HOUSING IN KUWAIT: A STUDY
OF THE RELATIONSHIP BETWEEN DESIGN CONCEPTS
AND SOCIO-ECONOMIC CHANGE

A thesis submitted in partial satisfaction of the requirements for the degree of Master of Science in Home Economics by Nafeesah Al-Ghusain

January, 1984
The thesis of Nafeesah Al-Ghusain is approved:

Marjory L. Joseph

Patricia L. Beals

Victoria Brinn Feinberg
Committee Chair

California State University, Northridge
DEDICATION

To the memory of my father
Dr. Ahmad Nouri el-din Al-Ghusain.
ACKNOWLEDGMENTS

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ABSTRACT

HOUSING IN KUWAIT: THE RELATIONSHIP BETWEEN DESIGN CONCEPTS AND SOCIOECONOMIC CHANGE

by

Nafeesah Al-Ghusain

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The study examined the impact of socioeconomic change in the city-state of Kuwait on the residential designs of homes for the accommodation of families. The design concepts embodied in the construction of these homes were measured as indicators of the socioeconomic change which has occurred within the society.

The null hypothesis was stated as follows: It is hypothesized that no significant relationship exists between per capita GNP and design of residential architecture in Kuwait.

The research was conducted in two parts. A sample survey was conducted of 15 architects in Kuwait city practicing in the private sector who were mainly involved in residential design. The second part was a comparative field study of both early and recent housing structures.

The survey was both descriptive and correlational in
that it described the changes which occurred within Kuwait city in the areas of residential housing design and related housing changes brought about by change in per capita GNP.

Based on findings of the study, the null hypothesis was accepted. Changes in housing design concepts were found to be constrained by climatic conditions and deep-rooted Islamic traditions. The departure in design concepts from traditional Kuwaiti homes was restricted to those areas that improved the environment of the house but not at the expense of relinquishing customs, values and mores.

More than one half of the respondents/architects practicing in Kuwait from the mid 1960s to the early 1980s had a tendency to retain only five of the twenty-one features of the traditional Kuwaiti house researched in the Residential Design Survey in the houses they designed.
CHAPTER I
INTRODUCTION

A combination of economic, political and social factors has contributed to the creation of the climate of change which existed within the State of Kuwait in the early 1980s. The traditional Arabic society upon which a climate of change has been imposed provided the basis for interest in the conduct of this study.

This study has examined the impact of such change on the residential designs of homes built as early as 1950 for the accommodation of Kuwaiti families. The design concepts embodied in the construction of these homes were measured as indicators of the socio-economic change which existed within the Kuwaiti society (Allison, 1979).

Justification

The real turning point in Kuwait's economic growth and social change occurred when oil was discovered in the 1930s. However, detailed planning for this growth and change did not begin until the early 1950s. Kuwait the city-state was then a comparatively small and compact Arab seaport. The buildings were one story, with nearly 150,000 inhabitants living entirely within the confines of the old city wall (Jamal, 1973).

In 1980, Kuwait enjoyed the status of the nation with the highest per capita income in the world, which was
estimated in U.S. dollars at $17,500, with a population of 1,357,982 estimated for the same year (Annual Statistical Abstract, 1982). This was the result of economic development achieved in the short span of three decades. The discovery of oil, followed by large scale industrial and commercial activities, has resulted in the emergence of Kuwait as an important commercial center of the region. The physical characteristics of Kuwaiti contemporary domestic architecture reflect the socio-economic changes which have existed within the Kuwaiti society since 1950 until the 1980s (Allison, 1979).

Kuwait, an Islamic Arab State, is rich in cultural traditions that influence its social development; its geographic location on the north-west coast of the Arabian Gulf, between Iraq and Saudi Arabia shown in Figure 1, has had a definite influence on the physical aspects of housing. Vernacular Kuwaiti architecture for some hundreds of years owed its character to the origin of its people in the interior Najd in north-eastern parts of Saudi Arabia (Lewcock, 1971).

In 1914 the State of Kuwait was recognized by the United Kingdom as an independent government, but it was not until 1961 that the State of Kuwait assumed full responsibility for the conduct of both the internal and external affairs of the country. Economic development has been dependent upon the exploitation of crude petroleum.
Figure 1: The Geographical Location of the State of Kuwait
Development of the crude oil reserves within the State of Kuwait began in 1950 (Paxton, 1981).

Through a combination of development of the country's crude oil reserves, formation of the Organization of Petroleum Exporting Countries (OPEC), and subsequent acquisition of control and management of its own natural resources, the per capita Gross National Product (GNP) reached the highest in the world (World Development Report, 1980). By moving in less than three decades from one of the poorest nations in the world to a position as the wealthiest nation in the world, on a per capita basis, the State of Kuwait has exposed itself to a potential for significant social and economic change.

Sheikh Ali Khalifa Al Sabah, Oil Minister of the State of Kuwait, was quoted by Servan-Scheiber (1980:31) as stating that Kuwait must "build a new economic system ... to avert collapse." Such a collapse, were it to occur, would likely result in a concurrent collapse in the social and political structure of the state. Perhaps of even greater importance was the potential for the socio-economic dynamics of Kuwait society in the early 1980s to damage or destroy the traditional Arabic values upon which the society was built.

To many, the concept of housing environment has included physical, material and tangible surroundings in which people live. Yet, an important and emerging concept
of housing included the socio-cultural environment which affected people as much as the physical environment. The importance of socio-cultural aspects of housing environment has been supported by the definition of architecture by Lynden (1972:162) as: "The provision of suitable total environment for the exchange of evolving cultural information."

The physical characteristics of Kuwaiti early domestic architecture reflected many socio-cultural forces which existed within the city-state in the pre-oil era. These forces included such factors as religious beliefs, family and clan structures, social organizations, ways of gaining a livelihood, and social relations between individuals. Housing forms then expressed the aims and desires of the inhabitants influenced by climatic forces and availability of materials and construction techniques. These considerations formed the basis for traditional Islamic domestic architecture (Rapoport, 1969).

The value of this study has been thought to be in the potential to identify a correlation, if one existed, between the per capita Gross National Product (GNP) for the State of Kuwait, and the design and construction of the Kuwaiti home.

The government of the State of Kuwait should be able to use the findings of this study in the development and revision of policies related to management of change within
the society; and urban planners and social planners outside the State of Kuwait should be able to use the findings of the study in the development of theories related to the impact of dynamic socio-economic changes on traditional housing designs.

Objectives

The specific research question which was addressed by this study was stated as follows: Has socio-economic change in Kuwait, as represented by change in per capita GNP, been accompanied by changes in residential architecture resulting in an increase in the proportion of structures of Western design, as opposed to traditional Arabic designs?

The broad emphasis of the research which was performed by the study was an examination of the impact of dynamic socio-economic change on housing design concepts in the Kuwaiti society.

Statement of the Problem

The traditional residential unit in Arab cities and towns has been a house built on several stories around a central courtyard. Where possible the wealthier families included ponds in the courtyards. The traditional house faced inward away from public life. Costello (1979:11) stated that: "The form of the house resulted from the
demands of climate, of family life and of Islamic ideology."

In Kuwait in the summer, the days are hot, the nights are cool, and high, dry winds are prevalent. The traditional house was designed, in part, to accommodate these climatic factors. In the design, rooms opened onto courtyards and windows on exterior walls were quite small if they were not absent entirely (Lewcock, 1978). The high narrow shape of the central courtyard restricted exposure to the rays of the sun. During the night, cool air formed on the flat roof of the house and sank into the lower portions of the courtyard. During the day, the radiation from the protected courtyard surface helped to cool the rooms of the house (Dunham, 1960).

The design of the traditional Arab house also provided for family privacy through its ability to segregate visitors. Male friends were received in all public rooms, while the harem (private rooms) remained as a family sanctuary. In the typical traditional house, public rooms were on lower floors or around a separate courtyard, while the harem was on the upper floors or around its own courtyard (Costello, 1979). The essential difference between a small house and a large one was the performance of all functions of the house around a single courtyard (Lewcock, 1979). Thus, the design of the traditional Arab house both accommodated the unique climatic factors of the
area in which it was built and provided a physical structure which facilitated and enhanced observance by Kuwaiti families of Arabic traditions, laws and mores.

The new wealth acquired by the State of Kuwait has enabled many Kuwaitis to acquire the material goods and to employ design and construction techniques which have effectively accommodated the climatic factors characteristic of the area without using traditional Arab housing design. The result of this departure from the traditional Arab housing design has been the construction of an increasing number of Western style houses with more outside windows, fewer floors, and fewer courtyards.

The traditional Arab housing design, however, was more than simply a response to climate, and it would appear that its Western style replacement has not facilitated and enhanced the observance of Arabic traditions, laws and mores to the same extent as has the traditional design.

The hypothesis of this study stated in the null format was: It is hypothesized that no significant relationship exists between per capita GNP and residential architecture design in Kuwait.

Assumptions and Limitations

Kuwait was, and remains, an Arabic state in which there has been no distinction between religious and secular law and in which there has been no separation between
political government and religious government.

In a study investigating the impact of socio-economic change on the observance of Arabic traditions, laws and mores there exist countless facets of society which could be investigated. For that reason, the scope of the study was confined to an examination of the relationship between per capita GNP and residential housing design.

Although the significance of the findings of the study were limited to this extent, they constitute a valuable contribution to the overall understanding of the impact of change on traditional values within a society.

**Definition of Special Terms**

The terms of special significance for the study have been related to residential housing design. These terms were defined as:

**Amir:** Prince

**The Bauhaus:** 20th century German school for building arts attempted to link architecture and sociology to industry (Ball, 1980:335).

**Dihlis:** Doorway, space immediately behind entrance door (Lewcock, 1978)

**Diwaniyyah:** Men's reception area in Kuwaiti traditional house (Lewcock, 1978)
Harem: A house or part of a house allotted to women in a Muslim household (Webster's Seventh New Collegiate Dictionary, 1965)

International style: An architectural style of the 20th century based on the Bauhaus school of design characterized by asymmetrical composition, an absence of mouldings, large windows often in horizontal bands, and a predilection for white rendering (Fleming, 1966:147). The use of regular geometric forms, the repetition of support and windows in modular sizes to obtain clarity and order, the use of transparency to acquire spaciousness, the manipulation of plans in conjunction with open planning to secure movement in space, and the glint of steel and glass as principal material (Ball, 1980:324)

Kaaba: The holy site in the sacred city of Mecca, where Muslims visit for pilgrimage (Papadopoula, 1980)

Koran: The holy book of Muslims (Petherbridge, 1977)

Mashrabiya: Wooden screen placed on window (Shiber, 1967)

Minaret: A slender lofty tower attached to a mosque (Webster's Seventh New Collegiate Dictionary, 1965)
Minbar: The throne in the mosque, placed in the center of the quibla wall (Papadopoula, 1980)

The New Brutalism: A phrase emerging in the early 1950s and referring to treatments of building surfaces such as rough brickwork, and exposed concrete imprinted with the grain of wood forms (Walker, 1980:207)


Organic architecture: Architecture that has grown naturally and logically to suit its habitat constructed in local materials with simple constructional techniques (Shiber, 1967)

Post Modern: Beyond modern architecture, either adapting a mixture of modernist styles, or mixing these with previous modes (Jencks, 1977)

Quibla: Obligatory orientation - toward the holy site of Mecca - while praying (Papadopoula, 1980)

Ringroads: The intersection of radials and circumferentials, called turnabouts (Shiber, 1967)

Roshana: Recess in interior wall, arch-shaped, used
as shelves (Lewcock, 1978)

Saha: Meeting-place in old Arab cities (Shiber, 1967)

Suk: Market-place in old Arab cities (Shiber, 1967)

Surrah: A phrase of the Koran (Petherbridge, 1978)

**Traditional Arab housing:** The terms Arab and Islamic are used interchangeably. Housing constructed around a central courtyard, in which the rooms of the house open into the courtyard; with few, if any, windows on the outside walls; and which provides for separate public and private areas, either through multi-level design or through multiple courtyard design (Shiber, 1967)

**Western housing:** Housing constructed essentially in a box-like configuration in which rooms of the house open into a hall or into a principal living area; having primary windows on the outside walls; and which has not been designed to easily accommodate separate public and private areas (Shiber, 1967)
CHAPTER II
REVIEW OF LITERATURE

Housing and Urban Development of Kuwait

Old Kuwait had a unique form. It had a mud wall around its perimeter protecting it from the attacks of both man and sandstorms. Kuwait was sea oriented and the inside anatomy of the city was formed to answer basic needs. The town was compact with the necessary requirements for fresh air, shade and circulation. The houses that the Kuwaitis built evolved organically out of the constraints of a desert soil, harsh climate and absence of local building materials except for sun-dried mud (Figures 2, 3,). They were built close to each other, protecting one another from sandstorms and heat. Houses were built, generally, to produce an internal courtyard around which the social life of the Kuwaiti family revolved (Shiber, 1968; Allison, 1979).

New Kuwait has changed from a traditional Arab seaport to a modern metropolis. Present day Kuwait city, which is Kuwait town with the residential areas around it, is the capital of the State and the commercial and governmental center of the metropolitan area. In only three decades, Kuwait has achieved a high level of development and urbanization. This has occurred through the wise investment of its capital resources into the development of
Figure 2: Two Scenes of Old Kuwait before 1950. (Schiber, 1967)
Figure 3: The Organic Urban Form of Old Kuwait before 1951. (Municipality of Kuwait, 1980)
the country since the early 1950s. This was encouraged by the Amir, Abdullah as-Salem, the 11th Ruler of Kuwait who channelled his accumulating wealth towards improving the condition of his people (Haddad, 1970). Change came to Kuwait as a result of the discovery of oil in the 1930s. However, planning for this development did not begin until the early 1950s (Shiber, 1961; Haddad, 1970; Jamal, 1973).

The 1951 Physical Development Plan, PDP, was nothing more than a street plan that indicated in detail land uses and residential densities (Figures 4, 5). The main highlights of the plan consisted of radials fanning out from the gateways of the city, with circumferentials parallel to the arcuation of the old wall. The old city in the plan, in a way, was considered non-existent, for a street plan was superimposed on it, and this plan constitutes the present overall structure of the old city. Karim Jamal in his article, "Kuwait: A Salutary Tale," (1973:1452) defined the 1951 plan as the first mistake and stated the following:

The proposed road system was almost a duplicate of the dense pattern of streets found in the old city. But the new roads were much wider than the existing streets and resulted in the ruthless destruction of the closely packed pattern of courtyard houses and other established sections of the city ... the new street system disrupted the socio-economic structure of the city and destroyed the traditional ways of life of most people ... This first master plan was simply the imposition of western technology onto an established Arab society ...

The basic design of the 1951 plan has remained the
Figure 4: The Original Development Plan by the City-Planning Firm of Miniprio and Spencely in 1951. (Shiber, 1967)
Figure 5: The first Physical Development Plan of Kuwait City in 1951 by Miniprio and Spencely. (Municipality of Kuwait, 1980)
guiding principle for urban development until the present time. The system of ringroads and radial roads leading into the heart of the city established the lay-out of the expansion areas and neighborhoods (Jamal, 1973).

The first Physical Development Plan for Kuwait, drawn in 1951 by a British city-planning firm by the name of Miniprio and Spencely and amended in 1954, was pursued until 1967. Anthony Miniprio was interviewed by Stephen Gardiner (1981) in his book *The Making of a City* in which he stated that the first thing he saw when he got to the old town of Kuwait in the early fifties was a fourteen foot high mud wall and he wanted to keep it. But the wall was to be demolished to keep the cars out. A green belt which followed its semi-circular form was to act as boundary for the new city center. Beyond this were the new neighborhoods.

If only Miniprio and Spencely had preserved Kuwait town as an old township, it would now be restored, white-washed and - most important - the past forms would have remained behind to guide the architecture of the future. Continuity would have been assured. One remembers Le Corbusier's plan for the old town of Algiers of twenty years before when he proposed just this; the old city of Siena was restored. In Yemen, Baghdad and Tunis, old towns have been saved and new developments were built beyond their boundaries (Figures 6, 7, 8).
Figure 6: Two scenes of Yemeni cities.

Upper: The traditional sky-scrappers of the city of Hadramut in Yemen.

Lower: Some of the houses in Sanaa, Yemen, are centuries old. Others have been built or added recently. (Shiber, 1967)
The organic form of geographic-urban mosaic of old Baghdad city.

A close view of the gilded Al-Kathmi mosque in Baghdad. (Shiber, 1967)

Figure 7: Two scenes of Iraqi cities.
Figure 8: Two scenes of Tunisian cities.

Right: Typical lines of a traditional Arab city in which the old town is restored behind the old city wall. New developments feature the continuity of traditional designs. (Shiber, 1967)

Left: A close-up of the minaret of the Grand Mosque in the city of Tunis. (Shiber, 1967)
The reaction of the city-planner Anthony Miniprio about what he saw in the old town of Kuwait upon his arrival in February 1951, was stated by Stephen Gardiner (1940:17) "There was just a town ... no buildings of any architectural value..." Miniprio meant that there was nothing unique - none of the mosques with gleaming sea-blue domes and sparkling minarets that were found in other ancient Islamic Arab countries. Yet a town did exist, and one of as much quality as old Algiers, Yemen and Bahrain, as shown in Figure 5. Fortunately, not all was demolished: a number of distinctive mosques of the old period remained (Figures 9, 10, 11, 12, 13). Al-Ghanim House by the sea-front (Figure 14) shows the facade facing the sea. One of the original gateways of Kuwait, built in 1921, is shown in Figure 15. All monuments dated back to the 1930s, a vague link with the immediate past and a permanent reminder of lessons in planning and design.

In 1962, the government established the Planning Board; it gave greater emphasis to planning, co-ordination and supervision than to execution. One of their first projects was to prepare the Five Year Development Plan, 1968-72, shown in Figure 16. The Planning Board prepared the physical master plans of residential areas (Figures 17, 18, 19) in Nuzha, Sabahiya and Omariya residential areas. Also, it planned for the development of the 5th and 6th ringroads beyond the 4th ringroad and the boundary of the
Figure 9: Minaret of Al-Mudira Mosque. (Lewcock, 1978)
Figure 10: Al-Dayj Mosque: Interior Courtyard. (Lewcock, 1978)
Figure 11: Al-Khalifa Mosque: Minaret and Interior Courtyard. (Lewcock, 1978)

Figure 12: The Friday Mosque in the Suk (Lewcock, 1978)
Figure 13: Al-Khalifa Mosque: Minaret and Interior Courtyard. (Lewcock, 1978)
Figure 14: Al-Ghanim House by the Sea-Front. (upper) (Lewcock, 1978)

Figure 15: One of the Original Gateways of Kuwait, 1920. (lower) (Lewcock, 1978)
Figure 16: The Five Year Development Plan, 1968-72, prepared by the Planning Board of Kuwait. (Municipality of Kuwait, 1980)
Figure 17: The Physical Master plan of Nuzha, 1968. (Haddad, 1969) (Scale 3/4" = 200 m. = 655 ft.)
Figure 18: The Physical Master Plan of Sabahiya, 1968. (Scale = 1 = 450 m. = 1475 ft.) (Haddad, 1969)
Figure 19: The Physical Layout Plan of Omariya Neighborhood, 1966. (Haddad, 1969)
1952 plan shown in Figure 20, which demonstrates the physical development plan as it existed in 1969. The purpose of the Five Year Development Plan was to maintain the pace of orderly physical development that had taken place since 1952 and to enhance it.

The Kuwaiti government, on advice from the United Nations, appointed an advisory group to direct the preparation of plans for development. The advisory group was composed of Sir Leslie Martin of Britain, Professor Albini of Italy, and Dr. Azzam of the United Nations Middle East Regional Office in Lebanon. Colin Buchanan and Partners (CBP), a British consulting firm, was selected to prepare the National Physical Development Plan (NPDP); the development of a Master Plan for the Urban Areas where pressures of development were acute; and the development of a Master Plan for the Central Business District (CBD) of the Kuwait Metropolitan Area. The National Development Plan of 1970 and the revised plan in 1977 are demonstrated in Figures 21, 22, 23, 24 (Haddad, 1970; Jamal, 1973).

In 1970 the Master Plan for the CBD of the Kuwait Metropolitan Area was given to four international architects: Candilis, Josie and Woods of France, Belgiogase (BBPR) of Italy, Smithson of England and Reima Pietila of Finland. They were asked to prepare architectural plans for the Civic Center which would incorporate desirable aspects of the physical form of the
Figure 20: The Existing Physical Development Plan (Haddad, 1969)
Figure 21: The National Physical Development Plan of 1970 by Buchanan. (Municipality of Kuwait, 1980)
Figure 22: The National Physical Plan and Master Plan for Urban Areas, 1970. (Jamal, 1973)

Figure 23: The Physical Plan for Kuwait City, by Buchanan, 1970. (Jamal, 1973)
Figure 24: The Revised National Physical Development Plan of 1977. (Municipality of Kuwait, 1980)
old city.

Sir Leslie Martin was interviewed on matters related to the establishment of the NPDP by Stephen Gardiner (1980:31) in which he stated the following:

The architects were all influenced by climatic conditions ... Westerners can never be expected to understand the intricacies of these people's Moslem culture ... The designs from the four firms of architects were most illuminating, revealing where the special interests of each lay, all of which - climate apart - were different ...

The Candilis group concentrated on the layout of a residential neighborhood, while BBPR chose to examine new surroundings for the old Suk. Peter and Alison Smithson were particularly concerned with climatic problems while Reima Pietila was clearly drawn to the waterfront. But the groups had some general common interests, which were the following:
1. The waterfront seen as some sort of seaside, public park with cars banned from the Gulf road, something Buchanon wanted in the first place
2. The location of Government buildings near the Sief Palace - the official headquarters of the Amir of Kuwait, located by the seaside - in the old town
3. The location of residential neighborhoods in the city's center
4. The preservation of the old Suk, its character expanded and the construction of strong connections with surrounding streets
5. The approval of Miniprio and Spencely's boundary park, but equally strong was the disapproval of the continuation of building beyond this and the 4th ringroad.

The final recommendations clashed with the Master Plan that Buchanon had previously agreed upon with the Kuwaiti Government (Gardiner, 1981).

The recommendations of the four firms of architects had an enormous influence on the character, architecture and shape of the city that had, thus far, emerged. In fact, when the programs of the 1970s and 1980s have been completed, the city of Kuwait will have been built and demolished three times.

The 1951 plan committed the areas beyond the limits of the wall for residential use to be distributed by the government to Kuwaiti families whose property inside the city wall was taken. The difference between acquisition price, distribution sale value, and real market value, was the means through which the riches of oil were distributed.

The residential areas were planned for limited-income and average-income Kuwaiti families. They were zoned for single family occupancy. The physical designs of various residential areas differed, but were based on separation of pedestrian and vehicular traffic, and regularly shaped lots. Lots ranged in size from 5400 sq. feet (60 x 90 ft.) to 6750 sq. feet (75 x 90 ft.) and 9000 sq. feet (75 x 120 ft.).
ft.). Often, the size of the lot depended on the size of the family (Haddad, 1969).

The involvement of the Kuwaiti government in the housing development began in the early 1950s. A Development Council was established in 1952 to implement Kuwait's first urban development plan; Kuwaitis were granted generous compensation for their expropriated property in the old town of Kuwait to enable them to build new homes on lands distributed to them in the new suburbs, as part of government policy to provide a comfortable house to all Kuwaiti families. As early as 1952, the government influenced the housing development by the displacing of Kuwaiti homes inland away from the sea (World Bank Report, 1979).

In 1954, a Construction Council was formed to provide housing for limited-income families in conjunction with a Housing Council for the distribution of these units to eligible households (World Bank Report, 1979).

In 1962, the responsibility for registering applicants and distributing houses was assigned to the Ministry of Labor and Social Affairs, which was also responsible for the design and construction of these units. The architectural layouts in Appendix A show examples of houses planned, designed and executed by the Ministry of Labor and Social Affairs during the years from 1962-1972 for the housing of limited-income families. The architectural
plans shown demonstrate the basic design requirements for a limited-income family as developed throughout the time periods from 1962-1972 by architects working at the department of design at the Ministry. These houses were one-story high and designed with traditional Arabic concepts in mind, such as the arrangement of rooms, the circulation between rooms, and the separation in public zones within the house between males and females. The diwaniyyah, with a separate entrance as a social requirement is demonstrated clearly in all plans in which it functions as the men's reception room.

In 1960, the Savings and Credit Bank (SCB) was founded, and one of the main purposes was to provide 40 year interest-free building loans to average income Kuwaitis who had benefited from the government's distribution of plots, either as compensation for their expropriated property, or as part of the effort to redistribute part of the country's new oil revenues. In addition to its role as a credit institution, the Savings and Credit Bank was mandated by the government to assist in the implementation of subsidized housing projects shown in Appendix A. The figures included demonstrate the architectural plans of "popular houses" for relocation of shanty dwellers, built by Savings and Credit Bank in 1974 in Mina Abdullah and Jahra.

Yet the government's ability to provide housing for
Kuwaitis was falling behind the demand of housing assistance, which called for the establishment of the National Housing Authority (NHA) in 1974. The NHA was responsible for providing houses to Kuwaitis in the limited and the average income groups, and the design and construction of housing projects - including their internal, physical and social infrastructure - on government owned sites approved by the Municipality. In 1975, the Ministry of Housing (MOH) was formed to provide the general guidelines necessary for a national housing policy. It was responsible for receiving and processing applications for limited and average income housing, determining the eligibility of applicants, distributing the units, collecting installment payments, and generally managing the housing projects completed by NHA.

The need for vigorous and sustained government intervention in the housing market, in spite of the highest GNP per capita in the world, has been the result of specific structural factors. These include the following:

1. A rapid rate of population growth resulting from the immigration of expatriate workers who, in 1975, made up 70 percent of the country's labor force

2. Rapidly rising land prices due to the very limited amount of land in private ownership and an active governmental role in the land market which is part of the implementation of the national physical plan
3. Speculation in land by wealthier Kuwaitis who, in the absence of long-term credit, tend to make short-term high equity investments in real estate and view it as a commodity to be traded.

4. A lack of fiscal restraints on speculation, such as real estate income or capital gains taxes.

5. Regional inflationary trends in the cost of both materials and labor which has driven the cost of construction to an annual average rate of increase of 30 percent since 1973 (World Bank Report, 1975).

Kuwait, like any other developed country - and particularly like the fast-developing ones - has continued to suffer from inadequate housing. Although the need for middle and low income housing for Kuwaitis has not been satisfied, the government has subsidized housing development by giving urban infra-structure development first priority, by levying no taxes on houses, by making capital available for the housing industry and by charging low interest rates on housing loans (Haddad, 1970).

Social Change and Housing Development

In Kuwait, change and development appeared through housing and building of urban infrastructure rather than through the development of agriculture or industry. John Holliday (1977:30) stated that the "development of society is a sequence process, which moves from relative simplicity
to great complexity, which may be disordered in appearance and fact ..." Changes in social structure produced changes in physical structure to meet social needs, but physical structure also affected social order and - in public housing - by emphasizing class differences (Holliday, 1977).

Social changes, that is, changes in social values, normally come about through major changes such as war, population or discovery. However, differences in the outcome of social changes have occurred between nations as a result of each nation's historical and cultural foundation. Changes in values have been influenced by travel and contact with strange places and people, but it has been the designer's role to distinguish universal social needs from the characteristics of each culture, and to understand the local culture and its own desire to change (Holliday, 1977).

In Kuwait, social change came about through the discovery of oil. As a result of rapid economic growth in the 1950s and the presence of Western architects in Kuwait, physical changes in housing design were introduced that were a dramatic departure from traditional designs. Many Kuwaitis travelled to Western Europe, where they observed Western architecture which they copied when building their new homes. The National Housing Authority built housing for the limited-income and average-income Kuwaiti families
in the 1970s when population was increasing rapidly. These houses were also based on Western design, but resulted in monotony when the basic unit was repeated too often (Kuwait Housing Policies, 1979).

Holliday (1977) noted that the environment itself has provided one means for influencing individual and social change, and it has been the designer's role to lead rather than follow. The climatological requirements of the environment were ignored, and the materials specified were imported. Architects preferred to apply the most current Western technology to solve the architectural problems they had created rather than to improve the performance of the traditional Arabic architecture. Gardiner (1981:13) stated in describing the first stage in architectural development in Kuwait in the early 1950s, "... The damage done, for instance, to indigenous architecture - and so to a society's structure - has been immense --- air-conditioning takes care of extreme climatic differences."

Housing design as the reflection of cultural values, social requirements and climatic conditions of a group of people in a certain type of environment has been supported by the definition of house form by Amos Rapoport (1969:47) in which he stated the following:

House form is the consequence of a whole range of socio-cultural factors seen in their broadest terms ... modified by climatic conditions, methods of construction, materials available and the technology --- the socio-cultural forces are called primary and the others secondary or modifying.
Housing forms vary from place to place, because of changes in the interplay of social, cultural, ritual, economic and physical factors. These factors and responses have been known to change gradually over time. However, lack of rapid change has been characteristic of primitive and vernacular dwellings (Rapoport, 1969).

Karim Jamal (1973:1454) in discussing the results of the implementation of the first Physical Development Plan of Kuwait city prepared in 1951, pointed out that it did not reflect the traditional Kuwaiti character, in which he stated the following:

... rapid growth resulting from implementation of the most recent plan will speed up material changes in the society, without compatible cultural change ... traditional Kuwaiti character will not be reflected in the new urban and physical environment, while the traditional environment will deteriorate further ... It is important to reduce any changes to a minimum and hold implementation of the Colin Buchanon and Partners long term national physical plan, and the master plan for urban areas prepared in 1970, at least until these studies have been completed, and local people had their say in them...

Social change and housing development in Kuwait has stood very much in contrast to what existed only three decades before. The people of Kuwait, in earlier days, were mainly engaged in simple production and commercial activities. The soil being sandy and unsuitable for any extensive agricultural use, most occupations were linked with the sea. People lived in mud houses, which responded to the social mores, climatic conditions and the availability of building materials. Their designs were
simple and dignified: they were built close to each other, protecting one another from sandstorms and heat. Built generally to produce a courtyard, they became the entity around which the social life of the Kuwaiti family revolved. The simplicity of the walls and their thickness, the use of wood logs for roofing, the size and location of windows, and the design of doors and windows still command the attention of the sensitive eye as it is annoyed by the styles of modern architecture, evident in Kuwait in the early 1950s when urban development first started (Shiber, 1967).

Family ties and kinship relations constituted the basic cornerstone on which social life was built. Aged members enjoyed authority in large extended families. Division of labor between sexes was simple, men for outdoor work and women taking care of the home. In such a traditional society, where community ties were strong, religious beliefs and distinct cultural values developed, took deep roots and were respected. As a result of development and its associated change, the extended family system has been moving towards the nuclear pattern common in other developed countries. In the process, women have become less content in their roles which confine them to the house and have come forward to be active participants in all aspects of economic and social activities.

Kuwait has changed from a typically organic community
to a typically developed community, as illustrated by its physical and social changes. In this context, Rapoport (1969:128) noted the following:

One characteristic of developing countries is often the breakdown of folk arts ... there is danger in applying Western concepts ... to the problems of other areas, instead of looking at them in terms of local way of life, specific needs and ways of doing things.

Kuwait, after the discovery of oil in its land, experienced a constant process of evolution as different forces impacted on it, as knowledge and techniques advanced, and as wealth accumulated. By the end of the 1950s, Kuwaitis were already dissatisfied with the results of the advice they were given on the urban development of their city. With the Declaration of Independence in 1961, a vastly increased revenue from oil and the formation of a democratic government, Kuwaitis became more generally dependent upon themselves; with the riches of the sixties, they began to travel west, to see the world, and to arrive at their own conclusions.

Charles Abrams (1965) has often commented in his work on how experts and officials disapproved of traditional solutions in spite of their clear social and climatic advantages. Rapoport (1969) commented on the advantages of traditional housing forms versus modern forms. He (Rapoport, 1969:129) noted the following:

Housing needs should achieve four objectives in order to be successful ... first, it needs to be socially and ultimately valid ... second, it should be sufficiently economical ... third, it should ensure
the maintenance of the health of the occupants ... fourth, there should be a minimum of maintenance over the life of the building ... that the utilitarian functions of the house are not primary ... and that those functions may be better satisfied by traditional housing than by new housing in many areas ... Our attitude toward traditional housing may change ... Therefore, traditional housing may be acceptable if not in fact more desirable than has been assumed, and housing attitudes in developing countries should be possibly adjusted accordingly.

Christopher Alexander (1977:939) recognized the inappropriate application of Western architectural solutions to the housing of the developing world when he said the following:

Structure follows social spaces ... No building ever feels right to the people in it unless the physical spaces (defined by columns, walls and ceilings) are congruent with the social spaces (defined by activities and human groups) ... And yet this congruence is hardly ever present in modern construction ... Modern construction - that is, the form of construction most commonly practiced in the mid-twentieth century - usually forces social spaces into the framework of a building whose shape is given by engineering considerations.

Architectural Effects on Human Behavior

Literature was reviewed in the context of the impact architecture has on the conduct of human beings. Lynden Herbert (1972:159) stated:

... architecture is a form of cultural message which can and does act as controlling influence on society ... architecture consists of an organization of deliberate and carefully selected items of cultural information ...

Therefore, architectural works and built environments should be studied as constructed systems embodying cultural
and social information. In architectural terms, constructed systems convey the content of a construction and the cultural need for it, so that the cultural human behavior can be deduced from it (Herbert, 1972).

Other discussions on the impact of the built environments on human behavior were suggested by Amos Rapoport (1982) in his book, *The Meaning of the Built Environment* in which Rapoport (1982:178) stated, "... the environment can be seen as a series of relationships between things and things, things and people, and people and people." This was apparent when environments were being designed, in which four elements were being organized: space, time, communication and meaning. Communication has been said to refer to verbal or nonverbal communication among people, while meaning has referred to nonverbal communication from the environment to people. The purpose of structuring space and time has been to organize and structure communication (interaction, avoidance, dominance) through organizing meaning; for example, privacy in a system of interaction or withdrawal has communicated in the separation of spaces, in which physical devices were used to communicate social rules (Rapoport, 1982).

theory of behavioral design that answers the following questions: How does architecture affect behavior? What is the responsibility of the architect? Heimsath (1977:46) noted common fallacies about the relationship between behavior and buildings, as follows:

... it is false to suggest there is no connection between behavior and design decisions, for decisions determine lifetime configurations of people. And the genius cannot be uncritically followed, for genius in form giving does not automatically mean genius in social ordering ... Other common fallacies suggest that the society is completely open, or accept the connection between form and behavior but fear regimentation, conveniently forgetting that regimentation occurs nonetheless but is unaccountable. Finally, it is easy when faced with the complexity of the problem to throw up our hands and look the other way, feeling there can be no solution.

Environmental psychology has placed major focus on investigating the effects of environmental design on behavior. The emphasis has focussed on the role of the environment in human behavior and on the nature of the interaction between person variables and environment variables. Behavior has been seen as the dependent variable and the environment as the independent variable. David Pomeranz (1980:74) stated:

...Although architects have long been concerned with the effects of buildings, roads, and the layout of towns on behavior, their investigations have not incorporated principles and empirical findings from psychology.

Pomeranz (1980) noted that a recent series of studies was developed to demonstrate the effects of architectural design on several aspects of the user's behavior, ranging
from feelings of being crowded to effects on friendship patterns, room usage, avoidance of social interactions, and performance of a variety of tasks. Pomeranz (1980) concluded that greater communication between individuals in architectural design and those in psychology and sociology would result in structures that would better meet the needs of the users.

**Characteristics of the Arab/Islamic Kuwaiti House**

The Arab traditional towns and houses. The basic anatomy of the typical Arab town has resembled the Medieval European town. The mosque, its dominant architectural feature, replaced the cathedral; the minaret, the church tower; and the saha, the church square. By virtue of size, location and distinctive architectural form, the mosque dominated the silhouette of the Arab town. Around the mosque were assembled the residential, commercial and artisan quarters. The internal road systems, designed primarily for pedestrian and animal purposes, grew organically. Entrances to the houses opened off from the narrow streets. The surrounding protective wall was another common feature of the Arab town, although the walls of most Arab towns have now been torn down. Kuwait's walls were torn down, and their arc shape inspired the unmistakable arcuation of the concentric ringroads that characterize the structure of contemporary Kuwait. All
Arab cities possessed the basic unmistakable characteristics: a skyline dominated by domes and minarets; a wall or vestiges of a wall; the horizontal extension of the city, unless it was on hills (Shiber, 1967).

The Arab house has been typified by its interior courtyard, where frequently a fountain was placed and some greenery was planted. This provided a sheltered indoor/outdoor space and an airy private family meeting place. The repetition of the geometrical house and its courtyard formed a crescendo met by the open and larger courtyard of the mosque, its vertical minaret, and its dome (Shiber, 1967).

The Arab contribution to the world architecture was a great and significant contribution – whether the primitive skyscrapers of Hadramut in Yemen or the natural "air-conditioning" towers of Bahrain. It appeared in the courtyard and fountain concept or the mashrabiya, the skillful work in stone arches, vaults and domes and the composition of the dome and minaret in the mosque, like those found in the Alhambra in Spain, or in Baghdad (Figures 25, 26).

The Arabs excelled in achieving simplicity and good ratios of proportions in their architectural solutions. Furthermore, the Arab Islamic contributions of the mosque and minaret, the saha or the suk were significant
Figure 25: The famous Andalusian Mosque in Cordoba, Spain. (Shiber, 1967)
Figure 26: The Kathmi Mosque in Baghdad. (Shiber, 1967)
architectural, urbanistic and spatial contributions (Shiber, 1967).

Classical Arabic architecture has been considered to be architecture that earned a place for itself among the great and grand styles such as the European Gothic, the Byzantine, Indian, Japanese, and other great styles of architecture. Of the many Arabic architectural types and vernaculars, the Moorish type appeared in southern Spain (al-Andalus), and northwestern Africa in Morocco. The Arabic architecture of Morocco derived beauty from the noble masses, shapes and forms, ratios and proportions, shades and shadows; for example, the Moroccan mosques such as those in the old quarters of Casablanca and other cities in Morocco (Figures 27, 28, 29, 30) were masterpieces of creation in space flow, space articulation, and surface decoration. Morocco has retained its classical urban architectural character by transfusing its contemporary urban architecture with some of the features of traditional architecture (Shiber, 1964).

Shiber (1963) noted that the Yemeni urban architectural aspects were rich, significant and potent in visual, aesthetic and constructional components. The high-rise buildings the Yemenis erected, the simple and pure forms they employed in decoration, and the functional ways by which they tackled their urban, architectural and constructional problems have been of great significance to
Figure 27: The Interior of Dar-Jama'ei: An old palace in Meknes, Morocco, now a museum. (Shiber, 1967)
Al-Masur Gate in Meknes, Morocco: Arab architecture in Morocco is enriched by an arch, an effective and decorative element which architects nowadays find very inspiring. (Shiber, 1967)

The Central Business of Al-Dar Al-Baida in Morocco in a process of densification. (Shiber, 1967)
Figure 30: The Remaining Minaret of a Moroccan Mosque:
dating back to the 14th century.
(Shiber, 1967)
architects involved in the design of contemporary residential structures in other parts of the Arab world (Figure 31).

Brolin (1976) discussed the extraordinary architecture found in Sanaa in which he stated:

The skills that built it are not gone, though they were nearly lost due to the insistence on being modern that dominated the country for nearly a decade. Fortunately for Yemen, its architectural traditions are now in less danger of being destroyed because of the words of a United Nations planner named Alain Bertaud. During the three years – 1970 to 1973 – that Bertaud worked in Yemen, he reacquainted the Yemenis with the technical and aesthetic values of their own architecture ... The most successful tactic he used was to build his own home using mud brick in the traditional Yemeni style. (See Figures 32, 33, 34, 35, 36, 37.)

Arab/Islamic architecture. Papadopoula (1980) noted that appreciating modern architecture was the precondition for understanding Islamic architecture. Furthermore, the great emphasis in modern architecture came at the turn of the 20th century when we learned to look at architecture in its essential purity, and without regard for whatever decoration concealed its form. Influenced by both Cubism and industrial design, the Bauhaus campaigned against an earlier academic ornamentation in favor of exposing the structural framework of the building. Papadopoula (1980:194) noted that studying Islamic architectural forms

... is an examination ... of their proportions, the equilibrium of their masses, the relationship of the general aesthetic of decoration with the building on such, the symbolic meaning of architectural forms in
Figure 31: Two Views of the Old Arab City of Hadramut in Yemen: Note the Organic Sky-scrapers. (Shiber, 1967)
Figure 32: Traditional Yemini Stone Construction in Sanaa, Yemen. (left) (Brolin, 1976)

Figure 33: New House with Traditional Construction in Sanaa, Yemen. (right) (Brolin, 1976)
Figure 34: Seven- and Eight-Story Houses in Sanaa, Yemen: Stone is used for the lower floors and baked brick for the upper ones. (Brolin, 1976)
Figure 35: Window Treatment in Traditional Yemeni House. (upper) Small ventilation windows are located between the larger window sets in traditional Yemeni house. (Brolin, 1976)

Figure 36: Bertoud's Yemeni-style house: proved to be a turning point in the Yemenis' rediscovery of their traditional architecture. (Brolin, 1976)
Figure 37: A View of Old and New Houses in Sanaa, Yemen: Some of the houses in Sanaa are centuries old. Others have been built or added recently. (Brolin, 1976)
Muslim terms, and the geometrical secrets of their architects.

In defining the most striking features of Islamic monuments as physical expressions of a culture created by Islam, Ernst Grube (1978:10) noted:

... the most striking features of all Islamic architectural monuments is their focus on the enclosed space, on the inside as opposed to the outside, the facade or general exterior articulation of a building.

The Muslim house has been the most common expression of this attitude. This disregard for the exterior appearance of a building appeared even in monumental structures such as a mosque, in which the exterior is completely hidden or totally surrounded by secondary adjacent buildings, and a bazaar. Ernst Grube (1978:11) noted that "hidden architecture may be considered the main dominant form of truly Islamic architecture." The dome has been used in both religious and secular structures; it indicated a mosque, a palace, or a tomb. It appears that it was a general symbol, indicating power, royalty, or the focal point of assembly. It has been a principal feature in a structure, or a minor element in a vast structure; hidden or half-hidden by other structures. Other features of Islamic architecture have related closely to the concept of "hidden architecture," the absence of a specific architectural form for a specific function; for example, the courtyard design concept was used in the constructional plans of mosques and palaces as well as in public baths and
private dwellings. The lack of direction or focus and the lack of balance between the various parts of a building characterized Islamic architectural designs in all times and in all parts of the Islamic world. Ernst Grube (1978:13) pointed out the basic differences between the main architectural forms of Classical European architecture and Classical Islamic architecture in which he noted,

European architecture is generally designed as a complete balanced plan; Islamic architecture usually shows no basic structure, and additions to an original plan are, consequently, never hampered by an inherent principle governing the whole and conditioning all parts in an equal manner ...

This feature has been considered to be an example of the architectural principle of organic growth (Grube, 1978).

The most important element of Islamic architecture has been the enclosed space - defined by walls, arcades and vaults. Decoration in Islamic architecture ranged from the use of mosaic and painted decoration to tiles - especially luster and painted polychrome - and from moulded and deeply cut stone or plaster to actual open work and pierced walls, vaults and supporting pillars. The use of a multitude of decorative treatments of surfaces in Islamic architecture served a functional purpose by creating the visual effect of unlimited space. And the development of a rich repertory of designs - from geometric abstract shapes to full-scale floral patterns, from minutely executed inscriptions to a full variety of calligraphic styles and monumental single words - served both religious images and
decoration. In this context, Grube (1978:15) noted:

... the tendency to an infinite repetition of individual units (bays, arches, columns, passages, courtyards, doorways, cupolas) and the continuous merging of spaces without any specific direction or any specific centre or focus ... It is that of a metaphysical concept of the world, rooted in the religion that created it - Islam.

John Hoag (1963:47) defined Islamic architecture as God-centered, in which he stated:

The complex ornament of a damascened tray, the intricate stucco patterns of the walls of a private house, or the endless arabesques of the tiled walls of a mosque invite, through their study, the submergence of the individual will into that of God.

Hoag (1963:48) discussed the symbolic use of light, both natural and artificial, in Islamic monuments in which he noted that Surrah 24 of the Koran reads, in part, "God is the light of the Heavens and the earth. His light is as a niche in which is a lamp and the lamp is in a glass, the glass is as though it were a glittering star." Representations of a niche with a lamp suspended in it characterized early Islamic structures. The use of light as a mystical synonym of God added a new element to Islamic architecture (Hoag, 1963).

In Islamic culture, it is both the explicit and the implicit Koranic prohibitions that have been the primary determining factors in the formation of a domestic unit and what has been socially unacceptable. Guy Petherbridge (1978:196) noted that in Surrah 32-33 of the Koran - the Surrah of the Confederate Tribes - it was stated:
Wives of the prophet you are not like other women. If you fear Allah, do not be too complaisant in your speech, lest the lecherous-hearted shall lust after you. Show discretion in what you say. Stay in your homes and do not display your finery as women used to do in the days of ignorance...

And the Surrah 27 - the Surrah of the light stated, "...Believers, do not enter the dwellings of other men until you have asked their owners' permission and wished them peace..." (Petherbridge, 1978:196)

The house of prophet Muhammad in Medina in 622 became the archetype of all Muslim houses of prayer and palaces as well as private dwellings. Papadopoula (1980:195) noted, "... That distinction was conferred on it quite early, however, solely because the life of the Prophet, and everything connected with it, was taken as model by the faithful." The house consisted of a simple row of chambers each opening on a vast square courtyard measuring 100 cubits (about 160 feet) per side. The enclosure was built of unbaked bricks and the walls, with their height of about 11 feet, were supported on a bed of stones around the terrain. There were no walls on the west side of the square outlined. The rooms opened directly on the courtyard. There were stone gateposts but no gates or doors; those openings did not take any particular shape, being disposed as practical necessity required. In order to mark the quibla, and to provide shelter from hot sun - rain being a rarity in that region - prophet Muhammad set up, with the help of his companions, a simple roof of palm
fronds resting on two rows of palm trunks aligned parallel to the south wall. Another shelter from the sun was built along the north wall but less deep, with only a single row of palm trunks as support. The courtyard was a very large living area in a house where most activities were carried on in the open air. The covered part played the role of an audience hall with the minbar in the middle. The original minbar in the center of that first quibla was an armchair in tamarisk wood raised above the ground by two steps, which was destroyed by fire in 1246 (Papadopoula, 1980). Papadopoula (1980:217) spoke of the house of the Prophet as follows:

Primitive as the dwelling of Muhammad was, with a rustic simplicity befitting the Arab mores of its time, it had a general disposition dictated directly by the functions it had to fulfill and by the very simple means within the group of the Arabs.

Simple in plan, its construction required no more than local materials found in any oasis having a stand of palm trees, and available techniques. The initial tendency and impulse of Islamic architecture came from the prophet himself and from Arabia. These features included: an enclosure in crude bricks to isolate and symbolize the new community and its faith; a few chambers for the leader and his family; and two shaded areas in the courtyard, of which the larger, the quibla, gave the ensemble an orientation with respect to the physical and spiritual position. The only furnishing needed was a throne for the head of the
community, the minbar, where he could receive outsiders in proper dignity and from which he could address the assembly of the community. The explanation of the choice of the square in plan has been thought to be: 1) rational, in which it emphasized the dimension of 100 cubits per side; 2) religious, in which the square is the shape of the base of Kaaba; or 3) functional, for defensive purposes (Papadopoula, 1980).

The traditional need to entertain male guests, and at the same time prohibit their access to the females of the household, created the importance of planning for a double circulation system. Men's reception rooms tended to be located for accessibility from the entrance lobby of the house, so that visitors were prevented from conversing with the females of the household. This social need gave rise to additional complexities which created the preceding design requirements typical of Islamic domestic architecture (Petherbridge, 1978).

The symbolic importance of the house entrance as the vulnerable threshold between the household and the public dictated the construction of a monumental and sometimes highly decorated doorway. The Islamic house usually had only a single entrance. The main gateway of the house did not give immediate access to the domestic quarters, but led into a passage with a right angle turn so that it was impossible to see into the courtyard from outside
In both the hot/dry and the hot/humid areas of the Islamic world, architecture was a means of controlling the environment. Orientation of dwellings was influenced by factors such as climate, society and religion. Underground dwellings were found in most areas of the Islamic world in which the natural insulation properties of the earth were used. Basement rooms were found in many homes in Iraq and Iran, and were certainly in use as early as the 9th century (Petherbridge, 1978:201).

Recently, in the Islamic world, major social changes have been affecting the form of domestic architecture. The change of family structure has resulted in smaller housing units. Also, the increased acceptance of women's freedom has resulted in less enclosed environments (Petherbridge, 1978:208).

Kuwaiti traditional house. Kuwait has yet to create a style of building which can match, in modern terms, the character and ingenuity of the traditional dwellings of the old town. Stephen Gardiner (1981:6) described this character when he noted:

... narrow streets, courtyards and houses were as closely interwoven as a Kuwaiti rug ... The plan was traditional ... its arrangement was simply an expression of the best answer for life in a hot climate - no embellishments, utter functionalism, a bare frame for the family.

Apart from the Sheikh's residences, the most prominent houses in Kuwait stood on the sea-front. Those who lived
in the old town of Kuwait earned their living from the sea as owners of trading ships, captains, pearling captains or pearl merchants. Between the large houses of the richer families stood smaller homes of others who worked with them and for them, such as the boat builders and repairers, pearl-divers, fishermen and sailors.

The occupants of every house were numerous, representing an extended family. In addition to parents and children, there might be one or two grandparents in the household, or a divorced or widowed female relation, and there always seemed to be numerous aunts or cousins who needed accommodation at various times (Lewcock, 1978).

Houses to accommodate these large family groupings were described by Allison (1979:1) in his book, *The Kuwait Home*. Allison believed that the Kuwaiti traditional house was ideal for the society and climate. Characteristics of these homes were identified and are discussed below.

An entrance wooden door, often elaborately carved, gave access to the compound (Figures 38, 39, 40). The *dihlis* was an entrance or vestibule that functioned as both a climatic modification and as a transitional space between the outdoors and indoors for the provision of privacy.

The *diwaniyyah*, or men's reception room, was situated just inside the door, usually fronting a main street and this was the only part of the house which might have windows on the street side, unglazed but with bars and
Figure 38. The details in the facade of the door were characteristic of traditional doors constructed of vertical planks of wood, fastened by closely spaced nails which have large dome-shaped bosses ending in an elegant cluster of four bosses close together at the outside end of each row.
Figure 39. Elaborate entrance doors were characteristics of the old city of Kuwait. The top part of the door was designed with Koranic phrases carved in wood. Modified shapes of the traditional door designs were used in contemporary houses.
Figure 40. Decorations in the facade above the entrance door display simple designs of floral and leaf patterns in mud moulding that suggest Islamic decorative influences.
shutters. It was always located on the east wall of the house with a view to the sea, and had its own courtyard with a separate entrance. A feature of the diwaniyyah was its handsome double doors of carved and studded teak, which were frequently left standing open, revealing a wide passageway with benches of masonry on either side where the owner or his servants sat. It served as a traditional place for males to get together in the evenings, and it was also part of the extended family concept in which members of the family gathered in the most special part of the house.

The courtyard served several purposes as a design feature in traditional Kuwaiti homes. It contained the water well, provided privacy for women when they were carrying out their daily chores, and it acted as a temperature regulator for the exchange of air from the rooms that opened on to it (Figures 41, 42). In all courtyards, it was desirable to have shady verandas along the inner walls. In one type the veranda roof was supported by a series of masonry arches of a simple pointed style. A more common type of veranda had wooden pillars whose design varied little except in the fretwork pattern applied to the capitals.

The kitchen was situated in the harem or women's courtyard. Separating the kitchen from the main living quarters was a custom in designing Kuwaiti homes to keep
Figure 41. An old mud house in the course of demolition stood the test of time and remained an evidence of Kuwait's vernacular architecture.
Figure 42. An old mud house with one courtyard, and a roof room was still inhabited in the course of demolition.
heat and odors from the main house. The kitchen had no windows and cooking was done on the ground with the pots raised on stones or bricks over an open fire. Water from the well was used for cleaning purposes. A storeroom was located off the kitchen for fuel which included brushwood from the desert, charcoal, or dried palm-fronds from Iraq.

The roof was supported on mangrove poles - round wooden poles 10 cm. in diameter and always cut to a standard 3 m. length. On top of these were placed reed mats which supported about 30 cm. of mud mixed with straw (Figure 43). These flat roofs were surrounded by high walls broken by a slotted parapet and were approached by an outside staircase from the courtyard (Figure 44). Often this room provided an area which captured the cool night breezes and provided sleeping quarters during the summer. It served also to provide an outdoor sitting room for the women of the household who according to strict Islamic values were to be screened from neighbors and passers-by (Figures 45, 46).

The walls were constructed of sun-dried mud pallets or lumps of coral rocks taken from the foreshore and whitewashed to reflect heat. Mud mortar was used to bind these units together, and mud plaster to face them. Islamic art was found in the abstract form of the dwelling rather than in surface patterns. Gardiner (1981:7) noted the following:
Figure 43. Details in the ceiling revealing the materials used and methods of construction. Wooden poles supported the roof. Detail of wooden column supported loggia outside the men's reception room carrying a square capital of the traditional Persian type.
Figure 44. This staircase to the roof completed the picture of a small old house with one courtyard and a limited number of rooms which was built from indigenous materials, plastered and furnished.
Figure 45. This partly demolished house in Kuwait showed a Bahraini type wind-catcher facing in four directions with four vertical shafts leading to a corner of the principal men's reception room.
Figure 46. This light wooden structure was on the open roof of an old home overlooking the sea-front. A masonry bench in housefront was used for outdoor conversations.
... The quality resided in the form, the top of a column supporting shady colonnades, in their vaulted ceilings; and with several houses in a group, there were several corresponding courtyards ... and these courtyards formed a private street of spaces - some large, some quite small - for the community off the main street ... Inside, there was space, quiet and security; outside, activity - markets, business, work. And here again, there was the answer to the climate: narrow streets acted as shutters for the hot straight sun, creating shade.

Within the rooms the bareness of the walls was often relieved by a series of rectangular niches, roshana, which provided handy shelves on which rose-water bottles and sandalwood incense holders might be placed (Figures 47, 48, 49).

The standard rough wood mangrove poles limited the width of every room. The width of rooms in these houses was determined by the maximum available length of the mangrove poles (about ten feet) imported from India. Gardiner (1981:6) noted that:

the length of the pole acted as a module that organized the plan and so introduced order to the houses and to collections of houses. The structure influenced the form, and so followed human form and a pleasant scale, as in all true architecture, the pole was of a length one man could handle.

Although the traditional Kuwaiti home was limited in modern conveniences and required constant maintenance, it served the traditional Kuwaiti family well.

The preserved buildings remain as witness to the strength and beauty of an ancient architectural tradition and for the pleasure they may give to future generations (Lewcock, 1978).
Figure 47. These details in construction of the interior walls revealed construction techniques used in traditional architecture in Kuwait. The house is in the process of demolition, with the exterior walls and ceiling removed to reveal the original wall niches. Wall niches were employed as built-in shelves; these mostly displayed rose water containers, sandalwood incense holders and elaborate coffee pots.
Figure 48. These details of interior walls show the designs employed in the construction of interior walls mostly used in the indoors public areas of the house and in the men's reception room diwaniyyah.
Figure 49. More details of the interior walls in a house in the process of demolition reveal the wall treatment. Some of these traditional wall niche designs are incorporated into contemporary designs of interior walls in new houses in more durable finishes.
Modern and Post-Modern Movements in Architecture

Brent Brolin (1976:61) in his book, The Failure of Modern Architecture, wrote on the social concern of the Modern movement in which he stated:

It is evident from the world-wide uniformity of modern architecture that the universal approach promoted by the architect allowed his own values to be consistently dominant and cultural differences to disappear by virtue of the supposed homogeneity of modern times.

However, cultural differences did not disappear. Every wall and window had a social as well as an aesthetic implication which differed from class to class and from culture to culture. Brolin (1976:62) cited an example of culturally different perceptions of space which related to the Arab countries in which he noted that when Algiers became independent, the Algerians moved into the high-rise buildings that had been built for the French. Instead of using the rooms as they had been intended, however, they removed all the doors and broke through many walls in an effort to open up the living spaces. Whereas the Europeans had required physical barriers to insure their privacy, the Algerians preferred large open spaces, having other means of insuring the privacy of their family; they did not invite strangers into the household.

Founded in 1919 by Walter Gropius, the Bauhaus remained a center for all phases of modern architecture until 1933 (Brolin, 1976). During that period it developed
a systematic approach to the planning, design and construction of what Gropius called the "New Architecture." One of the main achievements of the new constructional techniques was standardization, which was defined by Gropius (1965:37) as "... The unification of architectural components would have the salutary effect of imparting that homogeneous character to our towns which is the distinguishing mark of a superior urban culture." A second achievement was rationalization which was defined by Gropius (1965:38) as follows:

... We are approaching a state of technical proficiency when it will become possible to rationalize buildings and mass produce them in factories by resolving their structure into a number of component parts ... The repetition of standardized parts, and the use of identical materials in different buildings will have the same sort of coordinating and sobering effect on the aspect of our towns as uniformity of type in modern attire has in social life.

John Jacobus (1966) noted that the period from 1927 to 1932 centered about the peak years of the so-called International style. The International Style (whether called the modern movement, new architecture or functionalism) produced forms that were completely abstract; that is to say, their appearance and expression owed nothing to traditional architectural vocabularies. These forms were made of glass-enclosed volumes with thin textureless walls, steel or reinforced concrete. Generally undecorated, even major forms defied convention by general avoidance of normal structural expression. Interior spaces
were conceived in a functional spirit and sometimes through nominal interior partitions. The International Style was employed in the design of residential structures in Kuwait in the early 1950s. Western or Arab architects who were influenced by the dogmas of this style through their training or practice were responsible for the design of these structures. The characteristics of this style were expressed in the abstract forms produced by the use of reinforced concrete, cubic shapes, large windows often in horizontal bands, avoidance of traditional architectural features and interest in white rendering (Figures 50-53).

Jacobus (1966:101) noted the characteristics of architecture in the early 1960s, stating:

... One of the lashing - and, in part, debilitating - effects of the postwar neo-picturesque tendency was the questioning and dismissal of many rationalizing dogmas that had prevailed in the 1920s.

Many architects of the 1950s indicated rejection of the socio-mechanistic content of early modern architecture, but continued to employ the exterior stylish forms of the International Style. This exteriorizing tendency led to the New Formalism, which culminated in the late 1950s and early 1960s.

Jacobus (1966:157) stated, "... The new forms of the 1960s are bulkier, their spaces more emphatically shaped and their structures visually more pronounced than before..." The architectural products of this trend were characterized by interest in broken silhouette forms,
Figure 50. Traditional Kuwaiti courtyard style house in the left of the figure was built before 1950, adjacent to a Western style house built in the early 1950s. The Western style house illustrated the characteristics of the International style in the abstract form of the house produced by the use of reinforced concrete. Other characteristics illustrated were the asymmetrical composition, cubic shapes, absence of decoration, and a predilection for white facades.
Figure 51. A close-up of the Western style house built in the early 1950s featuring the characteristics of the International style. The general form of the house did not express any of the architectural features of Kuwaiti traditional architecture except in the high walls that surrounded the property and the elaborate wrought iron entrance gate.
Figure 52. A cluster of four houses built in the early 1950s, two houses are shown in the figure. The house on the right illustrated the characteristics of the International style in the abstract form of the house's asymmetrical composition and absence of traditional architectural features. The house to the left was altered by the placement of brickwork on the exterior walls of the house, replacement of the windows with aluminum frame windows and the replacement of the upper section of the garden wall with wrought iron work.
Figure 53. A close-up of the back side of the house built in the International style shown in Figure 73. Traditional architectural features were evident in the use of traditional doors, presence of a roof room and the use of earth bricks for roof construction. These features contrast with the general style used in the design of this house.
uneven sky-lines, masses that were articulated rather than unified, and exposure of individual structural elements which were sculptural rather than mechanistic in character. The materials used in the construction of these buildings favored the texture of the skin in the materials specified for their designs (Hitchcock, 1977). The New Formalism trend in architecture was applied in the design of residential structures in Kuwait in the 1960s. The characteristics of this style were represented in Kuwaiti houses built in this period. The characteristics of this style were featured in the sculptural rather than abstract forms illustrated earlier in the 1950s. Another characteristic represented in the New Formalism trend in architecture was the expressive exposure of individual structural elements evident in the massive sun screens characteristic of Kuwaiti contemporary residential architecture in the 1960s (Figure 54).

Another architectural movement which responded to the rigid doctrines of the International Style occurred in Europe during the 1960s was the New Brutalism in England. The architectural products of this movement were characterized by the use of naked concrete and usually rough and dark-colored materials. Other materials used were bricks, pre-cast slabs with a coarse aggregate in relief, and stone masonry of rubble or quarry-faced granite with rather heavy trim of raw or varnished wood and wrought
Figure 54. These two houses built in the early 1960s incorporated features of the New Formalism style in architecture found in the early 1960s in Europe and America. The structure is sculptural rather than cubic in form. The structure had articulated rather than unified masses. The expressive exposure of individual structural elements illustrated in the massive sunscreens as decorative elements were characteristic of Kuwaiti contemporary architecture in the 1960s (Allison, 1979).
iron (Hitchcock, 1977). The New Brutalism style was applied in the design of houses built in Kuwait in the 1960s. The characteristics of this style were illustrated in the tendency towards regularity, the use of rough brickwork and exposed concrete. These characteristics were evident in the contemporary residential architecture in Kuwait shown in Figures 55-67.

In this context Hitchcock (1977:580) stated:

Even if it could be accepted in the sixties that these two tendencies represented the whole story, few are impartial enough to admit that they were equally characteristic of the more serious architectural production of the decade.

Houses built in Kuwait in the 1970s reflected an awareness of designing for hot climates and incorporating design concepts and design features typical of their traditional architecture. This trend was influenced by the Post-Modern movement that began in the United States in the decade from 1960 to 1970.

Charles Jencks (1972:92) discussed the Post-Modern movement as a departure from the Modern movement in architecture that took place in the 1970s in which he stated:

Several architects are moving beyond modern architecture in a tentative way, either adapting a mixture of modernist styles, or mixing these with previous modes – ancient, modern or hybrid.

The architectural products of this movement were characterized by the use of various contrasting styles in the design of one structure. Jencks described these
Figure 55. The house on the left illustrated the architectural features of the International style in the use of cubic forms, asymmetrical composition and absence of decoration. This house contrasted with the other house on the right built in the early 1960s. The characteristics of this house illustrated the architectural features of the New Brutalism style in the use of brickwork, aluminum work in the entrance doors, and the reinforced concrete overhangs above the windows.
Figure 56. The architectural characteristics of this house illustrated the application of the New Brutalism style in its design. These characteristics were featured in the tendency towards regularity or symmetry in general form, the use of rough brickwork, reinforced concrete overhangs above the windows and doorways, aluminum work in the gate and woodwork in the window frames.
Figure 57. The architecture of the house on the left built in the late 1960s illustrated the characteristics of the New Brutalism style in its design. These characteristics were featured in the tendency towards regularity or symmetry in the general form, the use of brickwork and exposed concrete in the exterior walls and the aluminum work in the window frames.
Figure 58. The architectural characteristics of this house built in the late 1960s illustrated the characteristics of the New Brutalism style in its design. These characteristics were featured in the tendency towards regularity or symmetry in the general form, the use of textured brickwork in exterior walls and aluminum work in window screens and the gate. The decorative pattern used on the facade is formed by the tile work. The same pattern is repeated in wood on the entrance door and in the aluminum gate. This pattern represented the use of Islamic motifs in modern housing designs in a modified form when compared to the Islamic designs found in ancient monuments.
Figure 59. The architectural characteristics of this house built in the late 1960s illustrated the characteristics of the New Brutalism style in its design. These characteristics were the tendency towards regularity or symmetry in general form, the use of brickwork with a heavy band of reinforced concrete in the exterior walls and overhangs above the entrance, and the use of aluminum in the window frames and the staircase rail. The open roof design is a feature of Kuwaiti traditional architecture in a modified form. Horizontal planks of wood were placed between columns representing the form of roof found in traditional structures.
Figure 60. The architectural features of this house built in the late 1960s featured the characteristics of the New Brutalism style of architecture in its design. These characteristics were the tendency towards regularity, the use of shapeless stone and reinforced concrete in the exterior walls, and iron work in windows and the gate.
Figure 61. The architectural features of this house built in the late 1960s featured the characteristics of the New Brutalism style of architecture in its design. The characteristics were the tendency towards regularity and symmetry in general form, the use of stone and reinforced concrete in the exterior walls of the structure and the iron work in windows, entrance door and the fence that surrounded the property.
Figure 62. The architectural characteristics of this house built in the late 1960s featured the characteristics of the New Brutalism style of architecture in its design. These characteristics were the use of stone and reinforced concrete in exterior walls, aluminum work in the windows' designs and iron work on the gate. The use of narrow arched windows for minimal sun radiation represented the use of traditional Arab architectural features in a modified form by applying it to Western housing design.
Figure 63. The architectural characteristics of the New Brutalism style were illustrated in the design of this house built in the late 1960s. These characteristics were featured in the use of stone with concrete overhangs. The reinforced concrete was imprinted with the grain of wooden shuttering in the walls around the property and iron work in the gate is characteristic of the New Brutalism style in architecture.
Figure 64. The architectural characteristics of the New Brutalism style were illustrated in the design of this house built in the late 1960s. These characteristics were featured in the use of stone and reinforced concrete in exterior walls and iron work in the fence surrounding the property. The articulation of masses in the general form of the house provided for mutual shading and minimal sun exposure by creating enclosed outdoor spaces for recreational activities.
Figure 65. The architectural features of this house built in the late 1960s featured the characteristics of the New Brutalism style in architecture. These characteristics were featured in the use of brickwork and reinforced concrete in the exterior walls and the iron work in the gate and fence. The articulation of masses in the general form of the house provided for mutual shading and minimal sun exposure creating an interesting texture in the facade.
Figure 66. The architectural features of this house built in the late 1960s featured the characteristics of the New Brutalism style in architecture. These characteristics were featured in the use of stone and reinforced concrete in exterior walls, bulky overhangs to provide maximum shading and iron work on rough textured walls surrounding the property. The design of the roof expressed the traditional Arab design in a modified form.
Figure 67. The architectural features of this house built in the 1960s featured the characteristics of the New Brutalism style in architecture. The characteristics were featured in the use of stone and reinforced concrete in the exterior walls, iron work in the gate and the wood work of the trellis in the roof room. The concept of the roof room in traditional Kuwaiti architecture is represented in a modified form creating an interesting composition of mass and space.
architectural structures as follows:

It is variegated rather than homogeneous, witty rather than sombre, messy rather than clear, picturesque but not necessarily without a classical, geometric order (usually it is made from several orders in contrast).

The Post-Modern style in architecture was applied to residential structures in Kuwait in the 1970s. Its main characteristic was the use of contrasting styles in the general form of the structure. Classical Western features and traditional Kuwaiti features were incorporated in the design of Western housing design shown in Figures 68-77, in a creative architectural context.

Hitchcock (1977) noted the cultural influence of the West on Asia and Africa in the 1950s when he stated:

Moreover, while the West was more and more losing political control of Africa and Asia, its cultural influence on those continents did not necessarily decline, indeed as regards architecture it probably increased.

What has happened since urban development of the Kuwaiti city-state started in the early 1950s represents a case study of the influence of the western culture on an Arab society. In the 1950s, the responsibility of selecting architects for the implementation of Kuwait's first Physical Development Plan was in the hands of the ruler's chief advisor, General Hasled, when Kuwait was still under the political influence of the English. In consequence, Gardiner (1981:22) stated:

... the Kuwaitis got what the English were getting three thousand miles away ... the power to choose was in the wrong hands, in General Hasled's hands. And
Figure 68. The architectural features of this house built in the 1970s featured the characteristics of the Post-Modern style of architecture. The main characteristic is the use of various contrasting styles in its design. Classical European style was incorporated along with the Western modern design and the use of Kuwaiti traditional doors for the gate.
Figure 69. A close-up of the same house in Figure 89 built in the Post-Modern style. Facade design illustrated the use of the architectural features borrowed from the Classical European styles. The use of stone represented the Western modern trends in architecture. In addition, the traditional Kuwaiti door was included in the design of this house which is an example of combining architectural features of various styles which is characteristic of the Post-Modern style in architecture.
Figure 70. The architectural features of this house built in the 1970s featured the characteristics of the Post-Modern style in architecture. These characteristics were illustrated in the use of traditional architectural concepts in combination with Western housing design. The traditional architectural concepts were featured in the use of high walls surrounding a one-story house with a modified court. The Western influences were represented in the use of stone and reinforced concrete canopies in the exterior walls and the use of large windows in the facade.
Figure 71. The architectural features of this house built in the 1970s illustrated the characteristics of the Post-Modern style in architecture. These characteristics were observed in the application of traditional architectural concepts in Western housing design. The courtyard concept was applied in a modified form. The natural smooth walls and the roof design represented the traditional features of Kuwaiti architecture in a modified shape. The mixing of styles created an interesting structure which was more reflective of the people's cultural and social needs.
Figure 72. The architectural features of this house built in the 1970s illustrated the characteristics of the Post-Modern style in architecture. These characteristics were observed in the use of architectural features of Islamic architecture, traditional Kuwaiti architecture and Western styles in modern architecture. The structural elements in the facade represented an Islamic appearance in the design of a niche with a lamp suspended in it. The one-story high structure with high windowless and whitewashed walls represented traditional influences designed in a modified style to blend with modern Western architecture.
Figure 73. The architectural features of this house built in the 1970s illustrated the characteristics of the Post-Modern style in architecture. These characteristics were featured in the use of traditional Kuwaiti architectural concepts and modern Western styles in its design. The courtyard concept was observed in the semi-enclosed interior spaces. Large window walls overlooked the courtyard. Outside walls were windowless. The use of brick and exposed concrete suggested the New Brutalism style in the creation of this house design.
Figure 74. The architectural features of this house under construction in 1983 illustrated the characteristics of Post-Modern style in architecture. The combination of Modern and Traditional architectural features illustrated the tendency towards this style. The use of stone and marble in the exterior walls represented the New Brutalism style in architecture. The high walls and the arch's shape - although facing outwards - represented the architectural features of Kuwaiti traditional architecture.
Figure 75. The architectural features of this house under construction in 1983 illustrated the characteristics of Post-Modern style in architecture. These characteristics are observed in the combination of Traditional and Western architectural features in its design. The Traditional Kuwaiti architectural features incorporated were: narrow windows in the facade and the semi-enclosed interior spaces presenting an interior courtyard. The Western influences were observed in the cubic form, the unified articulation of masses and regularity in the general form and the individual structural elements.
Figure 76. The architectural features of this house under construction in 1983 illustrated the characteristics of the Post-Modern style in architecture. The combination of Traditional architectural features with Western modern architectural styles was represented in the application of the following traditional Kuwaiti features: High walls, narrow windows in facade, and the projections in the roof. These projections are copied patterns from traditional Kuwaiti architecture seen in the design of the old city wall built in 1920 shown in Figure 15. The Western influences were observed in the use of cubic shapes, regularity in the general form, and the structural elements used.
Figure 77. The architectural features of this house under construction in 1983 illustrated the characteristics of the Post-Modern style in architecture. These characteristics were observed in the application of the traditional Kuwaiti architectural features: High walls, narrow windows and the projections in the roof. The Western influence was observed in the use of cubic shapes, regularity in form and the clean cut horizontal lines in the cornice.
so, instead, they got the really trite, bourgeois, run-of-the-mill, commercial kind of architects who were just beginning the spoiling of English cities, towns and countryside: the Hertford and London groups' work only represented a single, brilliant streak of sunlight in an otherwise dismal and clouded scene.

The first building boom that occurred in Kuwait in the 1950s brought the work of English architects like Tripe and Watcham, Hubbard, Ford and others, along with their design of flats and offices in box-like styles, and by the 1970s much of it had been demolished. On their rapidly deteriorating structures and blind disregard for climate and culture, Gardiner (1981:23) commented:

... displayed, for instance, in the brash chequerboard facades that were a commercialized British fashion of the time, and in huge windows that ignored factors like intense heat, shortage of water for cleaning, sand storms in summer, the cold of winter and the Kuwaiti's profound desire for privacy, the buildings of the period were a precise reproduction of the kind of junk that was being run up in England after the war.

With the Declaration of Independence in 1961, the English influence declined. Gardiner (1981:24) stated, "... Kuwaitis became more generally dependent on themselves; with the riches of the 1960s, travel went into reverse, they began to go West, to see the world and arrive at their own conclusions."

Gardiner (1981:25) quoted Hamid Shnaib, the chief architect in the Kuwait Municipality, which had the most constructive influence on the city since the middle 1960s, as stating, "It was typical of the period. Buildings went mad, as they did in England, France." Shnaib was trained
as an architect in England, at Oxford; he qualified in 1957, worked for two London architects and returned to Kuwait in 1960 to join the Ministry of Public Works. And, in 1965, the year he became assistant to the director of the department, he called for expert advice from Professor Thaisi of Holland and from Dr. Omar Azam, an Egyptian United Nations representative of Middle Eastern planning affairs. Events developed which led to the hiring of Colin Buchanon, the English city planning firm which prepared the National Physical Development Plan of Kuwait city-state in 1970. This has proven to be the pivotal decision which has resulted in the westernization of Kuwait.
CHAPTER III

METHODOLOGY

The Pilot Study

A pilot study was conducted for the development of this study in which ten architects practicing in the private sector in Kuwait were interviewed. The interview consisted of questions regarding their architectural training and their architectural designs for Kuwaiti residences shown in Appendix B. The architects' responses served as a background for the development of the residential design survey conducted for this study.

The findings of the pilot study revealed the major phases of architectural development that took place in Kuwait city after the exploitation of oil from the year 1950 until the year 1974. The architects interviewed pointed out that the continuous change in styles employed in the design of Kuwaiti residences during this span of years was subsequent to changes in the economical and social characteristics of the Kuwaiti society. The majority of architects interviewed pointed out that the styles employed in the design of Kuwaiti residences since the early 1950s until the early 1980s were modern. Three (30 percent) architects said they incorporated Traditional Arabic/Islamic, Modern Islamic or Modern Arabic styles when asked to indicate the style of architecture they
preferred. Ten (100 percent) indicated the definite phases of architectural development employed in the design of residential structures in the city of Kuwait in the 1950s, 1960s and the 1970s, when asked to describe their clients' requirements in terms of architectural design and layout of their homes. In all time periods mentioned, the architects were responsible for the design of their clients' homes rather than the clients themselves. The major phases of architectural development pointed out by the respondents to the interviewer were:

1. The first phase of architectural development after the exploitation of oil during the 1950s illustrated the sudden departure from the traditional styles in house designs and layouts to Western styles. The courtyard was abandoned, and Western detached houses were adopted. The examples of the architectural products of this period illustrated a tendency towards incorporating the characteristics of the International Style in their designs. These characteristics were featured in the abstract forms of the structures, general avoidance of any traditional architectural features, large horizontal windows and cubic-shaped architectural forms (Figures 71-74).

2. The second phase of architectural development in Kuwait during the 1960s illustrated a tendency towards incorporating the characteristics of the New Brutalism and
the New Formalism trends in architecture. These styles were found in the 1960s in Europe and America. Arabic architects who were trained in Europe or America were responsible for their designs. The characteristics of the New Formalism were featured in the sculptural forms of the structures, uneven horizontal lines and articulated masses rather than unified as shown in Figure 75. The characteristics of the New Brutalism were featured in the use of naked concrete or rough brickwork and stone, the use of ironwork in gates and windows, and the tendency towards regularity in general form as shown in Figures 76-88.

3. The third phase of architectural development in Kuwait during the 1970s illustrated houses featuring many of the characteristics of Kuwaiti traditional houses. The courtyard was retained in a modified fashion. The houses tended to be L or U-shaped, providing a semi-enclosed outdoor space rather than a complete rectangular enclosure. The architectural features of the structures built in this period illustrated a tendency towards the Post-Modern trend in architecture. These features were illustrated in the use of various contrasting styles in the design of the structure. Classical architectural features were used in Western design housing as shown in Figures 89-96. Traditional architectural features were also used in Western design housing as shown in Figures 97, 98.

The majority of the architects interviewed indicated
Figure 78. Accommodation of both nuclear and extended family (Lewcock, 1980)

Figure 79. One floor housing
Figure 81. Presence of a central courtyard

Figure 80. Flat Roof
Figure 82. Few or no windows on outside walls

Figure 83. Water wells in the courtyard
(Lewcock, 1978)
Figure 84. Separate public and family areas (Lewcock, 1978)

Figure 85. Men's reception room (*) with a separate entrance (Lewcock, 1978)
Figure 86. Facades with Arabic appearance (Lewcock, 1978)

Figure 87. Outdoor kitchen (Lewcock, 1978)
Figure 88. Typical Kuwaiti door on the main entrance

Figure 89. Walls 4 m. high
Figure 90. Rooms 3.6 m. wide (Lewcock, 1978)

Figure 91. Ceiling with rough mangrove poles 8-10 cm. in diameter spaced 15-20 cm. apart
Figure 92. Whitewashed exterior

Figure 93. Waist-high niches set between door openings in men's reception room (Lewcock, 1978)
Figure 94. Earth bricks and layered earth walls
Figure 95. Yellow clay tile flooring (Lewcock, 1978)
Figure 96. Yellow clay arches and vaults (Lewcock, 1978)

Figure 97. Entrance halls immediately inside the entrance to the home (Lewcock, 1978)
Figure 98. Masonry stairs to the roof of the house (Lewcock, 1978)
that the materials specified for the design of the exteriors of structures were natural materials represented in stone and marble; other materials used were lime-bricks and white cement blocks. The materials specified for the design of the interiors of structures were stone or marble tiles for flooring, plastered walls except in the diwaniyyah - the men's reception room - which usually had wooden planks in Islamic patterns and plain plastered ceilings or false ceilings in white gypsum.

The majority of the architects believed that the design concept of a modern Kuwaiti house was the design that mostly responded to the Kuwaiti's social needs and Kuwait's climatic requirements. The courtyard concept employed in the traditional dwellings of the old town answered social motives, climatic conditions and ready availability of building materials.

The architects were asked to state their design philosophies related to designing residential dwellings in Kuwait. Their responses reflected these design considerations.

1. function
2. clients' requirements
3. the study of design elements
4. reflect cultural needs
5. clients' requirements in inner spaces and architects' ideas in exteriors
6. design reflects status symbol, social symbol and different kind of needs, it isn't design for need
7. function, clients' requirements and participation of members of family especially the wife
8. design is a living object, it feels and would suffer when hurt
9. traditional and classical designs

The pilot study assisted in the development of the methodology for this study, which attempted to correlate changes in the GNP of Kuwait and architectural preferences for residential design.

The Study Methodology

The study was conducted in two parts. The first part was a sample survey of 15 architects in Kuwait City practicing in the private sector who were primarily involved in residential designs. The second part of the study was a comparative field research of both early and contemporary housing structures in Kuwait.

The survey performed for the study was both descriptive and correlational in that it:

a. Described the changes which had occurred within the State of Kuwait in the areas of residential housing design, and

b. Related housing changes brought about by change in per capita GNP for the State of Kuwait.

In this study the independent variable was the mean per capita GNP for the State of Kuwait for each five years between interval 1950-1980.

The dependent variable was the type of architecture represented in the design and the construction of the Kuwaiti home. This type of architecture was expressed
numerically, and represented traditional Kuwaiti residential design on an extreme of the numerical scale (63) points, and Western contemporary type residential design at the opposite extreme of the numerical scale (0) points.

The scale is a composite of responses to the questionnaire which were based on an extensive literature search that revealed the following 21 characteristics as features of Islamic architectural design, typical of traditional Kuwaiti homes:

- Accommodation of both nuclear and extended family (Figure 78)
- One floor housing (Figure 79)
- Flat roof (Figure 80)
- Presence of a central courtyard (Figure 81)
- Few or no windows on outside walls (Figure 82)
- Water wells in the courtyard (Figure 83)
- Separate public and family areas (Figure 84)
- Men's reception room with a separate entrance (Figure 85)
- Facades with Arabic appearance (Figure 86)
- Outdoor kitchens (Figure 87)
- Typical Kuwaiti door on the main entrance (Figure 88)
- Walls 4 meters high (Figure 89)
- Rooms 3.6 meters wide (Figure 90)
- Ceilings with rough mangrove poles 8-10 cm. in diameter spaced 15-20 cm. apart (Figure 91)
- Whitewashed exterior and interior walls (Figure 92)
- Waist-high niches set between door openings in men's reception room (Figure 93)
- Earth bricks and layered earth walls (Figure 94)
- Yellow clay tile flooring (Figure 95)
- Yellow clay arches and vaults (Figure 96)
- Entrance halls immediately inside the entrance to the home (Figure 97)
- Masonry stairs to the roof of the house (Figure 98)

Points on the scale between the extremes represent the degree of departure from traditional Arab residential design.

The data for the Residential Design Survey were collected through an interview questionnaire. The questionnaire consisted of three parts. Part one was concerned with general information about the respondents. Part two consisted of twenty-one questions regarding the type of architecture represented in the design and the construction of Kuwaiti homes. The last part of the questionnaire requested that the respondents give examples of houses they had designed over the years including a brief description of the project, house location, design
concept, and client's specified requirements (Appendix C).

Architectural firms registered at the Kuwaiti Engineering Society were contacted by telephone. Appointments were made with firms that were mainly involved in the design of residential structures.

Fifteen firms agreed to participate in the survey. The subjects who answered the questionnaire were architects involved in the design of houses for middle-income Kuwaiti families. Responses to the questionnaire were recorded by the interviewee directly on the questionnaire, except for the residential design section, which was recorded on a separate matrix covering the time periods from 1950s to 1980s (Appendix C).

Statistical analysis for hypothesis testing employed was correlation analysis. The rejection criteria for the null hypothesis was set at 0.05 level of significance.

Initially, all questionnaires were reviewed for completeness and for usability. The numerical ratings for each responding architect was used in the correlation analysis in order to test the null hypothesis formulated for the study. A comparative field research of both traditional and contemporary housing structures in Kuwait was performed for the study. The analysis of the design features characterising both traditional and contemporary housing structures in Kuwait represented the socio-economic change that took place within Kuwait city from the early
1950s until the early 1980s. The comparative field research consisted of:

- Field observations of selected traditional houses still existing in the old part of the city, during which photographs were obtained of the exteriors and interiors of these houses;

- Field observations of selected contemporary houses built in the 1950s through the 1970s, and houses still under construction were obtained to represent the residential architecture of the 1980s;

- Blueprints of houses built from the 1960s through the 1970s supplied by architects as examples of houses they built which most reflected their clients' needs and requirements (See Appendix D).
Chapter IV

FINDINGS OF THE STUDY

This chapter provides an interpretation of the findings obtained by the residential design survey and the comparative field research of both early and contemporary housing structures in Kuwait.

The Residential Design Survey

Data Presentation

Fifteen architects, all registered by the Kuwaiti Engineering Society and in practice in 1983 were interviewed. The following results were obtained from their responses to the Residential Design Questionnaire which was developed for the purpose of this study (Appendix C).

Four architects (36 percent) were Kuwaitis and eleven (64 percent) were non-Kuwaitis of different Arab nationalities. All architects interviewed were graduates of American, European or Arab Universities. Seven respondents (47 percent) had a Masters Degree in Architecture and one had a Doctor of Philosophy Degree in both Architecture and Planning. The respondents were all males whose ages ranged from 35 to 51 years of age (Table 1).
Table 1
Demographic Information: Architects interviewed for the Residential Design Survey

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sex:</strong></td>
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<td></td>
</tr>
<tr>
<td>Male</td>
<td>15</td>
<td>100</td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Nationality:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kuwaiti</td>
<td>4</td>
<td>36</td>
</tr>
<tr>
<td>Non-Kuwaiti</td>
<td>11</td>
<td>64</td>
</tr>
<tr>
<td><strong>Education:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bachelor's degree</td>
<td>7</td>
<td>47</td>
</tr>
<tr>
<td>Master's degree</td>
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<td>6</td>
</tr>
<tr>
<td><strong>Age:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>35-40</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>41-45</td>
<td>6</td>
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<td>46-50</td>
<td>5</td>
<td>34</td>
</tr>
<tr>
<td>50+</td>
<td>1</td>
<td>6</td>
</tr>
</tbody>
</table>
Architects responded differently when they were asked whether they have preferred any particular style in their architectural practices. The styles indicated were Western, Traditional Arab or Other. The responses were as follows:

1. Traditional Arab
2. Other Modern
3. All designs
4. Modern arabesque
5. No specialization
6. Traditional Arab
7. Western
8. Modified Islamic style
9. Western
10. Western and Traditional Arab
11. Western and Traditional Arab
12. Good architecture
13. Western
14. Western
15. Western and Traditional Arab

The majority of the respondents indicated that they specialized in Western style architecture. Three (20 percent) of the respondents indicated that Traditional Arab or modified Traditional Arab, which combined Western and Traditional Arab, as the style they preferred. Two (13 percent) of the respondents preferred Traditional Arab architecture.

Data analysis revealed that none of the architects who responded to the Residential Design Survey were in practice in Kuwait during the time period 1950-1954, and only two (13 percent) of the respondents indicated that they had started their practice in Kuwait in the time period 1955-1959. In the following time periods from 1960-1969,
eight (53 percent) of the architects indicated that they had started their practice in Kuwait. Five (33 percent) of the architects started their practice in Kuwait between the time period 1970-1979; therefore, they could not respond to the late 1960s time period. Three (20 percent) of the architects did not respond to the early 1970s time period. This has made statistical analysis of these data impossible.

Many of the features of traditional Kuwaiti architecture were present in current residential design from the mid 1960s to late 1970s. More than half of the architects indicated that they frequently designed houses to accommodate the extended family, whereas five (32 percent) indicated that they seldom or never included this design feature (Table 2).

All of the architects indicated that they always or frequently designed houses with multiple floors by the late 1970s (Table 3).

All of the architects indicated they always or frequently designed houses with flat roofs from the early 1970s (Table 4).

The majority of the respondents indicated that the traditional practice of providing a separate men's reception room, Diwaniyyah with a separate entrance continued to be a common feature by the late 1970s. Eleven (73 percent) of the architects frequently or always
Table 2
Response to Q. 1 of the Residential Design Survey
Q.1: Do the houses you design accommodate extended family?

<table>
<thead>
<tr>
<th>Response</th>
<th>Time Periods</th>
<th>( T_1 ) (65-69)</th>
<th>( T_2 ) (70-74)</th>
<th>( T_3 ) (75-79)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Always</td>
<td>2</td>
<td>13</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>Frequently</td>
<td>6</td>
<td>40</td>
<td>6</td>
<td>40</td>
</tr>
<tr>
<td>Seldom</td>
<td>1</td>
<td>7</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>Never</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>No Response</td>
<td>6</td>
<td>40</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100</td>
<td>15</td>
<td>100</td>
</tr>
</tbody>
</table>
Table 3
Response to Q. 2 of the Residential Design Survey
Q.2: Do the houses you design have multiple floors?

<table>
<thead>
<tr>
<th>Response</th>
<th>Time Periods</th>
<th>T1 (65-69)</th>
<th>T2 (70-74)</th>
<th>T3 (75-79)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Always</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>40</td>
</tr>
<tr>
<td>Frequently</td>
<td>9</td>
<td>60</td>
<td>7</td>
<td>47</td>
</tr>
<tr>
<td>Seldom</td>
<td>1</td>
<td>7</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Never</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No Response</td>
<td>5</td>
<td>33</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100</td>
<td>15</td>
<td>101*</td>
</tr>
</tbody>
</table>

* Percentages may be slightly under or exceed 100 percent due to rounding.
Table 4
Response to Q. 3 of the Residential Design Survey
Q.3: Do the houses you design have flat roofs?

<table>
<thead>
<tr>
<th>Response</th>
<th>T1 (65-69)</th>
<th>T2 (70-74)</th>
<th>T3 (75-79)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Always</td>
<td>5</td>
<td>33</td>
<td>6</td>
</tr>
<tr>
<td>Frequently</td>
<td>5</td>
<td>33</td>
<td>8</td>
</tr>
<tr>
<td>Seldom</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Never</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No Response</td>
<td>5</td>
<td>33</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>99</td>
<td>15</td>
</tr>
</tbody>
</table>
included this feature (Table 5).

The respondents indicated that provision of separate public and family areas followed traditional practices. Thirteen (87 percent) of the architects indicated that they designed houses with separate public and family areas (Table 6).

Some features of traditional Kuwaiti houses were found in almost half of the houses designed by these respondents. These features included the outdoor kitchen, entrance halls or dihlis, Arabic appearing facade of houses and whitewashed exterior and interior walls.

Eight (53 percent) of the architects always or frequently included outdoor kitchen. Six (40 percent) of the architects frequently designed houses with an Arabic appearance. Eight (53 percent) seldom or never designed houses with this facade (Table 7).

Seven (46 percent) of the architects always or frequently designed houses with entrance halls dihlis immediately inside the entrance. An equal number of architects seldom or never designed homes with this feature (Table 8).

Six (40 percent) of the architects indicated that they designed houses that present an Arabic appearance, but eight (53 percent) indicated that they seldom or never designed facades in this manner (Table 9).

Six (40 percent) of the architects specified
Table 5
Response to Q. 8 of the Residential Design Survey
Q.8: Do the houses you design provide for separate men's reception room diwaniyyah with a separate entrance?

<table>
<thead>
<tr>
<th>Response</th>
<th>Time Periods</th>
<th>T₁ (65-69)</th>
<th>T₂ (70-74)</th>
<th>T₃ (75-79)</th>
</tr>
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<tbody>
<tr>
<td></td>
<td>N  %</td>
<td>N  %</td>
<td>N  %</td>
<td></td>
</tr>
<tr>
<td>Always</td>
<td>4  27</td>
<td>5  33</td>
<td>5  33</td>
<td></td>
</tr>
<tr>
<td>Frequently</td>
<td>4  27</td>
<td>4  27</td>
<td>6  40</td>
<td></td>
</tr>
<tr>
<td>Seldom</td>
<td>1  7</td>
<td>4  27</td>
<td>4  27</td>
<td></td>
</tr>
<tr>
<td>Never</td>
<td>0  0</td>
<td>0  0</td>
<td>0  0</td>
<td></td>
</tr>
<tr>
<td>No Response</td>
<td>6  40</td>
<td>2  13</td>
<td>0  0</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>15  101</td>
<td>15  100</td>
<td>15  100</td>
<td></td>
</tr>
</tbody>
</table>
Table 6
Response to Q. 7 of the Residential Design Survey
Q.7: Do the houses you design provide for separate public and family areas?

<table>
<thead>
<tr>
<th>Response</th>
<th>Time Periods</th>
<th>T1 (65-69)</th>
<th>T2 (70-74)</th>
<th>T3 (75-79)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Always</td>
<td>3</td>
<td>20</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>Frequently</td>
<td>6</td>
<td>40</td>
<td>6</td>
<td>40</td>
</tr>
<tr>
<td>Seldom</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>7</td>
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<td>0</td>
<td>0</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>No Response</td>
<td>6</td>
<td>40</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>15 100</td>
<td>15 100</td>
<td>15 101</td>
<td></td>
</tr>
</tbody>
</table>
Table 7

Response to Q. 10 of the Residential Design Survey
Q.10: Do the houses you design have an outdoor kitchen?

<table>
<thead>
<tr>
<th>Time Periods</th>
<th>T1 (65-69)</th>
<th>T2 (70-74)</th>
<th>T3 (75-79)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>---------------</td>
<td>-----</td>
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</tr>
<tr>
<td>Always</td>
<td>6</td>
<td>40</td>
<td>7</td>
</tr>
<tr>
<td>Frequently</td>
<td>2</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td>Seldom</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>Never</td>
<td>1</td>
<td>7</td>
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<td>6</td>
<td>40</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>15</td>
<td>100</td>
<td>15</td>
</tr>
</tbody>
</table>
Table 8

Response to Q. 20 of the Residential Design Survey

Q.20: Do the houses you design have entrance hall dihlis immediately inside the entrance?

<table>
<thead>
<tr>
<th>Response</th>
<th>T₁ (65-69)</th>
<th></th>
<th>T₂ (70-74)</th>
<th></th>
<th>T₃ (75-79)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
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<td>Frequently</td>
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<td>40</td>
<td>5</td>
<td>33</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>Seldom</td>
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<td>13</td>
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<td>20</td>
</tr>
<tr>
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<td>27</td>
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<td>99</td>
<td>15</td>
<td>100</td>
</tr>
</tbody>
</table>
Table 9

Response to Q. 9 of the Residential Design Survey

Q.9: Do the facades of the houses you design present an Arabic appearance (arches-decorations-surface materials)?

<table>
<thead>
<tr>
<th>Response</th>
<th>Time Periods</th>
<th>T1 (65-69)</th>
<th>T2 (70-74)</th>
<th>T3 (75-79)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Always</td>
<td>1</td>
<td>7</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Frequently</td>
<td>3</td>
<td>20</td>
<td>6</td>
<td>40</td>
</tr>
<tr>
<td>Seldom</td>
<td>6</td>
<td>40</td>
<td>6</td>
<td>40</td>
</tr>
<tr>
<td>Never</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>No Response</td>
<td>5</td>
<td>33</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100</td>
<td>15</td>
<td>100</td>
</tr>
</tbody>
</table>
whitewashed interior and exterior walls in the houses that they designed, but eight (53 percent) seldom or never specified this feature (Table 10).

Many features of traditional Kuwaiti houses were not specified by architects practicing from the late 1960s to the late 1970s. Some of these were outmoded by equipment such as piped water which eliminated the need for a water well and the courtyard where it had been located.

Other features of traditional Kuwaiti house were replaced with imported materials. Earth bricks and yellow clay were replaced by reinforced concrete, imported stones or marble. Room sizes were no longer limited to the dimensions of mangrove poles when steel beams became available. Other design features such as Kuwaiti doors and niches in the men's reception room did not enhance the Western contemporary architectural designs.

Nine (60 percent) of the architects indicated that they seldom designed houses with central courtyard or courtyards by the late 1970s. Six (40 percent) stated that they always or frequently designed houses with this feature (Table 11).

The respondents indicated a departure from the traditional Arab/Islamic house in the presence of a water well. Twelve (80 percent) of the architects designed houses which seldom or never had a water well. This response would be expected since the water well was
Table 10

Response to Q. 15 of the Residential Design Survey
Q. 15: Are the exterior and interior walls in the houses you design whitewashed?

<table>
<thead>
<tr>
<th>Response</th>
<th>Time Periods</th>
<th>T1 (65-69)</th>
<th>T2 (70-74)</th>
<th>T3 (75-79)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Always</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Frequently</td>
<td>6</td>
<td>40</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>Seldom</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>Never</td>
<td>3</td>
<td>20</td>
<td>5</td>
<td>33</td>
</tr>
<tr>
<td>No Response</td>
<td>6</td>
<td>40</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100</td>
<td>15</td>
<td>99</td>
</tr>
</tbody>
</table>
Table 11

Response to Q. 4 of the Residential Design Survey
Q. 4: Do the houses you design have a central courtyard or courtyards?

<table>
<thead>
<tr>
<th>Time Periods</th>
<th>T1 (65-69)</th>
<th>T2 (70-74)</th>
<th>T3 (75-79)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Always</td>
<td>1</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Frequently</td>
<td>4</td>
<td>27</td>
<td>4</td>
</tr>
<tr>
<td>Seldom</td>
<td>5</td>
<td>33</td>
<td>8</td>
</tr>
<tr>
<td>Never</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>No Response</td>
<td>5</td>
<td>33</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100</td>
<td>15</td>
</tr>
</tbody>
</table>
traditionally located in the courtyard which is seldom included in house design in the late 1970s (Table 12).

The respondents indicated a departure from the traditional Arab/Islamic house in the use of windows. Ten (67 percent) of the architects indicated by their responses that they were designing houses with more windows on the outside walls (Table 13).

All of the architects indicated that they seldom or never constructed walls of the houses they designed with earth bricks or layered earth as early as the mid 1960s (Table 14).

Only one architect indicated that he frequently specified the flooring of houses he designed to be yellow clay tiles in the late 1970s. All others seldom or never specified this design feature (Table 15).

Only two (13 percent) of the architects indicated that the arches and vaults in the houses they designed were frequently of yellow clay. All other respondents seldom or never used this material for this design feature (Table 16).

Five (33 percent) of the architects indicated that they always or frequently specified masonry for stairways to the roof in houses that they design. The majority seldom or never specified this material for this purpose (Table 17).

All of the architects who responded indicated that the
Table 12
Response to Q. 6 of the Residential Design Survey
Q.6: Do the courtyards of the houses you design have a water well in them?

<table>
<thead>
<tr>
<th>Response</th>
<th>Time Periods</th>
<th>T1 (65-69)</th>
<th>T2 (70-74)</th>
<th>T3 (75-79)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Always</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Frequently</td>
<td>1</td>
<td>7</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Seldom</td>
<td>4</td>
<td>27</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>Never</td>
<td>5</td>
<td>33</td>
<td>8</td>
<td>53</td>
</tr>
<tr>
<td>No Response</td>
<td>5</td>
<td>33</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100</td>
<td>15</td>
<td>100</td>
</tr>
</tbody>
</table>
Table 13
Response to Q. 5 of the Residential Design Survey
Q. 5: Do the houses you design have few or no windows on outside walls?

<table>
<thead>
<tr>
<th>Response</th>
<th>T1 (65-69)</th>
<th>T2 (70-74)</th>
<th>T3 (75-79)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Always</td>
<td>2</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>Frequently</td>
<td>1</td>
<td>7</td>
<td>2</td>
</tr>
<tr>
<td>Seldom</td>
<td>5</td>
<td>33</td>
<td>7</td>
</tr>
<tr>
<td>Never</td>
<td>2</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td>No Response</td>
<td>5</td>
<td>33</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>99</td>
<td>15</td>
</tr>
</tbody>
</table>
### Table 14

Response to Q. 17 of the Residential Design Survey

Q. 17: Are the walls in the houses you design constructed of earth bricks or layered earth?

<table>
<thead>
<tr>
<th>Response</th>
<th>Time Periods</th>
<th>T₁ (65-69)</th>
<th>T₂ (70-74)</th>
<th>T₃ (75-79)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Always</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Frequently</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Seldom</td>
<td>2</td>
<td>13</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>Never</td>
<td>7</td>
<td>47</td>
<td>10</td>
<td>67</td>
</tr>
<tr>
<td>No Response</td>
<td>6</td>
<td>40</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100</td>
<td>15</td>
<td>100</td>
</tr>
</tbody>
</table>
Table 15

Response to Q. 18 of the Residential Design Survey

Q.18: Is the flooring in the houses you design of yellow clay tiles?

<table>
<thead>
<tr>
<th>Time Periods</th>
<th>Response</th>
<th>( T_1 ) (65-69)</th>
<th>( T_2 ) (70-74)</th>
<th>( T_3 ) (75-79)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Always</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Frequently</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Seldom</td>
<td></td>
<td>3</td>
<td>20</td>
<td>3</td>
</tr>
<tr>
<td>Never</td>
<td></td>
<td>6</td>
<td>40</td>
<td>9</td>
</tr>
<tr>
<td>No Response</td>
<td></td>
<td>6</td>
<td>40</td>
<td>3</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>15</td>
<td>100</td>
<td>15</td>
</tr>
</tbody>
</table>
Table 16
Response to Q. 19 of the Residential Design Survey
Q.19: Are the arches and vaults in the houses you design constructed in yellow clay?

<table>
<thead>
<tr>
<th>Response</th>
<th>T1 (65-69)</th>
<th>T2 (70-74)</th>
<th>T3 (75-79)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Always</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Frequently</td>
<td>1</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>Seldom</td>
<td>3</td>
<td>20</td>
<td>1</td>
</tr>
<tr>
<td>Never</td>
<td>4</td>
<td>27</td>
<td>9</td>
</tr>
<tr>
<td>No Response</td>
<td>7</td>
<td>46</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>15</td>
<td>100</td>
<td>15</td>
</tr>
</tbody>
</table>
Table 17
Response to Q. 21 of the Residential Design Survey
Q.21: Are the stairs to the roof room in the houses you design built of masonry?

<table>
<thead>
<tr>
<th>Response</th>
<th>Time Periods</th>
<th>T1 (65-69)</th>
<th>T2 (70-74)</th>
<th>T3 (75-79)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Always</td>
<td>1</td>
<td>7</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Frequently</td>
<td>3</td>
<td>20</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>Seldom</td>
<td>2</td>
<td>13</td>
<td>2</td>
<td>13</td>
</tr>
<tr>
<td>Never</td>
<td>4</td>
<td>27</td>
<td>8</td>
<td>53</td>
</tr>
<tr>
<td>No Response</td>
<td>5</td>
<td>33</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100</td>
<td>15</td>
<td>100</td>
</tr>
</tbody>
</table>


homes they designed never had ceilings constructed with rough mangrove poles as early as the late 1960s (Table 18).

Only two (13 percent) of the architects indicated that they frequently designed houses with rooms 3.6 m. in width, the majority seldom or never designed rooms with this dimension (Table 19).

Four architects indicated that they frequently designed houses with walls 4 m. high in the early 1970s. The majority of the respondents indicated that they seldom or never designed houses with this dimension from the mid 1960s onward (Table 20).

Only three (20 percent) of the architects indicated that they designed houses with typical Kuwaiti doors on the main entrance. The majority of the respondents indicated that they seldom or never included this design feature (Table 21).

Only one architect indicated that the houses he designed had waist high niches set between the door openings and a similar pattern on the opposite long wall. Twelve (80 percent) indicated that they seldom or never incorporated this design feature (Table 22).

Statistical Analysis

The following hypothesis was tested: No significant relationship exists between per capita GNP and residential architecture design in Kuwait.
Table 18
Response to Q. 14 of the Residential Design Survey
Q.14: Are the ceilings in the houses you design constructed with rough mangrove poles, 8-10cm in diameter spaced 15-20in. apart?

<table>
<thead>
<tr>
<th>Response</th>
<th>Time Periods</th>
<th>T1 (65-69)</th>
<th>T2 (70-74)</th>
<th>T3 (75-79)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Always</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Frequently</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Seldom</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Never</td>
<td>9</td>
<td>60</td>
<td>13</td>
<td>86</td>
</tr>
<tr>
<td>No Response</td>
<td>6</td>
<td>40</td>
<td>2</td>
<td>13</td>
</tr>
</tbody>
</table>

Total        | 15  | 100   | 15  | 99    | 15  | 100   |
Table 21

Response to Q. 11 of the Residential Design Survey
Q.11: Do the houses you design have typical Kuwaiti doors on the main entrance?

<table>
<thead>
<tr>
<th>Response</th>
<th>Time Periods</th>
<th>T₁ (65-69)</th>
<th>T₂ (70-74)</th>
<th>T₃ (75-79)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>Always</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Frequently</td>
<td>1</td>
<td>7</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Seldom</td>
<td>5</td>
<td>33</td>
<td>6</td>
<td>40</td>
</tr>
<tr>
<td>Never</td>
<td>4</td>
<td>27</td>
<td>6</td>
<td>40</td>
</tr>
<tr>
<td>No Response</td>
<td>5</td>
<td>33</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100</td>
<td>15</td>
<td>101</td>
</tr>
</tbody>
</table>
Table 19

Response to Q. 13 of the Residential Design Survey
Q.13: Are the rooms in the houses you design 3.6m. in width?

<table>
<thead>
<tr>
<th>Time Periods</th>
<th>T1 (65-69)</th>
<th>T2 (70-74)</th>
<th>T3 (75-79)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Always</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Frequently</td>
<td>2</td>
<td>13</td>
<td>2</td>
</tr>
<tr>
<td>Seldom</td>
<td>7</td>
<td>47</td>
<td>9</td>
</tr>
<tr>
<td>Never</td>
<td>1</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>No Response</td>
<td>5</td>
<td>33</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>15</td>
<td>100</td>
<td>15</td>
</tr>
</tbody>
</table>
### Table 20

Response to Q. 12 of the Residential Design Survey

Q.12: Are the walls of the houses you design 4m. high?

<table>
<thead>
<tr>
<th>Time Periods</th>
<th>T₁ (65-69)</th>
<th>T₂ (70-74)</th>
<th>T₃ (75-79)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Response</td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Always</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Frequently</td>
<td>2</td>
<td>13</td>
<td>3</td>
</tr>
<tr>
<td>Seldom</td>
<td>3</td>
<td>20</td>
<td>4</td>
</tr>
<tr>
<td>Never</td>
<td>4</td>
<td>27</td>
<td>6</td>
</tr>
<tr>
<td>No Response</td>
<td>6</td>
<td>40</td>
<td>2</td>
</tr>
</tbody>
</table>

Total          | 15 | 100| 15 | 100| 15 | 101|
Table 22

Response to Q. 16 of the Residential Design Survey

Q.16: Do the walls in the men's reception room have waisthigh niches set between the door openings and a similar pattern on the opposite long walls?

<table>
<thead>
<tr>
<th>Response</th>
<th>Time Periods</th>
<th>T₁ (65-69)</th>
<th>T₂ (70-74)</th>
<th>T₃ (75-79)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
</tr>
<tr>
<td>Always</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Frequently</td>
<td>3</td>
<td>20</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>Seldom</td>
<td>2</td>
<td>13</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>Never</td>
<td>4</td>
<td>27</td>
<td>27</td>
<td>6</td>
</tr>
<tr>
<td>No Response</td>
<td>6</td>
<td>40</td>
<td>40</td>
<td>3</td>
</tr>
</tbody>
</table>

Total       | 15           | 100 | 15     | 100 | 15     | 100 |
The instrument used to test the hypothesis was a residential design survey developed for the study which identifies the type of architecture represented in the design and construction of the Kuwaiti home for the past thirty years. The type of architecture is expressed numerically. A scale of 63 points maximum score and a 0 minimum score was based on responses to the 21 questions included on the survey questionnaire. A product-moment correlation coefficient, Pearson r, was computed and then tested for statistical significance. There was no significance; the null hypothesis was accepted. No significant relationship existed between per capita GNP and residential architecture design in Kuwait.

Comparative Field Observations

For this part of the field study, comparative observations of both old and contemporary houses were illustrated with photographs of old and contemporary structures. Old structures, which were photographed, are partly demolished and will be soon demolished completely.

Comparisons were based on the exterior and interior design features, materials used, and method of construction of both old and contemporary structures. A thorough definition of the styles employed in the design of contemporary housing in Kuwait from the early 1950s to the new developments still under construction in the early
Features of traditional architecture in Kuwait were observed in the few structures that are still existing in the old parts of Kuwait city (Figures 59-70).

The contemporary structures selected for photographing represented the architectural styles employed in housing design since the early 1950s. The structures that represent the first stage in the 1950s were located in the housing areas between the first and second ringroad in the Shamiya and Abdulla as-Salem areas. The second stage in the 1960s was represented by structures located in the housing areas between the second and third ringroad in the Shuwaikh and Nuzha areas. The third stage in the 1970s was represented by structures in the areas between the third and fourth ringroad in the Khalidiya and Idailiya areas. Architecture of the 1980s was featured in the housing areas beyond the fifth ring road, i.e., in Bayan and Meshrif areas (Figures 71-98).

While viewing the housing areas in Kuwait city, a feeling of the change in architectural styles used in housing design is evident. These stages of contemporary architecture can be traced along the newly developed housing areas.

Architectural Plans

A total of twelve examples of single family house
plans were provided by the architects. The homes were designed in the 1960s and the 1970s for middle income families. Six of the houses were in the New Brutalism style and the remaining six were in the Post Modern style. The reduced blueprints of these homes may be found in Appendix D.

The first example was designed in the New Brutalism style which included a heavy concrete cornice and numerous Western style windows (1.1 to 1.4). Sections A-A and B-B (1.5 and 1.6) illustrated elevations of interior spaces, stairways, and dimensions. The boundary wall facade and boundary wall plan indicated a rhythm of Islamic patterns which formed the wall (1.7). The ground floor plan (1.8) indicated the presence of the dihlis or entrance hall, a living room, a sitting room, a kitchen, dining room and bathroom. The first floor plan (1.9) included a master bedroom with bathroom, three bedrooms with a shared bathroom, a study, a library and a service kitchen. The roof room of traditional Islamic houses was illustrated in the roof room plan (1.10).

The second example was designed in the New Brutalism style. Broad concrete cornices and numerous large Western style windows were featured on the four facades (2.1-2.4). Sections A-A and B-B elevations (2.5-2.6) indicated space relationships between rooms. The ground floor (2.7) appeared to house the service areas including the servants'
quarters, kitchen, laundry, guest room, sitting room and dining room. The first floor (2.8) included three bedrooms, a wardrobe, two bathrooms and a family room.

The third example (3.1-3.4) illustrated a transitional phase of the New Brutalism which featured a heavy concrete cornice, security glass, aluminum hand rails and a facade of natural stone. The facade illustrated mashrabiiah or window screens at the windows. This building was a duplex which would be built for relatives or extended family. The boundary wall plan (3.5) and elevation presented a New Brutalism appearance. Section A-A and B-B (3.6-3.7) indicated space relationships between rooms. The plans for this duplex were mirror images. The ground floor plan (3.8) included dihlis and diwaniyyah. A living room and study were separated from the public area. A breakfast room, laundry, store room and dining room were adjacent to the kitchen. An interior courtyard with a water well was surrounded by the public rooms. The first floor (3.9) included a master bedroom with a bathroom and dressing room, a storage area, a kitchen service area and family living room which overlooked the interior courtyard. A shared roof room was accessible from each of the family living areas. A plot plan (3.10) indicated the location of this duplex within the block.

The fourth example (4.1) was designed in the New Brutalism style. The facade indicated the presence of
concrete bands above windows and entrances. Windows had a Western appearance. The section plan (4.2) indicated rooms of varying heights. The ground floor plan (4.3) indicated the dihlis, diwaniyyah, and living room overlooking the swimming pool. The kitchen was adjacent to the dining room, breakfast, and laundry area. A study room was detached from the main compound as were the servants' quarters. The first floor plan (4.4) indicated the master bedroom, dressing room and bathroom, two additional bedrooms with a shared bathroom, and a television room.

The fifth example (5.1) was designed in the New Brutalism style. This building is a duplex with a brick facade broken by concrete bands over the doors and windows. The elevation (5.2) indicated space divisions with a raised ceiling in the library. The ground floor plan (5.3) indicated a distinct plan for each unit. Each unit provided a dihlis, a diwaniyyah, and a dining area on the left. A family courtyard separated the two sides of each unit. In the lower unit, the kitchen and store room were located on the right. In the upper unit, a bedroom with a bath and dressing room were located on the right. In each case the servants' quarters were separated from family living quarters and were accessible from a separate entrance. The first floor plan (5.4) of these units was designed with different room arrangements. Each included a library and master bedroom with a dressing area. In
addition, the lower plan included two bedroom units with bathrooms, a storage room, a laundry, and a family room. The upper plan had one large bedroom with a dressing room and a bathroom.

The sixth plan (6.1) was designed in the New Brutalism style with a brick and concrete facade with western style windows. The section (6.2) suggested a change in room height from the first to the second floor. The ground floor (6.3) included a dihlis and a diwaniyyah. The living room, family room and dining room overlooked the pool area. The kitchen was adjacent to the dining room, storage, and utility rooms. Servants' rooms with a bath were located near a kitchen area. The first floor plan included the master bedroom, with a bathroom and dressing area and study. Three other bedrooms were situated near one another and adjacent to the television room.

The seventh example was a duplex built in the Post Modern style. The perspective (7.1) illustrated some traditional characteristics of Islamic architecture including narrow arched windows, domes, slanted walls and roof rooms. The features were combined with larger western style windows and a western style door. The ground floor plan (7.2) indicated a dihlis, diwaniyyah, dining room, and kitchen. A large bedroom and bathroom were also situated on the ground floor. The first floor (7.3) included master bedroom with a bathroom and dressing room. A second
bedroom with a bath, a study and a living room that overlooked the diwaniyyah were also located on the first floor.

The eighth example (8.1-8.4) was designed in the Post Modern style to accommodate an extended family. The facade illustrated the presence of features of historic Islamic architecture. There were arches, mashribiah, and a roof room, an interior court and water well. Sections A-A and B-B (8.5-8.6) indicated a change in room height from floor to floor. The basement floor plan (8.7) accommodated the garage, servants' room, child's room, laundry, store room and interior courtyard with a water well. The ground floor plan (8.8) included a master bedroom with a master bath, two additional bedrooms with a shared bathroom, a dining room and kitchen area which opened onto the interior courtyard. The first floor plan (8.9) showed two master bedrooms with bathrooms and dressing rooms, three bedrooms with shared bathrooms and a terrace. The roof floor plan (8.10) provided for privacy, security and fresh air.

The ninth example (9.1-9.4) was designed in the Post Modern style with arches and Islamic patterns, mashribiah, and a roof room. The facade material included fair face concrete and ceramics. The section plan A-A and B-B (9.5-9.6) illustrated the division of space. The boundary wall facade and plan (9.7) indicated a wrought iron and Jordanian stone fence. The ground floor plan (9.8)
included a living room, dining room and kitchen. Two bedrooms with a shared bath and a family room were also located on the ground floor. The first floor plan (9.9) included four bedrooms, two bathrooms, a family room and a study or library with access to a porch. The second floor plan (9.10) included a bathroom and a laundry.

The tenth example (10.1-10.2) was designed in the Post Modern style. Traditional arches define western windows. Mashribiah and the roof room are traditional house features. The ground floor plan (10.3) included the dihlis, diwaniyyah, and interior courtyard. A living room, dining room, kitchen, a saloon, sauna bath, and servants' rooms were located on the ground floor with the swimming pool. The first floor plan (10.4) included a master bedroom with a bath and dressing room, four bedrooms with shared bathrooms and a living room. The roof room (10.5) provided for an upper terrace that overlooked a terrace below.

The eleventh example (11.1-11.4) was designed in the Post Modern style. Traditional arches framed western style windows. A large roof room provided security and privacy out of doors. Traditional Islamic patterns decorated the East elevation (11.3). Section A-A, B-B, and C-C (11.5-11.6) indicated space divisions. The boundary wall plan and elevation (11.7) had an Arabic appearance. The ground floor plan (11.8) indicated the dihlis provided a
transition space into the diwaniyyah or the living room and dining area. Servants' quarters were located to one side of the plan near the kitchen. A large bedroom and bathroom were also located on the ground floor. The first floor plan (11-9) indicated five bedrooms with shared baths and a family room. The roof floor plan (11.10) indicated a bedroom, bathroom and an open area.

The twelfth example (12.1-12.4) was designed in the Post Modern style. Traditional Islamic architectural features included arches, mashribiah and balconies. The Sections A-A and B-B (12.5-12.6) indicated the division of space. The boundary wall facade and plan (12.7) showed an Arabic appearance. The basement plan (12.8) indicated servants' quarters, storage, a multiple car garage, and utilities. The ground floor plan (12.9) indicated the dihlis, diwaniyyah, living room and dining room, kitchen, maid's room, and a bedroom with a dressing room and bathroom. The first floor plan (12.10) indicated seven bedrooms with shared bathrooms, and a living room. The roof plan (12.11) indicated a utilities room and open space.
CHAPTER V

Summary, Conclusions
And Recommendations

The specific research question which was addressed by this study was stated as follows: Has socio-economic change in Kuwait, as represented by change in per capita GNP, been accompanied by changes in residential architecture resulting in an increase in the proportion of structures of Western design as opposed to traditional Arabic designs?

The null hypothesis for this study was: No significant relationship existed between per capita GNP and residential architecture design in Kuwait.

This study was conducted in two parts. The first part was a sample survey of 15 architects in Kuwait city practicing in the private sector who were mainly involved in residential designs. The second part of the study was a comparative field research of both early and contemporary housing structures in Kuwait.

The survey performed for the study was both descriptive and correlational in that it described the changes which have occurred within the State of Kuwait in residential housing design and related housing changes brought about by change in per capita GNP for the State of Kuwait.

The following null hypothesis was tested: no
significant relationship existed between per capita GNP and residential architecture design in Kuwait.

The instrument used to test the hypothesis was a residential design survey developed for the study which identified the type of architecture represented in the design and construction of the Kuwaiti home for the past thirty years. The type of architecture was expressed numerically. A scale of 63 points maximum score and a zero minimum score was based on responses to the 21 questions included on the survey questionnaire. A product-moment correlation coefficient, Pearson r, was computed and then tested for statistical significance. The null hypothesis was accepted: no significant relationship existed between per capita GNP and residential architecture design in Kuwait.

A comparative field research of both early and contemporary housing structures in Kuwait was performed for the study. This consisted of field observations of selected houses during which photographs were obtained. Architectural features representing the traditional architecture of Kuwait were illustrated. Styles employed in the design of contemporary residential structures during the time period from the early 1950s to the early 1980s were featured. Observations of the design elements incorporated in the creation of both old and contemporary structures were identified. Blueprints of contemporary
housing designs were obtained and reductions were included in Appendix D. The blueprints illustrated the developmental process of interior spaces, plan layouts and client requirements of contemporary homes compared to traditional ones, that were built from 1950 to 1980.

The review of literature surveyed the urban and housing development of Kuwait city which started in 1951 with the preparation of Physical Development Plan by the city-planning firm of Miniprio and Spencely. The review of literature also surveyed the involvement of the Kuwaiti government in implementing the development plans for city growth and the provision of housing for all Kuwaitis.

Social change and housing development were documented as Kuwait changed from an organic community to a developed community as evidenced by physical and social changes that occurred since the early 1950s.

Literature was reviewed in the context of the impact of the built environment on human behavior in which behavior has been seen as the dependent variable and the environment as the independent variable.

The characteristics of the Arab/Islamic cities and houses were identified and became the focus of discussion of architectural features embodied in the design and construction of Kuwaiti traditional houses. The twenty-one characteristics of the Kuwaiti traditional house were presented to the architects in the Residential Design
Survey to determine the presence of these features in housing designs completed from the late 1960s to the late 1970s.

Based on the review of literature of Western modern movements in architecture and the observation of traditional and contemporary residential structures in Kuwait, the following were observed:

The architectural features of contemporary residential structures built in Kuwait during the 1950s illustrated the characteristics of the International style in Western modern architecture. The characteristics of this style were observed in Kuwaiti contemporary structures by the abstract forms produced in reinforced concrete, cubic shapes, large windows and interest in white facades (Figures 71-74).

In the 1960s, the residential structures observed illustrated the characteristics of the New Formalism and New Brutalism styles in modern Western architecture. The characteristics of the New Formalism style were observed in Kuwaiti contemporary structures by the interest in sculptural rather than abstract forms, in articulated rather than unified masses, and in the expressive exposure of individual structural elements (Figure 75). The characteristics of the New Brutalism were observed in Kuwaiti contemporary structures by the tendency towards regularity and asymmetry, the use of rough brick work and
exposed cement (Figures 75-89).

By the 1970s, the residential structures observed expressed the characteristics of the Post-modern style in Western modern architecture. These characteristics were observed in Kuwaiti contemporary architecture by the mixing of various styles and in the borrowing of architectural features from various styles in the design of the structure (Figures 89-98).

Based on the findings of this study, it is apparent that housing features that are associated with the cultural and social life of the people will prevail.

Conclusions

The following conclusions were synthesized from the data collected in the Residential Design Survey, the statistical analysis of these data, and the comparative field observations of both traditional structures built before the oil era and contemporary structures built after the oil era began until early 1980s.

The changes that have occurred in Kuwait in housing design concepts were constrained by climatic conditions and deep-rooted Islamic traditions. The departure in design concepts from traditional Kuwaiti homes was restricted to those areas that improved the environment of the house but not at the expense of relinquishing customs, values and mores. The changes that were introduced in the design concepts were not indigenous to the Kuwaiti culture and
tradition with the result that some of the houses built in the 1950s employing Western modern influences have been demolished.

More than half of the respondents who were architects practicing in Kuwait from the mid 1960s to the 1980s had a tendency to include only five of the twenty-one features of traditional Kuwaiti architecture in the houses that they designed. The features included accommodation for the extended family, the presence of multiple floors, flat roofs, separate public and family areas, and the diwaniyyah. The features were important to the continuity of religious and cultural mores of the people.

Other features were included by only about half of the architects. These features were as follows: outdoor kitchen, Arabic appearance, dihlis and whitewashed walls. The remaining features were almost eliminated from residential architecture in the mid 1960s to the 1980s. These features were primarily associated with materials which were replaced by imported materials and technology. These features were as follows: presence of a courtyard, presence of a water well in the courtyard, narrow windows on outside walls, use of earth bricks in construction, use of yellow clay in flooring, masonry stairways to the roof, mangrove poles in the construction of ceilings, rooms 3.6 m. in width, walls 4 m. high, the use of Kuwaiti traditional door in the main entrance and the presence of a
repeated pattern of niches in walls in the men's reception room.

The plans supported the architects' statements that they designed houses with accommodation for the extended family, multiple floors, flat roofs, separate public and family areas, and the diwaniyyah. Many of these plans featured dihlis and had Arabic features. Interior courtyards were present in some plans and patios or porches were common. Other characteristics of traditional Kuwaiti homes were not observable or apparent on the plans.

Recommendations

Based on the findings, the following are recommended:

1. Careful attention must be given so that the facade and exterior structure of housing in Kuwait remains in harmony with the surrounding environment;

2. Architectural designs suitable for hot climates must be incorporated in building family dwellings in Kuwait;

3. Careful attention must be given when designing modern homes to expand and modify the vernacular Kuwaiti architecture rather than employing imported concepts that do not support the culture;

For further studies, the following are recommended:

1. A study to determine the impact, if any, which change in residential architecture has had on the observance of Arabic traditions, laws and mores within the
Kuwaiti home;

2. A study of other developing countries to determine Western influences in planning and housing.
BIBLIOGRAPHY


APPENDICES
APPENDIX A

Architectural Plans
KEY TO PLANS

1 Entrance Hall (Dihlis)
2 Living Room
3 Sitting Room
4 Men's Reception Room or Oriental Room (Diwaniyyah)
5 Kitchen
6 Service Kitchen
7 Dining Room
8 Family Room
9 Study or Library
10 Master Bedroom
11 Dressing Room
12 Bedroom
13 Bathroom
14 Lavatory
15 Corridor
16 Maid or Servant's Room
17 Storage or Pantry
18 Laundry
19 Utilities
20 Indoor Garden
21 Roof Room
22 Courtyard
23 Water Well
24 Porch or Gallery
25 Balcony
26 Swimming Pool
27 Garage
Plan 1: Popular Houses, No. 101 West A, one floor high, built in different areas on Lot size 500-600 m² by the Ministry of Labor and Social Affairs, 1962.
Plan 2: Limited-income Houses in Badawiyah No. A4, one floor high, Lot size 600 m², built by the Ministry of Labor and Social Affairs, 1966.
Plan 3: Limited-income Houses in Sabahiya, Sample C5, one floor high, Lot size 600 m², built by the Ministry of Labor and Social Affairs, 1967.
Plan 4: Limited-income Houses in Badiwiya area, one floor high, Lot size 600m², built by Ministry of Labor and Social Affairs, 1969.
Plan 5: Limited-income Houses in Sabahiya, Sample No. 204, one floor high, Lot size 600 m², built by the Ministry of Labor and Social Affairs in 1970.
Plan 6: Limited-income Houses in Sabahiya, one floor high, Lot size 600 m², built by the Ministry of Labor and Social Affairs in 1967, 1969 and 1972.
Plan 7: Limited-income Houses in Failaka Island, one floor high, Lot size 600 m², built by the Ministry of Labor and Public Affairs in 1967, 1969 and 1972.
Plan 8: Limited-income Houses in Sabahiyah, Sample No. 202, one-story high, Lot size 600 m², built by the Ministry of Labor and Social Affairs in 1970.
Plan 9: Limited-income Houses in Sabahiya, Sample No. 205, one-story high, Lot size 600 m², built by the Ministry of Labor and Social Affairs in 1970.
Plan 10: Popular Houses in Abdullah seaport, Sample No. 102K, one-story high, Lot size 600 m², built by Savings and Credit Bank in 1974.
APPENDIX B

Pilot Study and Interview
INTERVIEWS WITH ARCHITECTS
IN KUWAIT

NAME : 
AGE : NATIONALITY:
COMPANY:

1. QUALIFICATIONS:
1.1. Where did you get your degree?

________________________________________________________________________

________________________________________________________________________

YEAR:________________

1.2. Can you tell me whether there is any particular style of architecture you specialize in?

________________________________________________________________________

________________________________________________________________________

1.3. Can you briefly describe your experience. (How long in Kuwait, or any other Middle Eastern country?)

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
1.4. Where do you find your inspiration?
(Nature - Tradition - Professional Publications)

2. Design and Concepts for Kuwaiti Residences

2.1. What is your design philosophy when designing residential dwellings in Kuwait?

2.2. What styles do you incorporate in your designs?
(Modern - Classical - Traditional - Islamic)

2.3. In your opinion, what is your design idea of a modern Kuwaiti house?

2.4. What materials do you specify when building the homes
2.5. Can you indicate whether your Kuwaiti clients have definite ideas about what they require in terms of architectural design and layout of their homes?

2.6. Can you please describe what these are?

2.5.2. In your opinion, how does this discussion with your client about his housing needs influence your design work? Do you find the final results satisfying?
2.5.3. In your opinion do the houses which you designed reflect the needs, values, culture of your clients?

Give Examples:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
APPENDIX C

Questionnaire and Matrix
QUESTIONNAIRE

Residential Design Survey

This questionnaire is being administered as a part of a survey designed to collect information related to residential design in the State of Kuwait from 1950 to early 1980's.

Please mark the response for each item of the questionnaire which most closely reflects the facts concerning your design concepts of residential structures that closely represent your clients' requirements during the following specific time periods.

1965-1969
1970-1974
1975-1979

General Information
Name :
Age :
Company :
Nationality:

1. Where did you get your degree(s)? and what year?
   Degree/s ...................... Major .......................
   University ................... Year ....................... 

2. Can you briefly describe your experience in designing
houses?
- In Kuwait

- In Middle East

- In Other Countries ( )

3. Can you tell whether there is any particular style of architecture you specialize in?

Western ...
Traditional Arab ...
Other ...

Residential Design

1. Are the houses you design built to accommodate extended families?

3 Always ...
2 Frequently ...
1 Seldom ...
0 Never ...
2. Do the houses you design have multiple floors?

3 Always ... 
2 Frequently ... 
1 Seldom ... 
0 Never ... 

3. Do the houses you design have flat roofs?

3 Always ... 
2 Frequently ... 
1 Seldom ... 
0 Never ... 

4. Do the houses you design have central courtyards or courtyards?

3 Always ... 
2 Frequently ... 
1 Seldom ... 
0 Never ... 

5. Do the houses you design have few or no windows on outside walls?

3 Always ... 
2 Frequently ... 
1 Seldom ... 
0 Never ...
6. Do the courtyards of the houses you design have a water well in them?

   3  Always  ...  
   2  Frequently  ...  
   1  Seldom  ...  
   0  Never  ...  

7. Do the houses you design provide for separate public and family areas?

   3  Always  ...  
   2  Frequently  ...  
   1  Seldom  ...  
   0  Never  ...  

8. Do the houses you design provide for separate men's reception room (diwaniyyah) with a separate entrance?

   3  Always  ...  
   2  Frequently  ...  
   1  Seldom  ...  
   0  Never  ...  

9. Do the facades of the houses you design present an Arabic appearance (arches - decorations - surface materials)?
3. Always
2. Frequently
1. Seldom
0. Never

10. Do the houses you design have an outdoor kitchen?
3. Always
2. Frequently
1. Seldom
0. Never

11. Do the houses you design have typical Kuwaiti doors on the main entrance?
3. Always
2. Frequently
1. Seldom
0. Never

12. Are the walls of the houses you design 4 m. high?
3. Always
2. Frequently
1. Seldom
0. Never
13. Are the rooms in the houses you design 3.6 m. in width?

3  Always  ...
2  Frequently  ...
1  Seldom  ...
0  Never  ...

14. Are the ceilings in the houses you design constructed with rough mangrove poles, 8-10 cm. in diameter, spaced 15-20 cm. apart?

3  Always  ...
2  Frequently  ...
1  Seldom  ...
0  Never  ...

15. Are the exterior and interior walls in the houses you design whitewashed?

3  Always  ...
2  Frequently  ...
1  Seldom  ...
0  Never  ...

16. Do the walls in the men's reception room have waisthigh niches set between the door openings and a similar pattern of these niches on the opposite long walls?

3  Always  ...
2  Frequently  ...
17. Are the walls in the houses you design constructed of earth bricks or layered earth?

3 Always ... 
2 Frequently ... 
1 Seldom ... 
0 Never ... 

18. Are the flooring in the houses you design of yellow clay tiles?

3 Always ... 
2 Frequently ... 
1 Seldom ... 
0 Never ... 

19. Are the arches and vaults in the houses you design constructed in yellow clay?

3 Always ... 
2 Frequently ... 
1 Seldom ... 
0 Never ... 

20. Do the houses you design have entrance hall (dihlis) immediately inside the entrance
21. Are the stairs to the roof room in the houses you design built of masonry?

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<th>3 Always</th>
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22. Please include examples of houses you designed for Kuwaiti families, that mostly reflected your clients' needs. (Blueprints including perspectives, plans and elevations).

PROJECT (Brief description)

LOCATION
Design Concept

CLIENT'S SPECIFIED REQUIREMENTS (Please List)

1.
2.
3.
4.
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6.
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8.
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SAMPLE MATRIX

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| Never           |                   |                   |                   |

| Question        |                   |                   |                   |
| Always          |                   |                   |                   |
| Frequently      |                   |                   |                   |
| Seldom          |                   |                   |                   |
| Never           |                   |                   |                   |
APPENDIX D

Blueprints
KEY TO PLANS

1 Entrance Hall (Dihlis)
2 Living Room
3 Sitting Room
4 Men's Reception Room or Oriental Room (Diwaniyyah)
5 Kitchen
6 Service Kitchen
7 Dining Room
8 Family Room
9 Study or Library
10 Master Bedroom
11 Dressing Room
12 Bedroom
13 Bathroom
14 Lavatory
15 Corridor
16 Maid or Servant's Room
17 Storage or Pantry
18 Laundry
19 Utilities
20 Indoor Garden
21 Roof Room
22 Courtyard
23 Water Well
24 Porch or Gallery
25 Balcony
26 Swimming Pool
27 Garage
New Brutalism Style
North Elevation
Scale 1/100

1.1
2.1 FRONT ELEVATION New Brutalism Style
Aziz Sultan's Residence
Section

4.2
6.1 New Brutalism Style
Ground Floor Plan
Post Modern Style
North Elevation
Scale 1/100

Fair Face Concrete
Jordanian Stone
Ceramic
West Elevation
Scale 1/100
9.8 Ground Floor Plan
Second Floor Plan
Scale 1/100
Section CC
Scale 1/100

Section BB
Scale 1/100
First Floor Plan
Pedestrian Path
Scale 1/100
Roof Floor Plan
Scale 1/100
East Elevation
Scale 1/100