belle isle

Preface

This project is in partial fulfillment of the requirements for the Master of Architecture degree from Oklahoma State University. It is a continuation of my interest in the synthesis of "quantity" and "quality" with design.

Many people have helped me reach this point in my education: Jim Knight, who allowed me to add new meaning to the term "independent study;" Jim Bruza, who offered me employment when I had some time and sometimes when I didn't; various professionals in Oklahoma City who offered their advice; the Oklahoma Gas and Electric Company who cooperated completely during the project. And especially Gloria Corley, who typed all this; my parents, who never asked why I was still in school after seven years; and Kathy Hamlet, who understood, tolerated, and helped as I struggled to complete this final part of my formal education.

Allen L. Brown
May 9, 1981

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INTRODUCTION

Highest and Best Use

The ultimate goal of this project is the determination of the "highest and best" use for the Belle Isle Lake property in Oklahoma City, Oklahoma. Far more complex and far less common than a simple feasibility study or development program, it is necessary on highly valuable sites where several different types of projects might prove economically feasible. It involves maximizing all factors involved in the final solution within an interdependent network of decisions and compromises. This project will be defined by examining all factors that have been identified as key constraints and evaluating alternatives through economic analysis.

GOALS

Market

Oklahoma City by the year 2000 will be a city of at least 500,000 people in a metropolitan area of one million persons or more. If prospects for growth improve, particularly with a continued migration from the north and northeast to the sunbelt states, Oklahoma City's population could total 700,000 and the metropolitan area could approach 1.5 million by the year 2000. Certainly, these population increases will dramatically change the city. The population will be more diverse with a much broader variety of lifestyles than exist today. A growing segment will demand quality in the environment; greatly improved community services, more opportunities, preservation of environmental assets, and quality design of buildings and public spaces.

The potential of the Belle Isle Lake development must be weighed against this present and future market condition. The purpose of analyzing the development potential is to establish the range of specific land uses and the rate of development which can be supported by market conditions. In turn, they set the basis for revenue forecasts and a framework for subsequent development programming and financial analysis. Since events cannot be predicted, planning of subsequent development should be flexible and sensitive to future market demands.

Analysis of market potentials is conducted within a framework of regional economic trends and against past, current, and potential future patterns of metropolitan area development. Development patterns and trends in the Belle Isle Lake market area and the competitive strength of the Belle Isle Lake property with regard to other competitive offerings in each major land use category are evaluated to determine specific land use potentials and development timing.

Environment

In comparison to other cities, Oklahoma City has a relatively undifferentiated environment. However, the features it does have should be utilized to enhance the urban environment. New development should preserve natural process areas, which are usually accompanied by vegetation and some topographic relief. Activity centers such as Penn Square can provide unique services and a sense of place in the city and concentrated development provides visual landmarks. Height, set-back, and bulk of buildings are significant in forming visual corridors and enhancing or protecting views along major streets. Urban design considerations should be used in future traffic planning, street design, and zoning.

At the smaller scale of the community and neighborhood, enhancement and preservation of the urban environment is also important. Establishment of a physical identity can strengthen resident attachments to neighborhood, and enhance marketability. Neighborhoods, such as in the Belle Isle Lake area, that have an established image can be strengthened by improvements in the public environment. New infill construction should retain the architectural character of the neighborhood. The historical context of the area should be integrated into the development of the lake.

Analysis of site potentials is conducted within a framework of environmental constraints. Development is affected by social and physical factors which must be evaluated relative to the highest and best use of the land. This evaluation helps determine land-use and siting potentials and a contextual vocabulary.

Community

Oklahoma City is automobile-dependent. Urban sprawl, when combined with overly-protective land development practices, has segmented interdependent land uses. The increasing cost of energy will make close proximity to essential community services and minimization of the home-to-work travel distance desirable. Development of the city should be considered in a "holistic" sense, providing those services necessary for the day-to-day life of the residents in the Belle Isle area. Compatibility of land-uses should be considered due to the close proximity of uses.

Another result of Oklahoma City's growth seems to have been a loss of the sense of community. Neighborhoods have undergone insensitive "surgery," removing or neglecting areas possessing distinct qualities differentiating certain regions of the city. The result has been a more-or-less homogeneous urban fabric of a scale larger than human scale, and an inability of most residents to become interactive with the environment or community. The development of Belle Isle Lake should provide a sense of community at a scale encouraging the interaction of area residents.

Analysis of community development potentials is conducted within a framework of the interrelationships and area parameters of community functions, user characteristics and behavioral patterns. These generate land-use and distance requirements.

Economics

Financial analysis of the development program serves several purposes. Major financial ingredients and bottom line results of program implementation are among the most important items established. A planning framework is provided by means of which modifications in the development program, or in its financial implementation, can be tested in terms of their impact upon project return, cash requirements, and related parameters. The plan and program can thus be successively improved by systematically varying the factors most sensitive to the results sought in the development.

The project must be economically feasible. In addition, land value generated by the uses developed should be maximized. A sufficient return on investment must be realized. In addition, the life-cycle operating costs should be minimized, particularly energy requirements.

MARKET

FEASIBILITY
SENSITIVITY

ENVIRONMENT

PRESERVATION
IDENTITY

COMMUNITY

HOLISM
COMPATIBILITY
SENSE OF COMMUNITY

ECONOMICS

FEASIBILITY
MAXIMIZATION OF VALUE
MINIMIZATION OF COSTS

FACTS

Market

Metropolitan Demography

Between 1975 and 2000, Oklahoma City's population is forecast to grow from 391,600 to more than 564,000. This 44% growth compares with 60% between 1950 and 1975, an identical time period. If the early 1950's, the booming post World War II period, is disallowed, then the current rate of growth is 1-1/2 times the rate experienced between 1960 and 1975. Oklahoma City is expected to continue to capture about half of the population in the three county metropolitan area. This is largely due to existing concentrations of economic activity within Oklahoma City's boundaries and trends for equal concentrations in the future.

The city's economic base is diversified in that Oklahoma City is the state capitol, a regional financial center, a significant higher education location, an important regional transportation hub, and a focul point for petroleum activity. Moreover, federal employment at Tinker Air Force Base and the Federal Aeronautics Administration adds a valuable dimension to the local economy. Total metropolitan employment has grown from 118,400 in 1950 to 376,300 in 1979. Government is the largest employer today with 26% of total employment. By 2000, metropolitan employment is expected to total 505,200, an increase of 22% over 1980. Services, manufacturing, and government will be the most rapidly expanding sections of the economy for the foreseeable future.

The demands for additional urban development are the result of continuing economic and population growth. Total new housing demand between 1977 and 2000 equals 139,700 new dwellings. This is a 90% increase over 1977's 157,000 existing units. This translates into a ratio of one dwelling for each 1.15 persons population growth. This results from two factors. First, birth rates will continue to decline as divorce rates and trends toward later marriage increases. Household sizes have declined from 2.91 persons in 1960 to 2.46 persons in 1978. By the year 2000, average household size is expected to decrease to 2.33 persons, resulting in a 20% increase in housing demand as compared to a continuation of present household averages. The second factor producing a large demand is housing loss through demolition or abandonment. Oklahoma City planners estimate a loss of 27,700 units by the year 2000; these dwellings must be replaced by new construction.

In 1977, the City of Oklahoma City adopted a comprehensive plan for growth management and community development. One document, the Preservation Policy Plan, sets out goals, policies and directions for change to the year 2000. A second document, the Preservation Action Program, defines the initial steps to implement the plan.

The long-term plan attempts to shift current development trends away from the suburban areas to the inner city. However, a great deal of this housing must be developed in suburban areas. A maximum of 20% can be built in the inner city without requiring additional large scale housing redevelopment projects, or about 22,400 new dwellings. Translating the remaining 117,300 suburban units into land area places a dimension on the scale of growth and potential infra-structure demand: approximately 53 square miles of suburban land for housing construction by the year 2000. Total needs for commercial and industrial land totals only between 4.7 and 7.3 square miles by the year 2000.

Large public investment will be required to serve this new growth. Utility extensions, new streets and highways, public transportation, fire and police protection, a variety of community services, and maintenance of new and existing facilities will be required. Today about 35.5 square miles of fully serviced vacant land is available. When currently bonded facilities as well as other sanitary sewage projects mandated by the federal Environmental Protection Agency are built, another 12.5 square miles will be available. The Preservation Plan concludes that the city has little choice but to direct future growth into areas presently planned or served with utilities.

The Action Plan defines what is to be achieved during the ten year period from 1977 to 1987. Guidelines focus on the dimensions, location, and quality of residential, commercial, and industrial development. Parallel recommendations are concerned with public investment required to serve this growth and development: transportation, sewer, water and storm drainage.

The land use plan defines the locations of new residential, commercial, and industrial growth in suburban areas and provides a framework for inner city land use. The plan has two stated purposes. It provides, first, a basis for locating future capital improvements and community services and, second, a basis for regulatory actions including zoning and subdivision ordinances.

Metropolitan Growth Plan

The plan for growth in Oklahoma City responds to problems and opportunities in each of Oklahoma City's nine subregional areas. The major growth components include housing, community development, commerce and industry.

Housing allocations follow several basic land principles. New residential growth is located on vacant land already served by water, sewer, and fire protection; on vacant land that will be served when presently bonded projects are built; or on vacant land that will be physically and environmentally appropriate to serve in the future. Other services are considered in allocating residential growth: streets, school bonding capacity, sanitation, parks and recreation, and police protection. Existing excess capacities are utilized; new growth is located in forms that are cost effective to serve. Residential densities are increased over the existing levels. A variety of densities and housing types are recommended, these varying from 60 dwellings per acre near major activity centers, to moderate density, apartment densities of 20-30 dwellings per acre, to the lowest density single family detached housing at 1-5 dwellings per acre. New residential growth will be more compactly developed than in the past. Passed over land is reduced to a minimum. Both capital and operating cost savings accrue with this pattern and new growth will be more geographically balanced.

New housing production between 1977 and 1987 should total about 57,500 dwellings, based on expected population growth, household formation, and preservation of existing housing. This translates into an average annual production total of 5750 dwellings as compared to an annual average of 5640 between 1970 and 1975. The actual number of residential unit production in Oklahoma City has averaged 3419 units annually for the period 1977-1979.

A breakdown of the current housing supply in Oklahoma City shows a considerable gap in housing available compared to the ability to pay for housing. The lower income bracket is expected to experience a further deficit of available housing with all other brackets meeting or exceeding needs. An exception is the over $25,000 income bracket which by 1987 is expected to experience a shortfall of affordable housing. This is due to the differential between rising housing costs compared to income. National trends from 1970 to 1975 show that incomes increased at only about half the rate of housing costs and this is expected to continue.

Much of the new housing construction to 1987 will be single-family, following current market preferences. However, the trend toward smaller household sizes (now at 2.46 compared to 3.05 in 1970), higher divorce rates, and declining birth rates probably will increase demands for multi-family housing. Increasing housing costs and energy costs will also strengthen the trend for multi-family and higher-density housing.

Recent trends in construction indicate a shift from renting apartments to ownership of condominiums. The number of apartments built has declined from a high in 1972 to a low in 1975 with a slight recovery by 1979. This cycle probably is due to overbuilding in the early 1970's. In contrast, the number of condominiums built has increased steadily (considering the 1974-75 recession) from 1971 (the first year any condominiums were constructed) to 1979. By 1979, the number of condominiums and apartments being built were roughly equal.

Commercial and office demands for land to the year 2000 are projected to be approximately 950 acres. Major regional shopping centers will account for much of the new requirements. The Preservation Plan emphasizes two objectives. One is an emphasis on infill commercial development in existing activity centers as a means for achieving higher employment densities relating to future transit improvements and for encouraging home-work convenience. The second is an encouragement for neighborhood and community shopping centers to develop as part of major new residential developments or at the intersection of major arterials rather than along commercial strips.

Commercial development forecasts are based on disposable income of residents of Oklahoma City as well as residents in surrounding communities who shop in Oklahoma City. Recent trends indicate that approximately 17% of gross income is spend on shoppers goods and about 32% for convenience goods. This total expenditure can be translated into total floor area requirements for commercial space and land use demands.

In 1975, there was an unmet demand for commercial space in Oklahoma City amounting to about 900,000 square feet. Adding this to the new needs by 1987 results in a total demand as high as about 3,850,000 square feet. Of this total, about 1,115,000 square feet is for shoppers goods and about 2,735,000 square feet for convenience goods. This translates into 1 to 2 regional shopping centers and about 22 to 30 community/neighborhood shopping centers to meet 1987 projections. Revitalization of existing commercial areas could offset some of the

demand for new construction, but this requires increased disposable income in the surrounding area (higher income households, increased population, or both).

Total estimates for office development between 1977 and 1987 equal about 3,200,000 square feet and about 100 acres of land use. The primary office users are finance, insurance and real estate firms (fire); services, government, transportation and utilities.

Industrial land needs are difficult to forecast for either the long or short term. Large industry or industry seeking large land parcels for various reasons are impossible to estimate with any accuracy. Therefore, the Preservation Plan has identified the districts for major industry while encouraging special types of industry (R&D parks and office parks, for example) for certain other areas to allow greater proximity between home and work.

Industrial land use needs can be estimated from employment projections and the expected growth of various sectors of the economy. However, these projections do not account for the larger scale industries (such as General Motors), which may locate plants in Oklahoma City in the future. Such development can be anticipated, but land requirements are almost impossible to predict, requiring sufficient land reserves be set aside for potential industrial growth in identified industrial areas. New industrial growth should total 1200 to 1600 acres with 55 square miles in land reserve.

The first regional transportation plan (OCARTS, Oklahoma City Area Regional Transportation Study) was developed in 1965. Arterial improvements in the OCARTS plan are based on the assumption that existing section line roads in urban areas would be widened to four lanes. The plan recommended that 13 freeways and numerous primary arterials would be needed to serve anticipated development to 1995. In 1971, OCARTS was updated due to future projected land use, highway construction funding capabilities, and envionmental impacts of new construction. Between 1965 and 1971, several projects had been constructed or were acquiring rights-of-way. These projects were continued, but five other freeways omitted. In keeping with the goals of the Oklahoma City Preservation Plan, emphasis is now on maximizing use of existing or planned transportation facilities. Compact, geographically balanced, and higher density growth patterns will minimize capital costs for transportation improvements.

Long term transit service in Oklahoma City will be dependent on many factors. Energy availability, transit funding, air quality regulations and highway funding are likely to be closely interrelated with future technological innovations and Oklahoma City's land use pattern, employment intensity and residential densities. These trends are impossible to predict, but given the most conservative care, the Oklahoma City plan recommends several principles for long-term transit development. Initial efforts should be "market oriented," and higher density residential development should be encouraged, especially along major corridors. Emphasis will be on increased employment concentrations in existing centers, preservation of existing close-in housing, construction of new close-in housing, and compact, higher density suburban growth.

Four major highway improvement projects have been identified as needed in the 1977-1987 period. Each is presently justified based on current demand, existing vehicular movement patterns, and likely future demands generated by the scale and distribution of new growth.

Transportation planning in Oklahoma City over the next ten years will focus on selectively improving the arterial system to serve new development in recommended locations, not in a pervasive grid pattern through the rural areas of the City. Well-planned major arterials in conjunction with appropriate controls on adjacent land uses are cost-effective and can minimize the need for major highway projects.

Transit improvements in the short-term will stress certain programs. Bus service will be market oriented, directed toward transit-dependent and transit-oriented population groups where potentials for increased ridership exists. Park-and-ride, special activity routes, activity center connectors and express routes are current trends.

Development at urban densities must be supported by utility systems of adequate size and operational condition. This requirement is particularly important in Oklahoma City because of the cost of assuring a reliable water supply and natural limitations on the disposal of wastewater. Water supply has generally preceded development in Oklahoma City with a substantial public investment already in place. The sewer system, in contrast, has tended to lag behind development.

Subregion Demography

The 1976 water works master plan, when modified by the Oklahoma City plan, insures that future water plans and projects for each area of the city will be in accordance with the actual growth needs. Future water demand will be accommodated primarily by continued development of Southeast Oklahoma sources. The sizing and design of the City's wastewater disposal system are determined by topographic features, the extent and intensity of urban development, and water quality standards. Recent growth trends and development patterns in Oklahoma City have precipitated substantial expansion and upgrading of the wastewater treatment capacity. This improvement program will continue for some years to come and is essential to accommodating anticipated growth.

Wastewater treatment planning in Oklahoma City is organized around natural drainage basins. Water and sewer service must be coordinated with each other and with the full range of urban services. The Oklahoma City plan identifies sewer service, because of its sensitivity to topography and its resulting inflexibility, as a primary prerequisite for urban development.

Oklahoma City is composed of four primary areas of development: The Central Business District, the Developed City, the Urban Fringe, and the Large Rural areas extending to the city limits. Additionally, major barriers divide the city into quadrants: the northwest, northeast, southwest and southeast. Combining these regions with the primary areas produces nine geographically-defined, developmentally-distinct subregions. Belle Isle Lake lies in the transition area between the developed city and the urban fringe in the northwest quadrant, or the northwest central and far northwest subregions.

The developed city comprises the area around the CBD, where urban development is in place and land use patterns are clearly established. The northwest central area includes about 10.4 square miles and is located just northwest of the downtown area of Oklahoma City. Its boundaries are defined by the Santa Fe railroad tracks and the southern segment of the Broadway Extension on the east, I-240 on the north, I-240 on the west, and North 10th Street on the south. This subregion experienced some of the earliest growth in Oklahoma City and many of the neighborhoods remain in fairly good condition today. The strong markets and extensive development activity that occurred in early times was followed by trends of decline in the late 1950's and 1960's. Since the late 1960's, this trend had begun to change to stronger housing markets and a positive trend toward increasing property values brought about

by substantial investor interest. Market interest is increasing currently and likely, will continue among individual owner-occupants and investor-entrepreneurs. Although little vacant land is available for new growth, land use and development patterns are of concern. Commercial and industrial encroachment and traffic congestion negatively impact residential areas. Rehabilitation potentials exist in most areas but must be protected and reinvestment encouraged. Small scale development must enhance existing neighborhood scale. The public environment must be better maintained and services improved.

The urban fringe zone lies beyond the developed city. The far northwest has long been regarded as the most desirable place to live in Oklahoma City. This area contains recent development and includes vacant land required for growth over the next ten years. As a result of scattered development, sewer and water services have been scattered broadly. The far northwest will experience substantial housing growth (almost 50% of the total amount of new growth) due to a strong market and large amounts of served or soon to serve land. The ten year allocation (1977-1987) is 24,700 new housing units. The three developed city areas and the CBD are targeted for 13% of the total growth. This inner city construction would include high rise, moderate density low rise as well as low density infill on vacant lots or replacements for deteriorated housing. The ten-year allocation for the northwest central subregion is 1,500 new units.

Although market areas for regional shopping centers overlap and frequently cover an entire city, private investors normally try to locate in the vicinity of maximum demand and spending power. Penn Square, Shepherd Mall, and Quail Springs Mall serve the northwest quadrant of the city. Other potential opportunities exist in the western portion of the far northwest subregion along the Northwest Highway. The far northwest subregion is allocated 1-2 centers, while the northwest central demands no additional major commercial centers.

Community and neighborhood shopping centers are more locally tied, responding to adjacent residential development. Market demands in the far northwest total 752,000 to 933,000 square feet while the northwest central area is allocated 47,000 to 57,000 square feet. General and heavy commercial (auto sales, commercial recreation, motels, drive-in establishments) generally locate along heavily traveled major arterials and highways, and serve an important commercial function. Land needs for these uses are particularly difficult to

predict because of great variation in density of development and location preferences of businesses.

The location of office space is extremely important in the City's overall land use structure. Whereas average employment densities are 750 square feet per employee for retail and as much as 1000 square feet per employee for industry and warehousing, office densities average 180-200 square feet. This concentration of employment affects the transportation, parking demands, and location relative to the labor force. Office development should be concentrated in existing activity centers in the inner city and in new major centers on the urban fringe. The ten-year allocation for the northwest central subregion is 204,000 to 215,000 square feet. Demand in the far northwest will be 470,000 to 553,000 square feet.

In principle, jobs should be available in all sectors of the city with opportunities for several types of industry in all locations. In the northwest quadrant of the City, a major industrial district is planned along the Broadway Extension, while smaller developments are expected near Wiley Post Airport and the Kerr-McGee Research Facility area. The far northwest demands 296-394 acres in its ten-year allocation for small uses only, while the northwest central area is allocated none. In addition, 5.75 square miles in the far northwest is needed as land reserve.

The northwest quadrant of Oklahoma City has two highway projects identified as needed in the 1977-1987 period. Upgrading of the Northwest Highway to a six-lane freeway facility from Classen Boulevard to Council Road has second city-wide priority and will provide better access to designated growth areas in the far northwest, particularly close-in parcels south of the Expressway that are partially served by utilities today. Signalization and access controls will be upgraded to improve the safety of this highway which now has the highest accident rate of any highway in Oklahoma City. Construction of the West Bypass as a six-lane urban freeway to Wilshire Boulevard and a four-lane controlled access parkway from Wilshire North to Memorial Road. This project is necessary to serve existing north-south movement needs in the far northwest and will help to encourage desired growth patterns. The north outer loop is not justified during this period or until after the year 2000 if Oklahoma City's growth follows the Oklahoma City Plan for geographically balanced, compact, and higher density suburban growth. This loop is intended to provide a bypass route for through traffic around Oklahoma City.

The site is fully served by all utilities, meeting requirements for new development.

Subregion Growth Plan

The Action Program describes the actual 1977-1987 development forecast and total land use for each subregional area. Although the problems and opportunities of each area of the city are unique, they do have similarities; i.e., types of development, market conditions, age of structures, socio-economic position, etc. The area treatment approach provides a basis for defining a range of implementation programs. Market conditions are particularly important in designating housing and community development programs.

The Northwest Central subregion is composed of five select areas receiving different area treatments. Belle Isle Lake is adjacent to NWC 3 and 5. Total population for these areas is 6,529 with a 2.5 percent population loss over the last ten years. The population is contained within 3,110 households, resulting in a small average household size, 2.10 compared to 2.46 for the City. The relatively small average household size is due to a high percentage of childless households, 76 percent compared to 64 percent city wide. The household size for those moving into the neighborhood is approximately equal to the existing households, indicating no major relative household composition change. The percentage of retired heads of households is higher than the city's, 28 percent to 19 percent, possibly indicating a future increase in young households. The percentages of 1 and 2/4 person households are 28 and 67 respectively.

Following the overall trend of the city toward smaller household size, a positive household formation should result in 3,283 households by 1987. Areas three and five are rated a stable to strongly positive status with a slightly negative trend in households.

NWC 3 and 5 have a mixture of low, moderate and high density housing. Approximately 7 percent of the planning area are multi-family units and about three percent are two/four-family units. The market strength for apartment units is reflected by an increase in the number of units coupled with a below average vacancy rate, five percent compared to seven percent. The level of owner occupancy in this area is above the city average, 61 percent compared to 57 percent. Owner occupancy is positively correlated with housing maintenance. The owner vacancy rate is half the city's rate, 1.5 percent to 2.7 percent. NWC 3 and 5 are rated a stable status with a stable to slightly negative trend in housing.

The projected household formation and expected vacancy rate produces a total of 3,447 units needed by 1987, a net increase of 136 units over the current 3,311 units. Demand for all types of housing is good as shown by very low vacancy rates. The percentages of multi-family and two/four-family should remain steady with the possibility of increased demand due to increases in 1-person households and a potential shift to younger families in the future due to a large percentage of retired heads of households. This subdivides the total housing required into 10 multi-family, 4 two/four-family, and 122 single-family units needed by 1987. The commercial market for areas three and five can be estimated on disposable income of area households. The average household income is approximately equal to the city's, $15,689 compared to $15,694. The increase in total income due to household growth will be $2,714,197. Of this $461,413 will be spent on shoppers' goods, and $868,543 on convenience goods. This translates into 18,999 square feet of 'community'/neighborhood commercial space needed by 1987. The rate of commercial unit vacancy is relatively low at present and is decreasing. Coupled with an overall increase in the supply of commercial units, this produces a moderately positive market status with a moderately positive trend.

Office space can be estimated from the number of "white collar" households in the area. Though out-migration of employment is large from any area, due to the location of the area and the planning goals, this figure will provide a conservative basis for decisions. Professional and clerical employment totals 35 percent of total employment resulting in 61 additional office workers by 1987. This can be translated to 12,200 square feet of new office space.

NWC 3 and 5 are considered to require correction of problems and routine maintenance of streets. The area has also been designated a market-oriented bus service area for public transit, and is fully served by utilities.

In general, housing is of generally very high quality, neighborhoods are well-maintained and very stable in area 3. This area is classified as Stage I neighborhood condition characterized by sound, well-maintained housing, adequate community services and often extensive commercial development serving residential areas. The area's housing market, which has traditionally been good, has gained added strength recently as income levels continued to increase. This positive trend certainly will continue in the future making the area a very sound one for investment. The market development concept recommended is to continue current patterns.

Short-term action recommended by the Action Program include instituting a preservation program to insure continued population stability, levels of investment, continued market strength, environmental quality, and neighborhood character. This would be accomplished by maintaining the quality and adequacy of community services, enhancing the general public environment, eliminating potential neighborhood encroachment of land uses and other activities incompatible with housing environs, insuring the continuing quality of housing, and enforcement of zoning regulations. However, the current market strength and high quality present in this area almost insures continued liability without major action. No service deficiencies are evident at present; however, continual maintenance is needed to insure no problems develop later.

NWC 5's overall socio-economic characteristics have remained stable indicating continuing reinvestment. Market characteristics in the area, while not overly strong, are nevertheless positive. In general, the area does not seem to be threatened with any imminent decline although an expansion of m5rginal decline existing in lower quality areas could pose a possible problem in the future. This area is also classified Stage I with a moderate current market condition. Short-term actions include instituting a preservation program with special attention focused on scattered pockets of housing decline, rehabilitation of about 200 housing units and new infill construction in the short term. Retaining positive market characteristics and neighborhood stability over the long term will, in part, depend upon maintaining adequate service levels and environmental quality. Continued viability can be assured with only minimal public investment.

The Far Northwest is composed of eight planning areas of which 1, 2 and 3 are adjacent to the Belle Isle area. FNW 1 has a total population of 11,754 as of 1978, a five percent population loss over the last ten years. The population is contained within 4,259 households which results in 2.76 persons per household compared to 2.46 city-wide. The percentages of 1 and 2/4 person households are 36 and 60 respectively. The relatively large average household size is due to a decrease in retired heads of households coupled with a moderate increase in households with children. The household size for those moving into the area is significantly lower than the existing 2.2 compared to 2.76. This indicates a net positive household formation overcoming a further decrease in population. Projecting this neighborhood trend with the city trend toward lower household size results in 4,976 households by 1987.

A mixture of low, moderate and high density housing make up the current 4,629 housing units. Approximately six percent of the units are multi-family and about five percent are two/four-family units. The market strength for apartment units is reflected by the extremely low vacancy rate of 1.7 percent. The level of owner occupancy is high at about 70 percent, with owner vacancy rate low at 1.5 percent.

The projected household formation and expected vacancy rate produces a total of 5,139 housing units needed by 1987. When compared with the current amount of 4,629 units, this produces a net demand for 510 units. Considering the trend toward smaller households and the demand for multi-family units, the percentage of multi-family units probably will approach the city average of 16 percent multi-family, five percent two/four-family. This breaks the 510 units into 82 multi-family units and 26 two/four-family units needed in this planning area by 1987.

The commercial market for FNW 1 is projected from the average household income of $16,402. The increase in total income due to household growth will be $11,760,234. Shoppers' goods will account for $1,999,239 and convenience goods $3,763,275. This translates into 168,003 square feet of community/neighborhood commercial spare needed by 1987. The rate of commercial vacancy is low, 11 percent compared to 18 percent city-wide, but has been increasing slightly. This trend produces a moderately positive market status but a moderately negative trend.

Office space is based on the professional and clerical employment, totaling 28 percent of total employment. This results in 200 additional office workers and 40,000 square feet of new office space by 1987.

FNW 1 is scheduled for concentrated maintenance and upgrading of streets and is adjacent to a proposed express bus route. It is fully served with utilities.

In general, FNW 1 is classified as Stage II neighborhood condition characterized by fully developed areas with older housing that, despite evidence of some scattered decline and poor maintenance, remain basically sound. Community services may not be up to standards and commercial services near the area have deteriorated to some extent. Short-term action recommended includes instituting a consolidation program to stabilize and increase market interest so that private reinvestment will occur. This could include encouragements for new infill housing construction compatible with the neighborhood

character, development of neighborhood amenities. Other actions recommended are rehabilitation of 1300 units, infill housing construction, and resolution of industrial-residential land use conflicts south of NW 63rd Street through special planning and district zoning.

FNW 2 has a 13,315 population which has remained stable over the last ten years and should remain constant through 1987. The population is contained within 6,544 households resulting in 2.03 persons per household in 1977, compared with 2.46 city-wide. The percentages of 1 and 2/4 person households are 26 and 70, respectively. The lower average is largely due to percentages of retired heads of households and households without children higher than the city average. The average size of households of those moving into the area is approximately equal to the existing, indicating a stable household composition. This trend, when coupled with an overall city trend toward lower household size, results in 6,925 households by 1987. Household status is strongly positive, with a moderately positive to slightly negative trend.

The current housing supply is composed of low, moderate and high density housing. Approximately 14 percent are multi-family, five percent two/four-family units. The vacancy rate for apartment units is currently 1.0 percent, single family units 1.5. This reflects a strong market for multi-family housing which is below the city rate of 1.7 percent. The level of owner occupancy is above the city average, 66 percent compared to 57 percent and the owner vacancy rate is below the city, 1.5 compared to 2.7 percent. Average income for FNW 2 is $18,666, significantly above the city average of $15,694. Housing status is strongly positive but indicates a slightly negative trend.

A total of 7,271 housing units are projected for 1987. This is an increase of 567 units above the current 6,704 units. Considering that the relatively stable household composition and the demand for multi-family units probably will remain constant, the percentages of multi-family units will not decline, subdividing the 567 units into 79 multi-family, 28 two/four-family, and 160 single-family units needed by 1987 in FNW 2.

Commercial growth will result from the average household income of $18,666 and the household growth of 381. Total income will increase $7,111,746 with shoppers' income accounting for $1,202,996 and convenience goods $2,275,759. This translates into 101,596 square feet of community/neighborhood commercial space needed by 1987. The current rate of commercial vacancy is low, but has been increasing. The result is a very positive market status but moderately positive to slightly negative trend.

A stable white collar employment totals 47 percent of the total employment in this area. This results in 179 additional office workers and 35,800 square feet of new office space by 1987.

FNW 2 is scheduled for routine maintenance and correction of street problems and is on future activity and express bus routes. It is fully served with utilities.

Belle Isle Lake falls in FNW 2. Generally, this area is classified as Stage I neighborhood condition and a preservation program is recommended to identify and address any major problems that currently exist regarding community facilities and urban services. Other actions proposed are enforcement of zoning provisions to control potential encroachment of land uses incompatible with existing neighborhoods and correction of traffic movement problems and neighborhood encroachment resulting from May Avenue and the Northwest Highway. Current market conditions are strong with a continued current level of services and maintenance required.

FNW 3 has a 1978 population of 7,976, and has remained stable since 1970. The population is contained within 3,650 households, resulting in a small average household size, 2.19 compared with the city's average household size of 2.46. The relatively small average household size is due not only to a slightly higher percentage of one-person households than is found in the city at large, but also to a much higher percentage of childless households. During the short-term, the overall city trend toward lower household size should produce 3,845 households. The average size of households moving into the area is close to the existing size producing a stable household composition. The percentages of 1 and 2/4 person households are 26 and 70 respectively. This area has an overall moderately positive household status and a moderately positive trend established.

The planning area has a mixture of low, moderate and high density housing. Approximately 26 percent of the 3,833 housing units in the planning area are multi-family, while seven percent are two/four-family. While the level of owner occupancy in the area is only 55 percent, this figure is reflective of the large number of apartment units. Over 80 percent of the blocks with single family and two-family housing, have a level of owner occupancy exceeding 70 percent. The market strength for apartment units in the planning area is reflected by a moderate vacancy rate estimated at approximately five percent. Housing status is moderately positive with a moderately positive trend.

Housing units will toal 4,037 by 1987, an increase of 204 204 units. Multi-family units will continue at 26 percent and two/four-family units at seven percent, producing a net 53 multi-family, 14 two/four-family, and 137 single-family units by 1987.

Commercial growth will result from the average household income of $16,124 and household growth of 195. Total income will increase $3,144,180, of which $534,510 is shoppers' goods and $1,006,138 is convenience goods. This translates into 44,916 square feet of community/ neighborhood commercial spare by 1987. The rate of commercial vacancy is low, producing a moderately positive status for the commercial market with a moderately positive trend established.

Office space is based on the professional and clerical employment, totaling 38 percent of total employment. This results in 74 additional office workers and 14,800 square feet of new office space by 1987.

FNW 3 is scheduled for a correction of problems and routine street maintenance. It is situated adjacent to the express bus route and activity routes. The area is fully served by utilities.

A preservation program is recommended for this area, including continuation of the present market.

The objective in the existing stable, strong market areas which are predominate in the Far Northwest is to maintain current liability and levels of investment. Public actions would be broadly applied to control land use encroachment (existing and potential), enhance environmental character, provide continuing high quality services, and correct severe service deficiencies where evident. Emphasis would be on regulatory enforcement. In the one weak market area, FNW 1, additional effects are needed to reverse decline and enhance market interest. Revitalization in FNW 1 is strongly linked to development in the Broadway Extension corridor as well as new housing growth in the west section. Developer incentives such as favorable zoning, bonus provisions and density averaging are the best means of encouraging appropriate development types and locations.

Competitive Projects

An analysis of comparative projects in the city and region surrounding Belle Isle establishes the range of type, character and quality level of a proposed development. Housing, commercial and office units are the major potential land uses.

Multi-family and two/four-family housing are relevant to achieving density and income-producing uses on the land. Similar two/four-family projects geared toward the above average income occurring in this region are composed of one and two bedroom units, ranging in size from 660 to 1520 square feet. As of September, 1980, rents range from $3.40 to $4.65 per square foot and above. Most utility bills are paid by the owner, except electricity. Almost as a rule, children are not permitted. Covered parking and washer/dryer hook-ups are provided in 50 percent of the projects; and 80 percent feature a security system of some sort, and tennis courts or exercise facilities. All projects include laundries, clubrooms and pool.

Local multi-family projects range from 460 to 1500 square feet making up one or two bed units, with one or two baths. Rents range from $2.90 to $5.90 per square foot. Most utility bills are paid, except electricity. All local projects prohibit children. Covered parking is provided in 40 percent of the projects, with one providing garages. Security systems are not common and tennis courts are featured as being "close" to one of the projects. Fireplaces and clubrooms come with 40 percent of developments. All projects include laundries and swimming pools. Vacancy rates are below the city average and are acceptable, indicating market appeal and a demand for multi-family units.

Commercial competition occurs at various levels. Penn Square fills the demand for regional shopping centers with 587,930 square feet of gross leasable area and a planned expansion of approximately 200,000 square feet. Capacity of Penn Square is 50 stores with 37 occupied. This high vacancy rate of 26 percent is reportedly due to current remodeling inconvenience, though the need for remodeling itself indicates a "face-lifting" attempt to attract more business by one of the oldest regional centers in Oklahoma. Plans include enclosing the mall to provide a competitive, all-weather shopping environment. Anchor tenants are three department stores of 48,912, 127,287, and 205,357 square feet, respectively. Quail Springs Mall in the extreme northwest part of Oklahoma City is expected to reduce Penn Square's market area further, making a regional shopping center an extremely pessimistic area for commercial investment.

There are eight community shopping centers over 50,000 square feet in this region. Most are located along arterial streets. Average size is 138,681 square feet of gross leasable area (GLA), average rent is $2.28 per square foot. Community centers provide "convenience goods" such as apparel and furniture. The center also usually includes banking, professional services, and recreational facilities. A junior department store or variety store is the principal tenant. The vacancy rate is low with no market gap noteworthy. Geographically, the market area to the south and east of Belle Isle Lake contains few community centers indicating a possible high capture rate in this area.

Neighborhood shopping centers are scattered throughout the Belle Isle Region, again usually along major arterial streets as "strip" developments. The average size is 57,285 square feet GLA, average rent is $2.45, reflecting the higher per square foot sales of the principal tenant, the supermarket.

A neighborhood center provides for the sale of daily living needs, "convenience goods" such as food, drugs, hardware and personal services.

Despite the completion of over 350,000 square feet of suburban office space in the last year, there has been no significant increase in vacancy rates as tenants continue to expand as quickly as additional space is available. The inventory of suburban space now under construction, 1,165,164 square feet, is greater than at any point since 1972, but preleasing remains very strong. Total suburban rentable area is 3,721,690 square feet; total city-wide, 6,974,833 square feet. Recent rental rate increases of $1.00 per square foot for existing space and as much as $2.00 per square foot for new construction continue to be solid evidence of both strong demand for space and sharply increased construction and financing costs. Average rent is $9.00 to $11.00 per square foot. Classen Boulevard has an above average concentration of office space with three office buildings between 36th and 50th Streets totaling 322,227 square feet. Average size of office buildings in this area is 72,330 square feet. Recent office building construction has tended toward "office park" concepts, clustering office space in a campus environment.

Industrial land use is not considered for potential development of Belle Isle due to regulations, inappropriate character for developed city infill, and proximity to the planned Broadway Industrial Park.

Market Summary

Oklahoma City, in general, and the Belle Isle Region in particular, are expected to continue strong market demands for housing, commercial space and offices. Because of the strategic location of the site, the development will draw upon the entire city market. However, in estimating a basic structure of development potential, a conservative estimate is a continuation of existing trends drawing upon the Belle Isle Lake region. An increase in the scope would have to be generated by increased population or a change in socio-economic characteristics. The latter would be difficult to accomplish and also deviate from the goals of the city plan. Strategy for development is recommended to be a continuation and stabilization of the existing demography, with a possible population increase paralleling Oklahoma City's estimated 17.6 percent growth by 1987.

A profile of the Belle Isle Region shows the population to be 39,574 and with a potential of 48,027. Households should increase to 19,029, producing a demand for 1,417 new units. Of these, 224 multi-family and 72 two/four-family units are needed. The average income is $17,062, producing an increase of $24,730,357 for this region's total income by 1987. Based on this income, 333,514 square feet of commercial space will be required. Locally-generated office space will increase by 102,800 square feet.

A comparison of these figures to the projections for the total far northwest and northwest central regions, and the city as a whole, indicates some possible adjustments in development potentials. The Belle Isle area, with 10 percent of the city population, is allocated 3 percent of office space, 12 percent of commercial space, and 2 percent of new housing units. Residential development results from the promise of a stable to increasing area population. Due to the strategic location of Belle Isle along Interstate 240 and adjacent to a major activity center, office development should be able to capture from the city market at least the amount lost to out-migration, or an additional 7 percent of the city office space projections. This would result in a total of 320,000 square feet of office space potential. Commercial space has been generated by local population markets and seems sufficient and does not attempt to capture the existing regional market of the adjacent Penn Square development.

Typical concerns at this point center on assessing multiple market potentials. These should include both typical market potentials associated with each use, together with market synergy resulting from a combination of complementary uses, in order to ascertain the benefits derived from a mixed use approach. Market synergy can take two forms, on-site market supports and/or improved market image and penetration. If multiple uses are developed, the elements of market synergy should be examined. Development potentials initially indicated by market research can be substantially expanded in scale and character if a project achieves a conceptual "critical mass," a concentration in scale and density of development and diversity of activities which allows a multiplier effect of 50 to 100 percent. A conservative estimate is 500,000 to one million square feet of gross built area, containing mutually supporting functions, to generate this additional potential. The figures developed for residential, office and commercial space meet this requirement and, especially if links are developed to the regional shopping market present, receive additional market viability.

The target market for the residential development will reflect the trends in demographic composition of the Belle Isle area. Residential development should concentrate on satisfying the multi-family housing trend becoming increasingly desirable as the intensity of land use in the area rises. The proportion of 1 and 2/4 person households indicates an approximate 40/60 split between one-bedroom/two-bedroom units, more typically occupied by singles, young couples and families with 1 or 2 children. However, the shrinking household size will approach 2.0 in the area, indicating an adjusted proportion of 50/50 between one-bedroom/two-bedroom units. Units larger than this would tend to increase the amount of children present, a negative market characteristics for multi-family housing. Additionally, the percentage of multi-family housing versus single-family housing should reflect this changing composition, adjusting from about 70/26 percent, single-family/ multi-family, to 50/46 percent. About 4 percent of the households will be of 5 or more in size. Recreation facilities are not demanded by competition, but standard community facilities will increase desirability by a market increasingly concerned with the quality of lifestyle.

Commercial development should concentrate on satisfying the convenience needs of the residential and, to a lesser degree, office development. This would be reflected by 20 percent of commercial space generated

by the approximately 300 units of multi-family residential use targeted. Office development should consider alternatives to the low density office park prevalent in suburban Oklahoma City in favor of higher density responding to the greater intensity of land use desirable adjacent to a regional node and reflective of potentially greater land value. The demand for large "corporate" office spaces is weak in Oklahoma City, giving a basis for a decentralized approach geared toward smaller tenants. A range of possibilities allocating office space would be a strong market response, with 25,000 gross square feet per floor being an "optimum" floor size.

The attractiveness of "lakefront" property undoubtedly could add to the market potential of Belle Isle Lake. No actual figure can measure this aspect, however, and further detail study is needed to determine possible higher demand and resulting higher rent.

An additional land use which could add further support to residential, commercial, and office market synergy is hotel/motel services. This would be measured by out-of-town market-business travelers, tourists, etc., who use retail facilities and desire to stay in close proximity to entertainment/cultural node, and large corporations and offices locating near meeting, convention, banquet facilities. The Penn Square/50 Penn Place is unusually suitable compared to other potential sites. In 1971, Oklahoma City had approximately 5,600 rooms available. The delegate count and number of conventions have increased 85 and 67 percent, respectively, while the room count has increased only 55 percent. This makes a shortfall of about 4,300 rooms in the present, indicating feasibility for strategically located hotel facilities. A preliminary capacity of 500 rooms could be planned.

OKLAHOMA CITY

ACTION PLAN

LEGEND
activity corridor and major comm
activity nodes
existing activity centers
existing commercial strip developm
long term activity center develop
primary industrial development ar
secondary industrial development
major thoroughfares
proposed major thoroughfares
open space system and major re
amendment action
historical preservation
top priority neighborhoods for revi
efforts, including rehab. program
other lower priority areas for comp
preservation or revitalization effort
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small amount of scattered site rede
moderate amount of infill constr
small amount of infill construction
scattered site redevelopment
small amount of infill construction
amount of scattered site redevelo
moderate amount of infill construc
scattered site redevelopment
significant amount of infill construc
scattered site redevelopment
new low density residential develo
(5-10 du's/acre)
new moderate density residential
(10-16 du's/acre)
new high density residential devel
(16-25 du's/acre)
PIEDMONT
EDMOND
ARCADIA
LUTHER
JONES
SPENCER
NICOMA PARK
HARRAH
YUKON
CHOCTAW
MIDWEST CITY
DEL CITY
MUSTANG
TUTTLE
NEW CASTLE
MOORE
NORMAN

WEST
BYPASS
NORTHWEST
HIGHWAY
CENTRAL
EXPRESSWAY
AIRPORT
SPUR
EDMOND
ARCADIA
LUTHER
PIEDMONT
JONES
UNION
BETHANY
SPENCER
NICOMA PARK
HARRAH
CHOCTAW
MIDWEST CITY
DEL CITY
MUSTANG
MOORE
NORMAN
TUTTLE
NEW CASTLE
WILL ROGERS
WORLD AIRPORT
TINKER AIR
FORCE BASE
LAKE
STANLEY
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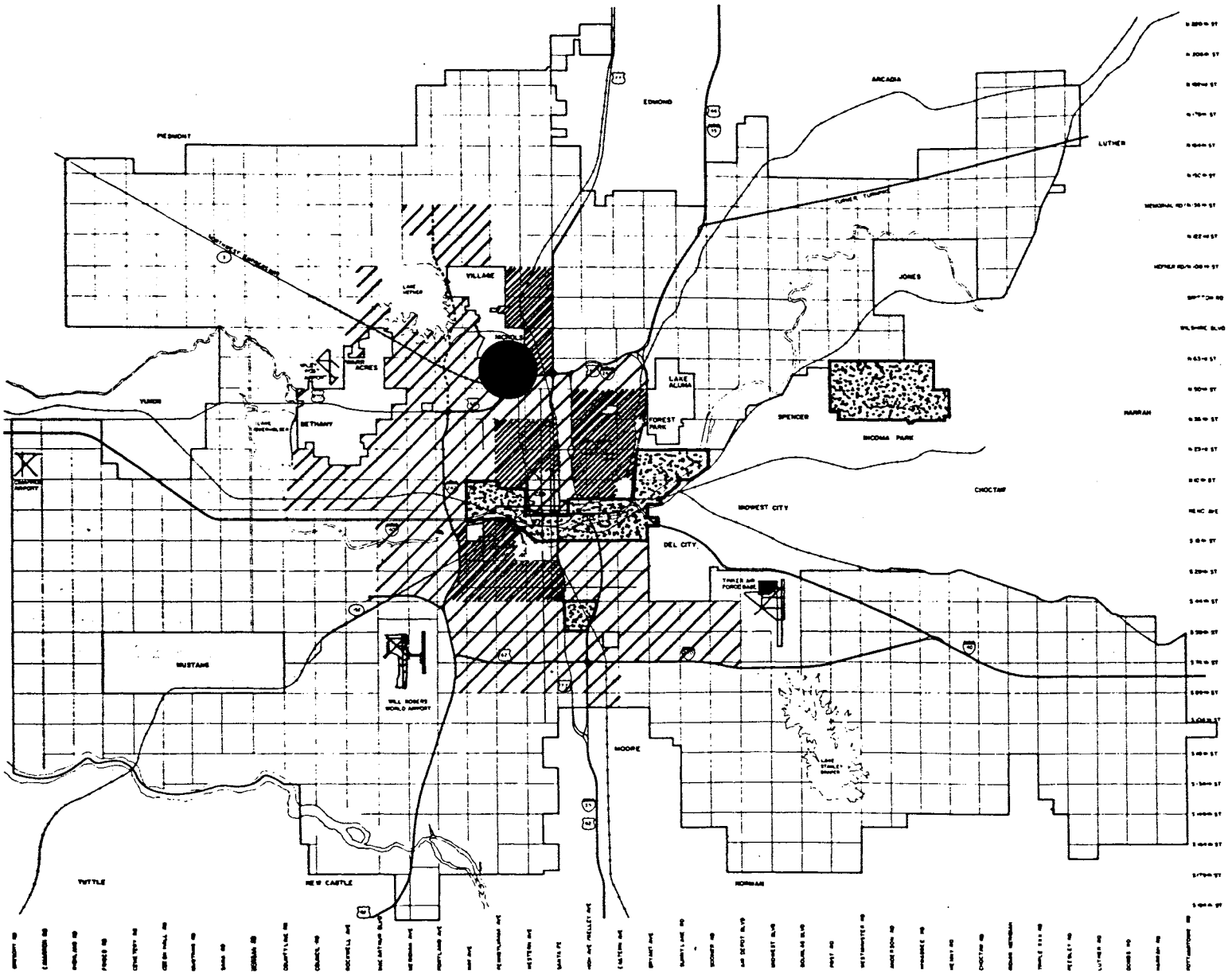
LEGEND
concentrated maintenance an upgrading
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correction of pro and routine maintenance (urban fringe/rur
special maintena for severe probl only
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PIEDMONT
VILLAGE
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LAKE ARCADIA
FOREST PARK
SPENCER
HARRAH
BETHANY
YUKON
MIDWEST CITY
DEL CITY
CHOCTAW
TINKER AIR FORCE BASE
MUSTANG
WILL ROGERS WORLD AIRPORT
MOORE
NORMAN
WYNNEWOOD
NEW CASTLE

LEGEND
market oriented service area
activity routes
express bus rout
park-and-ride fa
PIEDMONT
EDMOND
ARCADIA
LUTHER
JONES
VILLAGE
LAKE HEFNER
HIDDEN ACRES
YUKON
BETHANY
LAKE ALUMA
FOREST PARK
SPENCER
NICOMA PARK
HARRAH
WILL ROGERS WORLD AIRPORT
MIDWEST CITY
DEL CITY
TINKER AIR FORCE BASE
OKLAHOMA CITY
MOORE
SOUTH LAKE
TUTTLE
NEW CASTLE
NORMAN

LEGEND
fully served
new sewer
new water
new sewer and
PIEDMONT
EDMOND
ARCADIA
LUTHER
VILLAGE
JONES
BETHANY
SPENCER
NICOMA PARK
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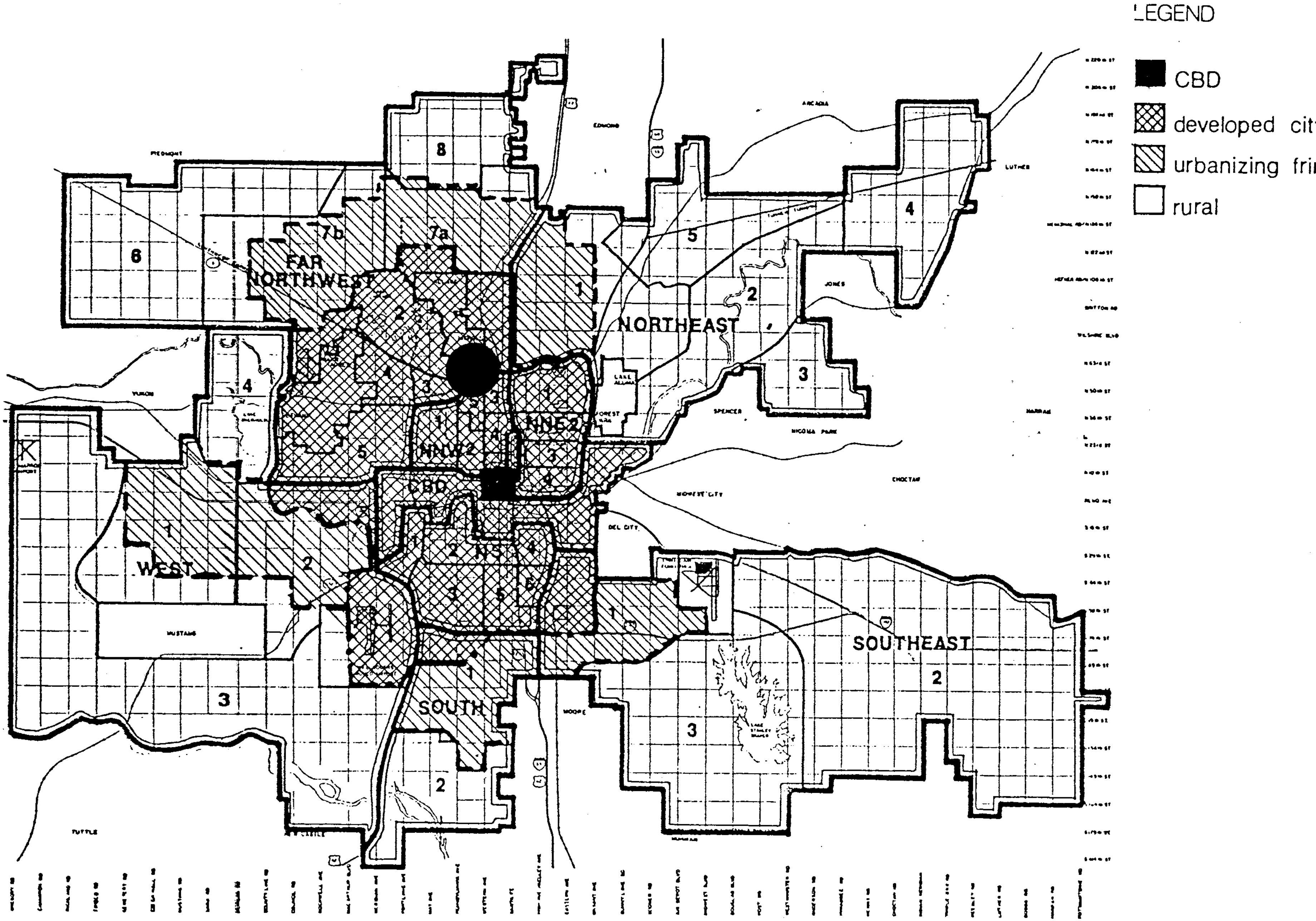
MIDWEST CITY
DEL CITY
MUSTANG
MOORE
TUTTLE
NEW CASTLE
NORMAN



LEGEND
CBD
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rural
FAR NORTHWEST
NORTHEAST
NNE2
NNW2
CBD
WEST
SOUTH
SOUTHEAST

LEGEND
new suburban gr
major activity centers / corridor
industrial areas
neighborhood pr tion areas
neighborhood re zation areas
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EDMOND
ARCADIA
LUTHER
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VILLAGE
NICHOLS HILLS
LAKE HEFNER
WARR ACRES
BETHANY
YUKON
LAKE ALUMA
FOREST PARK
SPENCER
HARRAH
NICOMA PARK
CHOCTAW
MIDWEST CITY
DEL CITY
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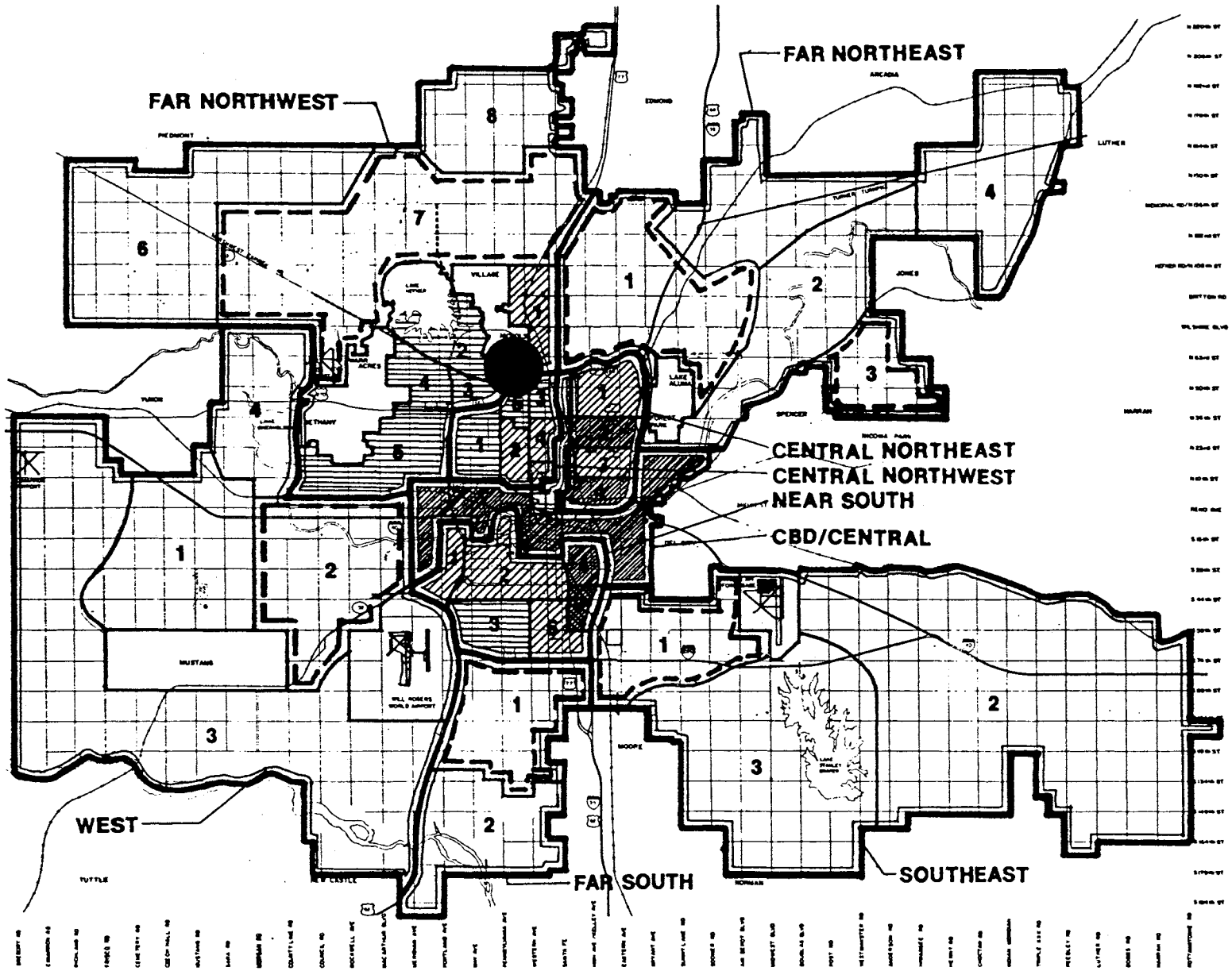
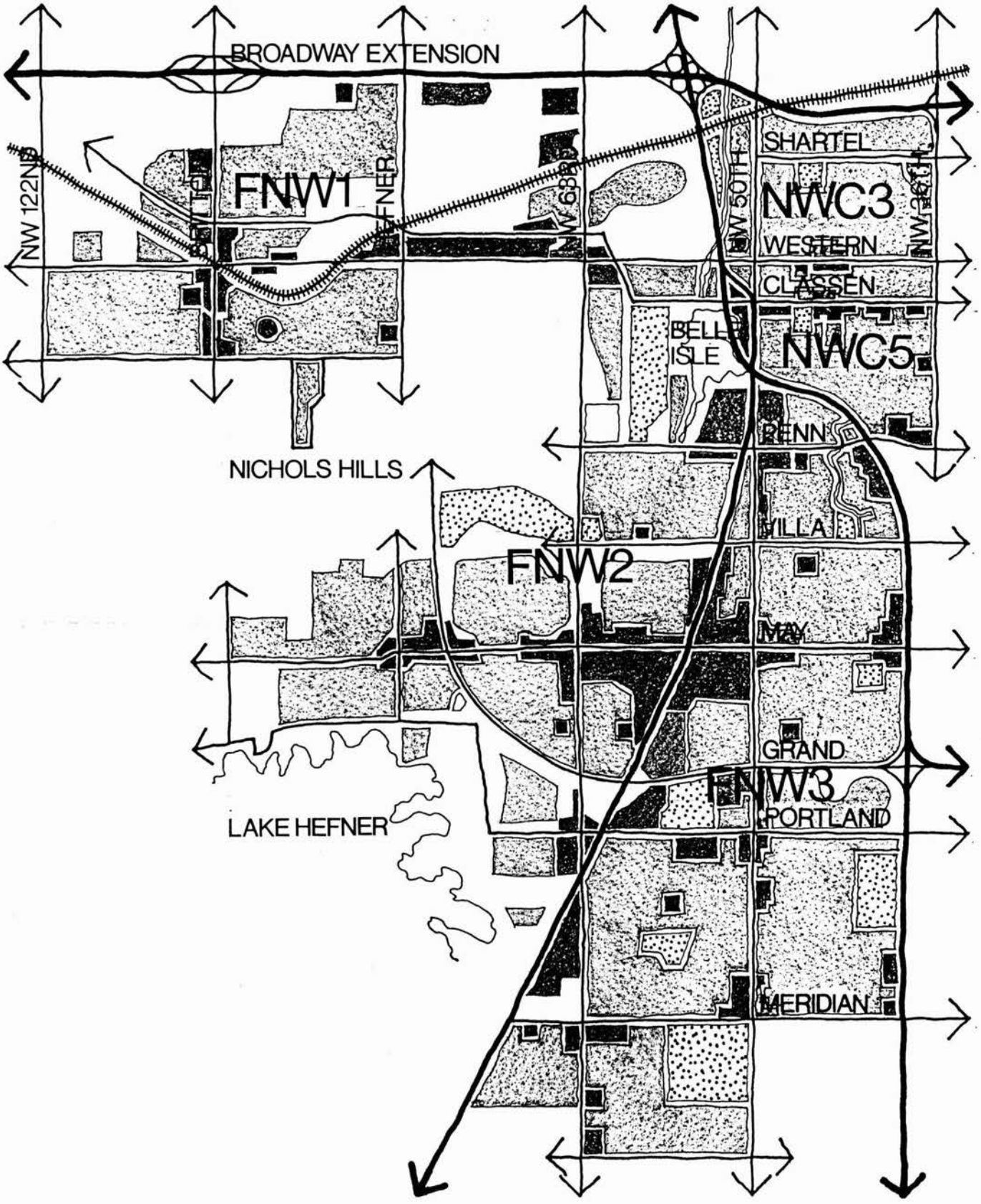
WILL ROGERS WORLD AIRPORT
MUSTANG
MOORE
LAKE STANLEY DRAPER
TUTTLE
NEW CASTLE
NORMAN

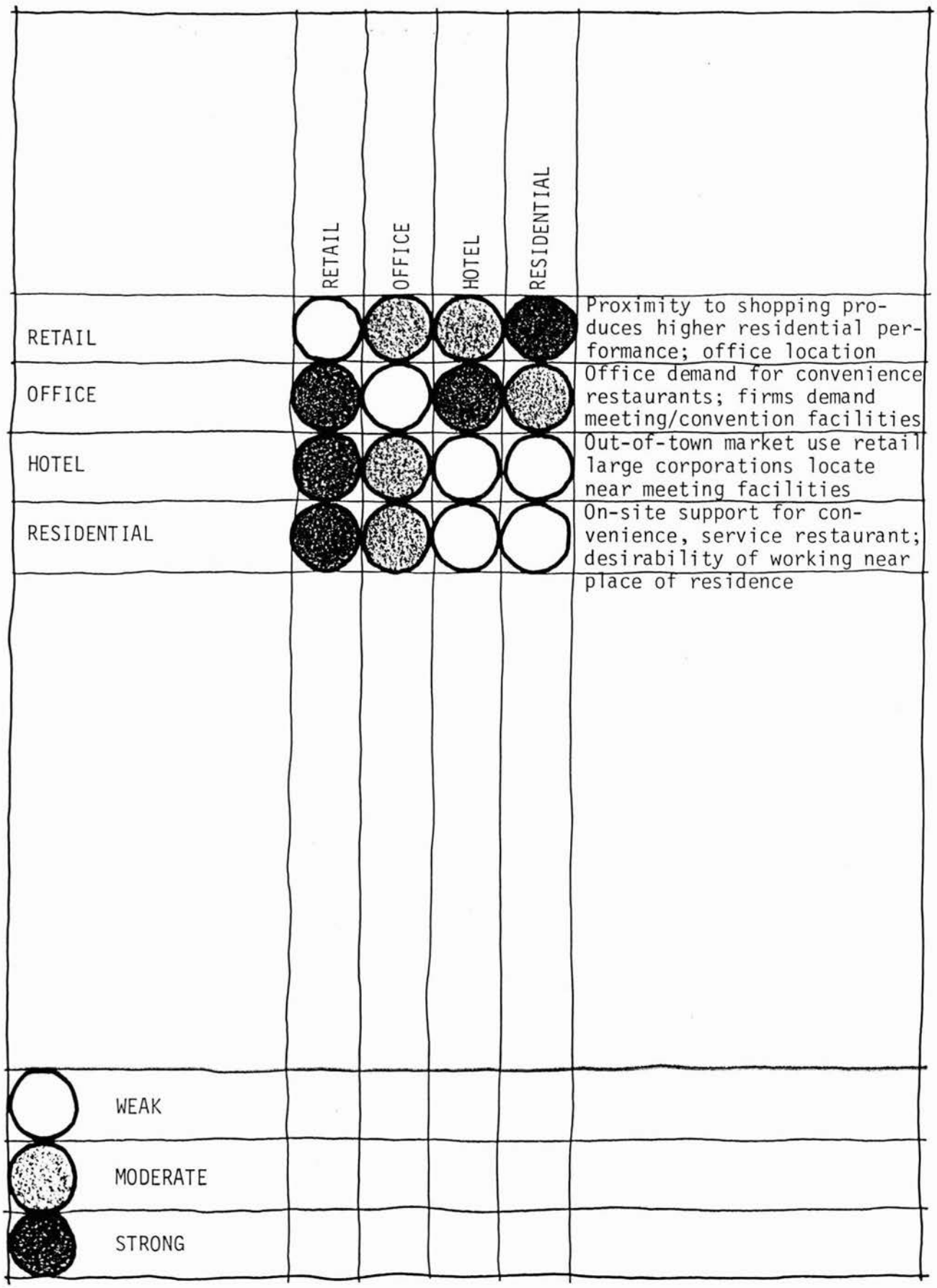

FAR NORTHWEST
FAR NORTHEAST
CENTRAL NORTHEAST
CENTRAL NORTHWEST
NEAR SOUTH
CBD/CENTRAL
WEST
FAR SOUTH
SOUTHEAST
LEGEND
undeveloped
partially develop
stage I
stage II
stage III
stage IV

LEGEND
new suburban g
major activity centers / corrido
industrial areas
neighborhood pr tion areas
neighborhood re zation areas
EDMOND
ARCADIA
LUTHER
PIEDMONT
YUKON
BETHANY
LAKE ALUMA
SPENCER
HARRAH
MIDWEST CITY
DEL CITY
MUSTANG
MOORE
TUTTLE
NEW CASTLE
NORMAN

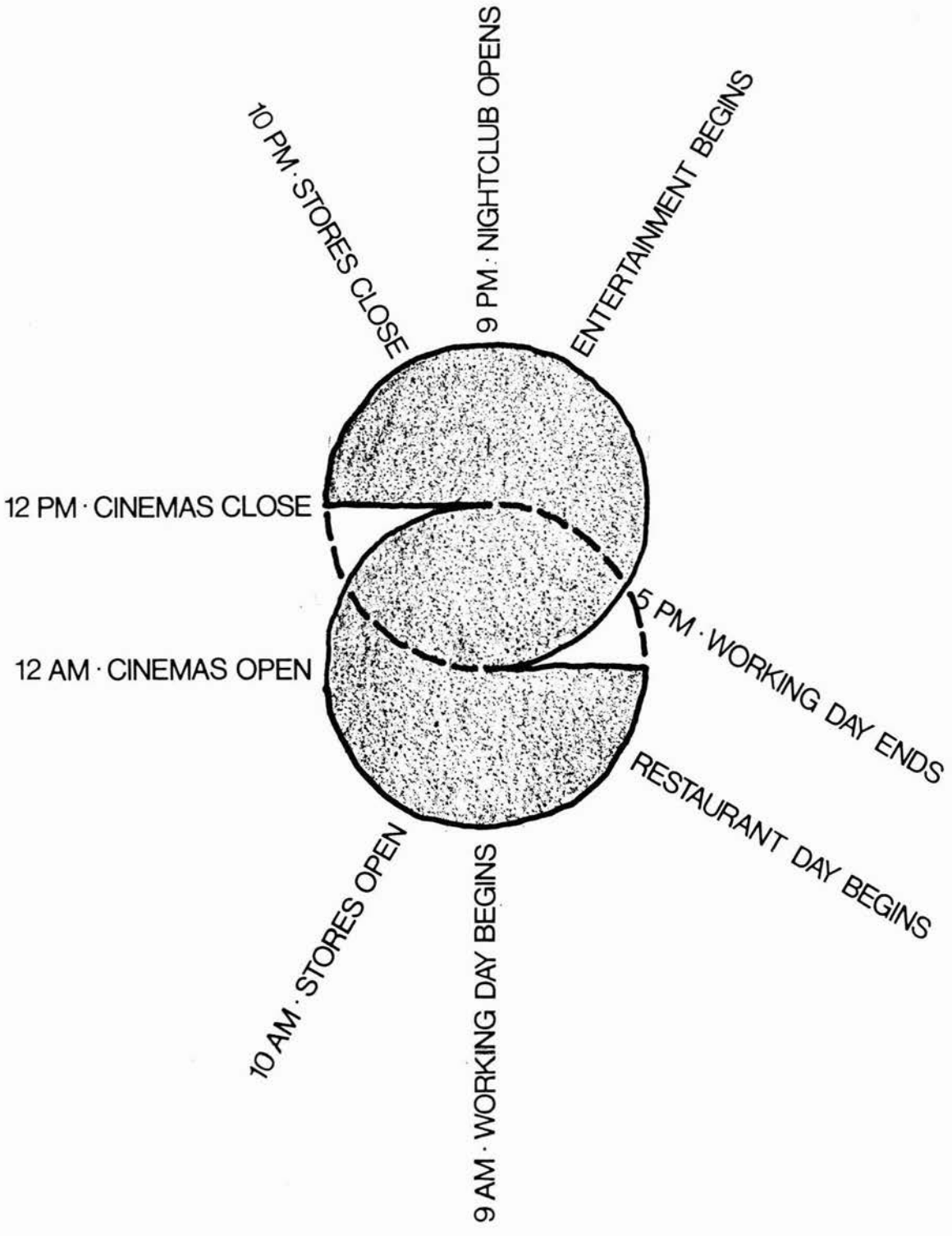
STRATEGY



PRIMARY MARKET



MARKET SYNERGY



24 HOUR CYCLE

1977-1987	CITY	NWC	FNW	NWC 3, 5	FNW 1, 2, 3	TOTAL	ADJUSTED TOTAL	MARKET SYNERGY
POPULATION	396,000			6500	33000	39500	2834	5668
HOUSING (UNITS)	57500	1500	24700	136	981	1117	1417	2242
SINGLE-FAMILY				122	699	821	550	1099
MULTI-FAMILY				14	282	296	572	1143
RETAIL (SF)	2,375,000	57000	933,000	19000	215,000	334,000	22098	44195
OFFICE (SF)	3,200,000			12000	91000	103,000	320,000	640,000
HOTEL (ROOMS)	4300		1000			500	500	1000

MARKET DEMAND

Environment

History

Robert Lake settled and established the Circle Bar Ranch where the North Canadian River made a crooked thread over the western prairies. In this hook of the river, Lake built a branding pen. Back of the pen and fringing the red bank of the stream, grew a little grove of small ash, oak, cottonwood and elm, which formed an ideal playground for picnics, parties and dances of the area.

On the upper side of the cross-timber pasture, and about four miles north of the ranch house, three small streams with insignificant sources, somewhere out in the old buffalo lands came into confluence forming Deep Fork. A few hundred feet east of this point, Charles Lake constructed a dam. Upstream was a long, narrow excavation made to retain waters equal to the ability of the dam to hold. These streams furnished clear water quite superior to the muddy liquid of the Canadian for the horses and spring calves.

In 1907, John Shartel and Anton Classen, who owned Oklahoma City Railway Company, purchased the land. A substantial dam with concrete spillway was built on Deep Fork, forming a large lake to furnish water for their steam generating plant. In 1922, the Oklahoma City Railway Company spent $200,000 to erect a new power station and $180,000 to improve the park and hoped to construct an interurban to Britton and Edmond. The interurban later extended to Guthrie.

In thirty years, the former farm pond had become a great lake with long, meandering inlets, furnishing shady retreats and picturesque nooks, a small wooded island created by canals cut from one inlet to another, and became known as Belle Isle, a 200 acre park.

Shartel and Classen's street cars ran down Classen Boulevard with Belle Isle as the turnaround point. Belle Isle was considered one of Oklahoma City's foremost entertainment attractions. Officials bragged that as many as 1,200 passed through the park on a busy Sunday. The park featured a merry-go-round, roller coaster, canoes and rowboats, kiddie cars, water swings, picnic spots, a dance pavilion, and a boardwalk cafe. The present business district to the south of the lake was one of Belle Isle's picnic grounds. Rows of wooden tables and benches were scattered amid a grove of tall cottonwoods and sycamores. "Honeymoon Bridge," a popular spot for marriage proposals, led to Picnic Island and the dance pavilion, where one could tap to the music of Clarence Tackett's Toe Teasers.

Physiography

In 1928, Oklahoma Gas & Electric Company purchased the Belle Isle property from Oklahoma Railway. A new power plant was erected on the north shore of the lake. The power company left Belle Isle Park open to the public for picnics and gatherings until 1953. But after construction of the power plant, only shore fishing was permitted. All commercial concessions were also removed. One huge sycamore remains at the old picnic grounds and Honeymoon Bridge stretches across the deserted lake. The original generator station was demolished in 1960 and the present station permanently shut down in 1980.

The Belle Isle Station remains relatively unaltered physically. It is a steel-framed, non-loadbearing, solid brick shell. A utilization study performed in 1980 found the building to be sound and feasible for retrofit. The station and outbuildings could be of historic value.

The bulk of the project site is located north of Interstate 140, south of Rosehill Cemetery, east of Penn Square and west of the Belle Isle subdivision. A portion of the site, an OG&E utility easement, extends east to Western Avenue. Belle Isle Lake snakes west along a tributary, separating Penn Square and a residential area to the north. Total area of the site is approximately 120 acres. Of this, 20 acres along the west and south have recently been sold to Penn Square Bank. Approximately 67 acres are below normal water level.

Belle Isle Lake was formed by constructing a dam across the Deep Fork River in the southwest quarter of Section 8, T12N, R3W, Oklahoma County. The dam is 1800' long and has a maximum height of about 22' above the valley floor. The crest is at elevation 1141'. The lake surface is normally at about 1134' and can be controlled by operating the outlet works floodgates. During the years the lake was owned by OG&E, several changes were made. Sheet-pile interior barriers were installed to control lake circulation, a sheet-pile weir was constructed across the channel of the creek flowing into the northwest end of the impoundment and a cellular coffer dam diversion weir was placed across the Deep Fork River at the southwest end of the lake, with a bypass conduit to divert low stream-flows around the lake.

The topographic character of the subject property is the product primarily of man's activities during the past 80 years. Landfill operations scaled to accommodate commercial developments such as the Penn Square Shopping Center have flattened the land to the extent that, today, there are little topographic relief and no significant natural features on-site, save the lake. Even Belle Isle Lake is an artificial creation which has grown smaller and shallower through urban encroachment and neglect.

The area surrounding the lake rises imperceptively northward from about 1135 feet in elevation to 1165 feet in elevation, producing an average slope gradient or less than 2%. It and the lake are part of the Deep Fork drainage basin.

For design purposes, the grades over the site will easily accept large facilities such as office buildings, roads, and surface parking lots without difficulty of construction or burdensome expense, and the erosion potentials, except along the lake and stream banks, is low.

Hydrography Belle Isle Lake is presently a very shallow body of water. The original depths and extent are not accurately known, but both have been affected by natural sedimentation processes and deposit of manmade fills. During the last 30 years this has resulted in encroachment upon the lake, especially the south side. The average present depth of water in the lake is about two to three feet, with a maximum depth of seven feet. A function of the lake is to provide a flood-relief basin. Estimated depth of the lake during a ten year flood is 1135, varying to 1139.5 during a 500 year flood. Approximately 4,000 CFS of drainage from Deep Fork is piped around the lake with the remainder flowing into the lake. Cloverleaf and Golf Course creeks contribute directly to the lake, making the most significant contribution to the lake water level during normal operation. A ten-year flood adds overflow from Deep Fork to this to produce a maximum drainage of 10,851 CFS. If the creeks were to be channelized into approximately the original course (before damming), the free water surface in the river would be approximately 12 to 15 feet below the free water surface of the lake. A channelization would basically continue the depths of the creeks, resulting in a water depth of ten feet during normal operation, 11 feet for a ten year flood, to 15.5 feet during a 500 year flood, assuming a continuation of the steam bed depth.

The direct consequence of draining the lake would be a permanent lowering of the ground water in the vicinity of the lake. This might lead to soil consolidation and area subsidence owing to the increase in overburden pressure that would result from the increased unit weight of the soil strata between the present and future elevation of the water table. The water table appears to be two to seven feet below the lake surface. The lake controls the ground water elevation in the near vicinity of its present and past shoreline. However, the influence has not extended more than about 200 feet from the lake.

After the lake is drained and the creek channels re-established, the relative position of the free water and ground water surfaces probably would be permanently reversed. This is, the general water table would not be expected to descend to the elevation of the stream surface but, rather, to rise from the stream surface toward its present elevation with increasing distance from the stream channel. If the river were to be channelized in approximately its original course, the maximum lowering of the ground water table, estimated at eight or nine feet, would occur in the soft sediments now lying in the lake. In areas presently developed, the ground water table probably would not drop by more than five feet. No effect should be noticed along the creek south of the cellular dam or east of the dam which formed the initial impoundment.

Geology

In the area of Belle Isle Lake, the Deep Fork River has cut its valley into the Hennessey, a Permian Period geological formation consisting of blocky day-shales and mudstone. Parts of the valley, including that occupied by the lake, are overlaid by Quarternary (recent) sediments. Those alluvial deposits range from clays, through silts and sands, to gravels; but, for the most part, they are fine-grained cohesive soils, frequently containing organic materials.

The USDA has not prepared a detailed soil survey for this particular area, although it has been done for much of Oklahoma County. The general soils map for Oklahoma County indicates that the Renfrow-Bethany soil series association occurs over this region. These soils are the weathered surface materials of the Hennessey Unit, formed on well-drained uplands and terraces. The near-surface soils are characterized as silt loams (Bethany) or day loams (Renfrow), and exhibit fairly low permeability and moderate to high shrink-swell potential. The depth of intense weathering varies; but partially weathered clays and shales are usually encountered at depths of about four feet, and gradually grade into the unweathered bedrock.

All available information indicates that the lake bottom is covered by eight feet or more of very soft sediments that overlie the original valley alluvium. Manmade fills that extend into former parts of the lake consist of demolition rubble and soil materials excavated from construction projects. These sediments normally have been consolidated under their own weight. The natural soils underlying the sediments are believed to be much less compressible than the sediments. If the creeks were channelized, the blanket of sediments would eventually consolidate, the surface would subside about 12 inches. Because of infiltration of rainfall and the poor surface drainage characteristics, it is not likely that the entire stratum would dry to its shrinkage limit, which would produce subsidence in excess of three feet.

In their present condition the shear strength of the sediments is very low, about 60 to 75 pounds per square foot, and the ultimate bearing capacity is approximately 200 pounds per square foot. Fills more than two feet in thickness could not be placed over these materials without causing failure and displacement of the soils. The capability for supporting fill can be improved by allowing a drying crust to form before placing fill. If the soils below the crust remain fairly soft after the lake is drained, in spite of some consolidation due to increased effective stress, the depth of fill could not exceed three feet. The sediments would be 50 percent consolidated under an increased stress of 500 pounds per square foot within two to three months after the lake is drained. The strength would be further improved by this, and somewhat greater depths of fill could be placed over the surface without causing failure of the soil. Increasingly greater depths of fill may be placed after the sediments have been allowed to consolidate for a few months under the previous fill application. The process may require two or three years, but the blanket of sediments normally will have been consolidated under the weight of the fill; additional structural loads will initiate further consolidation. Important or sensitive structures may be founded on the firm Permian formations that underlie the valley alluvium and lake bed sediments.

Structures in the vicinity of Belle Isle Lake will experience no significant movement if the lake is drained, provided that the structures are supported on foundations that extend to the Permian shales that underlie this region. Pavements and structures on shallow foundations within 200 feet of the lake may be expected to experience small movement due to area subsidence.

Vegetation

Much of the primary-succession vegetation has been removed from the site over the past fifty years due to large-scale landfill operations and changes in the way the land has been used. What remains are the comparatively dense stands of overstory and understory deciduous plants located along the edge of Belle Isle Lake and on its islands. Here, where the water table is a few feet below the ground and surface water is readily available, the plant association is riparian. Willow, Elm, and Hackberry are the predominant overstory species.

Over the rest of the site, where natural succession has been disturbed and where microclimatic conditions are fairly uniform, there is limited plant diversity and one predominant physiognomic type. Native grasses have moved into the denuded areas as the first regenerative species.

The degree to which the site is likely to be developed and the scarcity of "specimen" species may preclude salvaging many existing plants. Among other things, they provide food and shelter for wildlife and help to control erosion in a sensitive area. So it is important to re-establish cover as soon as possible after clearing and grading operations have ended. In addition, a revegetation should be prepared in conjunction with any plan for redevelopment. It should include the following recommendations:

1. Maintain vegetation cover during all phases of development to check erosion and, in turn, siltation.

2. Plant to create and maintain a variety of species.

3. Plant to migrate solar radiation and reflection, noise, and wind.

4. Plant for aesthetic affect, to enhance or to screen manmade structures, and to separate or delineate activities. The visual experiences are direct and have market value.

5. Introduce plant materials that complement existing vegetation and conform to existing biotic requirements. New species should naturally adapt to site conditions without extensive irrigation or maintenance.

Traffic

As indicated on the accompanying vicinity map, the project site is located approximately one-half mile northwest of the intersection of Classen Boulevard and the Northwest Highway. Its position within an

area served by a confluence of arterial and collector roads makes it readily accessible from all areas of Oklahoma City. Highway I-240, which is elevated along a short portion of its length to pass over the southern edge of Belle Isle Lake, Classen Boulevard, Northwest Highway, Pennsylvania Avenue and Western Avenue all intersect the site or pass nearby. The downtown business district is 10 minutes away; Will Rogers Airport is about 20 minutes away; the rapidly-expanding bedroom community of Edmond is only 30 minutes away via Broadway Extension; and I-35 is 10 minutes away.

Entrance into the site is limited, however. At the present time, the only approach is east or west along the 50th Street frontage road, then north along Belle Isle Boulevard. Although there are no collector roads leading directly into the site, it is possible to create entrances along Pennsylvania Avenue, immediately north of the Penn Square shopping center, along I-240 which presently exits into the 50th Street frontage road. In addition, the Oklahoma City Transportation Department is altering the existing Classen Circle and plans shortly to upgrade Belle Isle Boulevard, thus both enhancing entry to the site and internal circulation. Classen Circle will be replaced with a 4-way intersection with traffic signal lights, and Belle Isle Boulevard will be rerouted to the northeast corner of the site, widened to two 12' traffic lanes and repaved. The long-range plan is to extend Belle Isle Boulevard along the C.R.I. & P. Railroad until it reaches Western Avenue.

Available traffic information indicates that most of the site's traffic will come from the southeast along I-240 or from the southwest along Northwest Highway, thereby supporting entry along its southern boundary. Also, it may be desirable to evaluate any proposed project's sequence of development with this prediction in mind.

The design of on-site vehicular circulation patterns and arrangements will, of course, be influenced by such linkages. Projected land uses, population densities, physical constraints, and opportunities (notably Belle Isle Lake), and economics are interrelated factors, as well.

As indicated in a previous section, Highway I-240 is located near and along the site's southern boundary. Traffic on it is a major source of noise propagation, and, as such, will have an impact on new development nearby.

Noise

The Environmental Protection Agency (EPA) and the Federal Highway Administration have devised noise level standards based on categories of human activity and highway noise impact models to help determine and attenuate noise levels. Their publications were used in formulating the following noise attenuation model for for the subject property. It is necessarily simple - estimating highway noise impacts can be an involved and complex process which may require computer analysis - but adequate.

Based on information supplied by the Oklahoma City Planning Department and on my own estimates, average daily traffic along Highway I-240 is approximately 40,000 vehicles, of which 90% are automobiles, 5% are medium weight trucks, and 5% are heavy trucks. Average vehicle speed is 55 miles per hour.

Using these figures and the formulas contained in Chapter 4 - "Noise Impact Analysis" of the Environment Impact Analysis Handbook, it is further assumed that the combined auto and truck traffic along Highway I-240 generates an average hour noise level of approximately 76 decibels, and that 5 foot concrete barrier along the north edge of the highway reduces this level by 8 decibels to 68 decibels. The EPA recommends that outdoor noise levels do not exceed an average hourly rate of 45 decibels inside residential buildings and 50 decibels inside offices or retail buildings. City recommendations are slightly higher if the average outdoor-to-indoor attenuation rate is 10 decibels (EPA estimate), outdoor noise levels should not exceed 55 decibels in residential areas, and 60 decibels in commercial areas.

To meet these recommendations, it is obvious that some sort of mitigation measures are called for. Sound may be reduced by interrupting its path of transmission through the use of natural or manmade barriers, or by absorbing its energy, again either naturally or artificially. For the purposes of this study, the latter approach was taken to naturally allow a certain percentage of the noise emanating from Highway I-240 to be absorbed into the air, the percentage absorbed being a function of the distance between the source (Highway I-240) and its receiver (the proposed development). Although atmospheric attenuation cannot generally be included as an effective noise mitigation factor, it seems appropriate in this aituation due to the relatively small reduction in noise levels (approximately 13 decibels) and the location of the site in an area where generally high temperatures and low humidity combine to foster greater absorption rates.

It was determined that an acceptable noise level could be reached at a distance of 200 feet from Highway I-240. The noise level could be reduced so as not to exceed 55 decibels. The resulting "no-build" zone is shown on the accompanying map.

Zoning

The subject property is presently Zoned AA: Agricultural. To the north is Rosehill Cemetery, which is Zoned AA also. Residential developments located east, northeast, and northwest of the property - namely Brookhaven Addition, Meadowbrook Acres, and Wileman 8th Addition - are Zoned R-1: Single-Family Residential. There are several small parcels of land to the east along the east side of Belle Isle Boulevard Zoned I-2: Moderate Industrial, C-3: Community Commercial, or C-4: General Business. Miller's Belle Isle Addition and Belle Isle Center, located along the southern boundary of the site, south of Highway I-240, are zoned C-3 and C-4, respectively. The land surrounding the Penn Square Bank is zoned O-2: General Office. Finally, the land around the Penn Square Shopping Center, which abuts the western boundary of the site, is zoned C-3.

These zoning classifications represent a variety of land uses ranging from family residences to banking operations to retail establishments. It can be assumed that future development in the area should complement these uses. In addition, such development must be intensive to meet market demands. Obviously then, to responsively redevelop the subject property, it will need to be rezoned. If it is held in single ownership, and if it is to be rezoned in toto, there are three suitable options: O-2, C-3, and C-4. Which one is selected will depend upon the eventual program of development and upon the recommendations of the various public planning agencies.

The general office district (O-2) provides "a place for those office and institutional activities that require separate buildings." These activities, in turn, are to act as buffers between established residential neighborhoods and retail or commercial areas. This classification emphasizes office park development, but is flexible enough to permit multi-family residences and a certain amount (measured in floor area) of retail and commercial development. The commercial and retail inclusions are primarily thought of as supplemental; that is, they are to serve tenants of the development only.

The community commercial district (C-3) "is intended for the conduct of business activity which is located at the edge of residential areas, but which serves a larger trade area." The C-3 classification is similar

to, but less restrictive than, the O-2 classification. It allows for a greater variety and percentage of commercial and retail development.

The General Business District (C-4) is the least restrictive in terms of its variety of permitted uses. For this reason, it presents the broadest opportunity for mixed land-use development while creating the most problems related to conflictive usage.

The general business district is "intended for the conduct of wholesale, retail, and office business activities which serve the needs of citizens from anywhere in the metropolitan area rather than being oriented only to surrounding residential areas. The activities conducted...make this district very incompatible with residential development. Therefore, this district should be utilized at points of direct access from freeways...that will be well separated from nearby residential areas."

All three options have similar developmental regulations regarding building setbacks, parcel sizes, building heights, landscaping requirements, etc.

Parking regulations do vary from option to option, but they should only affect the cost of development, not the content of the site program.

The potential danger in rezoning the property C-3 or C-4 is that some of their permitted land uses may conflict with adjacent, off-site land uses. This problem could be avoided, or at least alleviated, through sensitive planning and design, and through the use of protective covenants or other developmental controls. One such control is the Planned Unit Development (PUD), an "overlay" zoning classification, recently adopted by Oklahoma City and included in the revised Planning and Zoning Code. It is described in the following section.

Planned Unit Development

As enacted by Oklahoma City in November of 1980, the Planned Unit Development (PUD) is an alternate approach to conventional land use controls. The PUD may be used for particular tracts or parcels of land that are under common ownderhip and are to be developed as one unit according to a Master Development Plan. The PUD is subject to special review procedures, and once approved by the City Council, it becomes a special zoning classification for the property it represents.

The intent and purpose of the PUD are to:

1. Encourage innovative land development while maintaining appropriate limitations on the character and intensity of use and assuring compatibility with adjoining and proximate properties.

2. Permit flexibility within the development to maximize the unique physical features of the particular site.

3. Encourage efficient use of land, and facilitate economic arrangement of buildings, circulation systems, and encourage provision of open spaces, recreation facilities, and public services.

4. Achieve a continuity of function and design within the development and to encourage diversified living environments and land uses.

5. Provide a vehicle for the planning and development of mixed land use projects utilizing a reallocation of the underlying zoning districts in accordance with a Master Development Plan.

A Planned Unit Development is permitted in any zoning district or combination of districts. The underlying zoning on the property shall continue to establish residential densities; and amount and type of commercial and industrial land uses. The overlay provision permits these uses and densities to be transferred or relocated within the PUD in conformance with an approved Master Development Plan. Where a parcel does not possess the adequate zoning, the PUD must include rezoning to the proper categories.

The maximum number of permitted dwelling units within a PUD shall be calculated by dividing the gross residential area by the minimum land area per dwelling permitted in the underlying zoning district. Gross residential area shall be determined by subtracting from the gross area of the PUD all areas designated for any use other than dwellings, quasi-dwellings, residential open space, and recreational areas. If the PUD is within two or more residential zoning districts, the permitted density shall be the sum of the permitted dwelling units computed separately for the residential area within each district. Location of housing types, however, shall be dependent upon the design in the approved PUD Master Development Plan.

Accessory commercial facilities may be included within the residential portion of a PUD as long as the aggregate floor area of accessory commercial uses does not exceed the lesser of fifty square feet per dwelling unit or a total of 30,000 square feet exclusive of recreational facilities. The accessory commercial uses shall be internally oriented, designed primarily for the service, convenience and benefit of the residents of the PUD. Required parking for the accessory commercial uses may be waived if the Master Development Plan indicates a lesser requirement.

Climatology

Oklahoma City is located approximately 260 miles south of the geographic center of the United States, latitude 35° 24', longitude 97° 36'. The highest point in the city is 1,320 feet in the northwest section; the lowest point is 1,140 feet in the eastern section along the North Canadian River. The climate can be described as temperate, and of the continental type, with cold winters, warm to hot summers, and great extremes of temperature. Portions of this region are frequently invaded by cold dry arctic air masses in winter, and warm moist maritime air often moves northward into the interior of the region during the summers. The contrast between the warm continent and the cooler oceans during the summer months causes air to flow northward over the region (monsoon effect). In winter, a reverse monsoon effect caused by the outflow of cold air from the continent contributes to the southward movement of cold air masses across the region.

Although weather conditions generally are pleasant, this region experiences many violent local storms in the form of tornadoes (8.52 per 10,000 square miles per year, the highest US average), severe thunderstorms, and hail storms. Squall lines in advance of cold fronts, and individual thunderstorms and tornadoes, bring very strong, sometimes destructive winds, particularly in spring and summer.

The discomforts of winter outweigh those of summer, though summer heat is still a design problem. Most of the region is in need of relief from summer heat for as much as 30 to 40 percent of the year. The sun can cause overheating during the summer, spring, and fall, and as a result, an additional 8 to 10 percent of the year can become too hot for comfort.

The region has a number of climatic assets. Although summer humidities are uncomfortably high, the entire region has a good deal of wind. Afternoon humidities drop significantly, allowing natural evaporative cooling. In spring and fall, there is a significant day-to-night temperature swing; on sunny days temperatures

are high but fall into the 40's and 50's at night. The percentage and intensity of sunshine is significant.

Within this overall pattern, however, there are many microscale effects which play an important role in the environment. These will be examined by elements and their variation with site characteristics such as terrain and vegetation.

Because of its relationship with so many other climatic elements, solar radiation is the key factor in climatology on any scale. Its variation during the season gives rise to differences in temperature, pressure, air masses and other major synoptic phenomena. Mean daily solar radiation in January is 200-250 langleys, in July, 550-600.

The annual mean amount is 400-450 langleys. Sky cover accounts for this variation, with 55 percent skycover in January, 45 percent in July, 50 percent annual. The mean annual number of clear days is 150.

In the Oklahoma City area, the mean annual rainfall of 30.22 inches is unevenly distributed throughout the year. The three winter months average 3.93 inches; three spring months 9.97 inches; 3 summer months 8.76 inches; three autumn months 7.56 inches. Lowest average is February with 1.17 inches; highest is May with 4.91 inches. There are about 80 days per year when precipitation exceeds 0.01 inches. Snowfall accounts for a small part of total precipitation, averaging about 9 inches per year, less than 5 days per year with 1 inch or more.

The mean annual temperature in Oklahoma City is 60°F. The three winter months average 30.3°F; three summer months 79.9°F. The highest monthly mean is July with 81.4°F; lowest January with 35.5°F. The mean daily maximum temperature in July is 95°F; in January 40°F. The mean daily minimum temperature in July is 70°F; in January 20°F. The mean annual number of days with a maximum temperature 90°F. and above are about 70. The temperature range in July averages 20-30 degrees; in January, the same. The mean annual temperature range (the difference between mean temperature of warmest and coldest months) is 45 degrees. The mean annual total heating degree days (base 65°F) is 3350; cooling degree days (base 65°F) is 2000.

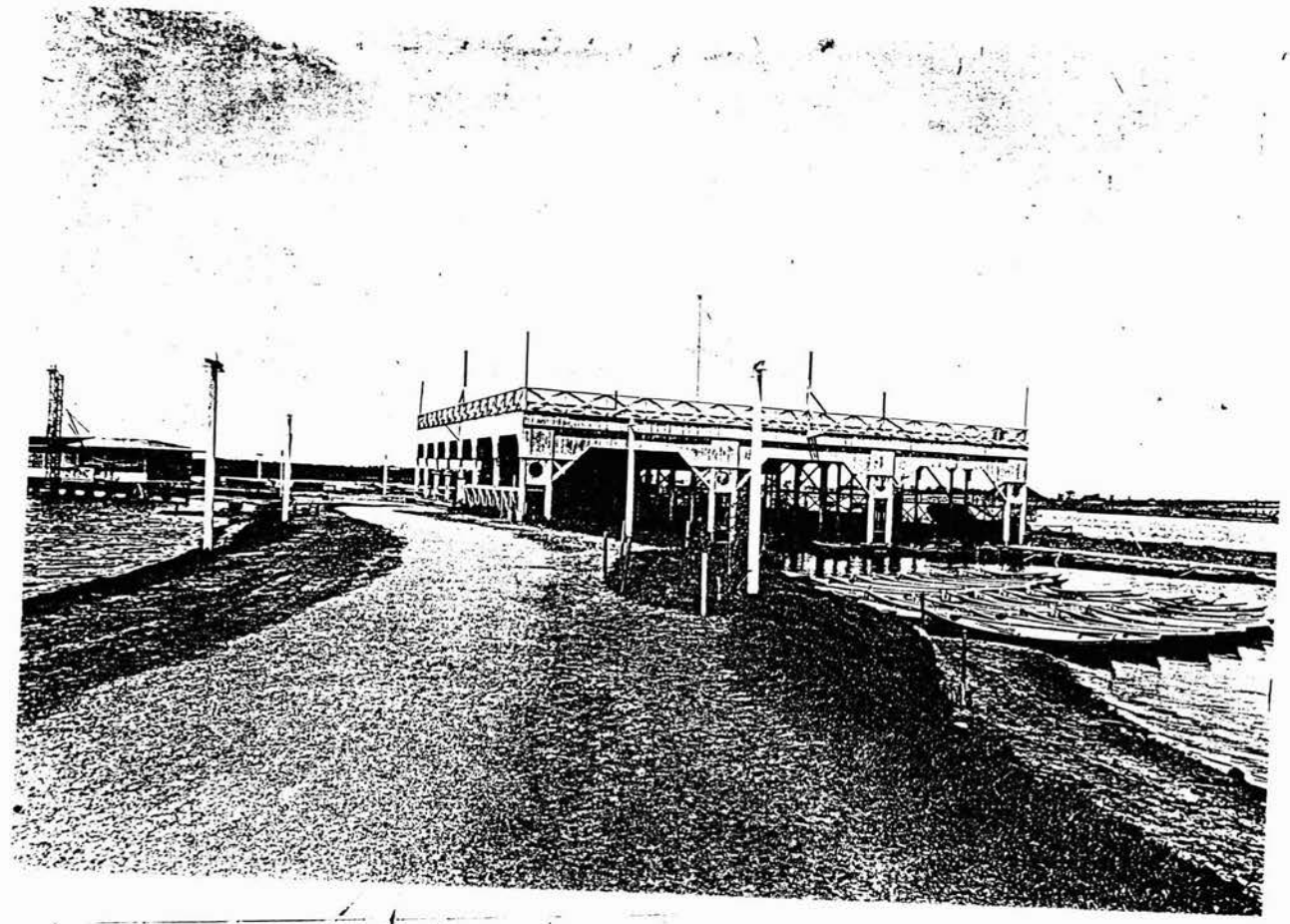
Temperature differences existing in the site will depend on such factors as terrain (slope aspect), vegetation, soil and surface covering type, and the presence

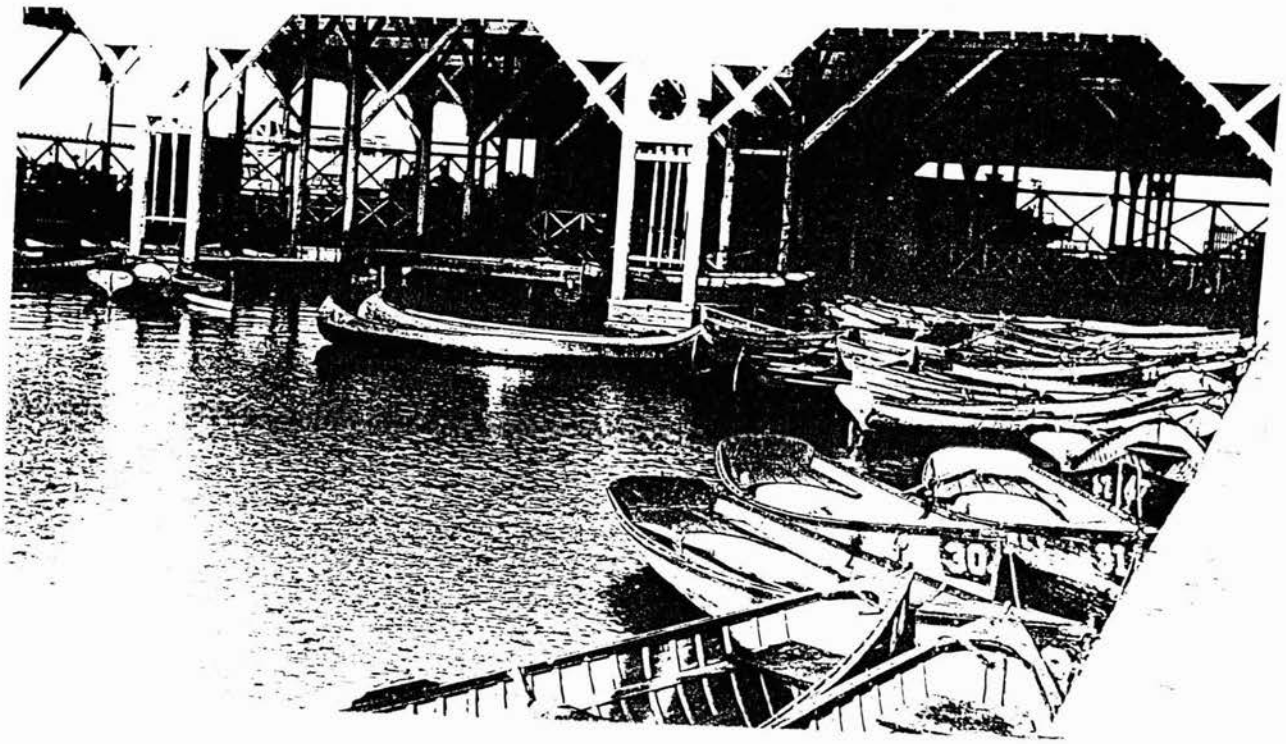
of a large body of water. Deciduous vegetation provides shading for cooling purposes; coniferous vegetation is good for warmth and wind control. Surface coverings such as tar, stone and concrete absorb heat and give rise to high afternoon temperatures, while grassy surfaces serve to retain coolness. Soils such as dry sand allow temperatures to rise and fall more quickly than do most loans or clay soils. Moist grassy surfaces have a smaller diurnal and annual range of temperatures than do dryer sands or paved surfaces.

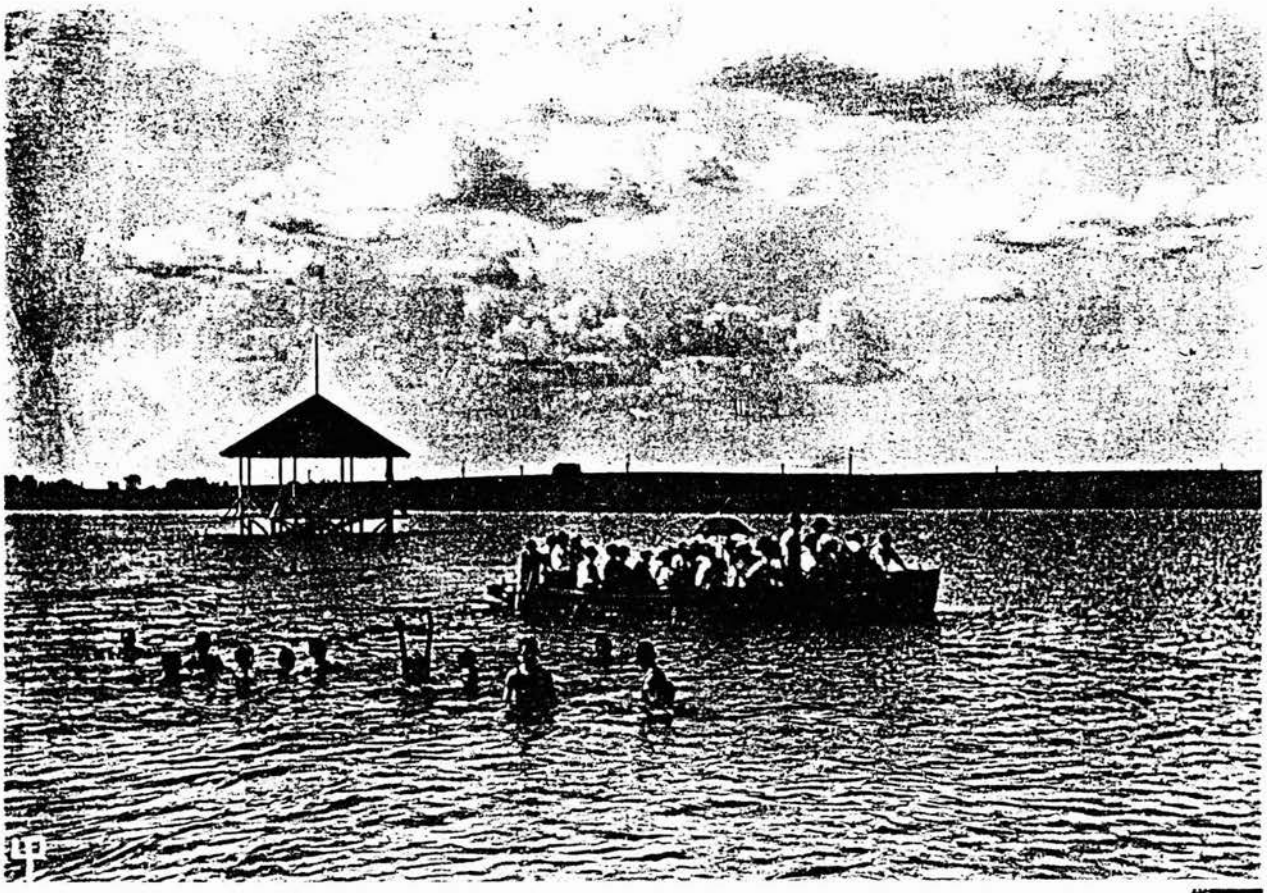
The mean daily highest relative humidity in January is 80 percent; lowest, 45 percent; average, 70 percent. In July, the highest is 80 percent; lowest, 40 percent; average, 60 percent. Annual mean daily is 60 percent, with 57 percent at noon.

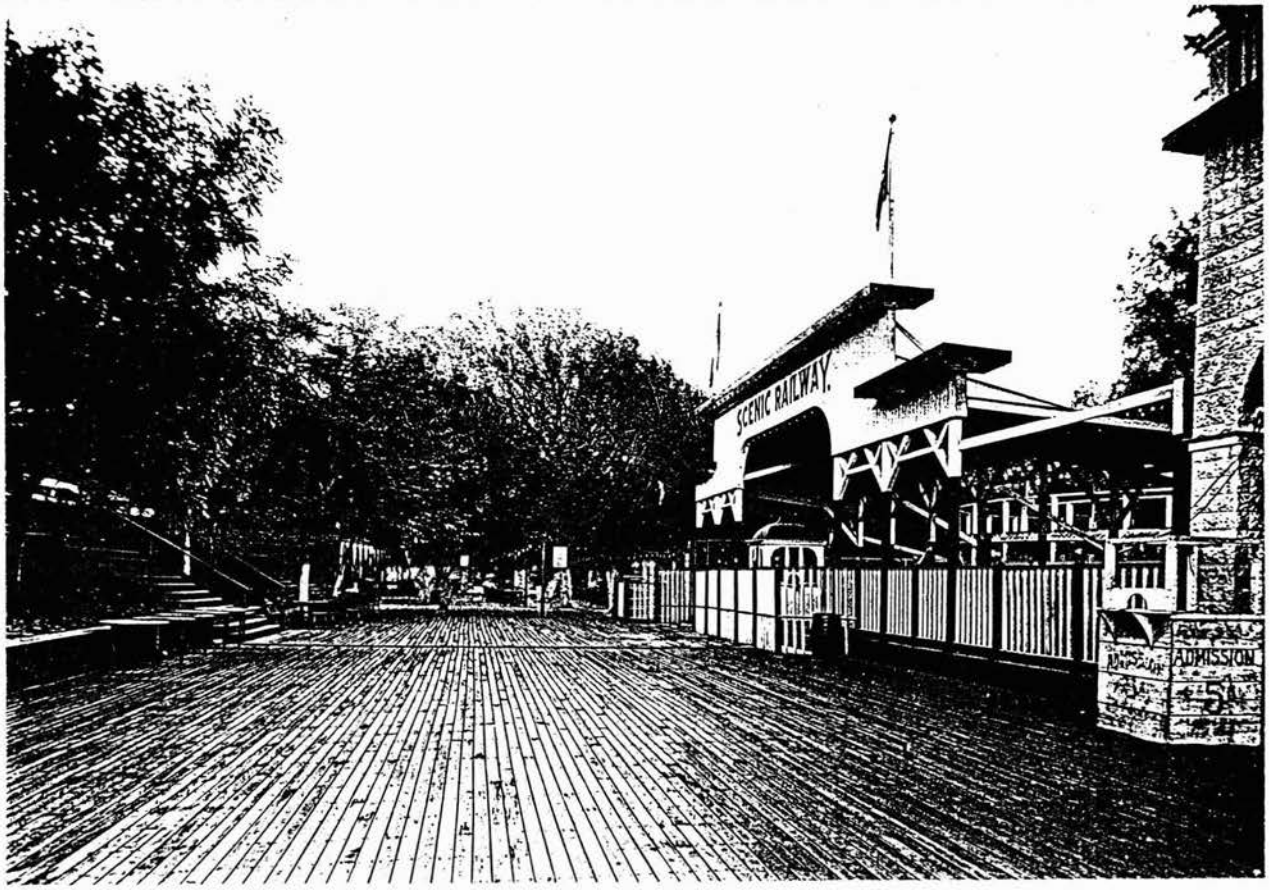
Prevailing winds are south-southwest 10 months out of the year. Only in January and February are they from the north, and then only slightly predominant. Average annual wind velocity is 13.8 MPH; highest monthly is in March with 16.1 MPH; lowest is in August with 11.6 MPH.

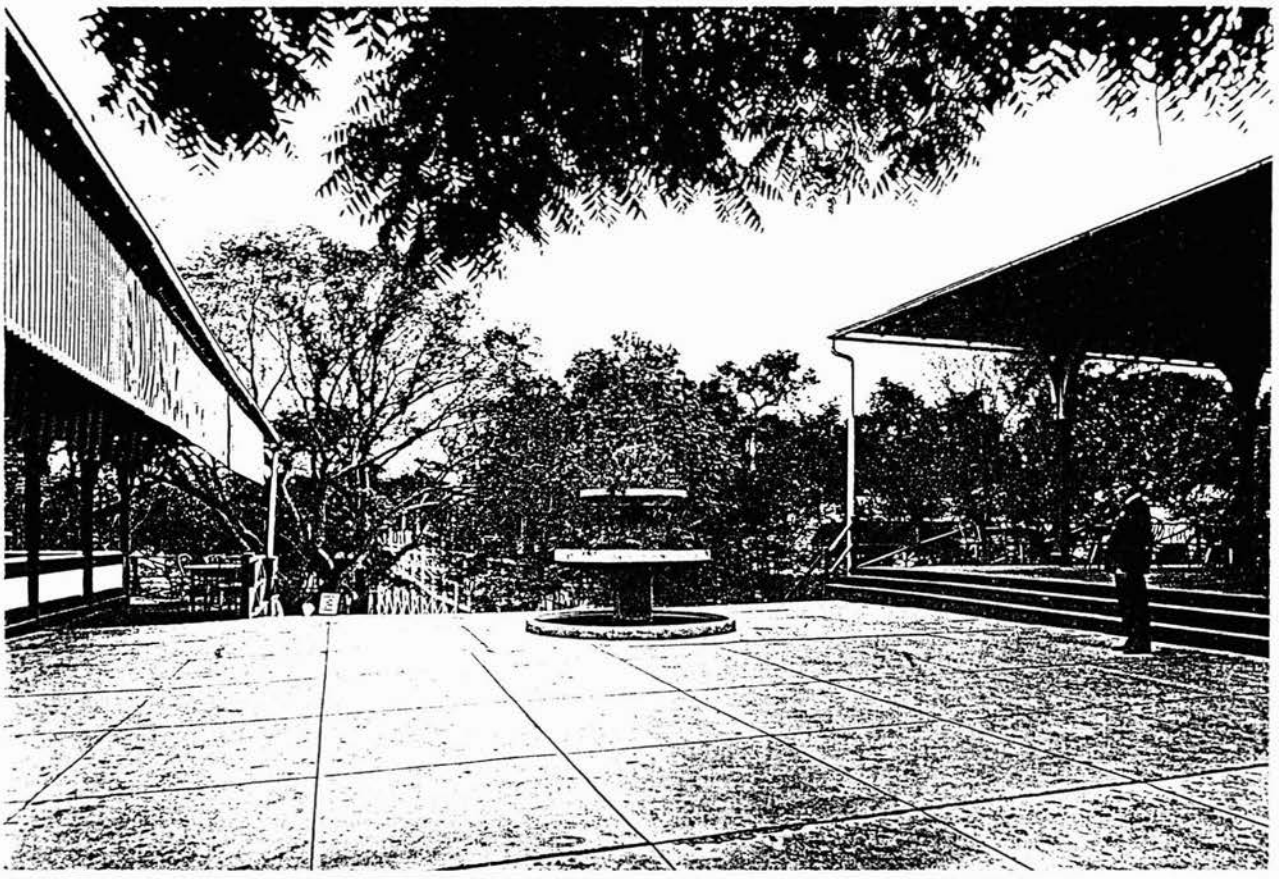
N

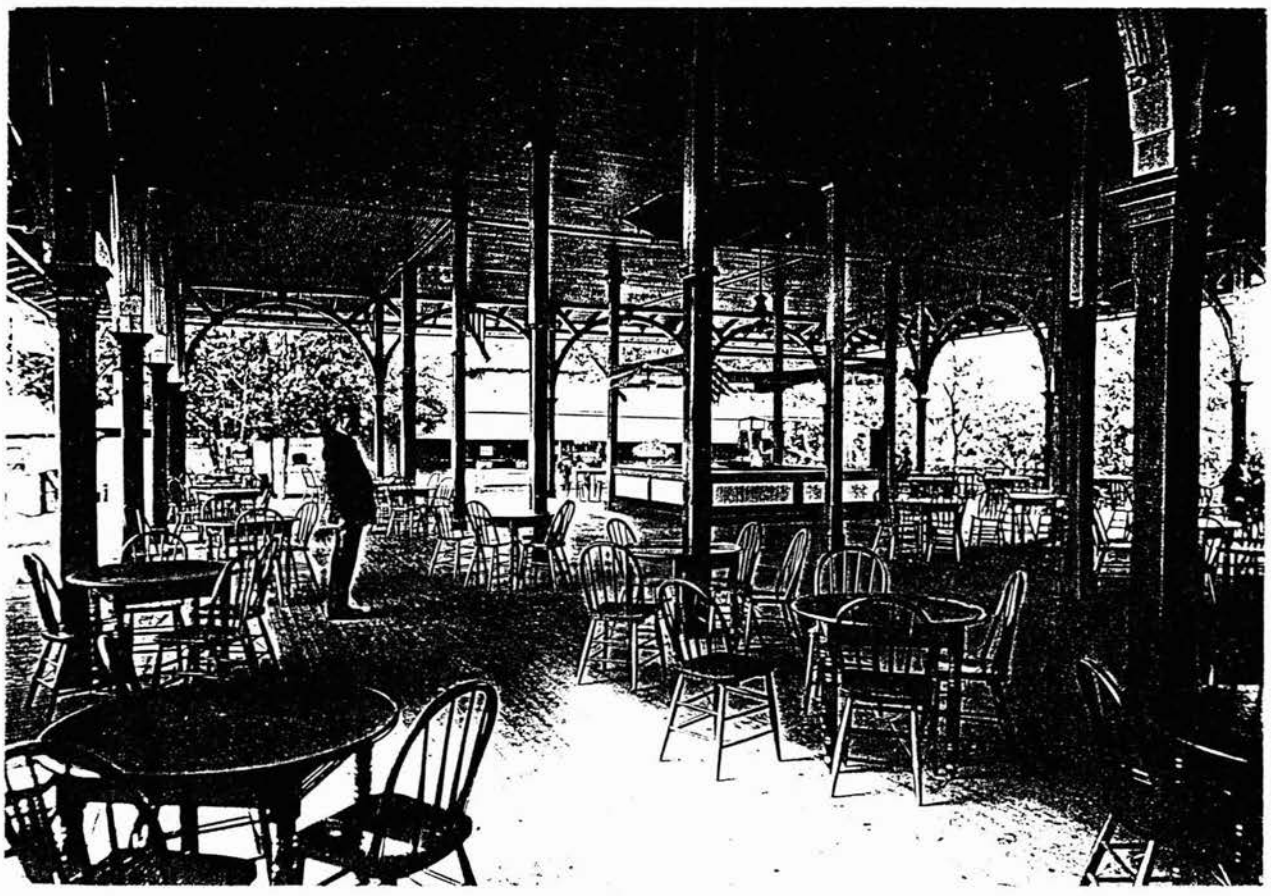


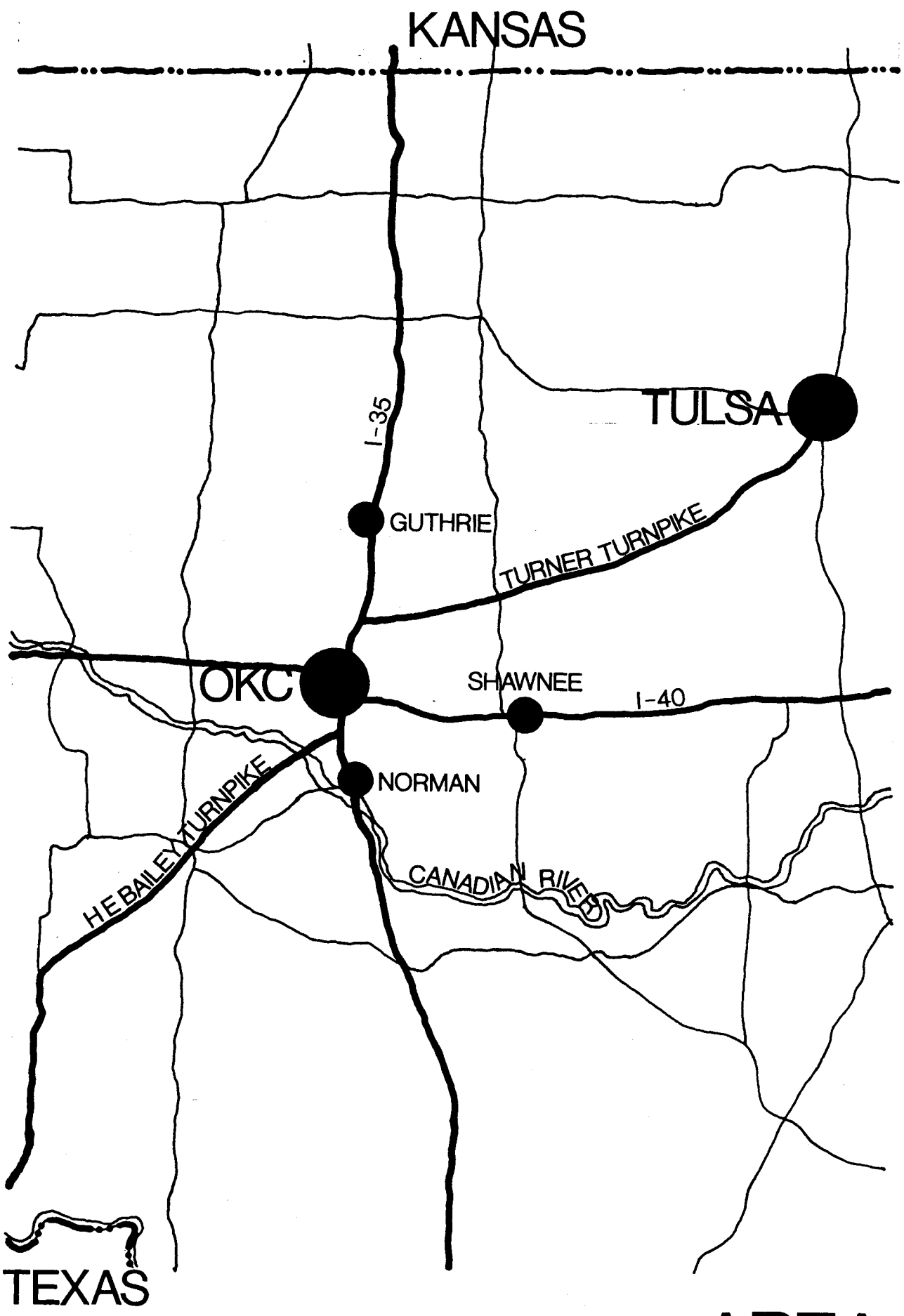




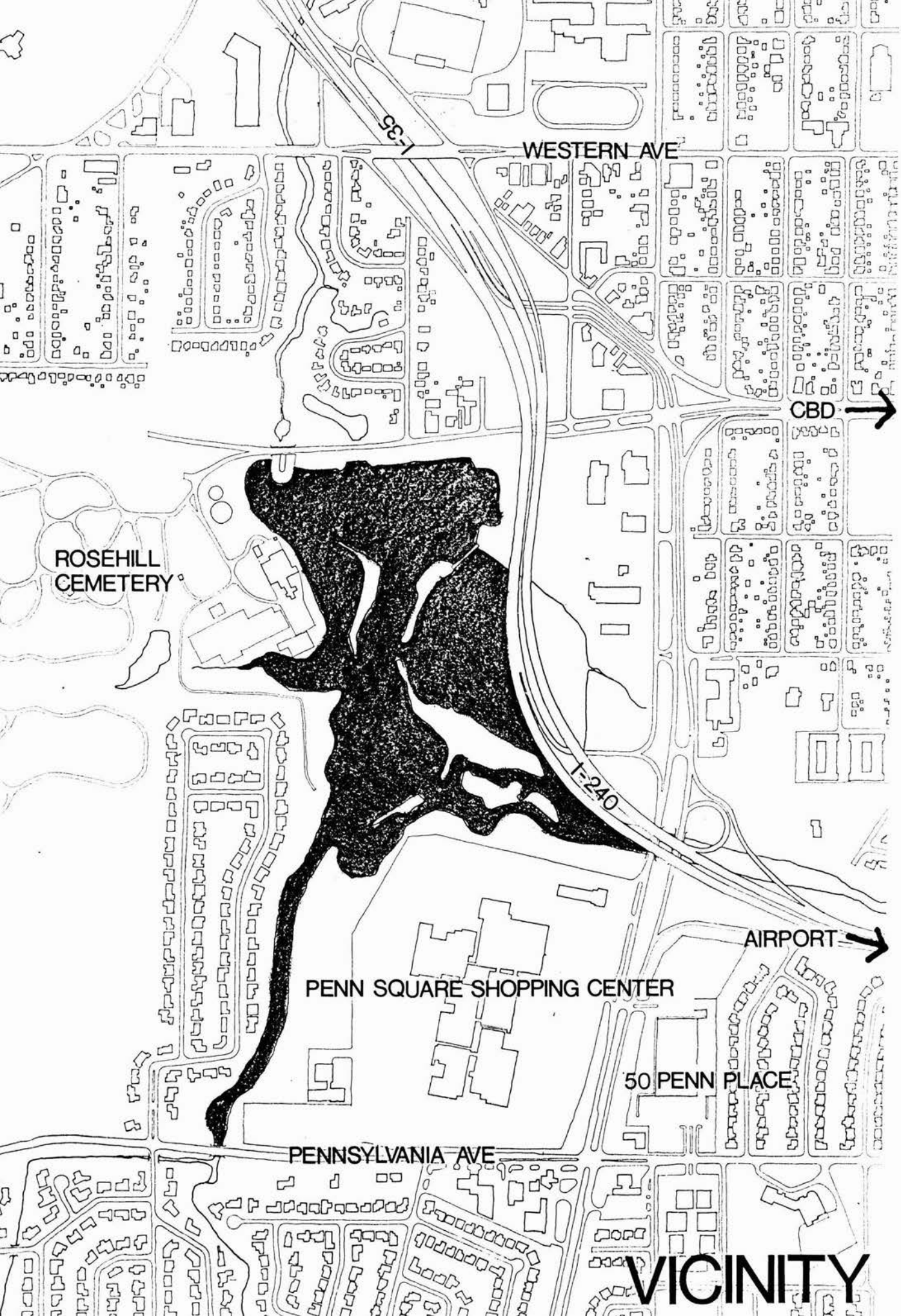

SCENIC RAILWAY.
ADMISSION



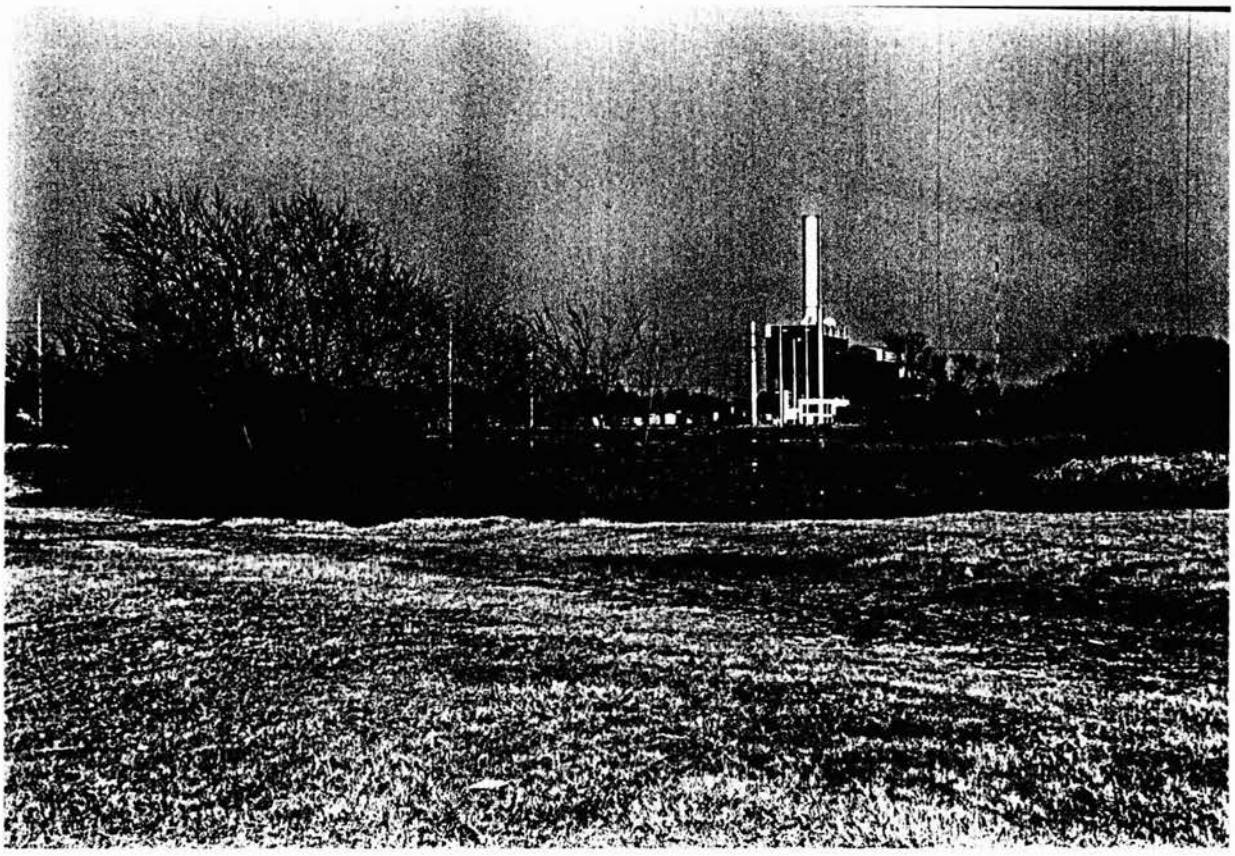



KANSAS
TULSA
I-35
GUTHRIE
TURNER TURNPIKE
OKC
SHAWNEE
I-40
NORMAN
H.E. BAILEY TURNPIKE
CANADIAN RIVER
TEXAS

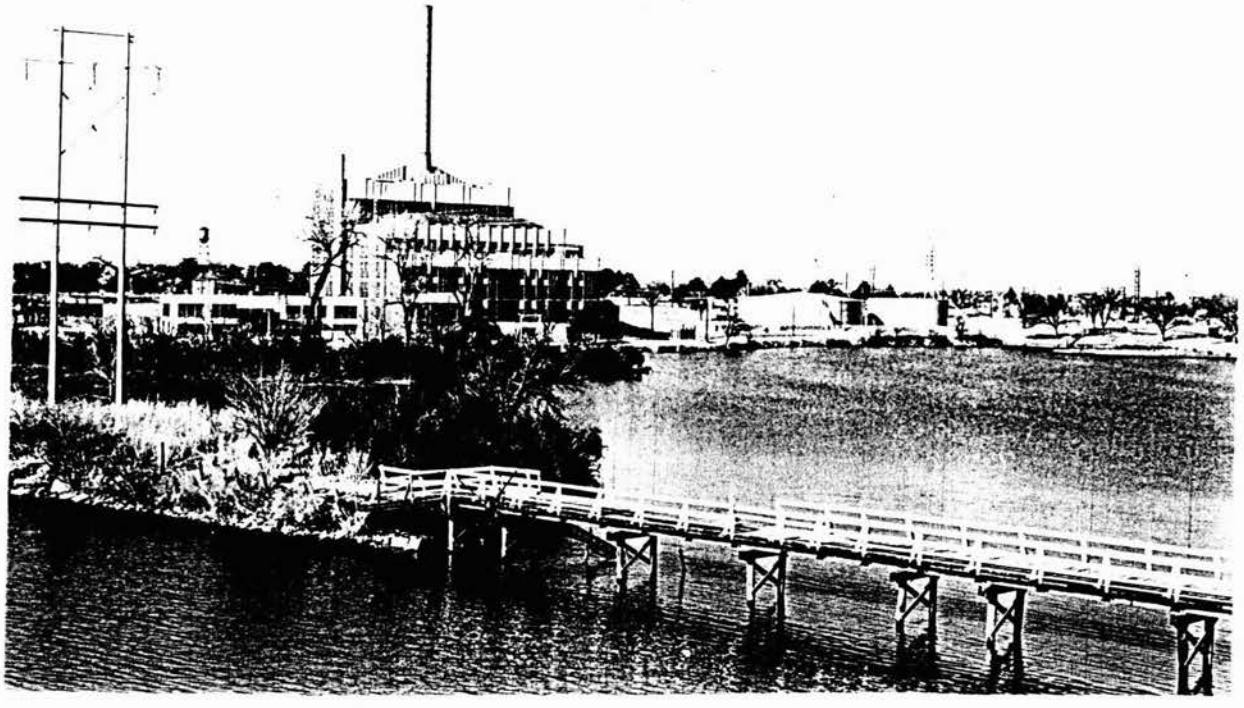
AREA

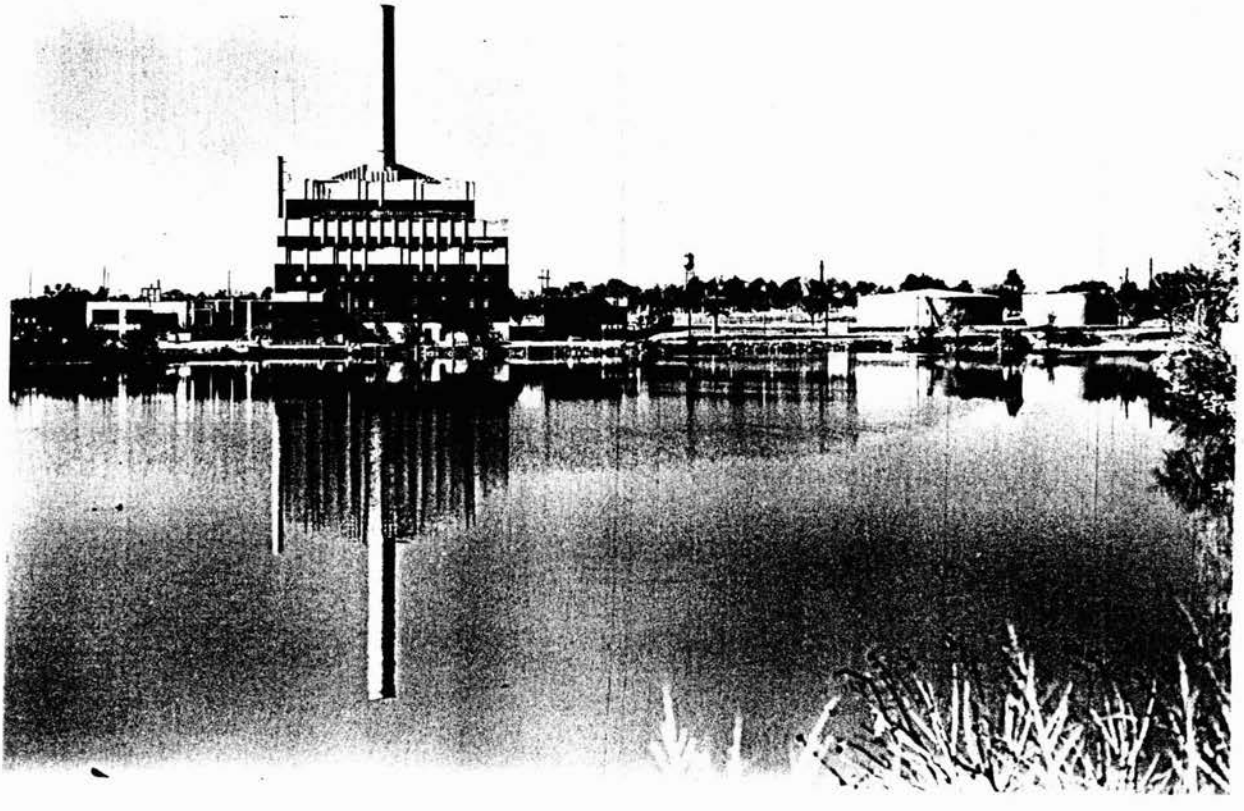

I-35
WESTERN AVE
CBD
ROSEHILL
CEMETERY
I-240
AIRPORT
PENN SQUARE SHOPPING CENTER
50 PENN PLACE
PENNSYLVANIA AVE

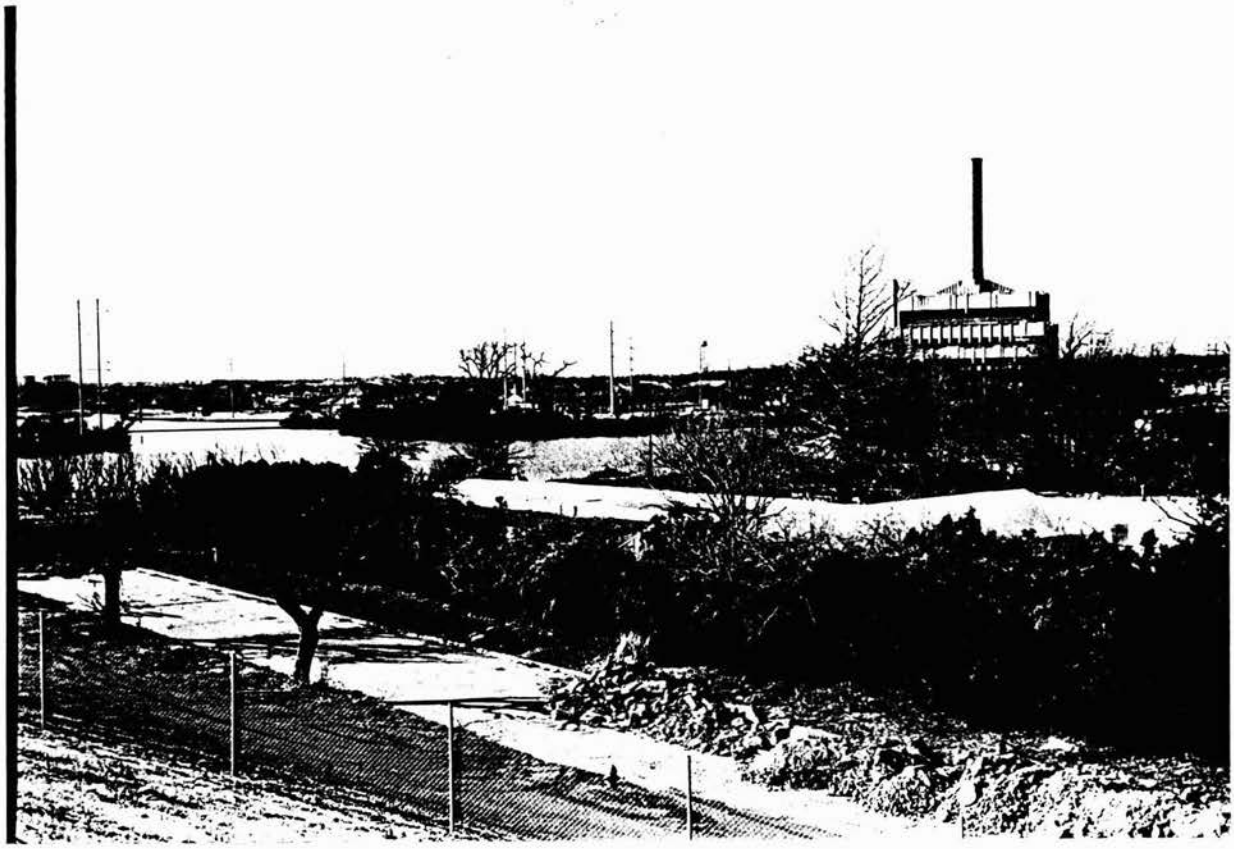
VICINITY

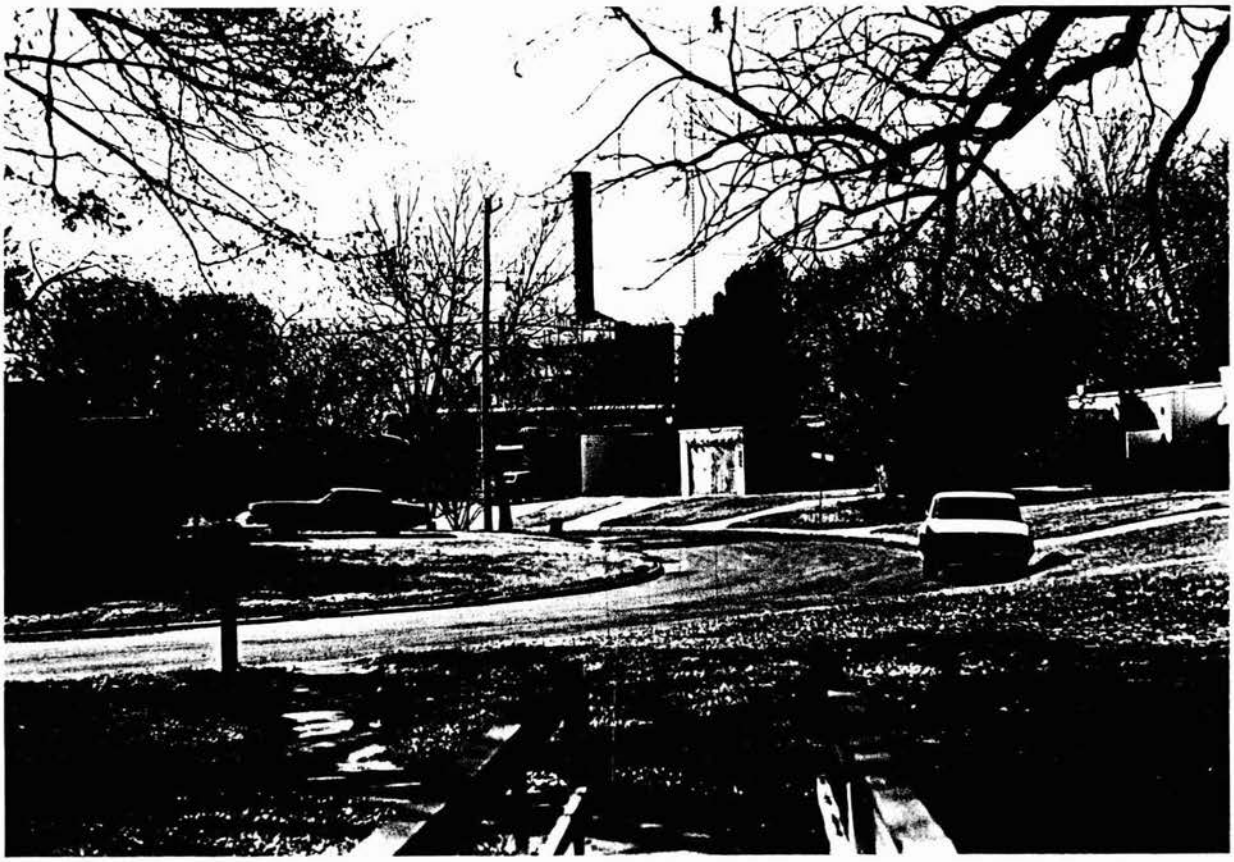


VISUAL SURVEY

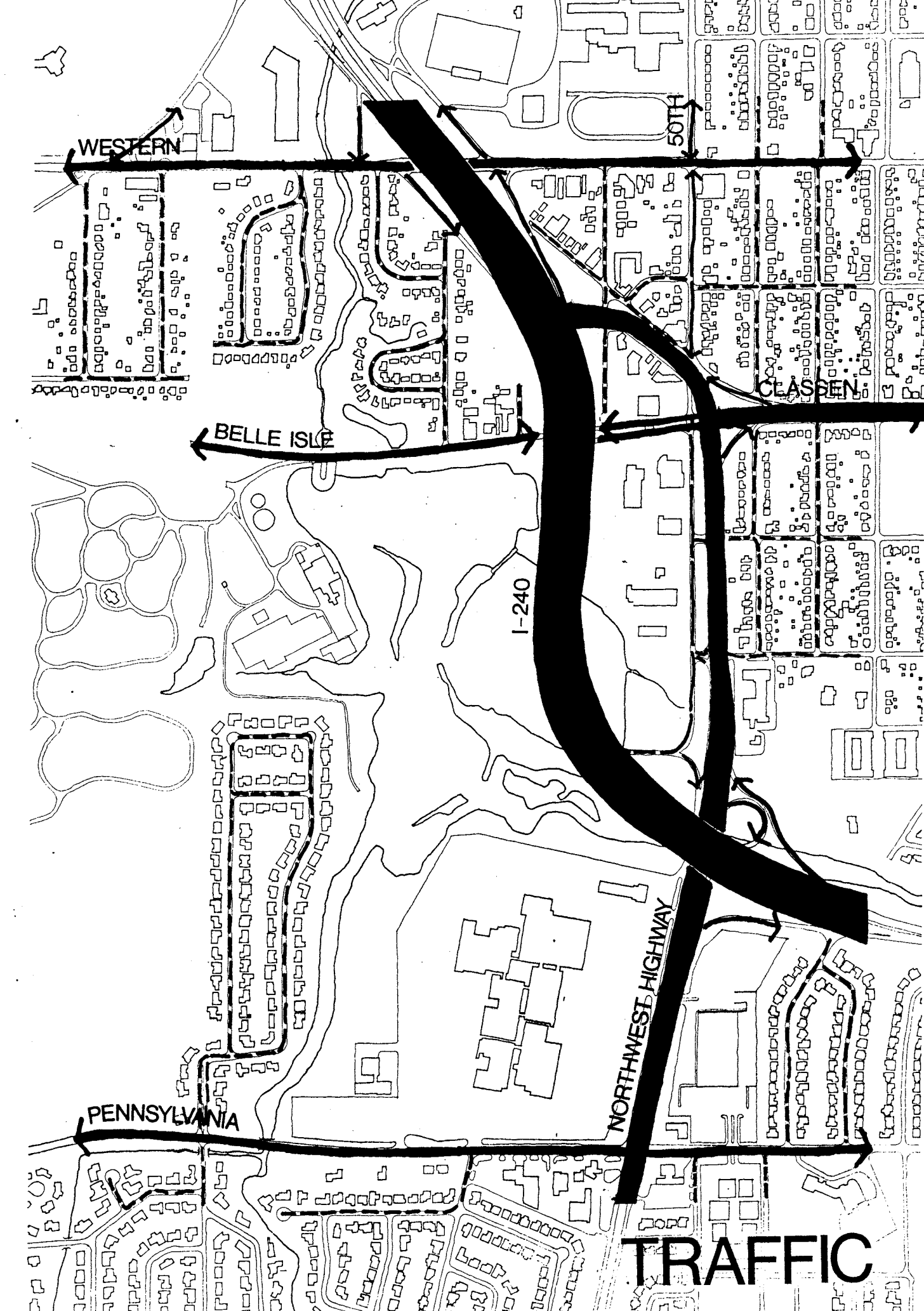








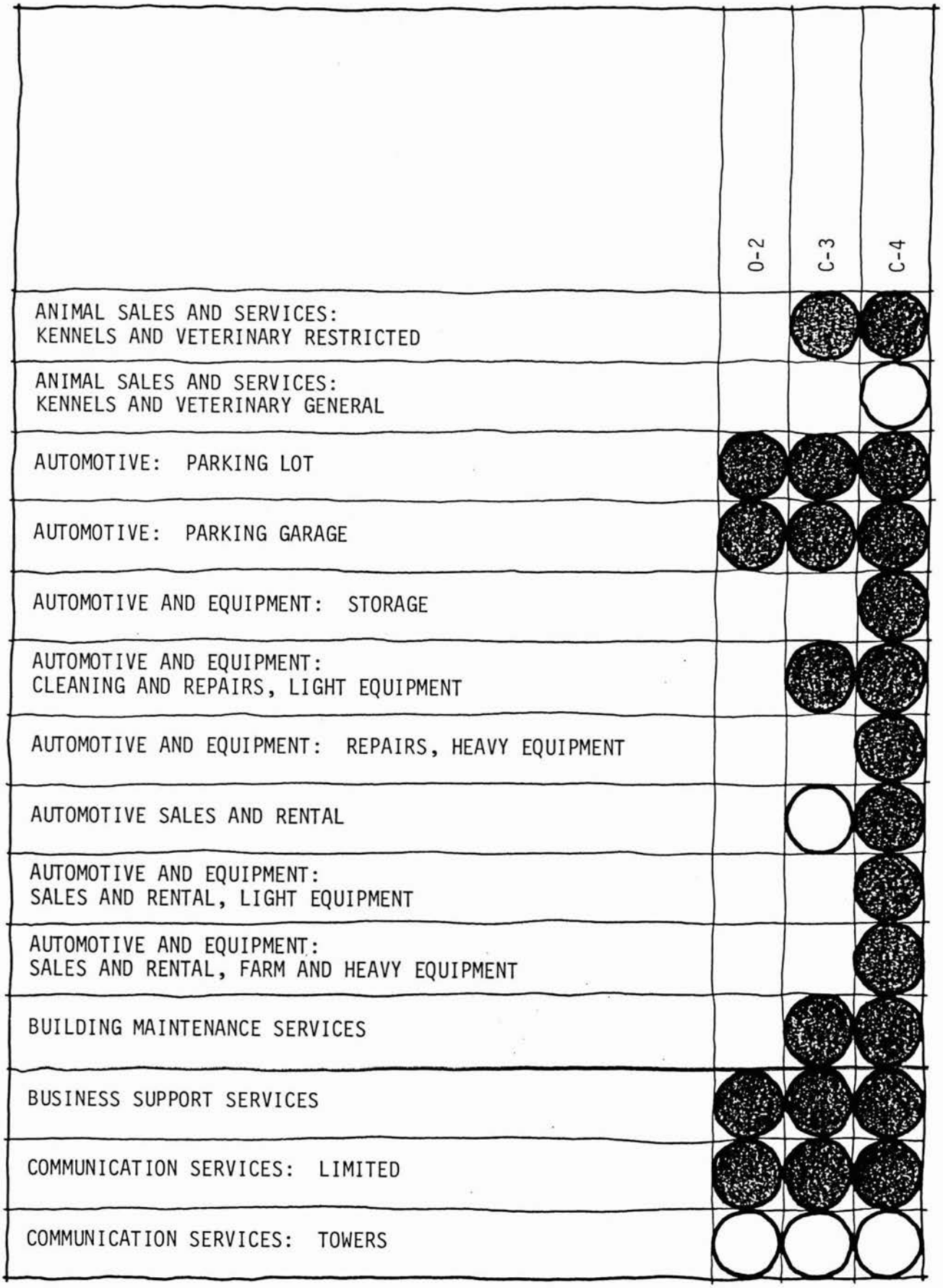
EASEMENTS

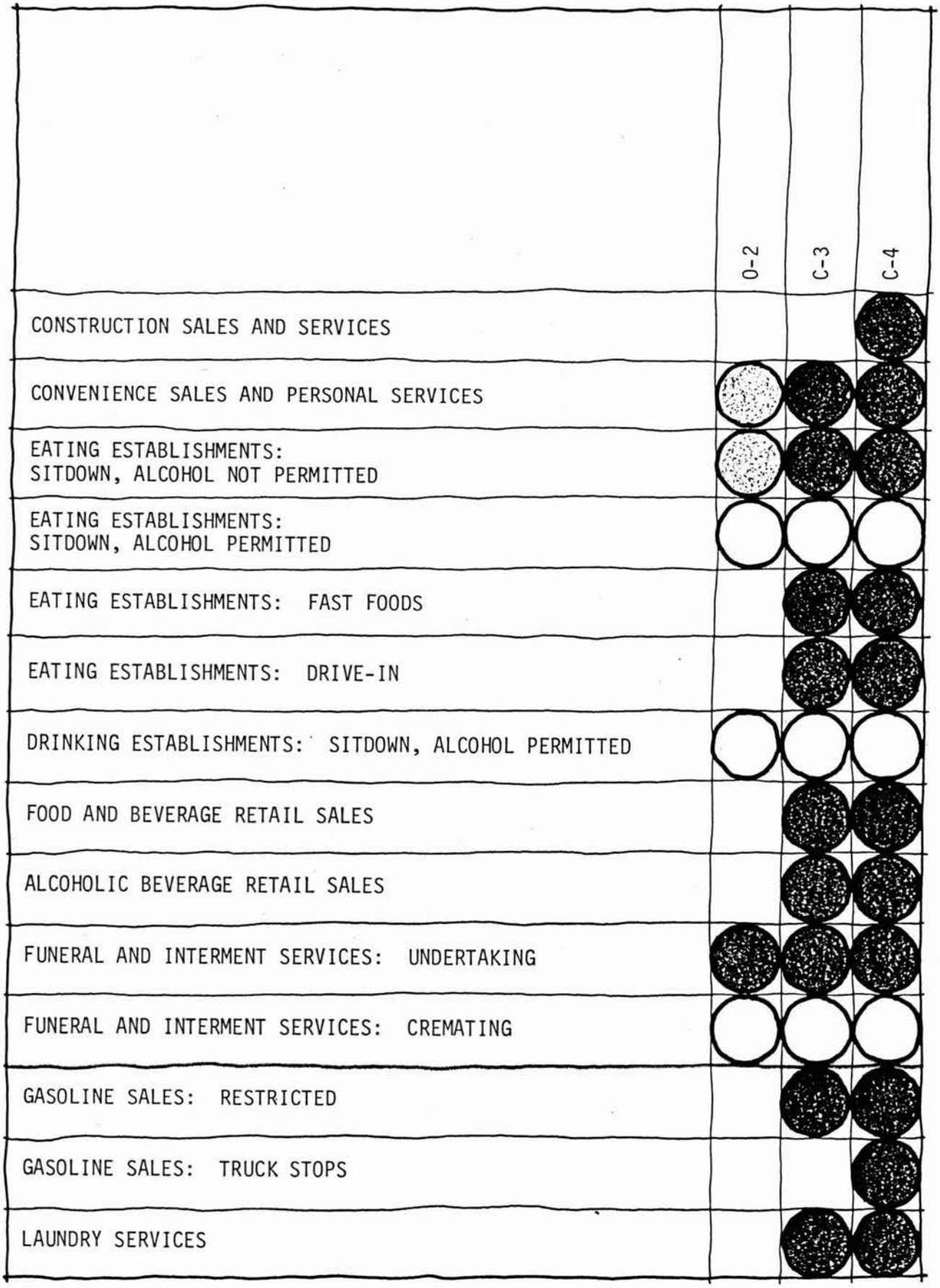

WESTERN
50TH
CLASSEN
BELLE ISLE
I-240
NORTHWEST HIGHWAY
PENNSYLVANIA
TRAFFIC

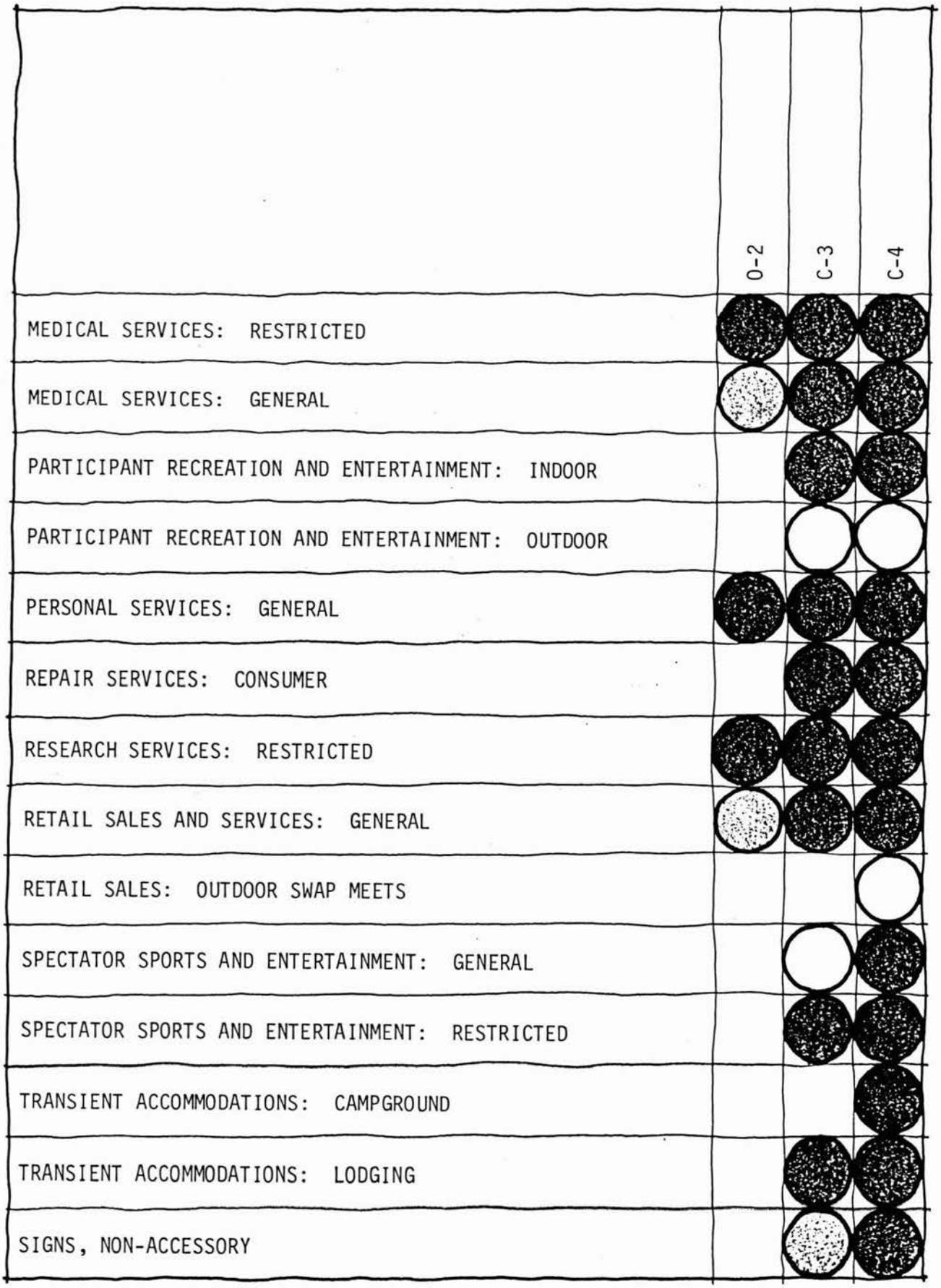
ZONING

ZONING USE CLASSIFICATION	O-2	C-3	C-4
THREE AND FOUR FAMILY RESIDENTIAL	●	●	●
MULTIPLE FAMILY RESIDENTIAL	●	●	●
GROUP RESIDENTIAL	●	●	●
LIGHT PUBLIC PROTECTION AND UTILITY: RESTRICTED	●	●	●
LIGHT PUBLIC PROTECTION AND UTILITY: GENERAL	●	●	●
LOW IMPACT INSTITUTIONAL: NEIGHBORHOOD RELATED	●	●	●
CULTURAL EXHIBITS	●	●	●
LIBRARY SERVICES AND COMMUNITY CENTERS	●	●	●
COMMUNITY RECREATION: RESTRICTED	●	●	●
COMMUNITY RECREATION: GENERAL	●	●	●
COMMUNITY RECREATION: PROPERTY OWNER'S ASSOCIATION	●	●	●
ADMINISTRATIVE AND PROFESSIONAL OFFICE	●	●	●
AGRICULTURAL SUPPLIES AND SERVICES			●
ANIMAL SALES AND SERVICES: GROOMING		●	●

PERMITTED USE


O-2
C-3
C-4
ANIMAL SALES AND SERVICES: KENNELS AND VETERINARY RESTRICTED
ANIMAL SALES AND SERVICES: KENNELS AND VETERINARY GENERAL
AUTOMOTIVE: PARKING LOT
AUTOMOTIVE: PARKING GARAGE
AUTOMOTIVE AND EQUIPMENT: STORAGE
AUTOMOTIVE AND EQUIPMENT: CLEANING AND REPAIRS, LIGHT EQUIPMENT
AUTOMOTIVE AND EQUIPMENT: REPAIRS, HEAVY EQUIPMENT
AUTOMOTIVE SALES AND RENTAL
AUTOMOTIVE AND EQUIPMENT: SALES AND RENTAL, LIGHT EQUIPMENT
AUTOMOTIVE AND EQUIPMENT: SALES AND RENTAL, FARM AND HEAVY EQUIPMENT
BUILDING MAINTENANCE SERVICES
BUSINESS SUPPORT SERVICES
COMMUNICATION SERVICES: LIMITED
COMMUNICATION SERVICES: TOWERS


O-2
C-3
C-4
CONSTRUCTION SALES AND SERVICES
CONVENIENCE SALES AND PERSONAL SERVICES
EATING ESTABLISHMENTS:
SITDOWN, ALCOHOL NOT PERMITTED
EATING ESTABLISHMENTS:
SITDOWN, ALCOHOL PERMITTED
EATING ESTABLISHMENTS: FAST FOODS
EATING ESTABLISHMENTS: DRIVE-IN
DRINKING ESTABLISHMENTS: SITDOWN, ALCOHOL PERMITTED
FOOD AND BEVERAGE RETAIL SALES
ALCOHOLIC BEVERAGE RETAIL SALES
FUNERAL AND INTERMENT SERVICES: UNDERTAKING
FUNERAL AND INTERMENT SERVICES: CREMATING
GASOLINE SALES: RESTRICTED
GASOLINE SALES: TRUCK STOPS
LAUNDRY SERVICES

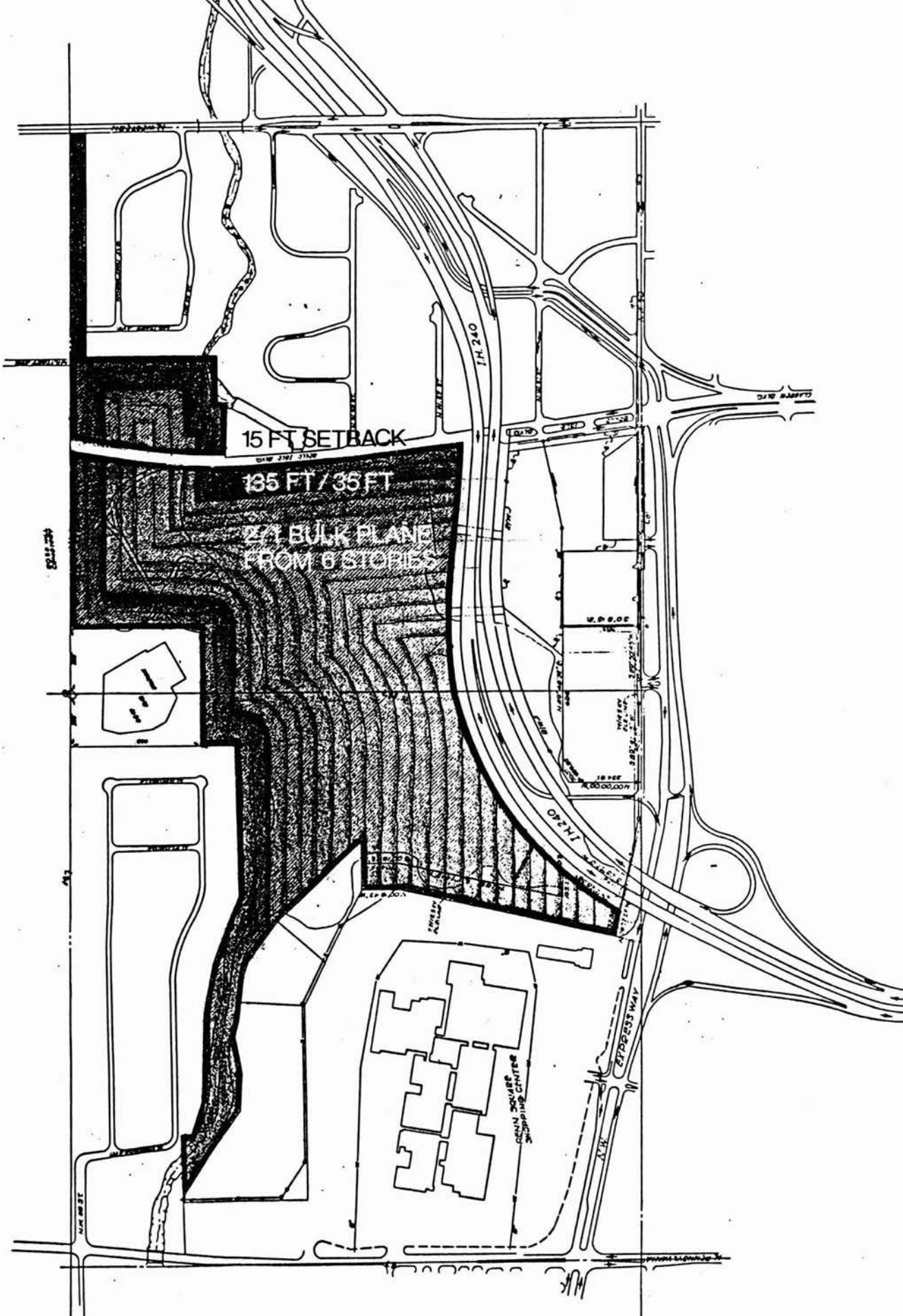

O-2
C-3
C-4
MEDICAL SERVICES: RESTRICTED
MEDICAL SERVICES: GENERAL
PARTICIPANT RECREATION AND ENTERTAINMENT: INDOOR
PARTICIPANT RECREATION AND ENTERTAINMENT: OUTDOOR
PERSONAL SERVICES: GENERAL
REPAIR SERVICES: CONSUMER
RESEARCH SERVICES: RESTRICTED
RETAIL SALES AND SERVICES: GENERAL
RETAIL SALES: OUTDOOR SWAP MEETS
SPECTATOR SPORTS AND ENTERTAINMENT: GENERAL
SPECTATOR SPORTS AND ENTERTAINMENT: RESTRICTED
TRANSIENT ACCOMMODATIONS: CAMPGROUND
TRANSIENT ACCOMMODATIONS: LODGING
SIGNS, NON-ACCESSORY

	O-2	C-3	C-4
PERSONAL STORAGE		●	●
CUSTOM MANUFACTURING		●	●
WHOLESALING, STORAGE, AND DISTRIBUTION: RESTRICTED			●
RESTRICTED LIGHT INDUSTRIAL			●
HORTICULTURE		●	●

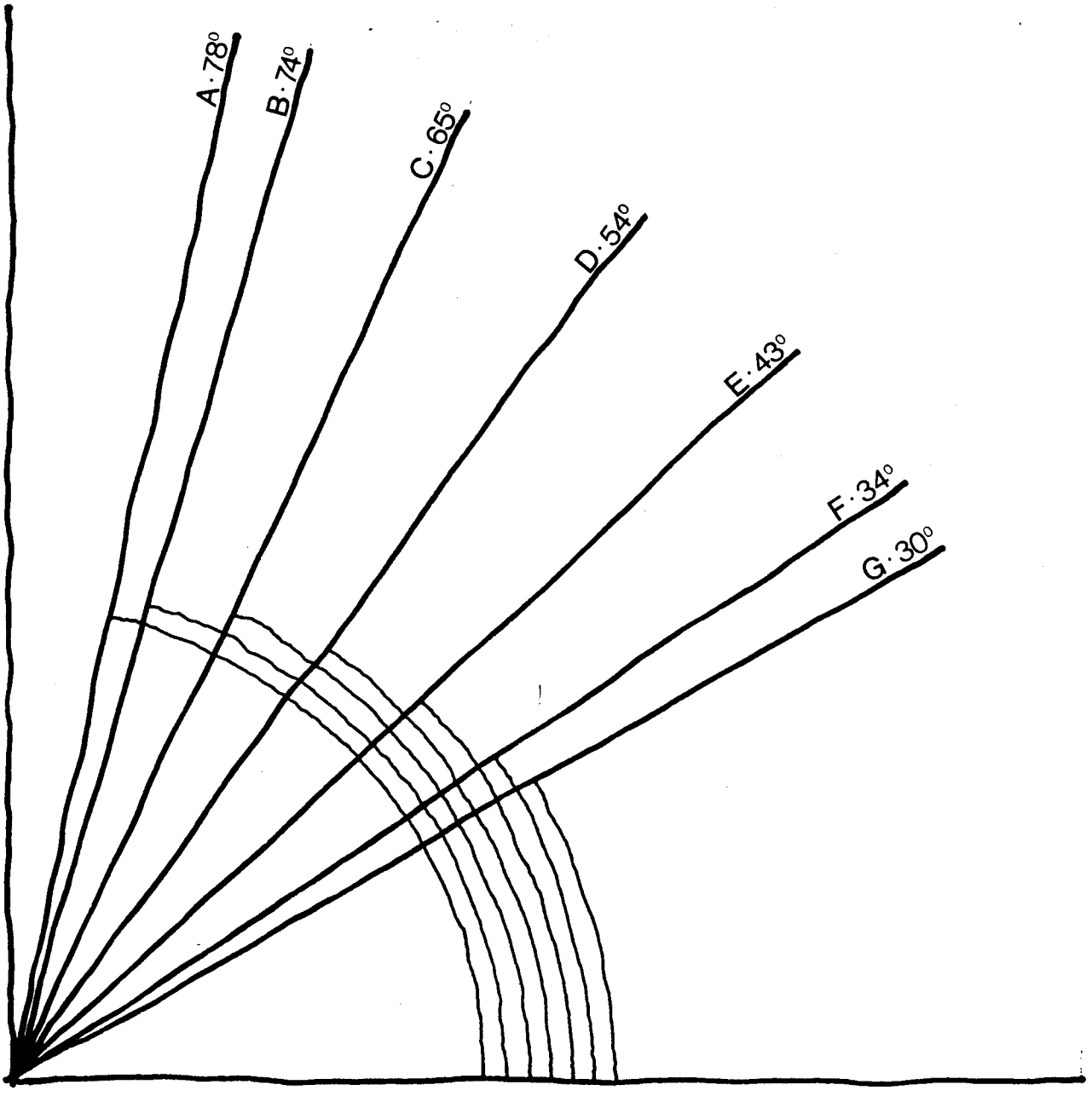
○ SPECIAL PERMIT USE

◐ CONDITIONAL USE

● PERMITTED USE

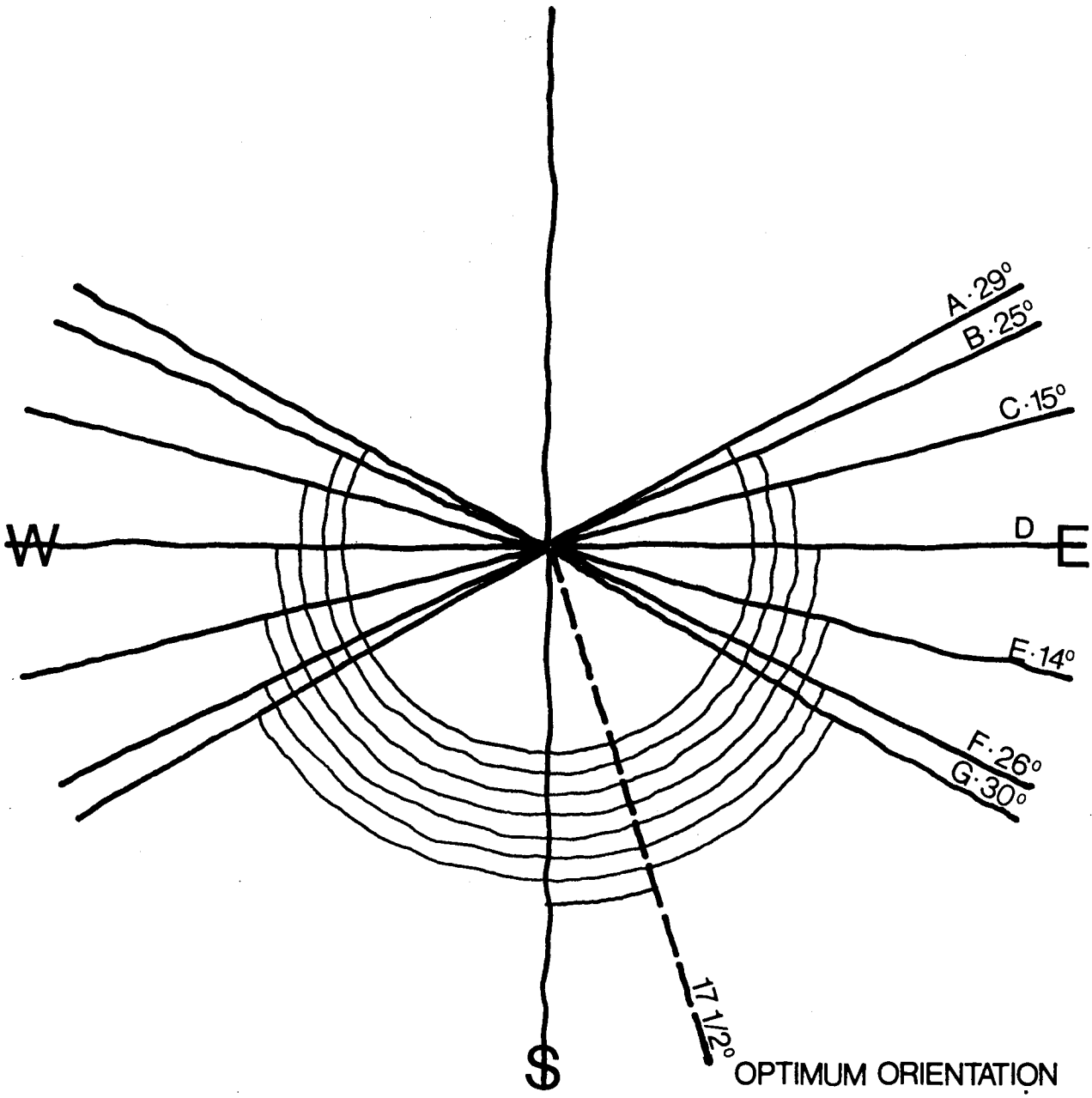

15 FT SETBACK
135 FT / 35 FT
2:1 BULK PLANE
FROM 6 STORIES
I.H. 240
I.H.240
EXPRESSWAY

C3 BULK



A JUNE 22
B MAY 22/JULY 22
C APRIL 22/AUGUST 22
D MARCH 22/SEPTEMBER 22
E FEBRUARY 22/OCTOBER 22
F JANUARY 22/NOVEMBER 22
G DECEMBER 22

ALTITUDE



OPTIMUM ORIENTATION

A JUNE 22
B MAY 22/JULY 22
C APRIL 22/AUGUST 22
D MARCH 22/SEPTEMBER 22
E FEBRUARY 22/OCTOBER 22
F JANUARY 22/NOVEMBER 22
G DECEMBER 22

AZIMUTH

Community

Density

The importance of density measurement as a planning tool arises from the fact that densities reflect with a certain degree of accuracy important characteristics of site planning. This section will expand the requirements for density standards beyond that required by zoning, to be used as a guide for preliminary design schemes, and for estimating population loads and required areas of land. Density measurements provide a uniform and objective method of comparison of site plans for general openness, amenity and liability.

For multi-family dwellings, total land area is derived from its important parts: (1) area covered by buildings, (2) outdoor living space, (3) area for service, laundry drying, walks and setbacks, (4) off-street residential parking areas. The area covered by multi-family buildings has been assumed on the basis of floor area allowances per family under standard design and construction practice. Total floor area of buildings (including shared circulation space) is divided by the number of stories per building. Gross floor area per family is assumed to increase as height increases, because of the need for added interior service and circulation space. Areas for outdoor living space, service, walks, setbacks and off-street parking are based on generally accepted servicing and layout practice and standards for different dwelling types. Off-street parking is calculated at 240 square feet per car, with 1-1/2 to 2 car per family (multiple-family dwellings).

One-family row houses should not normally exceed 19 dwellings per net acre. Although higher densities for these dwelling types may be compatible with standards for height and air, it is doubtful whether densities beyond these maxima will permit sufficient flexibility in design to insure privacy and other amenities that should be obtained with one- and two-family dwellings.

Apartment layout makes possible the shared use of service areas, approaches, play lots, and other residential land by a number of families and thereby permits some reduction of area allowances per family as compared to layouts in individual lots. Greater sharing of outdoor areas is possible as the number of families increases. Therefore, space allowances per family can be decreased somewhat for taller apartments housing a more concentrated population. Densities of multi-family buildings should be kept within the desirable range of 25 units per net residential acre for two-story apartments to 85 dwellings per net residential acre for thirteen-story elevator

apartments. Although the above dwelling densities are acceptable as standards, lower densities should be the goal, especially in an unfavorable location. They will permit flexibility in site layout where usable space is limited or where larger than normal setbacks are needed for noise reduction.

Dwelling densities have the limitation that they do not measure the exact population load on residential land. If the dwelling count is to represent the actual population load, both the dwelling sizes (number of rooms per dwelling) and occupancy condition (number of persons per room) must be taken into account. As far as housing environment is concerned, the number of persons per acre is particularly useful as an index of the population load on the various community facilities. For this reason, standards of population density are most usefully applied on a neighborhoodwide basis. However, population load has a direct effect on the amount of residential land required for multiple dwellings. Net population densities, therefore, are useful as a guide to residential land area requirements in multiple dwelling developments. Population densities should, under no circumstances, be so high that the outdoor residential space requirements cannot be met.

Building coverage is the proportion of net or gross residential land area taken up by buildings. While building coverage bears an obvious relationship to population density, it is obvious also that if buildings cover too large a percentage of the land, insufficient outdoor space will remain for various uses, and this lack of space may also result in inadequate arrangements for circulation.

Floor area ratio is the total floor area of all stories used for residential purposes, divided by the area of residential land. Figures for floor area ratios are in relation to gross residential site areas (including land for streets), because, from the point of view of spacing buildings for sunlight and daylight penetration, it does not make any difference whether streets occupy some of the intervening open spaces.

$FAR = GxS/L = B \times S$

FAR = Floor Area Ratio
G = Ground Area of Building
S = Number of Stories
L = Area of Land
B = Building Coverage

The definitions in this paragraph apply to terms used in density calculations. Unusable land is not beneficial to residential use due to location or character such as

swamps, drainage ditches, ravines, dense woods, and swabs, and utility strips when their presence renders land unusable for residential use. Non-residential land is used for such purposes as maintenace buildings, fire stations and community-use facilities such as swimming pools, baseball diamonds, tennis courts, or other developed sports areas. Boundaries for these facilities shall be established at exterior wall or fence faces or at the surfaced limits of parking or storage areas. Floor area is the sum of area for residential use on the several floors of a living unit measured from the faces of the exterior walls, including halls, lobbies, stairways, elevator shafts, interior storage areas. The floor area does not include relatively open exterior balconies, any garages or carports or any area used for mechanical equipment. Building area is the total ground area covered by enclosed building space. Car movement area is one-half of abutting streets plus on-site streets and roads, aprons, and drives to individual garages or carports where drives are too short for additional car storage. Open car storage areas are parking courts and drives to individual garages and carports where drives are large enough for additional car storage. This excludes area of garages and carports included in building area and areas not surfaced for vehicular traffic, such as islands. Recreation space can be open green area if the space has minimum area of 10,000 square feet with an average dimension of not less than 100 feet and no dimension less than 50 feet.

Neighborhood Density

Net residential land allowances are combined with the community facilities requirements and addition to these of street allowances gives the total neighborhood land requirement. Areas allowed for each type of land use conform to established recommendations. The most favorable conditions in regard to topography and usability of land have been assumed. Unusable land or land devoted to non-neighborhood uses has been excluded from the computations. Deductions must be made for any unusual setbacks necessary at boundaries or other similar unspecified land allowances. For irregular or steep land, densities must be lowered.

The figures indicate that neighborhood densities can rise as net residential densities increase without violating standards of healthful environment. However, there is a diminishing return on increasing the height of buildings as a means of increasing density. One reason for this is that as density rises, community facilities require an increasing proportion of the total land. The gap between net and neighborhood densities for multi-story buildings emphasizes the importance of insuring that housing areas conform to standards for both

types of densities. Also indicated is that permissible density increases not only with an increase in height of buildings, but with an increase in total neighborhood population up to a 5,000 person neighborhood. This is due to the fact that maximum permissible population loads on parks and playgrounds are not reached with less than 4,000 to 5,000 persons, (1,100 to 1,375 families), which is, therefore, the highest density attainable. Neighborhood densities beyond this point may decrease, because some duplication of playgrounds and parks may be required for neighborhoods with larger population.

The need for various kinds and sizes of dwellings to meet the needs of different families within a neighborhood cannot be too emphatically stressed. Neighborhood densities should always be visualized in terms of diversified dwelling types.

The neighborhood size at which all the requirements for neighborhood facilities can be met is based on the following factors:

1. Population that will support an elementary school and other neighborhood community facilities.

2. Area that will meet accessibility standards (walking distance to community facilities).

3. Area that will accommodate the necessary dwellings and community facilities, in accordance with space requirements.

4. City planning and administrative considerations that may modify theoretical size within the maximum limits. The most important of these are conformity to appropriate physical boundaries and choice of neighborhood density to avoid excessive multiplication of facilities within an area.

The size of a neighborhood is expressed in two ways: the population and the geographic area. The upper and lower limits for population are set by the capacity of the elementary school. The maximum extent of the area is fixed mainly by walking distance to school and other community facilities. Since density is the ratio of population to area, two of these variables will determine the third. Therefore, population or area within the above limits will depend on desirable densities.

Assuming a fairly central location of a school and other community facilities, an area of 126 acres will be equivalent to 1/4 mile radius of accessibility. An area of 500 acres will correspond to 1/2 mile radius.

Within these geographic limits of accessibility, the area of the neighborhood will depend on densities and dwelling types in relation to the population housed. An analysis of the population supporting normal sizes of elementary schools, in terms of different density distributions, gives a range of neighborhood areas. Even at the low density of five families per acre, the area will not exceed 1/4 mile radius. At high densities the service areas will be so small as to be economically inefficient. A school with two classrooms per grade, which is supported by about 4,300 persons, can serve an area within 1/4 mile radius for moderate to high densities (11 to 35 families per acre).

It appears, therefore, that a 4,000 to 5,000 person neighborhood offers certain advantages as a planning unit. In the first place, it efficiently uses land since population concentrations above these figures may require duplication of some community facilities. Second, the 4,000- to 5,000-person neighborhood supports a school of the size recommended by many educational authorities. Third, the geographic area will not exceed the desirable 1/4 mile radius of accessibility, except for low densities, in which case the farthest dwellings will be only slightly more than 1/3 mile distant from the school.

No scientific data exists as to the neighborhood size most suitable for resident participation in neighborhood activities and for the creation of a sense of neighborhood living. However, the general consensus, based on evaluation of existing neighborhood developments and small towns, indicates that many more than 5,000 persons is too large for a single neighborhood under normal circumstances. In the development of appropriate housing areas for a larger population, consideration should be given to the possibility of dividing such areas into several neighborhoods, just as it may be advisable to incorporate a number of smaller developments into a single neighborhood.

Administrative practices of local government may considerably affect the size of the neighborhood area. Neighborhoods at high densities may be contained in less than 20 acres, and still meet density and population requirements. However, multiplication of service facilities within a small area is apt to overburden municipal finances and thereby affect the adequacy of the facilities. It is, therefore, considered unlikely that neighborhood units of less than 30 acres will, in the long run, be considered desirable by city officials.

Community Facilities

The need for a total living environment surpassing the simple need for basic shelter has emerged as a significant development in recent years. Many housing developments and neighborhoods that appear stable and desirable are considered to owe a portion of credit to the ancillary community facilities for recreation and leisure. In addition, the quality of community life is further enhanced by the proper amount and location of educational, socio-cultural, and commercial facilities.

Educational facilities include preschool and formal school services. The neighborhood components will include a child care center and nursery schools in the preschool group, and elementary schools, with kindergarten, in the latter group. Day care centers should be planned into developments housing fifty or more children between the ages of 3 to 5 years. These centers should contain 50 square feet per child of indoor floor area and 200 square feet per child of outdoor play area. Insofar as availability of adequate day care services affects the employability of a mother, such services can be said to have a relationship to the City's community development goals and objectives. The nursery school is for the care of children in the 4- to 5-year old group, with the maximum size for a single group at 20-30 children, needing approximately 600-1,000 square feet.

The elementary school is considered to be one of the basic organizational elements of the neighborhood. Kindergarten is for children 5-6 years; average class size should be about 20-25 children, with a maximum of 30. The land area requirement is 10 acres plus 1 acre/100 students; building requirement is 30 square feet/child. The junior and senior high school facilities require 30 acres plus 1 acre/100 students and 25 square feet/child. In addition to serving the needs of the teenage student, these buildings are generally well-suited for evening adult education and community recreational uses.

Socio-cultural facilities include religious, library, recreation, social, health and multi-service centers. Neighborhood churches frequently play an important role, not only in the religious, but also in the cultural and social activities of the community. They often serve as recreational and community centers as well. On a national basis about 60 percent of the population may be expected to affiliate with a local church. Thus, on the average, a population of 5,000 might be expected to produce 3000 church constituents, disregarding the churching of some people outside of the neighborhood, and internal heterogeneity of the population, which may cut the degree of affiliation to one

specific church. Assuming the optimum size of neighborhood institution to be 500 members, this produces a need for about 5-6 church sites. There is no common uniform agreement as to the adequate size of a church site. An outdoor recreational program or parochial school will increase the size appreciably. An average of 2-5 acres has been recommended.

A branch library can play an important role as a cultural center. In addition to providing books, it can provide record and tape lending, music-listening facilities, visual-aid facilities, lecture series, and act as a general information center. Regardless of the size of the community, its library should provide access to enough books to cover the interests of the whole population. The library building should provide space for the full range of library services.

One of the new social institutions to emerge in the community is the multi-service center. This facility is being encouraged by the federal government, to be similar to a neighborhood community center housing federal, state, and local services. In theory, each multi-service center should reflect the social, economic, and educational needs of each community. Combined with these service features may be the more traditional social and recreational facilities. The location should be central and easily accessible to the entire community. Close proximity to bus stops is essential.

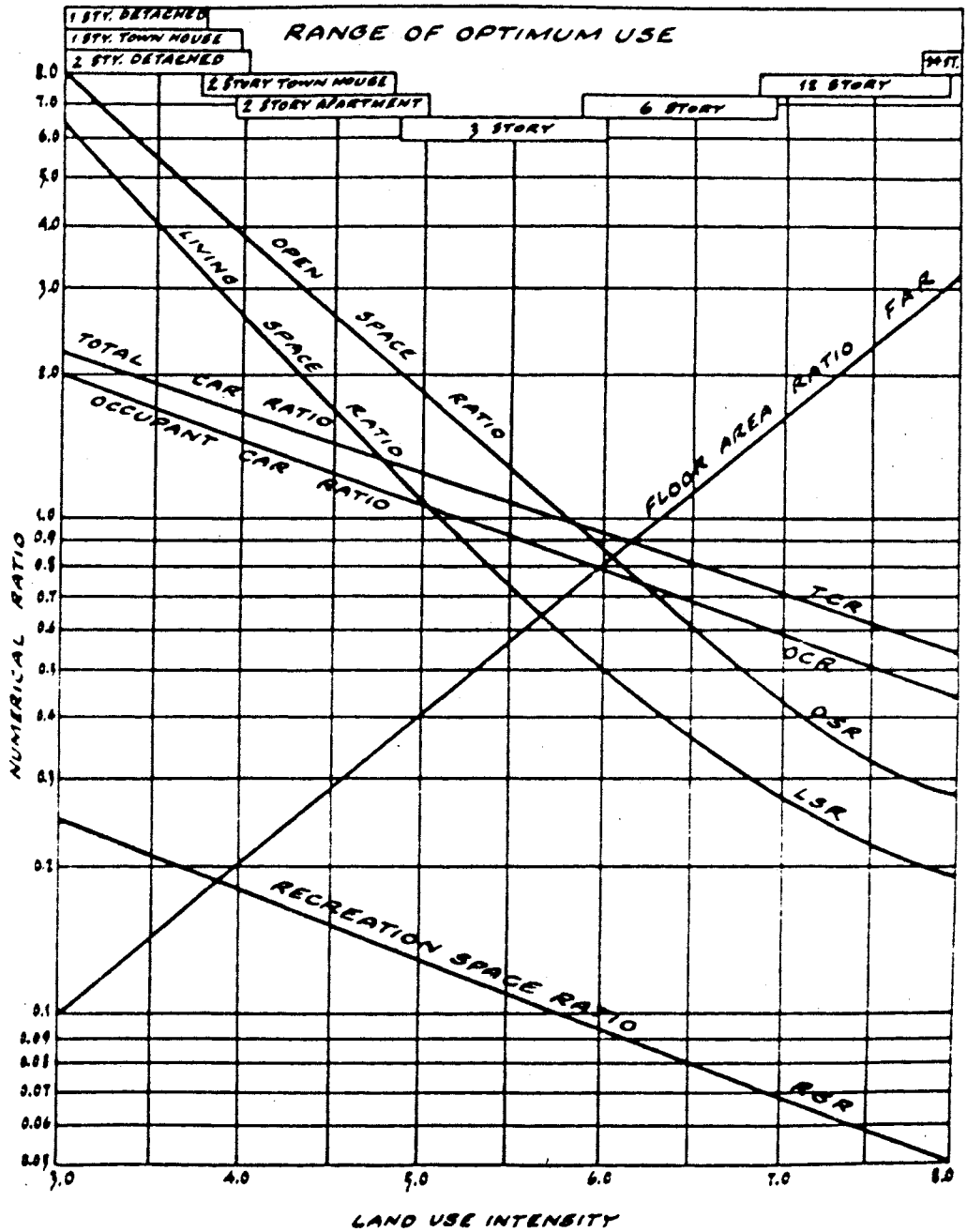
Adequate medical services are essential on the local level. This should include medical, dental, and psychiatric services. Provisions for accessibility to a hospital outside the neighborhood in emergencies is essential. Small preventive care and medical diagnostic facilities would also be appropriate.

One way to provide activity space for both young and old is with a community center. It should provide meeting and recreational spaces, with a serving kitchen for catering. A youth center contains meeting rooms, gym, swimming pools, shops, game rooms, and lounges. The site should be large enough to provide for outdoor activities and future expansion. A senior citizen's center provides them with a place to meet other people, and can be the location of increasing number of social, health, welfare, and employment services. The physical space required should be flexible to meet the changing needs of the elderly, primarily meeting rooms, shops, classrooms and offices. Considerations are easy accessibility and ground floor location.

Every residential neighborhood requires a range of facilities for both children and adults that are easily accessible to the living units. Such facilities should include a playlot, neighborhood parks, community parks, large urban parks and regional parks. Playlots should include an enclosed area for play equipment and an open, turfed area. Requirements are a location 300 to 400 feet of each living unit served, accessible without crossing any street, and have an easy gradient. A minimum enclosed area of 2,000 square feet will serve up to 50 preschool children (about 165 families).

Neighborhood parks are defined as areas providing passive and active recreation, located and serving primarily people living in the immediate residential area. Children should be able to walk to this type of park. Minimum size is five acres, serving 3,000 people within a 1/2 mile radius. Community parks are defined as recreation areas serving several adjoining neighborhoods and usually serve several square miles of residential development. Minimum size is 20 acres, serving 10,000 people within a two mile radius. Within each category, the minimum population must exist in the service radius before facilities are placed in park. As the "threshold" population is obtained, new facilities are added and a new level of park development achieved.

Shopping and other commercial space may be necessary if the development is sufficiently large enough to support such facilities. This usually includes retail shops for convenience goods and the supply of basic services. The location of the neighborhood shopping center is generally located on an arterial street at the intersection of a collector street. However, it may also be located more centrally within the neighborhood and closer to the other community facilities. Vehicular access for trucks is essential for deliveries of goods and other services. The neighborhood shopping center generally includes eight to fifteen stores with an average gross floor area of about 40,000 square feet. The site will vary from 1.5 to 4.0 acres, including parking area. A minimum of 800 to 1,000 families in its trade area is needed to support this center. Stores included are stationery, laundry, bakery, hardware, service station, barber and beauty shops, small restaurants, drug store, and a food market. It is important that the facilities are not larger than required by the development, which will result in either marginal business that cannot provide proper services or attract people from outside the development, causing undesired influx of people and cars. Limited parking areas must be provided for the commercial center, the recommended amount being a 20 to 1 area ratio. It is recommended that the commercial area be in close proximity to the school and play areas to encourage the multiple use of facilities.



LAND USE INTENSITY

NEIGHBORHOOD CENTER	% OF TENANTS	% OF GLA	% OF SALES
FOOD	10.4	26.5	43.8
SUPERMARKET			
FOOD SERVICE	8.5	5.1	3.2
RESTAURANT WITHOUT LIQUOR			
ICE CREAM			
GENERAL MERCHANDISE	9.9	16.3	8.9
VARIETY STORE			
CLOTHING AND SHOES	9.6	5.5	4.2
LADIES SPECIALTY			
LADIES READY-TO-WEAR			
DRY GOODS	6.6	3.8	1.6
YARD GOODS			
FURNITURE	6.9	4.8	1.7
RADIO, TV, HIFI			

TYPICAL RETAIL

	% OF TENANTS	% OF GLA	% CF SALES
OTHER RETAIL	10.8	16.9	13.4
HARDWARE			
DRUGS			
CARDS AND GIFTS			
LIQUOR AND WINE			
FINANCIAL	9.2	3.0	0
BANKS			
OFFICES	6.0	4.7	0
MEDICAL AND DENTAL			
REAL ESTATE			
SERVICES	10.1	5.6	2.5
BEAUTY SHOP			
BARBER SHOP			
CLEANERS			

	% OF TENANTS	% OF GLA	% OF SALES
LAUNDRIES			
SERVICE STATION			
OTHER	5.8	4.7	20.7
VACANT	6.2	3.1	0

Economics

Financial Analysis

Financial analysis of the development program is accomplished through application of techniques which, while relatively new in real estate analysis, have long been applied in evaluating capital investment proposals and related risk factors in industrial practice. The same methodology can be used to evaluate financial feasibility as well as determine the conditions which are necessary for achievement of the project objectives in programmatic, rather than financial terms. The all-important formulation of the development program reflects the generally limited state of the art in decision theory and optimization analysis. Techniques currently available for determination of the optimum development program are relatively crude. The conceptual framework is more sophisticated, however, and it is possible to systematically approach determination of the most appropriate land use program.

Profits in land development are made by creating the opportunity for development of land in structural (sale or rental) improvements. The total capital investment which can be supported by the resulting income stream includes a value for the land which is greater than the value that same land would have without the structural improvements. This creation of added or residual value, and resulting profit, is the productive function of land development.

The economics of developing each possible land use element must be determined. This can be expressed in terms of ground values supportable under development, equity and debt financing required, net cash flow projections, return on equity, and related financial parameters.

Required base financial data may be grouped into five categories:

1. capital cost calculations for building improvements
2. revenue and operating expense estimates
3. financing terms and conditions
4. land cost or value
5. land development costs.

Each of these data categories is approached initially in terms of individual land use components, with the analysis extended as the preliminary overall program takes shapes. Land value itself is valued residually at the outset, with its value derived from the demand and financial characteristics of the final building improvements in which land is the basic raw material. Land cannot be valued without regard to the prospects for its use and the economics of developing that use, although its value must be compared to other parcels in the market place. Accordingly, much of the data accumulated in analysis of the land development will also be useful in evaluating the economics of structural improvements.

Capital cost estimates of finished structures in each use should be prepared, taking account of product specifications set forth in the market analysis, alternate building systems, and other relevant factors. Each distinct type and quality of housing, offices, retail, and commercial space programmed must be individually considered and their costs estimated.

Annual revenue and expense projections for the operation of completed building projects must be established for each use. Revenue estimates and operating expense schedules must be prepared, based on experience of comparable projects in the local area and the individual features of the projected development. Available financing terms and conditions must be established on the basis of a full understanding of the quality of the investment reflected in each use under consideration; and current conditions regarding loan amounts, interest rates, and loan duration.

Land development costs ordinarily will be prepared for the total project, as well as for the individual components, reflecting the fact that not all land development functions can be accurately allocated to individual use items. A significant portion of land development costs can be allocated, if only on a pro-rated basis, and estimates should be related to individual uses where this is possible. Some costs are difficult to allocate. Project-wide costs, including community facilities and amenities, must either be accounted in relation to the total project or be prorated on an area basis.

Economic design is far less sophisticated than project design, and accordingly, is conducted on a less formal basis. Yet in one way or another, economic design should proceed through three basic steps - appraisal, feasibility study, and investment analysis.

For an income-producing property, the most rational method of appraising a real estate project is the income method. Calculation is based on gross leasable area, annual rental price, operating expenses, and a capitalization rate. The capitalization rate is the percentage of net income with respect to total project value. From this data, the capitalized value is computed, which serves as a basis for calculating the mortgage loan.

Appraised value, and consequently the mortgage loan, depends on the interest rate. Capitalization rates vary with the interest rate on the mortgage loan; the higher the interest rate, the higher the capitalization rate. Since the capitalized value is inversely proportional to the capitalization rate, the effect of high interest rates is to reduce capitalized value. Also, reduced energy costs which lower operating expenses can increase capitalized value by increasing net income.

1. Gross Income = Rent x Leasable Area

2. Operating Expenses = Percentage x Gross Income

3. Net Income = Gross Income - Operating Expenses

4. Capitalized Value = Net Income/Capitalization Rate

The most important economic study is the feasibility study. It normally forms the basis for decisions on when and what to build. The feasibility study presents key information needed for making a decision; the maximum project cost, or budget, that can produce an acceptable return on the cash investment. Calculation is based on the project's appraised value, mortgage terms (loan amount, interest rate, term of constant annual payment), and minimum acceptable rate of return on equity investment. From these data, the maximum project cost that can hield the required return is computed. If the project can be built within the budget, then the project is feasible.

The mortgage loan is directly proportional to capitalized value. A reduced mortgage loan, in turn, raises the cash investment required, thus reducing financial leverage. The increased capitalized value resulting from energy conservation, then, can reduce cash investments, increase the mortgage loan, and increase the maximum project cost, while maintaining return on investment.

5. Mortgage Loan = Percentage x Capitalized Value

6. Annual Debt Service = Debt Service Constant x Mortgage Loan

7. Profit Before Taxes = Net Income - Debt Service

8. Maximum Cash Investment = Profit Before Taxes/ Acceptable Return

9. Maximum Project Cost = Mortgage Loan + Cash Investment

Once it has been determined that the project will meet the criteria for a successful investment, maximizing financial leverage is a goal. Profit percentages are raised by increasing the debt-equity ratio. Tax advantages are secondary, but vitally important, investment factors. Real estate offers several unique tax advantages that weigh heavily in economic design. These tax factors may shape the final form of the financing.

Depreciation is, by far, the most beneficial of these unique tax advantages. In the early years of a project, it can reduce income taxes to zero, and even produce paper loss shielding other income from taxation. Unlike other depreciable items, real estate often appreciates in its early years when its depreciation is highest. Also, the full value of a building can be depreciated even though only a small equity is invested in the property. Buildings and other physical improvements can be depreciated. Project cost, not appraised value, serves as the basis for depreciation.

Depreciation can be computed as straight-line or accelerated. Straight-line depreciation is computed by dividing depreciable value by the assumed useful life, in years. Accelerated depreciation using the declining-balance method is computed as a multiple of the straight-line depreciation. The depreciable amount steadily decreases through the years, as the product of the multiple and the un-depreciated balance decreases. In the declining-balance method, salvage value is always assumed as zero, since there is always a depreciable balance remaining after the last year's depreciation. Limits on declining-balance method factors are set by the Tax Reform Act of 1969.

Energy conservation over the useful life of a building increasingly affects the net income of a project by lowering operating expenses. Since depreciation is relatively "fixed" by initial value, and income can vary as mentioned, reduced energy usage can affect capital gains and taxation levels.

10. $\text{Net Taxable Income}_x = \text{Net Income}_x - \text{Interest}_x$

11. $\text{Depreciation}_x = \text{Depreciation Factor} \times \text{Total Depreciable Value} \times (1\text{-DF})^{x-1}$

12. $\text{Interest}_x = \text{Interest Rate} \times \text{Principal}_{x-1}$

13. $\text{Principal}_x = \text{Principal}_{x-1} - (\text{Debt Service} - \text{Interest}_x)$

Computed for current year, x

Life Cycle Cost Analysis

Life cycle cost analysis is defined as "any technique which allows assessment of a given solution, or choice among alternative solution, on the basis of considering all relevant economic consequences over a given period of time (or life cycle)." It is of particular value in determining whether a future saving justifies an additional expenditure, but it can also be used to examine a number of other kinds of decisions whose dollar effects are spread over a number of years.

Life cycle cost analysis generally takes the position that a future dollar is not equivalent to a present dollar; that money has "time value." All future dollars are discounted (reduced in value) by applying a discount rate. The discount rate is a measure of how much money "costs" over time. This is done considering particular motivation, objectives and financial capabilities. The federal government mandates a 7% discount rate in making decisions to lease or purchase real property, and a 10% rate for other kinds of decisions. Considering energy costs, the 10% rate is used. The resultant value of a discounted cost is called its present value. The present value factor is the number which, when multiplied by the cost, will yield the present value amount. Present value is a common denominator which can be used to measure the value in today's dollars of several alternatives.

The life cycle, or time period considered in the analysis, is a crucial variable. The economic life of an alternative is defined as that period over which

the investment is deemed to be the lowest cost alternative for satisfying a particular need. Generally speaking, very short life cycles (less than five years) provide only limited opportunities to assess the continuing economic consequences of a design decision. Long life cycles (more than 25 or 30 years) require a great deal of speculation about future events. In order to retain consistency, the length of the mortgage used is the life cycle. Conventional practice suggests placing all initial costs in the "zero" year, even though these costs may spread out over some number of months.

Energy costs are singled out as a cost factor due to the differential in cost escalation compared to other factors. The method, additionally, is designed primarily to analyze "passive" energy conservation schemes which result in little or no additional initial investment, and require no additional costs in financing, repair, replacement. Salvage value is not applicable, consistent with depreciation methods.

The basis of investment analysis is the measurement of the benefits derived from a capital expenditure against its disbursement of funds. Incremental costing is the concept which explains the unique relationship between an investment and the returns it is responsible for generating. Present value of investment associated with energy conservation strategies are entered in the year required and subtracted from the present value of savings.

Energy savings are calculated by comparison to a baseline. Typical energy usage for a building type is used as a basis with alternatives calculated as a percentage of this figure. The energy savings in dollars is increased to account for the higher cost escalation of energy by multiplying by the differential escalation factor. This value is then converted to present value of energy savings.

The measure of comparison used is total present worth cost, where all present and future values are brought to their present costs and summed. This allows a direct comparison of investment and savings resulting from design decisions.

1. Present Value Factor = $1 / (1 + \text{Discount Rate})^{x}$

2. Differential Cost Escalation Factor = $(i_1 + 1)^{x} / (i_0 + 1)^{x}$

   Computed for current year, x

i_1 = escalation rate for the dominant input variable being tested

i_0 = average overall inflation rate affecting the other variable considered in the analysis

3. Present Value = Capital x PVF

Energy Conservation

Development patterns and land planning practices in this country have proceeded for several decades on the presumption that gasoline and electricity would continue to be available at bargain prices. Highways, rather than transit lines, have become the connectors between residential neighborhoods and employment centers. Convenience goods and services are consigned to strips along arterials, most often at the very fringe of their market area. Until the initial gasoline shortages of the early 1970's, little attention was given to the amount or type of energy that would be needed to support the community structures that were evolving.

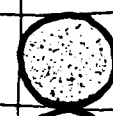
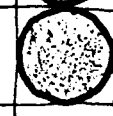
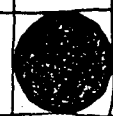
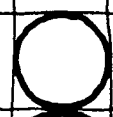
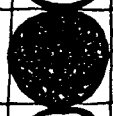
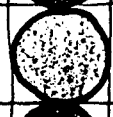
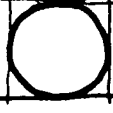
The average American family consumes enormous amounts of energy carrying out its daily routines. Transportation costs eat up nearly 70 percent of the family's energy budget. The typical "local" trip for work or shopping is in excess of five miles and, because the automobile is the only convenient way to get most places, the routes are so congested that gasoline efficiency is severely impaired. The decentralization of commercial and public facilities combined with large lot, low density subdivisions add additional driving time at each end of a typical trip.

Although only 30 percent of a community's energy use is associated with the operation of homes and commercial space, the amount of waste is still substantial. The sitting and configuration of most structures ignore the impact of sun and winds and the long-understood techniques for cooperating with nature. Mechanical systems within structures waste much of the energy they consume.

Building to conserve energy is not a simple proposition. Available knowledge and technology is sufficient, if applied, to make communities substantially more energy efficient. The obstacles lie with the expectation and lifestyles of the consumer, the practices of the building industry and public officials that have emerged in response to the public's demands, and economic feasibility. A variety of actions could be incorporated to reduce future energy demands. Options recommended are limited to those that are technically feasible, reasonably cost-effective, and that should generate little or no market resistance. If implemented, land development costs could be reduced by as much as 18 percent, while yielding the same densities. Total energy consumption by the buildings would be reduced by at least 33 percent and potentially higher. There should be no negative impact on either price or sales. Options can be grouped into community, neighborhood, and individual unit considerations.

JANUARY 1981	% OF YEARS
MORTGAGE LENGTH	33
MORTGAGE INTEREST RATE (LONG-TERM)	13
MORTGAGE AMOUNT (% OF CAPITALIZED VALUE)	75
MINIMUM RETURN ON INVESTMENT	10
DEPRECIATION (RESIDENTIAL)	200
DEPRECIATION (NON-RESIDENTIAL)	150
USEFUL LIFE (RESIDENTIAL)	40
USEFUL LIFE (NON-RESIDENTIAL)	45
GENERAL INFLATION RATE	10
ENERGY ESCALATION RATE (ABOVE INFLATION)	10
DISCOUNT RATE	10

FINANCIAL CONDITIONS

ENERGY CONSERVATION	APPLICABILITY	% REDUCTION
SITING		
PROTECTION FROM WINTER WINDS		25
SOUTH SLOPE		12
BERMING TO WINDOWSILL		10
BERMING TO ROOF		32
SOUTH ORIENTATION		4
BUILDING		
SOUTH GLASS		10
REDUCTION IN AIR INFILTRATION		39
INSULATED SLAB		
OVERHANGS TO SHADE GLASS		5
TROMBE WALL		85
GREENHOUSE		
EARTH-SHELTERED		30

ENERGY OPTIONS

	APPLICABILITY	% REDUCTION
ENCLOSED ENTRIES		6
VENTED ROOF		23
SHUTTERS		30
BEADWALL		34
AVERAGE FOR GROUND FLOOR		92
AVERAGE FOR UPPER FLOORS		48
AVERAGE FOR THREE-STORY BUILDING		63

 NOT APPLICABLE

 GROUND FLOOR

 ALL FLOORS

FACTOR	TOWNHOUSE	APARTMENT	COMMUNITY CENTER	OFFICE	UNIT
RENT	6	8	8	10	$/SF
OPERATION	2.52	3.60	2.50	3.60	$/SF
OPERATION (E.C.)	2.07	3.29	1.95	3.32	$/SF
ENERGY	0.71	0.49	0.88	0.44	$/SF
ENERGY (E.C.)	0.26	0.18	0.33	0.16	$/SF
CONSTRUCTION	26	29	34	42	$/SF
CONSTRUCTION (E.C.)	28.6	31.9	37.4	46.2	$/SF
SITE DEVELOPMENT	5	5	5	5	% OF COST
EARTH FILL	96600	96600	96600	96600	$/ACRE
SITE DEVELOPMENT (E.C.)	4.1	4.1	4.1	4.1	% OF COST
EARTH FILL	79212	79212	79212	79212	$/ACRE

CONCEPTS

Market

In complex projects which offer clear alternatives in the use of the land, the development timetable and financial returns, pressure is increased to utilize a wider range of available development opportunities to accelerate early cash flow. Each of these uses has varied market absorption potentials, consumes land at different rates, and exhibits distinct economics, including most importantly, financial rewards from development. Development of a given use cannot be initiated in advance of sufficient market support, nor can the pace of the development in that use be projected to range beyond estimated absorption potentials. The development program should respond to these factors by providing proportional allocations among competing land uses. Future market supports can be considered by a flexible land-use pattern responsive to market changes.

Environment

The existing urban and natural environment can be enhanced through development becoming physically and functionally integrated. By becoming an integral part of the overall area plan, existing land uses can halt encroachment. Less buildable areas can be preserved as open space, recreation and parks, and be functionally integrated into the urban fabric. A development approach such as this presents the opportunity to organize area growth.

Community

Infill development is placed within a complex network of interrelating land uses. New uses must respect the existing relationships and should attempt to enhance or complete the interrelationships. This range of area services gives a sense of community to a neighborhood and can be emphasized by focusing development upon a community center, creating a regional activity point.

Economics

The "bottom-line" of the project is always the financial benefits derived from the development. The greatest return on investment will be realized by the project which provides the most revenue for the least cost. However, overlaid upon the maximization of return are constraints which require an "optimization" of all factors. An early return on investment in large projects is desirable, prompting an attempt to create multiple markets for the product. Value can be increased by lowering operating costs, of which energy costs are an increasingly major portion.

MARKET

REFLECT DEMAND

FLEXIBLE LAND-USE

ENVIRONMENT

TRANSITION INTO EXISTING AREAS

INTEGRATION

PRESERVATION OF FEATURES

RETENTION OF HISTORICAL CONTEXT

COMMUNITY

INTERRELATE COMMUNITY SERVICES

FOCUS ON COMMUNITY CENTER

ECONOMICS

OPTIMIZE LAND VALUE

CONSERVE ENERGY

NEEDS

Mixed Use Development

Belle Isle possesses the requirements and opportunities suggesting a "mixed-use development." A mixed-use development means a relatively large scale real estate project characterized by (1) three or more significant, feasible revenue-producing uses, (2) functional and physical integration of project components, and (3) development in conformance with a coherent plan. Opportunities in mixed-use development include higher densities, faster development, product differentiation, shared intra-structure, superior performance, and economics of scale in operation.

Mixed use development can be the response to many emerging situations:

1. The monotony of many single-purpose developments has resulted from many automobile-oriented residential subdivisions, shopping centers, and office parks - competitive with the central business district, but better located to serve a growing suburban population. Since most such development is low density, opportunities are present for more intensive land use on passed-over sites such as Belle Isle. Mixed use can be seen as an answer to anonymity, through focused development in large increments and with a special sense of identity.

2. The availability of capital for large scale real estate projects has resulted from many large corporations and financial institutions becoming involved in real estate development. This is part of a general shift in the capital-flow-structure which favors real estate more than in the past. It makes possible attraction of new capital resources, particularly to large-scale, high-visibility projects.

3. Increasing land costs have resulted from a steady rise in land costs throughout major metropolitan areas where intensification of development occurs. As land costs climb, ways are sought to build greater "supportable values" through higher density and mixed use development.

4. The availability of compact land holdings, suitable in scale and location for mixed use development is enabled by assembled sites through urban renewal or public utility land holdings, such as Belle Isle. As higher "supportable values" are possible through mixed use, such sites become feasible for more intensive development.

5. Changing demographic characteristics are the result of shrinking household size, due to declining birth rates, the tendency of the young to establish independence at an earlier age, and the increasing importance of adult-oriented households. This particularly affects the residential component, as demand for housing increases among relatively small, adult-oriented families. Typically such households are more interested in urban amenities and entertainment than in schools and neighborhood playgrounds.

6. An increased use of motor vehicles is common for journey-to-work, shopping trips and other purposes, and of trucks for commercial purposes. Traffic congestion, air pollution, and fuel shortages create markets for real estate development which separates vehicular and pedestrian traffic, facilitate face-to-face contacts for a variety of trip purposes, and make living and working possible at nearby locations.

7. The availability of zoning to permit mixed use has been brought about by a relaxation of single-purpose zoning in communities to permit a mixing of use, as in the PUD-type ordinance.

Development Program

The program for development of Belle Isle Lake synthesizes market, environment, community and economic goals, facts and concepts into space requirements for the project. Residential, community center, and office uses provide the three components of the mixed-use approach.

Residential space consists of townhouses and apartments in response to single and multiple family dwelling unit preferences. An average dwelling unit size of 800 square feet, occupying the zoning-required 1000 square feet of land, produces an average floor area ratio of 0.80. The community center includes an elementary school site, multi-service center and community commercial space. Overall floor area ratio is 0.45, reflextive of low building height.

Office development is segmented into 8 low-rise components with an overall floor area ratio of 0.97. The total development utilizes a net land area of 73.4 acres with a floor area ratio of 0.83.

	QUANTITY	UNIT AREA (SF)	FLOOR AREA (SF)	BUILDING AREA (ACCESS)	PARKING (CARS)	PARKING (ACRES)	LAND AREA (ACRES)	FLOOR AREA RATIO
TOWNHOUSES	1099	1000	1,099,000	12.6	2198	12.1	37	0.68
APARTMENTS	1143		800,000	3.8	2000	11.0	15	1.23
1-BEDROOM	572	600	343,200		858	4.7		
2-BEDROOM	571	800	456,800		1142	6.3		
NET	2242		1,899,000	16.4	4198	23.1	52	0.84
STREETS							22.3	
GROSS							74.3	

RESIDENTIAL

	QUANTITY	% OF GLA	FLOOR AREA (SF)	BUILDING AREA (ACRES)	PARKING (CARS)	PARKING (ACRES)	LAND AREA (ACRES)	FLOOR AREA RATIO
RETAIL								
SUPERMARKET	1	26.5	11,712					
RESTAURANT	1	5.1	2,254					
VARIETY STORE	1	16.3	7,204					
CLOTHING/SHOES	1	5.5	2,431					
YARD GOODS	1	3.8	1,679					
RADIO/TV/HIFI		4.8	2,221					
DRUG/HARDWARE		16.9	7,469					
BANK		3.0	1,326					
OFFICES		4.7	2,077					
SERVICES		5.6	2,475					
OTHER		4.7	2,077					
VACANT		3.1	1,370					
TOTAL		100.0	44,195	1.01	203	1.12	2.13	0.47

COMMUNITY CENTER

	FLOOR AREA (SF)	BUILDING AREA (ACRES)	PARKING (CARS)	PARKING (ACRES)	LAND AREA (ACRES)	FLOOR AREA RATIO
ELEMENTARY SCHOOL	38,200	0.88	45	0.25	2.2	0.40
MULTI-SERVICE CENTER	39,422	0.91	131	0.72	1.9	0.48
NET	121,817	2.8	379	2.09	6.23	0.45
STREETS					2.07	
GROSS					8.3	

	QUANTITY	UNIT AREA (SF)	FLOOR AREA (SF)	BUILDING AREA (ACRES)	PARKING (CARS)	PARKING (ACRES)	LAND AREA (ACRES)	FLOOR AREA RATIO
NET	8	80000	640,000	4.9	1871	10.31	15.21	0.97
STREETS							4.9	
GROSS							20.1	

OFFICE

	FLOOR AREA (SF)	FLOOR AREA RATIO	OPEN SPACE (ACRES)	OPEN SPACE RATIO	BUILDING AREA (ACRES)	PARKING (CARS)	PARKING (ACRES)	LAND AREA (ACRES)
RESIDENTIAL	1,899,000	0.84	35.6	0.82	16.4	4198	23.1	52
COMMUNITY CENTER	121,817	0.45	3.43	1.23	2.8	379	2.09	6.23
OFFICE	640,000	0.97	10.3	0.7	4.9	1871	10.3	15.2
NET	2,660,817	0.83	49.3	0.81	24.1	6448	35.5	73.4
STREETS			24.5					24.5
GROSS	2,660,817	0.83	73.8	1.2	24.1	6448	35.5	97.9

TOTAL DEVELOPMENT

TOWNHOUSES

12.6 ACRES

TOWNHOUSE PARKING

12.1 ACRES

APARTMENTS

3.8 ACRES

APARTMENT PARKING

11 ACRES

RESIDENTIAL OPEN SPACE

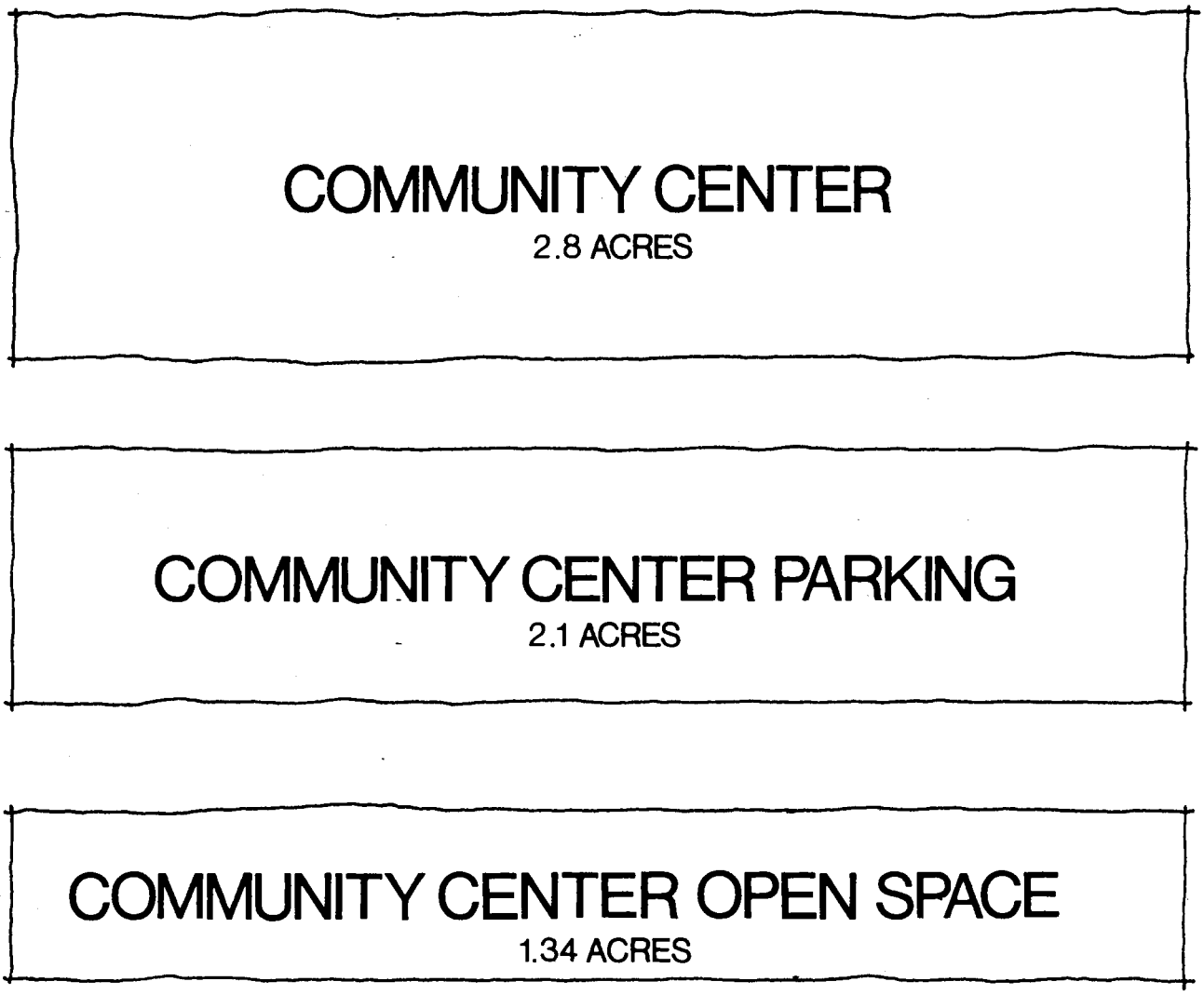
12.5 ACRES

OFFICES

4.9 ACRES

OFFICE PARKING

10.3 ACRES


COMMUNITY CENTER
2.8 ACRES
COMMUNITY CENTER PARKING
2.1 ACRES
COMMUNITY CENTER OPEN SPACE
1.34 ACRES

Financial Analysis

Financial feasibility for the program was tested, using computer analysis of economic factors for the base scheme outlined and energy conserving options.

SCHEME 1 , BELLE ISLE [illegible]

GROSS BUILDING AREA	[illegible]	SF
EFFICIENCY (NET/GROSS)	[illegible]	%
LEASABLE SPACE	[illegible]	SF
RENT	[illegible]	$/SF/YEAR
GROSS RENTAL INCOME	76[illegible]	$/YEAR
OPERATING EXPENSE	2.5[illegible]	$/SF/YEAR
OPERATING EXPENSE	27694[illegible]	$
NET INCOME	4[illegible]	$
CAPITALIZATION RATE	[illegible].2603	%
CAPITALIZED VALUE	[illegible]7129800	$
MORTGAGE LOAN	75	%
MORTGAGE LOAN	2[illegible]4735.	$
MORTGAGE LOAN LENGTH		YEARS
MORTGAGE LOAN INTEREST		%
DEBT SERVICE COVERAGE	[illegible]	
ANNUAL DEBT SERVICE PAYMENT	3692640	$
PROFIT BEFORE TAXES	1230880	$
MINIMUM ACCEPTABLE RETURN	10	%
MAXIMUM CASH INVESTMENT	12308800	$
MAXIMUM PROJECT COST (BUDGET)	40156150	$
BUILDING CONSTRUCTION COST	28574000	$
UNIT CONSTRUCTION COST	26.00	$/SF
SITE DEVELOPMENT COST	5582010	$
PERCENTAGE SITE COSTS	5	%
LUMP SUM SITE COST	3574200	$
FEES, FINANCING, PERSONALTY	4015620	$
LAND AREA	37.0	ACRES
LAND VALUE	1984520	$
UNIT LAND VALUE	1.23	$/SF
LIFE CYCLE LENGTH	33	YEARS
DISCOUNT RATE	10	%
TOTAL LIFE CYCLE COST	60257100	$
LIFE CYCLE INVESTMENT COSTS	33754400	$
LIFE CYCLE OPERATING COSTS	4071080	$
LIFE CYCLE ENERGY COSTS	22431600	$
TOTAL LIFE CYCLE SAVINGS	0	$

SCHEME 1 , BELLE ISLE DEVELOPMENT, APARTMENT USE

GROSS BUILDING AREA	800000	SF
EFFICIENCY (NET/GROSS)	95	%
LEASABLE SPACE	760000	SF
RENT	9	$/SF/YEAR
GROSS RENTAL INCOME	6840000	$/YEAR
OPERATING EXPENSE	3.60	$/SF/YEAR
OPERATING EXPENSE	2880000	$
NET INCOME	3960000	$
CAPITALIZATION RATE	13.2603	%
CAPITALIZED VALUE	29863600	$
MORTGAGE LOAN	75	%
MORTGAGE LOAN	22397700	$
MORTGAGE LOAN LENGTH	33	YEARS
MORTGAGE LOAN INTEREST	13	%
DEBT SERVICE CONSTANT	.132602754229	
ANNUAL DEBT SERVICE PAYMENT	2970000	$
PROFIT BEFORE TAXES	990000	$
MINIMUM ACCEPTABLE RETURN	10	%
MAXIMUM CASH INVESTMENT	9900000	$
MAXIMUM PROJECT COST (BUDGET)	32297700	$
BUILDING CONSTRUCTION COST	23200000	$
UNIT CONSTRUCTION COST	29.00	$/SF
SITE DEVELOPMENT COST	3063890	$
PERCENTAGE SITE COSTS	5	%
LUMP SUM SITE COST	1449000	$
FEES, FINANCING, PERSONALTY	3229770	$
LAND AREA	15.0	ACRES
LAND VALUE	2804040	$
UNIT LAND VALUE	4.29	$/SF
LIFE CYCLE LENGTH	33	YEARS
DISCOUNT RATE	10	%
TOTAL LIFE CYCLE COST	54708600	$
LIFE CYCLE INVESTMENT COSTS	27148700	$
LIFE CYCLE OPERATING COSTS	16290900	$
LIFE CYCLE ENERGY COSTS	11269000	$
TOTAL LIFE CYCLE SAVINGS	0	$

SCHEME 1 , BELLE ISLE DEVELOPMENT, COMMUNITY CENTER USE

GROSS BUILDING AREA	83617	SF
EFFICIENCY (NET/GROSS)	100	%
LEASABLE SPACE	83617	SF
RENT	8	$/SF/YEAR
GROSS RENTAL INCOME	668936	$/YEAR
OPERATING EXPENSE	2.50	$/SF/YEAR
OPERATING EXPENSE	209043	$
NET INCOME	459893	$
CAPITALIZATION RATE	13.2603	%
CAPITALIZED VALUE	3468190	$
MORTGAGE LOAN	75	%
MORTGAGE LOAN	2601142	$
MORTGAGE LOAN LENGTH	33	YEARS
MORTGAGE LOAN INTEREST	13	%
DEBT SERVICE CONSTANT	.132602754229	
ANNUAL DEBT SERVICE PAYMENT	344919	$
PROFIT BEFORE TAXES	114974	$
MINIMUM ACCEPTABLE RETURN	10	%
MAXIMUM CASH INVESTMENT	1149740	$
MAXIMUM PROJECT COST (BUDGET)	3750882	$
BUILDING CONSTRUCTION COST	2675740	$
UNIT CONSTRUCTION COST	32.00	$/SF
SITE DEVELOPMENT COST	576842	$
PERCENTAGE SITE COSTS	5	%
LUMP SUM SITE COST	389298	$
FEES, FINANCING, PERSONALTY	375088	$
LAND AREA	4.0	ACRES
LAND VALUE	123213	$
UNIT LAND VALUE	.70	$/SF
LIFE CYCLE LENGTH	33	YEARS
DISCOUNT RATE	10	%
TOTAL LIFE CYCLE COST	5153310	$
LIFE CYCLE INVESTMENT COSTS	3152900	$
LIFE CYCLE OPERATING COSTS	-114896	$
LIFE CYCLE ENERGY COSTS	2115310	$
TOTAL LIFE CYCLE SAVINGS	0	$

SCHEME 1 , BELLE ISLE DEVELOPMENT, OFFICE USE

GROSS BUILDING AREA	640000	SF
EFFICIENCY (NET/GROSS)	95	%
LEASABLE SPACE	608000	SF
RENT	11	$/SF/YEAR
GROSS RENTAL INCOME	6688000	$/YEAR
OPERATING EXPENSE	3.60	$/SF/YEAR
OPERATING EXPENSE	2304000	$
NET INCOME	4384000	$
CAPITALIZATION RATE	13.2603	%
CAPITALIZED VALUE	33061100	$
MORTGAGE LOAN	75	%
MORTGAGE LOAN	24795825	$
MORTGAGE LOAN LENGTH	33	YEARS
MORTGAGE LOAN INTEREST	13	%
DEBT SERVICE CONSTANT	.132602754229	
ANNUAL DEBT SERVICE PAYMENT	3287990	$
PROFIT BEFORE TAXES	1096010	$
MINIMUM ACCEPTABLE RETURN	10	%
MAXIMUM CASH INVESTMENT	10960100	$
MAXIMUM PROJECT COST (BUDGET)	35755925	$
BUILDING CONSTRUCTION COST	26880000	$
UNIT CONSTRUCTION COST	42.00	$/SF
SITE DEVELOPMENT COST	3256120	$
PERCENTAGE SITE COSTS	5	%
LUMP SUM SITE COST	1468320	$
FEES, FINANCING, PERSONALTY	3575590	$
LAND AREA	15.2	ACRES
LAND VALUE	2044220	$
UNIT LAND VALUE	3.09	$/SF
LIFE CYCLE LENGTH	33	YEARS
DISCOUNT RATE	10	%
TOTAL LIFE CYCLE COST	52103600	$
LIFE CYCLE INVESTMENT COSTS	30055500	$
LIFE CYCLE OPERATING COSTS	13952800	$
LIFE CYCLE ENERGY COSTS	8095280	$
TOTAL LIFE CYCLE SAVINGS	0	$

SCHEME 1 TOTAL DEVELOPMENT

BELLE ISLE DEVELOPMENT

GROSS RENTAL INCOME	21889900	$/YEAR
OPERATING EXPENSES	8162520	$
NET INCOME	13727400	$
CAPITALIZED VALUE	103523000	$
PROFIT BEFORE TAXES	3431860	$
MAXIMUM CASH INVESTMENT	34318600	$
MAXIMUM PROJECT COST (BUDGET)	111961000	$
BUILDING CONSTRUCTION COST	81329700	$
SITE DEVELOPMENT COST	12478900	$
FEES,FINANCING,PERSONALTY	11196100	$
LAND AREA	71.2	ACRES
LAND VALUE	6955990	$
UNIT LAND VALUE	2.24	$/SF
TOTAL LIFE CYCLE COST	467568000	$
LIFE CYCLE INVESTMENT COSTS	252826000	$
LIFE CYCLE OPERATING COSTS	78880800	$
LIFE CYCLE ENERGY COSTS	135861000	$
TOTAL LIFE CYCLE SAVINGS	0	$

TABULATION OF LIFE CYCLE PRESENT VALUES (DISCOUNTED): SCHEME 1

YEAR	INVESTMENT	OPERATIONS	ENERGY	SAVINGS
1	94111500	5905620	1514840	0
2	0	5243550	1502320	0
3	0	4642720	1489920	0
4	0	4097520	1477600	0
5	0	3602900	1465380	0
6	0	3154260	1453280	0
7	0	2747400	1441270	0
8	0	2378520	1429360	0
9	0	2044170	1417540	0
10	0	1741180	1405820	0
11	0	1466710	1394210	0
12	0	1218150	1382690	0
13	0	993131	1371260	0

TABULATION OF FINANCIAL DATA: SCHEME 1

YEAR	DEPRECIATION	TAXABLE INCOME	INTEREST	PRINCIPAL
1	4133950	3633960	10093500	77440000
2	3945800	3660220	10067200	77211600
3	3766440	3689900	10037500	76953700
4	3595460	3723430	10004000	76662100
5	3432440	3761330	9966080	76332700
6	3277000	3804170	9923250	75960400
7	3128820	3852560	9874850	75539700
8	2987520	3907240	9820170	75064400
9	2852760	3969050	9758360	74527200
10	2724270	4038880	9688530	73920200
11	2601730	4117790	9609630	73234400
12	2484860	4206950	9520460	72459300
13	2373400	4307700	9419710	71583500

SCHEME 2 , ADD ENERGY CONSERVATION OPTIONS, TOWNHOUSE USE

GROSS BUILDING AREA	1099000	SF
EFFICIENCY (NET/GROSS)	100	%
LEASABLE SPACE	1099000	SF
RENT	7	$/SF/YEAR
GROSS RENTAL INCOME	7693000	$/YEAR
OPERATING EXPENSE	2.07	$/SF/YEAR
OPERATING EXPENSE	2274930	$
NET INCOME	5418070	$
CAPITALIZATION RATE	13.2603	%
CAPITALIZED VALUE	40859300	$
MORTGAGE LOAN	75	%
MORTGAGE LOAN	30644475	$
MORTGAGE LOAN LENGTH	33	YEARS
MORTGAGE LOAN INTEREST	13	%
DEBT SERVICE CONSTANT	.132602754229	
ANNUAL DEBT SERVICE PAYMENT	4063540	$
PROFIT BEFORE TAXES	1354530	$
MINIMUM ACCEPTABLE RETURN	10	%
MAXIMUM CASH INVESTMENT	13545300	$
MAXIMUM PROJECT COST (BUDGET)	44189775	$
BUILDING CONSTRUCTION COST	31431400	$
UNIT CONSTRUCTION COST	28.60	$/SF
SITE DEVELOPMENT COST	4698430	$
PERCENTAGE SITE COSTS	4	%
LUMP SUM SITE COST	2930840	$
FEES, FINANCING, PERSONALTY	4418980	$
LAND AREA	37.0	ACRES
LAND VALUE	3640970	$
UNIT LAND VALUE	2.26	$/SF
LIFE CYCLE LENGTH	33	YEARS
DISCOUNT RATE	10	%
TOTAL LIFE CYCLE COST	58914600	$
LIFE CYCLE INVESTMENT COSTS	37144800	$
LIFE CYCLE OPERATING COSTS	13555500	$
LIFE CYCLE ENERGY COSTS	8214320	$
TOTAL LIFE CYCLE SAVINGS	-1342160	$

SCHEME 2 , ADD ENERGY CONSERVATION OPTIONS, APARTMENT USE

GROSS BUILDING AREA	800000	SF
EFFICIENCY (NET/GROSS)	95	%
LEASABLE SPACE	760000	SF
RENT	9	$/SF/YEAR
GROSS RENTAL INCOME	6840000	$/YEAR
OPERATING EXPENSE	3.29	$/SF/YEAR
OPERATING EXPENSE	2632000	$
NET INCOME	4208000	$
CAPITALIZATION RATE	13.2603	%
CAPITALIZED VALUE	31733800	$
MORTGAGE LOAN	75	%
MORTGAGE LOAN	23800350	$
MORTGAGE LOAN LENGTH	33	YEARS
MORTGAGE LOAN INTEREST	13	%
DEBT SERVICE CONSTANT	.132602754229	
ANNUAL DEBT SERVICE PAYMENT	3155990	$
PROFIT BEFORE TAXES	1052010	$
MINIMUM ACCEPTABLE RETURN	10	%
MAXIMUM CASH INVESTMENT	10520100	$
MAXIMUM PROJECT COST (BUDGET)	34320450	$
BUILDING CONSTRUCTION COST	25520000	$
UNIT CONSTRUCTION COST	31.90	$/SF
SITE DEVELOPMENT COST	2561000	$
PERCENTAGE SITE COSTS	4	%
LUMP SUM SITE COST	1188180	$
FEES, FINANCING, PERSONALTY	3432050	$
LAND AREA	15.0	ACRES
LAND VALUE	2807400	$
UNIT LAND VALUE	4.30	$/SF
LIFE CYCLE LENGTH	33	YEARS
DISCOUNT RATE	10	%
TOTAL LIFE CYCLE COST	54035900	$
LIFE CYCLE INVESTMENT COSTS	28848900	$
LIFE CYCLE OPERATING COSTS	21047400	$
LIFE CYCLE ENERGY COSTS	4139630	$
TOTAL LIFE CYCLE SAVINGS	-673069	$

SCHEME 2 , ADD ENERGY CONSERVATION OPTIONS, COMMUNITY CENTER USE

GROSS BUILDING AREA	83617	SF
EFFICIENCY (NET/GROSS)	100	%
LEASABLE SPACE	83617	SF
RENT	8	$/SF/YEAR
GROSS RENTAL INCOME	668936	$/YEAR
OPERATING EXPENSE	1.95	$/SF/YEAR
OPERATING EXPENSE	163053	$
NET INCOME	505883	$
CAPITALIZATION RATE	13.2603	%
CAPITALIZED VALUE	3815020	$
MORTGAGE LOAN	75	%
MORTGAGE LOAN	2861265	$
MORTGAGE LOAN LENGTH	33	YEARS
MORTGAGE LOAN INTEREST	13	%
DEBT SERVICE CONSTANT	.132602754229	
ANNUAL DEBT SERVICE PAYMENT	379412	$
PROFIT BEFORE TAXES	126471	$
MINIMUM ACCEPTABLE RETURN	10	%
MAXIMUM CASH INVESTMENT	1264710	$
MAXIMUM PROJECT COST (BUDGET)	4125975	$
BUILDING CONSTRUCTION COST	2943320	$
UNIT CONSTRUCTION COST	35.20	$/SF
SITE DEVELOPMENT COST	484263	$
PERCENTAGE SITE COSTS	4	%
LUMP SUM SITE COST	319224	$
FEES, FINANCING, PERSONALTY	412598	$
LAND AREA	4.0	ACRES
LAND VALUE	285794	$
UNIT LAND VALUE	1.63	$/SF
LIFE CYCLE LENGTH	33	YEARS
DISCOUNT RATE	10	%
TOTAL LIFE CYCLE COST	5028530	$
LIFE CYCLE INVESTMENT COSTS	3468200	$
LIFE CYCLE OPERATING COSTS	767083	$
LIFE CYCLE ENERGY COSTS	793247	$
TOTAL LIFE CYCLE SAVINGS	-124800	$

SCHEME 2 , ADD ENERGY CONSERVATION OPTIONS, OFFICE USE

GROSS BUILDING AREA	640000	SF
EFFICIENCY (NET/GROSS)	95	%
LEASABLE SPACE	608000	SF
RENT	11	$/SF/YEAR
GROSS RENTAL INCOME	6688000	$/YEAR
OPERATING EXPENSE	3.32	$/SF/YEAR
OPERATING EXPENSE	2124800	$
NET INCOME	4563200	$
CAPITALIZATION RATE	13.2603	%
CAPITALIZED VALUE	34412500	$
MORTGAGE LOAN	75	%
MORTGAGE LOAN	25809375	$
MORTGAGE LOAN LENGTH	33	YEARS
MORTGAGE LOAN INTEREST	13	%
DEBT SERVICE CONSTANT	.132602754229	
ANNUAL DEBT SERVICE PAYMENT	3422390	$
PROFIT BEFORE TAXES	1140810	$
MINIMUM ACCEPTABLE RETURN	10	%
MAXIMUM CASH INVESTMENT	11408100	$
MAXIMUM PROJECT COST (BUDGET)	37217475	$
BUILDING CONSTRUCTION COST	29568000	$
UNIT CONSTRUCTION COST	46.20	$/SF
SITE DEVELOPMENT COST	2692720	$
PERCENTAGE SITE COSTS	4	%
LUMP SUM SITE COST	1204020	$
FEES, FINANCING, PERSONALTY	3721750	$
LAND AREA	15.2	ACRES
LAND VALUE	1235010	$
UNIT LAND VALUE	1.87	$/SF
LIFE CYCLE LENGTH	33	YEARS
DISCOUNT RATE	10	%
TOTAL LIFE CYCLE COST	51617300	$
LIFE CYCLE INVESTMENT COSTS	31284100	$
LIFE CYCLE OPERATING COSTS	17389500	$
LIFE CYCLE ENERGY COSTS	2943740	$
TOTAL LIFE CYCLE SAVINGS	-486231	$

SCHEME 2 TOTAL DEVELOPMENT

ADD ENERGY CONSERVATION OPTIONS

GROSS RENTAL INCOME	21889900	$/YEAR
OPERATING EXPENSES	7194780	$
NET INCOME	14695200	$
CAPITALIZED VALUE	110821000	$
PROFIT BEFORE TAXES	3673820	$
MAXIMUM CASH INVESTMENT	36738200	$
MAXIMUM PROJECT COST (BUDGET)	119854000	$
BUILDING CONSTRUCTION COST	89462700	$
SITE DEVELOPMENT COST	10436400	$
FEES,FINANCING,PERSONALTY	11985400	$
LAND AREA	71.2	ACRES
LAND VALUE	7969170	$
UNIT LAND VALUE	2.57	$/SF
TOTAL LIFE CYCLE COST	459442000	$
LIFE CYCLE INVESTMENT COSTS	273347000	$
LIFE CYCLE OPERATING COSTS	136289000	$
LIFE CYCLE ENERGY COSTS	49806300	$
TOTAL LIFE CYCLE SAVINGS	-8123720	$

TABULATION OF LIFE CYCLE PRESENT VALUES (DISCOUNTED): SCHEME 2

YEAR	INVESTMENT	OPERATIONS	ENERGY	SAVINGS
1	100746000	5985610	555109	5754690
2	0	5395590	550518	-799769
3	0	4859570	545970	-727114
4	0	4372670	541459	-660982
5	0	3930420	536983	-600876
6	0	3528730	532545	-546260
7	0	3163930	528144	-496610
8	0	2832630	523780	-451449
9	0	2531840	519452	-410409
10	0	2258750	515157	-373107
11	0	2010830	510900	-339182
12	0	1785810	506677	-308350
13	0	1581580	502490	-280320

TABULATION OF FINANCIAL DATA: SCHEME 2

YEAR	DEPRECIATION	TAXABLE INCOME	INTEREST	PRINCIPAL
1	4400150	3890130	10805000	82899300
2	4199970	3918240	10776900	82654900
3	4009140	3950010	10745100	82378700
4	3827210	3985920	10709200	82066600
5	3653760	4026500	10668700	81713900
6	3488390	4072350	10622800	81315400
7	3330700	4124140	10571000	80865200
8	3180340	4182670	10512500	80356400
9	3036960	4248820	10446300	79781400
10	2900230	4323570	10371600	79131700
11	2769830	4408040	10287100	78397500
12	2645460	4503480	10191700	77567900
13	2526860	4611330	10083800	76630400

SUMMARY

Market

Since the Belle Isle Lake site is situated among competing land uses, a mixed-use development should be provided. This is also strengthened by the desire to realize early income from the land since no single land use has an absorption rate sufficient to consume the entire property area. The trends toward higher density residential in the area (and the City) indicate a market for apartments and townhouses. Since a growing number of residents desire amenities, a community center should be integrated into the development. Since the primary market for office space is composed of smaller tenants, low density development should be provided. This would also be more fully integrated into the total development. The natural qualities of the site are market attractions and should be preserved and utilized as open space. Since future demands are uncertain, the land-use pattern should be flexible to reallocation of land among uses or insertion of additional uses.

Environment

To become an integral part of the existing urban area, the development should transition into the surrounding uses. This would also solve neighborhood concerns by not only providing a compatible adjacent development, but also unifying these neighborhoods and thus stabilizing the land use of the area. Since the site must provide drainage functions, those areas necessary should be preserved and utilized as open space, recreation and parks. The site possesses a rich history that should be retained. The existing power station building should be utilized due to its soundness, aesthetic qualities, and landmark recognition.

Community

Since the development is to become a part of the existing community, services should be provided in the "holistic" sense. These will include retail, multi-service and school facilities, as well as recreation space. The sense of community should be emphasized through this community center. The residential development should utilize the center as a focus and activity center.

Economics

Since the optimal solution satisfying the requirements of the "highest-and-best use" of Belle Isle Lake necessarily must produce maximum economic benefits, the development must satisfy feasibility analysis and provide return on investment. Early return on investment demands full utilization of the property. Since lower operating costs increase net income and capitalized value, the site and buildings should utilize energy conservation techniques.

DEVELOPMENT PLAN

Market

The master plan responds to market demands by providing a cross-section of the land-uses indicated by the development program. This mixed-use approach to the land use should realize early income from the land development, as modified by other parameters. A community center and recreational amenities are included in the development to attract additional market support. The land-use concept provides close pedestrian circulation links to promote market synergy between existing plus new residential areas (including the community center which is primarily intended for resident use), retail areas (primarily Penn Square), and existing plus new office areas (with the Penn Square Bank Tower serving as commercial center). New office development is contained in medium density buildings to allow response to individual tenant demands. Approximately fifty percent of the lake area is preserved as a market attraction, bringing an estimated twenty percent higher rent.

Buildings suggested are segmented generally to allow flexibility in future land allocation.

Environment

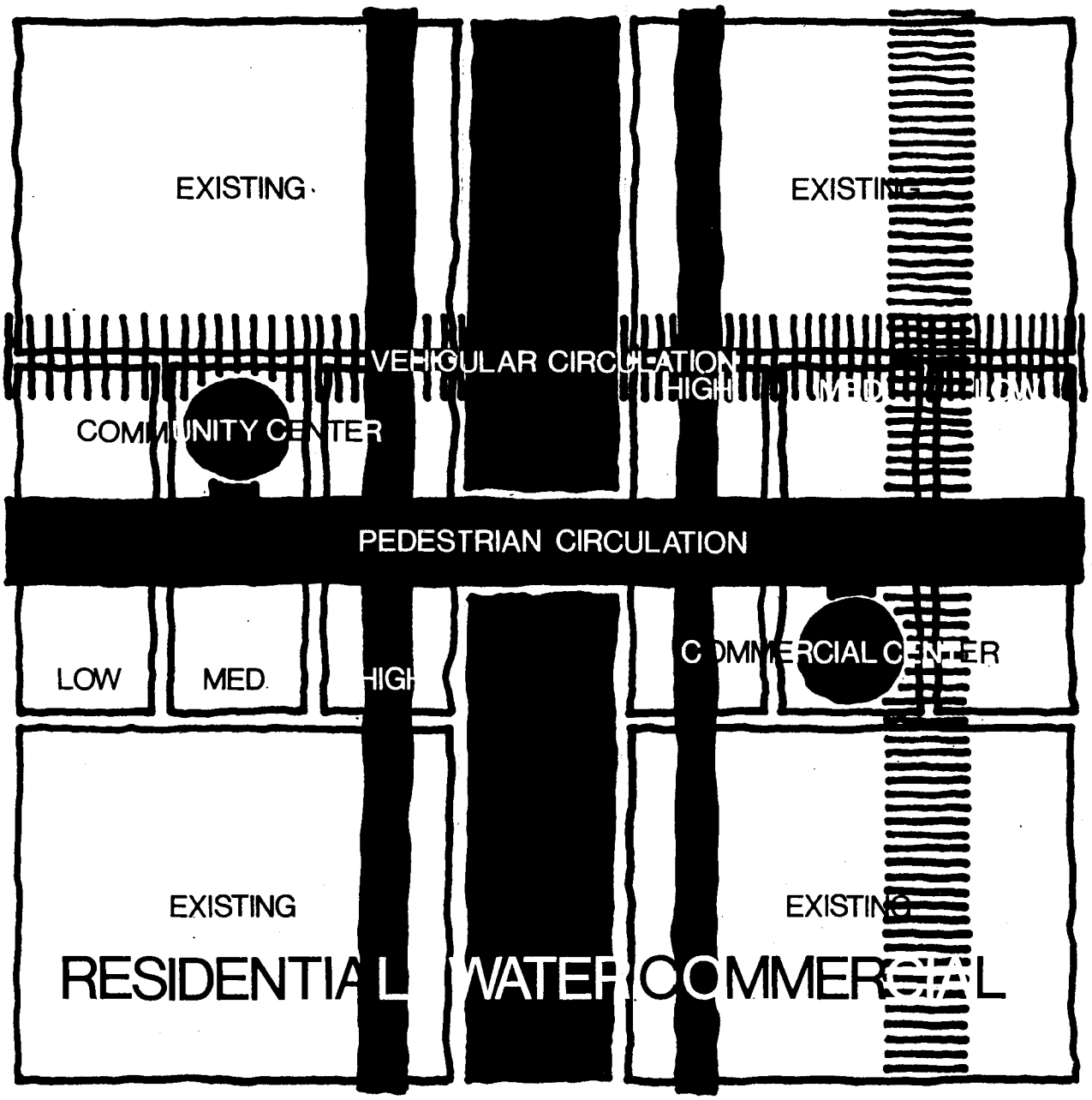
The plan attempts to transition new uses into existing similar uses surrounding the site. This is done by concentrating residential along the lake edge and establishing "bands" of increasingly lower density finally blending into the existing residential areas. The high density "edge" should stabilize the land use of the area. As previously mentioned, a great deal of the lake is preserved, providing drainage with no modification or channelization of surrounding water courses. This lake area is preserved as recreation and parks for the use of residents. The history of the site is recognized by retaining the lake and power station building, retrofitting the latter as a community center, an optimum use for such a "landmark" structure. Also, such features of the past development of the lake as boardwalks, outdoor cafes, and tree-covered pedestrian areas are incorporated into the suggested development.

Community

The provision of a community center unifies the entire residential areas with retail and multi-service facilities. A school site is not included due to the situation of Oklahoma City schools. The physical and psychological identification of the power station with Belle Isle makes it an ideal choice to unify and provide community focus. Walking distances within the development are well within the 1/4 mile pedestrian radius desirable and within the 1/2 mile radius acceptable for the surrounding residential areas. Pedestrian links are assisted through the use of bridges across water areas and main roadways, with the "layering" of interval car circulation reducing the amount of pedestrian/car intersections.

Economics

The optimal solution suggested balances the preceding parameters against the desire to achieve high land value. The land-use mix assists by providing immediate full development and shorten phasing requirements, providing early cash flow. A major decision to preserve a large part of the lake, thereby reducing the amount of "built" land from the 71.2 acres programmed (which allowed no lake area) to the 35.3 acres of the final scheme, required increasing value in other ways to preserve the programmed land value. An additional reduction in energy consumption due to the micro-climate affect of the lake area was estimated. A five degree increase in winter temperatures plus a ten degree decrease in summer temperatures, due to the lake functioning as a solar "heat sink" in winter and an evaporative "cooler" in summer, produced an additional yearly energy savings of approximately four percent. Additionally, by constructing the major buildings on pieces with a structured first floor, a savings in the amount of earthfill can be realized. And, finally, the preservation of the lake would enable approximately twenty percent higher rents to be charged, producing a rent level not in excess of the higher rent levels existing in Oklahoma City. These measures result in a land value of $2.84 per square foot over the entire 97.9 acres contained in the subject property, compared to $1.63 per square foot generated by Scheme 1 and $1.87 per square foot, Scheme 2.


EXISTING
EXISTING
VEHICULAR CIRCULATION
HIGH
COMMUNITY CENTER
PEDESTRIAN CIRCULATION
LOW
MED.
COMMERCIAL CENTER
EXISTING
EXISTING
RESIDENTIAL
WATER
COMMERCIAL

CONCEPT

	FLOOR AREA (SF)	FLOOR AREA RATIO	OPEN SPACE (ACRES)	OPEN SPACE RATIO	BUILDING AREA (ACRES)	PARKING (CARS)	PARKING (ACRES)	LAND AREA (ACRES)
RESIDENTIAL	605,400	1.1	9.53	0.69	3.57	1545	8.5	13.1
COMMUNITY CENTER	83,617	0.68	1.84	0.96	1.0	334	1.84	2.84
OFFICE	691,200	0.97	11.11	0.70	5.29	2020	11.13	16.4
NET	1,380,217	0.98	22.48	0.71	9.86	3899	21.47	32.34
STREETS			10.79					10.79
GROSS	1,380,217	0.79	33.27	1.05	9.86	3899	21.47	43.13

TOTAL DEVELOPMENT

SCHEME 1 TOTAL DEVELOPMENT

BELLE ISLE DEVELOPMENT

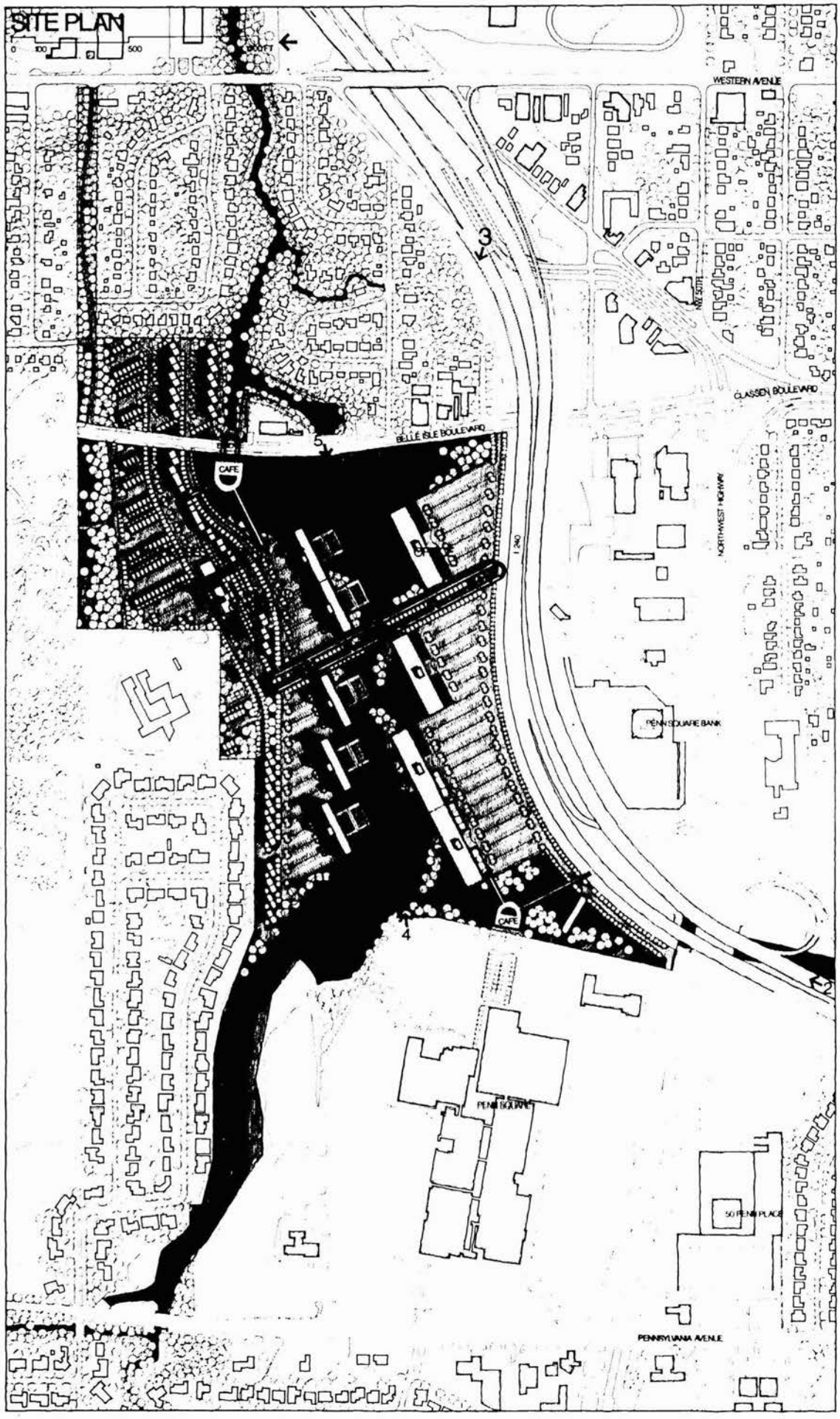
GROSS RENTAL INCOME	13400900	$/YEAR
OPERATING EXPENSES	4184840	$
NET INCOME	9216010	$
CAPITALIZED VALUE	69500700	$
PROFIT BEFORE TAXES	2304020	$
MAXIMUM CASH INVESTMENT	23040200	$
MAXIMUM PROJECT COST (BUDGET)	75165700	$
BUILDING CONSTRUCTION COST	51031300	$
SITE DEVELOPMENT COST	4488690	$
FEES,FINANCING,PERSONALTY	7516580	$
LAND AREA	35.3	ACRES
LAND VALUE	12129100	$
UNIT LAND VALUE	7.90	$/SF
TOTAL LIFE CYCLE COST	187465000	$
LIFE CYCLE INVESTMENT COSTS	111161000	$
LIFE CYCLE OPERATING COSTS	62350900	$
LIFE CYCLE ENERGY COSTS	13953300	$
TOTAL LIFE CYCLE SAVINGS	0	$

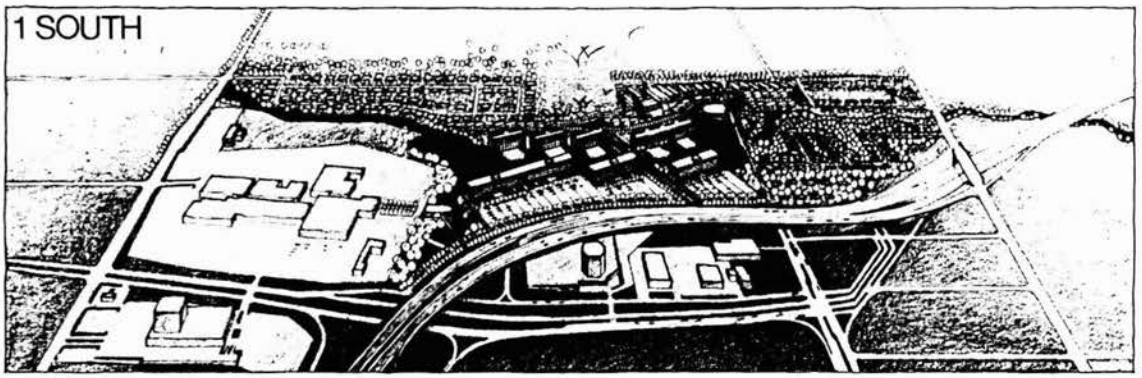
TABULATION OF FINANCIAL DATA: SCHEME 1

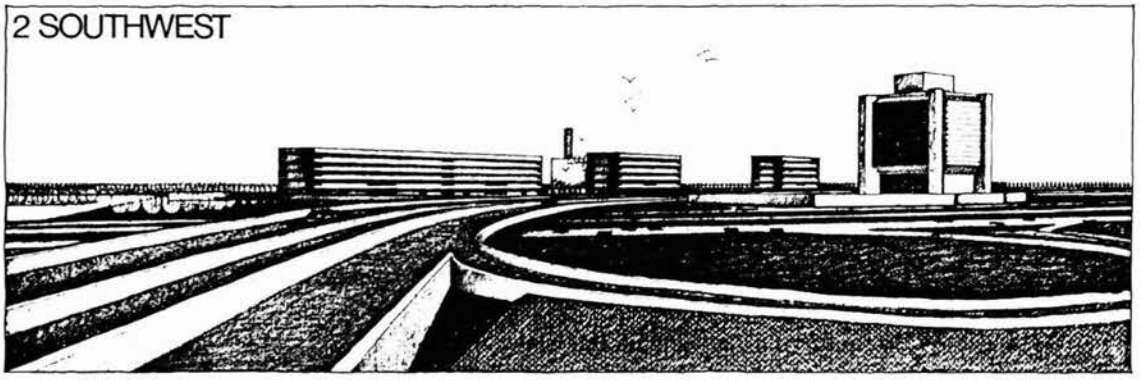
YEAR	DEPRECIATION	TAXABLE INCOME	INTEREST	PRINCIPAL
1	2146000	2439680	6776330	51990000
2	2059700	2457300	6758710	51836600
3	1977020	2477240	6738760	51663500
4	1897790	2499760	6716250	51467800
5	1821870	2525210	6690800	51246500
6	1749110	2553950	6662050	50996600
7	1679380	2586450	6629560	50714200
8	1612550	2623160	6592840	50395000
9	1548480	2664650	6551350	50034500
10	1487070	2711520	6504490	49627000
11	1428200	2764490	6451520	49166700
12	1371750	2824340	6391670	48646400
13	1317620	2891990	6324020	48058400

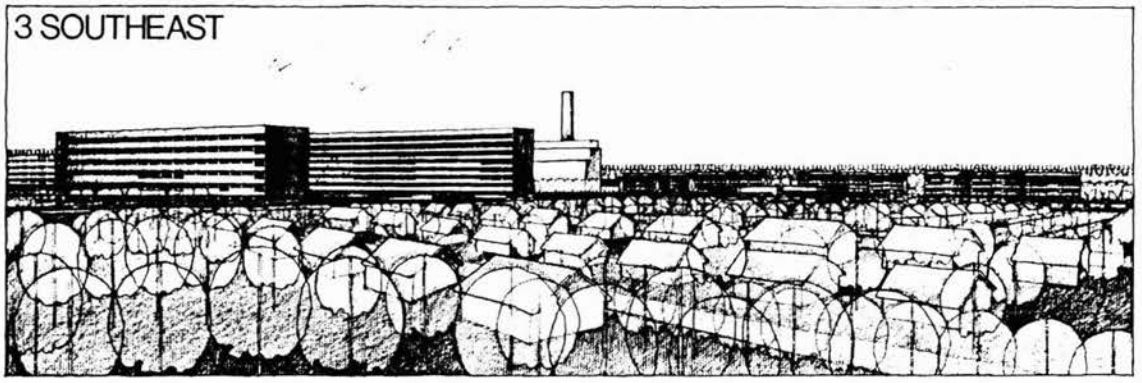
TABULATION OF LIFE CYCLE PRESENT VALUES (DISCOUNTED): SCHEME 1

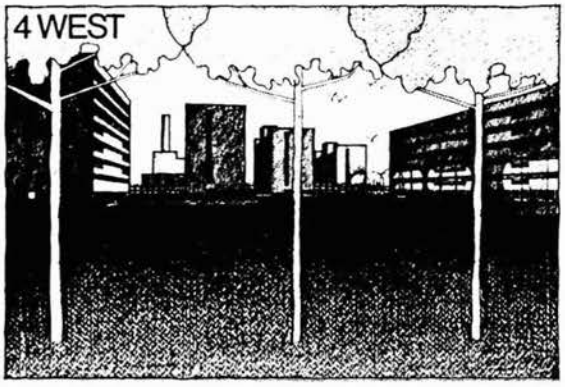
YEAR	INVESTMENT	OPERATIONS	ENERGY	SAVINGS
1	63182400	3568840	235563	0
2	0	3224940	233615	0
3	0	2912450	231684	0
4	0	2628520	229770	0
5	0	2370590	227871	0
6	0	2136260	225988	0
7	0	1923360	224121	0
8	0	1729990	222268	0
9	0	1554350	220431	0
10	0	1394830	218610	0
11	0	1249960	216804	0
12	0	1118410	215011	0
13	0	998965	213234	0


SITE PLAN
100
500
1000FT
WESTERN AVENUE
GLASSEN BOULEVARD
BELLE ISLE BOULEVARD
CAFE
CAFE
NORTHWEST HIGHWAY
2ND
PENN SQUARE BANK
PENN BOULEVARD
50 PENN PLACE
PENNSYLVANIA AVENUE
1
2
3
4
5


1 SOUTH


2 SOUTHWEST


3 SOUTHEAST


4 WEST


5 EAST


6 COMMUNITY CENTER


7 OFFICE

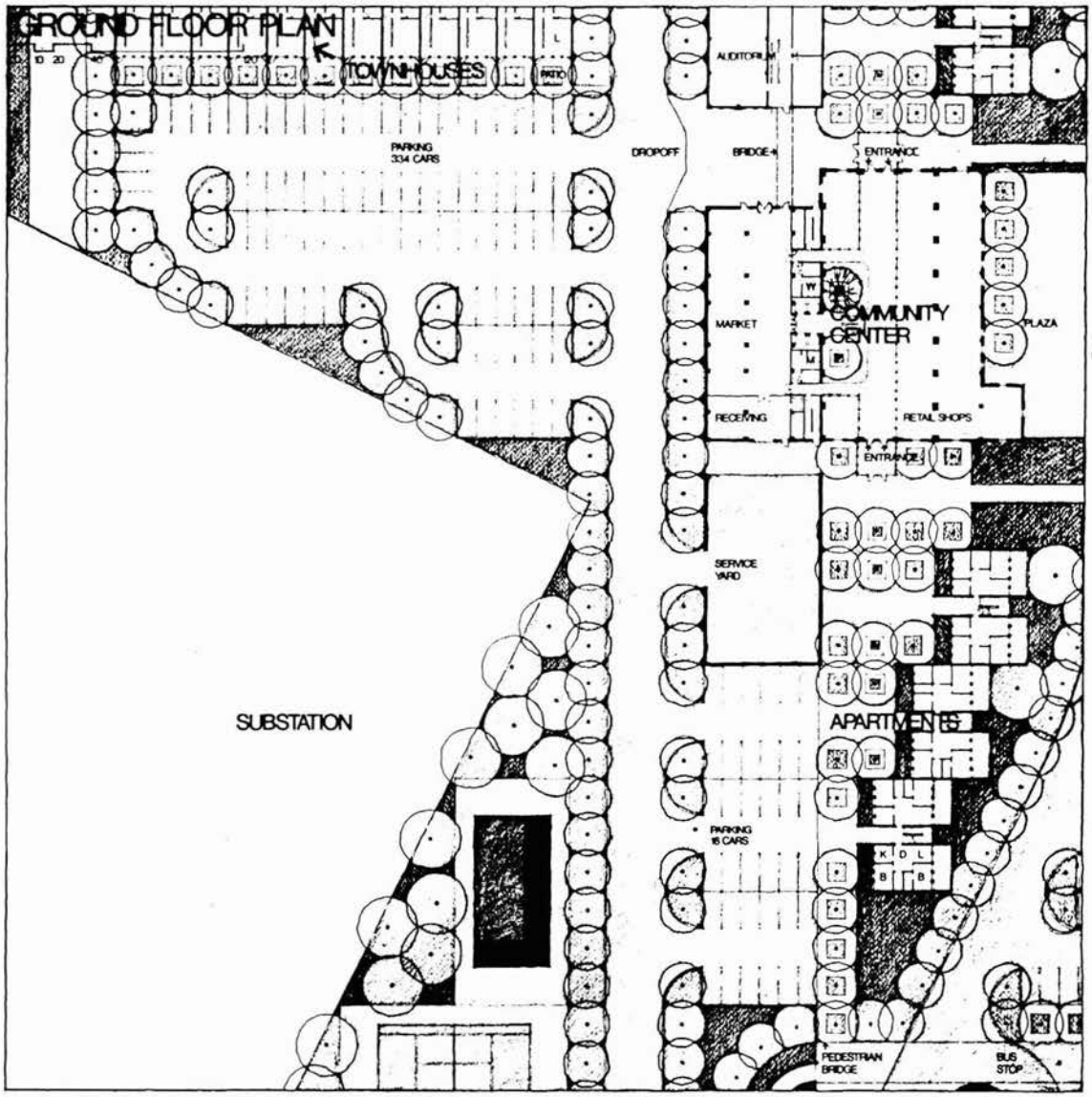

8 APARTMENT

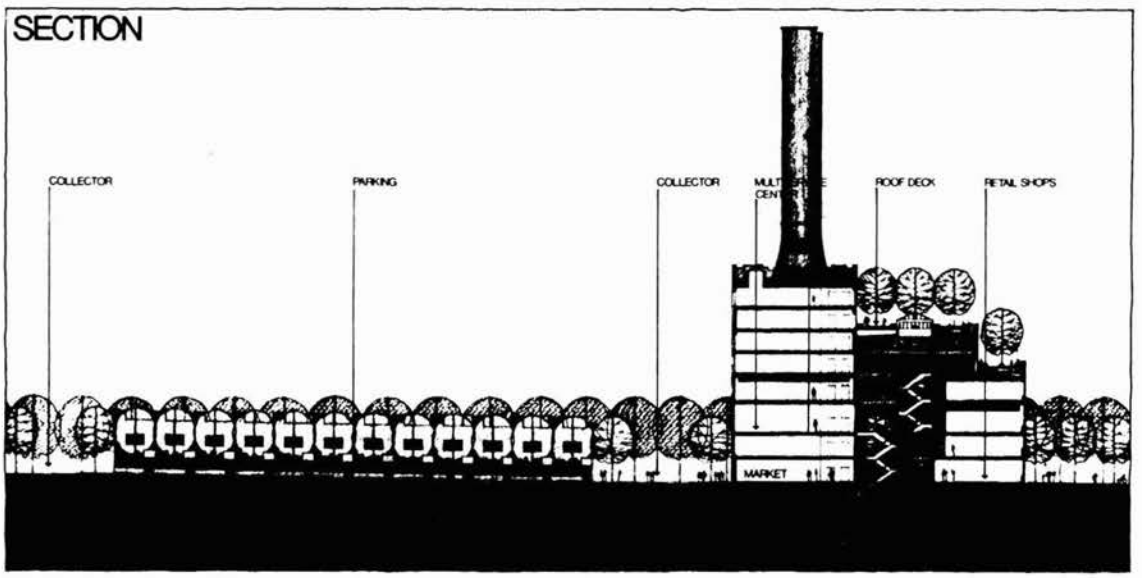
			FLOOR AREA (SF)	BUILDING AREA (ACRES)	PARKING (CARS)	PARKING (ACRES)	LAND AREA (ACRES)	FLOOR AREA RATIO
RETAIL			44,195	0.5	203	1.12	1.62	0.63
MULTISERVICE CENTER			39,422	0.5	131	0.72	1.22	0.74
NET			23,617	1.0	334	1.84	2.84	0.68
STREETS							0.94	
GROSS							3.78	

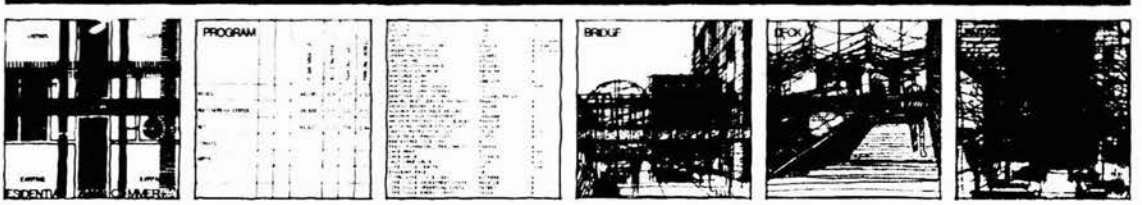
COMMUNITY CENTER

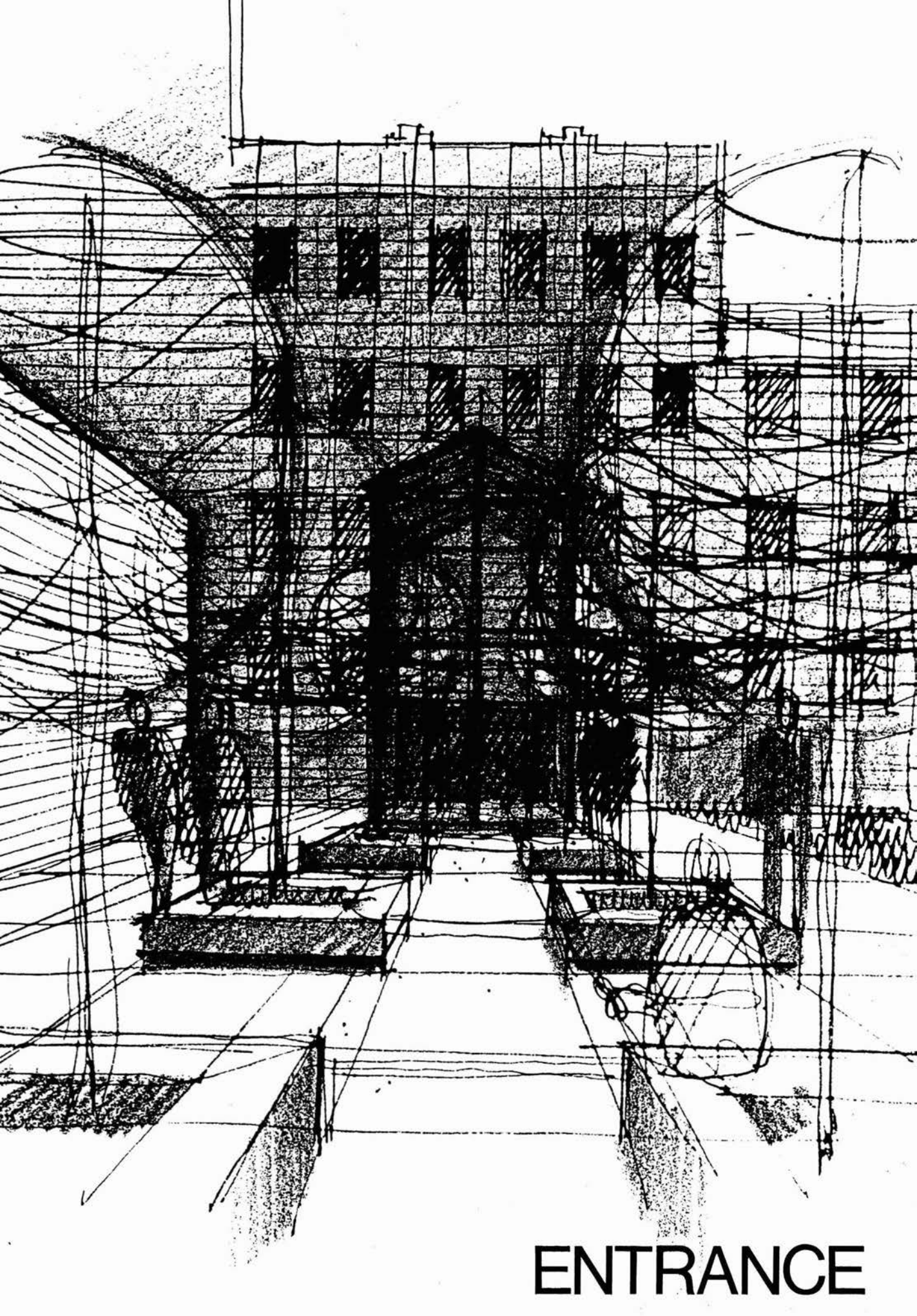
SCHEME 1 , BELLE ISLE DEVELOPMENT, COMMUNITY CENTER USE

GROSS BUILDING AREA	83617	SF
EFFICIENCY (NET/GROSS)	100	%
LEASABLE SPACE	83617	SF
RENT	10	$/SF/YEAR
GROSS RENTAL INCOME	836170	$/YEAR
OPERATING EXPENSE	1.95	$/SF/YEAR
OPERATING EXPENSE	163053	$
NET INCOME	673117	$
CAPITALIZATION RATE	13.2603	%
CAPITALIZED VALUE	5076180	$
MORTGAGE LOAN	75	%
MORTGAGE LOAN	3807135	$
MORTGAGE LOAN LENGTH	33	YEARS
MORTGAGE LOAN INTEREST	13	%
DEBT SERVICE CONSTANT	.132602754229	
ANNUAL DEBT SERVICE PAYMENT	504837	$
PROFIT BEFORE TAXES	168280	$
MINIMUM ACCEPTABLE RETURN	10	%
MAXIMUM CASH INVESTMENT	1682800	$
MAXIMUM PROJECT COST (BUDGET)	5489935	$
BUILDING CONSTRUCTION COST	2943320	$
UNIT CONSTRUCTION COST	35.20	$/SF
SITE DEVELOPMENT COST	219597	$
PERCENTAGE SITE COSTS	4	%
FEES, FINANCING, PERSONALTY	548994	$
LAND AREA	5.7	ACRES
LAND VALUE	1778020	$
UNIT LAND VALUE	7.14	$/SF
LIFE CYCLE LENGTH	33	YEARS
DISCOUNT RATE	10	%
TOTAL LIFE CYCLE COST	6175040	$
LIFE CYCLE INVESTMENT COSTS	4614710	$
LIFE CYCLE OPERATING COSTS	767083	$
LIFE CYCLE ENERGY COSTS	793247	$
TOTAL LIFE CYCLE SAVINGS	0	$

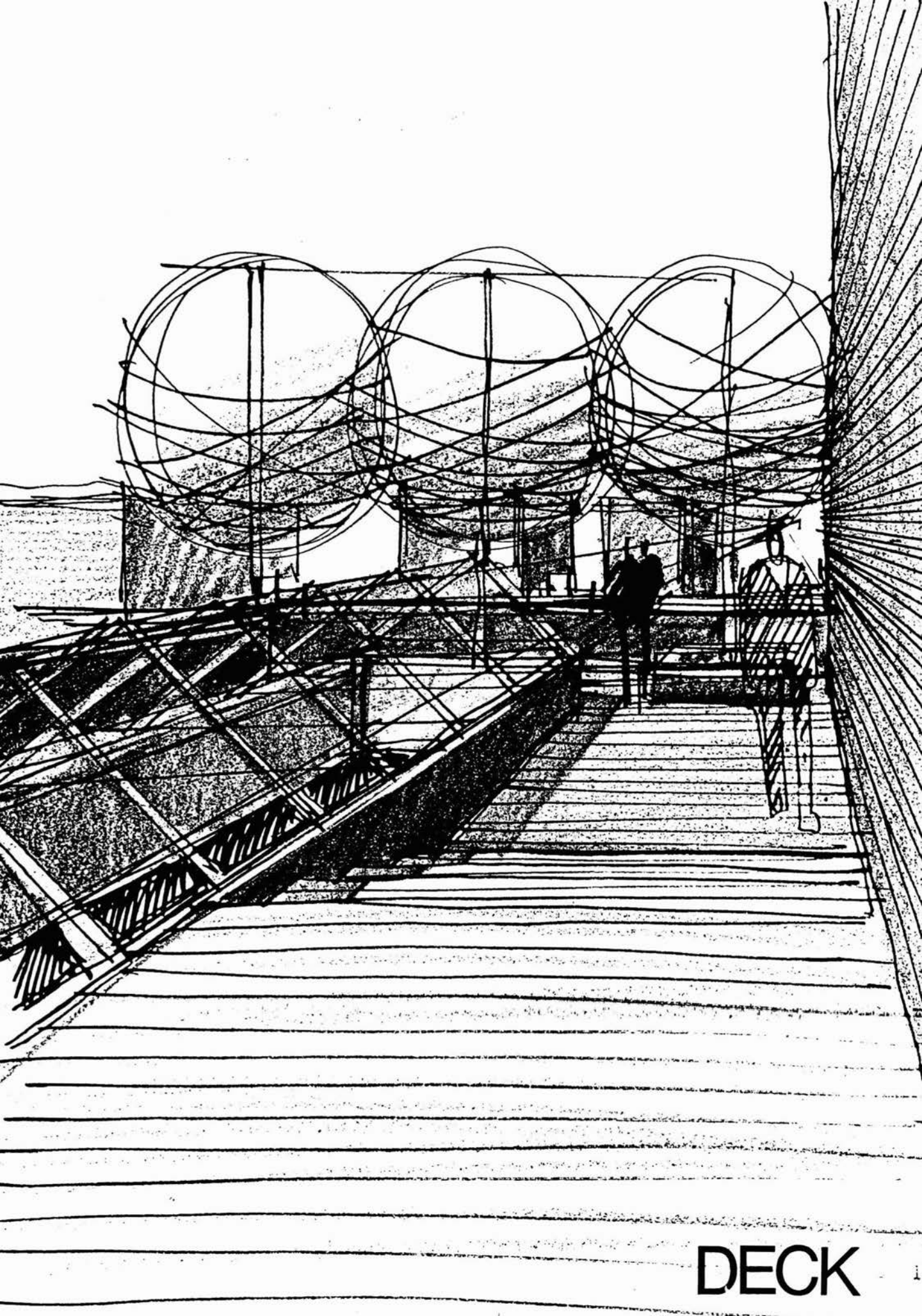

GROUND FLOOR PLAN
10 20
TOWNHOUSES
PATIO
PARKING
334 CARS
DROPOFF
AUDITORIUM
BRIDGE
ENTRANCE
MARKET
COMMUNITY
CENTER
PLAZA
RECEIVING
RETAIL SHOPS
ENTRANCE
SERVICE
YARD
SUBSTATION
APARTMENTS
PARKING
16 CARS
PEDESTRIAN
BRIDGE
BUS
STOP


SECTION
COLLECTOR
PARKING
COLLECTOR
ROOF DECK
RETAIL SHOPS
MARKET

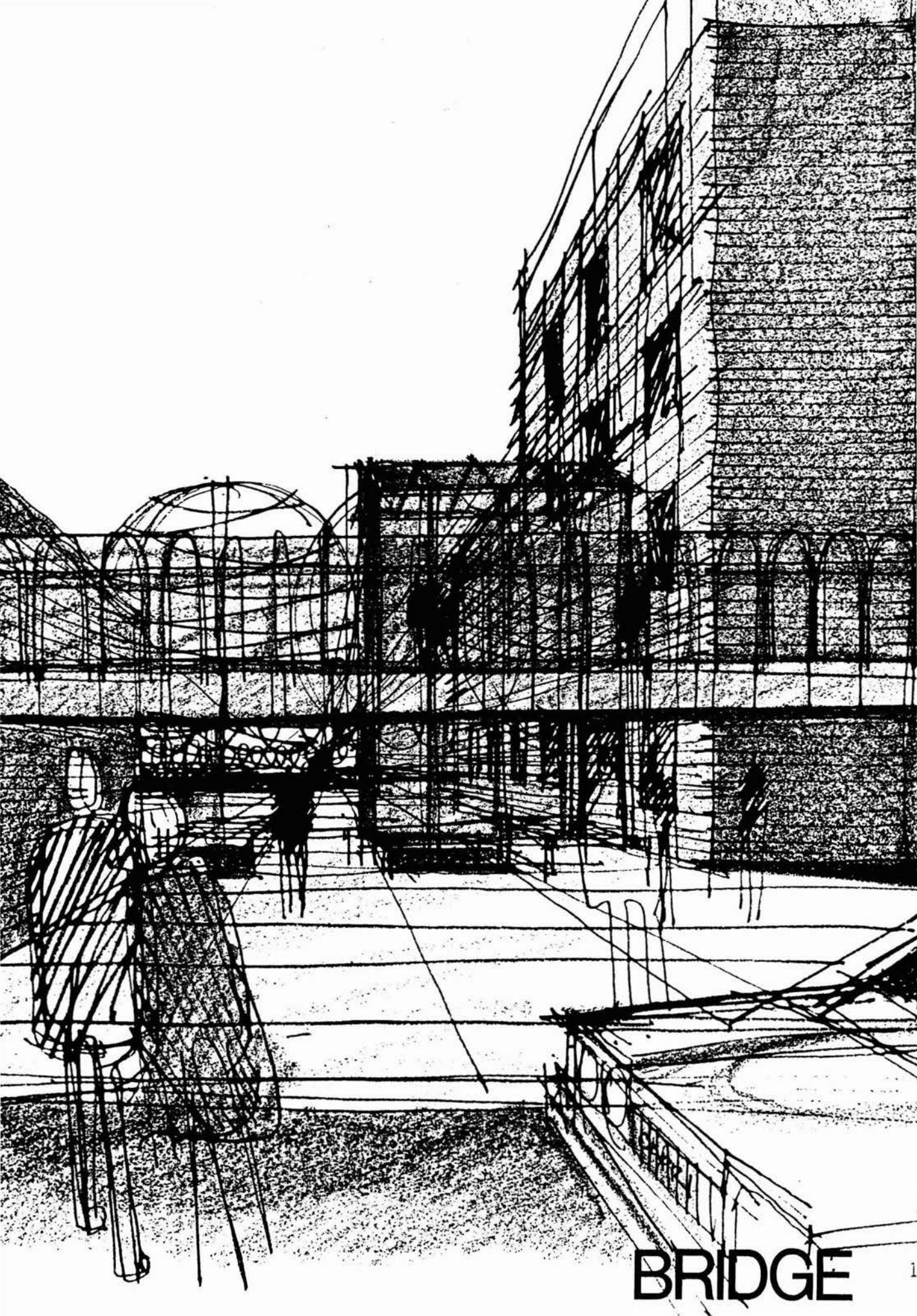

PROGRAM
BRIDGE
DECK



ENTRANCE



DECK



BRIDGE

	QUANTITY	UNIT AREA (SF)	FLOOR AREA (SF)	BUILDING AREA (ACRES)	PARKING (CARS)	PARKING (ACRES)	LAND AREA (ACRES)	FLOOR AREA RATIO
TOWNHOUSES	83	1000	83,000	0.95	166	0.91	2.8	0.68
APARTMENTS	788		522,400	2.62	1379	7.6	10.3	1.4
ONE-BEDROOM	540	600	324,000		810	4.4		
TWO-BEDROOM	248	800	198,400		496	2.7		
NET	871		605,400	3.57	1545	8.5	13.1	1.1
STREETS							5.6	
GROSS							18.8	

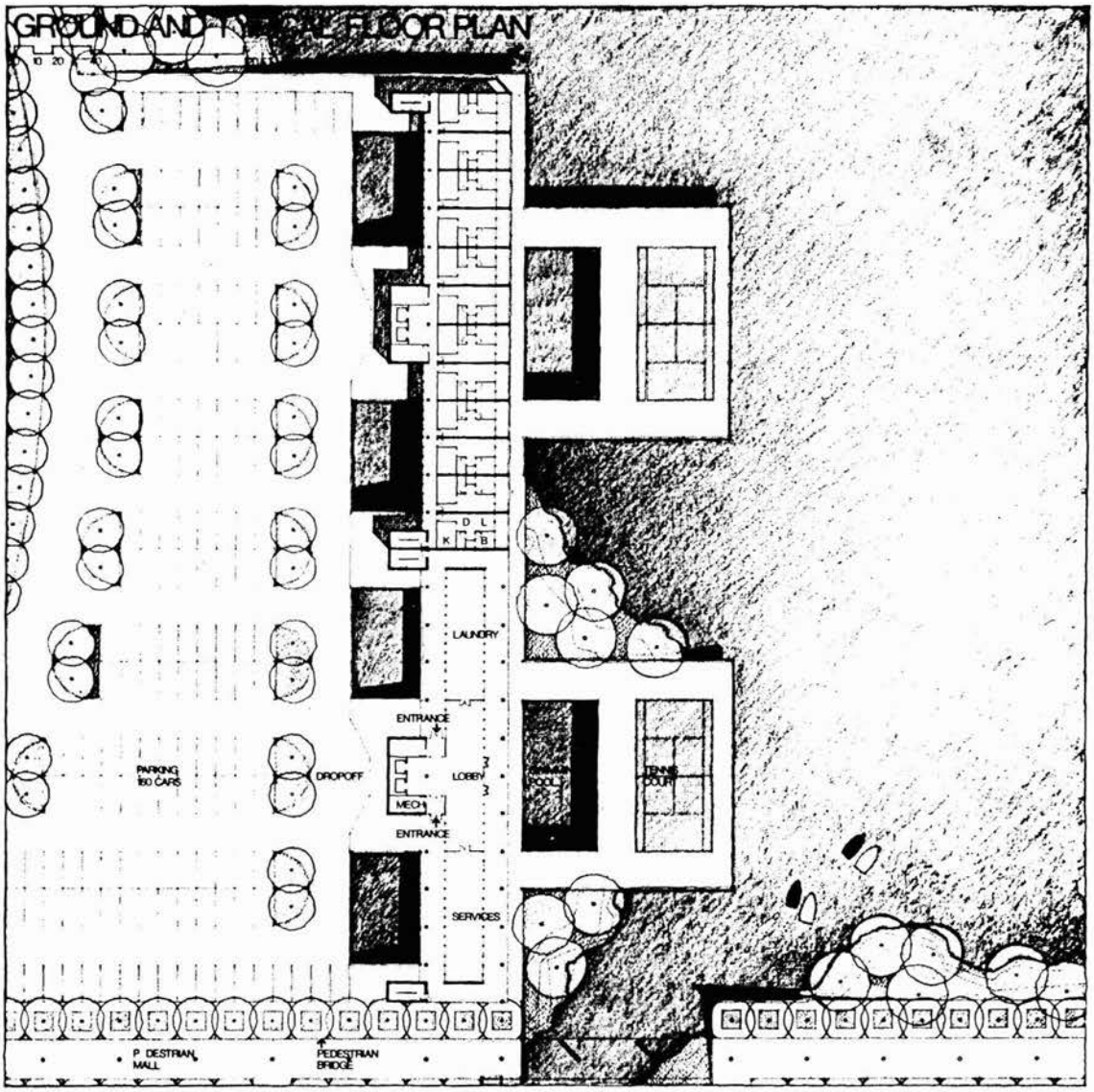
RESIDENTIAL

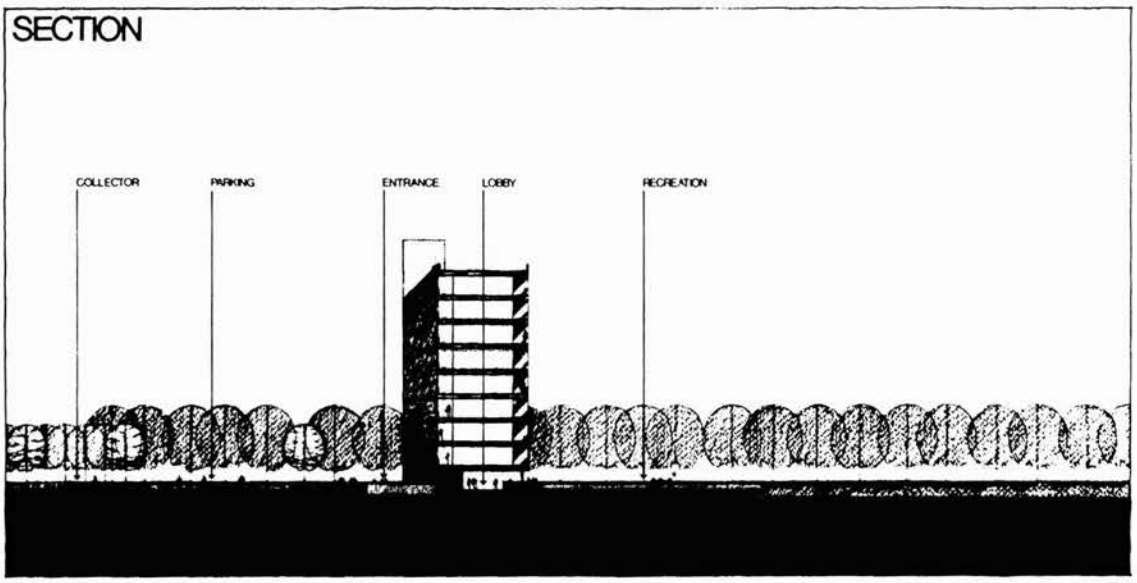
SCHEME 1 , BELLE ISLE DEVELOPMENT, TOWNHOUSE USE

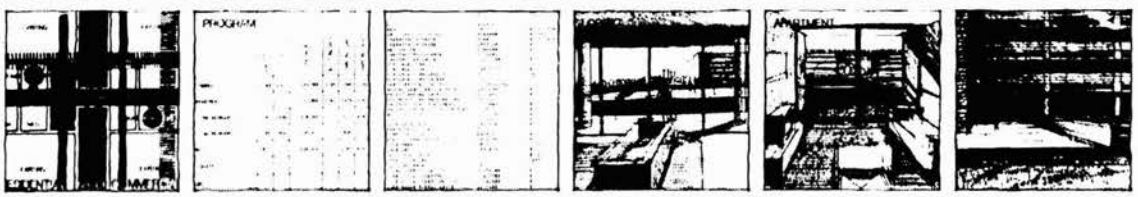
GROSS BUILDING AREA	83000	SF
EFFICIENCY (NET/GROSS)	100	%
LEASABLE SPACE	83000	SF
RENT	7	$/SF/YEAR
GROSS RENTAL INCOME	581000	$/YEAR
OPERATING EXPENSE	2.07	$/SF/YEAR
OPERATING EXPENSE	171810	$
NET INCOME	409190	$
CAPITALIZATION RATE	13.2603	%
CAPITALIZED VALUE	3085830	$
MORTGAGE LOAN	75	%
MORTGAGE LOAN	2314372	$
MORTGAGE LOAN LENGTH	33	YEARS
MORTGAGE LOAN INTEREST	13	%
DEBT SERVICE CONSTANT	.132602754229	
ANNUAL DEBT SERVICE PAYMENT	306892	$
PROFIT BEFORE TAXES	102298	$
MINIMUM ACCEPTABLE RETURN	10	%
MAXIMUM CASH INVESTMENT	1022980	$
MAXIMUM PROJECT COST (BUDGET)	3337352	$
BUILDING CONSTRUCTION COST	2373800	$
UNIT CONSTRUCTION COST	28.60	$/SF
SITE DEVELOPMENT COST	133494	$
PERCENTAGE SITE COSTS	4	%
FEES, FINANCING, PERSONALTY	333735	$
LAND AREA	2.8	ACRES
LAND VALUE	496324	$
UNIT LAND VALUE	4.08	$/SF
LIFE CYCLE LENGTH	33	YEARS
DISCOUNT RATE	10	%
TOTAL LIFE CYCLE COST	4449440	$
LIFE CYCLE INVESTMENT COSTS	2805300	$
LIFE CYCLE OPERATING COSTS	1023770	$
LIFE CYCLE ENERGY COSTS	620372	$
TOTAL LIFE CYCLE SAVINGS	0	$

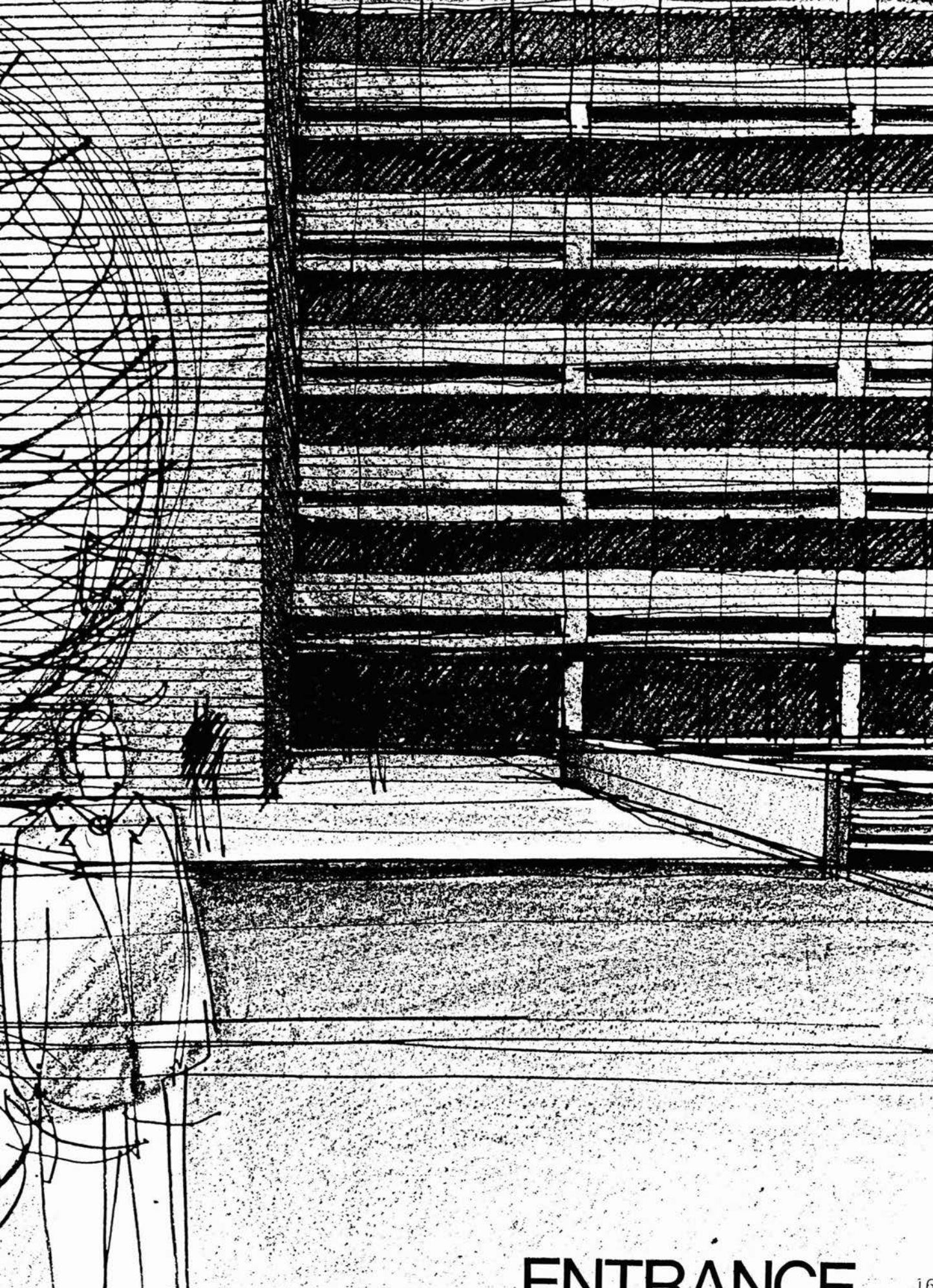
SCHEME 1 , BELLE ISLE DEVELOPMENT, APARTMENT USE

GROSS BUILDING AREA	432000	SF
EFFICIENCY (NET/GROSS)	95	%
LEASABLE SPACE	410400	SF
RENT	10	$/SF/YEAR
GROSS RENTAL INCOME	4104000	$/YEAR
OPERATING EXPENSE	3.60	$/SF/YEAR
OPERATING EXPENSE	1555200	$
NET INCOME	2548800	$
CAPITALIZATION RATE	13.2603	%
CAPITALIZED VALUE	19221300	$
MORTGAGE LOAN	75	%
MORTGAGE LOAN	14415975	$
MORTGAGE LOAN LENGTH	33	YEARS
MORTGAGE LOAN INTEREST	13	%
DEBT SERVICE CONSTANT	.132602754229	
ANNUAL DEBT SERVICE PAYMENT	1911600	$
PROFIT BEFORE TAXES	637200	$
MINIMUM ACCEPTABLE RETURN	10	%
MAXIMUM CASH INVESTMENT	6372000	$
MAXIMUM PROJECT COST (BUDGET)	20787975	$
BUILDING CONSTRUCTION COST	13780800	$
UNIT CONSTRUCTION COST	31.90	$/SF
SITE DEVELOPMENT COST	1431950	$
PERCENTAGE SITE COSTS	4	%
LUMP SUM SITE COST	600426	$
FEES, FINANCING, PERSONALTY	2078800	$
LAND AREA	10.3	ACRES
LAND VALUE	3496430	$
UNIT LAND VALUE	7.76	$/SF
LIFE CYCLE LENGTH	33	YEARS
DISCOUNT RATE	10	%
TOTAL LIFE CYCLE COST	32356200	$
LIFE CYCLE INVESTMENT COSTS	17473900	$
LIFE CYCLE OPERATING COSTS	12646900	$
LIFE CYCLE ENERGY COSTS	2235400	$
TOTAL LIFE CYCLE SAVINGS	0	$

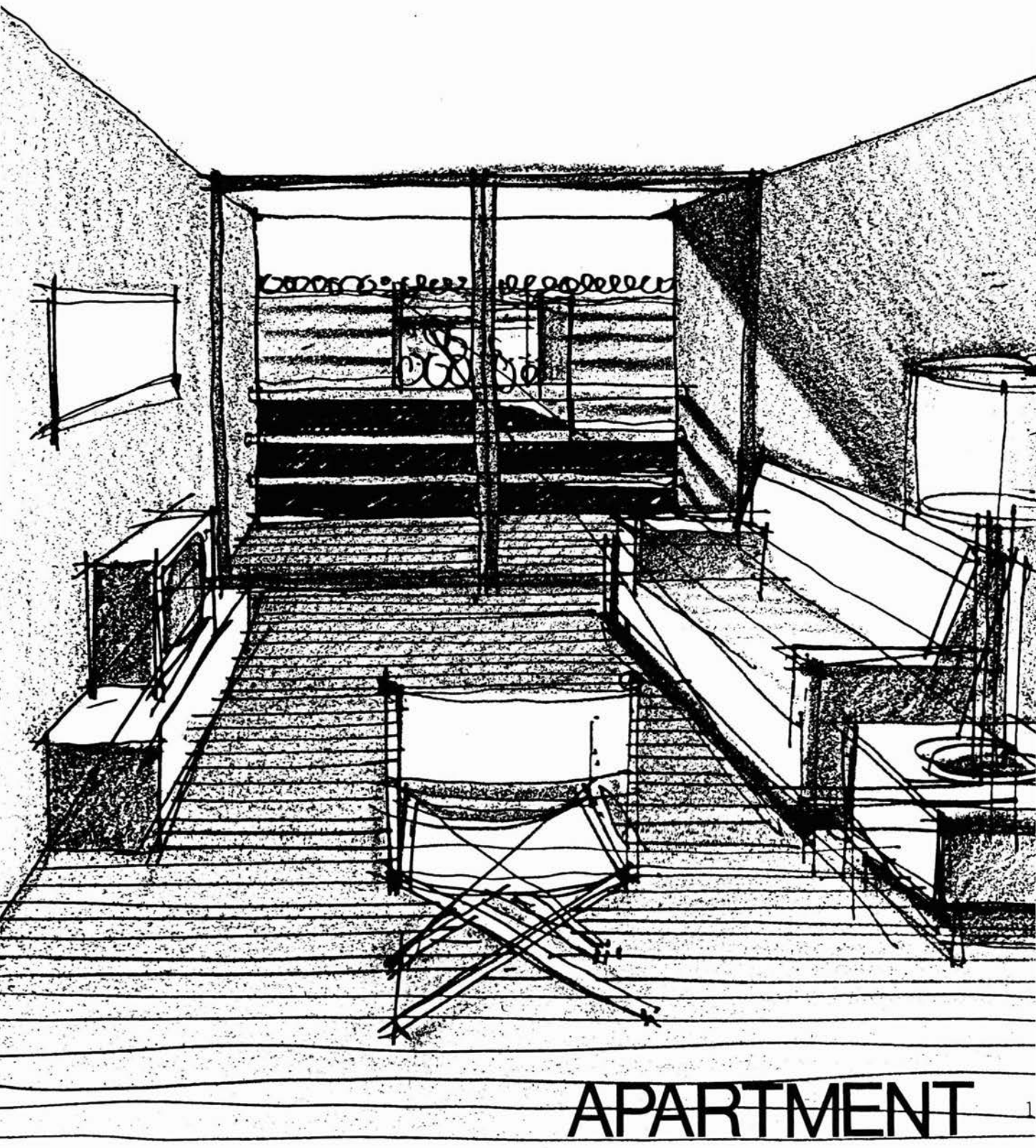

GROUND AND TYPICAL FLOOR PLAN
10 20
D
K
L
B
LAUNDRY
ENTRANCE
PARKING
160 CARS
DROPOFF
LOBBY
MECH
ENTRANCE
POOL
TENNIS COURT
SERVICES
PEDESTRIAN MALL
PEDESTRIAN BRIDGE


SECTION
COLLECTOR
PARKING
ENTRANCE
LOBBY
RECREATION

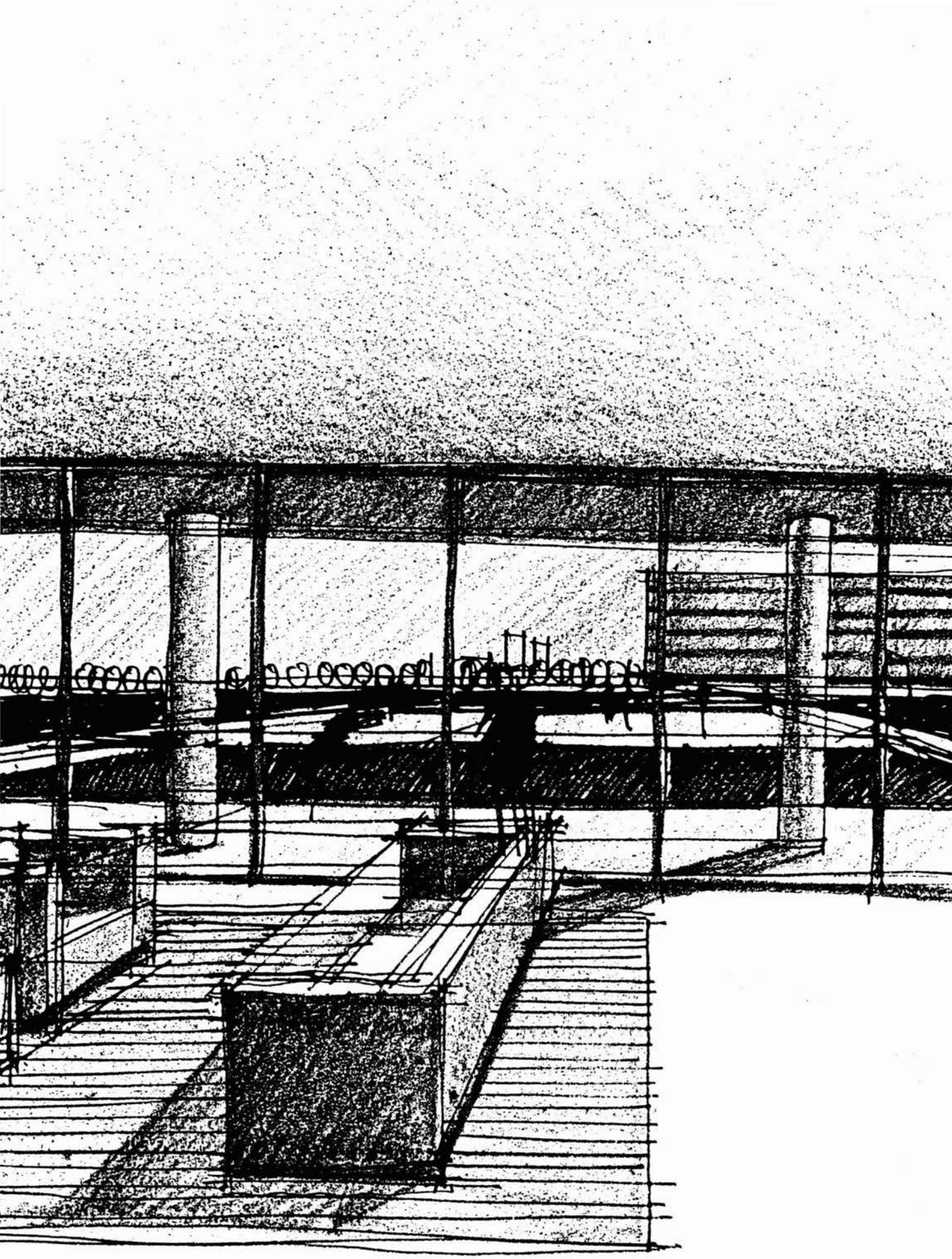

PROGRAM
APARTMENT



ENTRANCE



APARTMENT



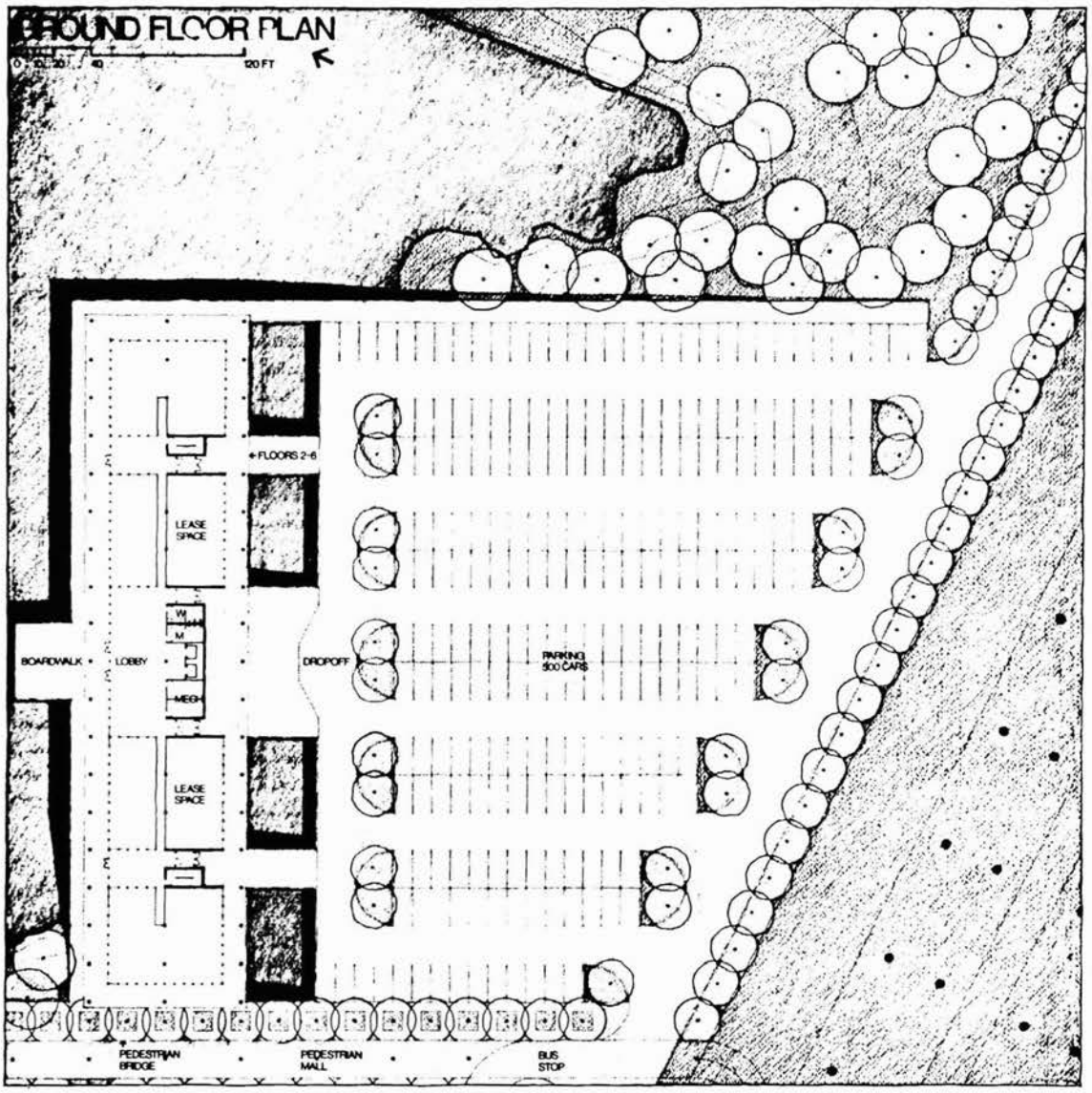
LOBBY

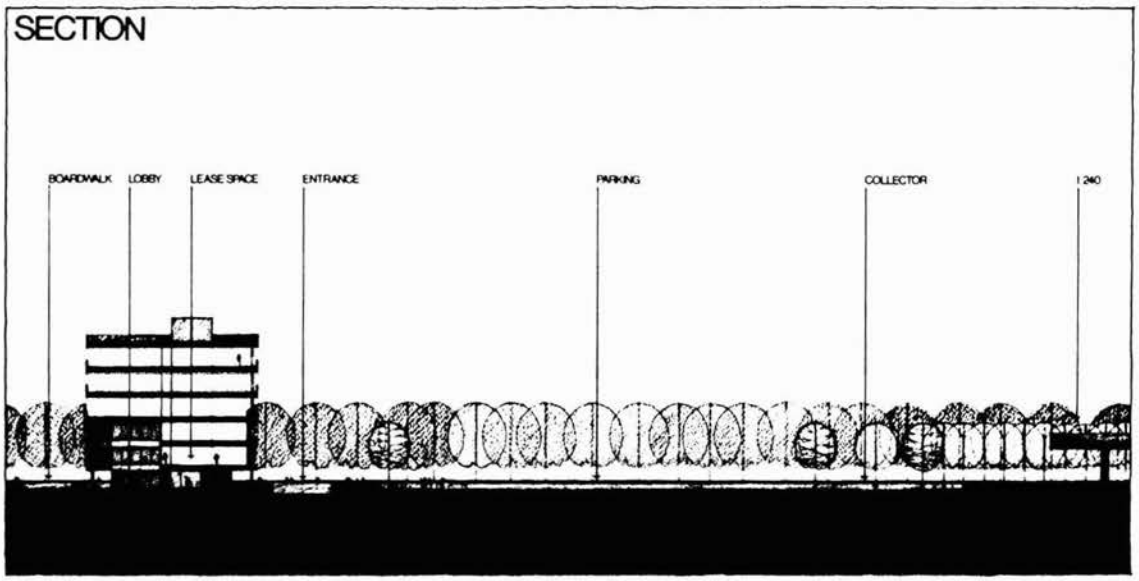
	QUANTITY	UNIT AREA (SF)	FLOOR AREA (SF)	BUILDING AREA (ACRES)	PARKING (CARS)	PARKING (ACRES)	LAND AREA (ACRES)	FLOOR AREA RATIO
NET	4	172800	691,200	5.29	2020	11.13	16.4	0.97
STREETS							5.28	
GROSS							21.68	

OFFICE

SCHEME 1 , BELLE ISLE DEVELOPMENT, OFFICE USE

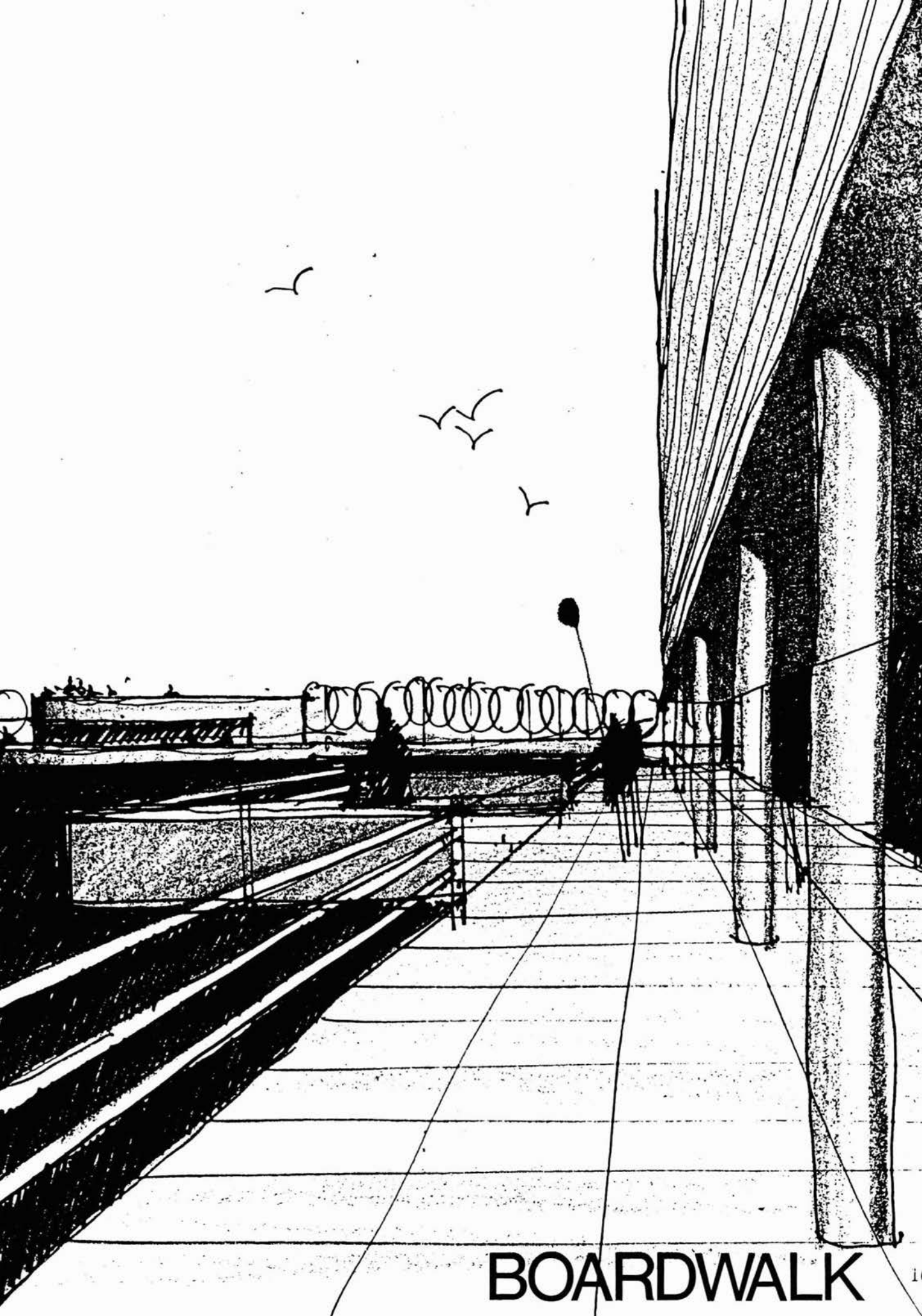
GROSS BUILDING AREA	691200	SF
EFFICIENCY (NET/GROSS)	95	%
LEASABLE SPACE	656640	SF
RENT	12	$/SF/YEAR
GROSS RENTAL INCOME	7879680	$/YEAR
OPERATING EXPENSE	3.32	$/SF/YEAR
OPERATING EXPENSE	2294780	$
NET INCOME	5584900	$
CAPITALIZATION RATE	13.2603	%
CAPITALIZED VALUE	42117400	$
MORTGAGE LOAN	75	%
MORTGAGE LOAN	31588050	$
MORTGAGE LOAN LENGTH	33	YEARS
MORTGAGE LOAN INTEREST	13	%
DEBT SERVICE CONSTANT	.132602754229	
ANNUAL DEBT SERVICE PAYMENT	4188660	$
PROFIT BEFORE TAXES	1396240	$
MINIMUM ACCEPTABLE RETURN	10	%
MAXIMUM CASH INVESTMENT	13962400	$
MAXIMUM PROJECT COST (BUDGET)	45550450	$
BUILDING CONSTRUCTION COST	31933400	$
UNIT CONSTRUCTION COST	46.20	$/SF
SITE DEVELOPMENT COST	2703650	$
PERCENTAGE SITE COSTS	4	%
LUMP SUM SITE COST	881629	$
FEES, FINANCING, PERSONALTY	4555050	$
LAND AREA	16.4	ACRES
LAND VALUE	6358350	$
UNIT LAND VALUE	8.90	$/SF
LIFE CYCLE LENGTH	33	YEARS
DISCOUNT RATE	10	%
TOTAL LIFE CYCLE COST	60248400	$
LIFE CYCLE INVESTMENT COSTS	38288500	$
LIFE CYCLE OPERATING COSTS	18780600	$
LIFE CYCLE ENERGY COSTS	3179250	$
TOTAL LIFE CYCLE SAVINGS	0	$

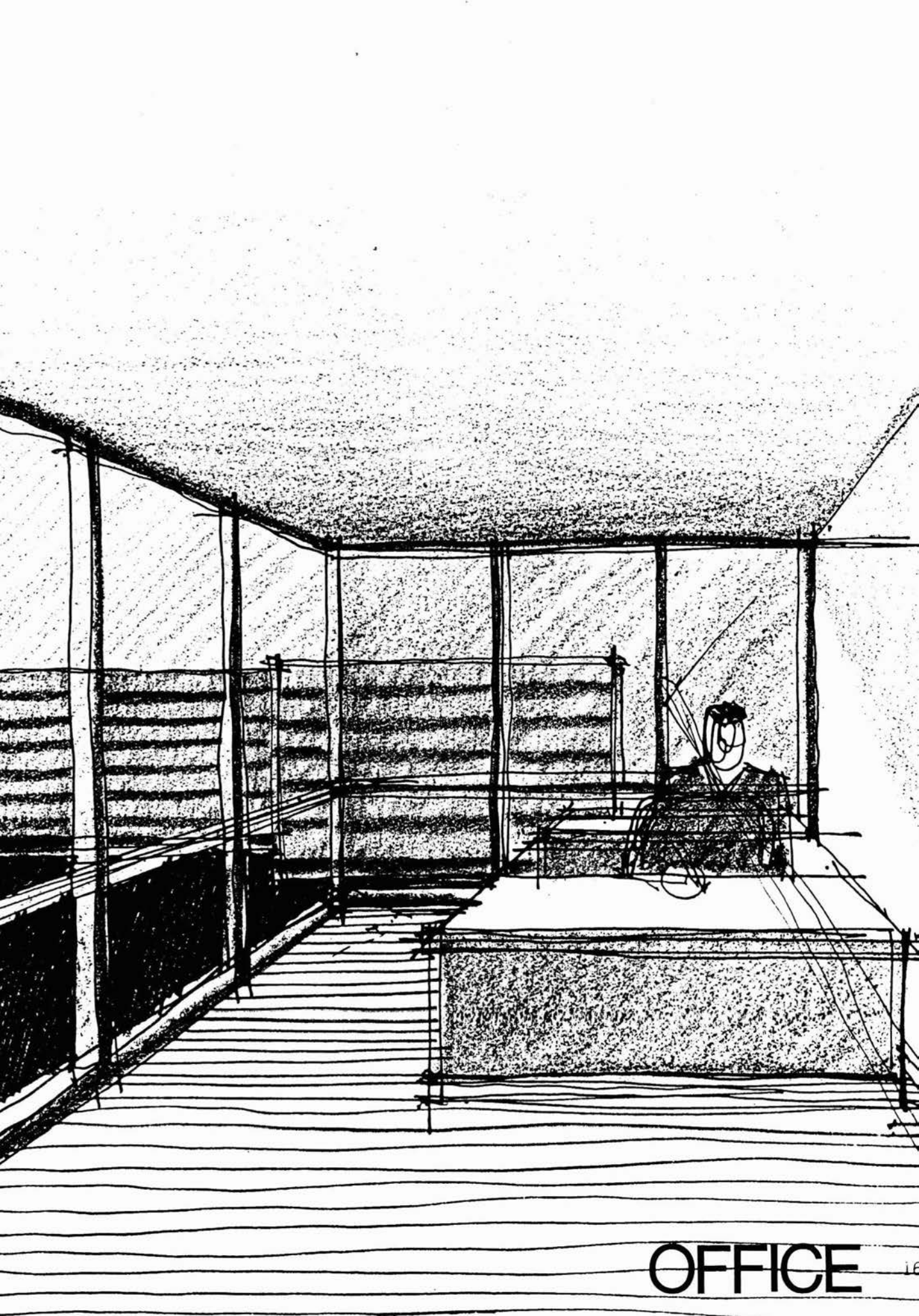

GROUND FLOOR PLAN
0
20
40
120 FT
+ FLOORS 2-6
LEASE SPACE
W
M
BOARDWALK
LOBBY
DROPOFF
PARKING 500 CARS
MECH
LEASE SPACE
PEDESTRIAN BRIDGE
PEDESTRIAN MALL
BUS STOP


SECTION
BOARDWALK
LOBBY
LEASE SPACE
ENTRANCE
PARKING
COLLECTOR
I 240

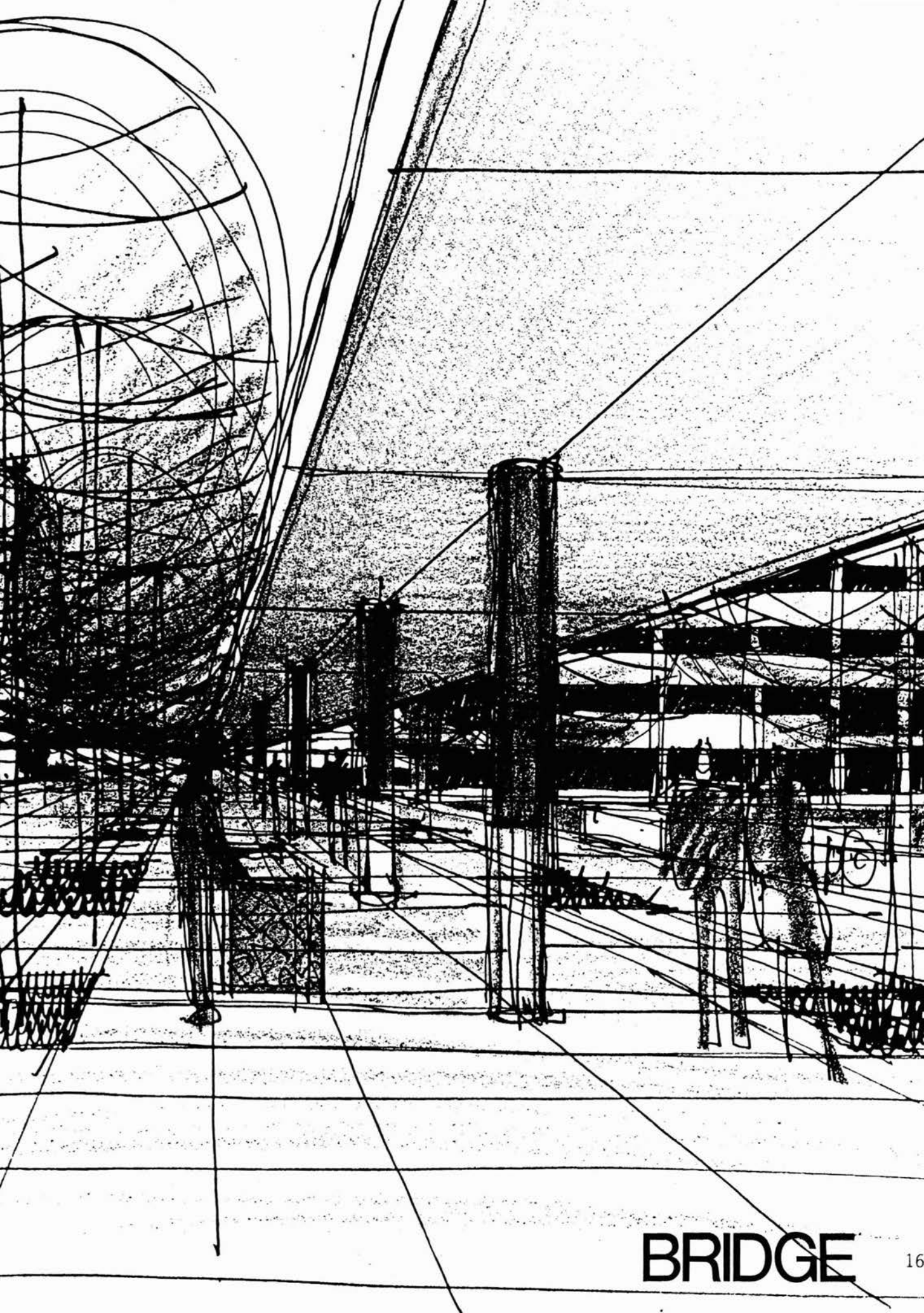

PROGRAM

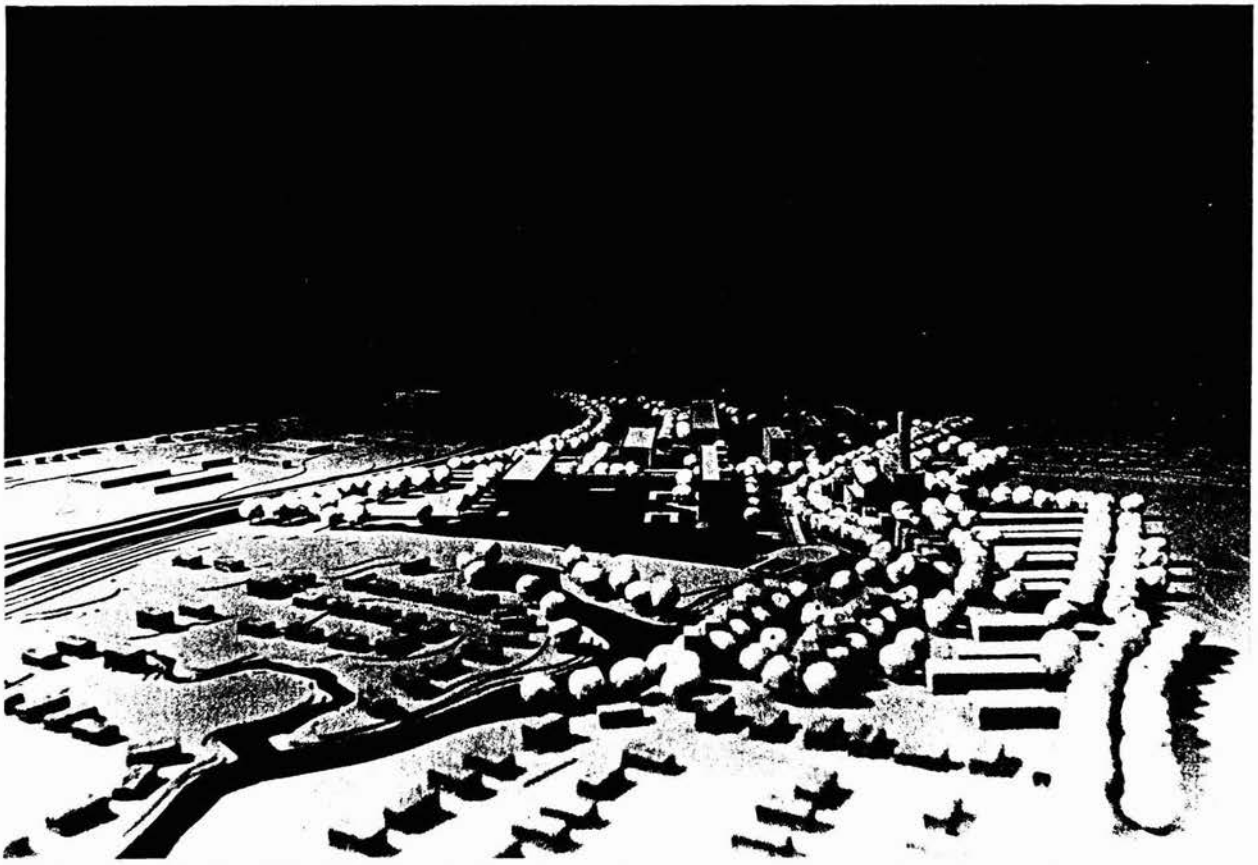

BOARDWALK

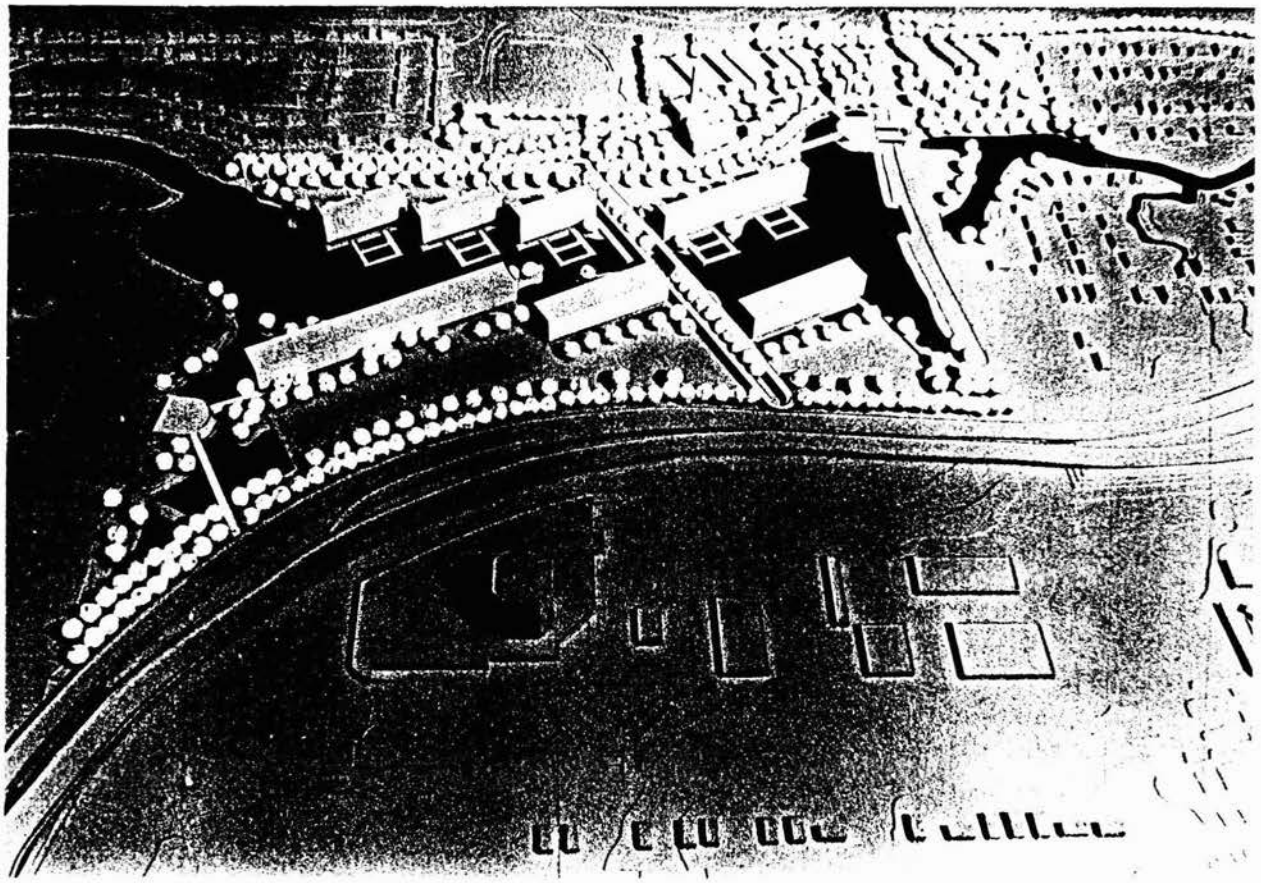

BOARDWALK

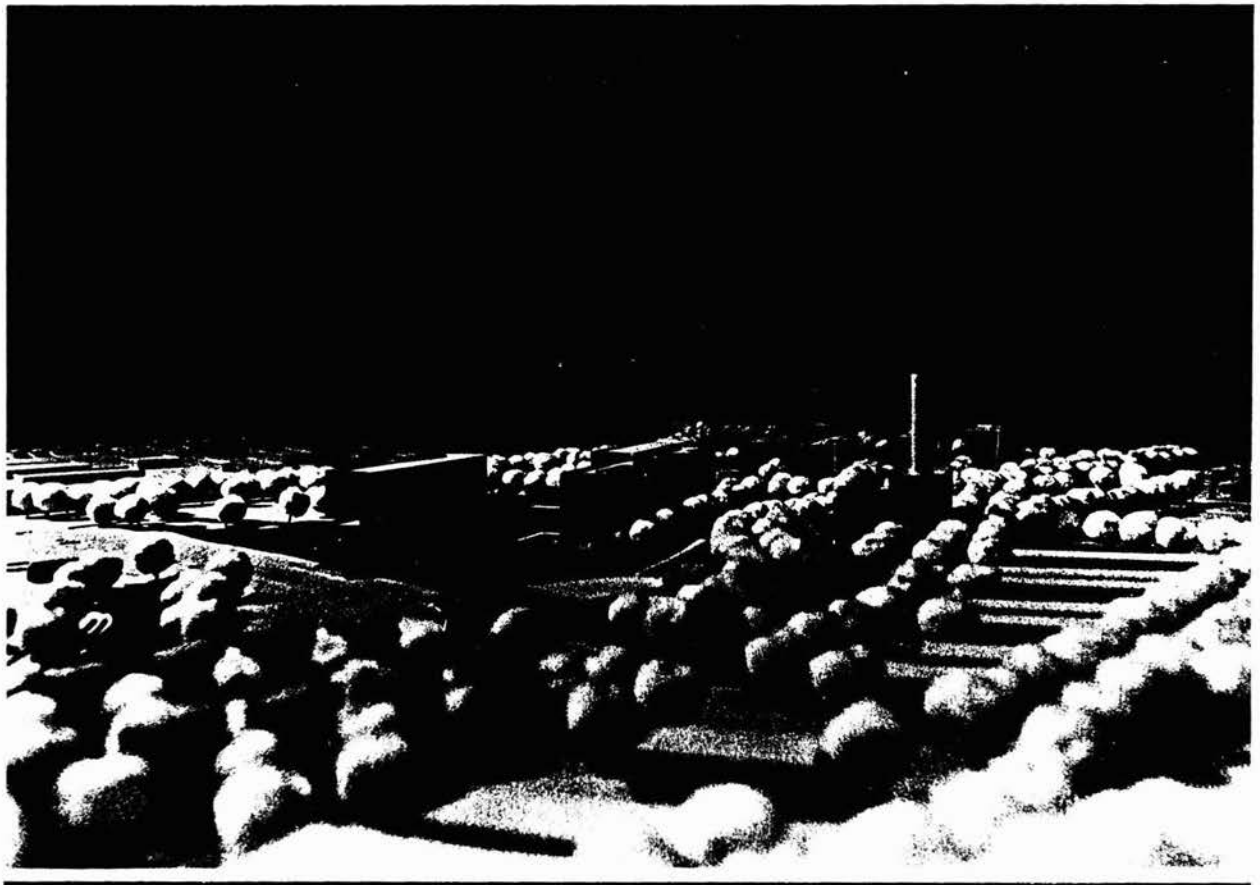


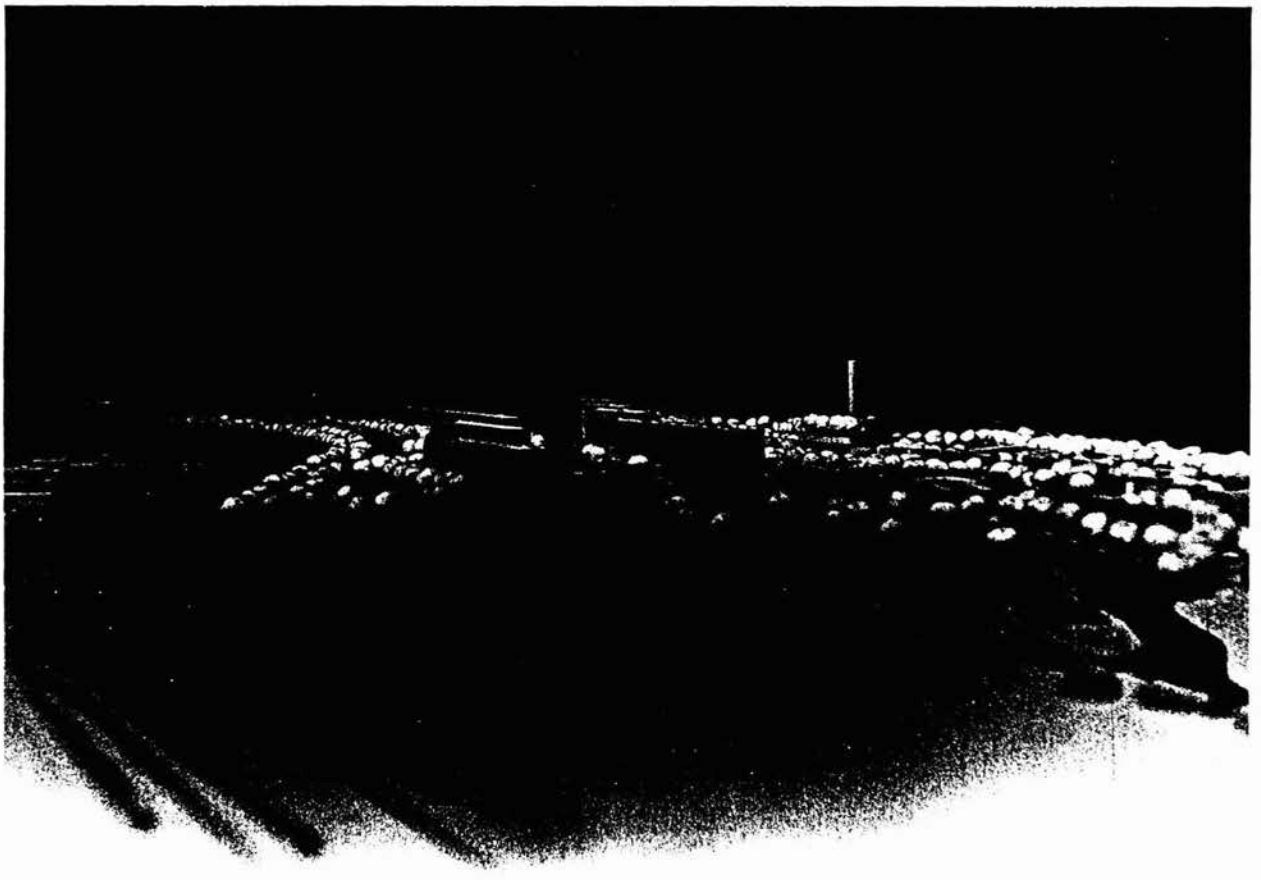
OFFICE

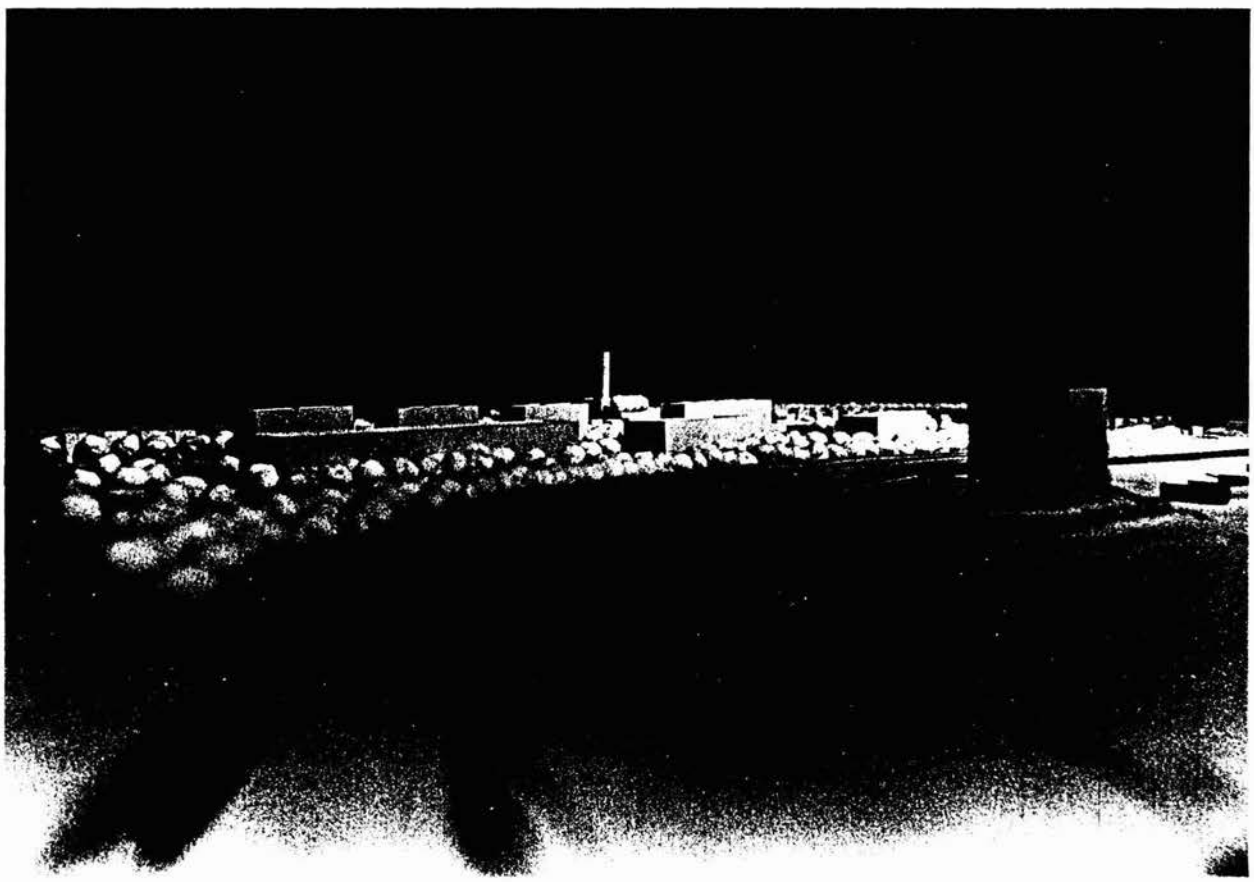


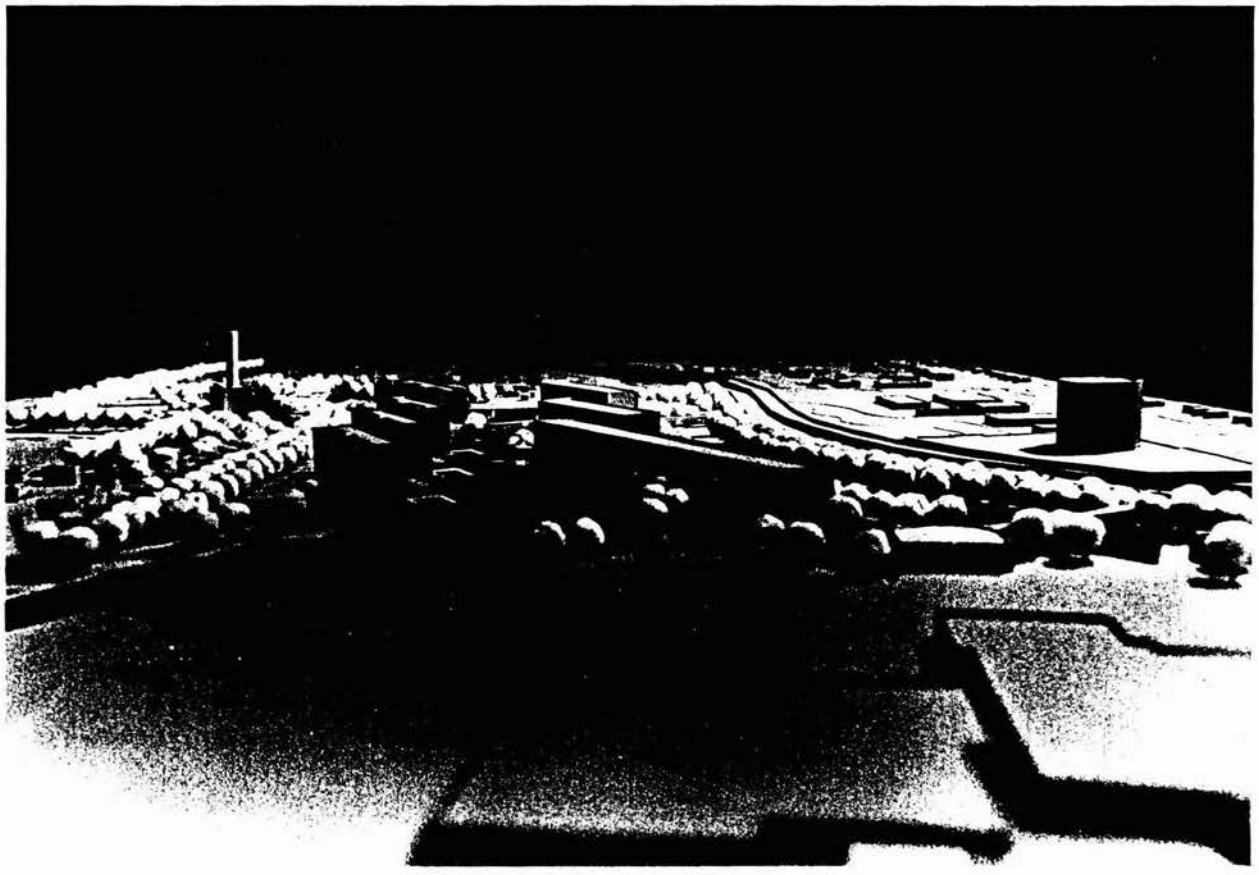


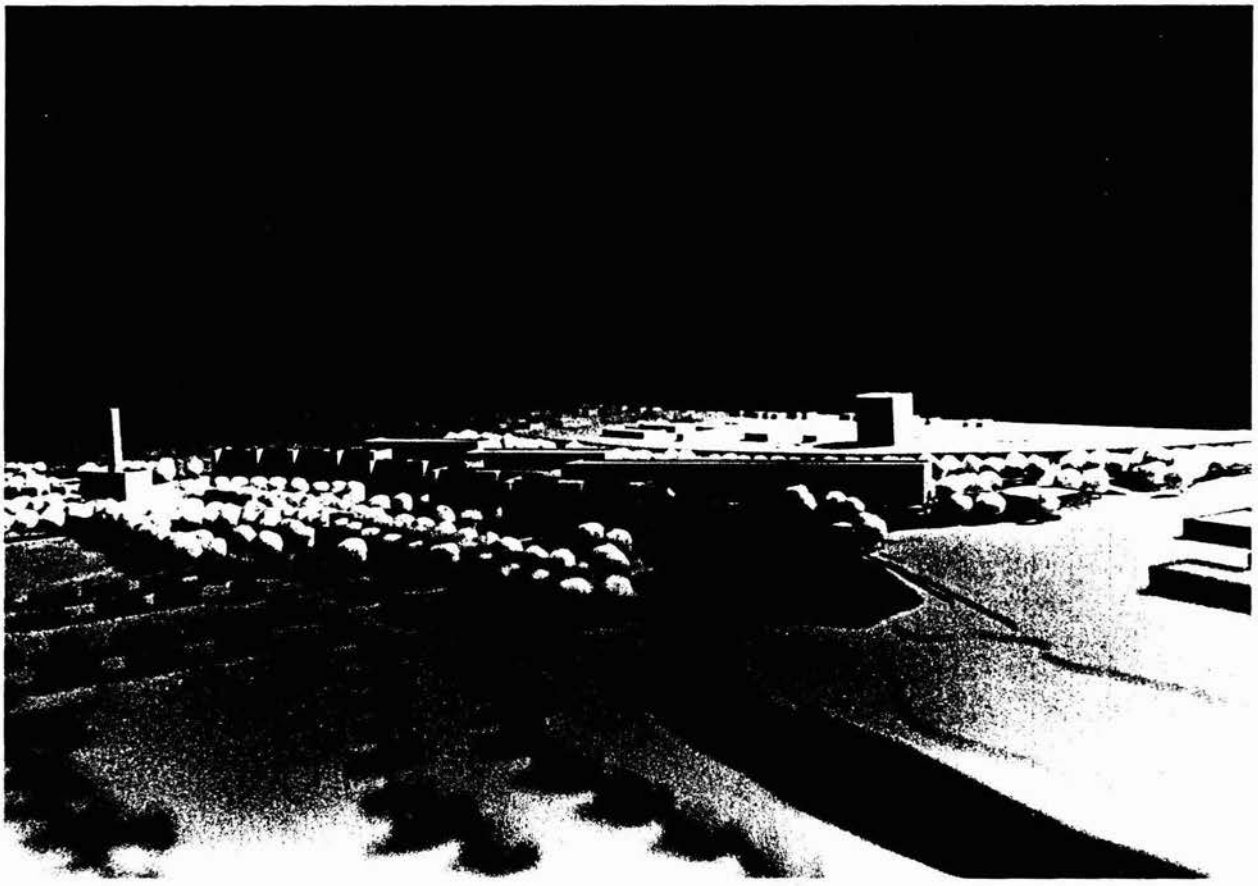












SOURCES

Market

1. The Preservation Plan, Oklahoma City

2. Dollars and Cents of Shopping Centers: 1980, Urban Land Institute

3. "Optimization of Development Profits," Urban Land Institute

4. "Spaulding and Slye Report," Oklahoma City

Environment

1. Oklahoma City Library Archives
2. GEOCON Study, 1980
3. Design with Climate, Olgyay
4. Energy-Conserving Site Studies, Department of Energy

Community

1. Urban Planning and Design Criteria, DeChiara/ Koppelman

2. Manual of Housing/Planning and Design Criteria, DeChiara and Koppelman

Economics

1. Life Cycle Costing Emphasizing Energy Conservation: Guidelines for Investment Analysis, ERDA
2. Development Building: The Team Approach, AIA
3. Dollars and Cents