A VIEW FROM MKALLES, THE SITE OF THE PROJECT
In the background, the compact skyline of Beirut. In the foreground, the semi-rural squatter settlements occupying the site. Notice their vegetable gardens and huts made out of galvanized iron sheets. The site is located approximately 6 kilometers from the center of Beirut.
MODEL OF Mkalles Housing Project and Vicinity  The site slopes from south to north and is bounded on the east side by the deep valley shown in the foreground. The following structures can be identified: Rows of walk-up apartments along the streets, row houses in the center of the blocks, school and the open space of a playground, squatter settlements on the right, existing one story public housing on the left.

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CONTENTS

ACKNOWLEDGEMENTS

Photographs: Nishan Bichajian; cover: Omar Take.
Drawings: Omar Take, Bulent Tokman, Jairo Milan,
Nimish Patel. A parallel development of alternative
proposals (not included) were carried out by members
of the Urban Settlement Design Program: Jairo Milan
(Colombia); Ali Shuaibi (Saudi Arabia); Mohammed
Al-Hussayen (Saudi Arabia); Chakorn Phisuthikul (Thai-
land); Nimish Patel (India); Jan Bazant (Mexico);
Bulent Tokman (Turkey). A lecture on the socio-econ-
omic structure of low income families in Beirut was
given at M.I.T. by Dr. Samir Khalaf, Chairman of the
Department of Sociology at the American University of
Beirut. The following people/officials participated in
the presentations in Beirut, January 1974, and con-
tributed with recommendations: H.E. Dr. Albert Mukheiber,
Minister of State and former Minister of Housing and
Cooperatives; H.E. Dr. Butrus Deeb, Director General
of the Presidential Palace; H.E. Dr. Fuad Bizry,
Advisor to the President for Public Works; Dr. Samuel
Kirkwood, President of the American University of
Beirut; Professor Raymond Ghosn, Dean of the School of
Engineering and Architecture, A.U.B.; Architect Assem
Salaam, Member of the Housing Counsel and Associate
Professor, A.U.B.; Mr. Maruan Mohsen, Ministry of
Housing and Cooperatives; Mr. Omar Tannir, Director
of Cadastre of Mount Lebanon. The following people
offered assistance and advise: H.E. Dr. Butrus Deeb,
H.E. Dr. Carlos Khoury, Mr. Hekmat Khodr, Professor
Raymond Ghosn and Mr. Omar Tannir. The authors are
deeply grateful to the people and institutions men-
tioned here as well as to others who have contributed
to this work.

H.C., R.G., O.T. Beirut/Cambridge, Summer 1974

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Cover: A family from South Lebanon living
in Quarantaine, Beirut.
INTRODUCTION

This is a preliminary design for the development of a residential community in the municipality of Mkalles, in the Beirut Metropolitan Area.

The design is primarily intended as a basis for the preparation of final development plans and working drawings.

The following were the main steps on the design of the project:

- Surveys and identification of dwelling environments in Beirut for the low income groups were completed by Omar Take as part of his graduate work in the program Urban Settlement Design in Developing Countries, School of Architecture and Planning, M.I.T. (Beirut-Cambridge, Fall 1972 - Spring 1973).

- The Mkalles Housing Project was commissioned by H.E. The President of Lebanon, Suleiman Bey Frangie, by presidential decree, through the Ministry of Housing and Cooperatives (Beirut, Summer 1973).

- A preliminary design was prepared by the staff and graduate members of the program U.S.D.D.C. at M.I.T. (Cambridge, Fall 1973). The design was presented to H.E. The Minister of Housing and Cooperatives, Mr. Michel Sassin, as well as to other officials of the Ministry by Omar Take at the American University of Beirut in January 1974. A second presentation was made at the Presidential Palace at the request of H.E. President Frangie in the presence of his advisors. These presentations permitted a review of the project and recommendations by the government officials (see acknowledgements).

- An additional socio-economic spot survey of the families living in the Mkalles area was completed by Omar Take (Beirut, January 1974).
- The design and the model contained in this report were prepared by the staff and graduate members of the program U.S.D.D.C. at M.I.T. (Beirut – Cambridge, Spring 1974). It will be eventually presented in Beirut for review.

The project represents a comprehensive framework for the formulation of housing policies and for the implementation of the physical plan, yet there is still much to be done and the final decisions can only be taken by local people. Further development of the project will be mainly carried out in Beirut.

The Mkalles Housing Project incorporates the following distinct characteristics:

- In LAND SUBDIVISION: provision of "condominium" or "clusters" ownership, with relatively large plots, to maximize private/collective initiative, responsibility, participation and to minimize government costs in implementation, maintenance and operation.

- In HOUSING: provision of dwellings that can be easily expanded to permit flexibility in their use, to absorb growth of the family needs and to minimize initial investment cost by the users and the government.

The Mkalles Housing Project is intended to be used as a pilot project for urban low income housing by the new Ministry of Housing and Cooperatives of Lebanon in addition to being a specific proposal for the development of the Mkalles site.

Horacio Caminos
Reinhard Goethert
Omar Take
Cambridge, Massachusetts
Summer, 1974
BASIC DATA

The Mkalles Housing Project is located in the Beirut Urban Area, 6 km south-east of the city center.

Area of the site: 13.2 hectares

Approximate population: 6860 Lebanese from the low and moderate low income groups

Number of dwelling units: 1248 apartments and houses

Number of small shops: 161 including artisan shops

Supporting facilities: primary school, day care nursery, kindergarten, playground, dispensary/social center, auditorium, movie theater

Approximate density: 520 people/hectare

At the present time part of the site is occupied by a squatter settlement of approximately 500 dwellings and 2500 people (Lebanese and Syrian). The project contemplates the relocation of most of these people.

All costs in U.S. Dollars

1 U.S. Dollar = 2.5 Lebanese Pounds

COST DATA

<table>
<thead>
<tr>
<th>BUILDINGS</th>
<th>NO OF UNITS</th>
<th>BASIC AREAS (m²)</th>
<th>TOTAL AREAS (m²)</th>
<th>BUILDING EXPANSION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dwellings</td>
<td>164</td>
<td>9,348</td>
<td>12,994</td>
<td>-</td>
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<td></td>
<td>178</td>
<td>12,994</td>
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<td>125</td>
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<tr>
<td></td>
<td>100</td>
<td>9,400</td>
<td>78</td>
<td>7,800</td>
</tr>
<tr>
<td></td>
<td></td>
<td>1248</td>
<td>101,072</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>34,633</td>
</tr>
</tbody>
</table>

| Shops     | 64         | 3,648           |                 |                   |
|           | 97         | 7,081           |                 |                   |
|           |            | 161             | 10,729          |                   |

Access Stairs 10,941

APPROXIMATE COST

- Dwellings 101,072m² at $70/m² = $7,075,040
- Shops 10,729m² at $70/m² = $751,030
- Stairs 10,914m² at $70/m² = $765,870
- Land Development/Community Facilities estimated at 1/3 cost of dwellings = $2,863,980

TOTAL $11,455,920

The cost estimate assumes that only basic units will be built. These units are expandable from 101,072m² to an additional area of 34,633m², an increase of 34.2% over the total initial area.
THE SITE

The site of the Mkalles Housing Project has the following characteristics:

LOCATION
- The site is located in the municipality of Mkalles, in the Beirut Urban Area, approximately 6 km south-east of the city center and the centers of employment. The site lies in a residential and industrial area.

APPROACHES/ACCESS
- Main route of approach is the Beit Meri Road which leads to the city center (north-west), to other industrial areas (north) and to the mountains (east). The Beit Meri Road is 300m from the site and accessible through narrow streets.

TRANSPORTATION
- The nearest public bus service is approximately 30 minutes walking distance. Village buses and service taxis offer limited service to the city center along the Beit Meri Road.

SIZE/SHAPE
- Gross area of the site: 13.2 hectares.
- Triangular shape

TOPOGRAPHY/NATURAL FEATURES/SOIL.
- The site overlooks the city of Beirut at an altitude of 125m. The site is irregular with slopes varying from 6% to 60%, with an average slope 12.5%. The site contains a prominent hill. The surface is devoid of vegetation and limited to sandy, rocky surfaces. Soil dumpings covering large portions of the site need to be removed. The soil is composed of clay, sand and gravel, with a deep rocky substrata. Limestone outcroppings are also found in several areas.

BOUNDARIES
- On the east: a deep valley with steep sides provides a natural barrier. On the south and west: existing developments of light industries and vacant land mesh with the site. On the north: a private Greek school and a squatter settlement mesh with the site.

ZONING RESTRICTIONS/REGULATIONS
- The site is zoned for residential and commercial purposes. Allowed ground coverage of the site 50%. Coefficient of land exploitation 1.65. Maximum height of buildings 17m.

EXISTING STRUCTURES
- Part of the site is occupied by a squatter settlement of approximately 500 dwellings and 2500 people (Lebanese and Syrian). A socio-economic spot survey was taken in January 1974 to identify the population.

OTHER FACTORS
- Views: the site enjoys a commanding view of the surroundings. Smoke, odors, dirt: none at the moment. Flooding: site well drained. Hazards: boundaries on east side should be fenced to prevent accidents.

LAND TENURE/LAND COST
- All the land in the site is owned by the government.
- The land is valued at approximately $32/m².

INFRASTRUCTURE/COMMUNITY FACILITIES
- No utilities exist on the site. All utilities are available from the surrounding areas. Limited commercial facilities exist along the Beit Meri Road and small shops are found in the squatter settlement.

The air photograph of the site (opposite page) illustrates some of the characteristics mentioned above.
THE PROJECT

The policies/goals that are proposed for the Mkalles Housing Project are as follows:

PRIMARY USE: RESIDENTIAL COMMUNITY
- The primary use of the site will be a residential community for 6860 people at full development. Public facilities will include: primary school for 1200 children, day-care nurseries, kindergartens, auditorium, playground, dispensary, police station. Facilities developed by the private sector will include: churches, mosques, a souk, artisan shops, movie theater.

TARGET INCOME GROUPS: LEBANESE LOW INCOME
- The development will aim at a community with Lebanese low income groups:

<table>
<thead>
<tr>
<th>PEOPLE PER INCOME GROUPS</th>
<th>TOTAL family annual income</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1200</td>
<td>$2000</td>
</tr>
<tr>
<td>$3200</td>
<td>$4800</td>
</tr>
</tbody>
</table>

From:
Site area 1000 397 1397
Quarantaine 397 1000 1491 2888
Other areas 500 2079 2579
TOTAL 1397 1397 1991 2079 6864

TENURE: CONDOMINIUM OWNERSHIP
- The development will offer condominium ownership with expandable apartments and houses.

INTENSITIES OF LAND USE: MEDIUM DENSITY
- The densities planned for the site range from 300 to 600 people per hectare.

FINANCING GROUPS: PUBLIC WITH LIMITED PRIVATE
- The size of the project and its prototype nature will demand primarily public financing. Private investment will be encouraged as a model for future housing.

CIRCULATION: PREDOMINANTLY PEDESTRIAN
- Pedestrians and vehicles will be mixed in the public streets, but pedestrians will dominate over vehicles. Control of traffic frequency, character and speed are mainly established by the street layout and use.

UTILITIES: CONNECTION TO EXISTING SYSTEMS
- All utility systems will be interconnected into the existing Beirut Urban Area networks.
  - Water: connection into Jal El-Deeb.
  - Sewerage/storm drainage: connection into planned system for Mkalles.
  - Electricity: connection into Beirut Urban Area network.

DEVELOPMENT MODE: INSTANT AND/OR INCREMENTAL
- The primary infrastructure networks (water, sewers, electricity, streets, street lighting) will be initially developed.
- The dwellings, community facilities, and secondary infrastructure will be instant or incrementally developed.

KEY OF PLAN OF PROJECT (opposite page)
A apartments/expandable apartments
H houses/expandable houses
C cluster courts
S primary school
AU auditorium
P playground

Note: shops are located along Souk and Main Streets
PLAN OF PROJECT
CIRCULATION AND COMMERCIAL AREAS  The two main arteries of circulation can be identified: Souk Street (running horizontally) which is bordered by arcades with shops; Main Street (running vertically in the center) which is the main spine of circulation and provides access to most of the apartments, houses, and school, playground and souk.
CORNER SHOPS  View of corner at the south end of the Main Street. Two small squares provide public space for daily gatherings and outdoor commercial activities. The buildings around are from four to five stories high, with shops at ground level and apartments on the floors above.
SCHOOL, PLAYGROUND, AUDITORIUM, DISPENSARY, SOCIAL CENTER  All these facilities shown are grouped in the center of the site over Tal el Mir (The Prince's Hill). The location is dominant, with good views and easily accessible from any point of the community.
CLUSTERS (AHIA') The picture shows a series of lot clusters, each containing a semi-private interior court (SEHAT) bounded by row houses and walk-up apartments. This interior court provides access to the dwellings and is the place for outdoor social activities of the families living in the cluster.
A CLUSTER is composed of:
APARTMENTS/EXPANDABLE APARTMENTS
HOUSES/EXPANDABLE HOUSES
CLUSTER COURTS
(See Land Subdivision page 16)

PUBLIC - streets, walkways
- steep slope areas
SEMI-PUBLIC - school, playground, open areas
recreation, community facilities
PRIVATE/SEMI-PRIVATE - residential, commercial areas

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.192 Ha.</td>
<td>24.0%</td>
</tr>
<tr>
<td></td>
<td>0.533 Ha.</td>
<td>4.0%</td>
</tr>
<tr>
<td></td>
<td>1.852 Ha.</td>
<td>14.0%</td>
</tr>
<tr>
<td></td>
<td>7.623 Ha.</td>
<td>58.0%</td>
</tr>
<tr>
<td><strong>Total Gross Area</strong></td>
<td><strong>13.200 Ha. 100.0%</strong></td>
<td></td>
</tr>
</tbody>
</table>

**PLAN OF LAND USE / SUBDIVISION**
Contours and cluster court elevations are indicated in meters.
LAND SUBDIVISION

The land subdivision proposed for the Mkalles Project is based on the following policies:

Minimization of: public land for circulation and lengths of infrastructure per area served (electricity, water, sewerage networks, street lights, police protection, garbage collection). The results are savings for the government in construction, maintenance and operation.

Maximization of: private (users) responsibility, initiative, participation. The results are social and economic benefits.

These policies lead to a type of land subdivision called "condominiums" or "clusters", where dwellings are grouped around a common court that serves as an access space as well as a semi-private open space. This court is owned in condominium by the owners of the dwellings, which control, share the use and the responsibility for the maintenance of the court.

Condominium is a system of direct ownership of a single unit in a multi-unit structure. The individual owns the unit in much the same manner as if it were a single family dwelling; he holds direct legal title to the unit and a proportionate share of the common areas and the underlying ground.

But most important, clusters (AHIA') and courts (SEHAT) belong to the Lebanese culture; they provide an environment for neighborhood associations and social pro-pinquity; they facilitate outdoor activities under the mild climate of Beirut.

HOUSING

The housing proposed for the Mkalles Project have the following characteristics:

- There are two basic types of dwelling units: walk-up apartments and houses.
- The ground floor of the buildings facing public streets can be alternatively used as dwellings or shops.
- The majority of dwelling units are basic shells that can be internally completed and expanded. The advantage of this system is that it provides flexibility and minimizes the initial investment by the users as well as the total investment by the government.
- The apartment units have a maximum of 8 families sharing the same facilities (stairs, terrace) to facilitate control and responsibility in the use and maintenance.
- Several dwelling options are available to different income groups: apartments, expandable apartments, houses, expandable houses of different areas.
- The type of tenure is condominium ownership in all the dwellings.

In the following pages, further aspects concerning dwellings are illustrated: construction, development, options, incomes, types.
DWELLING CONSTRUCTION

Dwelling design and construction system have the following characteristics:

- Building height: 2 to 5 floors for maximum land utilization within the Building Code restrictions. Main reasons are cost of land, the difficult topography of the site, saving on foundations and most important an adequate population density.

- Reinforced concrete frame construction: columns, bearing walls, beams, floor and roof slabs. The span ranges from 2.20m (stairs) to 6.60m (slabs).

- Minimum number of simple foundations.

- Minimum number of retaining walls. In most of the cases retaining walls and bearing walls are combined.

- Minimum public circulation (streets) and two basic directions for buildings: parallel or perpendicular to contours.

- Maximum cross ventilation and adequate orientation for dwellings.

Foundations: alternatives: a) reinforced concrete footings for columns, retaining walls, bearing walls; b) reinforced concrete slab on grade for partitions.

Retaining walls: reinforced concrete 2.40m, 3.00m high.

Bearing walls: alternatives: a) reinforced concrete, minimum width 20cm; b) concrete blocks 20cm with reinforced concrete columns, poured in block perforations; c) concrete blocks 20cm, with tie beams above.

Non-bearing walls: exterior, 20cm concrete blocks; interior, 10cm concrete blocks.

Floor slabs: alternatives: a) reinforced concrete, houardi block slab poured in situ; b) wood floor in case of expansions.

Roof slabs: reinforced concrete houardi slab poured in situ.

Balcony: same as slabs.

Bathroom: shower, lavatory, arabic water closet, ventilation duct.

Kitchen: sink, ventilation duct.

Stairs: reinforced concrete or wood.

Doors: wood, for entrance, shower, water closet, 1 room.

Windows: casement or sliding windows, wood or wood and metal.

Lightwell covers: translucent corrugated plastic sheets.

Walls/floor finish: exposed concrete floor, exposed walls painted.

Sewage/water: connections, fixtures, reserve water tank on terrace.

Garbage chute: access from each dwelling unit.

Electricity: conduits, outlets.

DWELLING PROGRESSIVE DEVELOPMENT

- First phase includes the basic shell described in construction system. It will be provided by the government and built by contractor.

- Second phase includes some elements added and paid by the owner for occupation of the dwelling: partitions, doors, closets, etc.

- Third phase includes more elements added and paid by the owner for expansion of the dwelling: interior partitions, floors, doors, closets, lightwell cover, interior stairs.
DWELLING OPTIONS

The following table illustrates the different dwelling options available in terms of types, area, number of rooms, capacity for expansion and costs. Unit construction costs, unit land costs are estimated on actual market values.

<table>
<thead>
<tr>
<th>TYPE</th>
<th>AREA (m²)</th>
<th>NO of ROOMS</th>
<th>NO of FLOORS</th>
<th>CONSTRUCTION COST $70/m²</th>
<th>LAND COST (1) $11/m² of const.</th>
<th>LAND COST (2) $8/m² of const.</th>
<th>INFRASTRUCTURE COST @ 1/3 of construction</th>
<th>DWELLING UNIT COST TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>APARTMENT</td>
<td>57M²</td>
<td>2</td>
<td>1</td>
<td>$3,990</td>
<td>$627</td>
<td>$456</td>
<td>$1,330</td>
<td>$6,403</td>
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<tr>
<td>APARTMENT</td>
<td>73M²</td>
<td>3</td>
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<td>$5,110</td>
<td>$803</td>
<td>$584</td>
<td>$1,703</td>
<td>$8,200</td>
</tr>
<tr>
<td>APARTMENT</td>
<td>76M²</td>
<td>3</td>
<td>2</td>
<td>$5,320</td>
<td>$836</td>
<td>$608</td>
<td>$1,773</td>
<td>$8,538</td>
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<tr>
<td>expandable to</td>
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<tr>
<td>APARTMENT</td>
<td>76M²</td>
<td>3</td>
<td>2</td>
<td>$5,320</td>
<td>$836</td>
<td>$608</td>
<td>$1,773</td>
<td>$8,538</td>
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<tr>
<td>expandable to</td>
<td>108M²</td>
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<td>4</td>
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<td>93M²</td>
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<td></td>
</tr>
<tr>
<td>APARTMENT</td>
<td>93M²</td>
<td>3</td>
<td>2</td>
<td>$6,510</td>
<td>$1,023</td>
<td>$744</td>
<td>$2,170</td>
<td>$10,447</td>
</tr>
<tr>
<td>expandable to</td>
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<td>6</td>
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<td></td>
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<tr>
<td>HOUSE</td>
<td>80M²</td>
<td>3</td>
<td>2</td>
<td>$5,600</td>
<td>$880</td>
<td>$640</td>
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<td>5</td>
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<tr>
<td>HOUSE</td>
<td>94M²</td>
<td>4</td>
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<td>$752</td>
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<td>7</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

(1) land cost assigned by government
(2) additional cost to reach market value
DWELLINGS AND INCOMES

The following table illustrates a suggested distribution of the dwelling options among different income groups, their annual family budget and the annual subsidy needed for each dwelling option. Land value and infrastructure are assumed subsidized for all income groups.

<table>
<thead>
<tr>
<th>ANNUAL FAMILY INCOME</th>
<th>$1200</th>
<th>$2000</th>
<th>$3200</th>
<th>$4800</th>
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</thead>
<tbody>
<tr>
<td>BUDGET: Housing</td>
<td>$240</td>
<td>$400</td>
<td>$640</td>
<td>$960</td>
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<tr>
<td>Transportation</td>
<td>$40</td>
<td>$40</td>
<td>$60</td>
<td>$60</td>
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<tr>
<td>Food/Clothing</td>
<td>$658</td>
<td>$1090</td>
<td>$1885</td>
<td>$2740</td>
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<tr>
<td>Health/Education</td>
<td>$100</td>
<td>$100</td>
<td>$200</td>
<td>$400</td>
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<tr>
<td>Utilities</td>
<td>$130</td>
<td>$150</td>
<td>$180</td>
<td>$60</td>
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<tr>
<td>Municipal Tax</td>
<td>$12</td>
<td>$20</td>
<td>$35</td>
<td>$60</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>$20</td>
<td>$200</td>
<td>$200</td>
<td>$400</td>
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<table>
<thead>
<tr>
<th>DWELLING OPTIONS</th>
<th>57M²</th>
<th>73M²</th>
<th>76M²</th>
<th>57M²</th>
<th>73M²</th>
<th>76M²</th>
<th>76M²</th>
<th>93M²</th>
<th>80M²</th>
<th>93M²</th>
<th>80M²</th>
<th>94M²</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACTUAL COST/YR(1):</td>
<td></td>
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<td></td>
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<tr>
<td>20 yr. loan:</td>
<td>$471</td>
<td>$604</td>
<td>$628</td>
<td>$471</td>
<td>$604</td>
<td>$628</td>
<td>$768</td>
<td>$939</td>
<td>$808</td>
<td>$1114</td>
<td>$958</td>
<td>$1126</td>
</tr>
<tr>
<td>15 yr. loan:</td>
<td></td>
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<tr>
<td>12 yr. loan:</td>
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</tbody>
</table>

| TOTAL SUBSIDY        | $231  | $364  | $388  | $71   | $204  | $228  | $128  | $299  | $168  | $154  | $-2   | $166  |
| PER FAMILY PER YEAR  |       |       |       |       |       |       |       |       |       |       |       |       |
| Additional land cost: | $29   | $37   | $39   | $34   | $43   | $45   | $55   | $67   | $58   | $79   | $68   | $80   |
| Infrastructure:       | $85   | $109  | $114  | $97   | $126  | $130  | $158  | $193  | $167  | $230  | $199  | $234  |
| Interest difference(2): | $61   | $79   | $80   | -$    | -$    | -$    | -$    | -$    | -$    | -$    | -$    | -     |

(1) based on 4% government loan
(2) difference between 4% government loan and 2.5% family payment

amounts preceded with (-) can be applied to reduce subsidies by government
**Mkalles Housing Project**

**DWELLING UNIT:** 57m² - 2 ROOMS - 1 FLOOR

- **Type:** APARTMENT
- **Tenure:** OWNERSHIP
- **Land/lot area:** VARIES
- **Development mode:** INSTANT

**76m² - 3 ROOMS - 2 FLOORS**

APARTMENT EXPANDABLE TO 89m², 4 ROOMS

- **Tenure:** OWNERSHIP
- **Development mode:** PROGRESSIVE

*(Ceiling height is 2.20m, limiting a second floor expansion to 2/3 of the first floor area.)*

---

**STRUCTURAL FRAME PLAN**

**BASEMENT PLAN**

**FLOOR PLAN**

**57m² APARTMENT**
76\text{m}^2 \text{ APARTMENT EXPANDABLE TO } 89\text{m}^2 - 4 \text{ ROOMS}
DWELLING UNIT: \(57\text{m}^2\) - 2 ROOMS - 1 FLOOR

- Type: APARTMENT
- Tenure: OWNERSHIP
- Land/lot area: VARIES
- Development mode: INSTANT

(Same as 57m\(^2\) apartment on page 20.)

\(76\text{m}^2\) - 3 ROOMS - 2 FLOORS

- APARTMENT EXPANDABLE TO 108\text{m}^2, 4 ROOMS
- Tenure: OWNERSHIP
- Land/lot area: VARIES
- Development mode: PROGRESSIVE

(Ceiling height is 2.80m, allowing a second floor expansion equal to the first floor area.)

**KEY**

- R room
- K kitchen
- B balcony
- O opening
- (E) expansion

**SCALE:** 1:200

**STRUCTURAL FRAME PLAN**

**BASEMENT PLAN**

**FLOOR PLAN**

\(57\text{m}^2\) APARTMENT

(Same as apartment on page 20.)
76 m² APARTMENT EXPANDABLE TO 108 m² - 4 ROOMS
Mkalles Housing Project

**DWELLING UNIT:** 73 m² - 3 ROOMS - 1 FLOOR
- **Type:** APARTMENT
- **Tenure:** OWNERSHIP
- **Land/lot area:** VARIES
- **Development mode:** INSTANT

**93 m² - 4 ROOMS - 2 FLOORS**
- **APARTMENT EXPANDABLE TO 121 m², 6 ROOMS**
- **OWNERSHIP**
- **VARIES**
- **PROGRESSIVE**

*(Ceiling height is 2.20m, limiting a second floor expansion to 2/3 of the first floor area.)*

**KEY**
- R room
- K kitchen
- B balcony
- O opening
- (E) expansion

**BASEMENT PLAN**

**FLOOR PLAN**

73 m² APARTMENT
93m² APARTMENT EXPANDABLE TO 121m² - 6 ROOMS
MKalles Housing Project

DWELLING UNIT: 73 m² - 3 ROOMS - 1 FLOOR

- Type: APARTMENT (Same as 73 m² apartment on page 24.)
- Tenure: OWNERSHIP
- Land/lot area: VARIES
- Development mode: INSTANT

93 m² - 3 ROOMS - 2 FLOORS

- APARTMENT EXPANDABLE TO 139 m², 6 ROOMS
- OWNERSHIP
- VARIES
- PROGRESSIVE

(Ceiling height is 2.80m, allowing a second floor expansion equal to the first floor area.)

[Diagram of structural frame plan]

[Diagram of basement plan]

[Diagram of floor plan]

73 m² APARTMENT (Same as apartment on page 24.)

[Diagram of floor plan]
93\,m^2\text{APT.}

73\,m^2\text{APT.}

\text{FIRST FLOOR PLAN}

\text{SECOND FLOOR PLAN}

93\,m^2\text{ APARTMENT EXPANDABLE TO 139m^2 - 6 ROOMS}
DWELLING UNIT:  

80m$^2$ - 3 ROOMS - 2 FLOORS  
HOUSE EXPANDABLE TO 123m$^2$, 5 ROOMS  

94m$^2$ - 4 ROOMS - 3 FLOORS  
HOUSE EXPANDABLE TO 172m$^2$, 7 ROOMS  

Tenure:  
OWNERSHIP  

Land/lot area:  
68m$^2$  

Development mode:  
PROGRESSIVE  

(Same house as 80m$^2$, but with one additional floor.)

KEY

R room
K kitchen
B balcony
O opening
(E) expansion

1:200

3.60 5.40 7.20 1.80

4.20

STRUCTURAL FRAME PLAN

80m$^2$ HOUSE EXPANDABLE TO 123m$^2$ - 5 ROOMS

FIRST FLOOR PLAN
DWELLING UNIT: 80 m² - 3 ROOMS - 2 FLOORS

- Type: HOUSE EXPANDABLE TO 123 m², 5 ROOMS
- Tenure: OWNERSHIP
- Land/lot area: 68 m²
- Development mode: PROGRESSIVE

94 m² - 4 ROOMS - 3 FLOORS

- Type: HOUSE EXPANDABLE TO 172 m², 7 ROOMS
- Tenure: OWNERSHIP
- Land/lot area: 68 m²
- Development mode: PROGRESSIVE

(Same house as 80 m², but with one additional floor.)

KEY
- R room
- K kitchen
- B balcony
- O opening
- (E) expansion

STRUCTURAL FRAME PLAN

FIRST FLOOR PLAN

80 m² HOUSE EXPANDABLE TO 123 m² - 5 ROOMS
REFERENCES

COMPREHENSIVE PLAN STUDIES FOR THE CITY OF BEIRUT, Executive Board for Major Projects for the City of Beirut, Beirut, 1968.


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