

AN APARTMENT HOUSE IN WESTGATE-WEST
FOR M.I.T. PERSONNEL

M.I.T.
CAMBRIDGE, MASSACHUSETTS

T H E S I S
B A C H E L O R O F A R C H I T E C T U R E
Massachusetts Institute of Technology

May, 1954

Tsun Wu W. Kwan

May, 1954

Dean Pietro Belluschi
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Dear Sir:

In partial fulfillment for the requirements of the Degree, Bachelor of Architecture, I herewith submit a thesis entitled " AN APARTMENT HOUSE IN WESTGATE-WEST FOR M.I.T. PERSONNEL ".

I take this opportunity to extend my sincere thanks and appreciation to the Faculty and Staff of the Department of Architecture for their aid and guidance during my past four years at M.I.T...

Very respectfully submitted,

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P A R T I

I N T R O D U C T I O N

The administration at M.I.T., after a short period of construction and re-modelling in the past three years, has barely managed to maintain the standard of progress which was planned in regard to Student Housing Development.

Overshadowed by the problem of Student Housing, there is also existent an imminently real problem which has risen as a parallel....that is the problem of adequate housing for faculty residents and certain staff members.

Other than the facts that a very minor fraction of the faculty group has been installed in the capacity of faculty-resident in the M.I.T. Dormitories and that some of the faculty and staff members have obtained residences in the Eastgate Apartments Project, there has been no actual move to establish housing specifically for the faculty and staff members.

It is this need, ever growing, which I propose to offer a sound, functional solution to remedy.

EXIGENCY

At present the faculty group of M.I.T. is spread throughout the Boston area. Home, to these people, is a physical reality in domiciles ranging from a single drab transient room to artfully improvised apartments to tastefully appointed "grass roots" houses.

The most proximate residences are located directly opposite M.I.T. on Massachusetts Avenue. Across the columned sanctum of the main entrance is the Apartment house known as Bexley Hall. The next closest is the Eastgate Apartment Project. The arc gradually swells in a widening circle encompassing residences in Cambridge, Boston, it's suburbs and scattered towns as far away as Worcester, Massachusetts.

For those faculty members who are home owners and are established citizens of their respective communities, accommodations present no special problem. Their time and space in relation to M.I.T. and their professions have been successfully planned and adjusted to a very functional and comfortable degree.

It is not among the forementioned group that difficulty in obtaining suitable dwellings arises. It is mainly among the less established members of the faculty and staff. Generally, this latter group is comprised of Assistant Professors, instructors, research fellows, D.I.C. workers, transient personnel and persons entrusted with responsibilities which obligate them to maintain constant surveillance over certain projects.

It is for these members of the M.I.T. family that this project is proposed.

C A U S A L M O T I V E

The number of graduate students at M.I.T. has been steadily increasing since the termination of World War II and the trend toward increase in graduate students is constantly growing. This trend may well continue in proportion to the years just past as the specialty fields of science and engineering expand.

However, as evidenced by the records contained in the office of the registrar, full time graduate students are a minority. This does not effect their relation to the M.I.T. faculty group, since their remaining time is engaged in instructing, research, or work with industrial firms connected with M.I.T. It must also be noted that most are graduate students on a fellowship basis.

Another unique M.I.T. - Staff relationship is the existence of the Division of Industrial Co-operation. These D.I.C. workers represent a strong bridge between the academic and industrial gap of educational institutions. In addition to an intellectual contribution such as is characteristic of the Graduate Schools, the D.I.C. also provides the M.I.T. organization with a material and financial source of revenue and ground of communication with commerce, industry and the public interests.

With the graduate students and D.I.C., there stand a large number of foreign students engaged in parallel tasks of learning and producing. Included in a similiar category are the visiting lecturers, foreign professors and advisors from varying organizations.

Taken in consideration as a group, such personnel would represent nearly one-half of the "population" of M.I.T.

It can be therefore emphatically stated that with such a proportion of graduates, part-time graduates, research fellows, D.I.C. workers and Faculty members, the welfare of such personnel cannot be ignored or merely treated in a piecemeal manner.

If this group is a minority, it is definitely not of lesser importance than the undergraduates or "official" student body of M.I.T. This un-collegiate phenomenon has existed only since the mid-forties, but nevertheless it has, in regard to suitable housing accommodations, come to the fore as a genuine problem deserving immediate consideration. M.I.T. should not hesitate to remedy this situation until the time when a feasible solution is obsolete from conception.

EXISTING SITUATION

The sole existing accommodation provided expressly for the welfare of the non-student members of the M.I.T. "population" is Bexley Hall.

Bexley Hall, located 46 - 52 Massachusetts Avenue, directly opposite the main entrance to M.I.T., is a structure assembled in the dawning years of this century. This apartment house contains only forty-eight individual units of three variations: studio apartments, one-bedroom apartments, and two-bedroom apartments. The entire edifice has been fully occupied since its purchase by M.I.T. some twenty five years ago. This apartment house has been managed by agents, the R.M. Bradley & Co., Inc.

With this four-story building completely occupied, and it's record of constant full occupancy, and the present waiting list of one-hundred and sixty parties, and the extreme low yearly turn-over rate of only nine apartments, the pressing need for low rental and proximate dwelling units for M.I.T. personnel is painfully and eloquently evident.

The Kresge Auditorium is nearly complete in construction, and the M.I.T. Memorial Chapel is proposed. The site of the proposed Memorial Chapel is directly behind Bexley Hall. With the possible destruction of Bexley Hall in plan, an additional impetus is given toward the development of low-cost, non-profit and convenient housing for M.I.T. Personnel.

B A S I S O F D E S I G N

In consideration of the fact that most of the tenants of a housing project or apartment dwelling group for M.I.T. personnel of the Faculty and Staff category would be the same or closely akin to the general caliber of the occupants of Bexley Hall, Bexley Hall itself is a source of information. The information obtained could be considered a reliable gauge by which to judge the potential occupants of a new M.I.T. apartment dwelling.

At the source of information, an investigation was conducted for the purpose of obtaining general knowledge pertaining to the general characteristics of the occupants as a group, the provisions available at present, and individual "ideals" in regard to the type of small, efficient, and livable apartment desired.

Interviews were obtained from several occupants of Bexley Hall picked at random and from each of the distinct type of units therein. Also interviewed were the manager-agent of Bexley Hall and the assistant superintendent of Bexley Hall.

These informative interviews have resulted in a living, human basis for the design and study of a future apartment dwelling for M.I.T. personnel to replace the presently existing inadequate and barely satisfactory accomodation.

It was finally determined, through such informal interviews with the occupants of Bexley Hall, that while the general backgrounds and spheres of daily activities of each individual person varied to a great degree, there are certain significant factors which are shared in common.

They are in the same financial category in general. They enjoy similar highly cultivated hobbies and pastimes.

They express a desire to continue associations and to broaden their relationships with people on the same sophisticated, intellectual levels.

They display a marked taste creative activity and a style of " contemporary " living.

Appreciation is expressed for their opportunities to be a part of the M.I.T. population and to function as a part of the Institutes program of education and progress.

The occupants of Bexley Hall display a maturity and tolerance which enables to adjust easily to their home environment, neighbors, and general surrounds.

A not too minor factor in common is the short distance to their jobs in M.I.T. and the vibrantly intellectual atmosphere.

In spite of it's limitations and lacks as an ideal dwelling, Bexley Hall is considered by it's occupants to be very good. However, at the same time, it is felt that there is room for improvement and better accomodations are definitely desirable.

DESIGN ANALYSIS

It has been determined through interviews with the occupants of Bexley Hall and the representatives of the R. M. Bradley & Co. that the average number of parties on the waiting list (on a yearly basis since the termination of World War II) numbers approximately one hundred and sixty.

It is also to be noted that the occupants of Bexley Hall, Eastgate and the administrative offices of both dwelling units have indicated (percentagewise) that most desire a studio type of living unit (40%). Next, a two bed room suite (30%) is desired. One bed room (25%) and three bed room (5%) units are also desired respectively.

The large number of visiting lecturers, professors, and transient personnel (those who remain in residence only six months or less) constitute a special problem in temporary accommodations. It is suggested that these visitors and transients be provided with accommodations of the studio type apartments.

The proposed apartment dwelling will therefore consist of 70 Studio apartments (45%), 42 two bed room units (28.5%), 35 one bed room units (23%), and seven three bed room units (4.5%). The extra studio apartments would, as indicated, be used expressly for transient personnel.

In view of the facts that the domestic habits of the occupants of the studio type apartments may differ from the habits of the residents in the non-studio type units, that the presence of children will be expected in the non-studio type, and that the room and space requirements

are not closely similar, this proposed design is divided into two separate but connected sections.

One section will contain the studio type apartments and the other larger section will contain the non-studio type units of one, two and three bedrooms. The two sections are joined on the ground floor by a common entry area and administrative office area.

The relationship of the two sections correspond with the West and North boundaries of the M.I.T. West Campus area. Visually it would be akin to a back-drop, appearing as a high, wall-like structure in contrast with the low level student housing and Briggs Field environs. These sections are designed and placed in order to take advantage of the view of the south and east with the Charles River in the foreground and the Boston skyline beyond. The prevailing summer winds will also be utilized and enjoyed, while the winter draft will be shielded.

P A R K I N G A R E A

After a survey of both Eastgate and Bexley Hall, it is noted that the great majority, or practically all tenants, are automobile owners.

Based on this fact, the proposed apartment dwelling is provided with parking space for at least 95% of the tenants in apartment units, or 151 parking spaces.

Two strips of parking area of paved asphalt are to be located parallel to Vassar Street and Audrey Street. The entrance and exit are both located on Audrey Street. Additional parking space is located on the curb parking spaces existing on Audrey and Vassar Streets. The Audrey Street area is designed to accommodate a total of 74 cars, while the Vassar Street area will have space for 77 cars.

A C O U S T I C S

In an apartment dwelling, the transmission of sounds of living in adjoining apartments is a potential disturbance and undesirable. Sound transmission in an apartment dwelling may arise from sources located in six possible directions; from the four walls, from the floor, and from the ceiling.

In respect to the acoustics problems which may be thus raised, it is suggested that the apartment units be sound-insulated in the following manner.

Neighboring party walls: To be constructed of staggered aluminum channels with lath and plaster on both sides. This light weight type of party wall gives a transmission loss of 50 DB+-.

Interior partitions should be constructed 4" thick, separated with Aluminum channels 16" O.C. with plaster on gypsum lath on both sides. This type gives a transmission loss of 35 DB.

Sound Insulation from floor to floor is provided by 7" concrete slab, surfaced with linoleum tile finish. Beneath the floor slabs, hung plaster ceilings, with 8" of air space between. This air space would be utilized as duct space for heating pipes.

The open corridor construction will serve to eliminate much of the reverberation generally occurring in the case of long corridors. With all the utility areas opening out to the open corridor which faces the parking spaces and business district areas, the main living area is thus free from acoustical disturbances arising from commercial and industrial sources.

The community living and recreation areas or suites on each floor are located at the West End of the wing, separated by the elevator and stairway. These suites are located directly above one another, thus eliminating to a great degree the sounds of convivial recreation which may be disturbing. The community area of the ground floor, which includes the laundry and hobby shop mechanisms which generate considerable noise, is located in the basement and connected by stairway to the main community area of the ground floor.

H E A T I N G A N D V E N T I L A T I O N

It is proposed that the present steam pipe main located beneath Amherst Alley be extended to the site of the apartment. The source of steam will be the M.I.T. central heating plant.

The heating medium will be changed from steam into hot water through the use of hot-water converters in the mechanical maintenance room of the proposed apartment dwelling.

Therefore, the heating system for the structure will be a zoned hot water heating system, with fin tube convectors located at the perimeters of each apartment.

The community rooms, utility rooms, recreation rooms, general store, nursery and all other rooms will be heated in the same system.

Natural ventilation is used throughout the apartments and community rooms, etc.

Exhaust fans will be installed in all kitchens, including the kitchens of all community rooms, snack bar, etc.

S I T E

The desirability of a location proximate to M.I.T. has already been stated. Approximately nine-hundred yards west from the main entrance on 77 Massachusetts Avenue, is situated a tract of land owned by M.I.T. This land is presently used as the site of Westgate West, a temporary housing development for married students. It is also the site of two restaurants and a gasoline station.

It is assumed that since the proposed apartment dwelling is designed primarily to accommodate M.I.T. personnel and the current leases on the forementioned site may possibly be terminated within the near future, this site will be available for my proposed plan.

The site is bounded on the North by Vassar Street, on the West by Audrey Street, on the South by Memorial Drive, and on the East, the western limits of Briggs Field. The final Eastern boundary of this site is determined by the design. The site is in an area zoned as a Business "B" District.

The variation in contour is insignificant and this tract is best described as flat land. The soil condition, according to M.I.T. Building and Power Department, is poor in bearing capacity, but somewhat better than that of the site of Eastgate.

The prevailing wind approaches from the Northwest in the winter months, averaging 11.8 MPH. During the summer months the wind approaches from the Southwest, averaging 12.5 MPH.

Considering the heavy traffic of Memorial Drive, which is also classified as US Route 1, no main entrance is provided for automobiles directly from Memorial Drive. The parking spaces, as indicated, are parallel to Vassar and Audrey Streets, both of which are sufficiently removed from Memorial Drive to avoid undue traffic congestion.

In addition to it's proximity to M.I.T., further advantages are the excellent view of the Charles River and Boston and the spaciousness of the land tract.

S P A C E R E Q U I R E M E N T S

I. Studio Apartments

Work area (Dining and Kitchenette)
Living area (Sleeping and Living)
Bath room
Storage space

I. One Bedroom Apartments

Living/Dining room
Kitchen
One Bedroom
Bathroom
Storage space

I. Two Bedroom Apartments

Living/Dining room
Kitchen
Two Bedrooms
Bathroom
Storage space

I. Three Bedroom Apartments

Living/Dining room
Kitchen
Two Bedrooms
Study/Spare bedroom
Storage space

I. Community Suite: One Community Suite on each floor

Community Room with dining room
Pantry & Kitchen
Storage
Lavatory
Coat Room

I. Utility Room: One on each floor for maintenance

I. Entrance Area: Space provided for bicycles, carriages, shopping carts, etc.

I. Administration Area

Main Control Desk
Managers Office
Mail Processing and Mail Boxes
Maintenance and Workroom
Storage space
Heating and Ventilation equipment space

I. Community Center

- Clubrooms with kitchenette and storage
- General Store with Snack Bar
- Game Room
- Lavatories for men and women
- Darkroom for film processing
- Reading room with book storage
- Music Listening room with storage
- Nursery
- Laundry
- * Machine Tool and Hobby Shop
- Space for coin operated vending machines

- * Both the Laundry and Machine Tool and Hobby Shop are to be well insulated from noise transmission.

GENERAL SPECIFICATIONS

FOUNDATION

Re-inforced concrete footings on concrete piles.

STRUCTURE

7" re-inforced flat slab with 14"x 24"inch re-inforced concrete column supports in 22½' bays with 8' and 6' cantilevers.

EXTERIOR MASONRY WALLS

Brick facing with 4" cinder block backing, interior furred and plastered.

EXTERIOR WALL

Porcelain enameled steel sandwiched panel, 2" insulation with vapor barrier set into metal frame with opening and fixed window sashes and door openings.

INTERIOR PARTITIONS

- a. Party walls: Staggered aluminum channels with plaster on metal lath on both sides. Noise reduction 50 db+-.
- b. Partitions: Aluminum channels 16" OC with plaster on lath both sides.

WINDOWS

Double strength glass, aluminum casement windows.

DOORS

- a. Interior: 1¾" flush doors.
- b. Exterior: Kalamein.

FLOOR FINISH

- a. Interior: Linoleum tile finish.
- b. Exterior: (Balconies) Clay ceramic tile.
Terrace: Clay ceramic tile.

STAIRS

Re-inforced concrete, risers finished with impregnated abrasive compound, tubular handrails.

INCINERATORS

Flue-fed, multiple floor type J3-L, Kernerator, outlets in maintenance rooms.

ROOFING

Four-ply 20 year bond built-up roofing, Celotex insulation with twenty guage metal gravel stops and facias.

BALCONY DRAINS

1" channels imbedded in scuttle portion of balcony floor.

BALCONY GUARDS

Tubular steel frame with wire mesh with detachable dyed canvas sections.

BATHROOMS

Standard plumbing fixtures. Tile floor and base.

HARDWARE

Satin finish chromed hinges, locks, knobs and plates.

ELECTRICAL WORK

As prescribed by NATIONAL ELECTRICIANS CODE.

VERTICAL TRANSPORTATION

Self-Service elevators.

INTERIOR WALL FINISH

Paint: two prime coats, two finish coats.

HEATING

Fin tube convectors with 3" supply risers.

VENTILATION

Exhaust fans for all kitchens. Door vents for utility rooms.

B I B L I O G R A P H Y

LIVING IN FLATS

Ministry of Housing & Local Government
London, 1952

APARTMENT HOUSES

J.H. Abel & F. N. Severud, 1947

CAMBRIDGE BUILDING CODE & ZONING ORDINANCE

City of Cambridge, 1943

CONTEMPORARY STRUCTURE IN ARCHITECTURE

L. Michaels, 1950

SOUND TRANSMISSION IN BUILDINGS

R. Fitzmaurice & W. Allen, 1939

ARCHITECTURAL RECORD

December, 1951; April, 1954

PROGRESSIVE ARCHITECTURE

November, 1952

ARCHITECTURAL FORUM

January and April, 1952

"100 Memorial Drive", (Pamphlet)

New England Mutual Life Insurance Company, 1951