factor in the financing program.

There are two related areas of water supply which are important and must be mentioned here; water for fire protection and water for golf course irrigation. Fire protection can be provided by adequate mains and hydrants located throughout the development. Golf course irrigation would put too much of an added load on the domestic supply during the irrigating season, so a separate source is necessary. During the irrigating season of about 100 days, the average course in this part of the country will need one inch of water each week. Spread over an estimated area of 45 acres to be irrigated, this is equivalent to 1,358,000 gallons per week. In a six day work week it amounts to 227,000 gallons per day, and assuming an eight hour irrigation shift, 500 gallons per minute would be required, or 60 percent more than the peak demand of the domestic supply. This would necessitate wells only for golf course irrigation, in addition to wells for residential consumption. In all probability, water pumped directly from the reservoir will be adequate for irrigation. Ponds or lakes are highly desirable for storage of irrigation water as pumps may be kept to an economical size. These ponds are provided on the course and add a great amount of interest to the entire plan and interesting problems to the golfer.

Sewage collection and disposal posed the most complex problem. The only reasonable conclusion was the provision for a complete sewage collection system and a disposal facility within the limits of the property. The general topography dictates the use of some sewage pumping stations, particularly because a good number of building sites border the shore line, an important feature in this development. Pumping stations are required to force sewage to a higher elevation where gravity flow may be obtained. Each such installation increases the cost of sewage collection so these installations were kept

to a minimum in the platting of home sites. The rambling plan of home sites which is characteristic of homes bordering a golf course adds some cost to the collection system. In many cases only one row of homes can utilize a sewer lateral. The usual method is to load a lateral with homes on each side of the line.

After the collection system has been laid out to service each home site and all laterals enter the main, either by gravity or from a pump, the sewage is channeled to two separate areas for treatment. These two areas were chosen due to the development schedule and to provide a minimum distance of 1,000 feet between the treatment area and the residential property. This distance is the minimum required by the Federal Housing Administration when considering building loans. In this area, a high-quality effluent is required by the State Board of Health even to chlorination as the final step. In order to obtain this quality of effluent, several methods have been investigated. Some of the considerations in the choice of treatment methods involve the area of ground required, ease of expansion so that the plant can grow as the development grows, initial cost, and operation and maintenance costs. Location within the boundaries of the site was critical as there will be some odor connected with any type of treatment. Four general types of operation were considered for this development: 1) waste stablization ponds, 2) activated sludge, 3) trickling filter, and 4) factory-built treatment plant.

The final decision was to use the factory-built treatment plants. This method proved advantageous over the other systems because a minimum amount of space is required, the cost of operation is low, and the system is easily expandable by adding more units as the need arises. This latter point is very critical in the over-all development schedule as these facilities are installed

over a period of ten years. The cost to the developer each year is only that amount necessary to provide treatment for the projected growth during that particular year.

The other three methods of sewage treatment were discarded for various reasons, such as excessive area required for installation, high initial cost, high operational cost, and excessive odors.

Garbage and trash disposal are items which can be handled but will involve a cost to the residents. Garbage and trash will be collected by truck and taken to an area off the site where it will be buried in a sanitary landfill. This will be provided off the site so that as the area grows this facility can be expanded without utilizing property which would be more properly used for residential and commercial development.

Storm drainage is of minor consequence in such a dispersed layout. Ponds constructed on the golf course will retain a great amount of surface water. Catch basins in the streets will pick up the bulk of other surface drainage which will then be directed into the reservoir through an underground collection system.

Streets are concrete with curb and gutter as required by existing subdivision regulations. Right-of-way for the major collector streets is 80 feet with 44 foot pavement, and a 60 foot right-of-way with 28 foot pavement is provided for the neighborhood streets.

SITE DEVELOPMENT

The site development represents the final solution to the problems encountered in the program and the site. The program encompasses all the requirements and restrictions established by the owner or developer, stemming from the original idea, while the site provides the physical characteristics around which the program is developed. The program begins with the idea of incorporating a golf course with its related facilities with a residential subdivision. Selection of a suitable site for this project modifies the original program in the physical requirements. An additional feature of the program is the inclusion of a marina, due to the presence of a large body of water adjacent to the site. Utilities requirements are established through investigation and availability of existing facilities. From this combination of program and site the designer may proceed.

First consideration is the scope or size of the development. Economic factors enter into the size of any project and these are reviewed in a later portion of this thesis. Physical space available must also enter strongly into preliminary investigation of over-all scope, as consideration for the resident is of utmost importance. The program is restricted to one golf course with home sites abutting the course. The number of golfers which one course can absorb is important in establishing the size of the development. Research has shown that 500 families is about the maximum number when a country club offers golfing as the major activity. Very far beyond this maximum number, and the country club course becomes over-crowded and the atmosphere of a private club degenerates into that of a recreation center.

Based upon an original estimate of 600 homes with ten percent of these being lake shore, and consequently of primary interest to boaters, a figure

of 540 potential golfing families was assumed. Research also shows that two-thirds of the male members will be golfers, or 360, and about one-third of the women are interested in golf, or 120. This totals 480 which is not unreasonable. The actual number of home sites is 574 with 63 along the lake shore so the development is well within the probable limits of one course. By complying with the maximum requirements, it can be seen that minimum requirements, from the standpoint of investment and anticipated return, can also be met.

The golf course consists of 18 holes grouped in two sets of nine wandering over the site among the residences. In addition to the course, a large practice area is provided and a spacious area is afforded the clubhouse proper. The course makes maximum utilization of the site from the standpoint of interesting and challenging problems for the golfer and interrelation with the residences. Because of the openness of the course, lot sizes are established with a 90 foot street frontage and 120 feet of depth abutting the course, or the lake, and 150 feet in depth along the perimeter greenbelts. Seven separate ponds were incorporated in the design serving primarily as reservoirs for course irrigation, but related in such a way as to provide interesting golf holes and a pleasant addition to the landscape. These ponds are of major importance to the landscape design. The additional interest gained by this open space with the contrasting texture of water provides views and vistas which can be gained in no other manner.

Two sizable park areas were provided along the lake shore and space for three schools is allotted. Play lots were incorporated in the school sites and parks, providing five separate play areas easily accessible from any building lot in the development. Three school sites were allotted in view of

the development of the surrounding area. In all probability, 574 homes will not provide an adequate quantity of school age children to justify three separate schools, however, as the adjacent area grows these three sites may be supplemented by others. The three sites also provide areas which may be utilized by a church related group in the establishment of a parochial school. This possibility may expand the potential customer market by including a church related group who might not be interested in a new residential area without provisions for this type of school.

A large open area at the primary entrance to the development was reserved for the addition of community buildings at a later date. This should provide a connecting link with future residential and commercial development of the adjacent land to the east.

The transportation system within the development is simple and straightforward. Two collector streets in low density areas service the neighborhood streets which provide access to each residence. In consideration for the topography, no grade of over eight percent is encountered and the collector streets are along the ridges affording an excellent view of the heart of the development. Access to the development is by means of one major trafficway and four minor streets which are provided as the development grows. Throughout the planning the method of growth has been a major factor. In a planned period of ten years of growth, each single year becomes a unit which is complete in itself, and also expands the over-all development in an orderly pattern. The utilities, roads, home sites and golf course are developed as ten separate pieces which are interrelated not only in the final complete scheme, but also at any phase of development. The year by year growth program, the final plat, and acreage allotted to each feature is shown by Plates III

through XIV, pages 25 through 47.

The golf course is interrelated with the development, providing the qualities of landscape and freedom of space to the adjoining home sites. It also offers the challenge and quality features which are expected of any first-class course. The golfing facilities consist of the 18 hole course, a large practice area, practice putting green, storage and locker areas in the clubhouse, and a golf pro shop located in the clubhouse.

Each group of nine holes starts and finishes near the clubhouse. Par on the front nine holes is 36 and it is 3,209 yards long. The back nine is 3,286 yards long and also is par 36. The greens vary in size from 7,000 square feet on number 17 to 3,000 square feet on number 9. The average size is about 4,200 square feet. This is somewhat larger than the average private course but is advisable when considering the amount of play this course will receive. Due to the proximity of the homes and the lawn areas adjacent to the fairways, the fairway widths have been increased. The normal rough or tall grass bordering a fairway is three inches or higher for a width of ten or 20 yards and will stop a rolling ball somewhat abruptly. Because of the homeowners' rear yards flowing over the fairways, grass this tall might be objectionable as a lawn or a border to a lawn. Without this buffer for rolling balls, the fairways have been increased to 80 or 90 yards in width. On an average course, the fairways are about 50 yards wide and have a normal rough bordering each side. Each hole is bent or doglegged somewhat depending on the strategy to be used on the hole. The runout of the dogleg is longer than usual and no dogleg is so sharp as to entice the golfer to cut across. Further protection is provided by the mass planting of trees in appropriate areas along the fairways. Bunkers are placed around the greens in such a manner that they not only penalize an inaccurate shot but direct the line of

play. The placement of the tee shot is indicated by the position of the bunkers guarding the green. In addition to the penalty value of a bunker it is an asset in that it provides orientation for the shot to the green, and in some cases prevents a more severe penalty. On the fourth hole the bunker behind the green prevents the ball from rolling into the road which is out of bounds or into the pond for an unplayable lie.

Distances from greens to tees are approaching the maximum recommended, about 75 yards, but in each case the route is forward to the next tee. Psychologically, it is desirable to eliminate a walk from green to tee which is "backward" or retraces the distance already walked by the golfer. On several holes the golfers cross a road to reach the next tee. On numbers 1, 8 and 10 a tunnel is provided under the road, which at these points is a major collector street.

The course was designed for the club player. It is not as demanding or as long as the championship courses on which the professionals compete in major tournaments; nor as straight-forward and simple as a public course must be. This is a proper compromise which demands skill with each club and offers a reward for a superior shot, but not extracting a heavy penalty for a less than perfect effort. The length of each hole varies and each presents a different problem. The first and tenth holes are straight-away par four's, relatively simple, in order to expedite the start of play on each nine. The sequence of pars on each nine is mixed to provide an interesting variety of play.

The handicap column on the scorecard indicates the order in which a poorer golfer is given strokes to equalize his chances with a better golfer. In allocating handicap strokes in their proper order to the 18 holes of a golf course, the first stroke should be taken on the hole where it is most

likely to be of use to the one receiving it. The theory of this system is that on a long par 5 hole the high handicap player is more likely than in the play of a par 4 hole to lose the hole by two or more strokes, in which case his handicap is of no use. On the short holes he is more apt than in the case of a par 4 hole to win without his handicap, and so again lose the benefit of his stroke.

The golf scorecard is as follows:

Scorecard

Hole	Yards	Par	Handicap
1	352	4	16
2	478	5	12
3	417	4	2
4	523	5	6
5	177	3	10
6	369	4	8
7	138	3	18
8	388	4	4
9	358	4	14
out	3,209	36	
10	372	4	3
11	162	3	17
12	361	4	15
13	514	5	13
14	411	4	1
15	379	4	11
16	392	4	5
17	202	3	7
18	493	5	9
in	3,286	36	
Total	6,495	72	

The teeing areas are long providing a front tee for ladies, medium tee for average play and a long tee for tournament play. Only on number 17 is a separate tee provided for ladies. At 202 yards this par three hole can be classed as "heroic" in character particularly because there is no safe land-

ing area in front of the green.

The three types of golf course design are heroic, strategic and penal, and each has been used in the over-all design of this course. Heroic is a combination of strategic and penal but the advantage is definitely with the golfer who is a long hitter. Strategic places a premium on accuracy and presents the player with more than one single plan of attack. The penal school of design extracts a strong penalty for a poor shot in the form of bunkers along the fairway and around the green, water hazards and out-of-bounds areas.

The prevailing winds influence each hole also. For instance, the long carry required to reach a flat landing area from the number three tee is acceptable due to the prevailing south wind. If the wind direction were reversed, this would be a much more demanding and difficult hole. The massing of trees on some holes will have an effect on the wind which becomes a part of the over-all design of the hole.

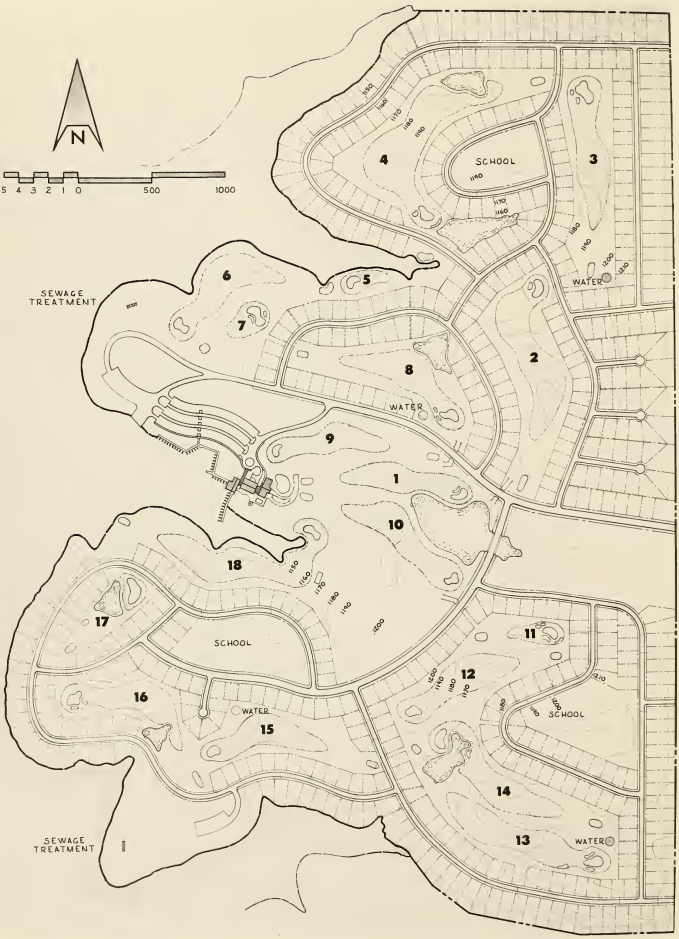
The greens are the most expensive, the most temperamental, and perhaps the most important part of any golf course. The size of the greens varies depending on the length of the hole and the type of approach shot which is demanded. The shape and placement of bunkers is dictated by the strategy of play which is desired. Each green has a slightly different configuration and there are several areas in which the hole may be positioned. Each different position poses a different problem of play to the golfer and presents a variety of putts to negotiate. The difference in the texture of the surface of the green, position of the hole, and changing climatic conditions provide a wide variety of interest for the player each time he plays a round. The problems are never exactly the same twice in a row.

Proper surface drainage, sub-surface drainage, soil texture, moisture

content, and turf cover are all critical features of a golf green. The same can be said for construction and maintenance details including soil analysis, type of grass, fertilizers and irrigation practices. It was not within the scope of this report to become deeply involved in these details. It is recognized that the skills of people in these specialized fields are necessary to the total effort.

EXPLANATION OF PLATE III
PLAT

Final plat showing street rights-of-way, individual lot lines, easements, final contours, clubhouse facilities and golf course. Location of sewage treatment facilities, elevated water storage tanks and areas reserved for schools are indicated.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EXPLANATION OF PLATE IV
FIRST YEAR OF DEVELOPMENT

60 lots are developed, seven golf holes are built, and two ponds are constructed. One water tank is erected and necessary roads and sewage treatment facilities are included.


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EXPLANATION OF PLATE V
SECOND YEAR OF DEVELOPMENT

84 lots are developed, two golf holes are built completing the front nine, and two more ponds are constructed. The sewage treatment facilities are expanded and the road system is further developed to serve the additional home sites and a second access is provided. Construction of the clubhouse is begun during this year.


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EXPLANATION OF PLATE VI
THIRD YEAR OF DEVELOPMENT

44 lots are developed and the club-house is completed. Necessary roads are added and utilities are expanded.


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EXPLANATION OF PLATE VII
FOURTH YEAR OF DEVELOPMENT

74 lots are developed, a second elevated water storage tank is added, the road system is expanded, and a third access is provided to the development. The park area on the point northwest of the clubhouse is developed and dedicated to the county.


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EXPLANATION OF PLATE VIII
FIFTH YEAR OF DEVELOPMENT

36 lots are developed and approximately one-half of the development is complete. Two golf holes are built in preparation for the back nine holes. The first school site is acquired by the school board.


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EXPLANATION OF PLATE IX
SIXTH YEAR OF DEVELOPMENT

72 lots are developed, five golf holes are built and two ponds are constructed. The marina facilities are completed, a third water tank is erected and sewage disposal facilities are developed in a second location.


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EXPLANATION OF PLATE X
SEVENTH YEAR OF DEVELOPMENT

52 lots are developed and two golf holes are built completing the full 18 holes. The golf practice area is completed, one pond is constructed, and the second park area, located on the point at the south of the site, is dedicated to the county.


N
5 4 3 2 1 0
500
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1170
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1190
1200
1210
1190
1180
1170

EXPLANATION OF PLATE XI
EIGHTH YEAR OF DEVELOPMENT

52 lots are developed and the fourth water tank is erected. The road system is expanded and a fourth access road is provided. A second school site is acquired by the school board.

N
5 4 3 2 1 0
500
1000

EXPLANATION OF PLATE XII
NINTH YEAR OF DEVELOPMENT

43 lots are developed and a fifth access road is added by the expansion of the road system.

N
5 4 3 2 1 0
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1200
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EXPLANATION OF PLATE XIII
TENTH YEAR OF DEVELOPMENT

In the final year 57 lots are developed and the road system is completed. A total of 574 lots are now developed, sewage and water supply facilities are complete, and the golf course and clubhouse belong to the homeowners. The third school site is acquired by the school board during this tenth year.


N
5 4 3 2 1 0
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EXPLANATION OF PLATE XIV
AREA

This plate shows the total acreage allotted to each major category of the development.

Lots	176.1 acres
Roads	55.1 acres
Clubhouse and marina grounds	10.9 acres
Parks	
1. 13.6 acres	
2. 12.4 acres	26.0 acres
School sites	
1. 4.9 acres	
2. 5.5 acres	
3. 6.2 acres	16.6 acres
Golf course	141.4 acres
Practice area	15.7 acres
Ponds	
1. 2.7 acres	
2. 0.9 acres	
3. 1.6 acres	
4. 0.9 acres	
5. 1.0 acres	
6. 0.5 acres	
7. 0.7 acres	8.3 acres
Major buildings area	15.9 acres
TOTAL	466.0 acres

CLUBHOUSE DEVELOPMENT

The clubhouse, with all its related facilities, is the center of recreational and social activity for the residents of this subdivision. It offers the combined facilities of a golf club, swimming club, yacht club, and social club in an exclusive and private manner. Services are available for all age groups represented by the families within the subdivision. This structure is the most important single feature of the entire development as it serves to mold families into one social unit. The clubhouse is the gathering place for all members for both daytime and evening activities. It is traditional in history but contemporary in function; and while it commands this dominant position, it must not become the identifying symbol of the development. This symbol must be portrayed by the religious and civic buildings which will be erected on the open meadow near the primary entrance to the development.

Several factors had to be taken into consideration in selecting a site for the clubhouse. Desirable climate orientation and proper control over golfing and boating activities were among the most critical. It was also desirable to provide pleasant views and vistas for occupants of the clubhouse and also an attractive view of the structure itself by those approaching the clubhouse. A central location on the south slope of gently rising ground was chosen. A narrow neck of the lake extends inland providing a docking area for the marina and a pleasant view to the south across this water. Fairways leading away from and back toward the clubhouse offer a large expanse of lawn over which the clubhouse may be seen by people on their daily excursions through the development and by those approaching the building to use some of its facilities. Direct access is provided easily. There is ample space for parking which has been tucked into the slope in such a

way that the hard-surfaced parking lot does not interfere with the view of the approaching visitor.

The southern exposure has been exploited; and the northern exposure is protected from winter winds by the topography and landscape treatment. Major views and the most pleasant outdoor summer living is on the south with some protection from the late afternoon sun. Summer prevailing winds are from the southwest and these breezes blowing across the water should make south terraces pleasant for evening activity. Major activity has been planned around the south exposure while service activity utilizes the north side of the building. Large glass areas are on the south where the summer sun may be shut out by roof overhangs. The glass area on the north has been limited as a protection against the winter winds. The topography is such that the two-story building has only a single story exposure to the north, but both floors are exposed on the south.

Functionally, the clubhouse provides services and controls circulation. The two primary services are social functions and sports functions. Sports activities are those of golfing, boating and swimming; while the social activities include dining, dancing, and party activities. These major categories have been broken down further by age groups and sex. Separate social facilities are provided for teenagers and separate locker areas are provided for young golfers. These have been incorporated with the men's and women's swimming locker areas. Along with these facilities are those service or support facilities such as offices, rest rooms, kitchen service, delivery entrance, various types of storage facilities, maintenance areas, mechanical equipment space, and employees' lounge and locker areas. Services of a somewhat commercial nature are included in the golf pro shop and the marina sales and service area.

Because of the separate nature of the social and sports activities, separate entrances have been provided. From the parking lot to the west of the clubhouse, the golfer or swimmer will use the east entrance. The approach is a paved walk which skirts the back of the ninth green and proceeds through a sheltered garden area. The golfers use the upper level while the swimmers proceed down a short outside stair to their entrance. The golfers' access to their locker areas is from a small lobby which is adjacent to the pro shop and the golfers' lounge. Access to the golf course is through the pro shop. The golf pro office and caddy room look out onto the starting tees and practice putting green. Below the men's locker room is storage space for the golfing functions of the clubhouse. Pro shop stock, repair service, club storage and golf car storage are housed in this large area. Golf cars are driven to the starting tees up a hard-surfaced path. All golf activity is under the direct supervision of the golf pro.

Each locker room is essentially the same. The lockers are generous, with space for hanging clothes, storing personal items and shoe storage under an attached seat. The men's locker room houses 310 lockers and the women's locker room has 195 lockers. Detached toilet areas are included and private shower stalls are provided for the women. Linen storage is in the men's locker area as is space for a locker room attendant. A stag lounge is also a part of the men's locker room. Food and drink is provided by the bar and grill in the golfers' lounge. The golfers' lounge is by the golf entrance lobby and adjacent to the main dining room to the west. This lounge may be made a part of the dining room when the situation demands, or it may serve as a private party room during the winter season. The north view from this lounge is across a sheltered garden area to the ninth green. To the south is the lawn leading down to the water, and across the water is the 18th fairway.

The swimming entrance is on the lower level below the golfers' lounge. A lobby serves the entrance, the stair to the golf lobby, the attendant's basket storage, and the men's and women's dressing rooms. This facility utilizes a basket storage arrangement so no individual lockers are provided other than those for the young boy and girl golfers. Access to the pools, which are immediately adjacent to the building, is through the lobby. A first aid room is directly off the pool area. The large pool is a standard swimming pool while the circular pool is for kiddies. A snack bar is located near the pools and also serves the teenage lounge. While these swimming facilities were included in the design, they were not included in initial cost estimates. The finishing of the locker areas and the construction of the pools were considered as an expansion of facilities which will be financed by the membership at some future date.

The social entrance is the west entrance directly off the circle drive. The walk is covered by a long canopy, and a low wall to the east defines a garden area which is off a small dining room. To the west an open lawn slopes to the docking area and the lake. The lobby is large and an expanse of glass on the south provides a view through the lobby to the lake. To the left of the lobby is a coat storage room and access to the lounge. The manager's office and men's and women's toilet facilities are adjacent. The lounge is divided by the cocktail bar into an easy lounging area and a cocktail area. To the west is a covered deck which looks out over the lake and offers protection from the glare of the setting sun on the water. This deck extends around the south of the lounge, and an outside stair leads to the docking area.

In the main lobby a stair leads to the teen lounge and the outdoor patio area. To the right of the main lobby is the main dining room which seats 300

diners. A large fireplace on the west wall serves the main dining room and the smaller party room which seats 70. The main kitchen is along the north side of the dining room and the south wall is glass, affording the diners a view over the lawn, the water, the 18th fairway, and beyond into the residential area. The teen lounge and the terrace below have this same vista. The teen lounge also has a fireplace on the west wall, a lounge area, and a large open floor for dancing and games. At the east end of the lounge is a snack bar. Rest rooms for the teen lounge are off the stair at the west end.

Boaters use the social entrance and the stair to the marina, or go directly from the parking area to the dock area and enter the marina from the docks. Facilities included in the marina are rest rooms, repair and service yard, commercial sales area and lounge, and docking for 80 boats. A hoist and track enables boats to be taken from the water into the repair yard for major servicing. Fuel is dispensed at one central point out on the dock. Gear lockers are built into the back of the dock for the convenience of the boaters. A launching ramp is located at the far west end of the docks for trailered boats.

All service to the clubhouse is by means of one receiving entrance on the north. This service area is screened by low walls and dense planting. This is also the employee entrance. Directly inside the receiving room is a stair and an elevator to the lower level. Food stuffs requiring refrigeration are stored in coolers in the main kitchen; dry storage is on the lower floor. Supplies for the golf and marina activities are distributed at the lower level.

Employees enter the building near the service entrance and have direct access by stairway to their dressing rooms which are on the lower floor. A lounge is provided for employee dining. Lockers and showers are included

within the dressing rooms. No provisions are made for employees staying overnight or living permanently in the clubhouse. During certain maintenance activities on the golf course, it may be desirable for some employees to remain overnight. These arrangements may be made in the course maintenance building which is located near the practice area, or in the storage room below the men's lockers. The course maintenance building houses large equipment and is located, but not included in the cost estimate.

Mechanical equipment is located under the kitchen in a large area reserved for this equipment. An incinerator is provided near the chimney. The building is heated and cooled by forced air through a system of ducts. Return air ducts have been provided except in the kitchen and locker room areas. This air is exhausted and is not recirculated. A sewage ejector pumps all sewage into a main in which it flows to the sewage treatment units by gravity.

The clubhouse structure is a concrete framed lower floor and a wood framed upper floor. The wood frame is laminated wood beams and columns and a wood roof deck. The wood structure is exposed on the interior in the dining rooms, lounges, entrance lobby, and pro shop. This structural system was chosen because of the atmosphere which is created through the use of massive wood members and the economy which it offers. Wood paneling, brick masonry and glass completes the material used in the dining room and lounges. The interior brick is the same as the exterior brick. Brick was chosen for an exterior material, along with wood paneling, to create a character for the clubhouse. The character of such a building is one of rural simplicity, yet durable, strong, and in a sense, proud. The building must blend with its setting yet not be something which loses itself in its surroundings. As was stated previously, this is an important architectural edifice, yet it must not dominate the development. Dark, rough brick, rough sawn lumber facing, and heavy,

rough textured roof treatment was chosen to achieve this goal. The white concrete structure around the marina, rising from the water, offers the perfect compliment to the building.

The massing of the structure denotes the functions contained within. The western most part of the building houses the lounge above and the marina below. The center mass is the area in which general social functions for all members take place and the major service functions are located here. In the east wing, golfing and swimming facilities are grouped affording direct access to the pools and the golf course. Circulation between the major masses is provided by the lounge at the east wing and the entrance lobby at the west.

Landscape treatment around the clubhouse, as well as throughout the development, utilizes the plant life characteristic of the region. The contrast of dense, dark foliage with the lighter colored, more delicately leafed trees, creates an interesting scene. Trees are placed to direct the observer's view and to frame views in particular areas. Ornamental trees are located in such a manner as to enhance their own beauty and that of the clubhouse. Interesting shadow patterns are cast, and in some instances, dense shade brings relief from the hot sun. Shrubbery is utilized in screening, directing traffic and to provide attractive garden areas around the building.

Adequate quantities of flowering plants provide a multicolored landscape in the spring, and the structure of deciduous trees in contrast with neighboring evergreens adds immensely to the winter scene.

All these features must be included in total design. The correct appearance, and the proper atmosphere is the result of the total design experience. While this is a prototype development, the same ingredients must be used in every locale. Each region will offer its own features, the best of which must be utilized to the utmost. While the final result may take many

years before fulfillment, design must be the first step.

In the course of any building project, a cost estimate and a construction schedule are necessary. In consideration of the prevailing costs in this area and the type and size of structure, an over-all figure of $17.00 per square foot was used. This is the total unit cost, but will not finish the building as completely as is indicated by Plates XV through XXV, pages 58 to 78. Included in this figure was the complete building with the exception of the swimming pools and finished and equipped swimming locker rooms. Kitchen equipment included in the building program is about three-fourths of the total amount of equipment which will be desirable when full membership is reached. This additional equipment may be added by the members at a later date. No furnishings of a detached nature were included. Dining room furniture, lounge furnishings and pro shop and marina fixtures will be provided by the members. Other equipment and construction of pool facilities will be accomplished by the members in their normal operating and expansion plans. Major landscape treatment was included in the estimate with additional plant material added over a period of time.

The upper floor level contains 15,888 square feet and the lower level is 13,872 square feet - a total of 29,760 square feet. This total area at $17.00 per square foot totals $506,000. In addition to this, the covered deck off the main lounge is 1,680 square feet and construction costs for this area should be about $8.00 per square foot, a total of $13,500. The parking area is almost 130,000 square feet and can be graded and surfaced with rock for $.50 per square foot - $65,000 total. Boat docks will be constructed for $17,000, which brings the total to $601,000. Architects' fees will total $37,000 based upon the recommended fee schedule of 7 percent for the first $100,000, and 6 percent for the next $2,000,000. Deducted from this total

estimate of $638,000 is the finishing of the swimming locker area of 4,892 square feet. Furnishing and equipment may cost $10.00 per square foot so a total of $48,000 is deducted. The total cost estimate for the clubhouse is $590,000.

The construction schedule has been planned in such a manner that the clubhouse will be completed during the third year of development. The marina will be finished and boat docks will be added during the sixth year of development. During the second year, the golf facilities will be completed as the first area to be constructed. The remainder of the building may easily be completed during the next year as total construction time should not exceed 15 months. As the initial expense will not include the marina and docks, these items are deducted from the total estimate and added to the development schedule during the sixth year. The marina is approximately 2,300 square feet in size and can be finished for $10.00 per square foot, or $23,000. The boat docks, as previously noted, are a $17,000 item; hence $40,000 is deducted from the total estimate of $590,000. During the second and third year, an expenditure of $550,000 is required for the clubhouse, and during the sixth year an additional amount of $40,000 is required to complete the facilities.

It can be noted in the following chapter that this entire expense is financed by a loan of $365,000, and this obligation is retired in five years, or by the end of the seventh year of development.

EXPLANATION OF PLATE XV
CLUBHOUSE PLOT PLAN

Plate XV is a larger scale plot plan of the clubhouse and the surrounding area. Contours show finished grade and are at two foot intervals.

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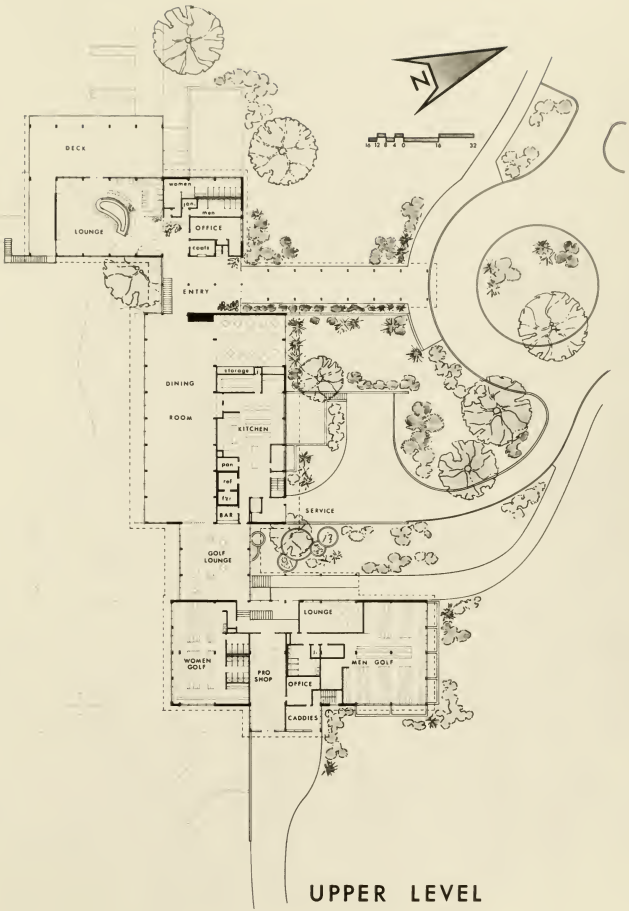
EXPLANATION OF PLATE XVI
CLUBHOUSE FLOOR PLAN, UPPER LEVEL

The upper level of the clubhouse building is shown in Plate XVI. Major elements are labeled for clarity.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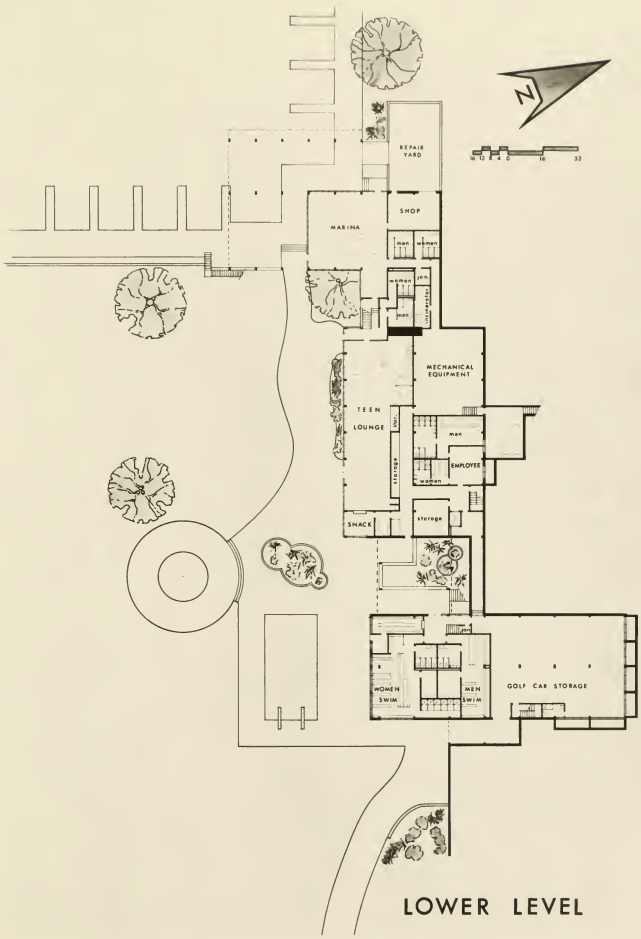
fry
BAR
SERVICE
GOLF
LOUNGE
LOUNGE
WOMEN
GOLF
PRO
SHOP
OFFICE
MEN GOLF
CADDIES

UPPER LEVEL

EXPLANATION OF PLATE XVII
CLUBHOUSE FLOOR PLAN, LOWER LEVEL

Plate XVII is a large scale drawing of the lower level of the clubhouse building. Each major element is labeled. The swimming pools and swimmers' locker room furnishings are shown in complete detail even though they are not included in the construction schedule or cost estimate. The large rectangular pool is the adult pool and the circular pool is a shallow children's pool.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REPAIR YARD
SHOP
MARINA
men
women
women
men
MECHANICAL EQUIPMENT
TEEN LOUNGE
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women
EMPLOYEE
storage
storage
SNACK
WOMEN SWIM
MEN SWIM
GOLF CAR STORAGE

LOWER LEVEL

EXPLANATION OF PLATE XVIII
EXTERIOR ELEVATIONS

The north and south elevations are shown in Plate XVIII. The north elevation may be referred to as the front elevation as the major entrances are encountered here. The south elevation overlooks the neck of the lake and is the outdoor activity space including a hard-surfaced terrace and the pools.

NORTH

SOUTH

EXPLANATION OF PLATE XIX
EXTERIOR ELEVATIONS

The east and west elevations are shown in Plate XIX. The east elevation is the golfers' end of the building, and the west elevation is the boaters' area with the marina and docks on the lower level and the lounge and deck on the upper level.

WEST

EAST

EXPLANATION OF PLATE XX
BUILDING SECTIONS

Plate XX shows six sections cut through the clubhouse at different points. View "A" is cut through the main entrance looking west. View "B" is cut through the dining room on the upper level, and the teen lounge and mechanical equipment room on the lower level, looking west. View "C" is cut through the golf lounge looking west. View "D" is cut through the main entrance looking east. View "E" is cut through the golf lounge looking east. View "F" is cut through the men's golf locker room, pro shop and ladies' golf locker room on the upper level and the golf car storage room, men's swimming locker room and ladies' swimming locker room on the lower level, looking east.


1138'-0"
1144'-8"

A


1138'-0"
1146'-8"

B


1138'-0"

C


1138'-0"
1144'-8"

D


1138'-0"

E


1160'-4"
1149'-0"

F

EXPLANATION OF PLATE XXI
PERSPECTIVE OF SOUTH SIDE OF CLUBHOUSE

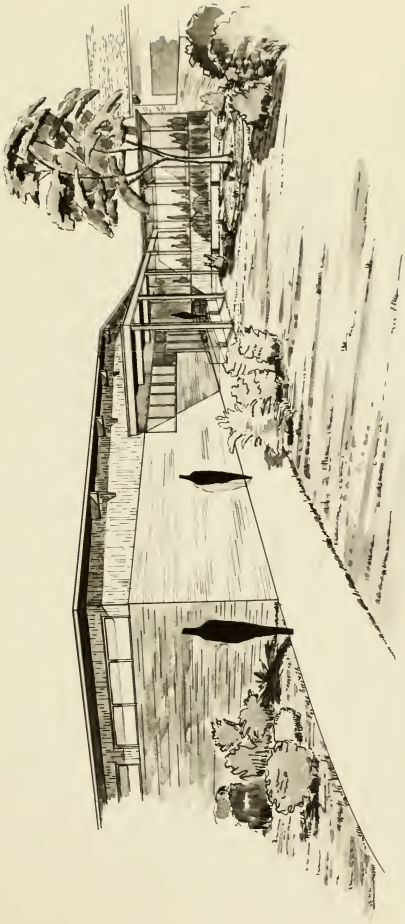
The view shown by Plate XXI is of the south side, or outdoor activity space of the clubhouse. The observer is standing down toward the water's edge looking northwest.

EXPLANATION OF PLATE XXII
PERSPECTIVE OF MAIN ENTRANCE

This view is encountered by the observer as he approaches the main entrance from the parking area. The direction of sight is southeast.

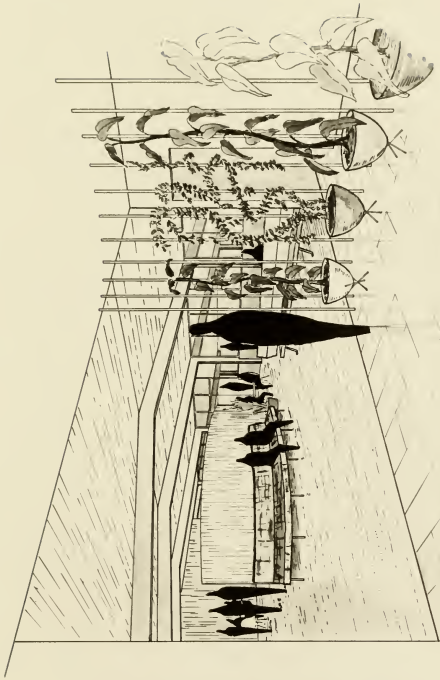
EXPLANATION OF PLATE XXIII
PERSPECTIVE OF GOLFERS' AND SWIMMERS' ENTRANCE

The observer is walking on the sidewalk which leads along the court to the golfers' entrance. Swimmers may use the outside stair or the inside stair in the golfers' lobby. In the background is the golf lounge.



EXPLANATION OF PLATE XXIV
INTERIOR PERSPECTIVE OF LOUNGE

The observer is standing in the lobby area by the manager's office looking south into the lounge. The lounge is divided by the bar into a cocktail area, in the distance, and an easy lounging area in the foreground and to the right. The deck is accessible from either area.



EXPLANATION OF PLATE XXV
INTERIOR PERSPECTIVE OF DINING ROOM

The observer is standing in the center of the dining room looking west toward the entrance lobby. Table arrangement shown is for an afternoon tea or dessert bridge and is not the maximum setup which would be required for a large dinner party.

ECONOMIC CONSIDERATIONS

In the course of any development program, the final retail or selling price must include all the developing costs plus the profit the developer hopes to realize. This is a simple analysis but the procedures in arriving at this selling price are somewhat complex. The amount of initial capital required, and any additional capital to be acquired through loans, must be planned in advance in a logical manner which will be acceptable to the mortgagor. In the following schedules a comprehensive program of development is outlined covering a ten-year period. Several assumptions must be made in the economic analysis of any long-range plan.

One assumption of major importance is that the long-range plan is sound and will operate over the time schedule toward fulfillment. Another prime assumption must be made in consideration of the financing of the program. There are various methods of financing large scale developments, some intricate and complex, but all with the basic feature of economics as their foundation. The method chosen must provide the most proper return on a minimum investment within the calculated risk. It appears obvious that some outside source of financing will be necessary and consequently some amount of interest will be required in return. This expenditure alone can assume major proportions if not carefully planned in advance. Therefore, without delving into the many financing methods used today, an assumption that seems reasonable is that the initial capital outlay, that of the cost of the raw land, can be born by the developer or whatever organization of initial investors may be involved. Therefore, the original $233,000 which represents the 466 acres at $500 per acre, comprises the initial investment and is available. Included in the eventual selling price of each lot is this entire amount of capital plus a

return of four percent per year on any outstanding balance. Table 1 outlines the manner in which this initial investment is returned to the developer. It can be noted that the original capital and interest can be returned within eight years.

It might be well to digress some here and consider the investment which is at stake against the possibility that the first premise is incorrect and the development does fail in the first year or years of the schedule. The risk can be only that of interest lost over whatever period of time the money is invested in the land. It must be assumed that the land itself will not depreciate and that this investment could be recovered upon sale of the 466 acres. Therefore, it seems quite realistic that the second assumption is valid.

During the third year some amount must be obtained from another source to cover the progressing development costs. One of the major features of this development is the golf course and clubhouse so it is necessary that these features be completed as soon as possible. The clubhouse and the first nine holes of the golf course are scheduled for completion during the second and third years and the additional capital is to be used to defray these major items. An amount of $365,000 is needed and should be available at an interest rate of six percent. The clubhouse and grounds are programmed as a $550,000 item and the loan would be in the form of a construction loan. The structure should be adequate security on a loan of this amount. It can be noted in Table 2 that this loan, including the interest, can be retired in five years - at the end of the seventh year of development. It is also significant that this loan is the only outside capital required for the entire development.

Table 4 describes the tax structure. Property taxes are assumed to be 85 mills on an evaluation of 30 percent of the actual evaluation. An actual

evaluation of $200 per acre is assumed for the undeveloped areas, and $3,500 per lot as the lots are made available for purchase. The area of developed fairways and clubhouse site is assumed to be $1,000 per acre. The tax structure during the ten-year development program, including disposition of various items on a year to year basis, is shown in Table 4. The developer is liable for these taxes and the improvements on this land as long as he holds title. Consequently, it is imperative that he dispose of his holdings as expeditiously as possible to keep this expense to a minimum. At the close of the fourth year it seems logical that the county would accept dedication of a park area in excess of 13 acres. By this time the clubhouse is completed and 262 lots have been sold; the community development is well underway. During the fifth year one of the areas reserved for elementary schools could be sold to the school board as there are now 298 lots sold and there are, or soon will be, enough school-age children to justify the establishment of a school.

By the eighth year the marina has been completed and the entire 18 hole golf course is complete. The $365,000 loan acquired during the third year has been retired and the initial investment is returned during this year. Also, 479 lots have been sold which represents over 80 percent of the development. It seems proper that the mortgage-free clubhouse, marina and golf course may now be deeded to a non-profit corporation comprised of the landowners within the development. The largest single tax item, the clubhouse, is no longer the responsibility of the developer. This structure has been his responsibility for a period of five years. Operation of the clubhouse during this period has been handled by the corporation and does not become a part of the developer's costs. Each corporation member is required to pay an initiation fee plus monthly dues and this is an entirely separate financial arrangement.

At the end of the tenth year the developer has retained title to only one area of nearly 16 acres. He will realize additional profit when this area is sold for whatever major or community buildings become desirable in the immediate future.

Dedication of parks and sale of school sites has been programmed as the project develops; however, the adjacent areas will begin to develop simultaneously and will add to the necessity for schools. With an eventual community of 574 homes and a population of 1,800 to 2,000, the nearby area would develop into shopping facilities and additional residential areas.

Other items which must be included in development costs are shown on Table 5, and the yearly breakdown for the entire program is outlined on Table 6. Complete utilities systems and transportation facilities are to be provided. Advertising and promotion and fees for various services will be costs to the developer which he must recover through the sale of his product, the home sites.

The sewage disposal system includes disposers of the factory-built type which are complete and ready for use. This type of disposer offers an excellent treatment process and allows installation of units sized for the number of homes requiring this service. This provides a desirable pro-rating of costs over the ten-year plan. At the completion of this development, there will be ten individual sewage treatment units, five in each of two locations.

Water supply will be provided by four elevated storage tanks and wells, thus providing a pro-rating of this cost as the development progresses.

When all costs are calculated, a profit may be added to arrive at the final selling price. A real estate broker's fee of five percent must be included as a part of the cost to the customer, but does not enter into the developer's scheme as this is paid directly to the broker only upon

completion of the sale of each lot.

A contingency item of ten percent is included primarily to cover unforseen costs and income taxes. Income taxes on such a venture as this may be computed in a variety of forms depending on the type of organization under which the developer is operating. The tax is due on the per lot profit rather than the gross profit item listed in Table 6. Under a corporation tax structure, taxable income under $25,000 is classed as small business and is taxed approximately in the 30 percent bracket. Taxable income over $25,000 is taxed on a sliding scale of 22 percent up to $25,000, and 28 percent of all over that amount, less a flat sum of $5,500. In corporations comprised of more than one individual the profit may be divided among the members of the corporation and each may file his own tax return. The concensus among tax authorities is that there is a definite benefit to the classification of small business, i.e. a taxable income under $25,000. The scope of this thesis does not permit a review of the formation of the most advantageous form of business structure. It appears that competent authority should be consulted by the developer in the formation of a company or corporation to undertake this development program.

A profit of 15 percent is the accepted amount assumed in today's land development market. This amounts to a profit of $726 per lot, or a total of $416,737 over the ten-year period. The selling price of each lot becomes $6,352 including a broker's fee of $302. For this amount, which is presently on a par with available building sites within the city limits, the purchaser has a beautiful home site in a restricted area surrounded by open fairways, protected by thick groves of trees, and he may become a member of an exclusive golf and country club. The clubhouse and golf course are debt-free and are operated by a non-profit corporation comprised of members like himself, who

are his neighbors. Sensible zoning and planning are protecting him from the establishment of features which are undesirable in a high-quality residential area. All facilities are debt-free, utilities and streets have been paid for in the initial cost of his lot, and it follows that maintenance of this area would be assumed by the county; or the community might incorporate. In an established area the county should have no reservations about assuming this responsibility in return for the added tax income which can be expected. This development will surely act as a catalyst attracting additional growth in the immediate area.

Two considerations have been made and discarded. One, that the utilities and roads in the last half of the development could be the responsibility of the county upon the establishment of the proper county tax revenue districts. After a development progresses to the stage where completion is assured, there should be no problem in establishing these districts; however, this would only prolong the payment of these services and lower the initial cost to the buyer. There is a certain advantage gained by maintaining the initial cost at the medium-high to high level in the restrictions of family income required for this purchase. The advantage is felt to be the most desirable even though this may dictate a larger population area in which the development could be successful.

The second consideration is that of the increase in costs over a period of time due to the general inflationary trend of the economy in the past 25 years. It follows that a yearly increase of one percent to two percent may be assumed in development costs which would dictate the same increase in the selling price of the lots. Inasmuch as this is a direct proportion, no adjustments have been made for this increase in Table 6. A lot costing $6,352 in the first year of development might cost from $6,800 to $7,200 in the

tenth year of development, but this would represent essentially the same competitive price on the real estate market. While the total dollar profit would increase too, the percentage remains constant.

Table 1. Interest Computations

Principal and interest payments on initial capital investment of $500 per acre, 466 acres, total capital $233,000. Interest rate, 4% per annum on outstanding balance.

Year	Interest	Principal	Outstanding Balance
			$233,000
1st year	$ 9,320	$ 25,000	208,000
2nd year	8,320	45,000	163,000
3rd year	6,520	10,000	153,000
4th year	6,120	10,000	143,000
5th year	5,720		143,000
6th year	5,720		143,000
7th year	5,720	33,000	110,000
8th year	4,400	110,000	-0-
Total Interest	$51,840		

Table 2. Interest Computations

Principal and interest payments on loan of $365,000. Interest rate, 6% per annum on outstanding balance.

Year	Interest	Principal	Outstanding Balance
			$365,000
3rd year	$21,900	$ 60,000	305,000
4th year	18,300	140,000	165,000
5th year	9,900	80,000	85,000
6th year	5,100	10,000	75,000
7th year	4,500	75,000	-0-
Total Interest	$59,700		

Table 3. Tax Rates

Property tax rates, 85 mills, 30% of total evaluation.

Unimproved Land	
$200 per acre x 30% x 85 mills	$ 5.10/acre
Improved Land	
$1,000 per acre x 30% x 85 mills	$25.50/acre
Building Lots	
$3,500 each x 30% x 85 mills	$89.25 each

Table 4. Yearly Taxes and Development Schedule

First Year

Develop and sell 60 lots (16.9 acres)

Build seven golf holes (#1, 2, 5, 6, 7, 8, 9)

Taxes on lots	$ 5,355
Taxes on unimproved areas (449.1 acres)	2,290
	$ 7,645

Second Year

Develop and sell 84 lots (20.8 acres)

Build two golf holes (#3 & 4)

Taxes on lots	$ 7,497
Taxes on unimproved area (369.7 acres)	1,885
Taxes on seven golf holes (50.6 acres)	1,290
	$10,672

Third Year

Develop and sell 44 lots (12.1 acres)

Build clubhouse

Taxes on lots	$ 3,927
Taxes on unimproved area (325.9 acres)	1,662
Taxes on nine golf holes (71.4 acres)	1,820
Taxes on clubhouse & grounds (10.9 acres)	13,360
	$20,769

Table 4 (cont.)

Fourth Year

Develop and sell 74 lots (21.7 acres)

Dedicate park to county (13.6 acres)

Taxes on lots	$ 6,604
Taxes on unimproved area (290.6 acres)	1,482
Taxes on nine golf holes (71.4 acres)	1,820
Taxes on clubhouse & grounds (10.9 acres)	13,360
	$23,266

Fifth Year

Develop and sell 36 lots (12.3 acres)

Build two golf holes (#10 & 18)

Sell school site (4.9 acres)

Taxes on lots	$ 3,195
Taxes on unimproved area (273.4 acres)	1,394
Taxes on nine golf holes (71.4 acres)	1,820
Taxes on clubhouse & grounds (10.9 acres)	13,360
	$19,769

Sixth Year

Develop and sell 72 lots (21.4 acres)

Build five golf holes (#11, 12, 15, 16, 17)

Build marina

Taxes on lots	$ 6,426
Taxes on unimproved area (232.0 acres)	1,183
Taxes on 11 golf holes (91.4 acres)	2,330
Taxes on clubhouse & grounds (10.9 acres)	13,360
	$23,299

Table 4 (cont.)

Seventh Year

Develop and sell 52 lots (16.7 acres)

Build two golf holes (#13 & 14)

Deed clubhouse, grounds and marina to corporation (10.9 acres)

Dedicate park to county (12.4 acres)

Taxes on lots	$ 4,641
Taxes on unimproved area (170.8 acres)	871
Taxes on 16 golf holes (123.8 acres)	3,157
	$ 8,669

Eighth Year

Develop and sell 52 lots (16.7 acres)

Deed golf course and practice area to corporation (157.1 acres)

Sell school site (5.5 acres)

Taxes on lots	$ 4,641
Taxes on unimproved area (106.7 acres)	544
	$ 5,185

Ninth Year

Develop and sell 43 lots (13.4 acres)

Taxes on lots	$ 3,838
Taxes on unimproved area (93.3 acres)	475
	$ 4,313

Table 4 (concl.)

Tenth Year

Develop and sell 57 lots (16.1 acres)

Sell school site (6.2 acres)

Taxes on lots	$ 5,087
Taxes on unimproved area (15.9 acres)	81
	$ 5,168
Total taxes over the ten years	$128,755

Table 5. Development Costs*

Item	Unit Cost	Quantity	Total	Per Lot
1. Raw land	$500/acre	466 acres	$ 233,000	$ 405.00
2. Planning, surveying, landscaping	$50/lot	574 lots	28,700	50.00
3. Legal services	$7.50/lot	574 lots	4,305	7.50
4. Site improvements	$25/lot	574 lots	14,350	25.00
5. Advertising & promotion	$50/lot	574 lots	28,700	50.00
6. Closing cost, registering deeds	$17/lot	574 lots	9,758	17.00
7. Paving, curb & gutter				
60' right-of-way	$14.50/lf	32,500 lf	471,250)	1,015.00
80' right-of-way	$19.70/lf	5,720 lf	112,680)	
8. Grading, roads	$ 1.50/lf	38,220 lf	57,378	100.00
9. Sewerage				
Collection system	$4.75/lf	40,030 lf	190,212	330.00
Treatment units			200,900	350.00
Manholes	$200 ea.	89	17,800	31.00
Pumps	$11,000 ea.	4	44,000	77.00
10. Water supply				
Distribution system	$4.00/lf	40,030 lf	160,120	280.00
Elevated storage tanks-100,000 gal.	$38,000 ea.	4	152,000	265.00
Pumps	$ 5,000 ea.	4	20,000	35.00
11. Storm sewers	$200/inlet	14	2,800	5.00
12. Street lights	$200 ea.	100	20,000	35.00
13. Golf course	$10,000/hole	18	180,000	313.00
14. Clubhouse	$550,000	1	550,000	960.00
15. Marina	$40,000	1	40,000	70.00
16. Taxes	See Table 4		128,755	225.00
17. Interest	See Tables 1 & 2		111,540	195.00
18. Total development cost			$2,778,248	$4,840.00
19. Contingency	10% of line 18		277,825	484.00
20. Profit	15% of line 18		416,737	726.00
			$3,472,810	$6,050.00
21. Broker's fee	5% of line 20		173,740	302.00
		Selling price of each lot		$6,352.00

* All totals to the nearest dollar.

Table 6. Yearly Breakdown

First Year (60 lots)

Item	Quantity	Income	Expense	Gross Profit
Raw land			$233,000	
Items 2 through 6- Table 5			8,963	
Paving				
60' right-of-way	3,650 lf		52,925	
80' right-of-way	2,500 lf		49,250	
Grading	6,150 lf		9,248	
Sewerage				
Collection	4,610 lf		21,970	
Treatment			21,000	
Manholes	12		2,400	
Pumps	1		11,000	
Water supply				
Distribution	4,170 lf		16,680	
Tanks	1		38,000	
Pumps	1		5,000	
Storm inlets	1		200	
Street lights	14		2,800	
Golf course	7 holes		70,000	
Clubhouse				
Marina				
Taxes			7,645	
Sale of lots		$363,000		
Capital		233,000	25,000	
Interest on capital			9,320	
Loan				
Interest on loan				
Sale of school sites				
TOTALS		$596,000	$584,401	$ 11,599

Table 6 (cont.)

Second Year (84 lots)

Item	Quantity	Income	Expense	Gross Profit
Raw land				
Items 2 through 6- Table 5			$ 12,504	
Paving				
60' right-of-way	4,600 lf		66,700	
80' right-of-way				
Grading	4,600 lf		6,900	
Sewerage				
Collection	5,970 lf		28,380	
Treatment			29,480	
Manholes	14		2,800	
Pumps	1		11,000	
Water supply				
Distribution	5,370 lf		21,510	
Tanks				
Pumps				
Storm inlets	3		600	
Street lights	11		2,200	
Golf course	2 holes		20,000	
Clubhouse			185,000	
Marina				
Taxes			10,672	
Sale of lots		$508,200		
Capital			45,000	
Interest on capital			8,320	
Loan				
Interest on loan				
Sale of school sites				
TOTALS		$508,200	$451,066	$ 57,134

Table 6 (cont.)

Third Year (44 lots)

Item	Quantity	Income	Expense	Gross Profit
Raw land				
Items 2 through 6- Table 5			$ 6,602	
Paving				
60' right-of-way	3,320 lf		48,200	
80' right-of-way				
Grading	3,320 lf		4,980	
Sewerage				
Collection	3,000 lf		14,230	
Treatment			15,390	
Manholes	7		1,400	
Pumps				
Water supply				
Distribution	3,440 lf		13,750	
Tanks				
Pumps				
Storm inlets	2		400	
Street lights	8		1,600	
Golf course				
Clubhouse			365,000	
Marina				
Taxes			20,769	
Sale of lots		$266,200		
Capital			10,000	
Interest on capital			6,520	
Loan		365,000	60,000	
Interest on loan			21,900	
Sale of school sites				
TOTALS		$631,200	$590,741	$ 40,459

Table 6 (cont.)

Fourth Year (74 lots)

Item	Quantity	Income	Expense	Gross Profit
Raw land				
Items 2 through 6-Table 5			$ 10,934	
Paving				
60' right-of-way	3,800 lf		55,100	
80' right-of-way				
Grading	3,800 lf		5,700	
Sewerage				
Collection	4,110 lf		19,520	
Treatment			25,900	
Manholes	10		2,000	
Pumps				
Water supply				
Distribution	5,190 lf		20,750	
Tanks	1		38,000	
Pumps	1		5,000	
Storm inlets				
Street lights	9		1,800	
Golf course				
Clubhouse				
Marina				
Taxes			23,266	
Sale of lots		$447,700		
Capital			10,000	
Interest on capital			6,120	
Loan			140,000	
Interest on loan			18,300	
Sale of school sites				
TOTALS		$447,700	$382,390	$ 65,310

Table 6 (cont.)

Fifth Year (36 lots)

Item	Quantity	Income	Expense	Gross Profit
Raw land				
Items 2 through 6-Table 5			$ 5,423	
Paving				
60' right-of-way	1,770 lf		25,650	
80' right-of-way				
Grading	1,770 lf		2,660	
Sewerage				
Collection	2,000 lf		9,500	
Treatment			12,590	
Manholes	4		800	
Pumps				
Water supply				
Distribution	1,800 lf		7,200	
Tanks				
Pumps				
Storm inlets				
Street lights	6		1,200	
Golf course	2 holes		20,000	
Clubhouse				
Marina				
Taxes			19,769	
Sale of lots		$217,800		
Capital				
Interest on capital			5,720	
Loan			80,000	
Interest on loan			9,900	
Sale of school sites		7,350		
TOTALS		$225,150	$200,412	$ 24,738

Table 6 (cont.)

Sixth Year (72 lots)

Item	Quantity	Income	Expense	Gross Profit
Raw land				
Items 2 through 6-Table 5			$ 10,739	
Paving				
60' right-of-way	2,570 lf		37,200	
80' right-of-way	3,220 lf		63,430	
Grading	5,790 lf		8,710	
Sewerage				
Collection	7,690 lf		36,642	
Treatment			25,200	
Manholes	18		3,600	
Pumps	1		11,000	
Water supply				
Distribution	6,690 lf		26,800	
Tanks	1		38,000	
Pumps	1		5,000	
Storm inlets	3		600	
Street lights	15		3,000	
Golf course	5 holes		50,000	
Clubhouse				
Marina			40,000	
Taxes			23,299	
Sale of lots		$435,600		
Capital				
Interest on capital			5,720	
Loan			10,000	
Interest on loan			5,100	
Sale of school sites				
TOTALS		$435,600	$404,040	$ 31,560

Table 6 (cont.)

Seventh Year (52 lots)

Item	Quantity	Income	Expense	Gross Profit
Raw land				
Items 2 through 6- Table 5			$ 7,782	
Paving				
60' right-of-way	3,820 lf		55,475	
80' right-of-way				
Grading	3,820 lf		5,730	
Sewerage				
Collection	2,770 lf		13,120	
Treatment			18,180	
Manholes	5		1,000	
Pumps	1		11,000	
Water supply				
Distribution	3,940 lf		15,740	
Tanks				
Pumps				
Storm inlets	2		400	
Street lights	12		2,400	
Golf course	2 holes		20,000	
Clubhouse				
Marina				
Taxes			8,669	
Sale of lots		$314,600		
Capital			33,000	
Interest on capital			5,720	
Loan			75,000	
Interest on loan			4,500	
Sale of school sites				
TOTALS		$314,600	$277,716	$ 36,884

Table 6 (cont.)

Eighth Year (52 lots)

Item	Quantity	Income	Expense	Gross Profit
Raw land				
Items 2 through 6- Table 5			$ 7,782	
Paving				
60' right-of-way	2,180 lf		31,600	
80' right-of-way				
Grading	2,180 lf		3,270	
Sewerage				
Collection	2,120 lf		10,050	
Treatment			18,180	
Manholes	5		1,000	
Pumps				
Water supply				
Distribution	2,700 lf		10,790	
Tanks	1		38,000	
Pumps	1		5,000	
Storm inlets	1		200	
Street lights	7		1,400	
Golf course				
Clubhouse				
Marina				
Taxes			5,185	
Sale of lots		$314,600		
Capital			110,000	
Interest on capital			4,400	
Loan				
Interest on loan				
Sale of school sites		11,000		
TOTALS		$325,600	$246,857	$ 78,743

Table 6 (cont.)

Ninth Year (43 lots)

Item	Quantity	Income	Expense	Gross Profit
Raw land				
Items 2 through 6-Table 5			$ 6,454	
Paving				
60' right-of-way	3,290 lf		47,700	
80' right-of-way				
Grading	3,290 lf		4,930	
Sewerage				
Collection	3,110 lf		14,750	
Treatment			15,030	
Manholes	6		1,200	
Pumps				
Water supply				
Distribution	3,050 lf		12,200	
Tanks				
Pumps				
Storm inlets				
Street lights	10		2,000	
Golf course				
Clubhouse				
Marina				
Taxes			4,313	
Sale of lots		$260,150		
Capital				
Interest on capital				
Loan				
Interest on loan				
Sale of school sites				
TOTALS		$260,150	$108,577	$151,573

Table 6 (concl.)

Tenth Year (57 lots)

Item	Quantity	Income	Expense	Gross Profit
Raw land				
Items 2 through 6-Table 5			$ 8,520	
Paving				
60' right-of-way	3,500 lf		50,700	
80' right-of-way				
Grading	3,500 lf		5,250	
Sewerage				
Collection	4,650 lf		22,050	
Treatment			19,950	
Manholes	8		1,600	
Pumps				
Water supply				
Distribution	3,680 lf		14,700	
Tanks				
Pumps				
Storm inlets	2		400	
Street lights	8		1,600	
Golf course				
Clubhouse				
Marina				
Taxes			5,168	
Sale of lots		$344,850		
Capital				
Interest on capital				
Loan				
Interest on loan				
Sale of school sites		12,400		
TOTALS		$357,250	$129,938	$227,312

Table 7. Summary of Table 6

Year	Lots	Income	Expense	Gross Profit
First Year	60	$ 596,000	$ 584,401	$ 11,599
Second Year	84	508,200	451,066	57,134
Third Year	44	631,200	590,741	40,459
Fourth Year	74	447,700	382,390	65,310
Fifth Year	36	225,150	200,412	24,738
Sixth Year	72	435,600	404,040	31,560
Seventh Year	52	314,600	277,716	36,884
Eighth Year	52	325,600	246,857	78,743
Ninth Year	43	260,150	108,577	151,573
Tenth Year	57	357,250	129,938	227,312
TOTALS	574	$4,101,450	$3,376,138	$725,312*

*This gross profit includes $416,737 from the sale of lots, $30,750 from the sale of school building sites, and $277,825 from the contingency item.

ANALYSIS

The limits of the potential customers for a development such as this may be established primarily by direct costs to each individual. Other limits, of course, would be interest in the facilities offered and interest in leaving established residences within the city limits. For the most part the cost factor should hold the dominant influence. A cost of $6,352 has been established for each building lot and this, in turn, should determine within limits the cost of the residence which might be erected. A reasonable assumption would be a minimum of $20,000, with many in the range of $40,000 to $50,000. The total investment now becomes from $25,000 to $50,000. The next step is to determine the income level of the family capable of this investment.

There is no fixed pattern to the determination of the amount allotted for home investment. The report published by the United States Department of Labor for 1960, entitled, Consumer Expenditures and Income, states that 11.75 percent of the yearly income of the American people is spent on individually owned homes. Experienced practitioners in mortgage lending have established an acceptable ratio of a percentage to the net effective income. This ratio exceeds the 11.75 percent figure somewhat in the higher income brackets, and more than doubles the figure in the lower income brackets. It is difficult to project the figure of a monthly or yearly percentage into the total cost without becoming involved in the various methods of financing. Therefore, the rule of thumb of two and one-half times the yearly gross income is a much easier ratio, even though it is sometimes viewed with skepticism by some authors of real estate texts. A brief calculation, assuming certain features of financing, indicates that this ratio is reasonable when compared to current data available.

Two and one-half divided into $25,000 to $50,000 fixes the income levels at $10,000 to $20,000. This is further substantiated when reviewing figures allotted for recreational expenditure against an assumed cost of country club membership. The national average of 4.06 percent spent for recreation when applied to the $10,000 to $20,000 income level is $400 to $800. A 1961 report on golf club operation by the Metropolitan Golf Association of New York indicates that an average house account per regular member varies from $160 to $600, depending upon the type of club. While the recreation percentage includes all forms of recreation, it seems reasonable that the income range chosen is a fair and reasonable figure. A minimum income figure is the most critical, and the assumption that a $10,000 yearly gross income is minimum may logically be made.

In restricting the potential customers to an income figure of this amount the number of customers in any metropolitan area is now reduced to 11.08 percent of the total population. The Consumer Expenditures and Income report states that there is 8.15 percent in the $10,000 to $14,995 income bracket and 2.93 percent in the $15,000 and up bracket. Projecting this percentage against the development total of 574 home sites should determine the population area which could logically produce a market for the product.

Before this can be established with any degree of accuracy, several allied factors must be taken into consideration. First of all, a large proportion of families in this income bracket are already members of established country clubs. Another proportion are not interested in these features of the development. Still others are established in desirable homes and would not be considered as potential customers. There are those at the lower end of this income bracket who cannot afford the added expense of country club membership. No figures are currently available in this area but it seems doubtful that more

than one-tenth of this population percentage could be considered as potential customers. This should be construed as a maximum figure.

On this basis, the population considered to be prospective lot buyers and country club members is one-tenth of 11.8 percent, or 1.1 percent. With a total of 574 lots the minimum gross population from which the customers may be drawn is 52,181. In an area with any lower population it is doubtful that this project could be carried out successfully. Before choosing a specific area in which to undertake a project such as this a detailed and comprehensive study would be appropriate.

The actual number of cities in the midwestern states in which this development could be considered feasible is shown in the following outline:

Cities and States	1960 Census
Kansas	
Kansas City	121,499
Topeka	118,561
Wichita	254,059
Nebraska	
Lincoln	127,799
Omaha	300,050
Missouri	
Kansas City	473,435
St. Joseph	79,035
St. Louis	747,127
Springfield	95,764
Independence	61,968
Oklahoma	
Oklahoma City	321,599
Tulsa	257,752
Lawton	60,346
Colorado	
Colorado Springs	69,181
Denver	490,969
Pueblo	90,440
North Dakota	
None	

Cities and States	1960 Census
South Dakota	
Sioux Falls	65,024
Minnesota	
Duluth	105,312
Minneapolis	477,884
St. Paul	313,209
Iowa	
Cedar Rapids	90,623
Council Bluffs	54,208
Davenport	88,738
Des Moines	207,823
Dubuque	56,358
Sioux City	89,154
Waterloo	71,054
Wisconsin	
Green Bay	62,653
Kenosha	67,330
Madison	126,063
Milwaukee	732,637
Racine	88,656
Wauwatosa	56,743
West Allis	67,634
Illinois	
Aurora	63,498
Berwyn	54,162
Chicago	3,511,648
Cicero	69,520
Decatur	77,422
East St. Louis	81,540
Evanston	79,179
Joliet	66,359
Peoria	102,714
Rockford	125,978
Skokie	59,358
Springfield	83,001
Waukegan	55,465
Arkansas	
Fort Smith	52,823
Little Rock	105,737
North Little Rock	57,211
Louisiana	
Baton Rouge	151,596
Lake Charles	62,395
New Orleans	621,259
Shreveport	163,663

Cities and States	1960 Census
Texas	
Abilene	89,428
Amarillo	136,199
Austin	185,052
Beaumont	118,791
Corpus Christi	165,724
Dallas	672,424
El Paso	273,212
Fort Worth	347,668
Galveston	65,662
Houston	932,630
Laredo	60,816
Lubbock	125,951
Midland	62,497
Odessa	79,123
Pasadena	58,613
Port Arthur	60,994
San Angelo	57,811
San Antonio	583,690
Waco	96,776
Wichita Falls	99,999
New Mexico	
Alburquerque	198,711

Within this 15 state area which includes a population of 48,734,402, there are 75 cities in which there could logically be expected a population sufficient to support at least one development of this nature.

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PROPOSAL FOR A GOLF COURSE AND RELATED RESIDENTIAL SUBDIVISION FOR A MEDIUM-SIZED CITY

by

RICHARD HUGH MORSE

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ABSTRACT

The objective of this investigation was to explore one method of developing a residential area which possessed some of the many desirable features necessary for today's families. The integration of a golf course and country club made possible many of these features. Social and recreational facilities are readily available, the natural beauty of the landscape was retained, and the investment was protected by sensible design and development controls.

Major considerations included the site development, golf course layout, complete clubhouse facilities, and the economic feasibility of such a project. The latter was considered from two standpoints: the size of the metropolitan area necessary to support such a project, and a proposed development schedule.

The combination of a golf course and residential development is not an original idea. In the past five years many such developments have been planned and several are being constructed. Each of these has included a golf course around which homes have been built, but all of these developments have been planned near a large population center. This project was designed in such a manner that the golf course wanders among the homes extending its benefits to a large majority of homeowners. Also a question of primary interest was the minimum population area which would provide an adequate number of potential customers to make this project attractive to investors.

A site was chosen, not as a specific location, but more to develop a prototype design. Over-all area requirements and actual layout were established to provide a basis for cost evaluation and some indication of the physical size which is necessary. Detailed cost studies were made covering every phase of development, and a reasonable time schedule for construction was established. One method of financing the project has been included.

There are many methods by which this type of development can be financed but each method must resolve the major considerations which are included in this thesis.

A complete program for the clubhouse building was established and from this program the building was designed. The clubhouse includes all facilities necessary for the various activities available to the members. The design is complete; selection of structural and mechanical systems and finish materials was made, and a cost estimate was determined. The next step would be the development of working drawings and the preparation of specifications.

The end result of this investigation is a residential development which would be an asset to any city. However, the population centers necessary for support of this type of development are quite restricted. The size of these population centers was determined by family income based on national averages. In the midwest, in a population area which includes almost 30 percent of the total population of the United States, there are approximately 75 cities of sufficient size to support this type of development. Within these cities, a complete survey of population characteristics, projected area growth, and existence of similar facilities would establish a more precise determination of the possibility of success of this development. But the potential exists, and with this specific calculation of the financial risk, one of these cities could enjoy the addition of this type of residential neighborhood.