

REHABILITATION FACILITIES FOR THE PHYSICALLY DISABLED:  
PLACES FOR TRANSITIONAL CARE

by

MITCHELL LEWIS GREEN

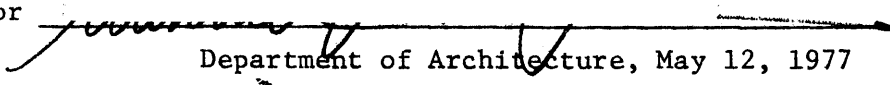
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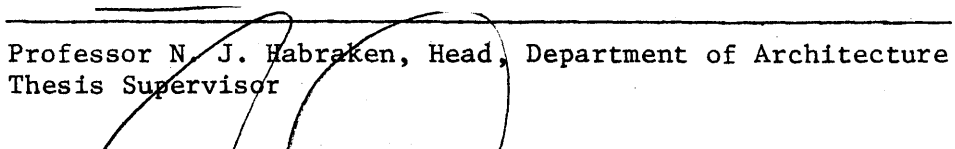
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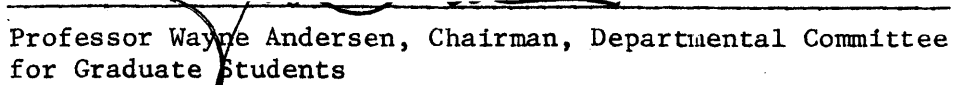
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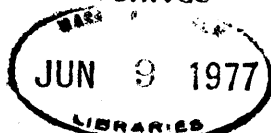
  
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ABSTRACTREHABILITATION FACILITIES FOR THE PHYSICALLY DISABLED:  
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MITCHELL LEWIS GREEN

submitted to the Department of Architecture on May 12, 1977  
in partial fulfillment of the requirements for the degree of  
Master of Architecture.

The Thesis is addressed to a three-part problem. The problem concerns new programs and facilities for the rehabilitation of the physically disabled. An examination of the existing physical rehabilitation process is the base for the first area of inquiry: Could new programs be designed for use in physical rehabilitation which respond to felt shortcomings in the present procedure? The Thesis proposes such programs and provides a thorough analysis. The design of facilities to house these programs leads to the second area of inquiry: Could a basic building be designed to shelter these programs with the needed amount of flexibility while maximizing shared elements? The thesis proposes a basic building and evaluates its ability to accommodate the new rehabilitation programs. The third area of inquiry derives from a potential application of the basic building. Could the basic building be used to organize a coordinated, phased, whole block development adjacent to the Tufts-New England Medical Center in Boston's Chinatown? The Thesis presents a design exploration for approximately 35,000 m<sup>2</sup> of construction including 200 dwellings, facilities for the new rehabilitation programs, a Learning Resources Center, and parking for about 200 cars.

Thesis Supervisor:

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Professor N. J. Habraken  
Head, Department of Architecture

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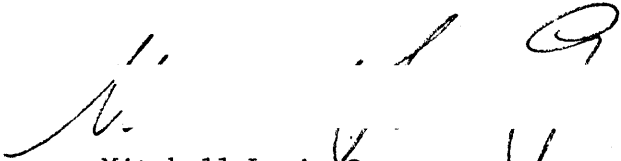
The research and preparation of this Thesis called upon the talents of a diverse group of people at both M.I.T. and the Tufts-New England Medical Center. At Tufts Rehabilitation Institute I would like to thank Dr. Paul Corcoran, psychiatrist and Acting Head of Rehab; Dr. Fred Fay, Research Director of RT-7; Dick Gould, Rehab Placement Coordinator and Peer Counselor; and Jim Holzer, Tufts Rehab Administrator. Their close cooperation in the development of transitional care programs was a vital part of the work. Within the Architectural Services Department of T-NEMC I would like to thank John Erickson, who was most helpful in assembling reference materials, maps, and charts for me. I am also indebted to Ed Ehrlich, member of the T-NEMC Administration, for his continued enthusiasm and interest in my work concerning the Harrison-Tyler block.

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 Mitchell Lewis Green  
 Beacon Hill, May 12, 1977

# 1 Method and Product

This Thesis proposes a complex problem, and then undertakes a step-by-step analysis to propose solutions to the problem. The problem concerns programs and facilities for rehabilitation of the physically disabled; buildings with inherent capacity to accommodate change; and the urban design of a one-block site in Boston's Chinatown. The step-by-step analysis will tie these three problem areas together. In each area the Thesis defines the problem, poses guidelines for possible solutions, and then works within the guidelines on a particular solution. In this way, this Thesis takes the form of a preliminary study.

The first problem area concerns the rehabilitation of the physically disabled. I worked closely with staff of the Tufts Rehabilitation Institute of the Tufts-New England Medical Center. The present rehabilitation process of the physically disabled was reviewed. Possible shortcomings and frustrated objectives were noted. With extensive cooperation from the people at Tufts Rehab I

proposed a set of three new programs called transitional care programs. The programs' goal is to ease the transition between hospital and home while simultaneously encouraging the development of a positive, outward-oriented attitude. The transitional care programs represent not only my feelings, but the ideas and recommendations of staff members at Tufts Rehab, some of whom have experienced physical rehab personally. Chapters Four and Five contain the analytical work in this area.

The second problem area concerns buildings with inherent ability to accommodate change. The infusion of "flexibility," or "ability to accommodate change" into a building design process prompts consideration of who all the actors would be, when they should/could/would/can act, what each actor had responsibility for, and what each actor could control. A building's life process would become an organized set of decisions, actors, and areas of control. Implicit in this concept is the idea that no one actor can ever control everything.

The Thesis adopts this approach to the making of and living in buildings. A building such as this thesis proposes would shelter transitional care programs as well as student and family housing, would be one where specified tasks and parts are the responsibility of different groups. I have considered two main groups in the work; the providers of the basic building, and the residents.

The providers of the basic building would include the developers, financiers, design consultants, public

agencies, construction trades, owners, and management group. Their responsibility is to create, operate, and maintain the basic building. The basic building is the combination of these parts: foundation; structure (including floors); envelope; circulation; life-safety provisions; and environmental services and controls. In addition, the basic building includes all partitions between dwellings over which any resident has no control. These parts, as the basic building, are independent of resident control and have a life cycle much longer than any resident's tenure.

The residents retain significant control over their environment. In any dwelling created within the basic building, the resident has control over the location of rooms, functions, layout of service and special purpose spaces. Thus a resident may control the location and size of bedrooms, living and dining rooms, as well as the choice of fixtures and layout of bathrooms and kitchens. In any dwelling the resident must, of course, respond to decisions already made in the basic building. Clients of the transitional care facilities, because of their short stay there, would cede control of the basic layout of rooms to the transitional care program staff.

The problem, then, is how to create a basic building which responds to the needs of the transitional care programs as well as to other, student or family housing needs. Chapters Six, Seven, and Eight analyze the problem and propose solutions. The methods employed to do this work have been influenced by the work of

S.A.R. (Architecture Research Foundation, Netherlands).

The problem is pulled apart into discrete steps. From an in-depth understanding of the kinds of spaces needed comes a proposal for norms associated with each space. Three kinds of norms are considered: relations of space size to function, relation of space to location in a basic building, and the relation of one space to another. The first two are considered explicitly, the latter implicitly. The norms themselves contain strong indications for the proportions and dimensions of a basic building. Space size and location are used to obtain a general understanding of useful widths and depths of bays. The inclusion of requirements or options for environmental controls, life safety, and envelope complete the set of basic building guidelines of Chapter Six.

Chapter Eight's proposal for a basic building uses those guidelines in combination with site analysis information contained in Chapter Seven. The basic building is organized around the circulation principles, with one entry unit corresponding to and giving access to one group module.

The basic building proposal is evaluated by testing it against both the transitional care program facilities and other housing needs. In this way the analysis-proposal-evaluation-guidelines loop is closed. The methods I used and the approach toward building I took had several consequences. First, the desire to accommodate change led to a separation of roles,

but made the design problem more complex. Second, the methods allowed me to analyze the problem and to pose specific solutions even though the particular end user is not known. Third, flexibility and change are possible even though a broad range of building characteristics are chosen. This broad range of basic building characteristics is essential to properly describe the project and evaluate its political ramifications.

The third problem area concerned the Harrison-Tyler block in Boston's Chinatown. What were the options for development there, what kinds of uses did various groups envision, how could the site be developed? Chapters Seven and Nine bring the community,

institutional, and site contexts together, propose guidelines for forming a site development strategy, and project a design exploration within the urban design, massing, phasing, and site constraints set forth. The design uses the basic building generated in Chapter Eight, itself derived from the transitional care programs proposed to Chapter Four. The transitional care programs could be located in several areas of the design exploration. Chapter Nine thus brings all three problem areas together: programs for rehabilitation of the physically disabled, sheltered within a basic building designed to accommodate change, located as part of a whole block development which brings community and institutional needs together into a lively mix.





# 2

## Community Context : The Chinese-American Community in Boston's South Cove

Boston is a collection of neighborhoods: localities where physical setting and ethnic background combine to yield unique environments. The inner city's topography is now the remnant of steep hills and filled-in coves and bays, added to by ribbons of transportation networks. The Shawmut Peninsula which greeted the Puritans in 1630 is discernible now only by a slight rise in contour.

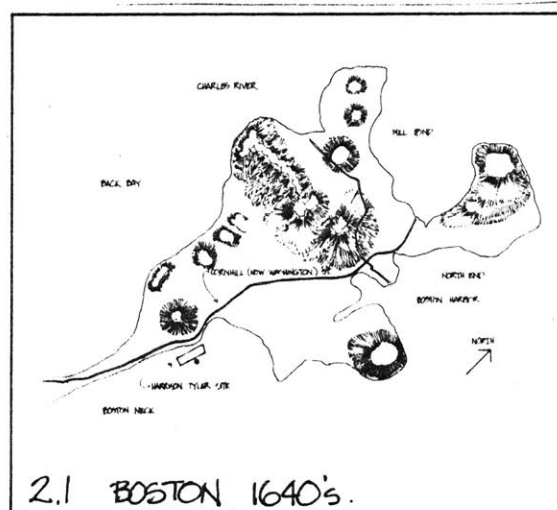
One such corner of the original peninsula led down Washington Street to the southwest in a Neck which connected Boston to Dorchester and Roxbury. Refer to Figure 2.1. To the west of the Neck lay the Tidal Flats of Back Bay, to the east, tidal flats at the edge of South Cove and Boston Harbor. There, where neck and peninsula join, grew up the South Cove, South End, and Chinatown.

A short history of the Chinatown-South Cove Neighborhood will set the community context for the thesis work. The author has drawn extensively on three documents which

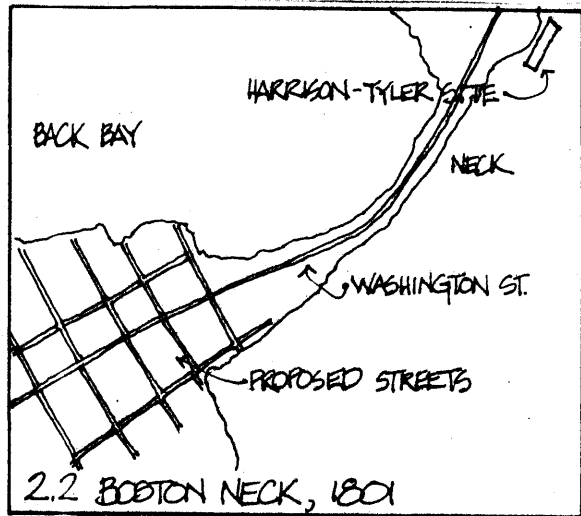
recount the history of Boston's Chinese-American Community. Chinatown/South Cove District Profile and Proposed 1977-1979 Neighborhood Improvement Program was prepared by the district planner of the Boston Redevelopment Authority, City of Boston. Chinatown, a booklet published by the Boston 200 Corporation, is one of a series on neighborhood history. Economic Development for Boston's Chinese-American Community was prepared by the Chinese Economic Development Council (CEDC) under a Technical Assistance Project Grant of the U.S. Department of Commerce. Material on the area's geographical history was supplied by Walter Muir Whitehill's BOSTON: A Topographical History.

### 2.1 HISTORY

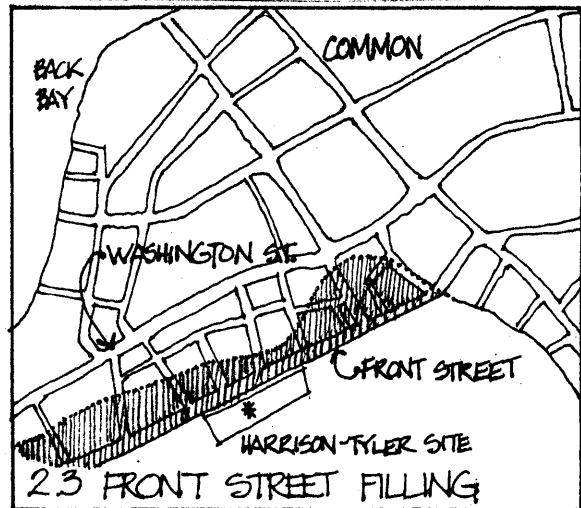
At the end of the War for Independence, Boston Settlement had spread across the Shawmut peninsula, but had not filled it. Between 1743 and 1790 Boston's population increased by only 10%. Improving economic conditions began to pres-



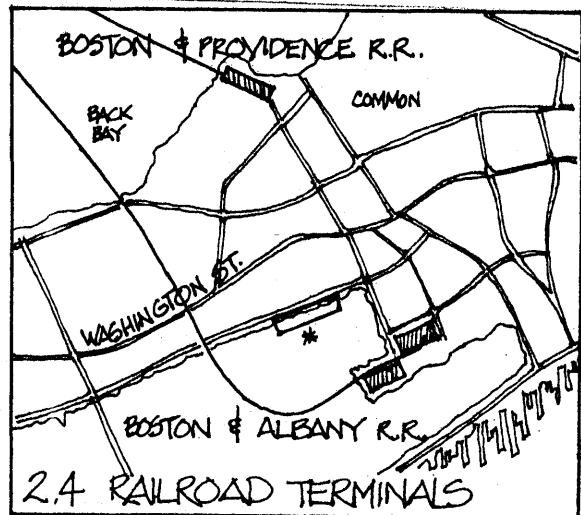
sure the community as businesses searched for expanded quarters. "... Ropemakers, candle manufacturers and the like began to eye the wastelands where the Neck widened as it approached Roxbury.... The Selectmen, under [Charles] Bullfinch's chairmanship, presented to the March 1801 town meeting a plan for developing the Neck into streets laid out in a regular rectangular pattern." [1]. The plan was carried out, although building projects elsewhere in the City depressed demand for this area for two decades. Refer to Figure 2.2.



Access to neighboring localities was an important goal of post-Revolutionary Bostonians. Bridges between Boston and Charlestown, Boston and Cambridge, Boston and South Boston were completed by the beginning of the nineteenth century. This last bridge, to South Boston, was approved by the State Legislature in a package deal which authorized the Front Street Corporation and approved the creation of a Front Street in the South Cove. "The space between this new Front Street and the original shoreline was to be filled individually by each owner of adjacent property. The street was begun in May 1804 and completed in October 1805." [2]. See Fig. 2.3.



The advent of Railroads produced changes in the South Cove geography much more extensive than that of the Front Street Corporation. Refer to Figure 2.4. In the early 1830's, two railroads were organized which brought their tracks to the edge of the South Cove. The railroads influenced the growth of two residential areas: Bay Village

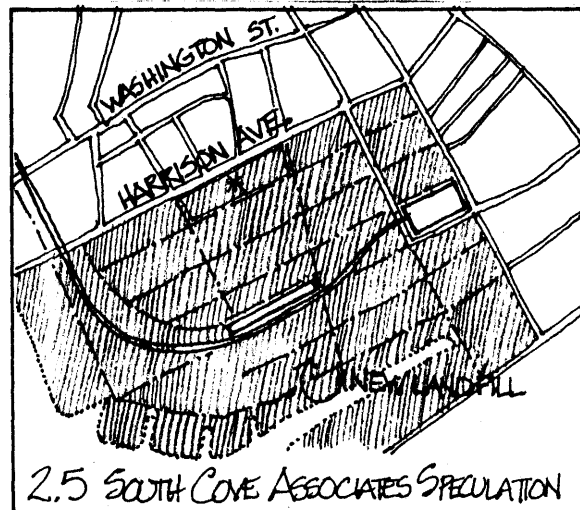


and South Cove. The Bay Village neighborhood had grown up in the first decades of the nineteenth century in the area south of the Common and west of Washington Street. Bay Village's street pattern relates to the Revolutionary shoreline and may in part account for the insular quality of the area. Despite the intrusion of newer streets and juxtaposition with other land uses, Bay Village retains much of its early 19th century quality.

The railroads confounded a grand scheme for the encouragement of industry in Boston. A milldam had been built across the Back Bay in 1821 to provide sites for tide-water-powered industry. "The damming of the Back Bay induced some random filling along the western shore of the Neck which permitted continuation of Suffolk Street through to Castle Street, and the extension of Tremont Street through the Necklands to Roxbury." [3]. The immediate result of the railroads on South Cove was occasioned by the Boston & Worcester Railroad. "In 1833 the South Cove Associates, organized with a capital of \$414,500 to provide the Railroad with a terminus and yard space, undertook practically to obliterate the South Cove." [4]. Refer to Figure 2.5. The investors expected a dense mix of warehouses, wharves, and freight terminals, but the Panic of 1837 depressed the conomy. After 1840 "the leather industry entered the area, displacing residences and depressing land values. The encroachment of the garment industry after 1860 and the construction of the elevated railway in 1899 through the heart of Chinatown further depressed rents and land values, not

to mention displacing a number of additional residences." [5].

Although Chinese had been in the U.S. since the end of the eighteenth century, significant Chinese immigration awaited the California goldrush of 1850. Attracted "by the promise of the mountain of gold and prodded... by severely limited opportunities and political suppression in their homeland," [6] few intended to settle. Most were sojourners who came to strike it rich, and then return to China.

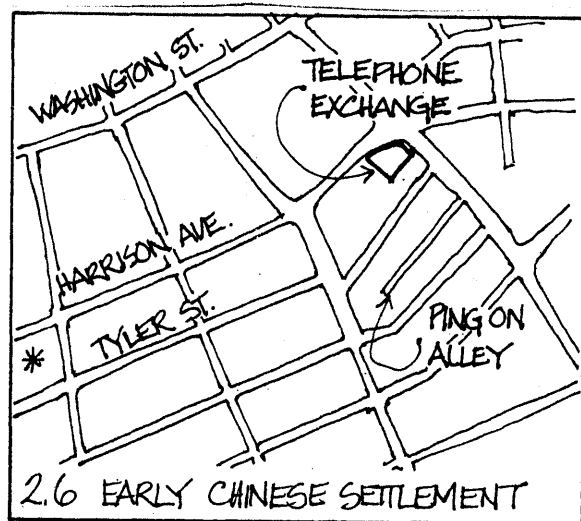


"Virtually all Chinese who came originated from Kwang-Tung province and more specifically Canton, the capital." [7]. The goldmines were soon depleted, but the Chinese kept coming; many worked on the Transcontinental Railroad. After, "jobless Chinese began to drift to the big cities of the east coast." [8]. In 1875, a group of Chinese were brought from the West Coast to break a strike at a shoe factory in North Adams. When the strike ended, the workers came to Boston in search of work. The Chinese were rooted temporarily in a part of Scollay Square.

"In 1883, a large number of Chinese were recruited to construct a telephone exchange on Pearl Street... a squatters' settlement soon mushroomed along a narrow street which came to be known as Ping On Alley." [9]. Refer to Figure 2.6.

Chinese immigration had continued heavily until 1882, at which time California urged passage of the first of several exclusionary immigration laws. Additional restrictive laws were passed as time went on. "The accumulative results of the laws proved largely responsible for reducing the Chinese population in the United States from a high of 107,488 in 1890 to a low of 61,639 in 1920." [10]. The immigration laws had this effect for two reasons: 1) in 1883, the majority of Chinese in America were male; and 2) the laws allowed in only the wives and children of laborers already settled. "Before World War Two, there were very few Chinese families living in [Boston's] Chinatown and rarely any Chinese women." [11].

Boston's Chinese community was small, numbering about 1,000 people in 1920. The small number of children meant few would go to school and learn English. Acculturation was therefore slow. "New communal institutions replaced the social hierarchy left behind in China. Family Associations all but governed the community." [12]. "... For years, the 'supreme organization' in New England was the Chinese Consolidated Benevolent Association (CCBA); an umbrella for most community groups," [13] including the Chinese Merchants Association.



The Second World War marked a radical change in the future composition of Boston's Chinese-American Community. Exclusionary immigration laws were repealed in 1943; the War Brides Act helped bring "about a 1000 percent increase in Chinatown's female population during the late 1940's." [13]. The composition and attitudes of immigrants changed. "It wasn't until after World War II, when the communists took over China and restricted travel...that the men finally realized they were going to have to stay in the country...then people started turning to the idea of bringing families over here." [15].

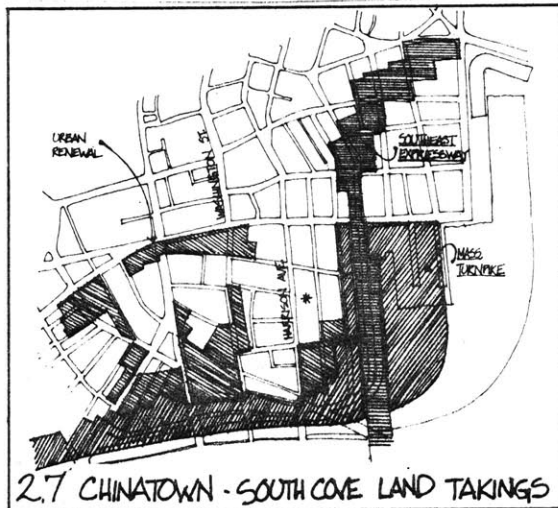
Boston's Chinese-American community began to expand significantly. Existing housing above Kneeland Street was already crowded. Similar-aged housing, 50-80 years old, in the South Cove to the edge of the railyard was utilized. More housing, and new housing, was needed. But "the mid-1950's marked another major turning point for Boston's Chinese.... In 1951, the Chinese Merchants Association

Building on Oxford Street was opened for community use. However, within a decade almost half the building was torn down to make way for the Southeast Expressway." [16]. Urban Renewal, the Massachusetts Turnpike Extension, and proposed expansion by Tufts-New England Medical Center took more land. Refer to Figure 2.7. The effect on residents was devastating. "Before 1955 there were no Chinese families living south of Dover Street. But after the Mass Pike extension came through and they knocked down our houses, the South End was the logical place to move. Chinese people couldn't move west or north because those areas were filled with the Combat Zone (red light district) and the downtown stores." [17].

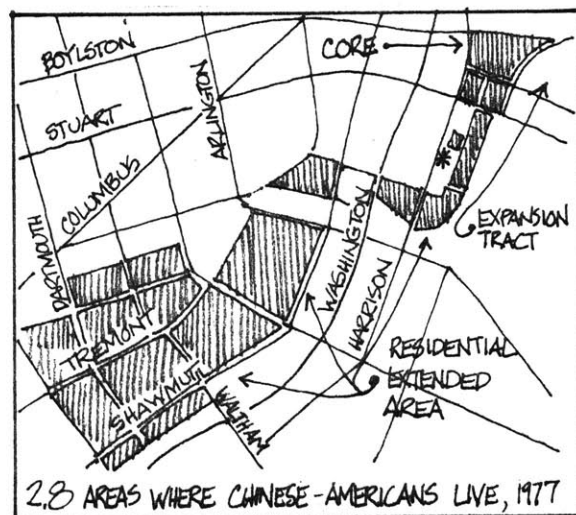
In the twenty-five years that Chinatown's population increased to three times its pre-1940 levels, government-inspired actions had reduced Chinatown's land area by half. In 1965 the U.S. Government abolished the quota system, and Chinese immigration increased. "Immigration has continued at a rate of 20,000 per year.... Today's immigrants are composed of whole families with members of all ages... they are primarily urban-oriented (most having lived in Hong Kong) and tend to possess a much greater degree of skills." [18]. These changes in demographic mix of the community create a demand for additional housing and social services.

## 2.2 PRESENT SITUATION

Boston's Chinese-American Community has today grown beyond the traditional commercial center bounded



by Kneeland, the Surface Artery, Essex Street and Washington Street. The CEDC currently defines three segments of "Chinatown Proper": the Business and Commercial Core; the Chinatown Expansion Tract; and the Residential Extended Area. These three components are shown in Figure 2.8. The total population contained in Chinatown Proper is presently about 8000 [19]. The community's median family income is approximately \$5000 [20]. Action for Boston Community Development (ABCD) has determined that Chinatown Proper has the highest incidence of poverty of all ABCD-designated poverty areas.



The Community is surrounded and divided by a number of physical structures which greatly impact it. Refer to Figure 2.9. The CEDC report identified nine elements of the environment whose presence affect the current situation and could impact future decisions [21]. Those nine were :

1. The Boston Edison Steam Generating Plant

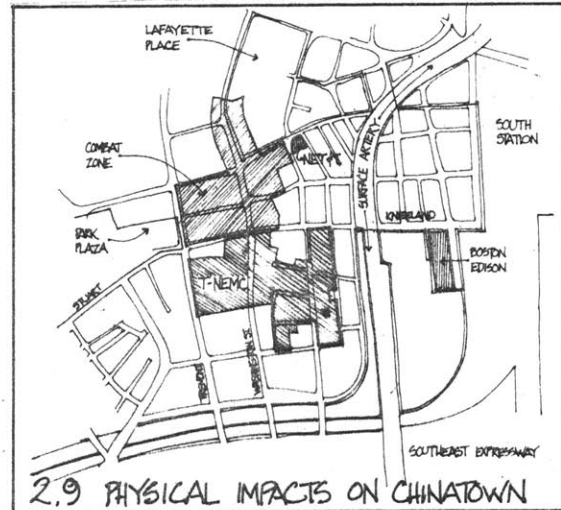
The Plant was built in 1930, employs 80 people and is in constant operation. Recent repairs to steam lines in the area has caused considerable congestion. Should Chinatown expand eastward, the Plant may have a negative impact on property values.

2. New England Telephone Company

Located on Harrison Avenue and Essex Street, with a switching station and office building, the company has also been repairing its lines lately. Activities of the utilities are not coordinated; this produced maximum disruption and congestion. Businesses located in the area have been directly impacted.

3. The Southeast Expressway

Land taking for the Southeast Expressway significantly reduced the size of Chinatown and had a crippling effect on housing supply. The Surface Artery caused a large barrier to movement between the Leather District and Chinatown Proper. Traffic congestion in the area is acute; air quality is below federal standards much of the time. This traffic, commuters moving through Chinatown on their way to the suburbs, has prevented the federal government



from supporting subsidized housing applications.

4. Massachusetts Turnpike Extension

Highway disruption and construction of the 1950's was followed by more disruption in the 1960's as the Mass Pike was extended from Newton to the Southeast Expressway beside the original right of way of the Boston & Worcester Railroad. An additional 60 housing units were taken, as well as reinforcing the barrier between the South End and downtown Boston, first drawn in 1835. The inevitable and necessary movement of the population into the South End has served to fragment the Chinese community.

5. Combat Zone

The Adult Entertainment District has overwhelmed Washington Street between Kneeland and Summer Street. The businesses are extremely profitable, whether they operate legally or not. Land values in this area are relatively high. The City has suggested "cleaning up" or "dressing up" the Zone, hoping that cosmetics will make the area palatable

to opponents. The Chinese community is not pleased by their more recent neighbor but is more concerned with controlling future developments at their borders than with expelling the Zone.

#### 6. Jordan Marsh/Lafayette Place

This multi-million dollar retail, hotel, and office development is planned by a French consortium to replace a significant portion of Washington Street between Summer and Essex Streets. 2.8 million square feet of development was once proposed, although the global recession has put the plan in check. Chinatown is concerned chiefly about how this development may be used to further the goals of the community; and how real estate speculators, buying land in advance of development, may be driving up property prices beyond the resources of the Chinese Community.

#### 7. Park Plaza

This large, controversial development may actually get underway soon, considerably reduced in scale, bulk, density, and height. Phase I, from Tremont to Arlington along Stuart, will include a State Office Building. The construction project will create employment opportunities as well as replace existing structures of advanced age. A second phase was originally projected for the block bounded by Boylston, Washington, Stuart and Tremont. Once thought a likely site for a performing arts center, the project is at best fifteen years away.

#### 8. Tufts Medical Complex

The Tufts-New England Medical Center (T-NEMC) combines several hospitals and clinics with the Tufts Medical School and Dental School. T-NEMC is a large landowner, controlling thirteen acres. The Medical Center is also a major employer, with about 4500 jobs. The Chinese community entered into an adversary position with T-NEMC in the middle 1960's to secure as many redevelopment parcels for community use as possible. T-NEMC has expanded its community health programs in the past decade and has adopted affirmative action hiring programs.

#### 9. South Station Transportation Center

Rehabilitation of the South Station is one component of a rejuvenation of the area southeast of the Central Artery. The BRA hopes to relocate the Trailways and Greyhound bus terminals to the Center. The impact of these proposals has been similar to that of Jordan Marsh/Lafayette Place: an influx of speculators who seem to be driving up real estate prices, thereby reducing the influence and opportunity available to the Chinese Community.

As the CEDC report states: "As one can literally see, the Community is not alone in the area." [22]. In addition to the nine elements identified by the CEDC which cohabit the South Cove with the Chinese Community, two additional projects could have profound physical impact on growth options available.



### 10. Burying the Central Artery

State Transportation Director Fred Salvucci is a strong proponent of rehabilitating the Central Artery by placing it underground. Divided into three segments, this project would include major alterations to the Expressway, might result in additional traffic problems, and could involve additional land-takings in the Chinatown area.

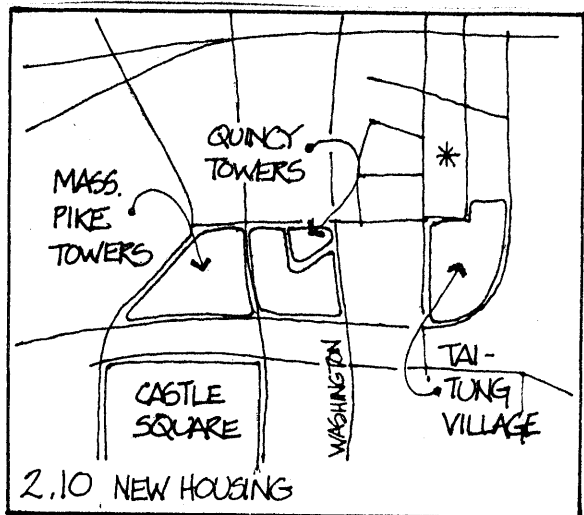
### 11. Orange Line Replacement

The federal government approved funding for the Orange Line Replacement from Essex Street to Forest Hills. As part of the Urban Renewal Project Street Renovations, a new South Cove tunnel spur was constructed under Washington Street. The tunnel contains a station on Washington Street adjacent to T-NEMC. Construction on the first phase may begin in 1977 and introduction of service about 1983.

These physical elements have attendant environmental impacts. The transportation arteries in particular engender serious traffic congestion, and air and noise pollution. The housing stock in the area is, for the most part, more than one hundred years old. The U.S. Census of 1970 recorded that 77% of the housing was more than 36 years old, which is not particularly descriptive. The "BRA, however, unofficially reports that before 1970, 72% of the housing units in Chinatown were considered delapidated or deteriorating, compared to 14% in the City as a whole.... The BRA also unofficially reported that 78% of the dwelling units are overcrowded, compared to 7.7% for the City

as a whole.... The BRA goes on to report that [an] average dwelling contains 2.6 rooms with 4.4 persons per dwelling, compared to 2.8 persons per dwelling in the City as a whole." [23].

Recent public investment has created a significant number of newer dwelling units. Tai-Tung Village, the Castle Square Housing Project, Mass Pike Towers, and Quincy Towers Housing for the Elderly provide homes for approximately 2000 people. Refer to Figure 2.10. This large stimulus has not, however, solved



the housing problem. A "long waiting list, among which many Chinese names appear, exists for all developments." [24]. In addition, the Chinese-American Community in Boston continues to grow. "An estimated influx of 300 additional immigrants per year [enters] the Boston area as well as [the arrival of] ... 150 or so Chinese people from other parts of the country...." [25]. Continued expansion of the housing stock thus becomes an important community goal.



Employment characteristics of the Chinese-American community pose serious problems for the near future. The CEDC report indicates that about three-quarters of the community's males are employed in the restaurant industry and about three-quarters of the community's females are stitchers in the garment industry. The garment industry is currently in a continued decline in Boston, while the recent expansion of Chinese restaurants may be leveling off as the cuisine reaches a saturation point in Boston's palate. The language barrier has created underemployment in the community; skilled immigrants cannot use their skills since they cannot communicate with English-speaking employers.

### 2.3 GOALS OF THE COMMUNITY

The Chinese Economic Development Council (CEDC) is an umbrella organization of community groups in the Chinese-American Community. Included on the CEDC board are the Chinese Consolidated Benevolent Association, the Chinese Merchants Association, and the National Chinese Welfare Rights Association. The CEDC has identified four goals, general in nature, which yield objectives and activities undertaken to achieve those objectives. The reader is referred to the CEDC report [26] for a detailed discussion of these goals, objectives, and activities. The author presents them only in outline form, elaborating where useful to the thesis.

#### A. Goal - Improve Entrepreneur's Competitive Ability

1. Objective - Diversification from Restaurant Industry.

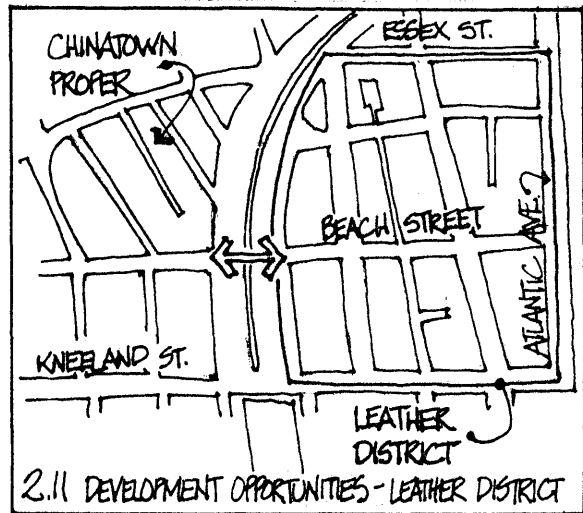
- a. Activity: Seminar with U.S. Army Food Labs on equipment.
  - b. Activity: Researching founding a restaurant-supply purchasing cooperative.
  - c. Activity: Radio programs to communicate alternative employment opportunities.
  - d. Activity: Economic Development Conference.
2. Objective - Assistance in Growth and maintenance of Existing Businesses.
    - a. Activity: Business Counseling.
    - b. Activity: Loan Packaging and Business Development.
    - c. Activity: Financial Resource Development.
    - d. Activity: Developing Legal Resources.
    - e. Activity: Development of Permanent Capital Base.

#### B. Goal - Expand and Revitalize Impact Area.

1. Objective - Assess Physical Space and Environment.
  - a. Activity: Physical Impact Study. This study was excerpted in this Chapter.
  - b. Activity: Environmental Impact Study. This study was excerpted in this Chapter.
2. Objective - Increase Housing Supply.
  - a. Activity: Residential Study. This study showed overcrowding, substandard conditions in many buildings. Immediate needs indicated were about 100 units for elderly housing, 400-600 units for low

and middle income, and about 100 units for moderate income potential residents.

- b. Activity: CEDC-Tufts Joint Housing Venture. Refer to Figure 2.12. A dialogue has been established concerning the parking lot bounded by Harrison, Oak, Tyler, and Harvard Streets. The project would include 200-400 housing units, a medical library, a Chinese cinema, parking, and a small pedestrian park.
- c. Activity: Additional Housing Site Study. Two additional housing sites have been established. One site will entail major rehabilitation, while the other will necessitate new construction.
- d. Activity: HUD 202/section 8 Proposal. A proposal for 100 units with a budgeted subsidy of \$3 million is under consideration.
- e. Activity: Housing Rehabilitation. 25 units of fair market housing and five stores were produced in eight months through CEDC coordination.
3. Objective: Commercial Activities Enhancement
- a. Activity: Economic Growth Potential Study. The report compared Chinese-American communities in the U.S. and concluded that Boston's was capable of rapid growth. Commercial activities possible included: an art store, service station, accounting firm, law firm, construction firm, pressed duck shop, and a bakery.
- b. Activity: Increase Tourism. A report stressed improved restaurants and improved environment as the key to growth. A Chinatown Restaurant and Shoppers Guide have been produced.
- c. Activity: Increase Commercial Space. Absorption of the Leather District Expansion Tract would provide almost 300,000 square feet of new commercial space as well as 1.2 million square feet of new upper floor space. This new commercial space could be used as a new commercial center and might be converted within ten years.
- d. Activity: Leather District Expansion Tract Study. Refer to Figure 2.11. Six blocks of loft buildings constructed in the latter part of the 19th century. Many of the buildings are now vacant, but in excellent condition. The CEDC undertook a complete space study, revealing 52 parcels owned by 26 individuals, containing more than 1.5 million square feet. The CEDC's actions indicate that



it views this area as the prime development area.

- e. Activity: Development of Planning Capability.

C. GOAL - Improve Standard of Living and Employment Opportunities.

- 1. Objective - Increasing Employment.
  - a. Activity: Skills Assessment
  - b. Activity: Job Bank
- 2. Objective - Establishment of Training Programs.

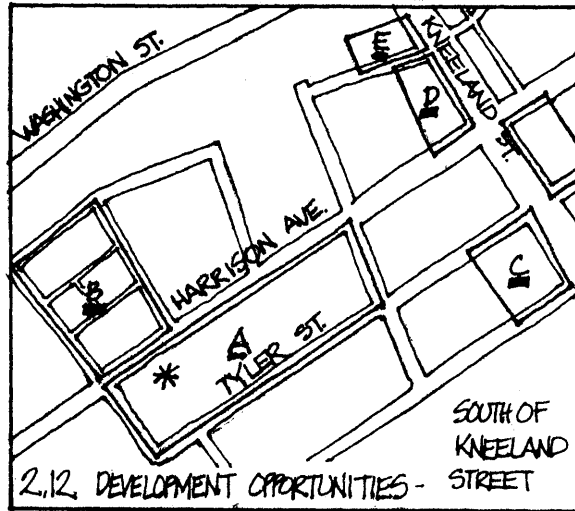
- a. Activity: Chef's Training
- b. Activity: Additional Training programs. These include computer programming, electronic assembly, needle skills.

3. Objective - Programs for the Elderly.

- a. Nursing home. Such a facility is badly needed by the Chinese American Community.

D. GOAL - Develop CEDC as a Viable Agency.

- 1. Objective - Establishment of Working Relationships.
  - a. Activity: Newsletter
  - b. Activity: Radio Program
  - c. Activity: Establishment of General Business Resources.
- 2. Objective - Development and Consolidation of Community Resources.
  - a. Activity: Development of a viable working board. The CEDC is expanding the mem-



bership of the board to include more community groups.

- b. Activity: Identification and Utilization of Community Business Resources.
- c. Activity: Development of Working Relationships with Institutions of higher education.

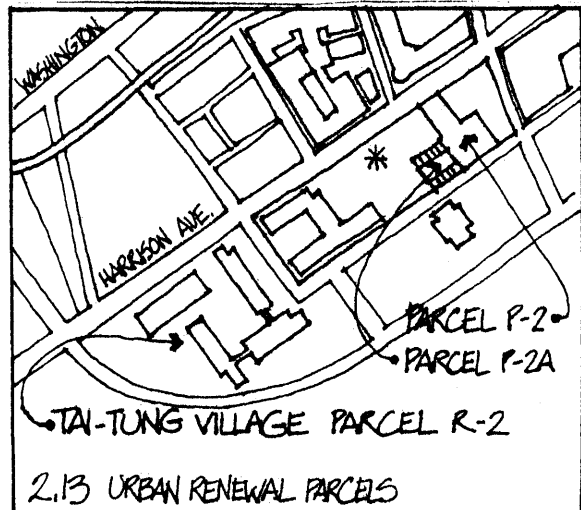
The CEDC has identified a series of parcels within Chinatown Proper as potential sites for new development [27]. These are shown in Figure 2.12.

For each site potential development programs are listed. The several parcels to the south of Kneeland are of interest to the Tufts-New England Medical Center. Site A, described as a possible T-NEMC-CEDC joint venture, was mentioned above. This site is the subject of the thesis. Other sites in this area include site B, which the CEDC feels is a candidate for major rehabilitation, site C, an opportunity for new construction, and sites D and E, potential sites for rehabilitation for commercial and residential uses.

The position of Sites A and B in the T-NEMC-Chinatown context was set by two land development documents negotiated in the mid-1960's. The first was a Memorandum of Understanding, dated May 23, 1963, signed by then Mayor of Boston John Collins, then BRA Administrator Edward Logue, and then President of the CCBA Denny K.H. Moy. The Memorandum states that the Chinese Residential Community "has suffered severe dislocation and reduction in its land area through highway construction... and is further endangered by intrusions of commercial and other uses not related to the Chinese Community..." [28]. Referring to the areas south of Kneeland Street, "It is recognized that with reference to the sub-area bounded north by Kneeland Street, east by Tyler Street, south by Oak Street, and west by Harrison Avenue, some portions are now owned and used by units of the Tufts-New England Medical Center, including Posner Hall and the Tufts Medical and Dental Schools, and adjacent parking areas, which are to continue in Medical Center use. Other portions of the sub-area, which are owned by other parties, and some of which are occupied by Chinese residents, are to be carefully studied and allocated

to the best uses consistent with the mutual interests of all concerned.... Such allocations will be discussed with the Chinese Association before any plan including them is filed...." [29].

The second document was a Cooperation Agreement, dated January 17, 1966, between the BRA and T-NEMC, signed by Edward Logue and Nils Wessele, President of Tufts University. It states that "The Authority shall sell and the Medical Center shall acquire and develop those institutional re-use parcels that are marked P-2 through P-11 [refer to Figures 2.12 and 2.13]...provided that the properties in Tyler Street...Disposition Parcel P-2A, will not be sold by the authority until such time as (i) new relocation housing has been built on Disposition Parcel R-2, (ii) the Medical Center has demonstrated to the satisfaction of the Authority that it has sufficient need for such properties; and (iii) the Authority's staff has reviewed and approved the Medical Center's plan for a small park which the Center will own, develop, and maintain between Tyler Street and Harrison Avenue



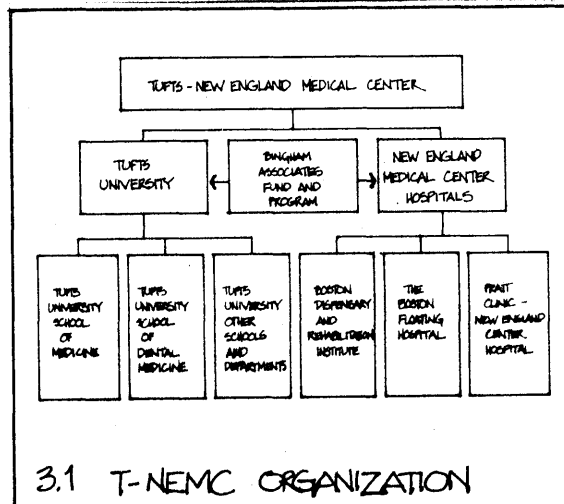
for public use and providing pedestrian movement between the two streets." [30].

The tone of these agreements committed T-NEMC and the BRA to cooperate with the Chinese community in its redevelopment. Expanded community health facilities is one example of this cooperation. T-NEMC aided the establishment of a community health center in the new Quincy School complex, as well as re-signing its outpatient clinics, adding Chinese characters.

This Chapter has outlined the history, present situation, and goals of the Chinese-American Community in Boston. Development opportunities identified by the CEDC have been mentioned and attention was focused on the Tyler-Hudson Street area. With the community context set, the thesis will now consider the institutional context: the development, current status, and future goals of the Tufts-New England Medical Center.



# 3 Institutional Context: The Tufts - New England Medical Center



The Tufts-New England Medical Center (T-NEMC) is a recent amalgamation of several health care institutions which have operated in Boston since as early as 1796. T-NEMC is composed of two groups: Tufts University and the New England Medical Center Hospital. Refer to Figure 3.1. The Tufts University Schools of Medicine and Dental Medicine have been affiliated with the New England Medical Center Hospital, the Boston Dispensary and Rehabilitation Institute, the Boston Floating Hospital for Infants and Children, and the Pratt Clinic--New England Center Hospital, since 1931. T-NEMC was organized as a single administrative unit in the late 1960's to coordinate services as well as to prepare for an extensive building program which would have almost completely replaced existing hospital facilities.

The history of the components of T-NEMC is worth outlining as the growth of the institutions paral-

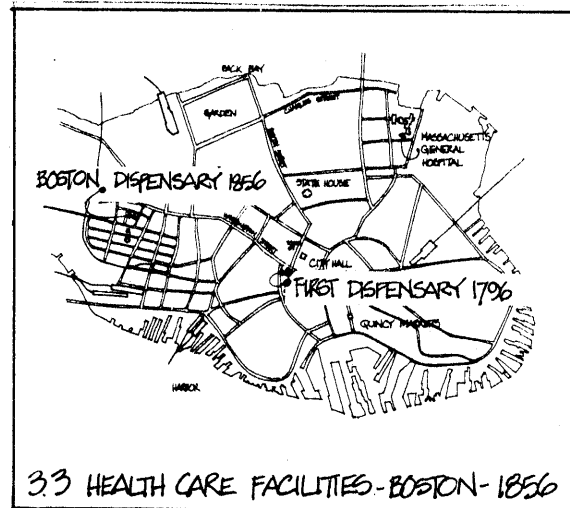
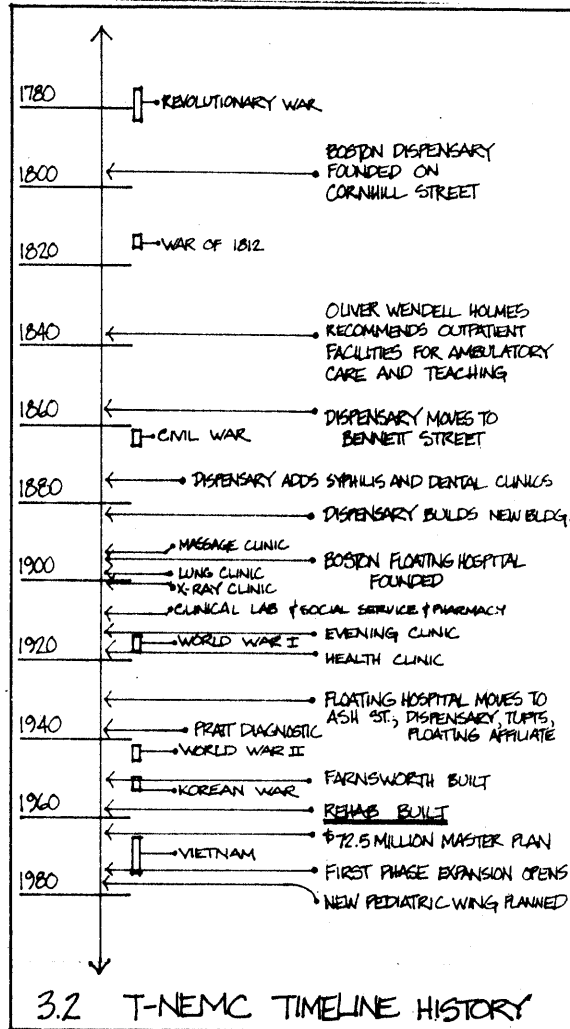
els the growth of the Chinese-American Community. A timeline history of T-NEMC is presented in Fig. 3.2. This chapter will trace the history of T-NEMC, describe its current situation, and present its goals and physical options for the future. Particular attention is paid to the activities of the Boston Dispensary and Rehabilitation Hospital, since the latter is the setting from which the thesis work extends.

### 3.1 HISTORY

T-NEMC begins with the Boston Dispensary. In 1796, "a group of prominent citizens headed by Samuel Adams established the Boston Dispensary as the first organized medical care service in New England and the third in the United States." [1]. The Dispensary was to be a primitive form of Health Maintenance Organization, interested more in preventive medicine and home care than in inpatient services. Subscribers of the Dispensary would be rewarded with savings,

as was recognized by the founders: "the sick, without being pained by a separation from their families, may be attended and relieved in their own houses...at less expense ...than in an hospital." [2]. A subscription of \$50 allowed the donor to have two patients treated at any one time for life, while annual donations of \$5 or \$10 enabled the treatment of two or four patients simultaneously. "The medical plan called for the appointment of a physician and an apothecary to begin the work." [3]. Thomas Bartlett became the first apothecary, located on Corn Hill near School Street. Refer to Figure 3.3. It soon became evident that some recognition of the Dispensary's "location" was needed. Bartlett's shop served as the message center for house calls, and so "for \$7... the colonial artist, John Johnston, painted on it a representation of the Good Samaritan, which became the symbol of the Dispensary." [4].

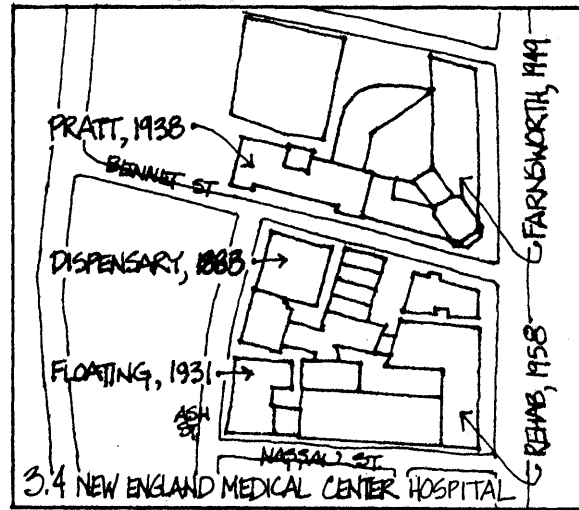
The Dispensary was an early advocate of public health during the first half of the nineteenth century. The Dispensary's Home Care activities were well established in that time. But in 1837 Oliver Wendell Holmes, then serving as a physician for the Dispensary's Home Care Service, recommended a broadening in the scope of services offered. He suggested that "some central place be provided where patients who can safely and conveniently leave their own residences...could be treated as effectually as if visited at their houses at a far less expense of time and labor to the physician." [5]. A benefactor soon provided funds to realize Holmes' recommendation. \$90,000 ultimately accrued from the will of Benjamin Dearborn (whose favorite symbol was





the Good Samaritan) and enabled the Dispensary to construct a permanent headquarters. In 1850 Boston still faced out toward tidal waters of the Back Bay. The South End was the City's newest residential district and enjoyed some popularity among the wealthy. Massachusetts General Hospital was located near Barton's Point, which it had been assigned in 1811. Refer to Figure 3.3. With the tide of residential settlement moving out of the Shawmut Peninsula, it must have been a natural decision to locate the new Dispensary part way along the route. And so in 1856 "the Dispensary opened its first medical and surgical clinics for ambulatory care and medical teaching." [6] on Bennett Street at the corner of Ash, a short block from Washington Street, still the town's main outbound thoroughfare.

In the last half of the nineteenth century, additional clinics were opened: a Syphilis Clinic, 1873; a Dental Clinic, 1873; a Massage Clinic, 1893; a Lung Clinic, 1899. The original house had been outgrown; the present brick structure was built on the corner in 1883. The twentieth century brought new opportunities and a shift toward diagnosis of disease. An X-Ray Clinic was established in 1900; a Clinical Laboratory in 1908; a Social Service Department also in 1908; and the beginnings of a comprehensive Pharmacy in 1909. The services offered had now significantly expanded and with the growing capabilities of medical care came rising costs. In order to reach back toward a growing number of individuals in need of health care, the first Evening Pay Clinic, started with an Eye Service, was organized in 1913 with the cooperation of Boston employers. In 1918 a Health Clinic was opened to encour-

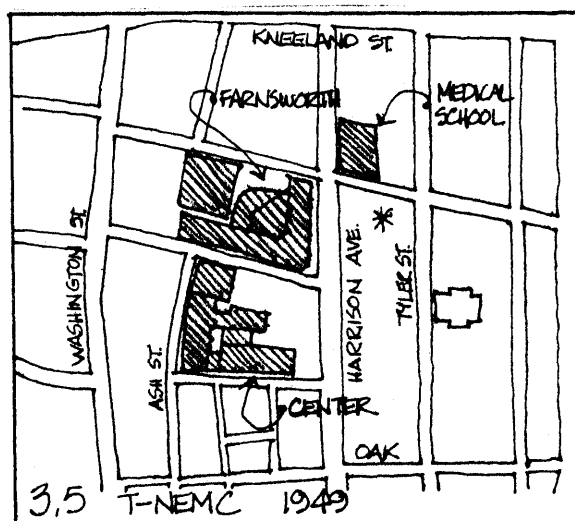


age periodic checkups, and a Food Clinic supplied nutrition advice to patients.

The Boston Floating Hospital for Infants and Children was established in 1894. A hospital ship was moored in Boston Harbor not far from the South Cove. The ship burned in 1930 and the Floating Hospital decided to search for a land-based facility. By the latter 1920's the Boston Dispensary had so extended its outpatient services that large deficits were piling up. A Facts-Finding Committee "recommended that, in addition to its Home and Ambulatory Services, the Dispensary should secure a limited number of beds, reorganize its clinical teaching with a firm medical school affiliation, and seek to add as patients those above the level of indigence." [7]. The Dispensary and the Floating Hospital chose to team up, and the two affiliated themselves with the Tufts University Medical and Dental Medicine Schools, forming in 1931 the "New England Medical Center." That same year the Floating Hospital anchored itself at the corner of Ash and Nassau Streets. Refer to Figure 3.4.

Dr. Joseph Pratt, Chief of the Dispensary's Medical Department, had inaugurated the educational programs with Tufts University in 1930. In 1937, funds were secured for the construction of a 63-bed Pratt Diagnostic Hospital, completed in 1938. In the early post-World War Two period, both Pratt and the Floating Hospital were expanded. The Farnsworth Surgical Building was erected along Harrison Avenue in 1949. By that time the Center Building had been constructed, greatly adding to the capacity of the Floating Hospital. In that same year the Tufts Schools of Medicine and Dental Medicine moved from Huntington Avenue to the Harvard Building, at the corner of Harvard and Harrison. Refer to Figure 3.5.

The specialty of physical medicine and rehabilitation grew up as a by-product of World War Two. Advances in medical practice prior to the war enabled physicians to save the lives of many servicemen who would previously have been lost. This disabled group, first a significant social phenomenon after World War One, required a different set of specialists, a different environment, and a different attitude if their rehabilitation was to be successful. "Experience had shown that the hospital patient did not respond rapidly to therapy which encouraged self-help if he were spending most of his time in the traditional hospital atmosphere, being cared for by others." [8]. The Boston Dispensary's first step was to expand and reorganize its Massage Clinic into a physical therapy unit, established in 1950. A Rehabilitation Department was begun in 1951. "By 1953, medical



evaluation, social service, speech and hearing, psychological and vocational guidance had been added, and by 1954 patients from the other hospitals in the Medical Center and industrial accident cases referred by insurance companies were added to the clinic clientele." [9].

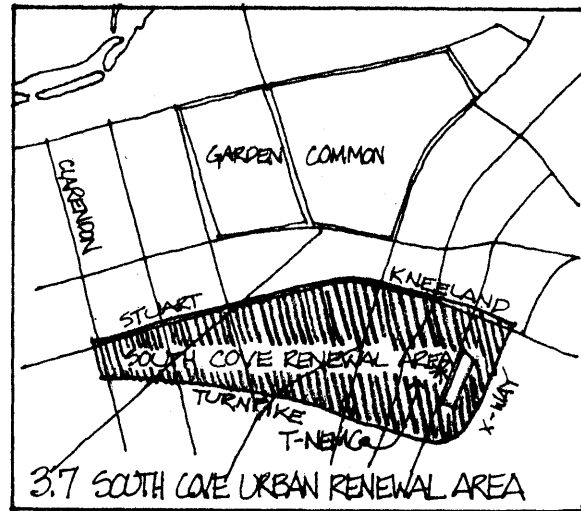
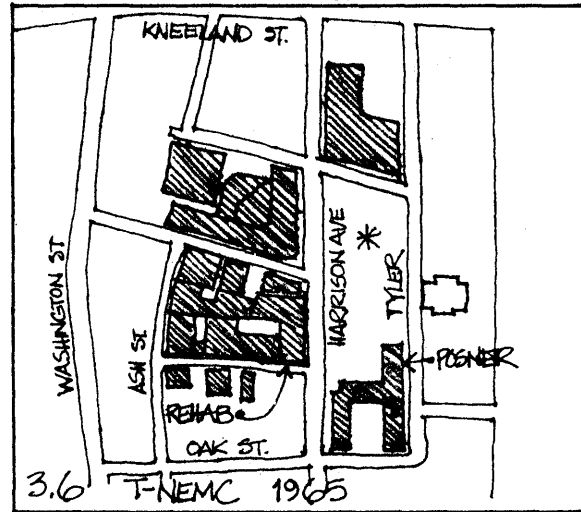
But this wasn't enough. If the traditional hospital setting was not adequate, neither were other existent solutions. "Having the patient commute from his home prematurely, where an oversympathetic family might discourage his early efforts, or housing him in a nearby hotel where he would spend lonely evenings, had been tried without success. By placing a few handicapped people in a 'dormitory' under supervision of a nurse, but conscious that they must learn to help themselves and also help one another, it was demonstrated that treatment was more effective, morale was improved, and the period of therapy reduced." [10]. A fundraising drive was aided by the Junior League of Boston, leading to the opening

of the 23-bed Rehabilitation Institute in 1958. Refer to Figure 3.6. This was the first comprehensive Rehab Institute in New England, and the first to be built under "Hill-Burton" federal funding programs.

The early 1960's were a period of intense analysis and planning at T-NEMC. The massive influx of urban renewal funds into Boston prompted institutions throughout the city to contemplate major building programs. BRA Director Edward Logue encouraged such private development by including more than half the city within urban renewal project areas. T-NEMC was included in the South Cove Urban Renewal Area. Refer to Figure 3.7. On October 1, 1964, T-NEMC published A Preliminary Study: Development of Tufts-New England Medical Center. [11]. This report, prepared under the guidance of Herman Field, T-NEMC Planning Director, listed six goals of the Medical Center [12]:

"1) To break out of a land-locked position which stood in the way of rational growth and long-range development of its facilities, and to acquire the property to achieve this where needed at reasonable cost.

"2) To arrest the progressing blight of the surrounding area, which has created an environment increasingly incompatible with the purposes of this institution and detrimental to its proper functioning and growth.



"3) To replace the present obsolete street and traffic pattern of the area with one that allows for full development of the Medical Center and other future functions of this part of downtown, and as part of this to meet the Medical Center's future parking and transportation needs.

"4) To provide for a neighborhood housing supply of a quantity and character to meet present and fu-

ture Medical Center Staff and student needs, and to provide a stabilizing and compatible land use in the Medical Center's vicinity.

"5) To lay the basis for a stable viable downtown neighborhood, structured and planned for a permanent positive symbiosis of its institutional and other sectors.

"6) To provide long-range landbank possibilities for later growth of the Medical Center beyond the foreseeable future.

The report analyzed current transportation problems and recommended solutions, especially concerned with parking. A personnel inventory and assessment of community needs and requirements led to formulation of T-NEMC objectives. Several of these "Community Needs and Requirements" and "Objectives" bear citation here as they are useful in measuring the performance of the Medical Center since 1964. Among the "Community Needs and Requirements" were the following [13]:

"2. Great differences in health levels exist for populations in nearby urban neighborhoods, in rural areas of the state and nation, and in foreign countries. These pockets of serious health care need pose a special challenge to the educational centers of the nation.

"5. The progressive control of specific diseases through the achievements of science and technology continues to foster division of labor and specialization in medicine. This

successful pattern in turn produces serious problems of coordination in the delivery of comprehensive, high quality care to individual patients and the provision of general medical education to students in the health occupations. Traditional practices of consultation, referral and the organization of the health services must receive particular attention at this time.

"6) There has been a great increase in medical research during the past 20 years. Financial support for health research in the United States has multiplied nearly ten-fold in this period. Medical centers have played a determining role in these activities. But there is a great need to assimilate and disseminate new information so that professionals quickly apply advanced practices. The educational process must now extend beyond the formal phase of training to encompass the entire career of the professional health practitioner.

"7) Under these conditions, a medical center represents a scarce and highly specialized regional resource. Such an educational center must constantly examine and reshape its role in relation to other centers, community hospitals, and the total group of health care practitioners operating in the geographic area where it is located. It must learn to perform its individualized function in concert rather than in competition with other organizations.

"9. Finally, there are additional responsibilities of the medical center to the community and the general

public. Some of these responsibilities are diffuse, indirect, and of fairly recent origin. Medical centers must participate in political and economic activities which influence such things as the economic aspects of health care, improved housing, better control of various types of pollution, reduction in the number of accidents and the properly balanced control of private and public resources devoted to provision of health care to the total community."

These statements were further expanded and clarified by a set of T-NEMC "Objectives." Excerpts [14]:

"We have recognized that service of the highest quality to individual patients is necessary not only as a responsibility to the patients who entrust themselves to us, but also as a sine-qua-non of the teaching and research phases of our educational program. We feel that service to groups of patients in great quantity must be avoided in order that staff and facilities may be used effectively to discharge our educational responsibilities.

"We feel that one goal should not be simply to increase in size. We have managed over the years to maintain a personal approach to the care of patients and to the education of our varied student body, and would consider excessive growth detrimental to this precious quality. However, our expansion should be guided by an orientation to continuity of care and provision of complex medical care and education not found elsewhere.

"Thus we should develop an institution dedicated to the pursuit of excellence and of a size most conducive to the achievement of this aim. Our institution should possess the elements of comprehensive or total care of our patients, yet need not contain all the elements of medical care which exist in today's society or will exist in the future. Our program should be guided by educational objectives. We are convinced that the medical center of the future will be strikingly different from that which now exists. Therefore, our organizational and physical structure should be flexible enough to permit development along unforeseen lines...."

The 1964 document pledged T-NEMC toward comprehensive services, toward the goals of quality and not quantity; toward comprehensive services, toward an environment where educational demands were balanced against health care delivery.

How large should this medical-center-of-the-future be? The authors admitted that no strict programming guidelines existed for a "medical center" due to its complex relationship to other health care providers. But "In the absence of detailed projections certain broad assumptions were made." [15]. Those included a "gradual" increase of patients and students, and proportional increases in staff, faculty, and employees. Tables IV-2a and IV-2b compile Volume Assumptions of the plan. The authors had noted the then prevalent notion that by 1980 U.S. population would be double that of 1950. This multiplier, plus what must have been an expected increase

in frequency of visit, or of population served by T-NEMC, produced a relatively uniform near tripling of medical center inpatient beds, outpatient visits, and total net area [16]. From 365 inpatient beds in 1964, T-NEMC projected a need for 979; from 68,000 outpatient visits in 1964, T-NEMC projected 200,000; and from about 465,000 net square feet in 1964 T-NEMC projected a need for more than 1.6 million net square feet in 1985, or a total of about 2.4 million gross square feet [17].

These figures included about 1.23 million net square feet of new construction, more than 75% of the total, representing almost three times the area of the medical center in 1964.

The Preliminary Study went on to propose three alternative development plans. An analysis of the medical center area located potential acreages open to expansion in each of the four cardinal directions: two acres to the north, two acres to the east, six acres to the south and six acres to the west [18]. Excerpts from the Study's recommendations [19]. See Fig. 3.8.

"1. North: Expansion in this direction is limited to a potential two acres because of the decisive Kneeland Street barrier...."

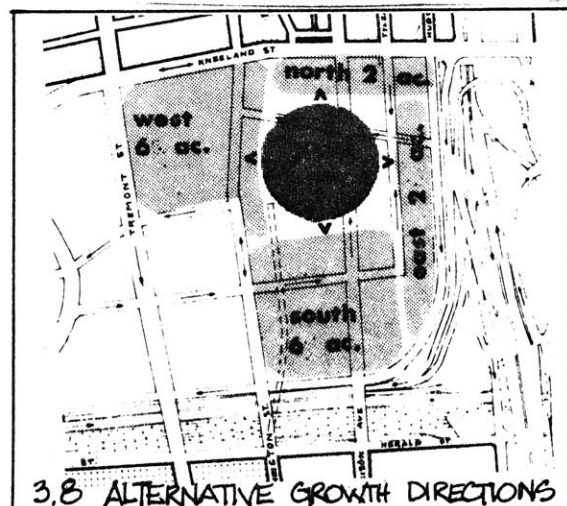
"2. South: Potentially the additional acreage required for the 20-year period could be available here. However, ... on the east it would absorb a major section where new housing under Chinese sponsorship

ship is visualized.... The western portion is made unusable by the Forest Hills elevated structure...."

"3. East: With the recent takings of the Turnpike, land available east of Tyler Street represents no more than two acres. It is the main strip of Chinese residential space that has survived. Its elimination at this time for Medical Center use would be unfeasible from a community point of view, and would be incompatible with the urban renewal goals for the area...."

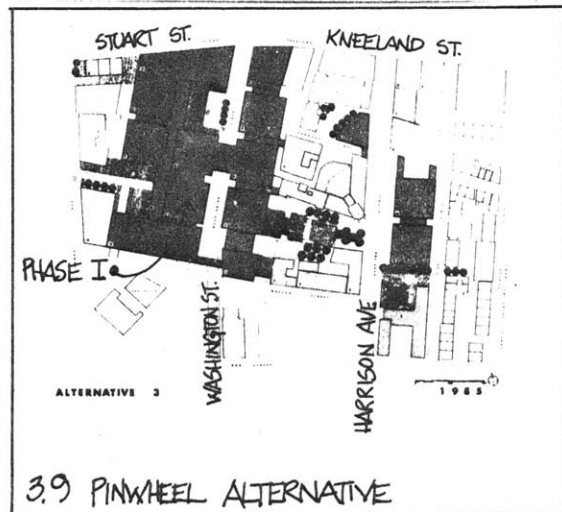
"4. West: A growth primarily westward from its present facilities would follow recommendations first made in the Kevin Lynch report in 1955 [21]. It also is in line with property acquisition policy of the Medical Center since then....". [22].

With these constraints in mind, the Planning Study chose to expand toward the west for its initial twenty-year development period.

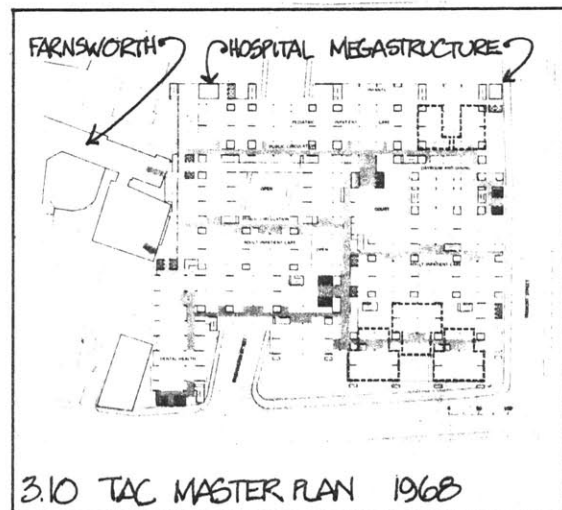


Three alternative site plans were proposed to demonstrate the ramifications of the expansion program. These were block diagrams and sketch perspectives only, and not detailed architectural presentations. Of the three, the "Pinwheel" alternative [23] "assumes that initial construction would start with a new core of central facilities common to the entire Medical Center.... This alternative would allow for immediate realization of the Floating Hospital's goal of new horizontally continuous facilities.... This link is not limited to all-weather circulation, but permits the functions to flow uninterrupted over Washington Street.... The "Pinwheel" approach, however, tends toward a looser grouping of elements. This in turn is reflected in less intense use of the land and greater pressures on it." [24]. See Fig. 3.9.

The Planning Study was well received and T-NEMC progressed toward a definitive architectural plan. The Architects Collaborative (TAC) was chosen as master planners and architects in 1965. "With the medical center planning office, TAC developed the overall concept of continuous layers of activity covering most of the 13-acre site [25]. "This study [of pediatric nursing care] showed that patient-care spaces extending horizontally over several acres have distinct advantages over the more common nursing tower scheme .... The horizontal scheme allows for flexible assignment of space and encourages informal contact .... The whole concept of horizontal layers depended on approval of air rights construction over Washington Street...." [26].



The master plan engaged in a thorough rethinking of traditional hospital forms. "The traditional layout of rooms along corridors was abandoned for a 'cluster' layout, with nurses, examination rooms, supplies, etc., located at the center [27]. The traditional topology of a 50- to 60-foot-wide wing with central corridor was abandoned as well. To link the clusters together, there are two networks of corridors-- a primarily public one for visitors and a more internal one for staff and supplies [28]. See Fig. 3.10.





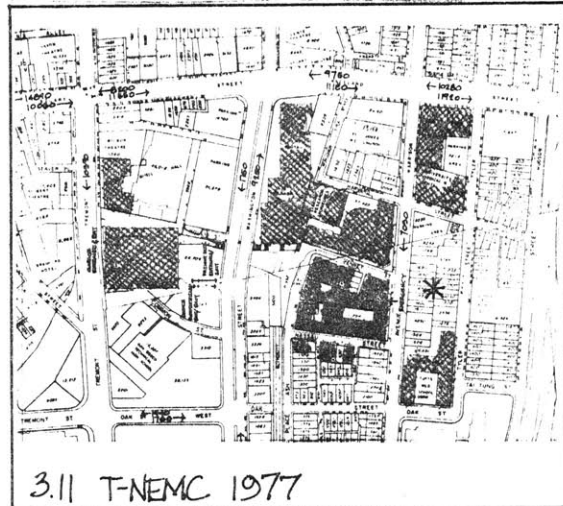
To supply, service, temper and condition these acres of horizontal continuity would require mechanical, electrical, and plumbing systems integrated into the design. TAC devised a structural grid with complementary pipe and air risers at frequent locations. Precast concrete double tees were to be laid over a poured-in-place concrete frame, the spaces between the bottom of beams and the undersides of the structural floor to allow primarily unidirectional distribution. Airhandling equipment penthouses, two floors high, ran across the top of the whole complex, tying it together.

Contemporary reaction was quite favorable and T-NEMC pressed forward with construction of the first phase. In the South Cove Urban Renewal Project, work was to begin on relocating the rapid transit system under Washington Street and foundations for T-NEMC buildings would best be laid concurrently with relocation work. So, an \$11.8 million Dental Health Sciences Building, to occupy the southeast corner of Washington and Kneeland, and a \$10 million Health Services Building, lying south of Dental and connecting to existing T-NEMC buildings, were begun. Before long the recession of 1970, decreased federal funding, increased neighborhood uneasiness with the master plan, as well as increasing questioning within Tufts as to its practicability, led to postponement of plan implementation.

### 3.2 CURRENT SITUATION

Major T-NEMC medical facilities remain east of Washington Street.

Refer to Figure 3.11. The Dental Health Sciences and Health Services Buildings were completed in 1973, and a 900-car parking garage between Tremont and Washington has been added. Significant changes have overtaken health planning in Massachusetts. Recall the 1964 statement which charged the Medical Center to evaluate its position continuously with respect to other medical centers in the area. The Certificate of Need Office of the Commonwealth's Public Health Department is now an agent in statewide health care facilities plan-



ning. The board now evaluates all proposals for expenditure with the aim of reducing duplication of facilities, waste, and, in general, controlling health care costs. Medicare and Medicaid have become at least as influential as the private insurance companies in the determination of rates of reimbursement. Medicare and Medicaid bring health care to more of those who could not normally afford it, raising state subsidies and thereby increasing taxpayers' burden. The state must try to balance taxpayers' ire against broader accessibility to health care. T-NEMC's ex-

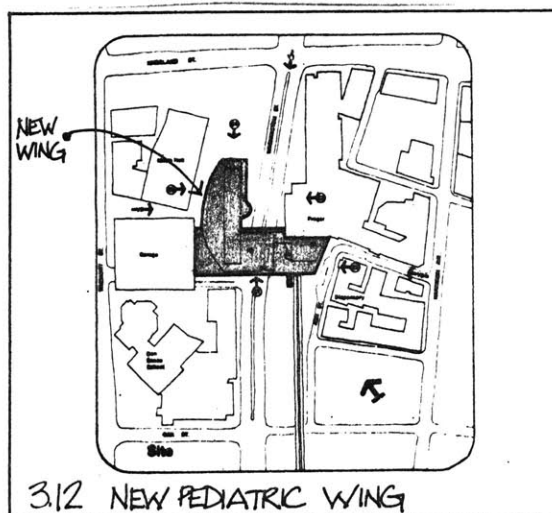


tensive development plan represents a sizable investment in new facilities aimed at improving health care delivery, as well as improved facilities to better render the specialized care procedures it has developed. Like all other hospitals, T-NEMC must now prove its case not only to the banks, or to the insurers, or to its own Board, but to state health planners.

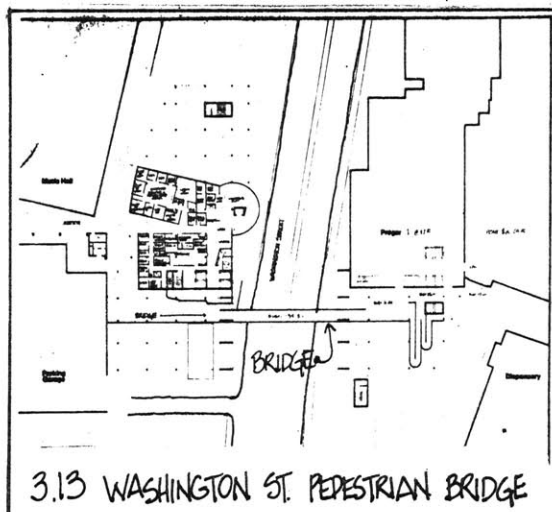
### 3.3 CURRENT PLANS

Past reversals and new realities have reshaped the attitude of T-NEMC planners. The determined orientation of the TAC plan retained a certain inflexibility in basic form and prevented nimble adjustments due to the vagaries of politics and economics. A more subdued, step-by-step approach is now in evidence.

A continuing priority is new facilities for pediatric care. Advances in programs and medical technology have long ago outstripped the capacity of existing structures, none younger than twenty-nine years. Perry Dean Partners has completed schematic design for a new pediatric wing to bridge Washington Street. Refer to Figure 3.12. Included in the design is a pedestrian bridge across Washington approximately level with Tremont Street at the Music Hall Theatre, and the first floor level of the Health Services Building. Refer to Figure 3.13. This link will facilitate negotiating the hill on Tremont Street, a remnant of the original Shawmut Peninsula.



3.12 NEW PEDIATRIC WING



3.13 WASHINGTON ST. PEDESTRIAN BRIDGE

In addition to pediatric facilities, the new wing will contain a surgery suite. Existing surgery at Farnsworth, see Figure 3.4, is located adjacent to the main kitchen facilities on the ground floor. Some adult clinics would be moved to the new wing, aligning them more closely with patient-care floors in Pratt and Health Services. Figure 3.14 presents the disposition of major activities along an east-west axis from Tremont Street to Harrison Avenue. T-NEMC planners feel that separation of adult and pediatric patients should be achieved where possible[29].

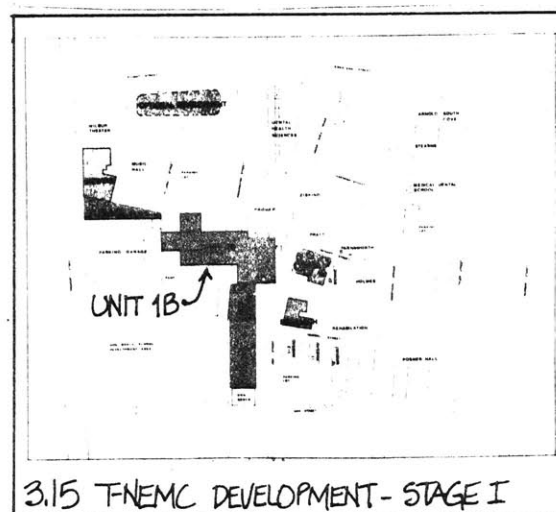
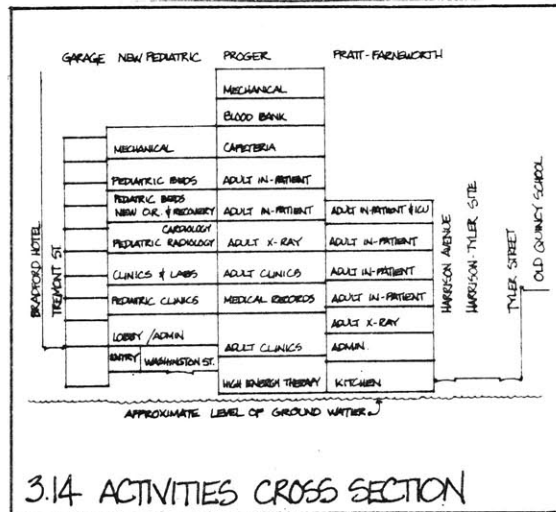
The current plan seems to achieve that aim, placing the main adult entrance and adult clinics east of Washington Street and pediatric entrance and clinics above Washington Street and to the west.

Longer Range

While not adhering to a fixed, inflexible form of the future, T-NEMC planners have set down some indication of what they could imagine the future to be [30]. Emphasis is on step-by-step growth, consolidation of existing resources, remaining within the boundaries already well established with the community. Three "stages" are illustrated in Figures 3.15, 3.16, and 3.17. Stage one's major effort is the construction of the new pediatric wing over Washington. Its completion will allow removal of the existing Dispensary and conversion of the Floating Hospital into a research building.

Stage Two concentrates on parking garage expansion to the south of the main buildings. Although forecasts of demand cannot be presently made, the bulk of the site suggests a structure similar to that on Tremont Street. Also important is development concerned with educational expansion. A new classroom and learning resources building is projected. In addition, demolition of other structures along the south side of Bennett Street would allow continuation of a small park to Harrison Avenue.

Stage 3 would signal the construction of a large new piece of in-patient hospital. Whether this piece is an expansion or a replace-

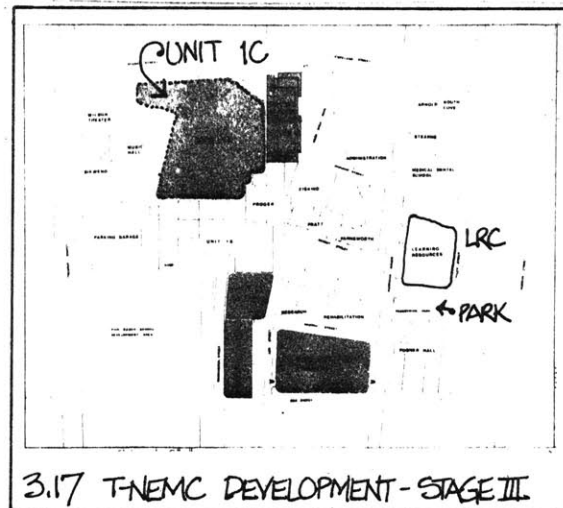
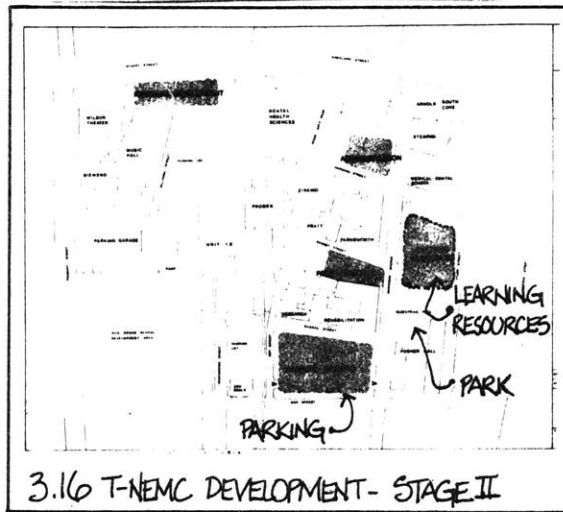


ment is unclear. Other developments include expansion of the pediatric wing southward, expansion of Dental Health Sciences vertically, and placement of research activities above the south parking garage.

The outcome of these stages would be a medical center astride Washington Street. Hospital facilities would be located toward the west, educational facilities toward the northeast, research toward the middle, and parking toward the western and southern fringes.

The Rehabilitation Institute would remain on Harrison Avenue. Demolition of neighboring buildings could allow the Rehab Institute a stronger, more independent-of-hospital, identity. The T-NEMC Emergency Ward, currently housed in the ground floor of Rehab, should be moved into hospital unit 1C at Stage 3.

Tufts-New England Medical Center is the context within which the Rehabilitation Institute operates. The development plans of T-NEMC form the institutional context for the thesis work. Any projection for the block bounded by Harrison, Oak, Tyler and Harvard will be colored by the goals, objectives, and planning proposals which have been set forth here.





# 4 New Programs for the Rehabilitation of the Physically Disabled

It seemed unwise to ask the reader to digest a thesis on design of facilities for physical rehabilitation without allowing some background as to what physical rehabilitation is. The process of physical rehabilitation (rehab) differs significantly from a normal hospitalization in an acute care facility and has different implications for design. This Chapter will outline the rehab process and consider its parts.

Physical rehabilitation concerns the physically disabled. Our society would have us believe that the disabled are mostly those in wheelchairs and that their numbers are small. Quite the opposite is true; the physically disabled constitute a significant fraction of our population and the title gathers to it many more than wheelchair users. The Chapter will primarily concern physical disability which results from two important causes: stroke, and spinal cord injury.

The Chapter will define the programming base from which thesis work will

come. New programs for rehab will concern the notion of transitional care, care which would ease and facilitate the change from in-patient hospital life to community-based everyday existence. The new programs are a goal: that combination of programs, policies, staffing levels, and organization of rehab services which would provide a continuum of responsibility and interaction between the rehab institute and their clients. The thesis will test that goal against the requirements of built form.

It is important to mention the informal group which has provided the groundwork for this program statement. Dr. Paul Corcoran and Dr. Fred Fay are currently staffmembers at Tufts Rehabilitation Institute, Boston, Massachusetts. Dr. Corcoran is a physiatrist, while Dr. Fay is research director of RT-7, the New England Region Medical Rehabilitation Research and Training Institute. Another staffmember, Dick Gould, serves as placement coordinator and as a peer counselor. Corcoran and Fay were among the founders of the Boston Center for Independent Living (BCIL), serving there before coming to Tufts Rehabilitation Institute. Dick Gould set up a placement counseling program at BCIL before transferring to Tufts. Corcoran and Fay are co-founders of Environmental Rehabilitation, Inc., a non-profit corporation they hope can help manage the creation of transitional care facilities.

This Chapter is divided into four parts. First, the grouping "permanent physical disability" is examined. The general size and character of the disabled American population is considered. The nature of disability

caused by stroke and spinal cord injury is outlined in detail, since it is these people who become prime "candidates" for rehab. Second, the "classical" rehab process is contrasted to the "medical model." The nature of the problem to which rehab is addressed, the nature of response to the problem, the components of the rehab team and treatment services provided are examined. An overview of the rehab process is included to show the relation of team members and how rehab fits into the client's life experience. Third, limitations and difficulties of the present rehab process are listed. The implications of monetary constraints as well as contradictions between the goals of rehab and the actual physical/social/psychological settings of rehab are exposed. Finally, the fourth section proposes new programs for rehab. It begins by restating certain goals in light of present experience. An argument is then made for transitional care facilities. The argument proceeds from several orientations: psychological; social; monetary; staffing; and facilities utilization. Three transitional care programs are proposed: weekendening; dorming; apartmenting. Each program is detailed in terms of staffing needs, organization of living units, orientation to rehabilitation institute, and integration with the surrounding community.

#### 4.1 DISABLED AMERICANS: WHO ARE WE?

Recent estimates indicate that one in seven Americans has some form of permanent physical disability [1]. A disability is not the same as a

handicap. The author defines a disability as a physical condition which alters a person's "normal" function and restricts function. A handicap results only if environmental situations prevent life activities because of the disability. Architectural barriers legislation removes impediments to the use of facilities so that many disabled are no longer handicapped.

The disabled include those with birth defects, amputated limbs, those with chronic back problems or degenerative diseases, those with severe arthritis or movement-limiting respiratory ailments. But two causes, spinal cord injury and stroke, are more often the concern of physical rehabilitation.

The sources of disability are numerous. 100,000 babies are born in the U.S. each year with a disability which will require use of walking device, braces, or a wheelchair. 325,000 veterans returned from Vietnam with some permanent physical disability. HEW estimates that more than 10,000 more people are confined to wheelchairs each year due to spinal cord injury [2]. The disabled are not necessarily elderly. At least half of the nation's quadriplegics are under 25 at the time of their accident. The incidence of stroke has increased recently and creates a large number of new disabled people each year.

Spinal cord injury (SCI) results from a lesion (cut or bruise) in the spinal cord. At the extreme, the cord may be sev-

ered. The degree of disability rises as one mounts the spinal column, with as many different shades of disability as vertebrae in the backbone. Two types of SCI are defined: paraplegia, in which the lesion occurred lower than the first thoracic vertebra; and quadriplegia, whose lesion occurred above that point. Paraplegics lose function of the legs and often control of the bladder and excretory system. Quadriplegics lose function of the legs and bladder plus function loss of the torso and arms to varying degrees. Paraplegics can return to near "normal" lives and operate with a great deal of independence. Quadriplegics can return to the community mainstream and live independently, although with varying amounts of personal care assistance.

Cerebral vascular accidents (CVA), or strokes, are caused by a blood clot which forms in, or travels to, the brain, or from a spontaneous brain hemorrhage, preventing flow of blood to a portion of the brain for some time. The resulting brain damage can cause paresis (weakness) or paralysis to one side of the body or another, dependent on the location of the damage. One-sided weakness or paralysis, hemiparesis or hemiplegia, has very different implications for lifestyle than does spinal cord injury. Coincident with the damage may be impairment of communication abilities, resulting in one of the several types of aphasia. Loss of one-sided function can cause perceptual, behavioral, respiratory or swallowing difficulties which complicate the stroke victim's return to the community.

Quadriplegics use wheelchairs, as do paraplegics. Almost invariably hemiplegics use wheelchairs or walking aids. But one should not presume that any person in a wheelchair is there due to the above-mentioned causes. Perhaps the most famous American wheelchair user was Franklin Delano Roosevelt, who had polio.

#### 4.2 THE PHYSICAL REHABILITATION PROCESS AND THE MEDICAL MODEL

The "classical" rehabilitation process is distinguished from the medical model of in-patient care by differences in emphasis, in goals, and in attitudes. In order to acquaint the reader with these differences and to assure a better understanding of the rehab process, this section outlines elements of the two approaches to medical care.

The "medical model" is a term used for the common approach to health care delivery in acute-care facilities. The approach is problem-oriented, in which specialists may be employed to treat the problem and eliminate its impact. A problem, then, is some set of bodily illnesses, diseases, or disfunction. Interaction with the acute care facility is episodic; once the patient's problem is resolved, the facility can discharge the patient and may not require further interaction. The emphasis is on solving the problem. To that end, stay in the acute care facility can be short, two weeks or less. During the stay, a patient accepts close nursing and physician supervision and yields to facility-administered structuring of everyday

life. The facility pre-empts actions of everyday life, including choice of diet, choice of foods, and food preparation. Pre-empted also is the scheduling of visitors. The potential for social interaction is controlled, including a recent trend to isolate patients in one-bed rooms in order to maximize utilization. The organization of daily schedule including staff visits, and the taking of medicine, is handled by the facility. Finally, the acute care facility pre-empts performance of housekeeping chores and even dictates the layout, materials, colors, and character of the patient's immediate environment, the room.

The rehab process differs from the medical model approach in both definition of the problem and response to the problem. The essential difference between the two springs from the fact that with rehabilitation, the client has undergone a fundamental change in physical characteristics and abilities and cannot be returned to the original condition. Thus very early on in the rehab process the client must ask, "Can I accept myself as I am now and go on living?" Some answer "No" outright. Some answer "No," tacitly, and live on with minimal contact with the larger world. But most answer, "Yes," within the first several months or first few years and begin the open-ended task of adjusting to the permanent change. Even those who wish to pursue rehab wholeheartedly can encounter attitudinal/emotional/psychological problems related to their new condition. These must be dealt with carefully if the client is to progress. Thus rehab must be concerned with the total client--soma and psyche--body and mind--if success is to be gained.

The approach taken by rehab staff-members is therefore at variance with the medical model. A team is formed, composed of all relevant disciplines, to work with each client. The team includes a physiatrist, a medical doctor whose emphasis is on physical rehabilitation, and may include a physical therapist, an occupational therapist, a speech pathologist, a psychiatrist or psychologist, a rehab counselor, a vocational-educational counselor, and a therapeutic recreation specialist. The team guides decisions on what services a client receives and evaluates the progress of each client.

The approach to rehab is further differentiated by the need to actively engage the client in the process. In the medical model, patients participate mainly by refraining from activities: no excitement, no smoking, restricted activity, restricted diet. But the rehab client must understand the physical problems and be willing to actively address them if progress is to be made.

Rehab clients spend much more time in "acute care" facilities [4]. Hemiplegics may spend up to four months in rehab; paraplegics spend at least three months in the rehab setting; while quadriplegics currently require at least six months' work in rehab. The length of stay increases by a factor of ten or more above the medical model; clients are around long enough to develop strong relationships to other clients, staff, and can build up strong associations with their physical environment. In fact, another factor which distinguishes rehab is the encouragement of group interaction and peer pressure to progress. The client farther along in rehab who lives across the hall may



serve as a role model for the newly-admitted client.

Finally, the concerns of rehab ought not stop with discharge. The rehab facility should guide clients in their steps back into the community. This may be accomplished through testing, securing of housing, recommendations for continued treatment.

A summary of the rehab process is presented below. The client begins with "onset"--the accident, the physical malady, which creates the disability. Then follows acute-care hospitalization to stabilize the client medically and allow the client to live without constant nursing attention. A series of conferences and evaluations follow in which the client's potential for rehab is assessed and a referral for admission to a rehab facility is made. A waiting period may ensue at this point, dependent on the load then experienced by the candidate facility. Upon admission the rehab team gathers to evaluate the client and devise a treatment plan. Treatment services then follow. Physical therapy is concerned with improving the client's strength and range of movement through special exercises. Occupational therapy amplifies and extends activity begun by the physical therapist by encouraging the client to undertake arts, crafts, activities of daily living (ADL), (cooking, cleaning, washing), learning new ways of doing familiar tasks. Speech pathology concentrates on improving communications skills. Psychiatry is concerned with resolving emotional and attitudinal problems of the client and client's family. The rehab counselor acts as a combination advisor, confidante, and

agent for the client in relating to the rehab process. Vocational-education training evaluates the potential of rehab clients and helps determine changes necessary in the client's existing home and/or work environments. The therapeutic recreation specialist tries to guide the client in reshaping lifestyle patterns and may aid in re-socializing the client through programming and "out-trips," limited excursions into the real world and its difficulties. During the rehab process, periodic evaluations, about once every two weeks, assess the progress of each client and approve changes in the treatment plan. As the client nears discharge, the team will work to refer the client to another facility for additional work or to coordinate the client's return to the home environment.

#### 4.3 QUESTIONING THE STATUS QUO

The implementation of any theory of medical care is tempered by restrictions of personnel, money, and facilities. Only a small portion of our population is wealthy enough to afford any required medical care, regardless of price. A majority of Americans retain medical insurance. The insurers carefully craft policies which specify what services are "reimbursable" and which are not. The range of services offered by a "health care provider" can be influenced by the decisions of the bureaucracies which regulate health care and insurance.

The unique qualities of the physical rehabilitation process can sometimes get lost in the crush of shorthanded staff, insufficient space, and overburdened equipment. The role, respon-

sibilities, and opportunities available to the rehab client may be confused due to the rehab facility's superficial similarity to an acute-care hospital. This section will examine these peculiarities which compromise the rehab process.

#### The impact of monetary arrangements.

New approaches to medical care may encounter difficulty in gaining approval for new combinations or variations of services from the insurers who finance health care for a majority of Americans. Certainly a timelag intervenes between proposal of service and approval by the state health planning agency or health insurers. Those contemplating innovative services or approaches have two choices: either adjust new ideas to fit within existing formulae of "reimbursable" services; or to apply for full reimbursement of new services and face a bureaucratic delay. The former option certainly has the potential to skew the provision of health care so that the goals behind the service may be compromised.

Restraints of reimbursement formulae extend to influence staffing levels and the type of personnel employed, as well as how and where those personnel are utilized. The formulae fix a maximum charge for health care services and, directly or indirectly, indicate what type and number of staff are required, as a minimum. But, as in federal housing standards, the minimum quickly becomes the maximum. Standards and formulae may also reduce flexibility. In-patient beds in physical rehabilitation settings may be classified as acute-care beds in order to guarantee reimbursement sufficient to balance costs of personnel needed to make the rehab

setting successful. These personnel may not need to perform "acute-care" services. But a self-fulfilling action may be commenced; the danger exists that "acute-care" labeled rehab beds may turn out to function like acute-care beds. Rehab goals are thereby compromised.

Health care costs have increased dramatically in the past decade and health care insurers, as well as Medicare and Medicaid, have come under fire from two sides. On one hand, consumers are agitated over the steep rise in premiums, or taxes; on the other hand, health care providers plead for more funds to pay for more costly equipment, utilities, and staff. Caught in the middle, insurers have demanded closer scrutiny of client progress and greater efficiency by providers. In rehab, this new input is reflected in client conference evaluations by staff. At each conference the client's progress is reviewed. Should the client have made little or no progress in the preceding early period, discharge of the client is encouraged. Reducing the length of stay allows scarce facilities to be available to more clients in the same period.

Contradictions between goals and the reality. The rehab process is supposed to facilitate adjustment--adjustment to a new physical condition which requires the learning of new skills and techniques. The adjustment is geared toward returning to the community mainstream, taking up an active and purposeful life. Returning to the community means moving toward the goal of independent living, functioning in a family unit if desired and living in a private

apartment or house, not in an institution.

But this adjustment requires a lot of preparation. Clients may be ashamed of or depressed by their disability and too early re-exposure to the real world may traumatize them severely. Further, clients may require outpatient services to maintain their level of mobility once discharged. What actually happens can come into conflict with these goals. Conflict is generated in four areas: control of lifestyle, control of physical setting, transition to the community, and follow-up.

If the disability was caused by an accident of some kind, the client will have been hospitalized before coming to the rehab facility. In hospital the client ceded control over daily activities. The nursing staff coordinated meals, medicines, visitors, roommates, while the client recuperated. On being transferred to the rehab facility, the client's initial impression may be that this, too, is a hospital, and may form expectations of that kind of care. Those expectations are usually fulfilled beyond the requirements of the setting. The client is not encouraged to exercise initiative concerning daily activities. This fosters a dependency on staff which directly conflicts with the goals of rehab.

An inpatient nursing unit is based on supervision. Staff should be able to see patients easily and to monitor their condition. But one goal of rehab is to adjust to a "home" situation, in which the client may freely assert the desire

for privacy. The nursing unit situation lies in conflict with this goal. Clients cannot "lock the door," figuratively or actually. The lack of privacy enforces a feeling of submission to staff which regulates the client's existence. This pattern is typically continued until discharge, when the client is suddenly faced with deciding how much privacy there ought to be.

To a new physically disabled client, the community can be a frightening place. The client may know that society's attitudes toward the disabled (including, until recently, his own!) are not always positive. The client might only guess at the uncountable obstacles to movement which will make activities in the community very difficult. The client may feel defensive about the disability and reticent to enter into community activity. The client may find it bewildering and certainly frustrating to be unable to move at the pace used previously. The client will have to master many skills as they can be performed in the new situation. Rehab does address these problems, but the transition between rehab facility and community is not well made. A rehab facility offers a lot of support: physical, psychological, social. Direct and abrupt transition to the community, which offers little or no support, is very difficult. The client may be "ready" physically, but is the client prepared psychologically?

The rehab team is concerned with placing clients in environments which match the individual's needs. But the constraints of time, and the pressure to discharge "ready" clients often combine to yield inappropriate and unproductive assignments. In addition, there has been a tendency to discharge

without follow-up. The rehab client who is confined to a second floor bedroom in the old family house, unable to get out and operate in the community, cut off from treatment services and psychological counseling, is not a successfully rehabilitated individual.

#### 4.4 PROPOSALS FOR CHANGE

What might be done to redress these problems? How could the rehab process respond, and to what? Changing the reimbursement system might be beneficial, but what grievance in particular needs remedy? Any change in the monetary aspects must be generated by new ideas about what should happen in the rehab process, and not vice versa. The principal problems seem to concern the client and the client's role in the rehab process. Related, the problems include role of the physical setting and the team members. Three goals seem to be most important. First, individual choice by clients should be encouraged and facilitated as early as possible. The range of choices potentially available should be reviewed. Clients should be appraised of these choices and encouraged to take them on. Second, team members should involve the client more extensively in understanding the disability. Team members should encourage the client to know, by discharge, as much about the client's personal disability as does the team. The knowledge will enable the client to understand problems encountered and how to respond. In addition, earlier inclusion of certain team members will smooth the transition to the community. For example, earlier input by peer counselors and the rehab carpenter would be beneficial. Peer counselors are current or former

clients who are farther along in rehab. They help the client with problems, to act as a cohort on excursions into the community, and as a role model who demonstrates what is possible. The rehab carpenter creates adaptive devices for the client, but can also modify the home and work environments to the needs of the client. The earlier the carpenter is included, the more time is available to accomplish changes. Third, more flexibility in physical and social setting is needed in the rehab process. In particular, the transition between in-patient status and the community could be explored. Removing the client from acute-care-like environments toward those closer to the reality of the community would be beneficial.

One way to approach those goals is the creation of "transitional care programs and facilities." "Transitional" means that the new programs are focused on the steps between in-patient routine and community living. "Care" implies that rehab team services would be available as needed, but not necessarily on-site. "Programs" means that we are discussing more than one step. Programs means that each step may have unique staffing components, unique relationships to the rehab facility and the community, and unique methods of funding. "Facilities" means that each program does have physical implications unique to it. It also implies that the programs cannot take place within the bounds of a traditional rehab facility.

Transitional care programs and facilities would fuzzi the line between inpatient hospitalization and home. Three programs are envisioned:

weekending; dorming; and apartmenting. Weekending would enable clients midway through the rehab process to "try out" living outside the hospital for a day, an evening and a day, or a weekend at a time. This program would enable families to gain exposure and experience living with the client. Dorming would enable clients in the last month or two of rehab to be discharged from inpatient services. In dorming several clients might live together, sharing responsibilities and commuting to the rehab facility for treatment services. Apartmenting would be the third step in smoothing the transition. Clients would live relatively independently in apartments, singly or in pairs, in the last few weeks of the normal rehab stay. Through flexible leasing arrangements clients might extend their tenure if placement efforts had not yet been successful, or if the chosen housing was not yet ready for occupancy.

What are the advantages which accrue to this proposal? They are numerous and concern cost of care, capacity of facilities, and psychological and social orientation.

Cost. It is expected that these programs would reduce the total cost of rehab care. Refer to Figure 4.1. Acute in-patient hospitalization costs at least \$150/day, while a level III nursing home is reimbursed only up to \$18/resident day. The Boston Center for Independent living costs approximately \$30/resident day [5]. Weekending, with the highest staff levels, would have resident costs approximately equal to an independent living center. Dorming would have resident charges

#### HOSPITAL PER DIEMS:

CHRONIC ..... \$80-\$150  
 ACUTE ..... \$150-\$300  
 TUFTS REHAB..... ~\$280

#### NURSING HOMES

LEVELS I & II..... \$20-\$35  
 LEVEL III..... \$12-\$18

#### CENTER FOR INDEPENDENT LIVING.....

~\$31

#### COMMUNITY CLUSTER

LIVING..... ~\$24

#### INDIVIDUAL HOME OR APARTMENT.....

\$11-25

#### 4.1 LIVING ALTERNATIVES-DAILY COSTS

approximately equal to community cluster living plus treatment services charges of up to \$100/day. Apartmenting would have costs comparable to an individual home setting, plus treatment services charges up to about \$50/day [6].

Capacity. The dorming and apartmenting programs would allow clients to terminate in-patient status earlier. This implies increased capacity for the rehabilitation institute in terms of total clients per year. This additional capacity would be

accomplished at a fraction of the cost of actually building additional rehab in-patient beds.

Evaluation. Presently clients are maintained in the rehab facility until discharge, with exposure to the community limited to occasional out-trips or family excursions. The transitional care programs would improve physical and psychological evaluation of clients by creating a series of reality-based but controllable "tests" of the client's real progress. The flexibility of these programs means that clients who do less well initially have time to improve their performance while still in a low stress situation, a valuable opportunity.

Psychological/social orientation. The transitional care programs, especially weekending, would be of great benefit to the mutual adjustment process between client and family. In addition, the client would be introduced to successively stronger "doses" of reality. In apartmenting, clients would spend large amounts of time moving about in the community, practising the skills of daily activities.

Placement. Transitional care programs would increase the flexibility of the rehab process and allow more comprehensive evaluation of clients. These two facts would complement the vocational-educational counseling and community housing search. Apartmenting might allow a client to return to the job, even though permanent housing is not ready.

Each of the transitional care programs and their needed facilities is

represented below. An individual client might use some, all, or none of these programs, dependent on need. Implementation of these programs would further the goals of physical rehabilitation. Rehab is interested not only in adjusting individuals to their disability, but in returning productive individuals to society. Rehab would like to produce taxpayers, not taxburdens. We believe that these programs aid that end.

Weekending: The client tries out living away from the hospital for periods of time up to a weekend.

Staff:

- A personal care attendant in the living unit 24 hours per day.
- Peer counselor interaction up to 4 hours per day.
- Nursing staff, doctors, other team members on call from T-NEMC.

Capacity:

- As a pilot project, approximately 8 clients/week.
- Living units 1, 2, and 3 bedroom. Designed for the disabled.

Dorming: Up to four clients live in one household, commuting to Tufts Rehab for team treatment services.

Staff:

- A personal care attendant in the living unit, morning and evening, up to 8 hours per day per client; otherwise on call.
- Peer counselors up to 1 hour per day, per client. Interaction between dormers encouraged. Dining in apartment or restaurant/cafeteria/coffee shop available in building.

- Capacity: ◦ Approximately 8 clients/week.
- Living units 1, 2, and 3 bedroom. Designed for the disabled.

Apartmenting: Clients live independent lives, going to T-NEMC for outpatient services as needed but interacting chiefly with community.

- Staff: ◦ A personal care attendant on call up to 4 hrs/day per client.

- Attendant on call for the group of 8.
- Peer counselors by appointment.
- Nursing staff, others available through attendant from Tufts Rehab.

- Capacity: ◦ Approximately 8 clients/week.
- Living units 1, 2, bedroom. Designed for the disabled.





# 5

## Transitional Care Programs : Analysis

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The previous chapter described how new transitional care programs could be introduced in the rehabilitation of the physically disabled. In order to design facilities for these programs, a detailed analysis must be undertaken. This analysis must further specify the characteristics of each of the programs, as well as propose a set of "norms." The norms represent agreements reached by the participants in one design process and are not necessarily applicable to all designs everywhere. A set of norms can be used in the design of a transitional care facility. The ability of a basic building to accommodate a transitional care facility designed according to these norms is an important measure of the basic building's adequacy.

The work in this Chapter and Chapter Six draws on the methods developed by the Stichting Architecture Research (Architecture Research Foundation) (SAR) of the Netherlands. Some of this work is recorded in Variations: The Systematic Design of Supports, by N. J. Habraken et al. The reader is referred to this book for a fuller understanding of the SAR methods.

### 5.1 METHOD OF ANALYSIS

In order to move from a brief program description to a detailed design of a program's facility, several intermediate steps must be taken. First, a more detailed understanding of each transitional care program must be achieved. Of particular importance to facility design are the number of clients the program is intended to serve, how the program would operate, what demands for flexibility the program would place on the facility, and supporting services which might require space. Based on this information, the second need is a set of norms, which can describe the relation of a space to its function, the relation of a space to its location in the basic building, or the relation of a space to other spaces. Minimum space sizes and the number and potential location in the basic building of each type of space are proposed. These first two steps set the standards by which facility design can be evaluated, while at the same time freeing the designer and client group from confusing discussions of space norms with discussions of facility layout and design.

### 5.2 PROGRAM OUTLINES

Each of the transitional care programs is outlined below. The attributes of each program are discussed according to the following organization:

- Purpose of the Program
- Tenure of the Client in the Program
- Capacity of the Program at the Outset
- Preparation and Followup
- Financial Arrangements

- Program Routine
- Supporting Staff
- Supporting Facilities
- Supporting Programs
- T-NEMC Support Staff
- Transportation Requirements
- Maintenance
- Interaction with Other Client
- Interaction with the Community.

#### WEEKENDING

**Purpose:** Weekending is designed to allow clients midway through rehabilitation to experiment with community interaction. In addition, weekending is designed to bring clients and their families together to experience each other's changed roles and capabilities.

**Tenure:** A client can use the program for a day, a day and night, a weekend. Where clients will work with their families, weekends will get higher usage.

**Capacity:** Provisions for up to eight clients at one time.

**Preparation and followup:** The client and family will discuss the program beforehand with the rehab counselor and agree on the basic schedule and activities planned. Peer counselors will facilitate evaluation during and after the weekending experience. Additional weekending experiences can be scheduled as needed.

**Financial:** As the client most probably maintains in-patient status during weekending, the savings incurred by not using in-hospital services are not easily transferred to the weekending program. Two possibilities emerge: either to bill weekending as an in-patient treatment service, convincing the several bureaucracies of its therapeutic values; or petition the third-party-payment-governing bureaucracies to add weekending as a new, independent, out-of-hospital service reimbursable directly to the transitional care administration.

**Program Routine:** The peer counselor

introduces the client to the apartment and the personal care attendant. Dependent on a client's status, weekending might include passive activities--e.g., reading, TV, cards; or active programs--cooking, gardening, exercise, or touring the neighborhood. The personal care attendant is available to the client continuously, and stays overnight in the apartment. If involved, the family also stays in the apartment.

**Staff:** One personal care attendant is assigned to each client and is based in the apartment. Peer counselors are available to each client up to four counselor-hours per day. At the outset, four peer counselors would be needed.

**Facilities:** As family participation is to be encouraged, some large living units will be required. The range of users would be between two people and eight people in any living unit. Each client apartment will have a full kitchen, up to two bathrooms, and a "normal" allocation of general purpose space. Bedrooms should be assignable to adjacent units to minimize over-supply. It should be noted that personal care attendants for all three programs may live in the weekending units, thereby partially deferring their cost.

**Programs:** Weekending's low-key emphasis should not place excessive demands on clients. Therefore no supporting programs are planned specifically for weekending.

**T-NEMC Support:** It is expected that clients ready for weekending would be medically stable and sufficiently progressed such that personal care attendants could handle all normal situations. For extreme situations, however, medical staff would be on call from Tufts Rehab.

**Transportation:** Dependent on the location of transitional care facil-

ities, transportation between hospital and the facilities would be arranged.

Maintenance: A small cleaning staff, possibly arranged through T-NEMC, would be necessary to maintain the living units. Should the transitional care facilities be located in close proximity, then all three could share a staff of approximately four or five people.

Client Interaction: Weekending is aimed at beginning the return to the community and to sensitizing the family to the new lifestyle. Interaction between clients and client families may be highly beneficial and mutually supportive, and is to be encouraged.

Community Interaction: specific community interaction is left to the client's initiative.

#### DORMING

Purpose: Dorming is designed to allow clients past the midpoint in rehabilitation to transfer out of the rehab hospital setting and into a living situation which places emphasis on individual action within a group setting. Clients are organized in related living units of from two to four people.

Tenure: A client might spend up to one-third of the rehab stay, four weeks for paraplegics and eight weeks for quadriplegics, in dorming. A client's entry point would depend on individual evaluation.

Capacity: Provisions for up to eight clients at one time.

Preparation and Followup: The rehab team would have full conference evaluation of the client and have the option of recommending dorming. The client would be fully briefed on the options available and, if the client agrees, would

be discharged from in-hospital stay and move to dorming. Evaluations of the client's progress by the rehab staff would continue and records of the experience would become part of the rehab counselor's file.

Financial: The client would be discharged from in-hospital to dorming. With current in-hospital rates hovering around \$300 per day, the incentive to reduce costs is intense. Dorming residence costs would be comparable to those of a community cluster living group home, about \$25 per client-day. To this cost is added the cost of out-patient treatment services, up to about \$100 per day. The total cost would be about half of in-patient care. Tufts Rehab would petition the bureaucracies to include dorming as a reimbursable rehab service, substitutable for in-patient status.

Program Routine: An analogue to dorming would be a college fraternity or sorority house. Members of dorming would live in the house, taking meals, cooking meals, sleeping, recreating, while going off to the Rehab Institute during the day for treatment services. Dependent on the schedule of treatment, members could return for lunch. The client is free to structure a lifestyle around scheduled treatment services and agreed-upon mealtimes. Clients can venture into the community at will. When the rehab team has determined that the client has made maximal use of rehab treatment services, discharge from dorming will be arranged.

Staff: A personal care attendant, one per client, will be in the living unit, mornings and evenings, and up to eight hours per day. The personal care attendant would otherwise be on call, located close by but not in, the dorming group.

Facilities: Dorming living units would accommodate between two and

four people. Each living unit would have a small kitchen and up to one-and one-half baths. Some flexibility in allocation of bedrooms is desirable for flexibility. Smaller general purpose spaces within each living unit would complement one or two common areas, including access to a hearth, and a group dining room and kitchen.

Programs: A major support program for dorming would be group dining. Lunch and dinner would be prepared each day and clients would serve themselves cafeteria-style. Meals at the dining room would be available to rehab in-patients on a transfer basis, and this would be encouraged. In addition, weekend-ing participants would be invited to dinners. Apartmenting participants, however, would be discouraged from becoming habitués of the dining room. A therapeutic recreation program would be an important adjunct to dorming. Leisure counseling and restructuring client recreation patterns would be stressed in conjunction with the rehab counselor and peer counselors. The activities of the therapeutic recreation specialist would be available to all transitional care program participants and to in-hospital clients.

T-NEMC Support: Same as for week-  
ending.

Transportation: Same as for week-  
ending, with the addition of trans-  
portation as needed for the thera-  
peutic recreation program. It is  
anticipated that the dorming facil-  
ity will be close enough to Tufts  
Rehab so that clients could go back  
and forth without transport.

Maintenance: Same as for weekend-ing.

Client Interaction: Comraderie be-  
tween clients and mutual support are  
important features of dorming and  
should be stressed. Clients in dorm-  
ing can act as role models to in-  
patients still located at TUFTS Rehab.

Community interaction: The thera-  
peutic recreation specialist will  
be expected to coordinate internal  
programs but also encourage indi-  
vidual client experiences in the  
community.

#### APARTMENTING

Purpose: Apartmenting is designed  
to allow individual clients to ex-  
perience living within the commu-  
nity while still utilizing rehab  
hospital services on an intensive  
basis. Apartmenting serves to pre-  
pare clients for independent living  
and provides a transition place for  
clients to live while awaiting com-  
pletion of community housing arrange-  
ments.

Tenure: Clients could spend as lit-  
tle as a week or as much as one  
month and, in some cases, up to four  
months. Apartmenting is not inten-  
ded to provide long-term housing  
for clients.

Capacity: Provision for up to eight  
clients at one time.

Preparation and Followup: The rehab  
counselor would brief the client on  
the program and review the client's  
progress to date. Review of the cli-  
ent's case by the rehab team would  
establish preparation for discharge.

Financial: Apartmenting is designed  
as a low-cost program with minimal  
support, closely matching the life-  
style a client might expect in the  
community. The client would pay for  
this program from disability pay-  
ments, or as a substitute service  
for rehab in-patient care. Out-  
patient treatment services furn-  
ished by the rehab hospital would be  
paid for accordingly.

Program Routine: An apartmenting  
participant is shaping a lifestyle  
which may carry over into the com-  
munity. Out-patient treatment ser-  
vices are reduced in importance  
and, where possible, vocational/  
educational training substituted.

In some cases clients could return to previous work situations or begin new ones, even though "technically" still in the rehab process. The client could be joined by wife or husband if applicable, and is free to arrange recreation activities.

**Staff:** A personal care attendant would be on call up to four hours a day, mornings and evenings, for each client. At other times a personal care attendant would be on call for the group of eight. All personal care attendants would live near, but not within, the apartmenting facility. Periodic conferences with a peer counselor would be scheduled.

**Facilities:** Apartmenting living units would accommodate from one to four people. Bedrooms should be flexible between units. Each living unit would have a full kitchen, living/dining areas, and up to one-and-one half baths.

**Programs:** Due to the community living orientation of apartmenting, no support programs are planned.

**T-NEMC Support:** Same as for week-ending.

**Transportation:** Individual clients may have to arrange transportation to and from work situations. The rehab counselor and vocational/educational counselor would coordinate this activity.

**Maintenance:** Same as for week-ending.

**Client Interaction:** Apartmenting participants may be asked to serve as hosts for rehab seminars with other rehab clients less far along in the rehab process.

**Community Interaction:** This aspect is stressed. All members of the rehab team and the transitional care staff should contribute to focusing clients on community living.

### 5.3 SPACES ANALYSIS

To shelter the programs outlined above, a variety of spaces is required. The numerous functions and activities suggest a range of spaces with varying amounts of specialization. The prevalent typology of spaces is residential. Only spaces for group dining, lounging, and recreation suggest a scale larger than that of the "extended family."

Each of the spaces needed for transitional care programs can be described as falling into one of three categories. General purpose spaces are those whose activities are not specialized. Therefore the layout of these spaces and their required dimensions are difficult to make explicit. Special purpose spaces are those with an acknowledged function, but not necessarily predeterminable arrangement of equipment and furnishings. Parameters for size for these spaces can be set forth. Service spaces are those with an acknowledged function, whose furnishings and equipment layout is easily predictable, and for which sizes can be postulated. Figure 5.1 presents a list of spaces needed to house activities expected in the transitional care programs. The spaces are organized by type of space. Included in service spaces are those required to accommodate environmental services.

Where in a basic building might any one of these spaces be located? To answer this question one must first develop a method for classifying locations for spaces in a basic building. What are the conditions which make the qualities of one

SPACE TYPE	SPACE NAME	ABBR.	POSITION			TRANSITIONAL CARE PROGRAMS					
			I	II	III	WEEKENDING		DORMING		APARTMENTING	
						PER LIVING UNIT	PER 8 CLIENTS	PER LIVING UNIT	PER 8 CLIENTS	PER LIVING UNIT	PER 8 CLIENTS
GENERAL PURPOSE SPACES	LIVING / TV / STUDY	L1	•	•	•	≤1	8			1	8
	STUDY / LIBRARY / HOBBY	L2	•		•	≤1	4-6	≤2	3-5	≤1	2-4
	GROUP DINING	L3	•	•					1		
	GROUP HEARTH	L4	•	•					1		
	DINING	L5	•		•	≤1	6-8	≤1	2	≤1	6-8
SPECIAL PURPOSE SPACES	ENTRY	E	•		•	1	8	1	3-5	1	8
	BEDROOM - ONE PERSON	B1	•			≤2	4-8	≤2	≤5	≤1	2-4
	BEDROOM - TWO PERSON	B2	•			≤2	4-8	≤2	4-6	≤1	2-4
	BEDROOM - MASTER	B3	•			1	8			1	8
	KITCHENETTE	K1	•		•	≤1	2	1	8		
	KITCHEN	K2	•		•	≤1	1-3			≤1	2-5
	KITCHEN - LARGE FAMILY	K3	•		•	≤1	1-3			≤1	1-3
	KITCHEN - EAT IN	K4	•		•	≤1	1-3			≤1	2-5
	KITCHEN - GROUP	K5	•	•	•				1		
	ATTENDANT / RECORDS	T1	•		•				1		
TREATMENT / EXAM	T2	•		•				1			
SERVICE SPACES	BATHROOM - SINK & TOILET	Ba1			•	≤1	4	≤1	1-3	≤1	1-3
	BATHROOM - SHOWER	Ba2			•	≤1	3	≤1	1-3	≤1	1-3
	BATHROOM - FULL	Ba3	•		•	1	8	1	3-5	1	8
	MECHANICAL - HOT WATER	M1			•		1-3		1-2		1-3
	MECHANICAL - TELEPHONE	M2			•		1-3		≤1		1-3
	MECHANICAL - ELECTRIC	M3			•	1	8	1	3-5	1	8
	TRASH	M4			•						
LAUNDRY	W	•		•	≤1	2					

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5.1 TRANSITIONAL CARE SPACES

place in a basic building different from another? The author proposes the following set of distinguishing characteristics:

- Proximity to the exterior.
- Areas which might be built or unbuilt (open).
- Proximity to public circulation.

With these three characteristics a series of locations can be notated for any basic building configuration. Flexibility is enhanced by the potential existence of areas where building might or might not exist. The choice on disposition of these areas would be partially determined by the occupant. Figure 5.2 presents how such a series of locations might be represented.

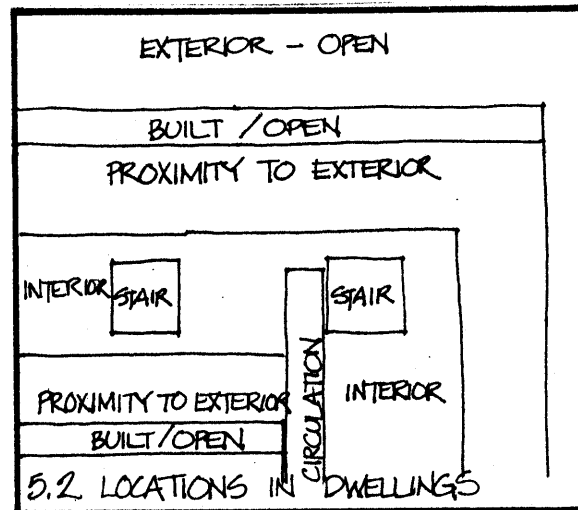
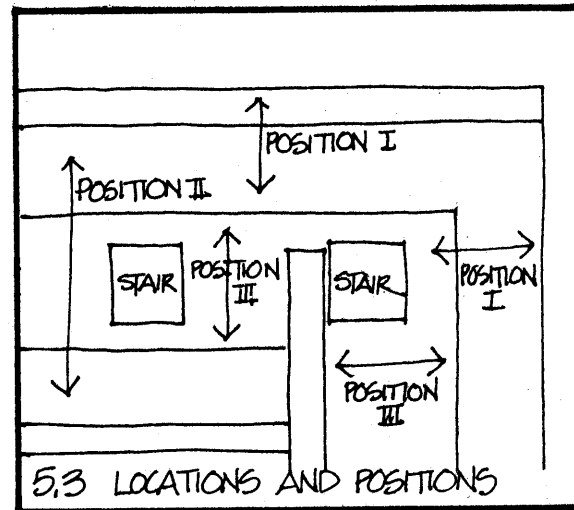


Figure 5.3 defines three positions for spaces within this organization of a basic building. Position I spaces are those which begin adjacent to the exterior and end in the middle area. Position II spaces are those which begin adjacent to the exterior and extend across the middle to the other exterior area. Position III spaces are those which are contained within the interior area only. Figure 5.1 notates possible position for each of the potential transitional care spaces, and cites expected quantities per living unit and per 8-client group.



#### 5.4 SPACE AND FUNCTION ANALYSIS

The design of transitional care facilities can be made considerably less burdensome if minimum standards for each type of space are agreed to beforehand. Evaluation of facilities and support design can therefore proceed independent of evaluation of individual spaces.

One way to perform a space and function analysis is to draw up a matrix of spaces whose dimensions increase along two axes in a repeating multiple. An example of such a matrix is Figure 5.4. In this matrix, the minimum dimensions can be located which are sufficient to shelter each of the activities called for in the transitional care program. Those spaces, once located, are notated with an example of the equipment and furnishings layout drawn in. For each L, B, K and Ba spaces listed in Fig. 5.1, the minimum space standards which can acceptably accommodate the activities are notated in Figs. 5.5 through 5.8.

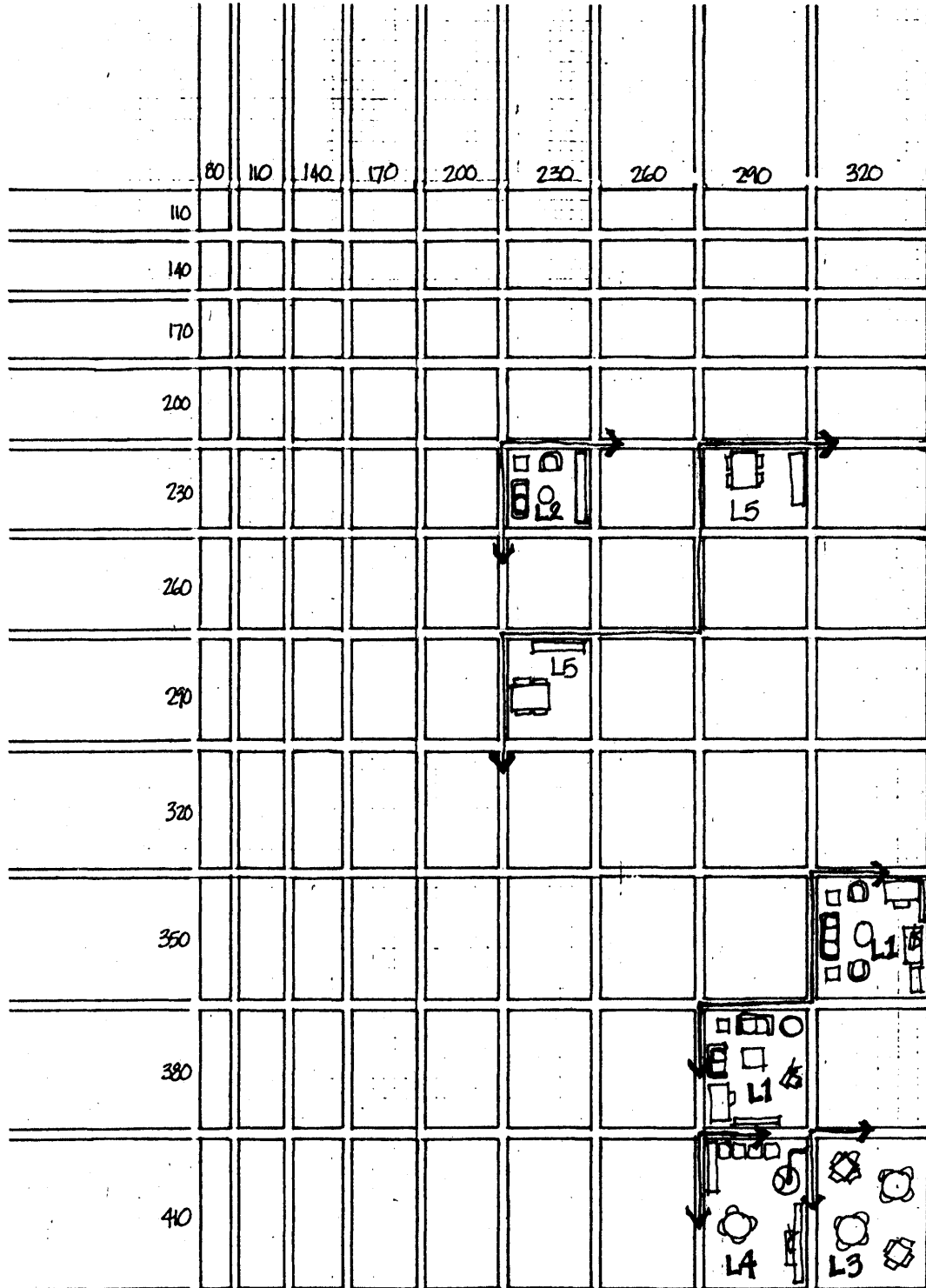




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SPACE AND FUNCTION ANALYSIS  
TRANSITIONAL CARE FACILITIES "L" SPACES

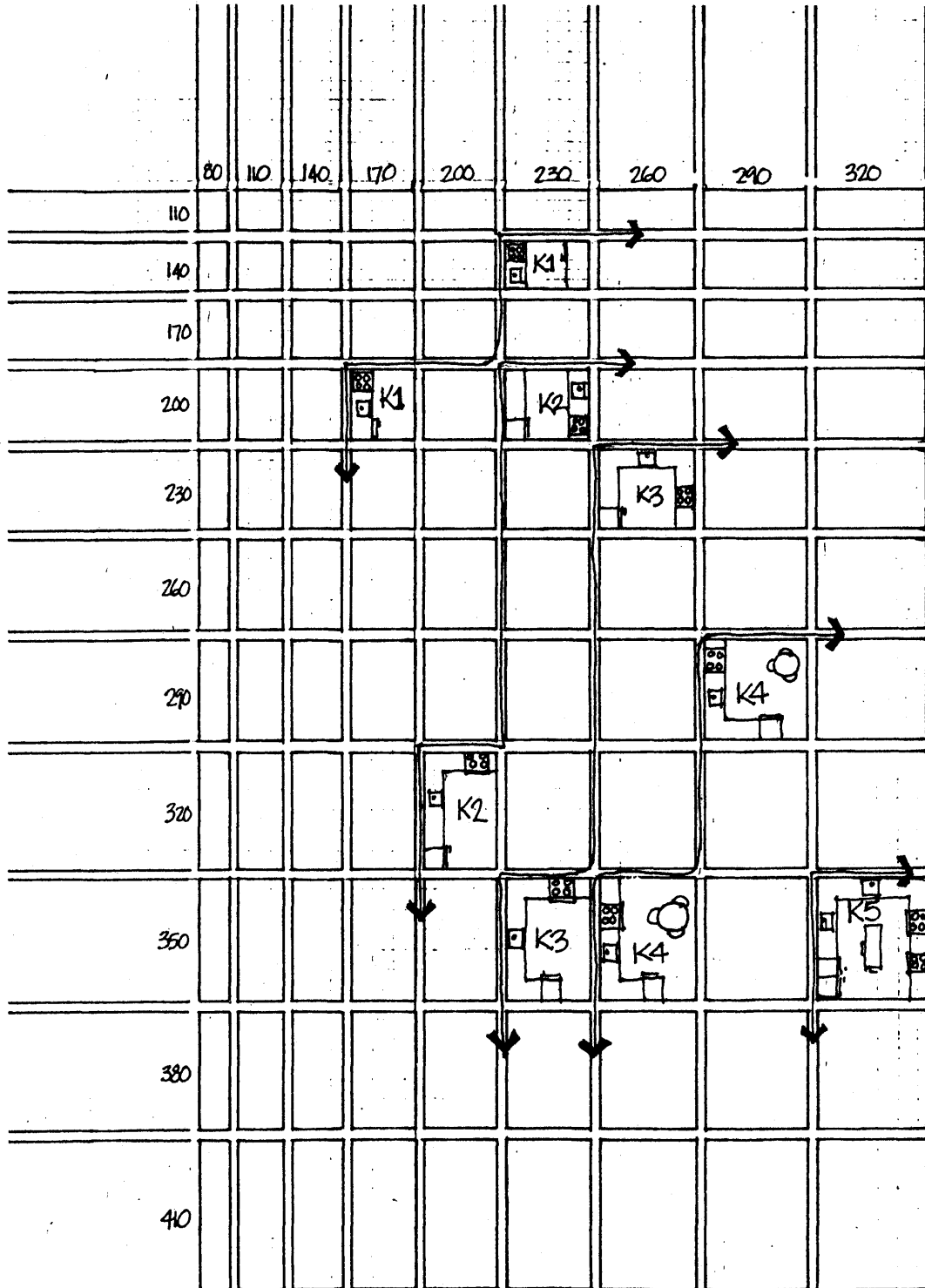




5.7

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SPACE AND FUNCTION ANALYSIS  
TRANSITIONAL CARE FACILITIES "K" SPACES





# 6

## The Basic Building : Analysis

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This Chapter continues the step-by-step progression from program analysis to the proposal of a basic building. Chapter Five described the transitional care programs and categorized the spaces needed for them. The next series of steps will identify potential characteristics of the basic building. First, the basic building is defined, and options for each of its constituent parts are explored. The result of this section is a group of options for each of the parts of the basic building. The choice of which options to pursue will be affected by the site analysis presented in Chapter Seven. Second, for one of the structure options, an analysis of sector widths is presented. This analysis, based on the space and function norms developed in Chapter Five, is essential if an economical utilization of built space is to be achieved. Third, for each of the transitional care programs, a comparison between the amount of perimeter space needed and the amount of interior space possible is performed. This analysis gives an important clue to the general proportions of each type of space needed. From this information flow suggestions as to con-

figuration of the basic building: Should it be shallow, with a high ratio of perimeter space to interior space, or deep, with a lesser ratio between the two? This clue to the design of the basic building directly precedes the site analysis in Chapter Seven.

This thesis defines a "basic building" as a combination of structure, envelope, life-safety elements, circulation principle, and environmental controls. All participants, users, and occupants of a development share the basic building, and no individual can change it. A basic building should be designed to meet these goals: 1) maximize shared elements while permitting needed flexibility; 2) facilitate individual imprint on the environment while remaining easy to maintain and manage. It is central to the programmatic work of Chapter Four that the Harrison/Tyler block development be thought of as more "residential" in character than "institutional" or "commercial." The next four sections propose options for structure, envelope, life-safety, and environmental controls. Evaluation of circulation principle options will follow from the site analysis in Chapter Seven.

### 6.1 STRUCTURE

The downtown location of the Harrison/Tyler site requires fire-resistant structure. The basic building structure will therefore be concrete, masonry, or fire-protected steel. The basic building will create zones to compartmentalize any fire. Within any "fire zone," lighter materials, such as wood, could be used.

The major structural system options are: 1) masonry bearing wall with precast concrete planks such as used at 808 Memorial Drive, Cambridge; 2) a precast wall and floor panel system, such as used at Tai-Tung Village, Boston; 3) poured-in-place concrete columns with flat slab floors, such as used at Harbor Towers, Boston; 4) steel columns and beams with light-gauge metal decking under poured concrete floors, such as used at the new MHFA Housing for the Elderly on Atlantic Avenue, Boston. The masonry bearing wall structures can be aligned either perpendicular or parallel to the facade.

Choice of one particular structural system is both infeasible and unwise at this time. The basic building will be designed, however, to maximize potential structural area and thereby accommodate even the more restrictive of these systems.

## 6.2 ENVELOPE

Design alternatives for the envelope, or exterior wall, of the basic building will be influenced by: 1) whether the envelope has a structural role; 2) the degree of individual imprint available in the wall; 3) heat transmission characteristics of the envelope; and 4) amounts of fenestration allowed on the various building exposures.

Even if the exterior wall is part of the structural system, as in a case of masonry bearing walls parallel to the facade, flexibility

is possible in the character of some of the facade openings. The thesis proposes that at least 15% but no more than 30% of the envelope area be subject to individual control, within guidelines.

Heat transmission characteristics of the envelope play a significant part in determining the project's energy efficiency. In residential construction in Boston, heat loss to the exterior is the controlling condition. Residents generate heat removal problems only in summer, not year round as in office buildings or medical facilities. The thesis proposes that the overall calculated U-value for any envelope segment not exceed .15 BTU /Hr-Sq. Ft.-°F.

Glass surfaces, even dual-paned, transmit three to four times the amount of heat transmitted by well insulated walls. In addition, to heat loss problems through all walls in winter, heat gain through windows on the west all year and through the south and east in summer presents a serious problem. The thesis proposes the following maximum percentages for fenestration occurring on various orientations: north, 30%; northeast, 35%; east, 50%; southeast, 60%; south, 50%; southwest, 40%; west, 30%; northwest, 30%.

## 6.3 LIFE SAFETY

The national Fire Protection Association has proposed a life-safety design "decision tree" as a systematic method for the design of fire protection in structures. The decision tree is a theoretical

approach to the fire design which presents fire-safety objectives, and strategies by which those objectives may be achieved. The two major fire-safety objectives are "prevent fire ignition" or "manage fire impact." Managing the fire impact is the more achievable of the two objectives in this case. Disabled residents pose unique needs, since their ability to move is vertically restricted. Emphasis should be placed on early detection of fire, adequate communications methods, and provision of fire refuge areas by means of horizontal exit. Fire suppression, automatically and manually, and controlling the fire by compartmentation are key strategies. The basic building should therefore include a centrally monitored smoke detection system with detectors in all semi-public and public areas as a minimum and potentially in dwellings as well; portable fire extinguishers in all dwellings; and continuing education programs in fire safety and control by building management for occupants. For community and educational areas a smoke exhaust system and complete sprinkler coverage is added.

#### 6.4 ENVIRONMENTAL CONTROLS

Three areas of environmental controls are examined: electric power supply; domestic hot water heating; and HVAC (heating, ventilating, and air-conditioning) design.

In residential use it is common to supply 120V/240V low-voltage electrical power. But medical and educational equipment as well as mechanical equipment benefits from 277V/480V high voltage 3-phase power. What types of power should the basic building supply?

All dwellings in the basic building should receive 120/240V low-voltage power with separate metering for each dwelling. Those areas which will contain medical/educational facilities and obviously all mechanical spaces should be supplied with 277/480V power. In addition, the design consultants should ensure that sufficient space exists for future horizontal distribution to the vertical electrical risers. In this way high-voltage service could be added only at the expense of wiring, and not rebuilding the basic building.

For a large building project of primarily residential use, three methods of hot-water heating could be employed: a central heater; individual dwelling heaters; and grouped dwelling heaters. The necessity for energy efficiency plus the long distribution runs required eliminate the first method as a viable alternative. The small size of many individual heaters plus the space occupied by them places the second alternative at a disadvantage to the third. The immediate impact of the energy cost is reduced in the third option, but if no more than six to eight dwellings would be tied together, a significant degree of control would remain. A particular design for hot-water heating would require a detailed analysis of this tradeoff.

HVAC design questions relate to three areas: perimeter conditioning; interior ventilation; and central system components.

Perimeter areas of building experience the extreme range of clima-

tic conditions and it is there that the need to heat or cool is felt most strongly. Important factors in perimeter conditioning are occupant control and energy efficiency. For projects of some size, a piped water heating system can be more economical in energy than electric resistance heating. Conditioned water is sent across a coil over which air is drawn by a small fan. By controlling the temperature and quantity of water supplied, the building manager can control energy input. By adjusting water flow through the unit and fan speed, the resident can control conditioning at the perimeter. Further economic analysis would have to be undertaken in order to choose between a two-pipe, zoned system and electric resistance heating.

Interior ventilation can become a problem in buildings where living units do not have two exposures. Bathrooms need ventilation for odor control. Deep buildings with large interior zones present heat buildup problems and therefore need ventilation. The basic building will be designed with an interior exhaust shaft. Fresh air will be drawn inward from the perimeter zone(s).

The need for central plant HVAC equipment will depend directly on choice of perimeter conditioning method. Cooling, if supplied through the two-pipe network, will require a number of chillers, attendant condenser and chilled water pumps, as well as some method of cooling condenser water. Cooling and humidity control will certainly be required by medical education uses. Design of the basic building will have to anticipate central mechanical equipment for

cooling and, potentially, boilers or steam heat exchangers for heating. All such equipment will require horizontal distribution easements below numerous perimeter zone risers.

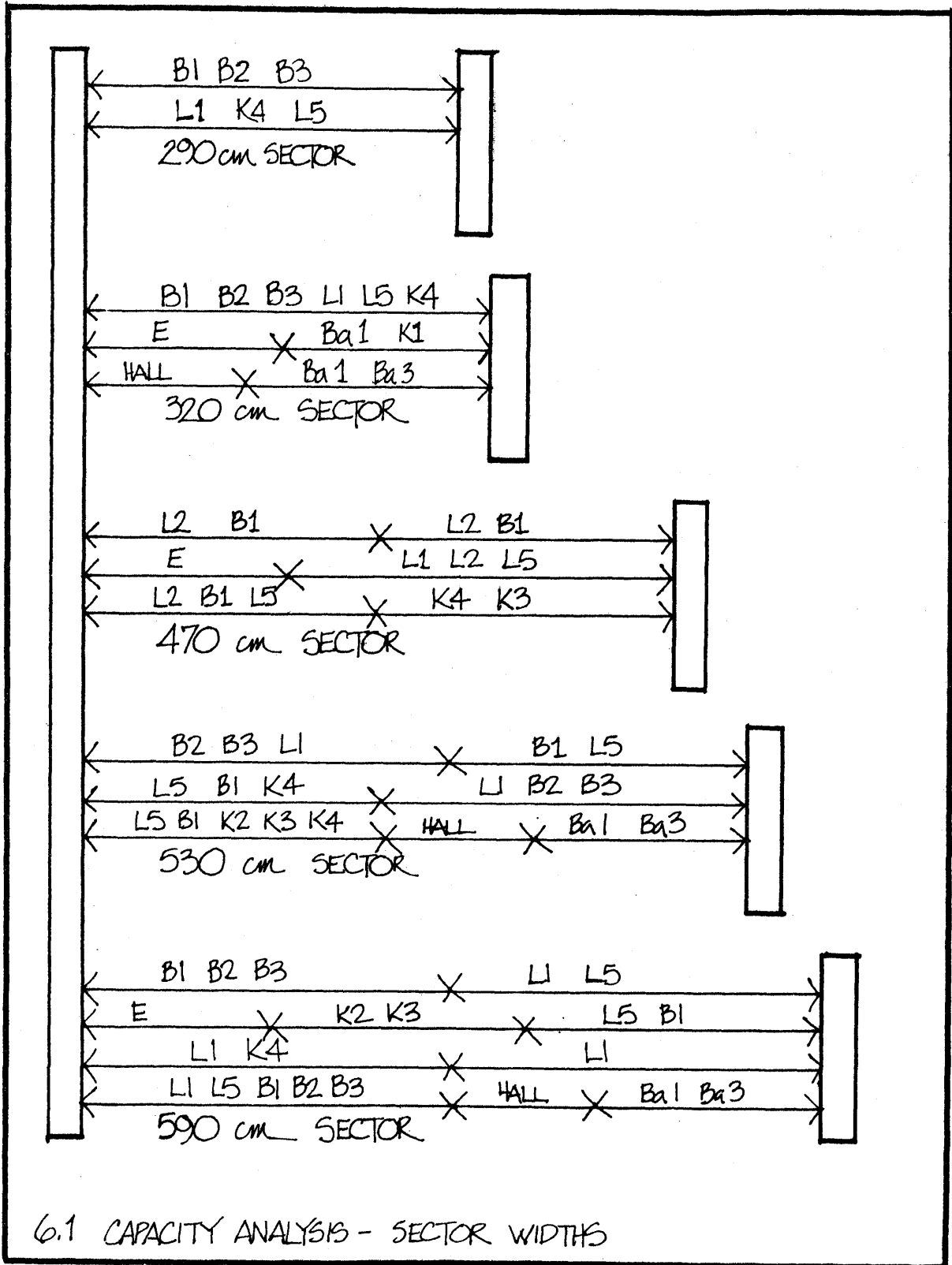
The above sections list a set of options and performance criteria for the components of a basic building. The basic building design developed in Chapter Eight will represent one set of choices for each of these components.

### 6.5 SECTOR WIDTH ANALYSIS

The space and function analyses in Chapter Five showed that position I spaces tended to have minimum widths of 290 cm or 320 cm, with the notable exception of one-person bedrooms and dining areas, which could be as narrow as 230 cm. For a masonry bearing wall structure running perpendicular to the facade, it is crucial to analyze what sector widths might be most appropriate. A most efficient sector width is one which permits the desired amount of combinations within the minimum width. Figure 6.1 presents a capacity analysis of 290 cm, 320 cm, 470 cm, 530 cm and 590 cm sector widths. The 320-cm sector width seemed not necessarily useful as a basic element in a dwelling layout. The 470-cm sector width also seemed restrictive in that it allowed only limited use of the perimeter by position I spaces. The 530-cm sector width offers a significant amount of variety, variety which is not much exceeded by the 590-cm width. This analysis suggests that, where dwelling depth is sufficient, the 530-cm



6A



6.1 CAPACITY ANALYSIS - SECTOR WIDTHS

sector width would be a useful base for dwelling design.

6.6 PERIMETER - INTERIOR SECTOR LENGTH COMPARISON

Should the basic building be shallow or deep? One measure which would indicate an answer to this question would be to compare the perimeter-interior requirements of the various transitional care programs. Figures 6.2 through 6.4 present estimates of the required "sector lengths" for each of the transitional care programs. The minimum sector width for each type of position I or position III space is listed along with the expected number of such spaces in an 8-client program unit. A total for both perimeter and interior "sector lengths" is calculated and then compared.

The analysis indicates that for both weekending and apartmenting more perimeter than interior area should exist and that the ratio could be as high as two-to-one. For dorming, however, the need for perimeter space is approximately equal to that for interior space. All three analyses show that excessively deep buildings, with significantly more interior area than perimeter, are not needed.

WEEKENDING							
$\alpha$			$\beta$				
SPACE #	WIDTH	SECTOR LENGTH	SPACE #	WIDTH	SECTOR LENGTH		
L1	8	290	2320	L5	4	260	1040
L2	1	230	230	K2	3	200	600
L5	4	260	1040	K3	2	230	460
B1	6	230	1380	K4	1	260	260
B2	6	290	1740	L2	1	230	230
B3	8	290	2320	Ba1	4	170	680
K4	1	260	260	Ba2	2	110	220
K3	1	230	230	Ba3	8	170	1720
			9520				4850
$p/\alpha \approx .5$ $\alpha \Rightarrow$ EXTERIOR LOCATION $\beta \Rightarrow$ INTERIOR LOCATION							
6.2 SECTOR LENGTH - WEEKENDING							

DORMING							
$\alpha$			$\beta$				
SPACE #	WIDTH	SECTOR LENGTH	SPACE #	WIDTH	SECTOR LENGTH		
L5	2	260	520	L2	3	230	690
B1	4	230	920	L5	1	260	260
B2	4	290	1160	K1	4	170	680
L3	1	320	320	T1	1	170	170
L4	1	290	290	Ba1	2	170	340
				Ba2	3	110	330
				Ba3	2	170	340
2940			2810				
$\beta/\alpha \cong 1.00$							
$\alpha \rightarrow$ EXTERIOR LOCATION $\beta \rightarrow$ INTERIOR LOCATION							
6.3 SECTOR LENGTH: DORMING							

APARTMENTING							
$\alpha$			$\beta$				
SPACE #	WIDTH	SECTOR LENGTH	SPACE #	WIDTH	SECTOR LENGTH		
L1	8	290	2320	L2	1	230	230
L5	3	260	780	L5	5	260	1300
B1	2	230	460	K2	6	200	1200
B2	1	290	290	K3	1	230	230
B3	8	290	2320	Ba1	1	170	170
K4	1	260	260	Ba2	3	110	330
				Ba3	8	170	1360
6430			4820				
$\beta/\alpha \cong .75$							
$\alpha \rightarrow$ EXTERIOR LOCATION $\beta \rightarrow$ INTERIOR LOCATION							
6.4 SECTOR LENGTH: APARTMENTING							



# 7

## Architectural Program

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### 7.1 SITE ANALYSIS

The Harrison/Tyler site at Tufts-New England Medical Center is currently employed primarily as a parking lot. Its characteristics are the result of factors both natural and man-made. It is difficult to separate any item as one or the other; the site and its surroundings are the result of an interaction between the two. The site analysis will therefore not distinguish between them, but instead list factors by their potential influence on design decisions. A list of factors to be discussed:

- Soils
- Circulation - vehicular and Pedestrian
- Land Control
- Sun Exposure
- Existing Structures
- Zoning/FAR
- Urban Design Constraints
- Air and Noise Pollution
- Utilities.

The thesis has defined the architectural problem at the scale of the individual and at the scale of the group. But how do the concerns of the community context--natural and man-made factors, urban design constraints, planning and development goals--shape the boundaries of what could be done? Indeed, the transitional care programs and the basic building analyses, being independent of situation, are somewhat unreal. Testing them against real site constraints will make them responsive to those needs and enhance their character.

Determining contextural constraints, choosing responses, and formulating project development options are the tasks of this Chapter. A site analysis, which will include natural factors, man-made factors, and planning constraints is followed by site guidelines which respond to the analysis. Architectural program possibilities are then listed, and from them a number of site development program options are proposed.

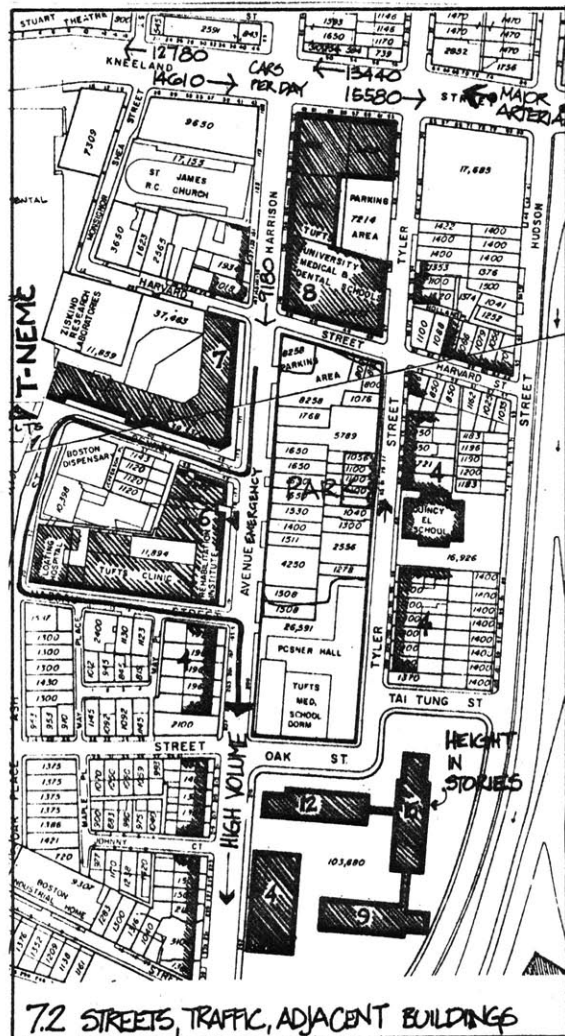
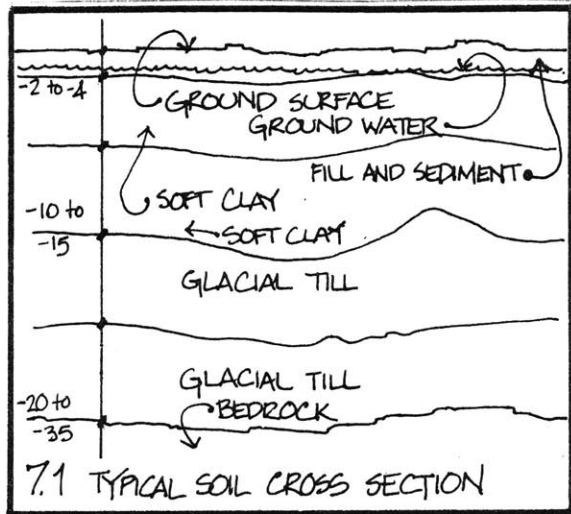
Soils. Chapter Two followed the history of the site from marsh and tidal flat in the colonial period, through collective wharf in the federal period, to filled lots by railroad speculators in Jackson's time, and to a combination of low-rent housing and light industry from the Civil War onward. Like much of the City of Boston, a site boring from Harrison-Tyler would reveal a six-layer soil section. Refer to Figure 7.1. Bedrock lies far under the surface, in not-original-peninsula areas from 20 to 35 meters below ground. Above that are two layers of dense glacial till and two layers of soft clay.

The last one to three meters below the surface is fill and sediment. At Harrison/Tyler, the groundwater level, approximately equal to the harbour elevation, lies two to three meters below the surface.

These conditions impose a significant premium on excavation below the water level. In addition, medium height or highrise buildings would require deep foundation in order to reach bearing strata of sufficient strength. One to four-story buildings might be carried on a shallow direct bearing foundation, dependent on careful evaluation of bearing capacity, soil permeability and compression characteristics.

Circulation. The site's strong rectangular shape is defined by its major bordering streets, Harrison Avenue and Tyler Street. Refer to Figure 7.2. Harrison is oneway southbound/out-of-the-city and continues across the railroad tracks and turnpike. It is a major commuting artery, handling approximately 8000 cars/day, with a major concentration in the evening rush hour. Trucks, delivery vans, ambulances, and cabs compete for curb space, with families of patients waiting to pick up their hospital-discharged members. The street is about 12 meters wide and most buildings on the west side have a four-meter setback from the curb. The street's nature is quite public and, while not clogged with traffic, busy.

Tyler Street's character is much different. One-way northbound, it now arises as a double-back loop off Oak Street from Harrison. It is not part of the larger network of arterials and is correspondingly narrow,



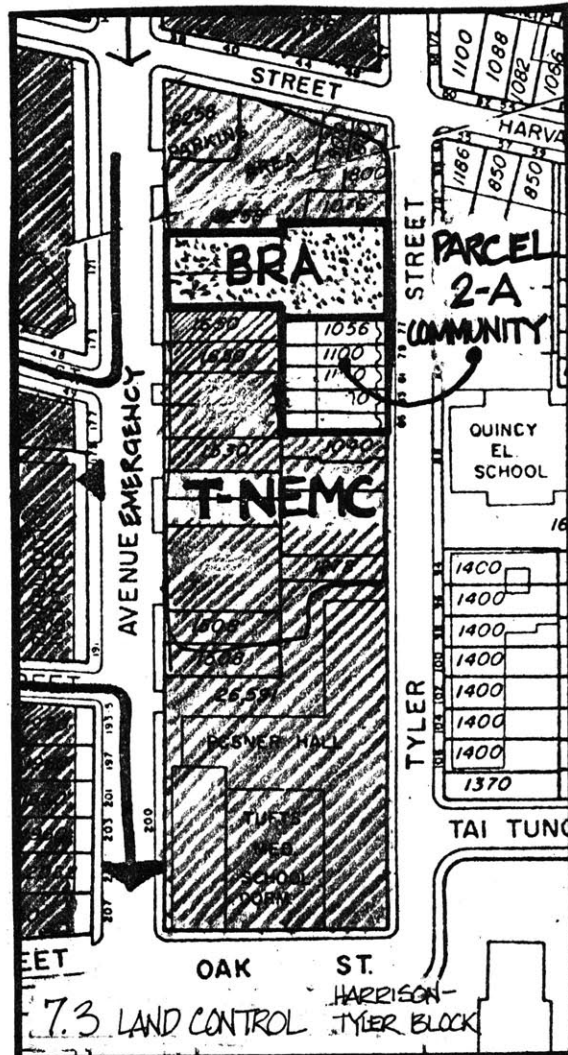
less than 8 meters wide. Street traffic is limited mostly to autos searching for a free parking space and the volume is light.

The two other streets, Harvard and Oak, are close in volume to Tyler. Harvard Street serves as truck access to T-NEMC, but adjacent to the site does not have this function. Oak Street terminates adjacent to the site. It is continuous from Mass Pike Towers to Tai-Tung, but vehicular traffic is not heavy.

Harrison Avenue serves as a significant pedestrian commuting route. Workers in the leather district and the Chinatown core who live in the South End use Harrison to cross the Turnpike. Harrison also bears crossing trips between the Tufts Medical Schools and the New England Medical Center Hospital.

The Circulation character of these streets suggests that automobile-related activities should be confined to Harrison, where possible, to protect the quiet character of Tyler. Harvard and Oak could be used for auto access to on-site parking.

Land Control. The context chapters indicated that control of land at the Harrison/Tyler site was not unambiguous. Figure 7.3 presents the current control status of land on the site. Parts of T-NEMC control the majority of the site, but private control of a section directly north occasions the need for community-institution cooperation for any development to be politically successful. These factors plus the existence of Posner Hall at the southern end of the block would



suggest phased, parceled construction as the most likely option for individual initiative. Such phased construction might nonetheless take advantage of a continuous building typology approach to enable the next generation's structure to be free of the ownership peculiarities of the past.

Sun. The north-south orientation of the block's major axis creates street spaces and street edge facades which receive sunlight around noon. All year, in addition,

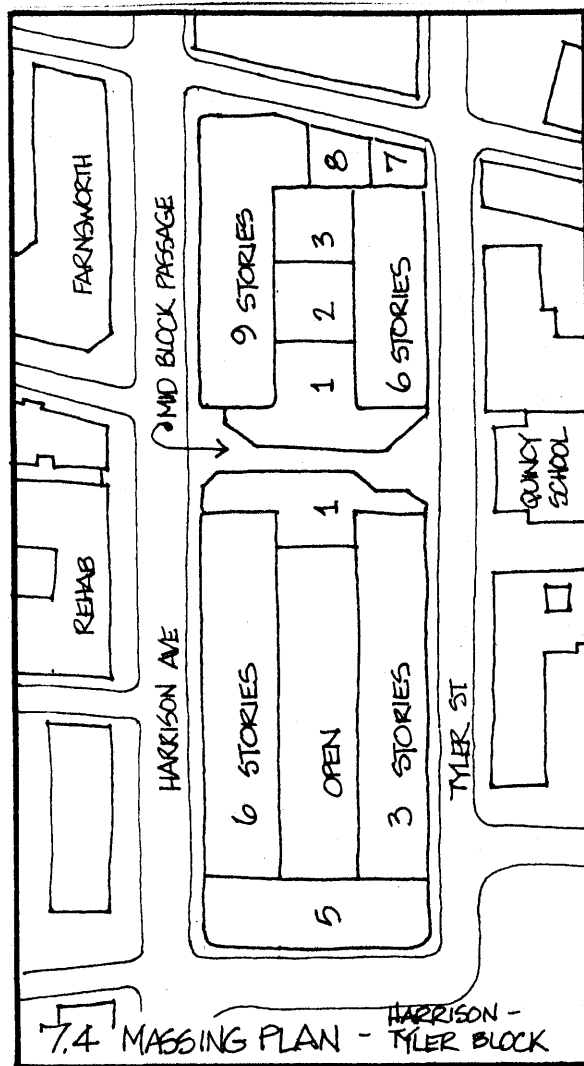
housing rows parallel to the major axis would receive direct insolation on both sides in mornings and afternoons through much of the year.

The major hindrance to solar exposure on the site is the tall blocking form of Tai-Tung Village, directly south of the site. Significant noontime shading occurs on the southern half of the block, as shown in Figure 7.2. Private exterior spaces at this end of this site would especially suffer.

The midrise buildings at the north and western edges of the site pose no problem. In fact, some shading by Harrison/Tyler buildings onto the Medical School's buildings might benefit laboratory conditions and the air-conditioning bill.

Taller construction should be kept to the northern portion of the Harrison-Tyler site, and the major axes of buildings should be aligned north-south to minimize shading. In addition, morning insolation of interior block spaces should be encouraged by maintaining a relatively lower height on the Tyler side than on the Harrison side. This implies a tendency toward sun blocking in the afternoon. Refer to Figures 7.4 and 7.5.

The orientation of building elements is a crucial decision to site development. The author believes that a) the amount of building facade area which receives exposure to the sun is a worthwhile goal; b) the creation of thru-building dwellings should be maximized; c) the quantity of interior circulation space should be minimized; and

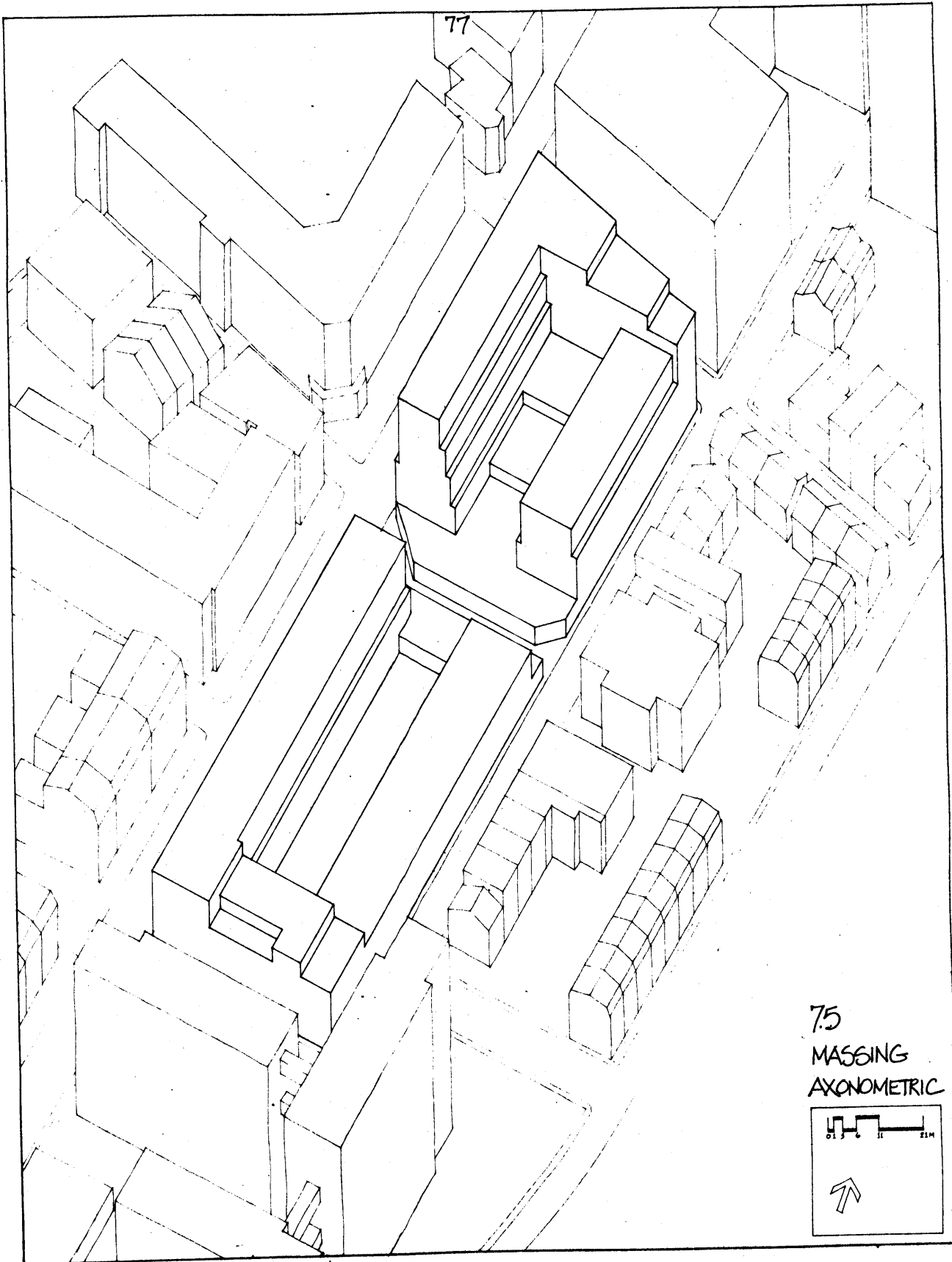


d) sunlight exposure and interior block spaces, private or public, should be maximized. For these reasons, the author proposes that building axes be oriented roughly north-south, while individual dwelling axes be oriented primarily east-west.

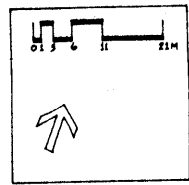
Sun control in the afternoon becomes a major problem with this solution. In addition to the fenestration standards specified in Chapter Six, the site analysis recommends vertical sun control construction on all floors above the second



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75  
MASSING  
AXONOMETRIC



floor for west-facing facades. Masking sufficient to block the sun until 3:00 pm in summer would be desirable.

Figure 7.6 summarizes the building massing and detailing responses developed in this section.

Existing Structures. Figure 7.2 noted the height, in stories, of the various structures surrounding the site. The buildings share masonry exteriors in which red brick predominates. The Medical School buildings are the major exception to fenestration percentages, which do not exceed 25% of the wall area. None of the immediately adjacent buildings is of outstanding architectural interest; Old Quincy School, although certainly historic, is blandly detailed. A street access circulation principle is shared by all buildings but Tai-Tung and Posner Hall; similarly, all but Tai-Tung closely follow the street edge. Harrison Avenue contains shops, medical center uses, and below Nassau Street some housing entries. Tyler is primarily residential, with a few shop fronts, including a local YMCA and a small community service center.

#### Zoning/FAR

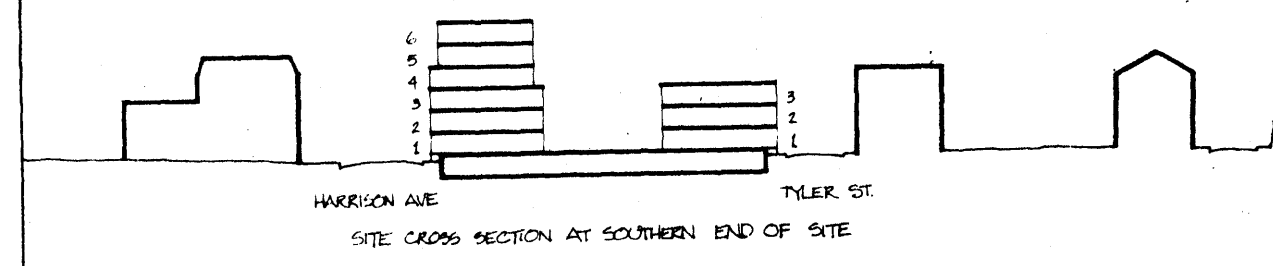
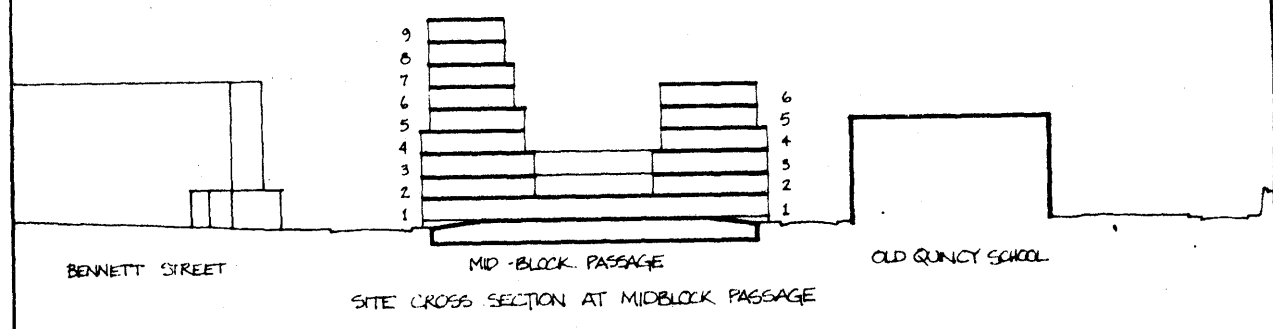
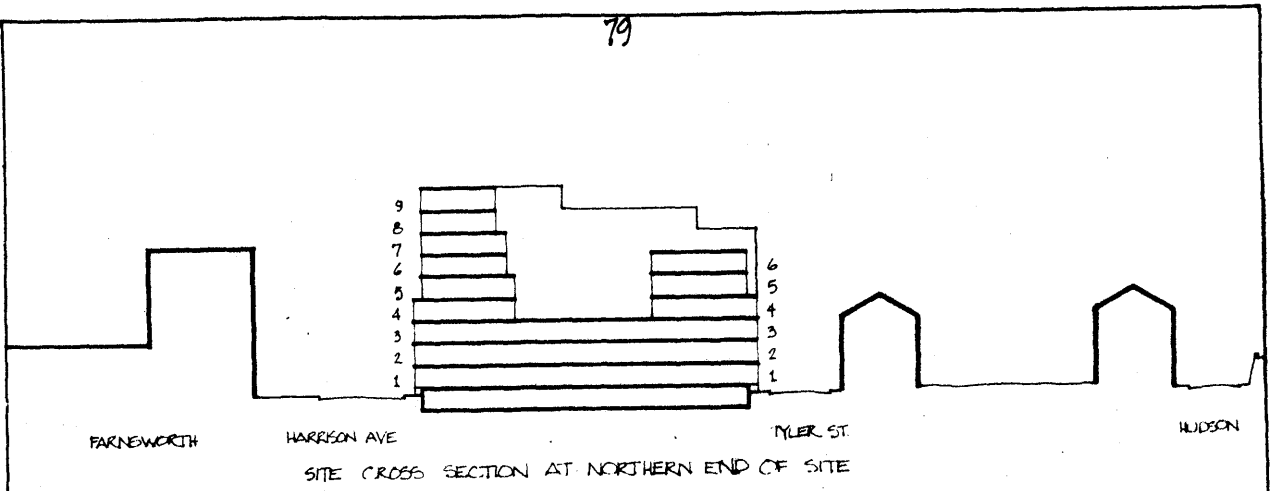
The City of Boston currently zones the Harrison-Tyler site as a B-4, business district. The maximum Floor Area Ratio is 4 (FAR = 4). Floor area can be computed by taking the sum of all enclosed, built areas on each floor above ground. Mechanical and circulation spaces usually are not included. Total floor area is then divided by the site area to figure the Floor Area Ratio. The building massing shown in Figures

7.4 and 7.5 falls within the FAR maximum. The Harrison-Tyler block's narrow cross section, combined with orientation of building rows along the major axis, produces substantial pressure to minimize building depth, especially at upper floors. The desire to maximize lowrise development of the site creates pressure to increase building depth as a trade-off against decreased dwelling width. Perimeter sector width standards developed in Chapter Six require about 8 meters of perimeter for apartmenting standard dwellings and 12 meters for week-ending standard dwellings, when a full interior zone is included. These standards also tend to increase dwelling depth.

As a guideline response to this problem, the author has organized the site into three 15m deep bands running parallel to Harrison Ave. The middle band is designated as typically open, whereas the two other bands are typically built or built-open margins. These boundaries extend upward to form a building mass envelope, as shown in Figures 7.4 through 7.6. Both street edges are matched closely.

Urban Design Constraints. The planning efforts of the BRA and CEDC have identified several needs of the site area which impact potential site development. These include a desire for: a) a thru-block passage oriented toward the Old Quincy School; b) a small "park" to serve open-space requirements; and c) recreation facilities for the adjacent residents.

The thru-block passage is aimed at



7.6 SITE SECTIONS

maintaining cross-block connections and as a means to the Old Quincy School into a context larger than Tyler Street. The intended renovation of the school into a community center would allow the building a larger role in the area and its presence ought to be emphasized.

BRA surveys have established a deficiency in open space, and the neighborhood improvement program recommends new park space. As part of its master plan T-NEMC was once supposed to create a park on the Harrison-Tyler site. As with the thru-block passage, the size, type, or exact location has not been specified. The neighborhood Y, however, is cramped for space and its gymnasium, a tennis "bubble," is approaching the end of its life expectancy. An opportunity therefore exists to bring recreation facilities, "passive recreation "park" space, and the thru-block passage into a coordinated relationship with the new Old Quincy School Community Center.

Air and Noise Pollution. Air pollution problems noted in Chapter Two are certainly shared by the Harrison/Tyler site, but determining their exact nature is beyond the scope of the thesis. Such a study would need to be performed if federal funding for development would be applied for. Noise pollution surrounds the site. To the east the Tyler Street buildings partially shield the site from the southeast expressway, which produces a high level of background noise in addition to occasional Diesel truck roar or police siren. The T-NEMC emergency room entry is adjacent to the site. This produces late-night activity, but not constant high-pitched ambulance sirens. The qual-

ities of Harrison might tend to encourage bedrooms oriented toward the interior nonetheless.

Utilities. A full complement of utilities, including steam, electricity, telephone, water, sanitary and storm sewers are assumed available beneath Harrison Avenue.

## 7.2 ARCHITECTURAL PROGRAM POSSIBILITIES

Formulating a development program for the Harrison/Tyler site is a necessary task since a development entity has not yet been formed and since potentially interested parties may not yet have specific goals for the site. The interested parties from whom architectural program possibilities are drawn include T-NEMC, the CEDC, and the BRA. Possibilities which have been mentioned include:

<u>Housing</u>	- Subsidized (MHFA)	
	low and moderate income	?
	- Loft apartments (interior finishes by resident)	?
	- Student housing	-
T-NEMC		150 people
	- Transitional care programs	16 dwellings
	- On-call suites	-
T-NEMC		25 people.
<u>Educational</u>	- Learning resources center, T-NEMC	5000 m <sup>2</sup>
	- Research labs/offices	?
	- T-NEMC Administration	2000 m <sup>2</sup>
<u>Recreation</u>	- Mini-park (passive recreation)	600 m <sup>2</sup>
	- Thru-block passage	225 m <sup>2</sup>

- Gymnasium	}	Indoor	500 <sup>2</sup>
- Squash			
- Hockey/skating	}	Outdoor	500m <sup>2</sup>
- Basketball			
- Movie House/lecture hall			40m <sup>2</sup>
- Community Hearth (subdividable)			40m <sup>2</sup>

Parking - 1/2 space/dwelling + ? = ?

Retail ?

Within a given maximum volume, varying quantities of any of these uses can be accommodated. The site area is approximately 7500 m<sup>2</sup>; with a maximum FAR of four, a maximum floor area of 30,000 m<sup>2</sup> is possible.

### 7.3 SITE DEVELOPMENT PROGRAM OPTIONS

Figure 7.7 presents four alternative development options for the Harrison/Tyler site. Each option emphasizes a particular mix of uses. For purposes of calculation a weekending standard dwelling is considered to be approximately 90 m<sup>2</sup> in area, and an apartmenting standard dwelling is considered to be approximately 60 m<sup>2</sup> in area. The approximate area needed for transitional care programs are as follows:

Weekending	:	800 m <sup>2</sup>
Dorming	:	400 m <sup>2</sup>
Apartmenting	:	500 m <sup>2</sup>
Total Area		<u>1700 m<sup>2</sup></u>

Option #1 represents a lower density, housing only scenario in which half the parking is retained by T-NEMC. Community facilities are held to a minimum.

Option #2 represents a lower density housing program plus a learning resources center. Community facilities are again held to a minimum. In this scenario two-thirds of the dwellings have a parking space.

Option #3 represents a higher density housing program with a maximum amount of community facilities. In this scenario each dwelling has a parking space.

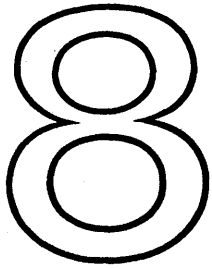
Option #4 represents a "maximum mix" scenario, combining a higher density housing program with a learning resources center. Community facilities are minimized. One-half of the dwellings have a parking space and 100 spaces are retained by T-NEMC.

Note that parking, if below grade, does not enter into floor area ratio (FAR) calculations. This is also true of outdoor areas, as marked by an \*.

PROGRAM COMPONENT	OPTION#1	OPTION#2	OPTION#3	OPTION#4
SITE AREA 7500 m <sup>2</sup> NET FLOOR AREA RATIO	2.58	3.38	2.77	3.50
1. HOUSING				
NO. OF DWELLINGS AT WEEKENDING STD. AREA AT 90 m <sup>2</sup> EA.	75 6750 m <sup>2</sup>	100 9000 m <sup>2</sup>	100 9000 m <sup>2</sup>	125 11250 m <sup>2</sup>
NO. OF DWELLINGS AT APT'ING STD. AREA AT 60 m <sup>2</sup> EA.	125 7500	100 6000	100 6000	75 4500
TRANSITIONAL CARE FACILITIES, 1700 m <sup>2</sup>	1700	1700	1700	1700
SUBTOTAL	15950	16700	16700	17450
MECHANICAL + CIRCULATION, 20%	3190	3340	3340	3490
TOTAL, HOUSING	19140	20040	20040	20910
2. EDUCATION				
LEARNING RESOURCES CENTER	--	5000	--	5000
RESEARCH	--	--	--	--
T-NEMC ADMINISTRATION	--	--	--	--
TOTAL, EDUCATION	--	5000	--	5000
3. COMMUNITY				
* MINIPARK	* 600	* 600	* 600	* 600
* THROUGH BLOCK PASSAGE	* 225	* 225	* 225	* 225
COMMUNITY HEARTH	75	75	75	75
LAUNDRY	35	35	35	35
MOVIE HOUSE / LECTURE	--	100	--	100
WORKSHOPS	100	100	100	100
GYMNASIUM	--	--	500	--
SQUASH	--	--	60	--
* HOCKEY / SKATING	--	--	* 500	--
* BASKETBALL	--	--	* 500	--
TOTAL, COMMUNITY	1035	1135	2595	1135
AREA FOR F.A.R. CALCULATION	19350 m <sup>2</sup>	25350 m <sup>2</sup>	20810 m <sup>2</sup>	26220 m <sup>2</sup>
4. PARKING				
SPACES FOR HOUSING	105	135	205	105
OTHER PARKING	100	70	--	100
AREA, AT 30 m <sup>2</sup> /SPACE	6150	6150	6150	6150
GRAND TOTAL BUILT SPACE	26325 m <sup>2</sup>	32325 m <sup>2</sup>	29325 m <sup>2</sup>	33195 m <sup>2</sup>

\* NOT COUNTED TOWARD F.A.R. CALCULATION

## 7.7 SITE DEVELOPMENT PROGRAM OPTIONS



## The Basic Building : Proposal

In Chapter Six the author presented options for the configuration of components of a basic building. Chapter Seven outlined several different site development programs. This Chapter describes the design of the basic building according to the guidelines set forth in Chapter Six. The basic building is evaluated in two ways. Capacity sketches, at small scale, show the range of functions and configurations possible in the basic building. The basic building is tested against the transitional care programs as well as typical housing uses. A large-scale drawing evaluates in detail the adequacy of the basic building to support one of the transitional care programs.

A 1:200 drawing of one of the basic building floor plans is shown in Figure 8.1. This drawing is typical of the information contained in the entire set of plans, which is presented in Figures 8.1 through 8.9. At this small scale the 10-20 tartan grid is abandoned and a 30 cm grid is substituted. The 30 cm grid lines represent the centerlines of 10 cm bands. Nonstructural partitions are drawn on the 30 cm grid line or, in larger

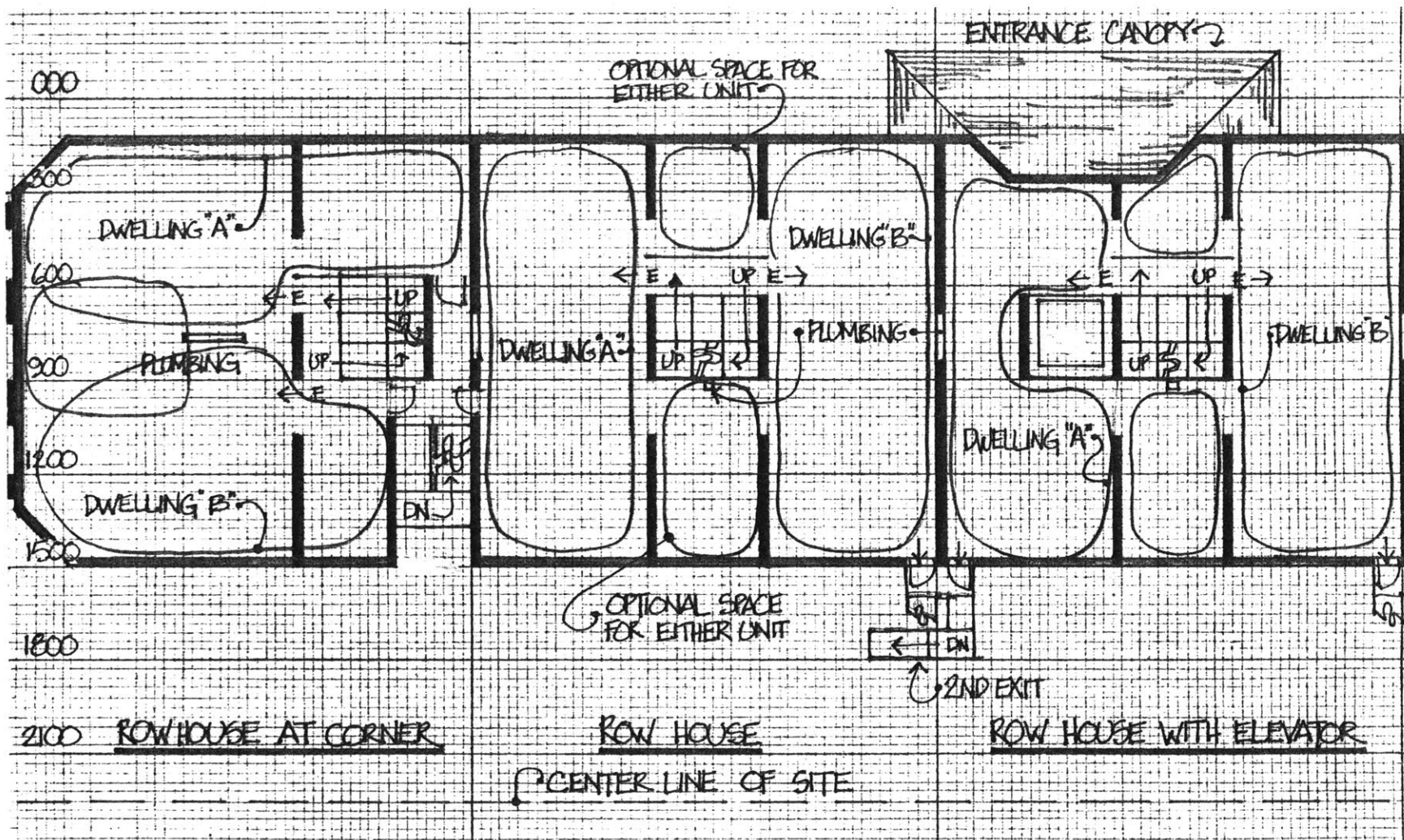
drawings, from one 10 cm band to the next, including both 10 cm bands and the intermediate 20 cm band. The plans show components over which the occupant has no control, such as location of structure, environmental services, life-safety elements, and circulation principle, as well as those areas over which the occupant has a degree of control, such as certain openings in the envelope. The essential characteristics of the basic building are: a bearing wall structure oriented perpendicular to the street; a nonstructural envelope with a specified maximum U-value; three circulation principles; life-safety elements responsive to each circulation principle; and an environmental control system which combines the capacity for individual control and a degree of centralized energy efficiency.

### 8.1 STRUCTURE

The site analysis in Chapter Seven led the author toward the goal of maximizing parking on-site, without resorting to structured parking. This decision prompted the choice of a structural system perpendicular to the major streets. Sector widths therefore had to maximize parking space while ensuring adequacy for housing above. A 15.00 meter group module was chosen, divided into two 570 cm sectors on either side of a 360 cm sector. The end walls of the group module are continuous fire walls, while those separating the 570 cm and 360 cm sectors are broken on either side of the central circulation zone. Refer to Figures 8.1 through 8.9. The tartan grid conventions allow the bearing walls

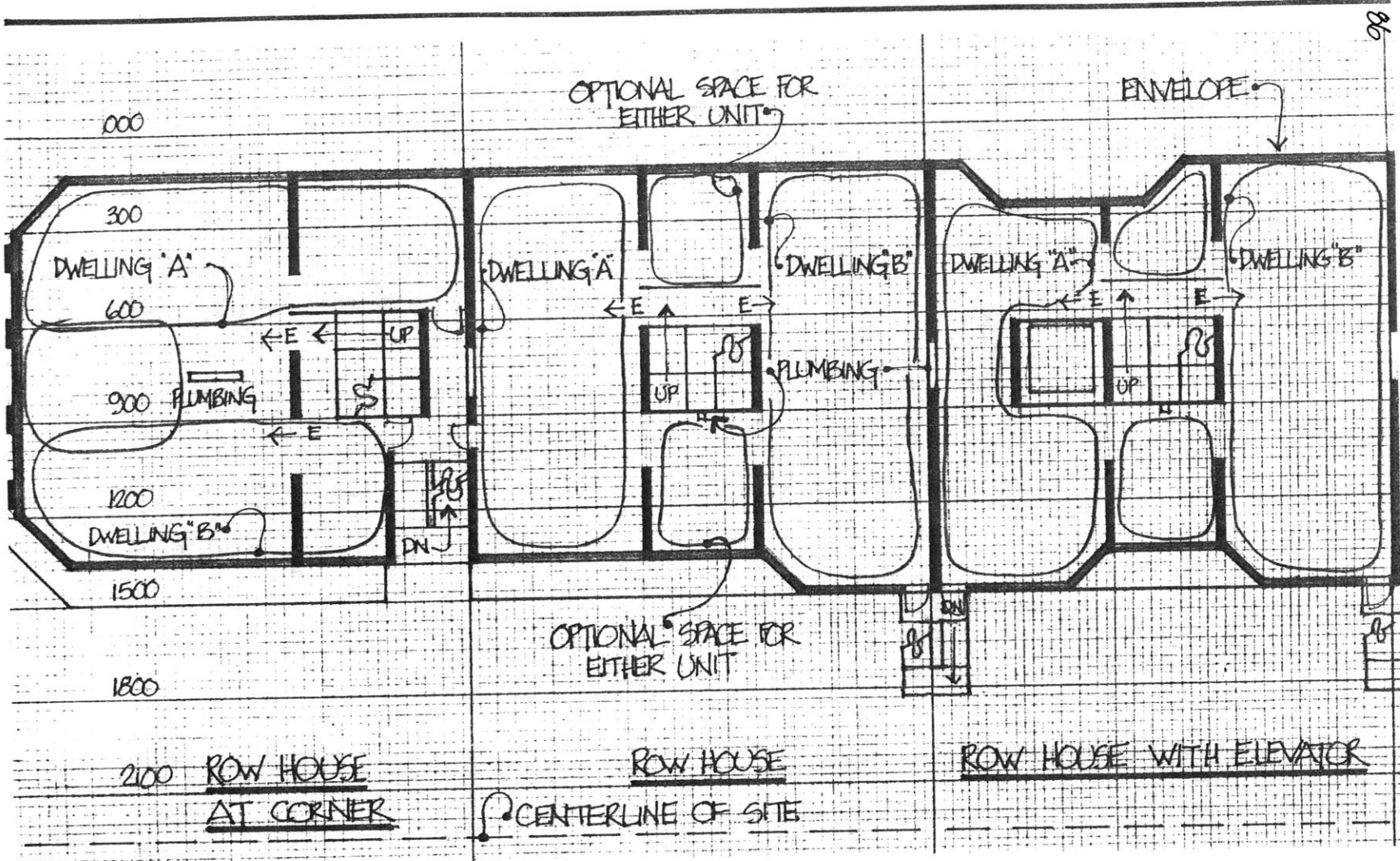






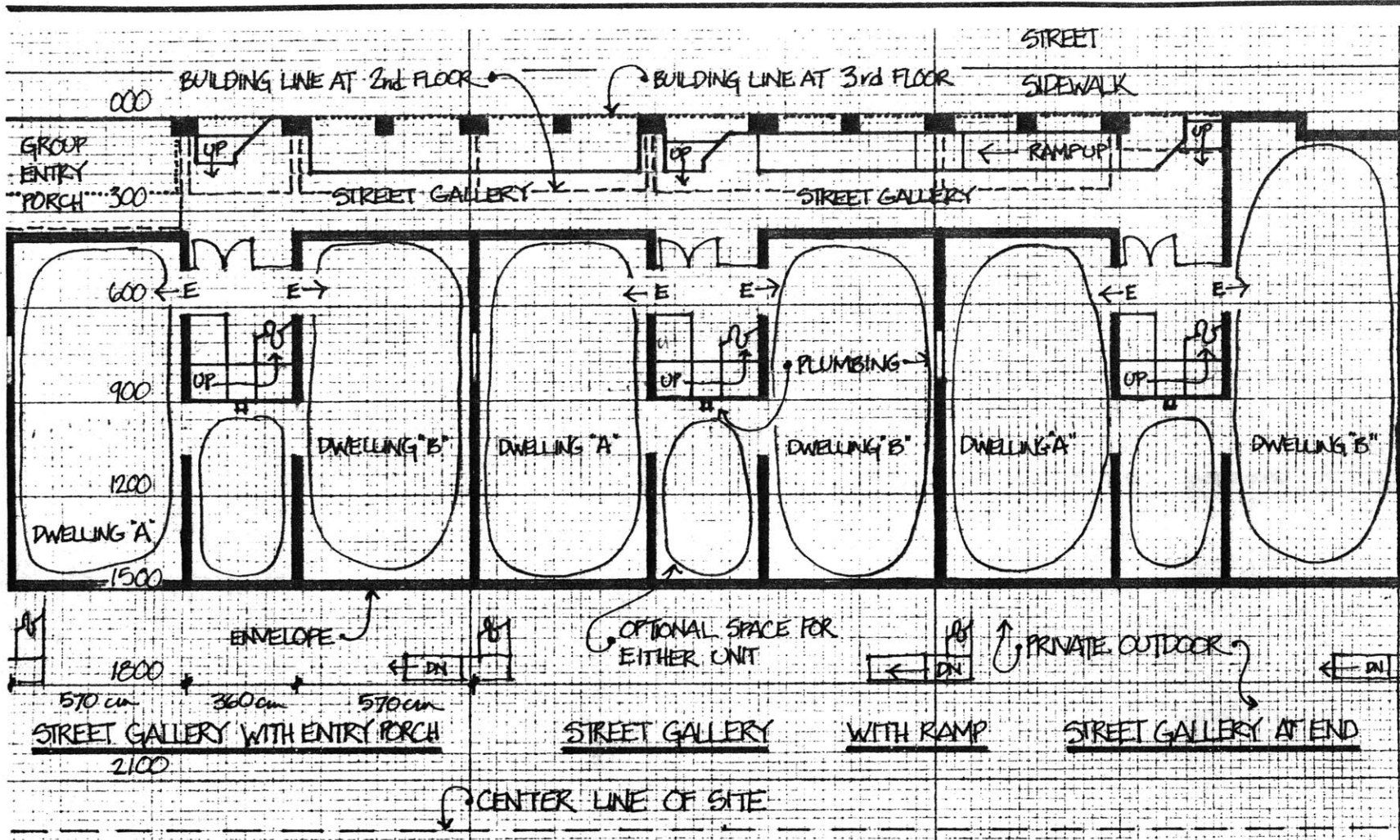
8.2

ROW HOUSE 2ND FLOOR



8.3

ROW HOUSE 3<sup>RD</sup> FLOOR

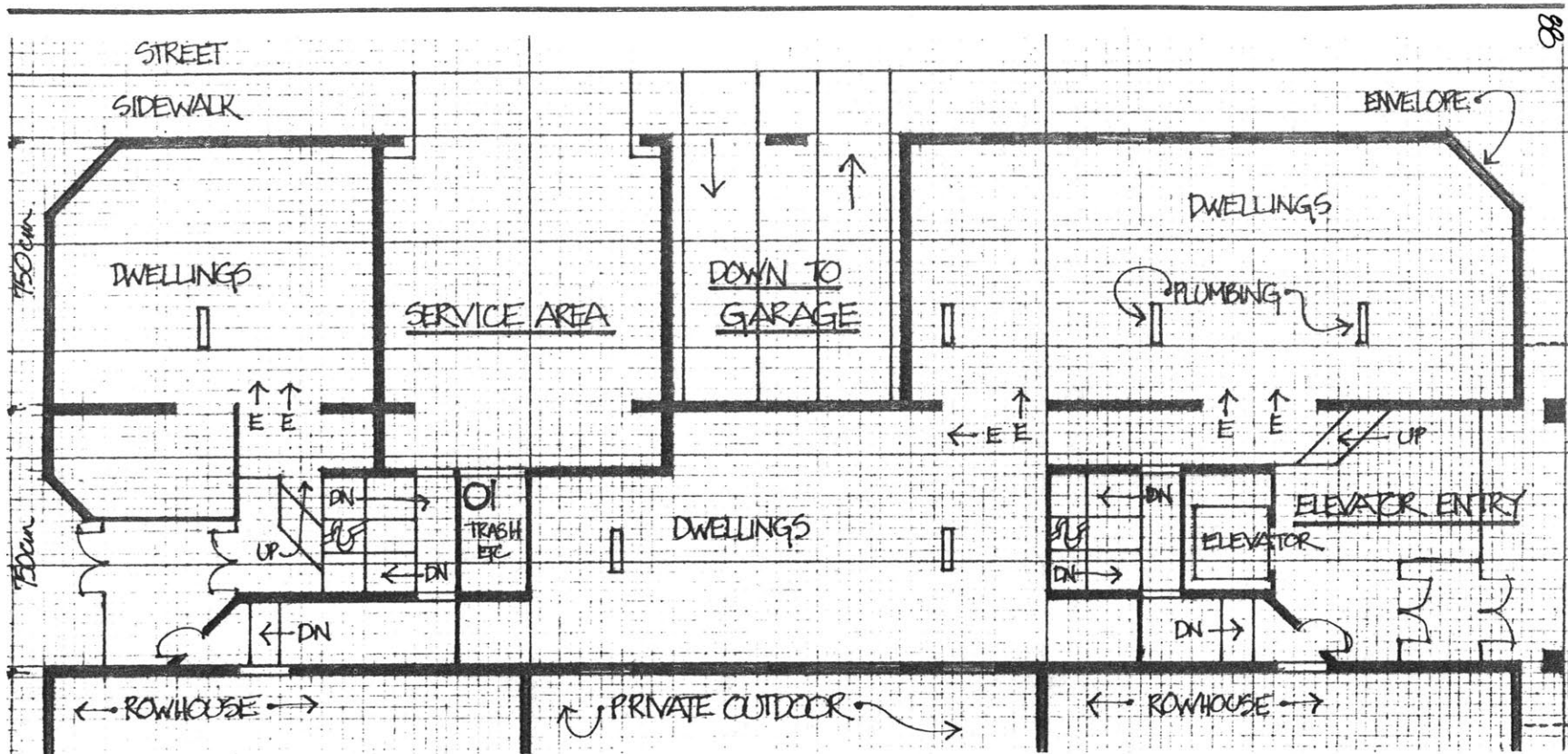


8.4

STREET GALLERY - ROWHOUSE

1st FLOOR 2nd FLOOR 3rd FLOOR

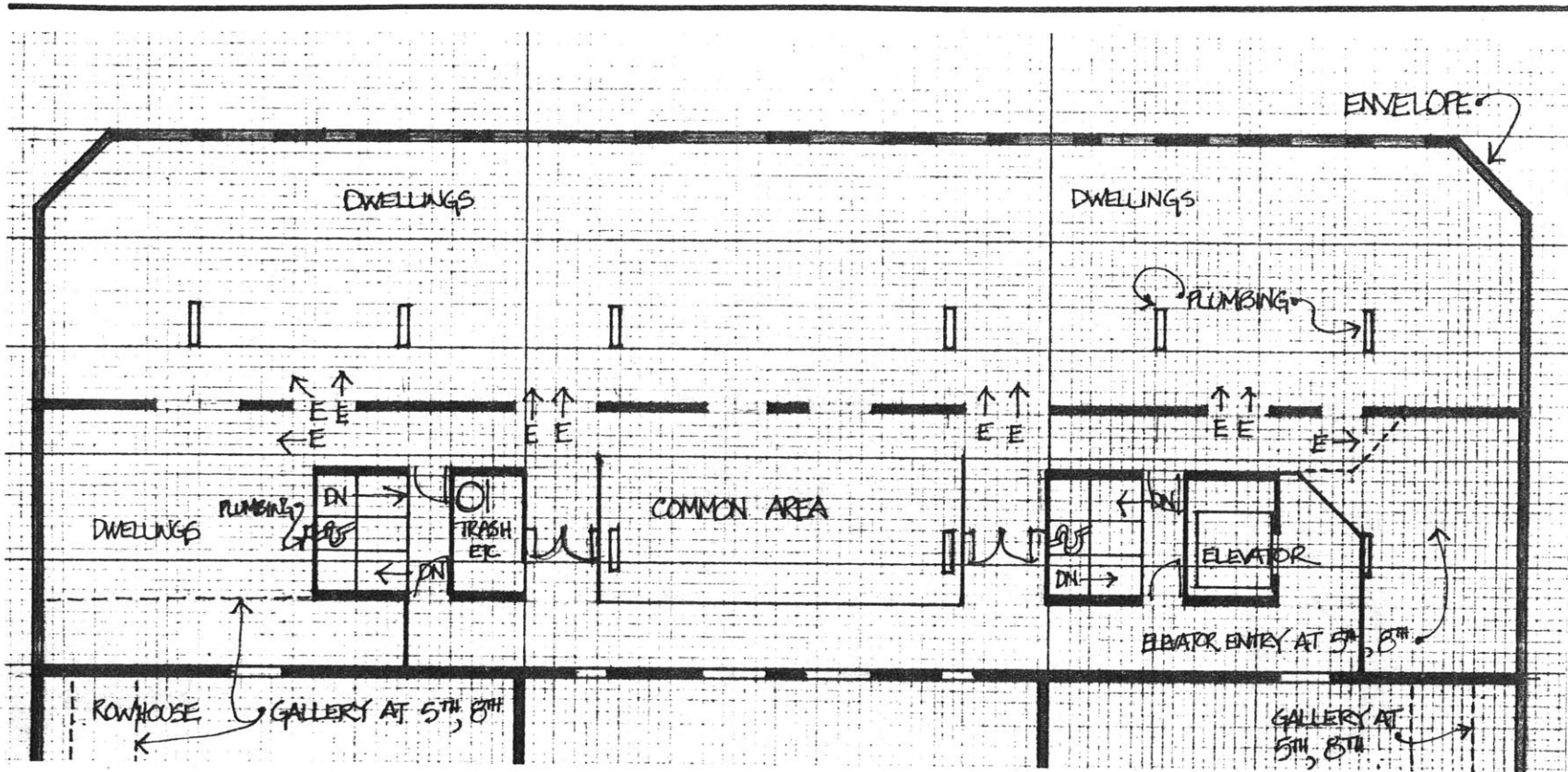




8.5

BUILDING CORNER - ELEVATOR ENTRY

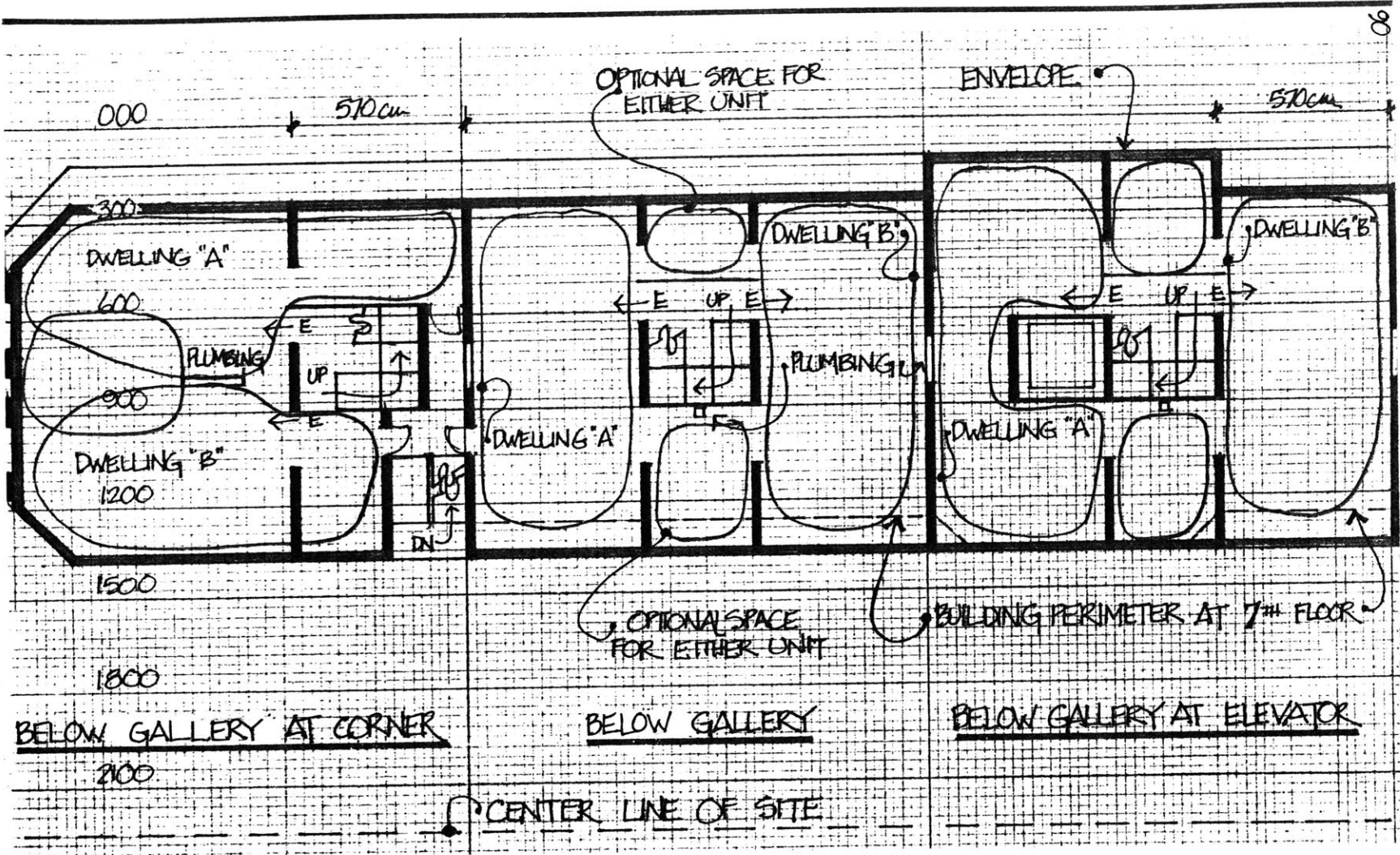
1ST. FLOOR



8.6

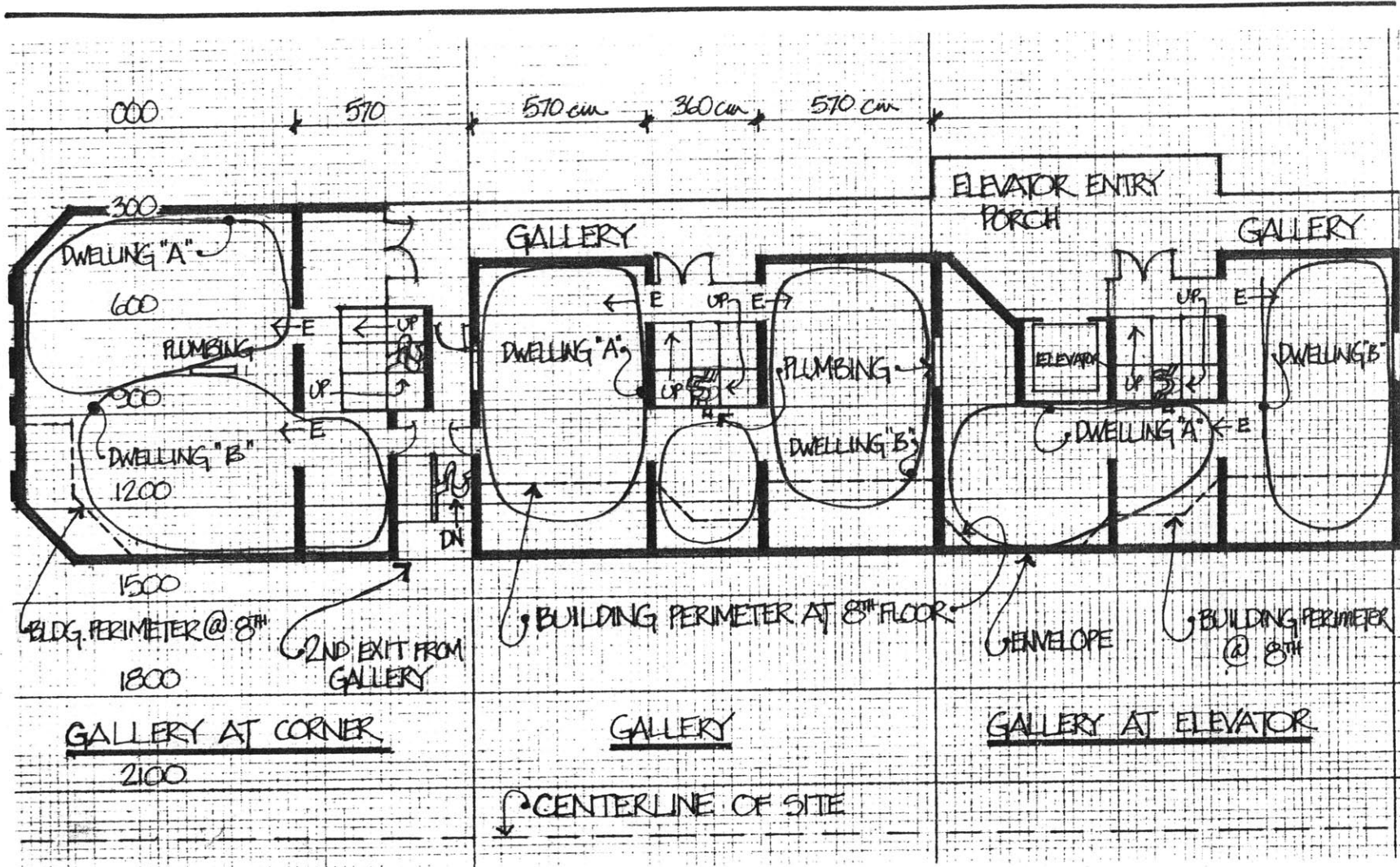
BUILDING CORNER - ELEVATOR ENTRY

TYPICAL FLOOR



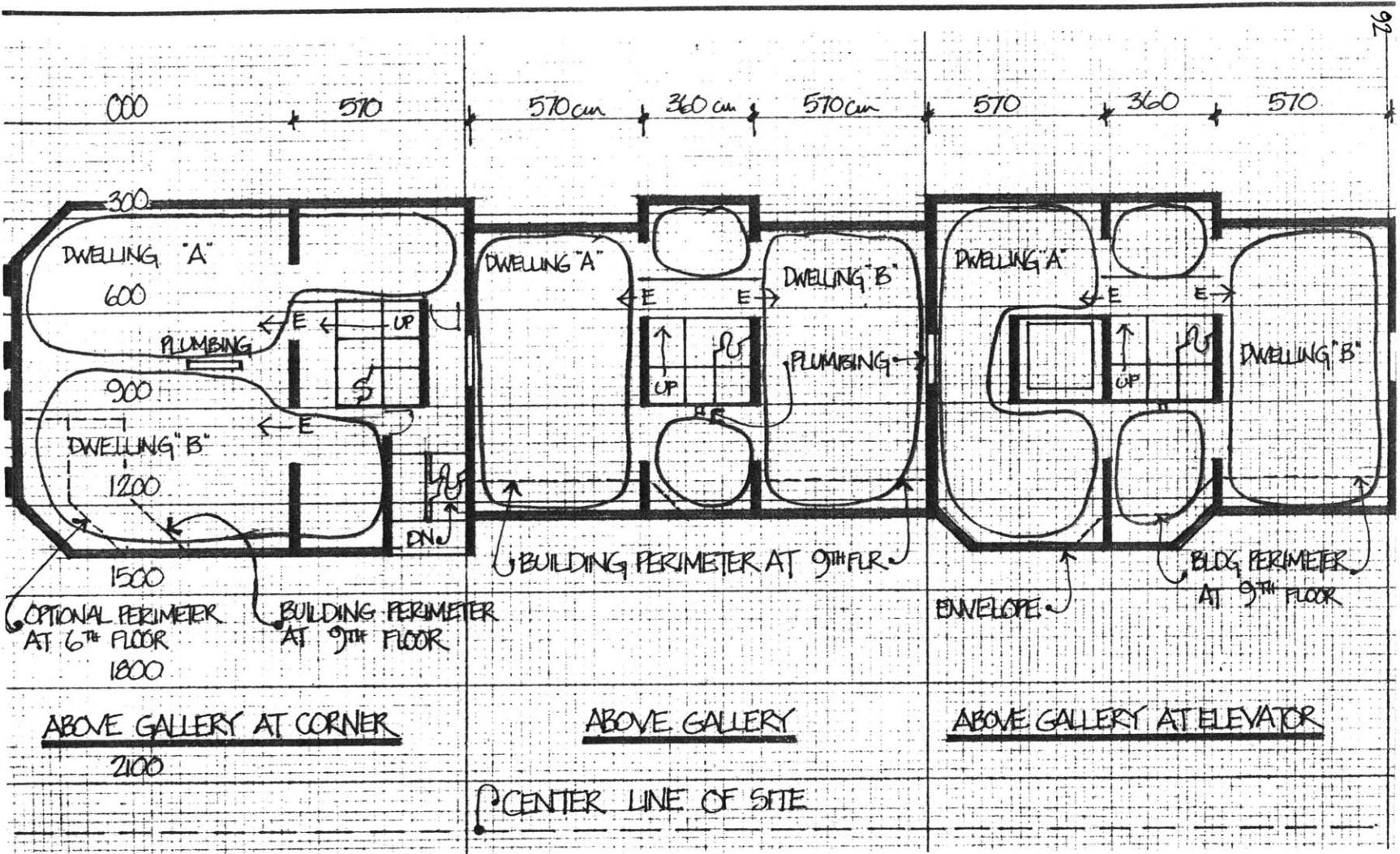
87

ELEVATOR GALLERY - BELOW GALLERY 4TH FLOOR  
7TH FLOOR



8.8 ELEVATOR GALLERY - GALLERY LEVEL 5<sup>TH</sup> FLOOR 8<sup>TH</sup> FLOOR





8.9

ELEVATOR GALLERY - ABOVE GALLERY 6<sup>TH</sup> FLOOR 9<sup>TH</sup> FLOOR



a thickness up to 40 cm, which should be more than adequate. To accommodate environmental control equipment and ducting, which may be necessary for transitional care or educational facilities, floor-to-floor height is fixed at 300 cm. Floor-to-ceiling height would be a minimum of 260 cm, and probably more than 280 cm.

One should be careful to note that the author's use of "structure" and "basic building component" somewhat interchangeably to describe walls perpendicular to the street is merely a purposeful ambiguity due to the impossibility of predicting a construction system choice. What is true about those walls is that the basic building would include them, whether structure lay behind them or not.

## 8.2 ENVELOPE

The orientation of the structure produces a nonstructural envelope. This allows it a certain flexibility in design, location, and materials since it need only support itself from one floor sill to the next. The site sections presented in Figure 9.17 shows the advantages of this flexibility in meeting urban design goals, such as a general widening of the midblock open space as building height increases. The envelope is designed to meet the heat transmission characteristics specified in Chapter Six. Fenestration in the east, south, and west facades is recessed to provide solar shading. In addition, horizontal sun shades would be added to south facing windows and horizontal and vertical sun shades added to west facing windows.

The flexibility of the envelope can also extend over time. Whether by the management or by the longer-term occupants of the housing, a portion of the envelope is designed to facilitate change over time and to allow individual expression. A typical 570 cm segment has an 170 cm by 170 cm opening which could be finished to the occupant's preference. The Harrison-Tyler development group might offer a number of standard infills, of net U-value not exceeding 1.00 BTU/Hr-Sq. Ft.-°F, such as small balconies, bay windows, large window units. Since the entire envelope is designed as if the occupant-chosen infill had a net U-value of 1.00 BTU/Hr-sq.ft.-°F, any of the infills chosen would not affect the overall performance.

## 8.3 CIRCULATION PRINCIPLE

The Harrison/Tyler block development should be sympathetic to the surrounding built context and, in particular, supportive of street activity. This goal is tempered by a concomitant desire to maximize accessibility of the housing by the physically disabled. Further, reducing the total number of dwellings accessed by any one circulation element and minimizing poorly supervised public areas will result in benefits in personal security. Three circulation principles evolved: rowhouse walkup; gallery access; and elevator distribution.

Rowhouse walkup modules, reached either by stair or ramp, accommodate up to four stories of dwellings off a central stair. Each 15.00 meter group module would

have one stair. Figure 8.10 outlines the levels of privacy occurring in this circulation principle.

Gallery access dwellings are organized into three floor groups, with a semi-public gallery located at the middle level. Off this gallery each group module has its own entrance and central stair to dwellings at gallery, above, and below. Figure 8.11 outlines the levels of privacy occurring in the circulation principle.

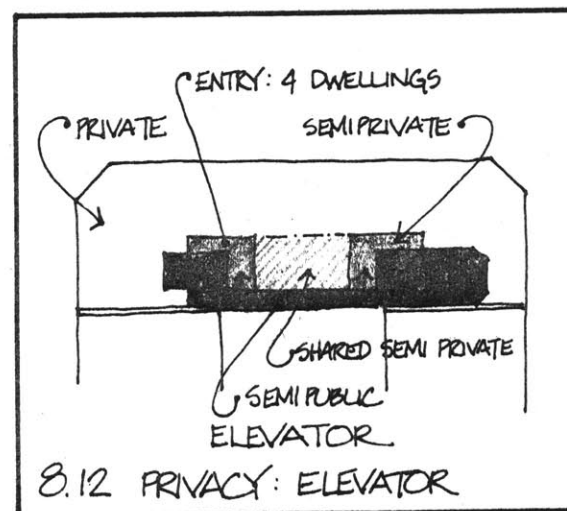
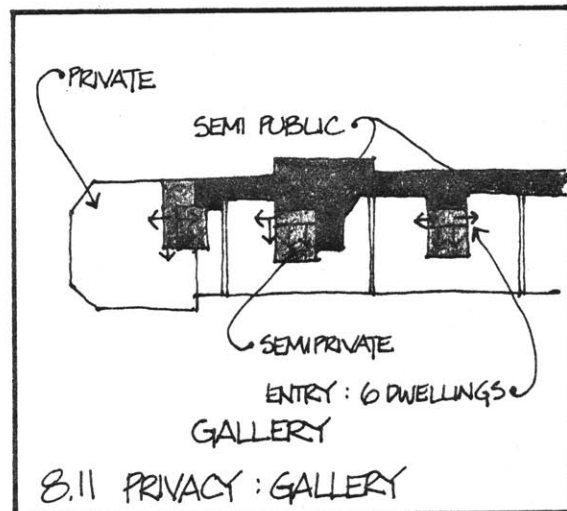
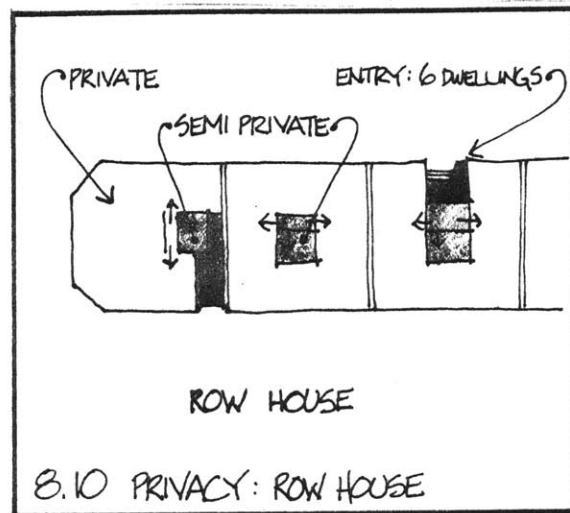
Elevator distribution dwellings are located in the corners of block development. The elevators serve both the gallery dwellings and these dwellings. All elevator distribution dwellings are accessible. Figure 8.12 outlines the levels of privacy occurring in this circulation principle.

#### 8.4 LIFE-SAFETY ELEMENTS

Chapter Six set the requirements for life-safety elements. This section explains egress provisions of the basic building. Rowhouse walkup group modules are provided with an exterior stair to the midblock courtyard as a second means of egress above the first floor. Gallery access dwellings are provided with two means of egress from any point along the gallery. Elevator distribution dwellings have two means of egress from the hall-gallery.

#### 8.5 ENVIRONMENTAL SERVICES AND CONTROL

Environmental services risers are shown on the basic building plans.



The main riser area is along the group module end walls, where plumbing, electricity, telephone, and ventilation risers would be located. The secondary locations, adjacent to the circulation stair in the middle of the 360 cm sector, would have plumbing services only.

The nature of the development and its low per-dwelling space conditioning needs make it an ideal candidate for solar-powered space heating and domestic hot-water heating. Heating would be supplied through a two-pipe network with fancoil units. The system would be decentralized with one package serving one to three group modules. Cooling would be supplied by two or three centrally located electrically driven chillers, with waste heat potentially recycled to the domestic hot-water supply. These systems choices would have to be verified by a detailed economic life cycle cost analysis.

## 8.6 EVALUATION OF THE BASIC BUILDING

It is necessary to examine whether the basic building proposed meets the performance requirements stated. Not only must the transitional care programs be accommodated, but sufficient flexibility in their layout and in the type and layout of other residential uses must also exist.

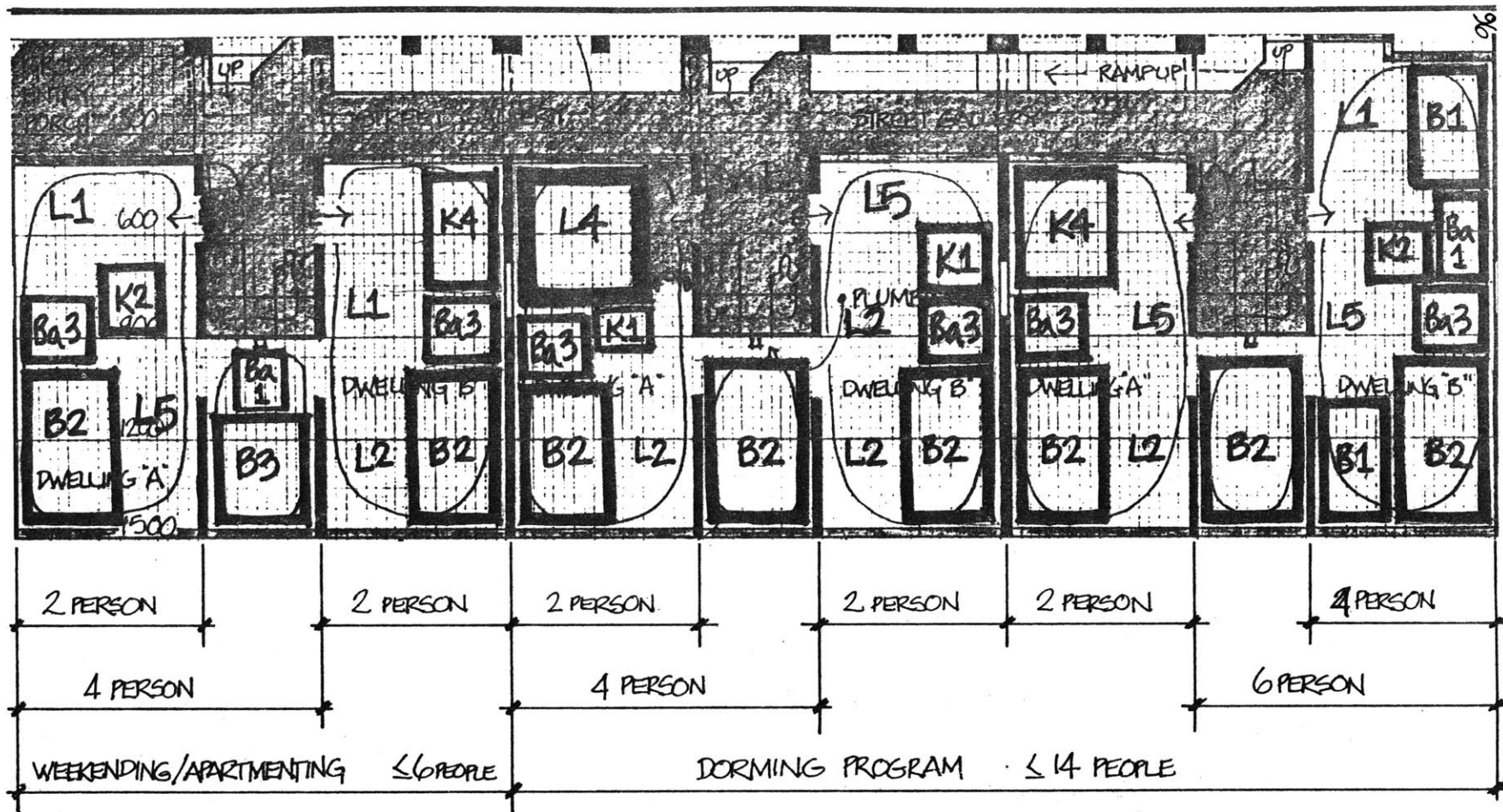
Figures 8.13 through 8.15 present capacity analyses of the basic building as they relate to transitional care programs. The transitional care programs can occur wherever the basic building is wheelchair-accessible: the first floor in street gallery row-houses; the middle levels in gallery access dwellings; and any floor in

elevator distribution areas. The capacity analyses are not particular layouts for the spaces, but instead show the possibilities inherent in the basic building.

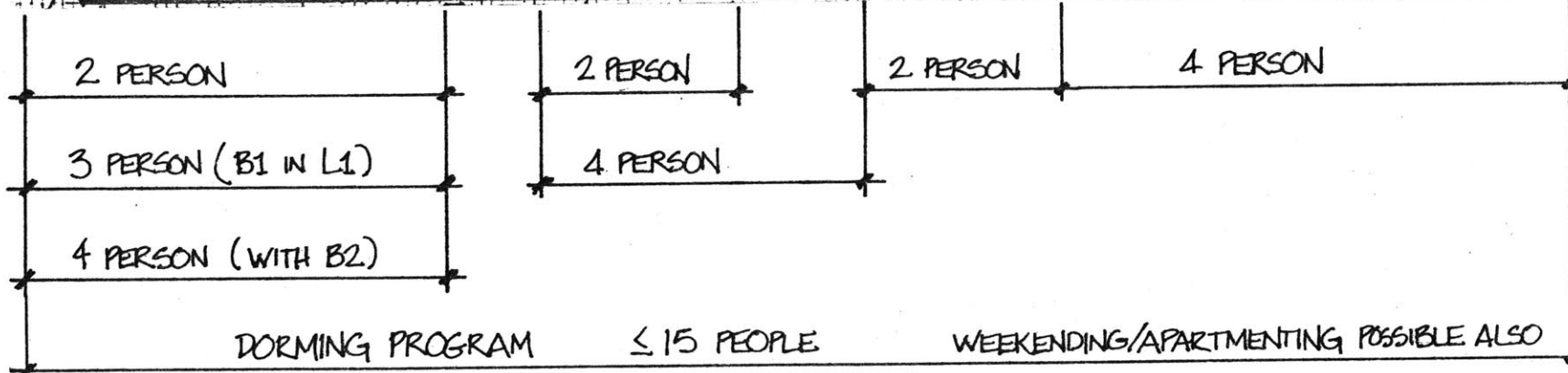
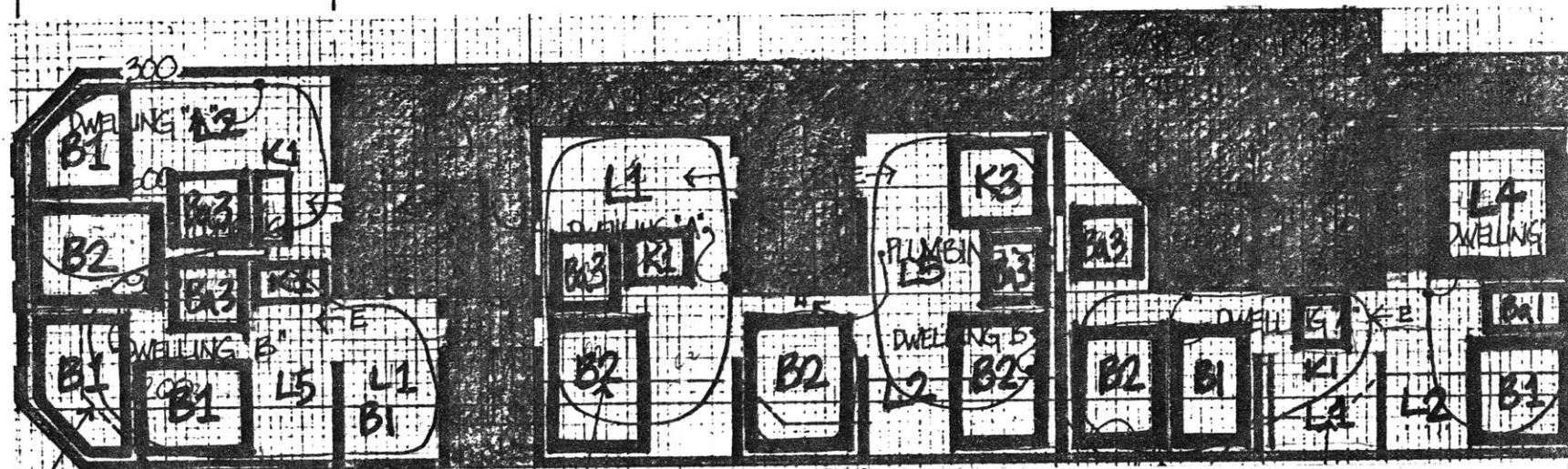
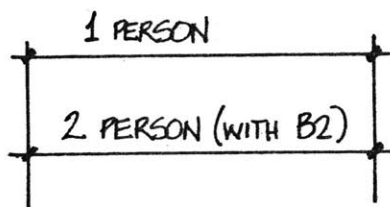
Figures 8.16 through 8.17 present capacity analyses of the basic building for typical residential programs. Facilities and layouts for both weekending and apartmenting programs are similar to residential layouts, and so those plans are not restudied. Variety and real choice in the potential layout of spaces is especially crucial here.

The capacity analyses give an idea of what is possible but cannot show detailed layout of a particular space. Figure 8.8 presents one such layout for the dorming transitional care program as it would be accommodated in the street gallery rowhouse.

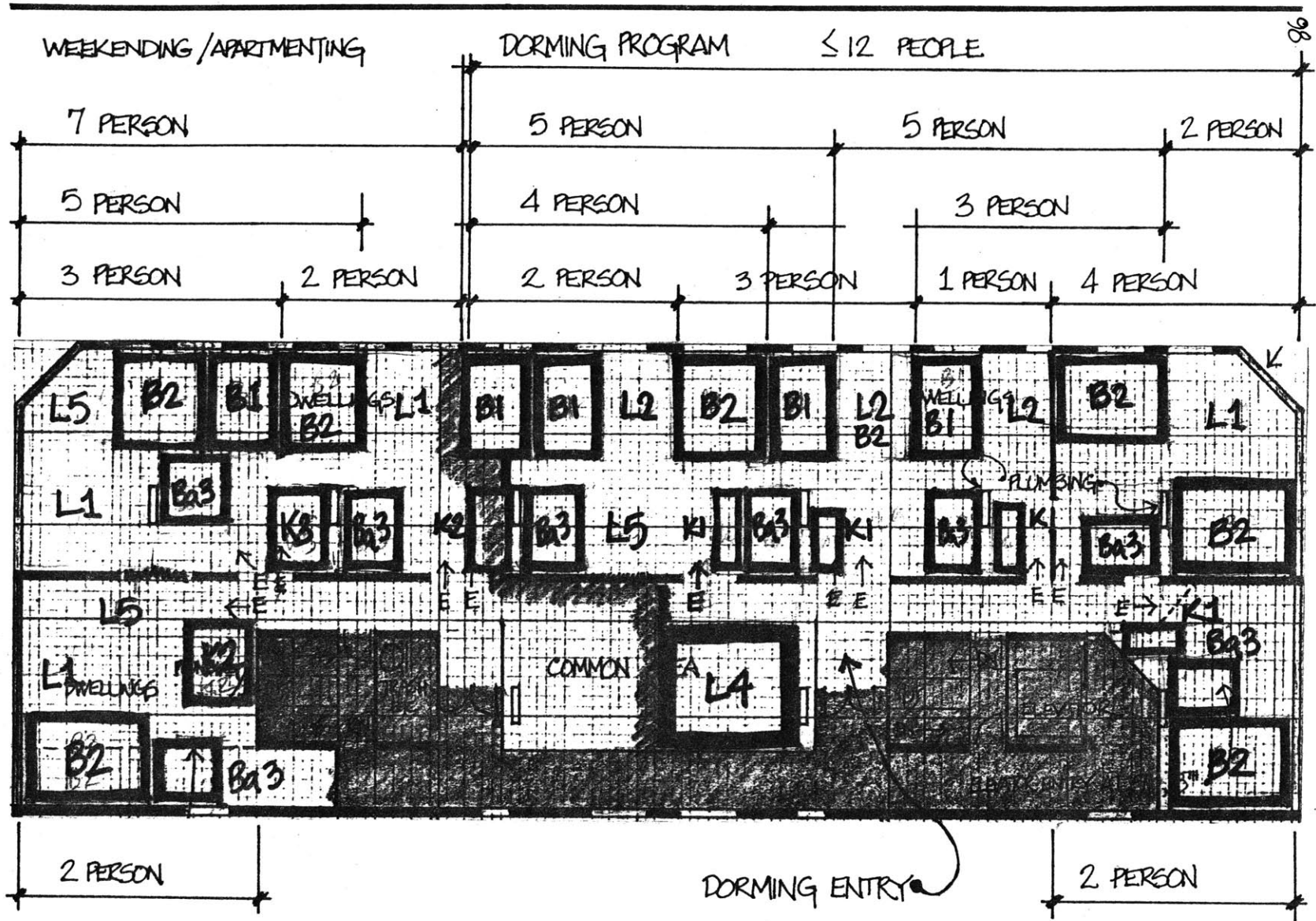
These evaluations have demonstrated that the basic building adequately responds to the requirements of both the transitional care programs and residential space needs. The next Chapter will bring the whole site development back into view by exploring option #4 of the site development programs presented in Chapter Seven.



8.13 CAPACITY ANALYSIS - STREET GALLERY ROW HOUSE - TRANSITIONAL CARE



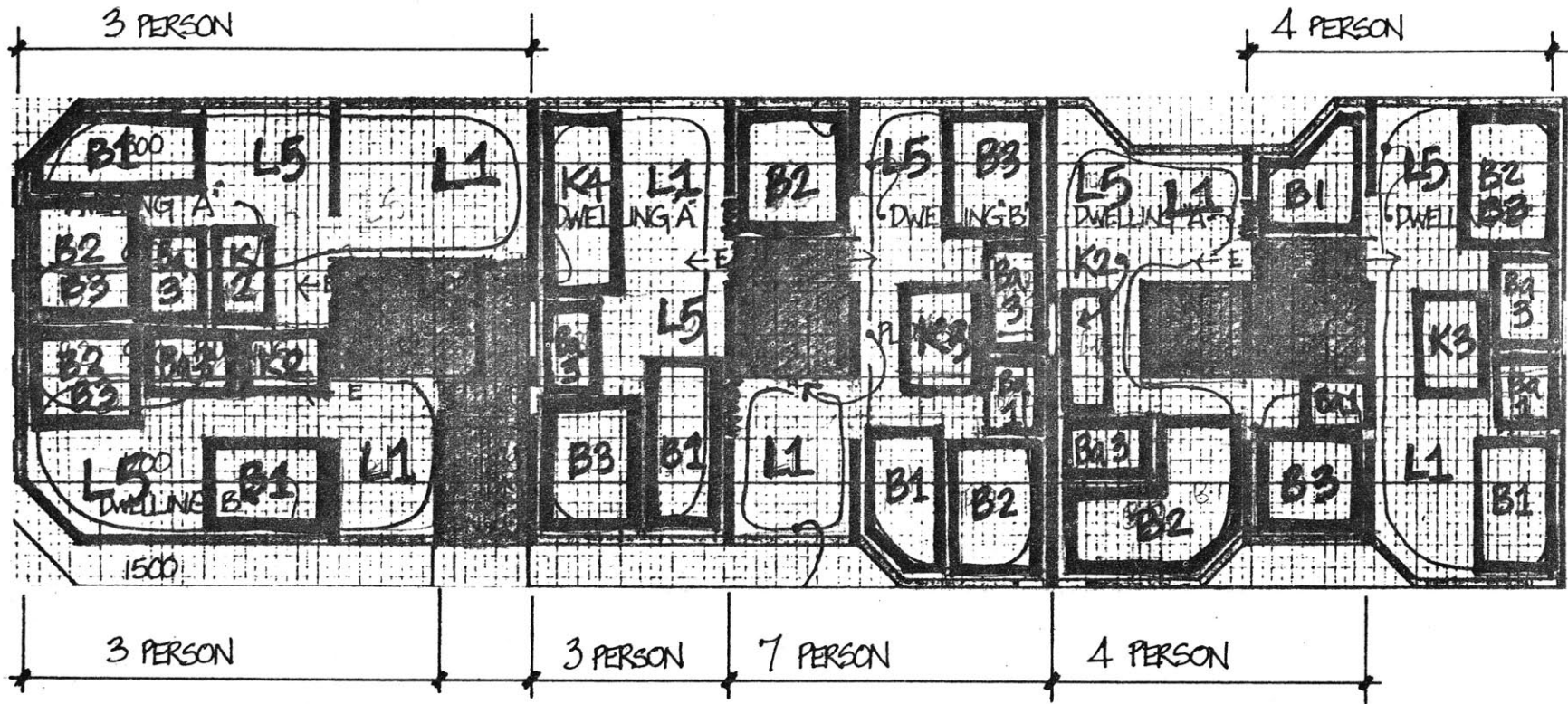
8.14 CAPACITY ANALYSIS - ELEVATOR GALLERY - TRANSITIONAL CARE



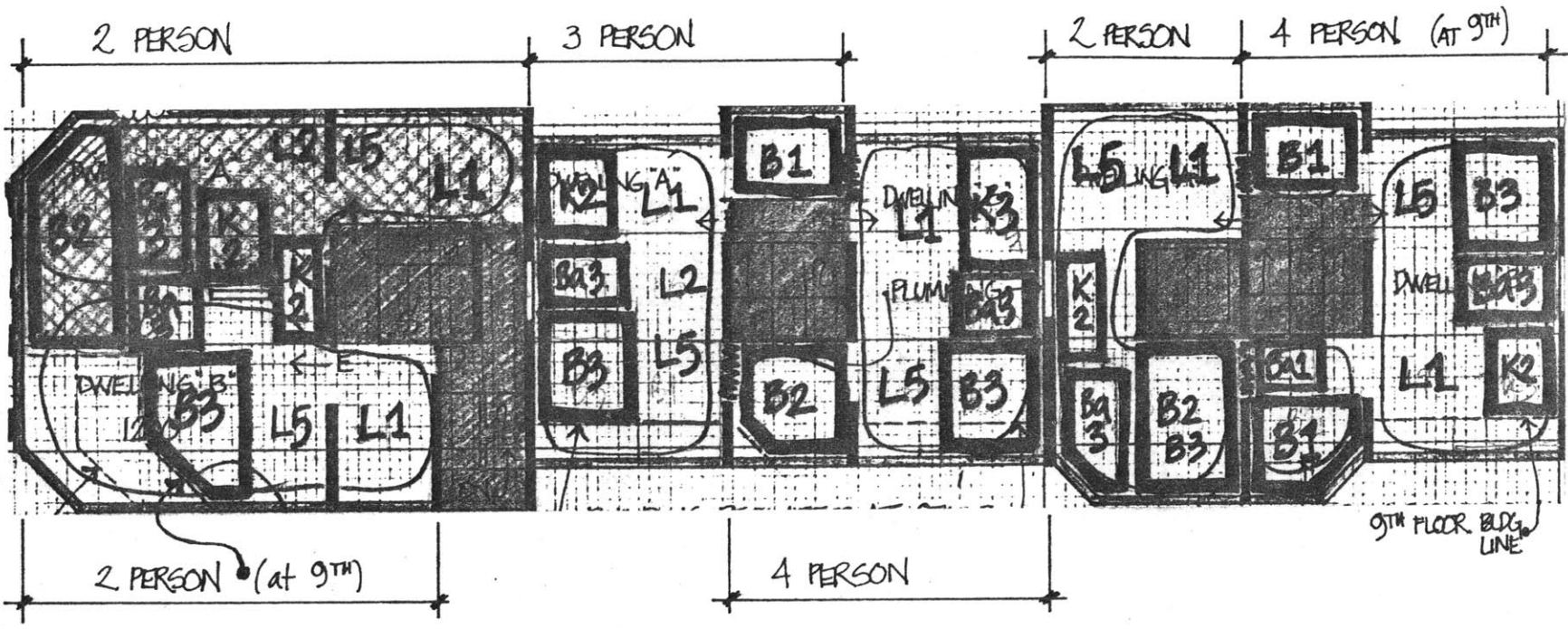
815 CAPACITY ANALYSIS

ELEVATOR ENTRY TYPICAL FLOOR TRANSITIONAL CARE



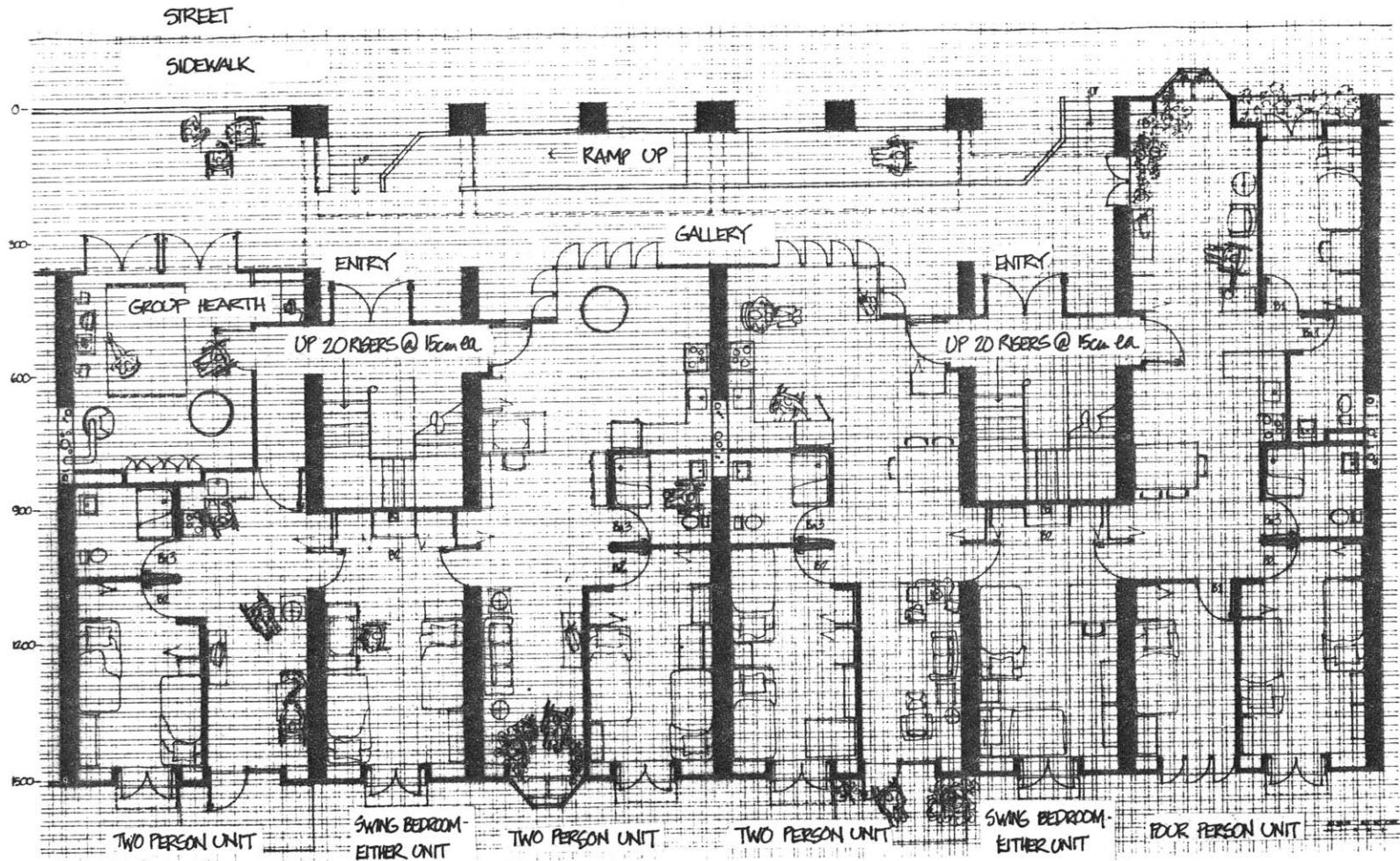


8.16 CAPACITY ANALYSIS ROW HOUSE 3RD FLOOR HOUSING



8.17 CAPACITY ANALYSIS - ELEVATOR GALLERY - ABOVE GALLERY - HOUSING



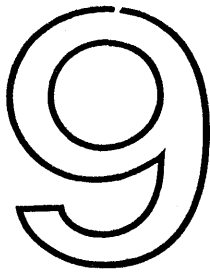


B.18

DORMING PROGRAM - TRANSITIONAL CARE FACILITIES







## Site Development : An Exploration

The thesis began with descriptions of the institutional and community contexts surrounding the Harrison-Tyler block. Part of these contexts are the goals and aspirations of the neighboring actors. Any site development strategy must take into account these actors and come to a clearer understanding of the roles any, some, or all of these actors would play. Without such an understanding, design explorations by architects and planners are useless.

### 9.1 ACTORS, GOALS, OBJECTIVES

The thesis has taken the Chinese Economic Development Council (CEDC) as a major, but not necessarily dominant, spokesman for the Chinese-American community in Boston. Of their four general goals, listed in Chapter Two, two form an appropriate base for a development strategy on the Harrison-Tyler block:

- Expand and revitalize impact area
- Improve standard of living and employment opportunities.

The CEDC is without extensive capital resources but is a viable conduit for State and Federal subsidies,

grants, and loans. Development of housing on the Harrison-Tyler block would have these advantages to the CEDC:

- Clarify the block's status as a part of the South Cove residential community.
- Increase housing stock available to local residents.
- Release some pressure on existing housing stock.
- Provide short-term employment opportunities in construction of the basic building.
- Provide medium-term employment opportunities in interior layout construction for basic building occupants.
- Provide long-term employment in service and maintenance.
- Provide training ground for Chinese building management firm.
- Provide the CEDC with a track record in urban development.
- Provide experience for Chinese construction firm.
- Increase capitalized base for future CEDC financing.

The various parts of T-NEMC have different sets of goals and priorities. The current T-NEMC master plan calls for medical support facilities on the Harrison-Tyler site, including the learning resources center and student housing. Growth in major medical facilities is aimed mostly west of Farnsworth, although in a manner much less grandiose. T-NEMC is currently re-assessing its facilities, goals, and priorities, trying to establish an understanding of what it wants to happen with its

various land parcels. Emphasis will probably be placed on:

- New pediatric in-patient facilities and combined adult-pediatric diagnostic and treatment areas.
- Headquarters facilities for a New England Regional School of Veterinary Medicine.
- A Nutrition Center.
- Facilities for undergraduate allied health educational programs transferred from Tufts Medford.
- Maintaining and increasing parking and commuting facilities.
- A Learning Resources Center.

It is the last two points, parking and the Learning Resources Center (LRC), which have potential application to the Harrison-Tyler site. T-NEMC currently parks approximately 160 cars on the Harrison-Tyler block and would need to carefully weigh the consequences of giving up that capacity. The LRC would contain the central bookstack for the several educational programs located at T-NEMC, plus media facilities, equipment, and files; programmed teaching materials, computer-aided instruction, microfilm, films, and slides would be included. Possible goals for T-NEMC on the site could be:

- Maintaining some parking capability.
- Possible location of the LRC.
- Options for future T-NEMC growth.

As an administrative organization, T-NEMC has few capital resources, but its parent institutions might be influential in facilitating financing for development. T-NEMC may not

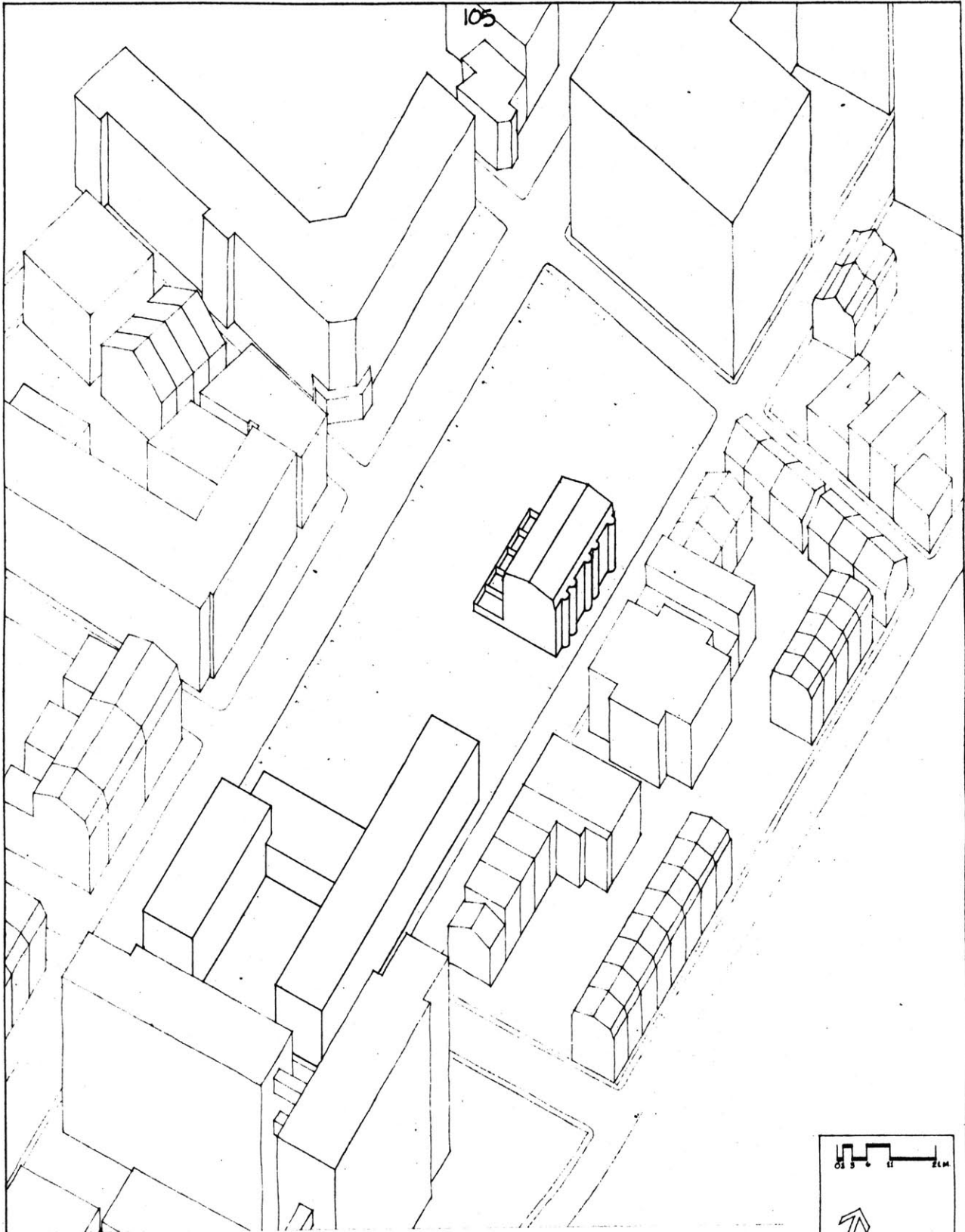
necessarily require land ownership; returning the block to the City tax rolls with new construction in place might be a strong incentive for City cooperation.

## 9.2 SITE DEVELOPMENT STRATEGY

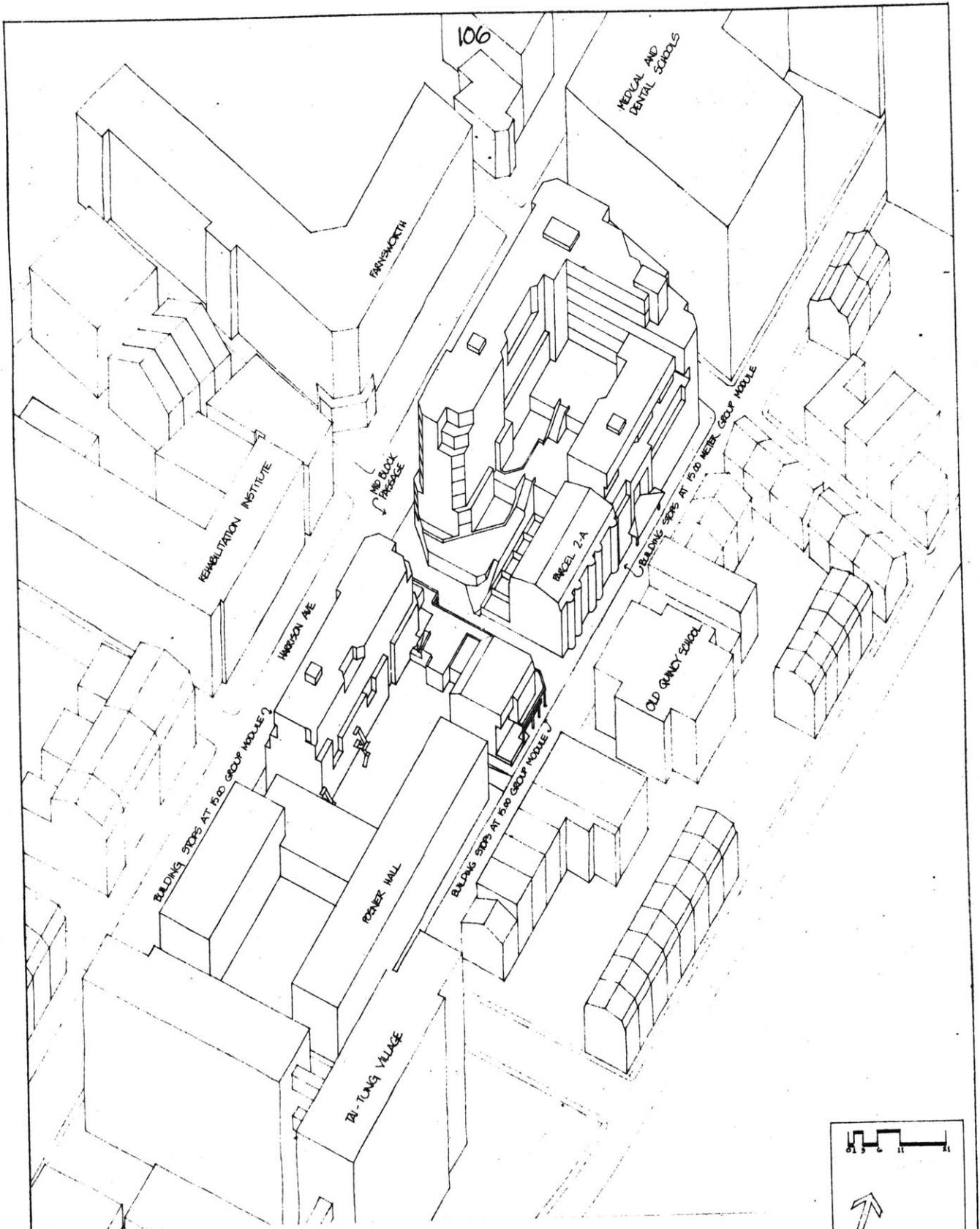
Chapter Seven highlighted the current land control situation on the Harrison-Tyler block and suggested the need for community-institution cooperation if whole block development were to be successful. Figures 9.1 through 9.4 illustrate the ramifications of this argument. In showing what part of the block could be developed under various land control scenarios, these figures also present a strong case for phased development. Building on the block could be reasonably complete at any stage and major urban design goals attained. Phased development would spread out capital requirements, stabilize construction employment, and minimize population dislocations, although environmental impacts due to construction would be aggravated.

The formation of any site development strategy hinges first on a mutual agreement between parties as to who should participate in development, i.e., who has "standing." Such a discussion of course would include the goals and objectives of the various parties, but it is important to establish the willingness to cooperate and work together first.

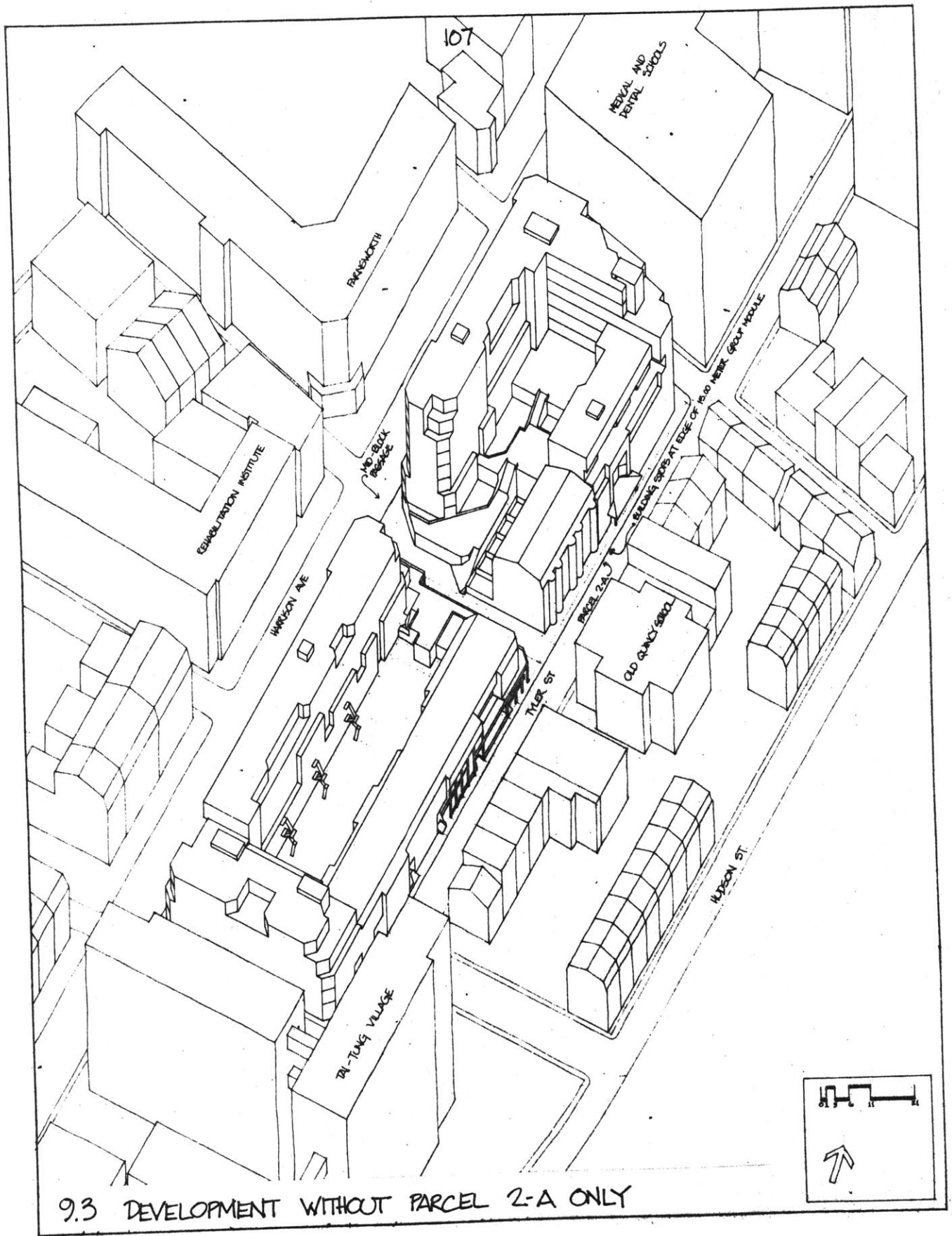
The second task of the development group would be clarification of roles in project planning, design construction, ownership and manage-



9.1 EXISTING BUILDINGS - HARRISON-TYLER SITE

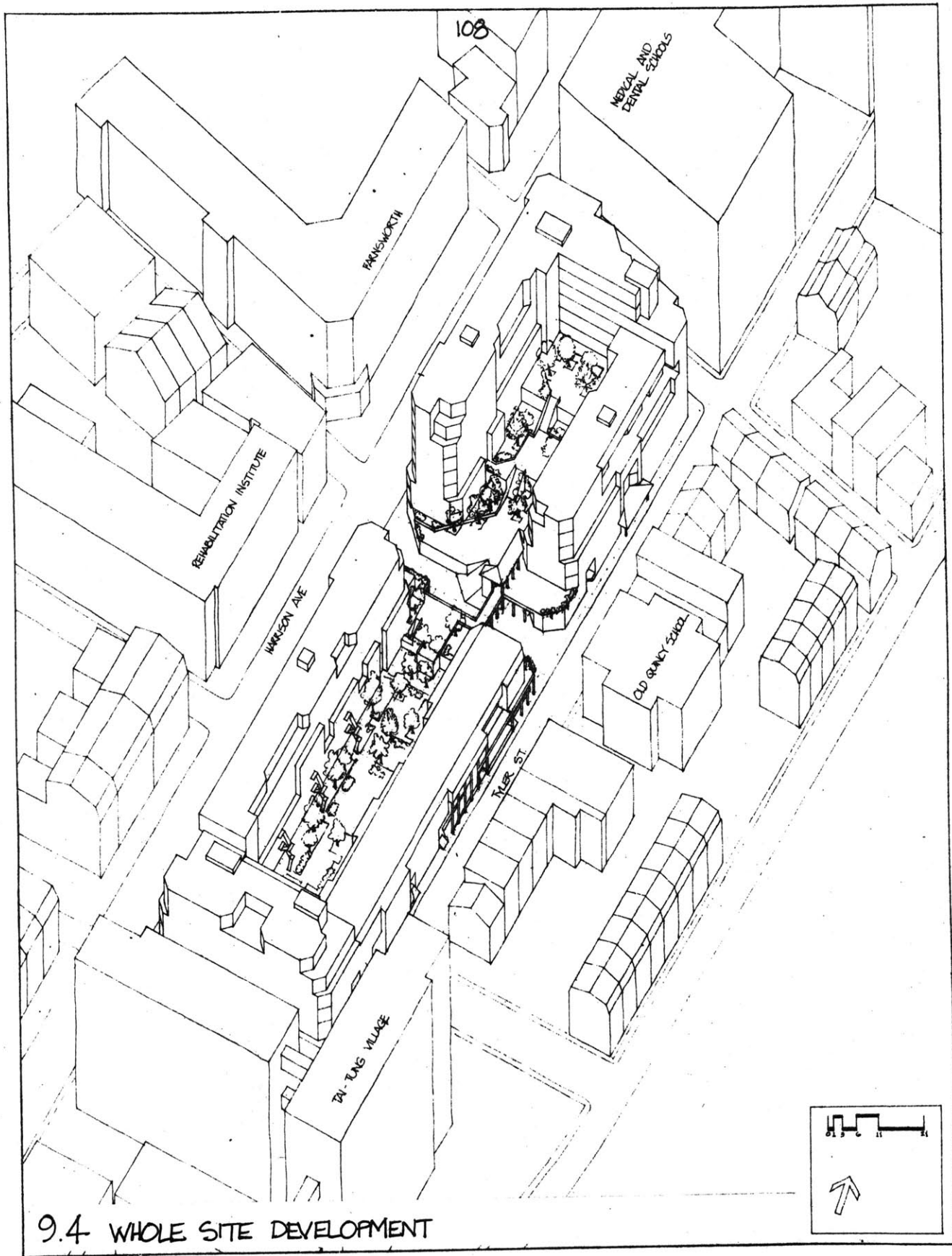


9.2 AXONOMETRIC: DEVELOPMENT ON LAND CURRENTLY PARKING LOT



9.3 DEVELOPMENT WITHOUT PARCEL 2-A ONLY





9.4 WHOLE SITE DEVELOPMENT



ment. These discussions would be accompanied by financial feasibility studies concerning questions of land control and ownership, building control and ownership, tax consequences of all of the above, financing mechanisms and the applicability of government housing programs.

The third task of the development group would be exploration of architectural program options and agreement on what should be built. Construction of about 35,000 m<sup>2</sup> on the site would probably cost about \$16 million, dependent on facilities mix. Work on this third task would be accompanied by the retention of design and construction consultants. From this point, then, development, design, and construction could proceed.

### 9.3 ONE SITE DESIGN EXPLORATION: "MAX MIX"

Section 9.2 made no recommendation concerning what development strategy should be pursued. Rather, it outlined how a strategy should be achieved. This section explores the physical consequences of one, possible, site development strategy. This scenario is only a product of the author's imagination and does not in any way represent the official sentiments of either the CEDC or T-NEMC. The scenario:

Actors. The CEDC and T-NEMC have agreed to work together to develop the Harrison-Tyler block. The T-NEMC administration will represent T-NEMC, with the Tufts Rehabilitation Institute acting as design consultants to them. An executive committee of the CEDC Board will represent the CEDC.

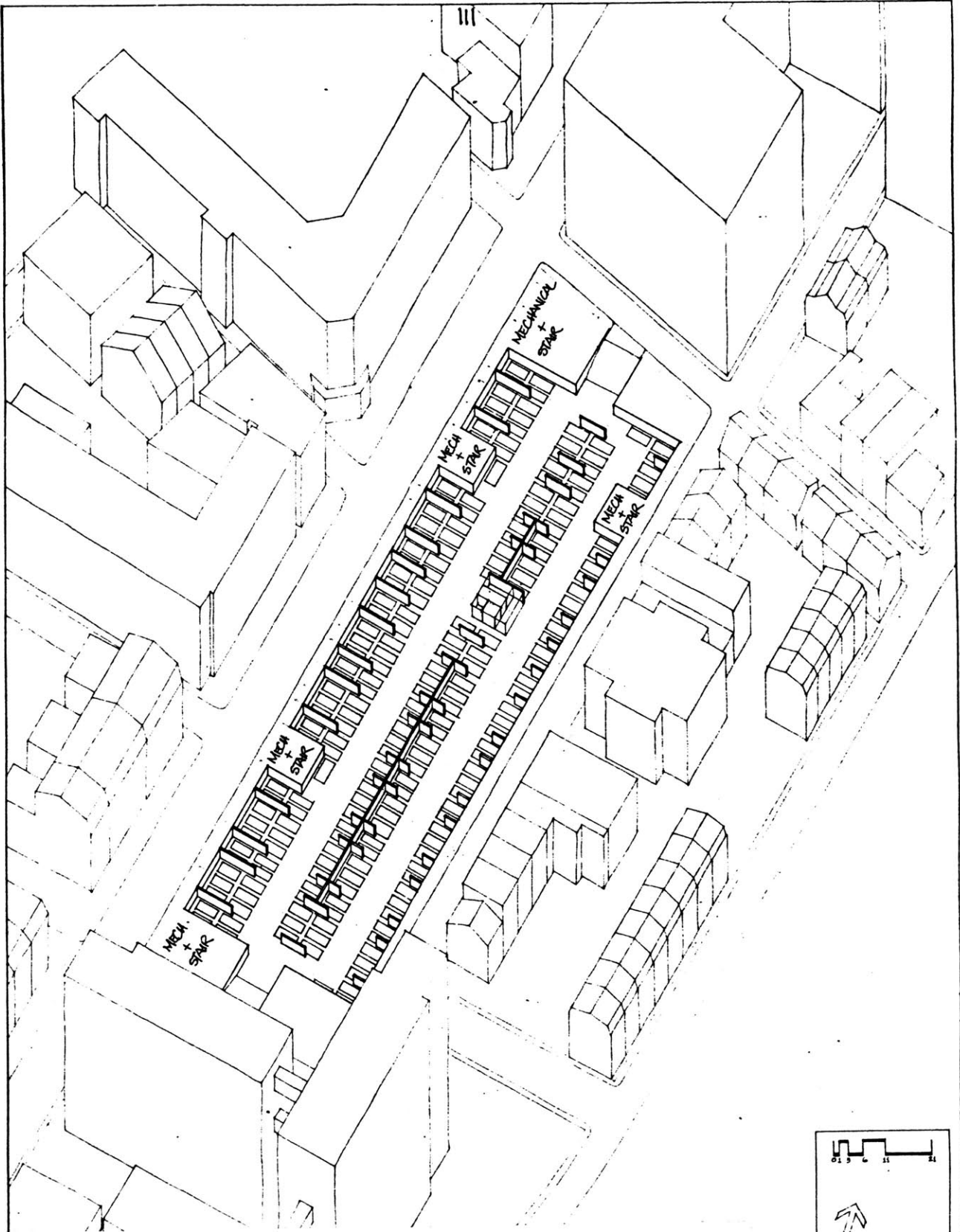
Roles. T-NEMC, upon completion of development, will transfer title of its land on the block to Harrison-Tyler Associates, a limited partnership with the CEDC Board as general partners. The land is to be conveyed with covenants allowing T-NEMC a 99-year lease on up to 5000 m<sup>2</sup> space on the first three floors of the northern half of the development. As an incentive to return the property to the tax roles, the development group has agreed to seek a 121A tax agreement with the City of Boston, which would fix real estate taxes for up to 25 years. Harrison-Tyler Associates has also agreed to lease up to 2000 m<sup>2</sup> to an agent of the Tufts Rehab Institute for use in transitional care programs, with options for an additional 1000 m<sup>2</sup> after five years. The development group has agreed to aid Harrison-Tyler Associates in choosing a well-known management firm with a good local reputation. The management firm may be invited to participate in ownership of the development. The housing could be built under some combination of these government programs:

- MHFA Middle- and Low-income Subsidy.
- HUD Housing for the Elderly.
- HUD 202/Section 8.
- HEW Educational Facility Housing Construction Programs.
- Mass. State Funding for Group residences.

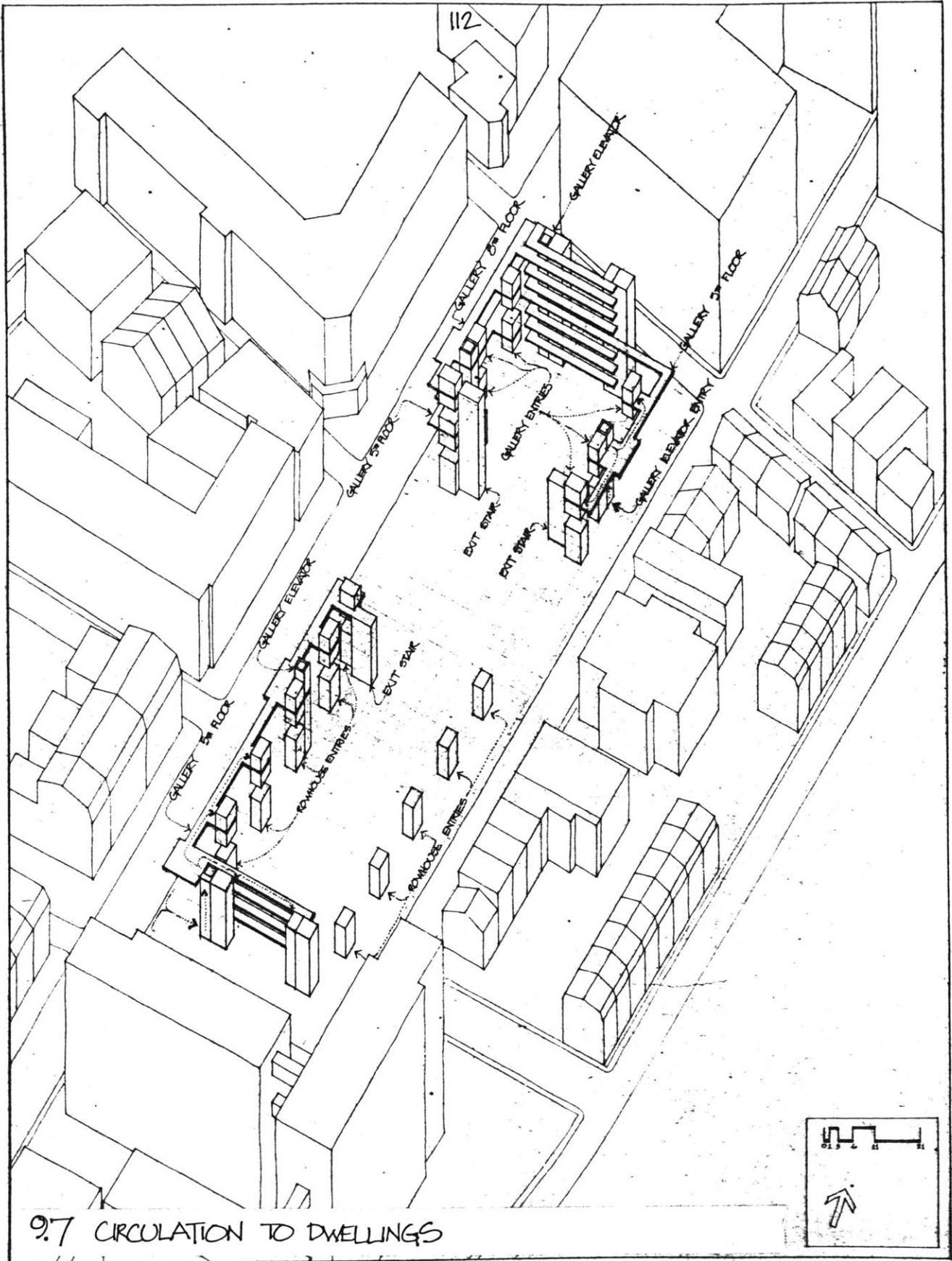
Architectural program. Figures 9.4 through 9.18 present a design exploration based on the above development scenario. The design exploration follows the site design guide-

FLOOR	FUNCTION TYPE	SOUTH BUILDING		NORTH BUILDING	
		AREA	NO. OF DWELLINGS	AREA	NO. OF DWELLINGS
G	PARKING	6000 m <sup>2</sup>		205 CARS	
1	LEARNING RESOURCES COMMUNITY HOUSING	300 m <sup>2</sup>		2100 m <sup>2</sup>	
	ELEVATOR ROWHOUSE	300 m <sup>2</sup> 1700 m <sup>2</sup>	5 17		
2	LEARNING RESOURCES COMMUNITY HOUSING	35 m <sup>2</sup>		1800 m <sup>2</sup> 165 m <sup>2</sup>	
	ELEVATOR ROWHOUSE	600 m <sup>2</sup> 2000 m <sup>2</sup>	7 20	200 m <sup>2</sup>	2
3	LEARNING RESOURCES HOUSING			1200 m <sup>2</sup>	
	ELEVATOR ROWHOUSE	600 m <sup>2</sup> 2000 m <sup>2</sup>	7 20	800 m <sup>2</sup>	8
4	HOUSING			575 m <sup>2</sup> 1080 m <sup>2</sup>	4 12
	ELEVATOR GALLERY (5 <sup>TH</sup> )	600 m <sup>2</sup> 900 m <sup>2</sup>	7 10		
5	HOUSING			575 m <sup>2</sup> 1000 m <sup>2</sup>	4 12
	ELEVATOR GALLERY	400 m <sup>2</sup> 900 m <sup>2</sup>	5 10		
6	HOUSING			575 m <sup>2</sup> 1000 m <sup>2</sup>	4 12
	ELEVATOR GALLERY (5 <sup>TH</sup> )	750 m <sup>2</sup>	10		
7	HOUSING			500 m <sup>2</sup> 500 m <sup>2</sup>	4 6
	ELEVATOR GALLERY (8 <sup>TH</sup> )				
8	HOUSING			400 m <sup>2</sup> 500 m <sup>2</sup>	4 6
	ELEVATOR GALLERY				
9	HOUSING			350 m <sup>2</sup> 450 m <sup>2</sup>	3 6
	ELEVATOR GALLERY (8 <sup>TH</sup> )				
BUILDING TOTALS		11,085 m <sup>2</sup> 118		13,900 m <sup>2</sup> 87	
WHOLE SITE TOTALS		30,985 m <sup>2</sup>		205 DWELLINGS 205 CARS	

9.5 "MAX MIX" - AREA AND DWELLINGS TABULATIONS



9.6 PARKING AT ONE-HALF LEVEL BELOW GRADE



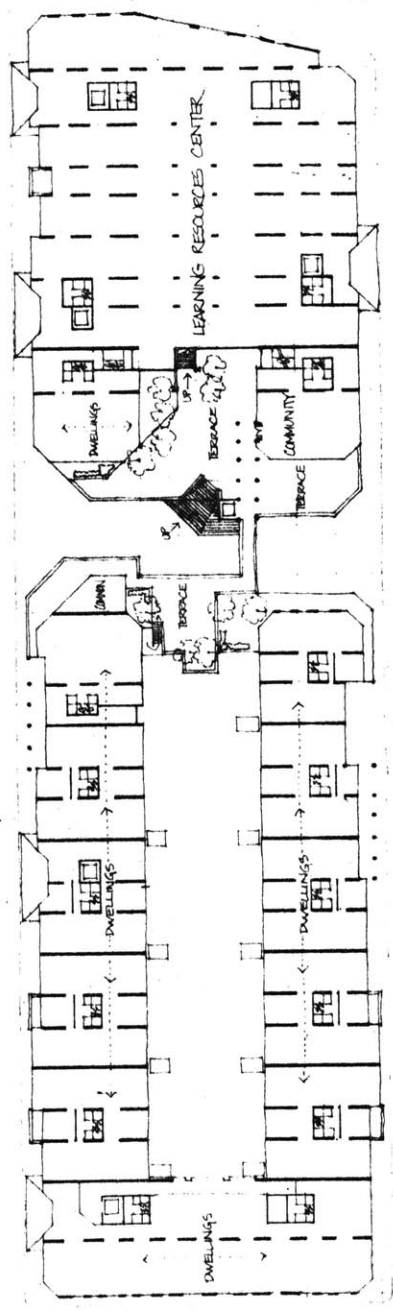
9.7 CIRCULATION TO DWELLINGS



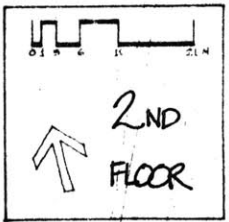
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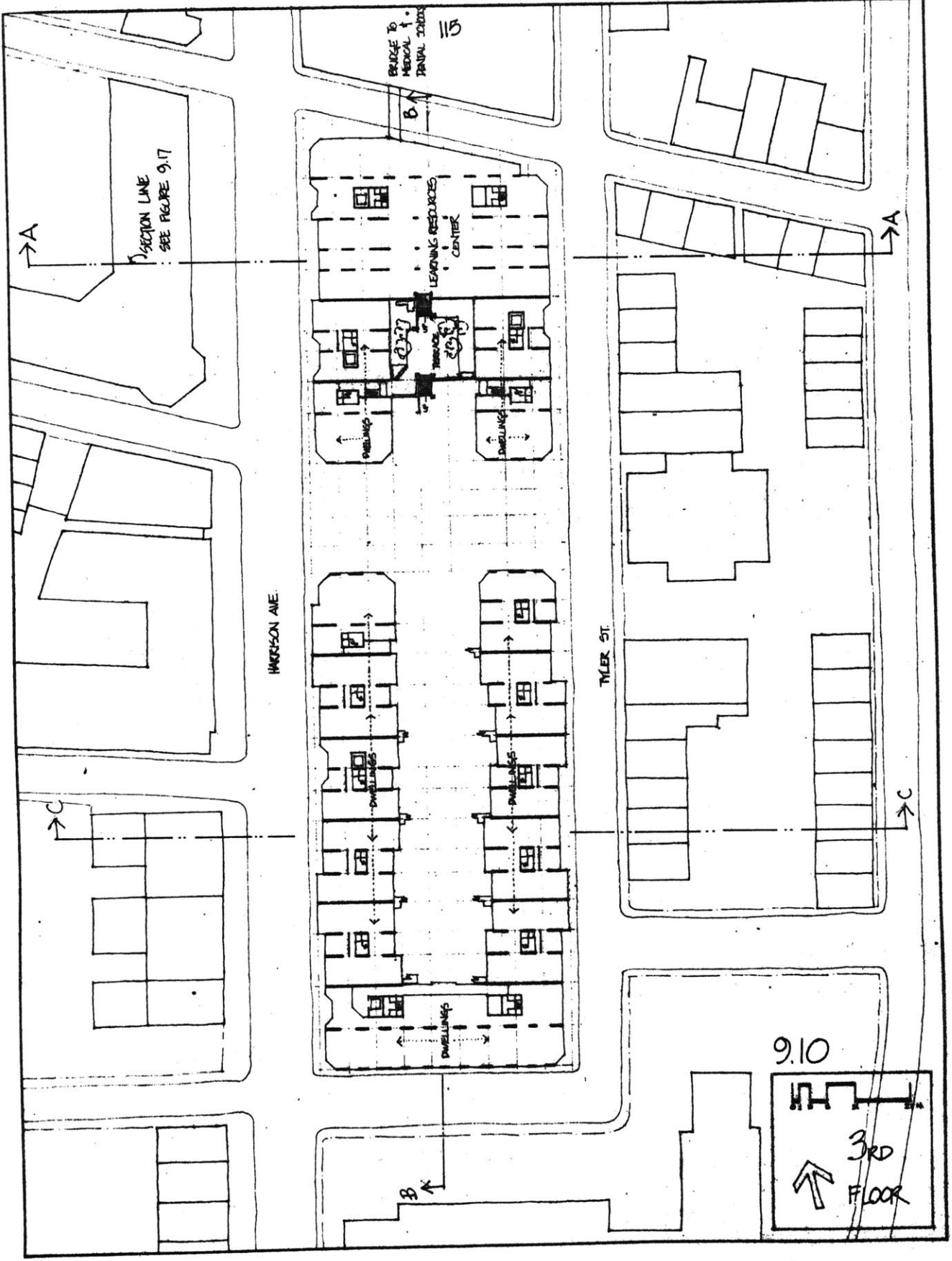
HARRISON AVE

TYLER ST



9.9





lines set forth in Chapter Seven and uses the basic building schematics presented in Chapter Eight. A summary of the areas devoted to transitional care programs, housing, educational, community uses and parking is presented in Figure 9.5. The FAR for this scheme is within the limits set in Chapter Seven.

The Harrison-Tyler block site is apportioned between two buildings, north and south, separated by the mid-block passage. See Figure 9.4. The passage is fronted on the south by community facilities, and on the north by the Learning Resources Center. Landscaped outdoor terraces for community use are located above the community facilities and the LRC.

Parking is provided under the site at 1/2 level below grade, reached by two-way ramps at either end of the block. See Figure 9.6.

Access to dwellings is distributed along the two major streets, Harrison Avenue and Tyler Street. Row-house-walkup type dwellings occupy the first three floors along the streets, with a group entry for up to six dwellings in each 15 meter group module. Above the rowhouses are up to two layers of gallery access dwellings, each a 3-floor unit. The galleries are reached by a number of elevators, distributed along the gallery to reduce travel distance by residents. See Figure 9.7.

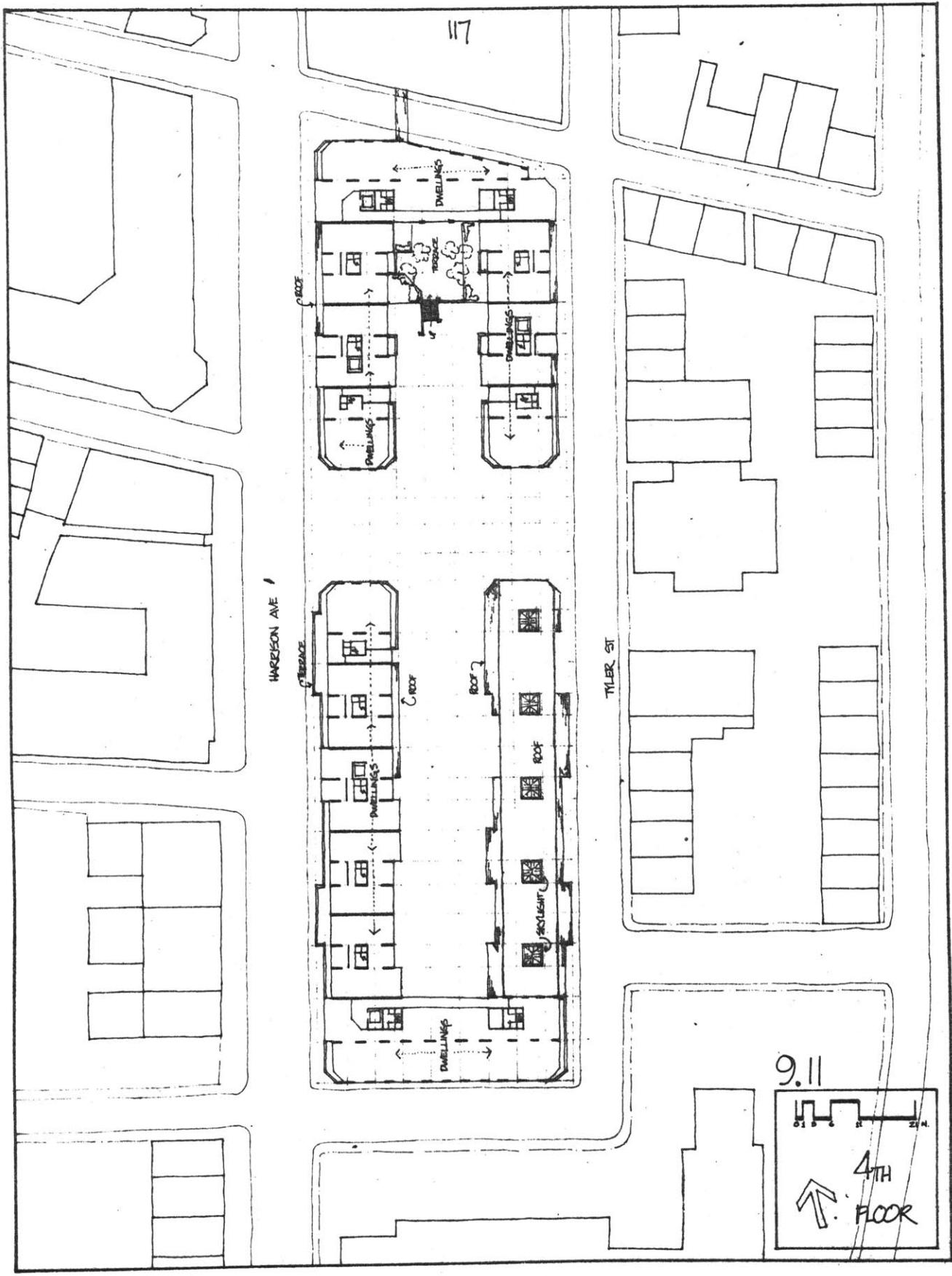
The placement of buildings and distribution of circulation allows flexibility in potential ownership and/or management of development.

This potential might have important and useful consequences for project financing or operation. Not only is the site separated in two buildings, but each of those buildings is in turn separated into discrete pieces. The walkup group modules in the south building are independent of the elevator gallery dwellings located above. See Figure 9.7. In the same way, the Learning Resources Center and walkup elements in the north building are independent of the elevator gallery dwellings above them. This organization of buildings could facilitate an air-rights development process on the site.

Plans for floors one through nine of the design exploration are presented in Figures 9.8 through 9.16. Major circulation entries are highlighted. See Figure 9.8. The mid-block passage brings the two buildings together and opens the interior block spaces to view as well. A major entry to the LRC is located on the passage, as are dining facilities for the transitional care programs. See Figure 9.8. Other community facilities located on the first two floors include laundry; workshops; a community health/multi-use activity space; and combination lecture-halls-by-day and community-cinemas-by-night. Elevator access to the parking level is located here also.

Two stairs on the midblock passage lead to community-use terraces on the second floor. See Figure 9.9. The LRC steps back at both the second and third floors. A pedestrian bridge connects the LRC to the Tufts Medical School at the third floor. Terrace space is given





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GALLERY 5<sup>TH</sup> FLOOR

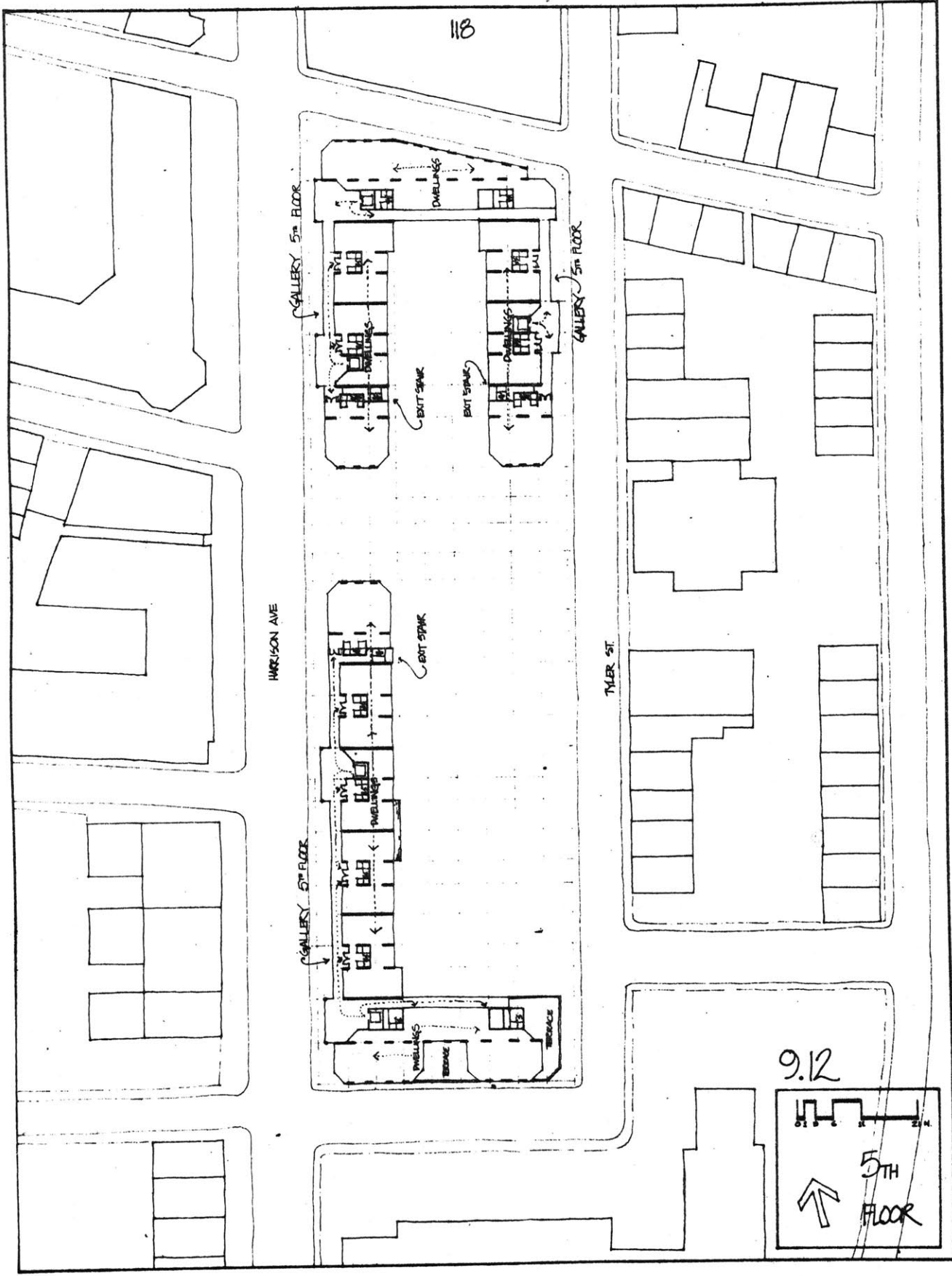
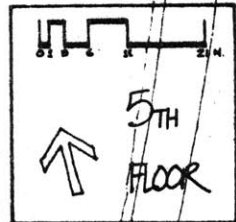
GALLERY 5<sup>TH</sup> FLOOR

HARRISON AVE

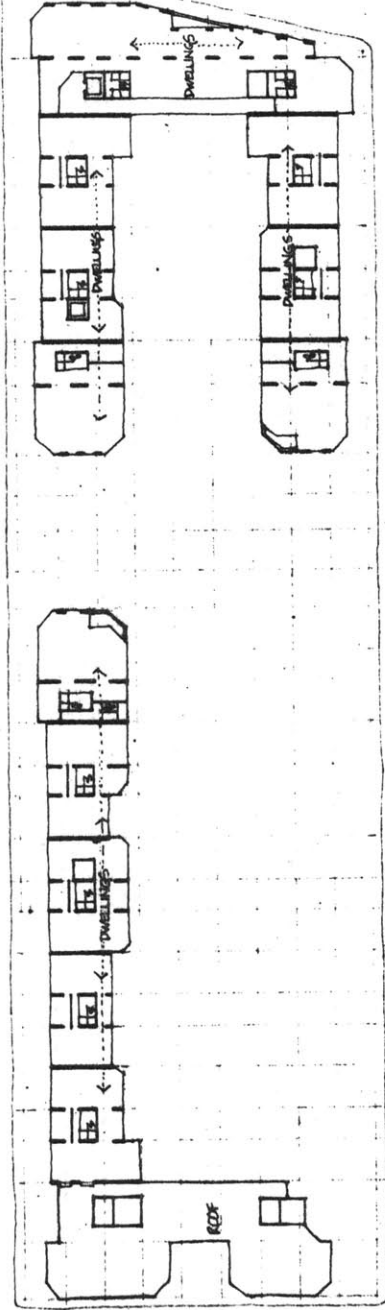
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GALLERY 5<sup>TH</sup> FLOOR

9.12



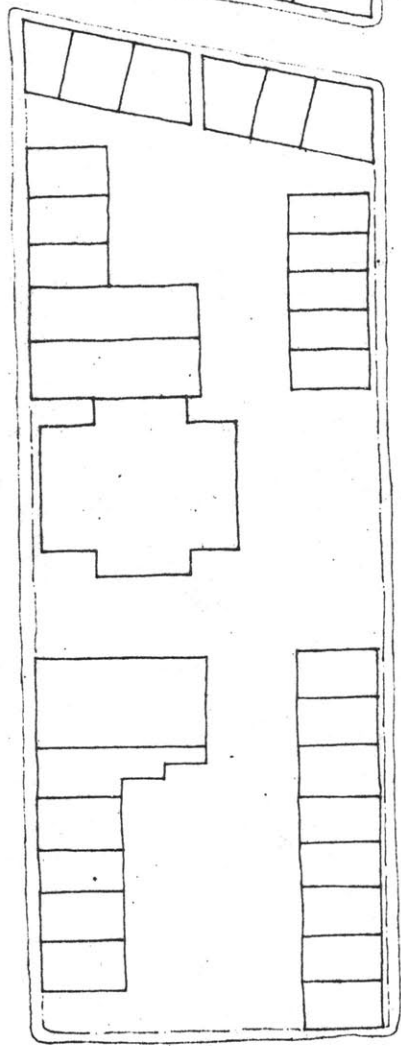
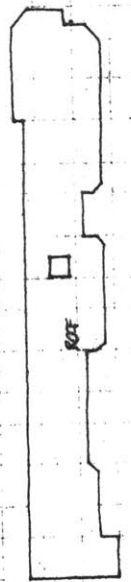
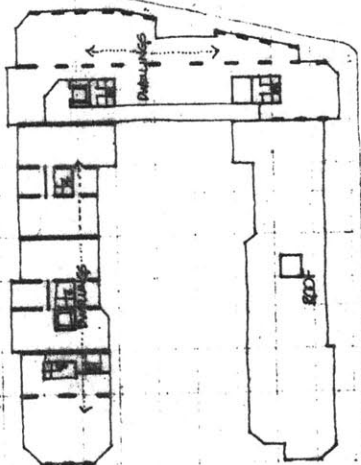
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9.13



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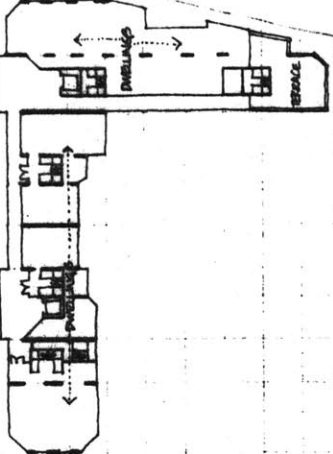
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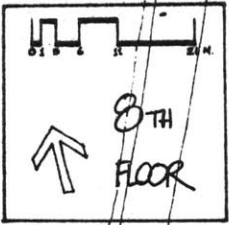
7TH FLOOR  
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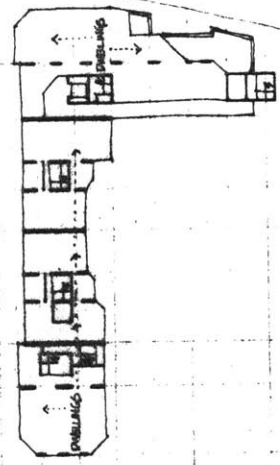
GALLERY 8<sup>TH</sup> FLOOR



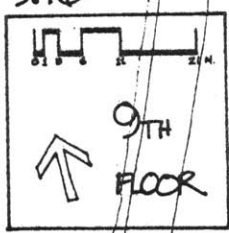
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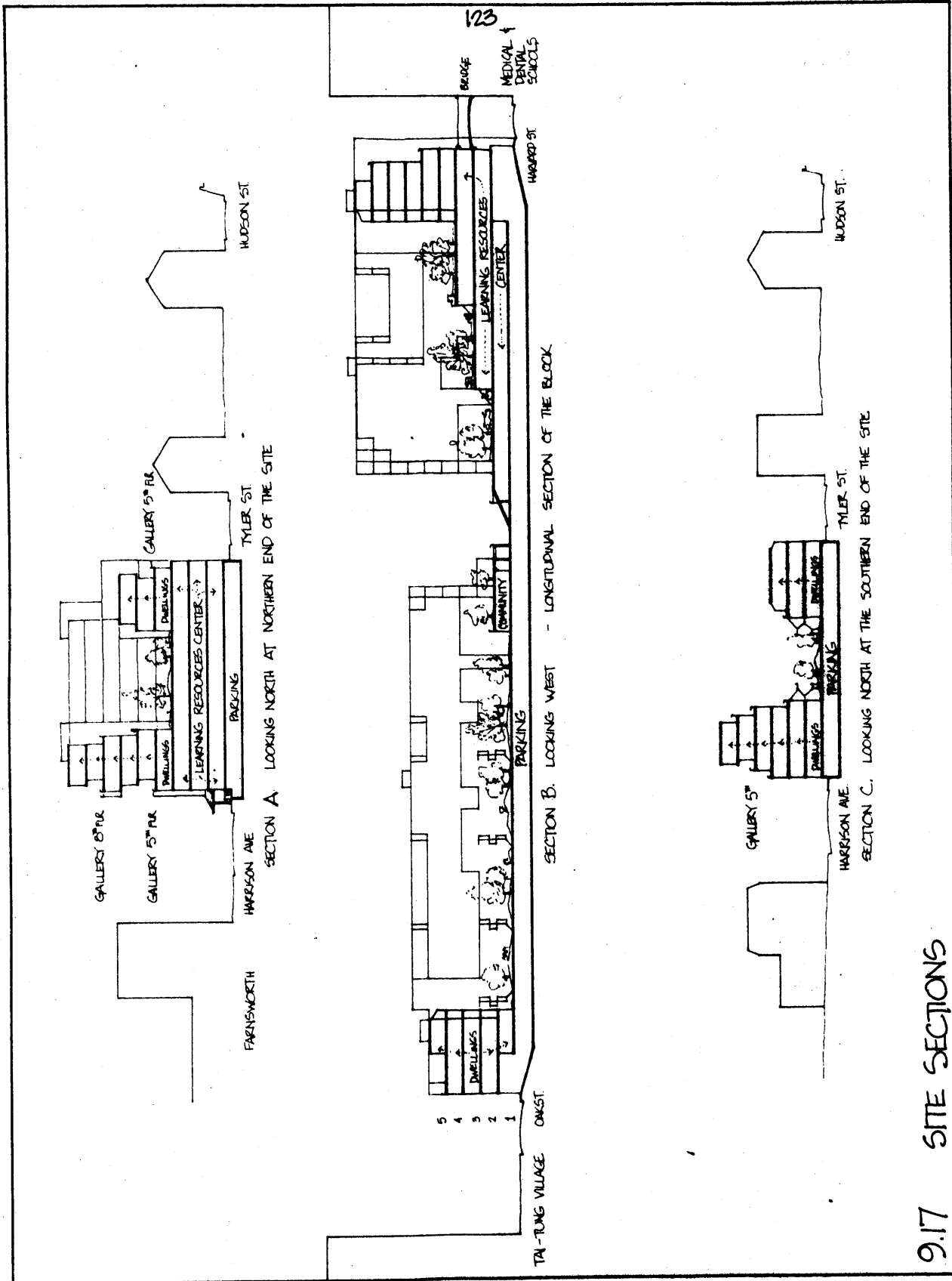


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9.16





9.17 SITE SECTIONS

both to community use and to private gardens. See Figures 9.9, 9.10, and 9.11. The first floor outdoor space in the south building is allocated to private outdoor spaces.

The fifth floor is the first gallery level. Elevators, distributed along the gallery, reduce walking distances considerably. No six-dwelling entry is more than 65 feet from an elevator. See Figure 9.12. A second gallery level is located on the eighth floor. See Figure 9.15. Despite the extensive use of stairs, 40% of the dwellings and all of the community space are wheelchair-accessible.

Security of the inhabitants is enhanced by any one circulation component. Walkup entries would provide access to no more than six dwellings. Elevators in the south building would provide access to no more than sixty dwellings; north building elevators would provide access to no more than ninety dwellings. At any floor reached by elevator, secondary entries provide access to no more than six dwellings.

Figure 9.17 presents sections through the development. The locations of these sections is shown in Figure 9.9. The predominant section, three floors on the east, six floors on the west, is actually repeated above the Learning Resources Center. See Figure 9.17.

The above scenario and the drawings of the design exploration represent one alternative for development on the Harrison-Tyler block. The design exploration completes the tasks of

this thesis. The thesis problem was threefold: 1) Could better programs for the rehabilitation of the physically disabled be designed? 2) Could a basic building be designed to shelter those programs with the needed degree of flexibility while maximizing shared elements? and 3) Could that basic building be used to organize a coordinated, phased, whole block development of the Harrison-Tyler site which would include not only transitional care programs but housing and educational facilities as well? The author believes the thesis answers these questions in the affirmative.



REFERENCES

## Chapter Two

1. Whitehill, Walter Muir, Boston: A Topographical History, Harvard, Boston, 1968, p. 74.
2. Ibid p 77.
3. Ibid p 124.
4. Ibid p 103.
5. Economic Development for Boston's Chinese-American Community, CEDC p 4, TAP Grant Project #01-6-02189, December 1976.
6. Ibid p 2.
7. Ibid p 2.
8. Chinatown Boston 200 Neighborhood History Series, Boston 200 Corp. 1975, p. 3.
9. CEDC p 4.
10. Ibid p 2.
11. 200 p 6.
12. Ibid p 8.
13. Ibid p 8.
14. Ibid p 9.
15. Ibid p 9.
16. Ibid p 12.
17. Ibid p 12.
18. CEDC p 3.
19. Ibid p 19.
20. Chinatown-South Cove District Profile and Proposed 1977-1979 Neighborhood Improvement Program, City of Boston BRA, Fall 1976, p 5.
21. CEDC pp 21-27.
22. Ibid p 27.
23. Ibid p 36.
24. Ibid p 39.
25. Ibid p 39.
26. Ibid pp 3-13.
27. Ibid pp 53-75.
28. Brief History-Chinatown and T-NEMC, T-NEMC Report 8-20-71, p 4.
29. Ibid p 4.
30. Ibid p 4.

## Chapter Three

1. Boston Dispensary and Rehabilitation Institute, Report of Activities 1962 and 1963, prepared by the Administration, 1964. Boston, p 1.
2. Ibid p 1.
3. Ibid p 1.
4. Ibid p 1.
5. Ibid p 3.
6. Ibid p 3.
7. Ibid p 4.
8. Ibid p 6.
9. Ibid p 6.
10. Ibid p 6.
11. A Preliminary Study: Development of Tufts New England Medical Center, 1965-1985, Herman Field, T-NEMC, 10-1-1964.
12. Ibid pp 1-2.
13. Ibid pp 96-97.
14. Ibid pp 98-99.
15. Ibid p 125.
16. Ibid pp 126, 127, 133.
17. Ibid pp 126, 127, 133.
18. Ibid p 181.
19. Ibid pp 179-184.
20. Ibid from Chart V-1, Alternative Growth Directions, Initial 20-Year Development, p 181.
21. Lynch, Kevin, Medical Center in the South Cove: A Study for the Development of New England Medical Center and its Neighborhood, December 1955.
22. T-NEMC Preliminary Study, p 183.
23. Ibid pp 203-209.
24. Ibid pp 203-209.
25. Dixon, John Morris, New Dimension in Urban Renewal, Arch. Forum 9/68, p 50.

## REFERENCES (Continued)

## Chapter Three

26. Ibid p 50.
27. Ibid p 54.
28. Ibid p 54.
29. Notes of Conversation with John Erickson, Arch. Services, 1/7/77.
30. Tufts New England Medical Center Master Plan Drawings, 12/28/73. Source: T-NEMC Arch. Services.

## Chapter Four

1. Abstracted from data in Fishman, Adaptive Housing for the Handicapped.

## Chapter Four Continued

2. Tufts Rehabilitation Institute internal correspondence.
3. Notes of Conversation with Dick Gould.
4. Notes of Conversation with James Holzer, Tufts Rehab. Administrator.
5. Abstracted from Reimbursement and Cost Data, the Massachusetts Rate Setting Commission, and from Notes of Conversations with Dr. Paul Corcoran.
6. Notes of Conversations with James Holzer.

BIBLIOGRAPHY

## TRANSITIONAL CARE PROGRAMS

- Butler and Benson, Aphasia: A Clinical-Anatomical Correlation, British Journal of Hospital Medicine, August 1974.
- Fay, Dr. Frederick, Housing Alternatives for Individuals with Spinal Cord Injury, Rehabilitation Services Administration, HEW, July 1975.
- Fishman, Paul, Adaptive Housing for the Handicapped, T-NEMC, Boston, October 1971.
- Homburger and Bonner, Medical Care and Rehabilitation of the Aged and Chronically Ill, Little, Brown, Boston, 1964.
- Massachusetts Department of Public Safety, Rules and Regulations of the Board to Facilitate the Use of Public Buildings by the Physically Handicapped, Commonwealth of Massachusetts, 1968.
- Sarno and Sarno, Stroke: The Condition and the Patient, McGraw-Hill, New York, 1969.
- Tufts Rehabilitation Institute, Resident's Manual, 1976.
- T-NEMC: ◦ Rehabilitation Institute, Pamphlet, 1975.  
 ◦ Medical Rehabilitation Research and Training Center Number Seven, Pamphlet, 1975.

## COMMUNITY AND INSTITUTIONAL CONTEXT

- Boston 200 Corporation, Chinatown, 1975, pamphlet
- Boston Redevelopment Authority, Chinatown/South Cove District Profile and 1977-1979 Neighborhood Improvement Program, Fall, 1976.
- Chinese Economic Development Council, Economic Development for Boston's Chinese-American Community, December 1976.
- Tufts-New England Medical Center:
- Master Plan, 1968
  - Preliminary 20-Year Development Study, 1965
  - Revised Master Plan, 1973
- Whitehill, Walter Muir, Boston: A Topographical History, Harvard, Boston, 1968.

## BASIC BUILDINGS

- American Society of Heating, Refrigerating, and Air-Conditioning Engineers, Inc. ASHRAE Standard 90-75, Energy Conservation in New Building Design, New York, 1975.
- Banham, Reyner, The Architecture of the Well-Tempered Environment, Chicago, 1971.

## BIBLIOGRAPHY (Continued)

## BASIC BUILDINGS

Habraken, N.J.:

- Supports, Praeger, New York, 1972
- Variations: The Systematic Design of Supports, MIT Laboratory of Architecture and Planning, 1976.

McGuinness and Stein, Mechanical and Electrical Equipment for Buildings, Wiley, New York, 1971.

## DESIGN EXPLORATIONS

Lynch, Kevin, Site Planning, MIT, Cambridge, 1974.

Newman, Oscar, Housing Standards for Defensible Space, U.S. Dept. of Justice, Washington, D.C., April 1976.

New York City Planning Commission, Zoning for Housing Quality, City of New York, September 1975.

Van Rensselaer, Henry Hobson Richardson and His Works, Prairie School Press, Park Forest, Illinois, 1967.

Wright, Frank Lloyd, Writings and Buildings, World Publishing Company, Cleveland, 1969.

WU, Nelson I, Chinese and Indian Architecture, Braziller, New York, 1963.