CLUSTER OF COURT HOUSES
for
CAMBRIDGE, MASSACHUSETTS

by

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Submitted in Partial Fulfillment

of the Requirements for the

Degree of Bachelor of Architecture

at the

MASSACHUSETTS INSTITUTE OF TECHNOLOGY

January 1964

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November 18, 1963

To:

Dean Pietro Belluschi
Prof. L. B. Anderson
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Prof. W. H. Brown
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Gentlemen:

In partial fulfillment of the requirements for the degree of Bachelor of Architecture I hereby submit the written portion of my thesis entitled: Cluster of Court Houses for Cambridge, Massachusetts.

Sincerely,

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Abstract

The purposes of this thesis are:

1. To investigate and determine the needs--social and psychological--of dwellers in a proposed housing cluster in Cambridge, Mass.

2. To plan and design the specific spaces and structures that will meet these essential needs and that could be constructed on the chosen site.

The ever-increasing population problem demands that architects be primarily concerned with urban housing. More investigation and research are needed to add to our knowledge of what a pleasant urban housing environment should be. Social and psychological aspects of housing, often neglected, are as important as physical comfort standards.

A primary essential of mass housing is the provision of private outdoor spaces for each dwelling unit.

GENERAL DISCUSSION OF THE PROBLEMS CONNECTED WITH URBAN HOUSING AND THE ARCHITECT'S ROLE:

The United States Census Bureau estimates that the population of the United States is increasing at the rate of 1,000,000 every 135 days. If that rate continues, the country will have 200,000,000 persons by 1967. Birth rate, death rate, immigration, and emigration combine to give an increase of 7,400 persons a day.[1]

These impressive facts make it imperative that architects be primarily concerned with urban housing. The availability and the quality of dwellings are matters of great importance to our whole society. Stereotyped-quick solutions are not good enough; planning for so-called "low-income" families must be the best that the profession has to offer. For, inevitably, poor present-day "low-cost" housing often proves costly indeed. Inadequate and depressing living conditions will only result in heavy expenditures later--in actual building deterioration, in the costs of juvenile delinquency and crime, and the need on the part of many dwellers in these "new slums" for "welfare" care.

Urban housing in the U. S. today is primarily constructed so that speculators can make high profits. Quick profits are put first and essential human needs are put second. Because of the population increase and resulting housing shortage, the

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[1]The New York Times, July 14, 1963, p. 35.

builders know only too well that they have only to provide barely minimal comfort and convenience to fill their places with renters. Furthermore even in the so-called "high income" housing units there are no clear standards as to what essential human needs in housing are:--renters here pay for false standards laid down by misguided people, and must endure automobile noise and fumes, poor orientation, neighbor-noise, unusable balconies, phony decorative effects, to name a few.

A primary cause of bad housing is that the standards are dictated by clients, and in many cases by the "anonymous client;" that is, in designing the large urban apartment building or housing development, the architects often deal only with investors, speculators--the people who will inhabit the building are nameless, souless statistics. But all too often, even when they are dealing directly with future users of their buildings, architects are reduced to the role of technicians who design (i.e. merely "draw up") what the clients think they want. A situation somewhat akin to a sick man's going to a doctor and saying "I'm ill; give me an aspirin."

It is time architects came to the fore and asserted themselves as professionals. The architect has to take social responsibility upon himself. Difficult, true, for individuals, but not so difficult for architects collectively in their societies. There they should speak out publicly and forcefully for the standards they know are right--yet on the whole they remain

strangely silent. A statement of the 1947 C.I.A.M. group could serve as a guide to professional architectural groups: "We have to work for the creation of a physical environment that will satisfy man's emotional and material needs and stimulate his spiritual growth."[2] In a discussion of the role of the scholar in America, the architect Louis Sullivan voiced an even more eloquent call for dedication which applies equally to his own profession:

> If true scholarship implies the possession and application of the highest type of thought, imagination, and sympathy, his works must so reflect his scholarship as to prove...that it has been applied for the good and enlightenment of all the people, not for the pampering of a class. His works must prove...that he is a citizen, not a lackey, a true exponent of democracy, not a tool of the most insidious form of anarchy...In a democracy there can be but one fundamental test of citizenship, namely: "Are you using such gifts as you possess for or against the people?"[3]

In all other fields of human endeavor research and experimentation are carried out as a matter of course, to test, find and explore new concepts. In architecture, research seldom if ever goes beyond the drawing stage. Vast housing complexes are built with public and private funds, without any attempt at building and testing of prototype units, or any preliminary theoretical and practical research. Research and testing are done on materials and structural elements, but little or none in the spatial

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[2] New Frontiers in Architecture, p. 12.

[3] Quoted by F. O. Matthiessen, American Renaissance, Oxford University Press, 1941, p. xv.

considerations of architecture. Much investigation needs to be done in the housing field to determine what the human-architectural essentials are. For instance, what causes slums? How can housing promote a sense of dignity and well being? How much privacy is needed by families--individuals, and how can people get a sense of community? Can they have the maximum of privacy together with necessary spontaneous social contacts? What particular spaces are needed by old people, by young people, married people, etc.? These and many more questions can only be answered by a vigorous research program carried on by architects. Their experiments and research must be carried through to the actual construction of buildings, for it is only in them that theories can be documented and proven in human terms. Since the architectural schools are the logical places to establish creative leadership in the profession, perhaps they might engage in a series of experimental projects on needed urban housing in their areas. Work at neighboring sites on actual buildings could provide a laboratory situation that will stimulate imaginations and contribute much needed information on urban problems. This sort of learning situation is provided in most of the other departments of any important university as a matter of course. Students, teachers and society will benefit by research and practical experimentations concerned only with creating a good human environment, unhampered by prejudiced, conventional thinking, by the profit motive, politics, high land

costs, and all the other "normal" factors that cause most housing projects to deteriorate into shopping centers, dormitory cells, or something that merely tries to "look good on the skyline"--in fact anything but an attempt to create a beautiful and satisfying environment for the people who will live there.

Small experimental housing clusters that are designed, built and lived in under controlled conditions will not only contribute much to the architectural knowledge needed to improve our environment but will be a valuable part of a student's education. It has been argued that architectural education must consist of practical application and that it should simultaneously interpret design, construction, and economy with its social suppositions. As Walter Gropius stated:

> The book and the drafting board cannot give that invaluable experience gained by trial and error in field and shop. For practical experience is the best medium for guaranteeing a synthesis of all the emotional and intellectual factors in the student's mind; it prevents him from rushing off into "precocious" design not sufficiently weighted down by the know-how of the process of building...Can we afford to disregard the great potential source of promoting creative ability through direct participation in the making of our visible surroundings? Making is certainly not a mere auxiliary to thinking. It is a basic experience indispensible for the unity of purpose within the creative art.[4]

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[4] "In Search of Better Architectural Education", A Decade of Contemporary Architecture, 1954, George Wittebern & Co., N. Y.

SOME ESSENTIAL CONSIDERATIONS IN URBAN-HOUSING DESIGN:

The essentials of housing may be said to fall into two broad categories. One involves fairly clear and easily definable elements such as structure, heat, insulation, sanitation, storage, ventilation, and other mechanical controls that affect human safety and comfort. These will not be discussed here, since they are generally well known and documented, although of course, there are great variations in methods of meeting these needs that will result in a great variety of final designs. The other broad category is not so easily defined and analysed. It relates more to the social, psychological and poetic side of man. We have relatively little concrete knowledge about ways in which architecture shapes and influences this side of man's nature.

Economy, although it has to be carefully considered, should not interfere with a recognition of what I have called the essentials. The habit of labelling housing units by the income of the renters--such as "apartments for moderate incomes"--or "low incomes" implies, and in fact results in different standards for families with different incomes. The same basic needs for space, privacy, light, beauty, and similar "intangibles" are felt by both rich and poor human beings, just as they need to breathe the same air. There should be no compromise with these essentials. It is not enough to provide housing that people

can merely exist in.

> Each man has the right to be in contact with that phenomenon called total life and it is through constructed volume that it may be attained.[5]

The following are essentials which must be considered:

1. PRIVATE OUTDOOR SPACES

Man has a fundamental relationship with nature. He wants to experience sunlight, sky, leaves, trees, grass, stones and the changing seasons. He needs the therapeutic benefits provided by sunlight, air and plants. Therefore it is necessary in urban housing to create an environment that fulfills these needs as much as possible.

It is especially important in the city that private outdoor spaces be provided for families--spaces in which they can have the right of self expression without intruding on others. Their outdoor space is traditionally found around the house in residential areas of low density, but in relatively higher densities it can best be made a part of the internal functions of the dwelling unit—in effect an outdoor room that could be the living core of the house because of its multiple functions. It can be used for dining, conversation, sunbathing, gardening, children's play, and a source of light and natural beauty.

A primary requirement for this outdoor room is that it should be sunlit, for unless it is warm it is useless. It

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[5]Aldo Van Eych, Architectural Design, Dec. 1962, p. 564.

should also be private, and screened from traffic and other intrusive sounds. In a climate such as New England's it should be sheltered from the wind during the cold months and have openings for breezes during the warm months.

For many years it has been fairly common to provide private outdoor spaces in urban housing by using courts on the ground and balcony-terraces above the first story. Now terraces serve to provide a "view" (good, bad or indifferent), but a little thoughtful analysis will suggest that they provide few or none of the other benefits discussed above. They offer little privacy and no shelter from the elements. Further thought on the problem suggests that there is really no structural reason to prevent small courts with high, sheltering walls from being used with dwelling units that are above the ground floor. The view may be cut off (not entirely, for in many cases windows could be provided in the walls) but the benefits gained far offset this deficiency.

2. TRANSITIONAL SPACES

Transitional spaces are those important, but often neglected spaces between major spaces. They form psychological as well as physical links. Thus, as one progresses from the city center to a residential block, from the residential block to the dwelling unit, one should be able to relate these spaces and their functions to each other in a way that provides a sense of identity and of community.

Man is involved in a paradox, the conflict between the need for privacy and the need for social contact, a sense of community. Both these needs must be translated into spatial terms, not radically separated but rather, related to each other. Transitional space can provide the necessary links.

The approaches and entrances to dwelling units form the occupants' links with society. These approaches and entrances can be planned to act as subtle inter-social stimulants. It should be easy and natural to meet one's neighbors--to exchange pleasantries--to form friendships. A statement of Aldo Van Eyck's may effectively sum up this brief consideration of Transitional Spaces.

> We must break away from the contemporary concept of spatial continuity and the tendency to erase every articulation between spaces, i.e. between outside and inside, between one space and another. Instead the transition must be articulated by means of defined inbetween places which induce simultaneous awareness of what is significant on either side.[6]

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[6] Dutch Forum on Children's Home, A. Van Eyck, Architectural Design, p. 602, 1962.

3. SOCIAL PATTERNS

When housing units are being designed the people who will occupy these units are too often thought of in terms of statistics--so many children, so many bedrooms. Perhaps it is understandable for planners to shy away from the social aspects of design--this is a tremendously complicated and little-understood matter. But it is a fact that the orientation and quality of dwelling units exert an enormous social influence on the lives of their occupiers, an influence that affects the whole fabric of our society. Society consists of a network of human relations, proper planning can strengthen and direct those relationships.

One frequent error of the planner is to think of families and groups of families as forming a static social structure, when in reality this social pattern is constantly changing and shifting, as individuals advance in age and as their habits and personal relationships change. "The population does not consist of so many bachelors, so many childless couples, so many families, so many old people, as the statisticians would have us believe. It consists of individuals moving progressively through these phases."[7] Housing clusters and dwelling units must be designed with these changing phases in mind. A variety of units and spaces within one cluster can help. Perhaps changeable spaces within dwelling units could be provided for by removing or adding walls so that varying degrees of privacy and social contact can be maintained.

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[7] Rattray Taylor, "The Social Basis of Town Planning," Architects Year Book #8, p. 30.

When uniform housing design provides only for parents and their children to live together, grandparents, spinster aunts, etc. are excluded. The old become unwanted and bored; the children are deprived of a possibly richer social experience that could be gained from a larger family group such as one finds in other societies. More variety and flexibility in housing design would allow for this kind of family expansion.

It is possible that the present-day desire of many people to escape into total privacy is a neurotic symptom. This attitude might change when people experience life in a fully developed group, and appreciate mutual social obligations. As the dwelling unit is the frame for the basic family group, a larger frame must be provided for the social grouping next in order above the family—that of groups of 20 to 50 families. The housing cluster should have a social structure similar to a village in that there should be a variety of units that would allow freedom of choice and a heterogeneous grouping of different family types. Entrance ways and internal passageways should be considered as more than a means of access to one's door. They can be planned to serve naturally in promoting social contacts and neighborly relations. It should not be possible to live in ignorance of one's neighbors for years. Shared experiences and personal relationships are the basis for community spirit. Commonly used exterior spaces linked with analogous interior spaces can help bring a sense of unity

to the inhabitants of neighboring dwellings.

Perhaps great strides will be made toward curing modern maladies such as prejudice, juvenile delinquency, alcoholism, etc., if planners face up to the necessarily elaborate structure of society and provide special meeting places in housing clusters for infants, children, adolescents, married couples and the aged, grouping their facilities in a pattern that will foster optimum social interplay among these groups. Much research and study needs to be done on this aspect of housing design.

4. COMMON OUTDOOR SPACES

It is essential that outdoor spaces be provided for strolling, playing, sitting, for all age groups. They must be easily accessible, and not intrude on each other, yet not foster a complete separation of age groups and activities. For instance, small sitting spaces for adults should be located in quiet areas, perhaps some of them reachable only by means of pleasantly secluded walkways, while others could overlook play areas for young children.

5. PRIVATE OUTDOOR SPACES

It is necessary that enough space be allocated so that members of a single family can have some privacy for play, study, etc. away from other members of the family, and that circulation be planned to maintain this privacy. In addition, as has been

suggested, each family should have some attractive private out door space, such as a courtyard or terrace not overlooked by neighboring families.

6. COMMON INDOOR SPACES

In clusters of 75 or more units (this figure is an unknown quantity and can vary widely) some common indoor social areas should be provided--playrooms for younger and older children, social rooms for other age groups (teenagers, married couples, the elderly) and possibly some indoor spaces that can be shared by any or all of these, or altered for different uses.

7. SEPARATION OF PEDESTRIAN SPACES FROM ROADWAYS AND PARKING AREAS

The machine is really alien to man's nature and is, or should be, only a device to serve him. When machines intrude upon such natural and simple acts as walking and conversation they become intolerable. In the city and town, it is essential that the needs of the pedestrian be put before the needs of the automobile. All outdoor spaces used by pedestrians--whether for recreation or in business, shopping, church and school areas (if these exist within the housing cluster)--should be free of motor traffic.

8. HOUSING DESIGN GUIDES

The following two lists could be used as a guide in the designing of any urban housing cluster.

List A[8] - Basic Requirements:

1. Efficient parking for owners and visitors; adequate maneuver space.

2. Temporary space for service and delivery vehicles.

3. Reception point to group. Sheltered delivery and waiting. Provision for information; mail, parcel, and delivery boxes; and storage of parcel carts.

4. Provision of space for maintenance and control of public utilities. Telephone, electricity, main water, sewerage, district heating, gas, air conditioning, incinerators.

5. Rest and conversation space. Children's play and supervision.

6. Private entry to dwelling, protected arrival, sheltered standing space, filter against carried dirt.

7. Congenial and ample private meeting space; washing facilities; storage for outdoor clothes and portable and wheeled objects.

8. Filters against smells, viruses, bacteria, dirt. Screens against flying insects, wind-blown dirt, litter, soot, garbage.

9. Stops against crawling and climbing insects, vermin, reptiles, birds, mammals.

10. A one-way view of arriving visitors; a one-way visible access space.

11. Access points that can be securely barred.

12. Separation of children and pets from vehicles.

13. Separation of moving pedestrians from moving vehicles.

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[8] S. Chermayoff and C. Alexander, Community and Privacy, pp. 160-161.

14. Protection of drivers during their transition between fast-moving traffic and pedestrian world.

15. Arrangements to keep access clear of weather interference: overheating, wind, puddles, ice and snow.

16. Fire barriers.

17. Clear boundaries within the semi-private domain. Neighbor to neighbor; tenant to management.

18. Clear boundaries between the semi-private domain and the public domain.

19. Maintenance of adequate illumination, and absence of abrupt contrast.

20. Control at source of noises produced by servicing trucks, cars, and machinery.

21. Control at source of noises generated in the communal domain.

22. Arrangements to protect the dwelling from urban noise.

23. Arrangements to reduce urban background noise in the communal pedestrian domain.

24. Arrangements to protect the dwelling from local noise.

25. Arrangements to protect outdoor spaces from noise generated in nearby outdoor spaces.

26. Provision for unimpeded vehicular access at peak hours.

27. Provision for emergency access and escape, fire, ambulance, reconstruction, and repairs.

28. Pedestrian access from automobile to dwelling involving minimum possible distance and fatigue.

29. Pedestrian circulation without dangerous or confusing discontinuities in level or direction.

30. Safe and pleasant walking and wheeling surfaces.

31. Garbage collection point enclosed to prevent pollution of environment.

32. Efficient organization of service intake and distribution.

33. Partial weather control between automobile and dwelling.

List B - a. The Dwelling:[9]

1. Can it adapt itself to various ways of living? Does it liberate the occupants from old restrictions or straightjacket them into new ones?

2. Are the spaces moulded exactly to fit their purposes? Or are they by-products of structural tidiness or plastic whim? Is the means of construction of the same order as the standard of living envisaged?

3. Is there a decently large open-air sunlit space opening directly from the living area of the house? Is there a place in the open air where a small baby (1 to 3 years old) can be left safely?

4. Can the weather be enjoyed? Is the house insulated against cold weather, yet made to easily open up in good weather?

5. Are there extentions of the dwelling (garden, patio, etc.) appreciated from inside?

6. Does it take account of the 3-5 year olds' play?

7. Is it easy to maintain (keep fresh looking with just a cleaning down)?

8. Is there a place for the belongings or special tasks peculiar to the class of the occupants--skis, camping gear, mending motorbikes, etc.?

9. Is there enough storage? (There is never enough storage.)

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[9] Criteria for Mass Housing in New Frontiers in Architecture, 1959, p. 79.

10. Can the dwellings be put together in such a way as to contribute something to each other?

11. Is the house as comfortable as a car of the same year?

12. Is the technology suitable to house construction: does it take account of electrict runs and do without traditional "style-left-overs", such as door frames?

b. The immediate extensions of the dwelling:

1. Has the relationship between the dwelling and its means of access been chosen for some good reason?

2. Does the reason include 3-5 year olds' play, if not, where do they play?

3. Does the idea for dwelling produce a clear external image?

4. Can these images add up to a composite one and is this composite image socially valid?

5. Are the extensions of the dwelling--gardens, patios, balconies, streets, access galleries, staircases, etc., sensible in relation to the physical environment of the dwelling and the activities of the occupants?

6. Are the gardens and streets (or their equivalents) necessary to the life of the occupants?

7. Is the delivery and collection antiquated and laborious?

8. Is it a labour to go out or to return home?

9. Does the public vertical circulation really work? Is there any indication that where people have been put up into the air that it is really getting them somewhere?

SITE:

The site chosen for this thesis is a topographically flat area of 1.88 acres, located in the south-central part of Cambridge, Mass. and bounded by Putnam Ave., Allston St. and Pleasant St.; see Fig. 1. It is on the border of a residential district and a district zoned for office buildings. The numbered arrows on the site map (Fig. 1) indicate where the photographs have been taken.

Public transportation by bus is within two minutes walk on the south and two minutes walk on the north. A family can live very comfortably there without owning an automobile. The bus service connects with all other public transportation of the Metropolitan Transit Authority.

There is a general shopping area located on Memorial Drive within a 4 minute walk. Central Square, the location of the civic center and a more varied shopping area is 10 to 15 minutes away by walking.

Public recreation areas are within easy distance. The Charles River bank area and a public swimming pool are reachable by only a 5 minute walk.

The site is in what is known as the "Riverside" area of Cambridge. The area was recently proposed for an urban renewal program, but the residents managed to have this postponed. They feared that renewal would mean removal for them, that the site would probably be razed and high rental units constructed there, as has been the pattern elsewhere. The residents are not transients.

A great many of them have lived in the area all their lives, and a great percentage own their own homes.

An urban renewal program that did not disrupt or change but strengthened the living patterns of the neighborhood would be welcome in Riverside. And this can be achieved through the design and construction of quality housing in small areas--such as this site--and demonstrating to the residents that modern environmental planning can be a factor in helping them live a much better life, not in disrupting their lives.

Joan Colebrook in an article entitled the "Backyards of Academia" discusses the area where this site is located. She insists that it must not be swallowed by the expansion of Harvard, M.I.T. and Boston University, nor remain a sort of back-yard slum. Yet these institutions in the past have demonstrated little concern about the depressed areas that lie so near their ivied walls. This type of isolationism is already too evident throughout our society, yet both the universities and this area in question would benefit by a community program that will raise living standards for the residents already there and perhaps provide added desirable housing for university members.

> And community feeling begets imagination. In real urban renewal, the public buildings we make could become learning constructs, the building itself a community affair (jobless teenagers could serve an apprenticeship on their own housing); the schools could be linked up with the outside world, giving a continuing experience in new skills and professions, in community relations, citizenship and entertainment.

> What is more, with the participation of universities, the low-income Housing Projects, now so choked with uneducated tenants, could benefit by the admittance of eligible married students. And when, as has been promised, Housing Projects cease to be so monumental and hideous (Alas! Chicago and Pittsburgh are planning some so <u>enormous</u> as to make this sentence optimistic) but are scattered in small units through renewal areas, a new image arises, a new hope of living for the poor. The smaller community within the city, allied to a responsive "open"-core city, would set free the psychic energy of the urbanite.[10]

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[10] Joan Colebrook,"Backyards of Academia", <u>The New Republic</u>, June 29, 1963, p. 18.

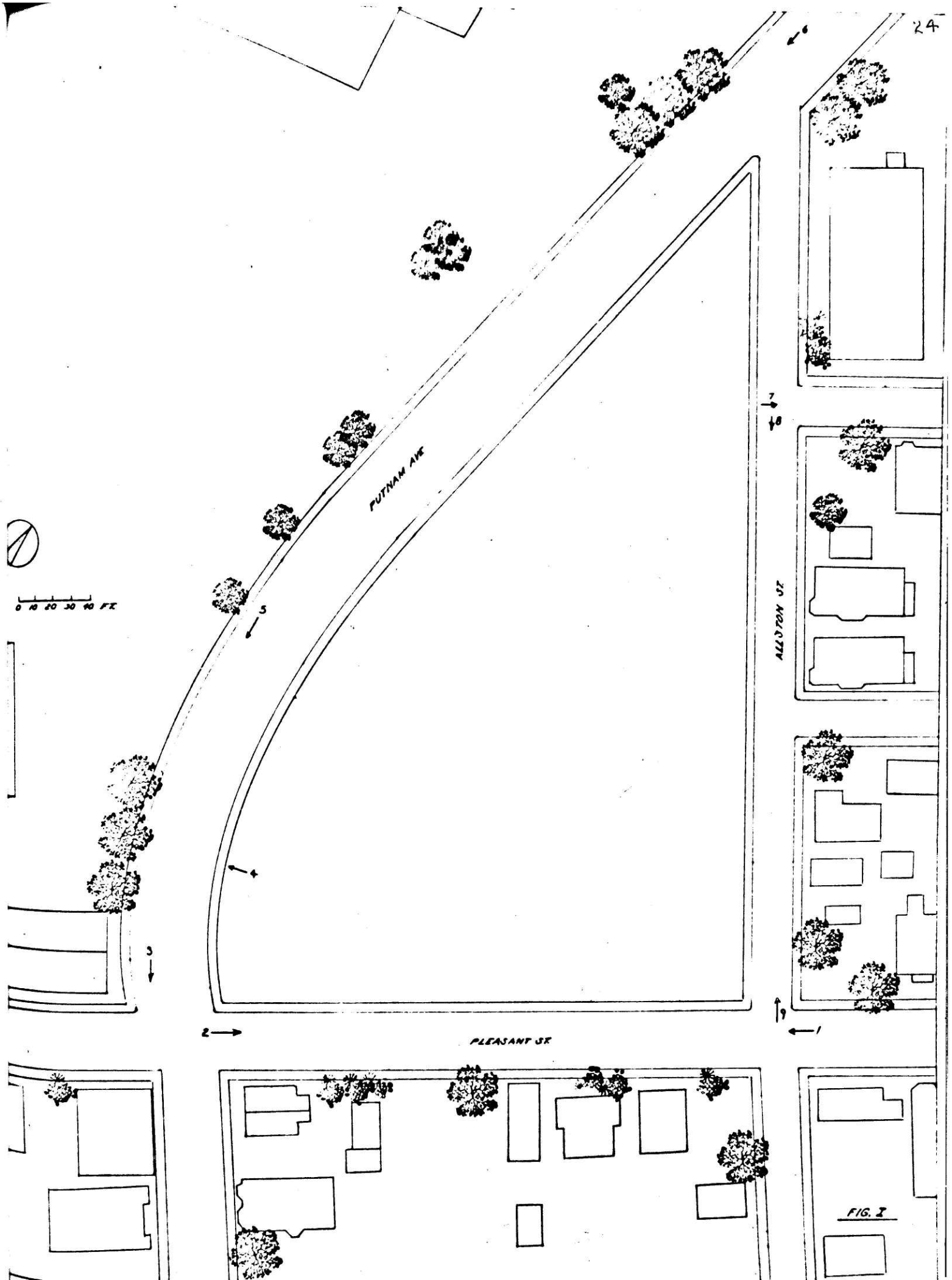

FIG. 2

THE SITE: Numbers refer to arrows on map

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THE SITE: Numbers refer to arrows on map

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THE SITE: Numbers refer to arrows on map

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PROGRAM:

For this thesis it is proposed to design a housing cluster or clusters for the site described with interior and exterior essentials as discussed in the foregoing pages. The spaces, materials and structures should be as economical or modest as possible without sacrificing any of the "essentials." Each dwelling unit will have a private outdoor space oriented towards the sun.

FAMILY TYPES AND SIZES OF DWELLING UNITS:

Families with and without children, plus single people, both young and old, will be living here; therefore the dwelling units will be of various sizes ranging from efficiency units to 4-bedroom units. A majority of the units should have 3 and 4 bedrooms, since fairly large size dwelling units are needed in this area. As a report by the Commission on Hygiene and Housing states:

> Normal, happy, and fruitfull family life is possible without modern plumbing and deep-freeze equipment. It is not possible without a reasonable modicum of space. The sense of inferiority due to living in a substandard home is a far more serious menace to the health of our children than all the unsanitary plumbing in the U. S.[11]

They offer the following chart that may be used as a guide:

1 person	400 sq. ft. req'd.
2	750
3	1000
4	1150
5	1400
6	1550

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[11] Building Types: Apartments. Reference Studies on Design and Planning. p. 124. Editors, Architectural Record, Spring, 1950.

The occupations or professions of the occupants will be varied; there may be students, clerical workers, teachers, engineers or truck drivers. The only common characteristics among them are that they want or need to live in Cambridge and probably earn what are known as moderate incomes.

FLEXIBILITY OF INTERNAL SPACES:

In order to encourage a variety of family types to dwell in the cluster, and to make it economically feasible for those who need them to own large size units, methods of varying the internal spaces should be explored. For instance, a 4-bedroom unit is needed by families with 3 to 5 children; when the children grow up, however, and leave the home, this unit will then be uneconomical for the two remaining parents. If the unit could be efficiently divided into two or one-bedroom units, the parents would be left with more livable space plus some income for their old age from the rental, also a place for the elderly is automatically guaranteed.

SCALE:

The cluster should be in harmony with the structures of the adjoining areas in such a way that the scale remains approximately the same, and the cluster has a rehabilitating effect, instead of a disrupting one on the surrounding neighborhood. The

total over-all height should probably be limited to three stories, since none of the surrounding units are higher, and people can walk up three stories without hardship.

EXTERIOR SPACES AND DENSITY:

It is intended that the overall design will provide for an exterior play area for small children, 2 to 8 years old; a common laundry and small "notions" store should be located near the children's play area. Exterior spaces will be provided for adults to sit or stroll in, and approximately one automobile parking space for each dwelling unit. The maximum density of dwelling units will be sought, within the limitation of 3 stories, and without sacrificing any of the "essentials" discussed above.

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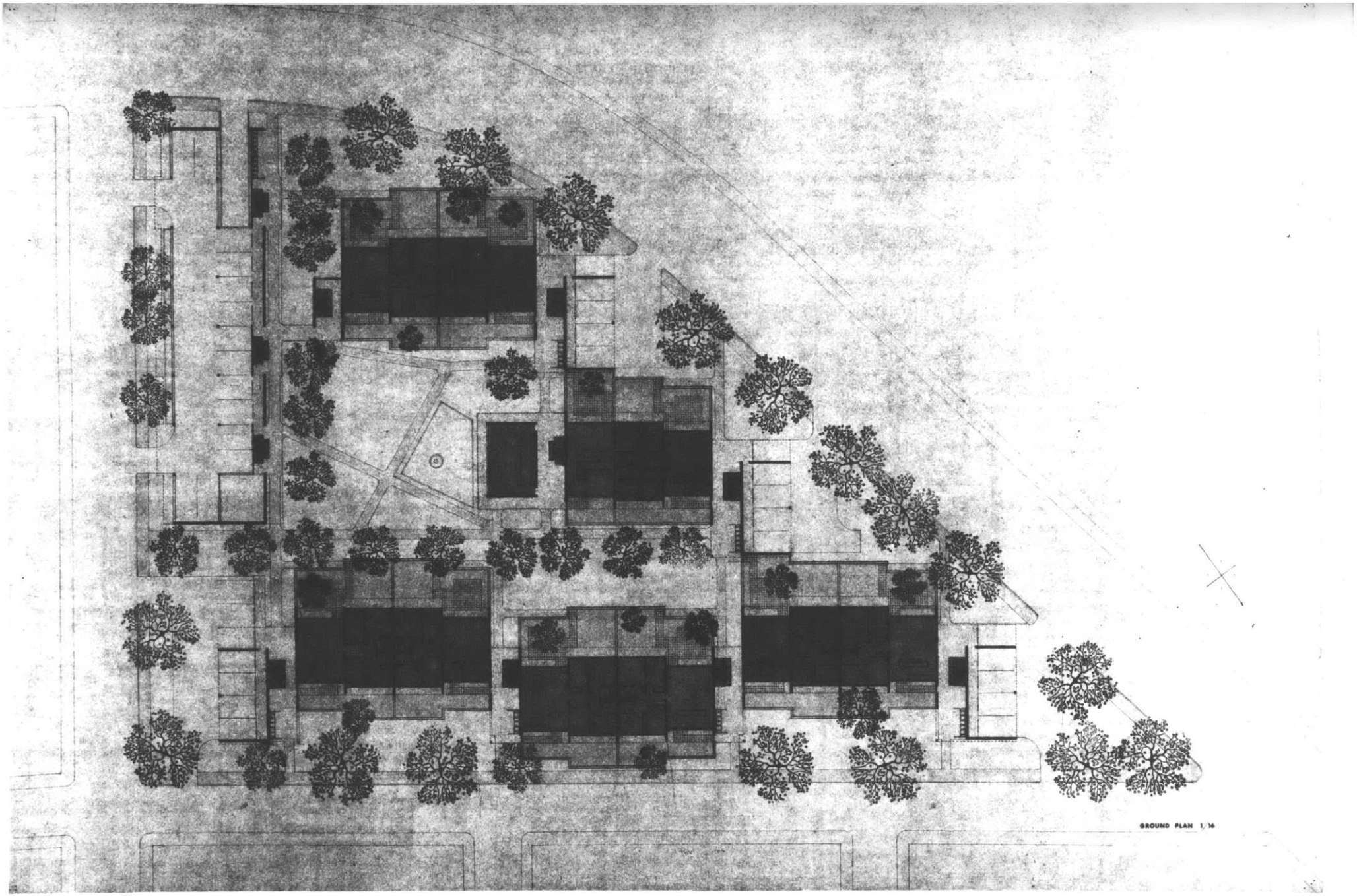

GROUND PLAN 1/16