

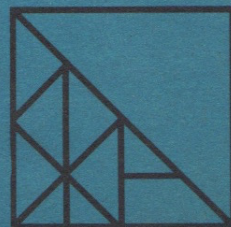


HOUSING STUDY

New Private Relocation Housing in the City of Boston

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THE BOSTON REDEVELOPMENT AUTHORITY



OVER-ALL PURPOSE

This study has as its central goal the development of sound housing at moderate rentals, \$75 to \$105 per month, including heat for 1 to 4 bedroom units, in the renewal and relocation areas of Boston. The Boston Redevelopment Authority sees such housing as a "key element in the rehabilitation of residential neighborhoods".

To achieve this goal, we have explored and initiated an approach to the residential portion of Boston's renewal program which shall answer the following needs:

To provide a rich living environment, urban in character and purpose, which is a renewed statement of the vitality of city life;

To establish a visual pattern expressive of that vitality without resort to chaos; to find again the proportion between repetition and the richness of individual expression exemplified by the Beacon Hills of yesterday;

To provide good housing, at a monthly cost range low enough to meet the requirements of the relocated and/or poorly housed families for whose needs the program is primarily intended; and

To delineate an answer and propose a program for which construction can begin immediately.

GENERAL APPROACH

The foregoing goals may best be met in a program which is founded on a system of standard parts. Such a system implies primarily a repetition of components, the ideal being a minimum number of identical elements repeatable in a maximum number of combinations. Standardization will:

First, reduce construction costs by taking advantage of volume production of standard components;

Second, reduce construction time;

Third, create an inherent discipline within which individual expression of architects, owners and tenants will enhance the patterned proportion of the whole;

Fourth, establish a framework for better cost and quality control;

Fifth, permit architect and developer to channel more time into a constructive study of planning and design, by reducing the time-consuming mechanics of working drawings, estimating and other routine processes essential in the conventional organization of building; and

Sixth, insure a repeatable, not a unique, demonstration of all these values.

EARLY CONSTRUCTION

The only sure test, the only sure method of procedure, having established the concept of standardization itself, is actual construction. The studies, planning and ideas being worked on are founded on the premise that at least 200 dwelling units can--and ought to be--under way by the spring of 1963. Not all of the mass-producible elements here proposed are susceptible of use within this time schedule, but enough are to make a significant initial demonstration. It cannot be over-emphasized that the 200-unit minimum to start is indeed minimal. 200 units based on the same structural system is surely a conservative goal within the total problem of Boston relocation housing alone. Maximum additional volume should be sought in the related use potential both within and beyond the city. Both advantages and the problems intrinsic in the selected system will be possible to evaluate only by a demonstration of at least this magnitude of the system in its basic form.

DESIGN FOR STANDARDIZATION

Designers and their customers generally dislike what they understand standardization to be in the house. This misunderstanding and the failure to design to intelligently use this tremendous mechanical aid has been expensive and has kept us from getting good houses at reasonable cost. We need only to realize that 26 letters in the alphabet are plenty to give us as rich a literature and communication system as the world has ever known. We haven't begun to exhaust the possibilities that 9 numbers and a "0" give us. The 13 tones in our musical scale, for all the discipline they impose, have almost limitless possibilities for building beautiful structures in music. This approach is possible in architecture. It has, on occasion, given us, and will again give us, outstanding beauty with the value from our money that we get from other manufactured products. The Royal Crescent at Bath is a famous example of standardization and repetition which no one accuses of monotony. The beautiful Greek island towns built of one standard material, construction method, and color are perhaps the most exciting and visually satisfying houses in the world.

This is the basis of our approach to designing for the BRA in Boston. Good architecture right here in Boston of which we are most proud has followed these principles long before we had to face the kind of economical necessities now required. Louisburg Square and Union Park in the South End are beautiful because they use repetition, as has all good architecture, to produce a unified whole larger than any of its parts.

DESIGN CRITERIA

The following design criteria considerations and premises are based on this attitude toward standardization. They have been divided into three categories, although

ultimately they are in large measure inseparable.

A. Economy

1. Dwelling Unit Planning - Maximum possible ratio of usable space to auxiliary space, i.e., corridors and stairways, etc., has been sought. Grouping of mechanical services, flues and other features usable by two or more units, is accepted as a primary rule. Planning will also take into account sizes and spans of optimum economy and efficiency for the particular and respective construction methods involved. Inherent limitations of particular materials or systems has been respected in planning.

2. Site Planning - Site development costs are a significant proportion of the total cost. Efficient distribution of utilities, maximum reasonable concentration of paving and other surfaces for ease of maintenance, and the best intensive use of all outdoor area whether public or private has been carefully studied. Unit plans and construction methods have been studied with a view to the most economical adaptation to varying site and soil conditions.

3. Materials for construction have been selected not only on the basis of initial cost but with consideration of long-range cost, including fire insurance, maintenance and repair. Material choice may also influence labor practices, time schedules, and shop fabrication vs. site work. Special emphasis has been placed on materials and methods which will provide multiple use, such as both structure and finish.

4. Methods of construction may provide the principal key to economy. The housing "industry", more so than most other industries, has failed to utilize the savings made available by the use of mass production techniques. A careful study of the principles involved in applying mass production techniques to housing over a long-time period has convinced us that not only the difficulties of ever-rising building costs, but also the total livability of our environment may be greatly improved through mass production. The automobile engine, for instance, in all its complexity of materials, machinery, assembly and precision manufacture, costs in the neighborhood of 30 cents per pound. This price, because it is sold in tremendous volume as a standard item, is little more than for steel used in building construction with almost no work done to it--but what little is done is performed on a semicustom basis.

Attempts have long been made to market housing components as standard items. However, standard items are developed largely in isolation from other standard items.

In certain cases whole houses are now factory-built with a potential substantial savings. For some housing problems this is an acceptable answer. But usually more flexibility than this is necessary--requirements vary due to people, climate, topography, soil, density requirements. The approach proposed is therefore a

system of standard parts each of which is designed for mass production. The optimum size of such components will be a compromise between the whole and the bits and pieces commonly used today. The key word is system, since only through systemized standardization can the necessary volume and resultant low cost be established.

This study of low-cost housing recognizes the potential savings in off-site fabrication. Therefore, where possible, certain constant items such as baths, kitchens, and stairs have been kept standard regardless of materials proposed.

At the same time, it is recognized that progress cannot be made "on paper", and our approach has been such that nothing need be prefabricated. Conventional, on-site building will be used throughout, unless a prefabricated part displaces it in the open market place.

B. Livability

1. FHA MPR's govern minimum sizes, but larger sizes will be aimed for throughout. Space is to be given priority over gadgets.

2. The individual family is the planning unit, but it is recognized that the total environment is as important as the unit itself. Neighborhood and community grouping is a direct function of housing design.

3. Maximum privacy, both visual and acoustic, for individual families is a prime consideration. Private gardens or other outdoor spaces are provided to the maximum degree allowed by budget considerations.

4. Variety of accommodation type as well as size is desirable.

5. Parking (off-street) should be in the 50% to 110% range, depending on location and other conditions. Car-to-apartment walk should not exceed 400 feet horizontally or three flights of stairs vertically. Provisions should be made for immediate or future enclosure of larger parking areas, whether by structure or planting.

6. Outdoor spaces and facilities need a variety of areas in both size and function. Some division of adult and children's areas is desirable. In addition to small private yards, moderate-sized "semiprivate" areas should be delineated, serving as activity focus for neighborhood groups of from 24 to 100 units, using 50 as the assumed optimum average grouping. Larger areas linking these sub-groups would be wholly public. Demarcation of these areas must be made with consideration for ease of maintenance.

7. Community facilities such as nursery schools, convenience shops and home businesses require consideration, both in terms of economic value and as assets in daily living.

C. Aesthetics

1. The scale and character of the existing area is a factor in design. Local flavor should be retained or reinforced where desirable and possible, through use of texture, color, form and scale.

2. While neighborhood and community organization provide a sense of identity to the new elements, ties to the existing surrounding areas must also be established to give a sense of continuity.

3. Services such as garbage disposal, electric service, clothes drying are fundamental to the design problem.

4. Choice of materials in addition to considerations of maintenance cost, and relation to the existing community, should be based on the provision of color, warmth and texture without ostentation. Individuality is desirable, but is to be obtained not by proliferation of colors and material on each facade, or arbitrary changes in roofs, but by articulation of family units and material changes where they are rational.

5. Diversity within uniformity is an inherent feature of standard component construction. In a three-story building the exterior facade may represent less than 20% of the surface area of the building shell. If the balance of the building is built from catalogued parts, there is therefore room to vary the facade greatly without large cost changes. At the same time, if the fixed components are well proportioned, the total building will form a strong framework within which variety on the surface will add interest without deteriorating into chaos. Thus the discipline afforded by standardization is valuable for its aesthetic features alone, since the most immediately obvious failure of modern building in city and suburbs is a lack of coherence. True individual expression will be possible and its value enhanced by its incorporation into an over-all pattern, rather than the current artificial method of multiplicity of materials, heights and roof slopes.

RESULTS TO DATE

In the following pages are illustrated the key elements of unit planning considered in moving toward a single family of building blocks which can be interchangeable in whole or in part. The series given in the following pages are not intended to convey limitations but to present the inter-relationships of a family of parts in the simplest and clearest way.

The system of components being established must, to meet our given program, produce in addition to the general goals listed, the following:

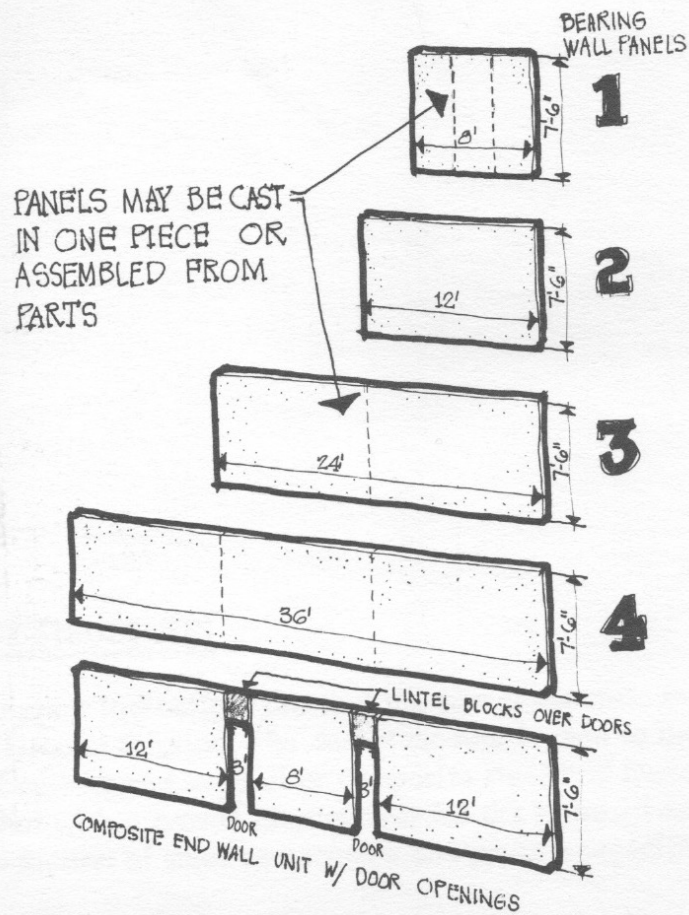
1, 2, 3, 4, and 5 bedroom family units at moderate rentals

2, 3, or 4-story buildings, adaptable to differing site and density conditions

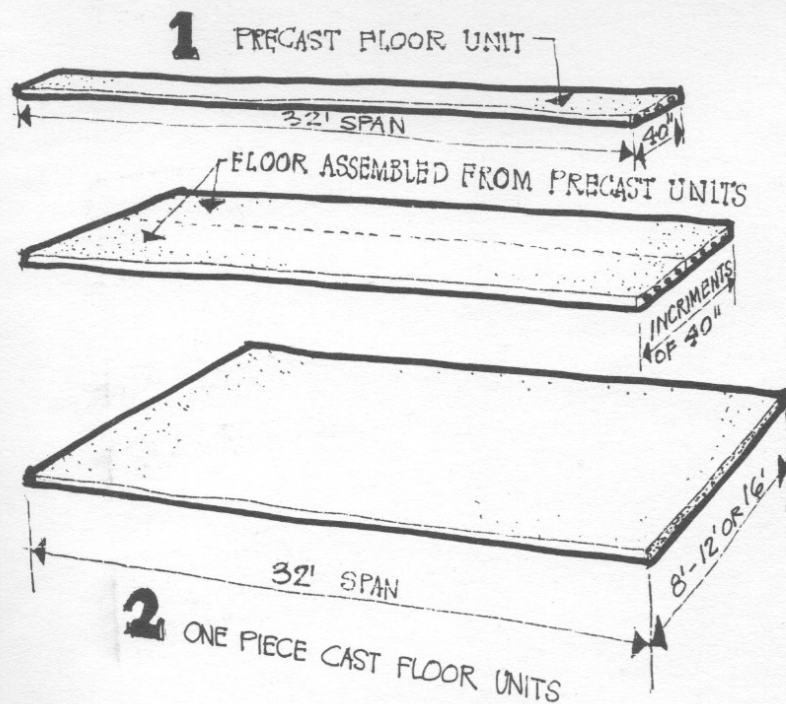
Ideally, frame or skeleton construction (in wood, steel or concrete) as well as bearing wall and slab construction. Concrete construction appears to offer the most advantages and to be the most susceptible of significant improvement in cost at the present time.

Adaptability to varying exterior treatments to allow sympathetic placement in existing community surroundings and to permit individual expression and creativity by architects and owners.

The search was made for a basic module flexible enough for the desired variations, permitting moderate-sized basic unit sizes with provision for increased areas depending on cost factors; dimensions suitable to variety of structural elements; and divisible component parts readily produced from marketed materials. Plumbing, heating, electrical systems; stairs, partitions, casework; floors, walls, roofs; all should be adaptive to changeability. Freedom of architectural expression is attainable by varying the exterior treatment of the unit. It is intended that the exterior walls be nonload-bearing and thereby easily modified.



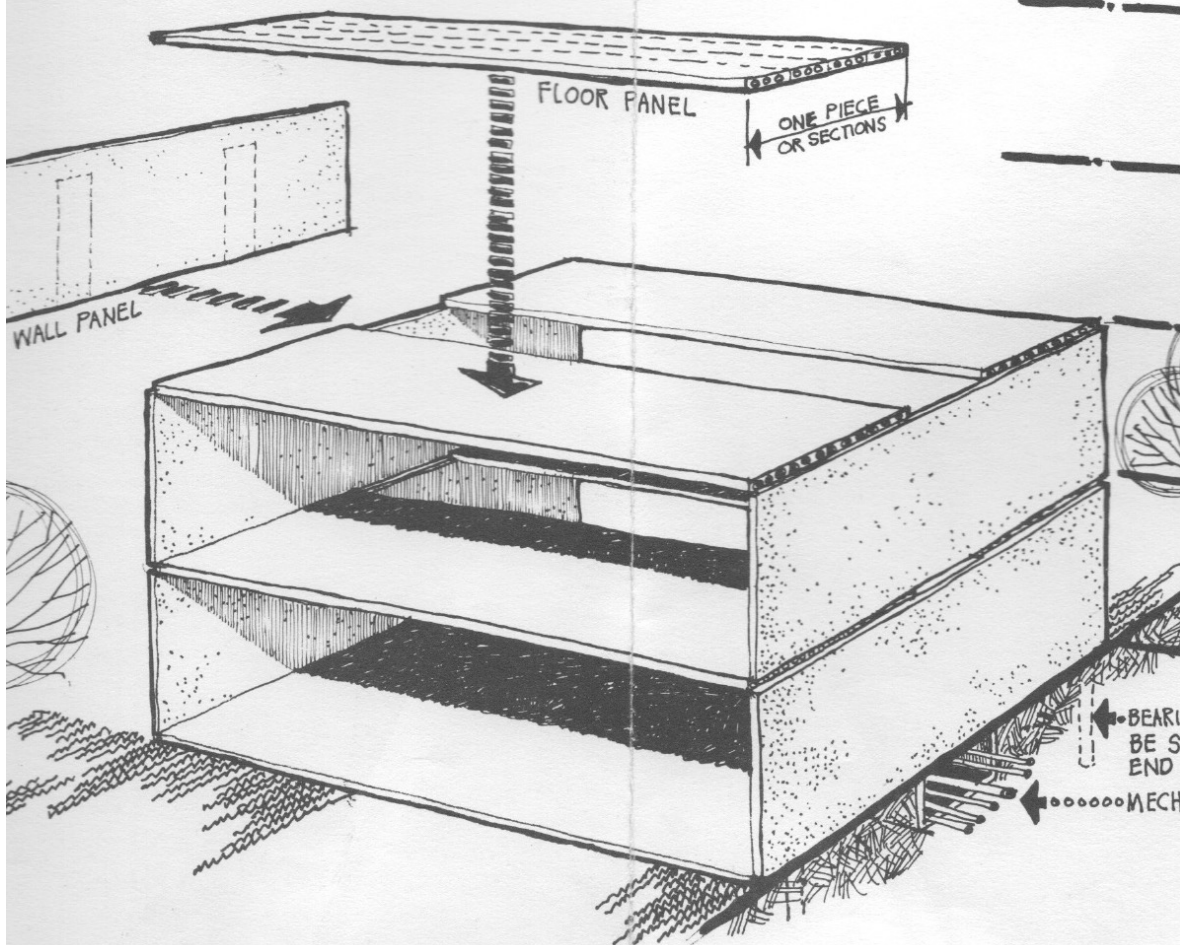
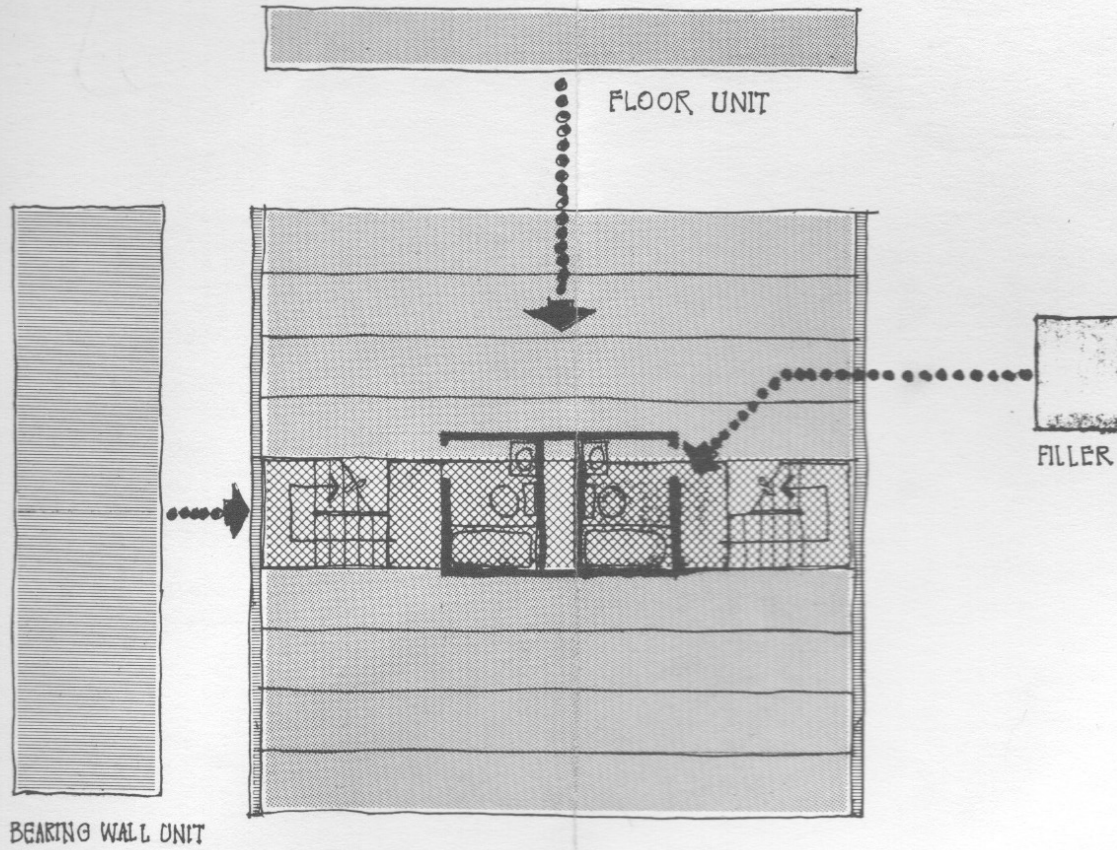
CONCRETE BEARING WALL + GIRDER PANELS

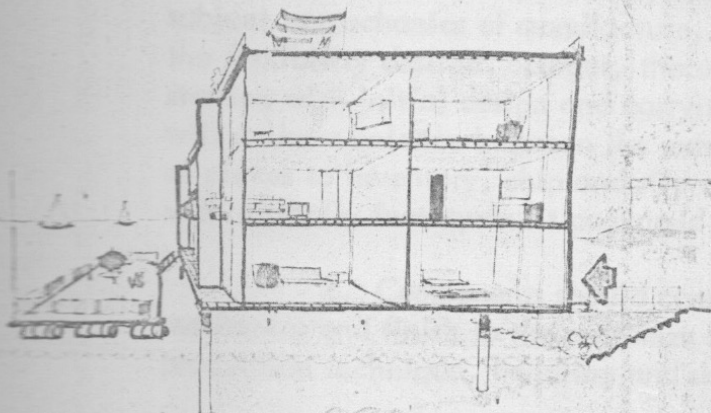


CONCRETE FLOOR PANELS

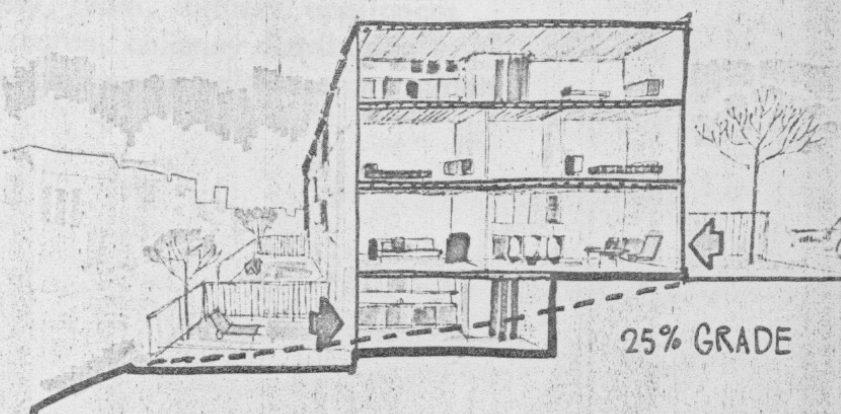
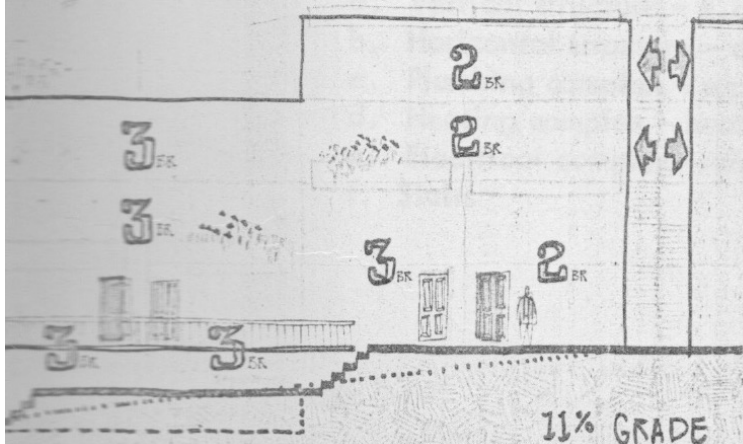
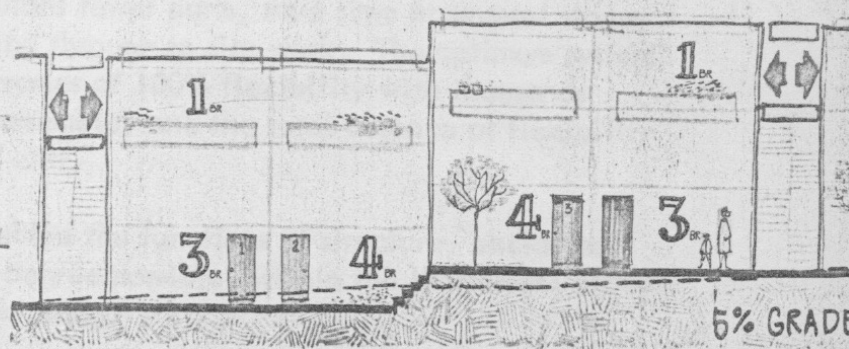
STRUCTURE AND SITE

An advantage of the proposed structural system is its adaptability to a great variety of site conditions. Through the use of prestressed, precast concrete which allows for relatively long spans, it is possible to build economically over poor soil conditions or even watery marshland with caissons or piles set approximately under the four corners of the units. The modular system is adaptable to a variety of sloping sites, producing buildings which can be stepped up and down the hillside to allow for grade changes and provide for extra dwelling units at the lower levels.





OVER WATER, MARSH OR TIDAL AREAS,



STANDARD COMPONENTS

The principle of maximum flexibility built from a minimum number of elements suggests certain corollaries. Worthy of note are:

1. Standard pre-assembled components should be as large as possible, subject to mechanics of manufacture, handling and shipping, and consonant with the flexibility desired. Larger, therefore fewer parts, save time at several stages starting with initial design and carrying through to site work. The optimum system will strike a balance between the extremes of 100% flexibility with thousands of pieces to inventory, ship and site assemble, and the total absence of flexibility with a wholly factory-built packaged unit.
2. Components should combine the functions of structure, enclosure, mechanics and finish to the maximum degree possible, within the limitations of production technique, handling and shipping.
3. If the system to be established is to be only partial, whether for lack of research time, availability of plant or other reasons, priority in standardization should be given to those elements which represent the highest cost percentage, those which are most common to the structures envisioned and those which will contribute most to a valid aesthetic statement when buildings are grouped.

The essential components whose design must be considered with maximum effect on architectural, economic and construction value for the BRA study are as follows:

- a. Vertical structure - e.g., bearing walls, columns
- b. Horizontal structure - e.g., beams, floors, roofs
- c. Plumbing complex - supply, drain, fixtures, appliances
- d. Heating complex - heat source, chimney distribution
- e. Electrical complex - entrance panels, distribution, outlets
- f. Stairs

VERTICAL ELEMENTS

In order to insure maximum standardization of floor and roof components the number of breaks through the standard elements must be minimized. While this is most obvious in the design of a concrete system, whether precast or cast in place, using prebuilt forms, it is, in terms of mass production, valid also for a floor framed in wood, metal or a combination of these materials.

Since special floor panels or slabs are necessary where stacks, vents or stairs must penetrate, the number and type of such special elements should be held to an absolute minimum. In addition, economic planning clearly calls for grouping the vertical components so that two or more dwelling units share them.

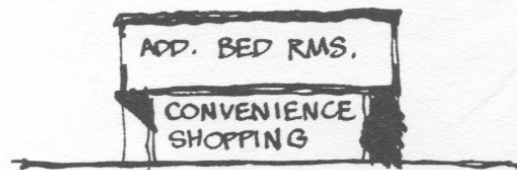
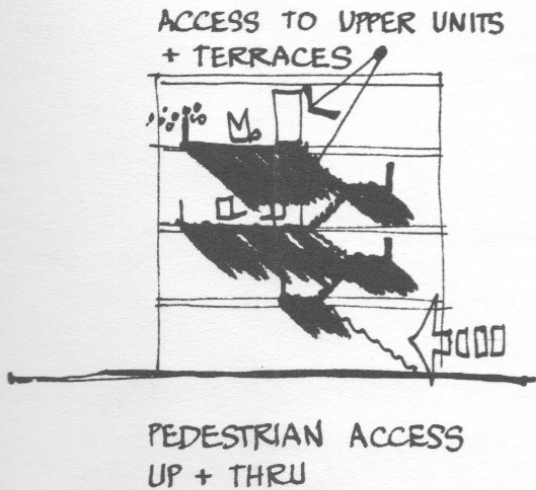
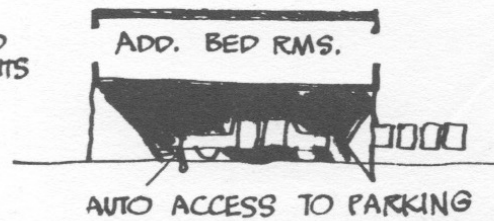
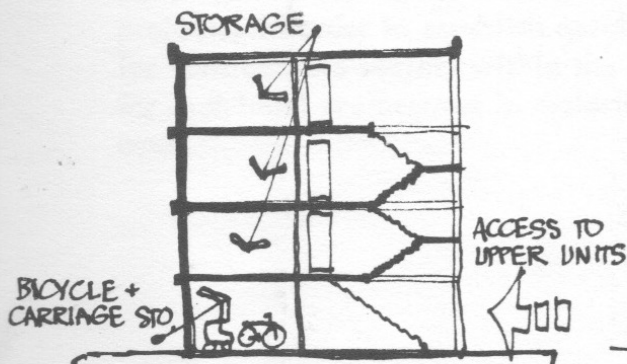
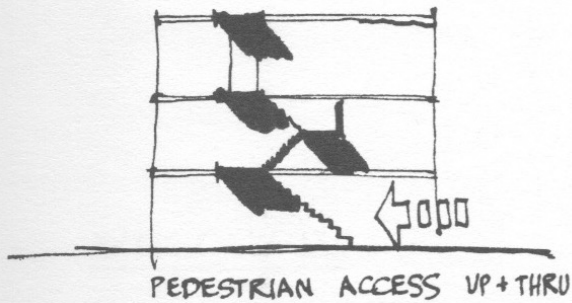
STAIRS

To provide maximum flexibility and therefore production volume, stairs may be prebuilt in half-runs, from which can be assembled straight-run, scissors, L-shaped or other varieties of stairs as suggested. The basic principle applies regardless of materials used.

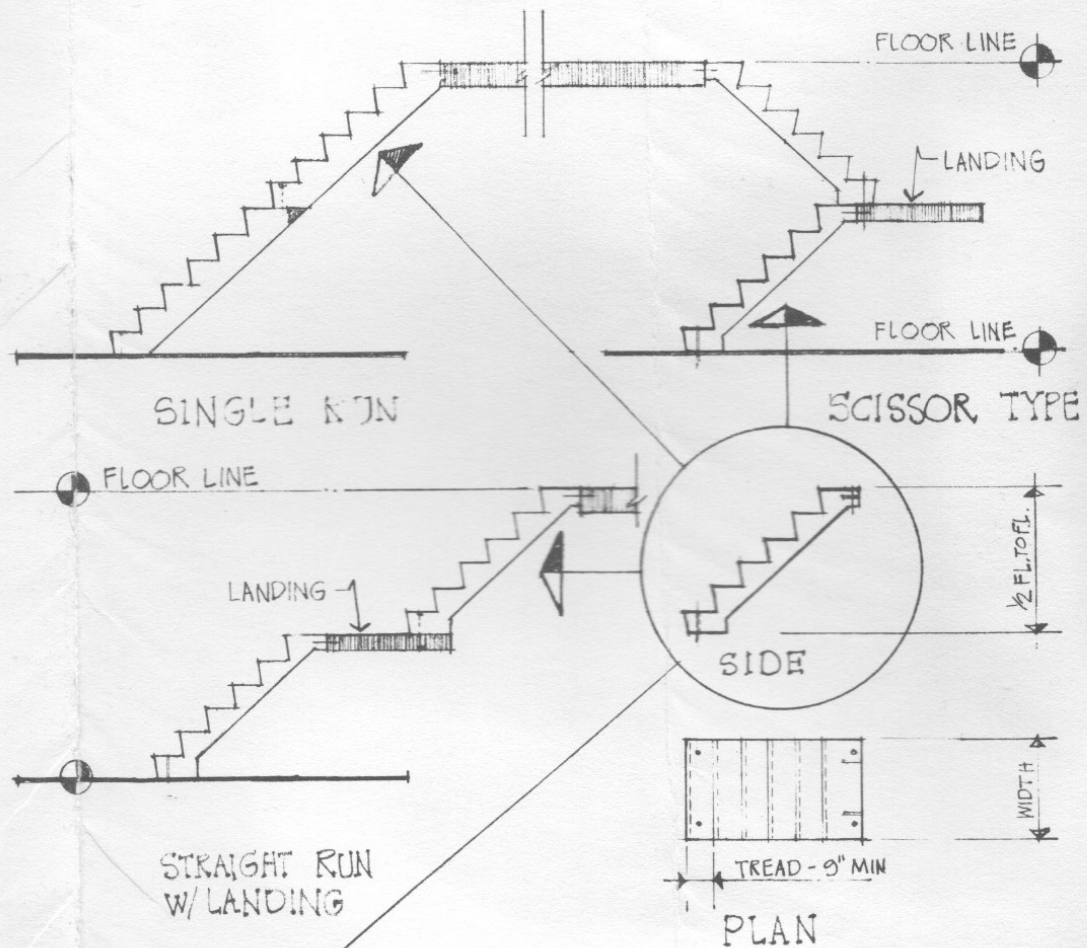
Public access stairs may be fabricated on the same basis as private stairs. Public stair areas may also incorporate other functions such as storage, balcony, and walk-throughs. A given number of standardized arrangements is being established for these purposes.



NOTE: WIDTH OF SLOT TO VARY FROM 6'-6" MINIMUM ON UP

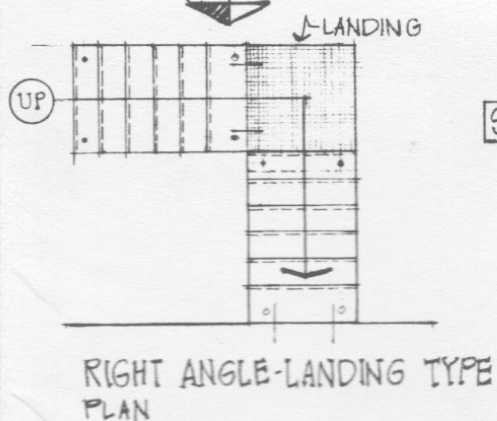


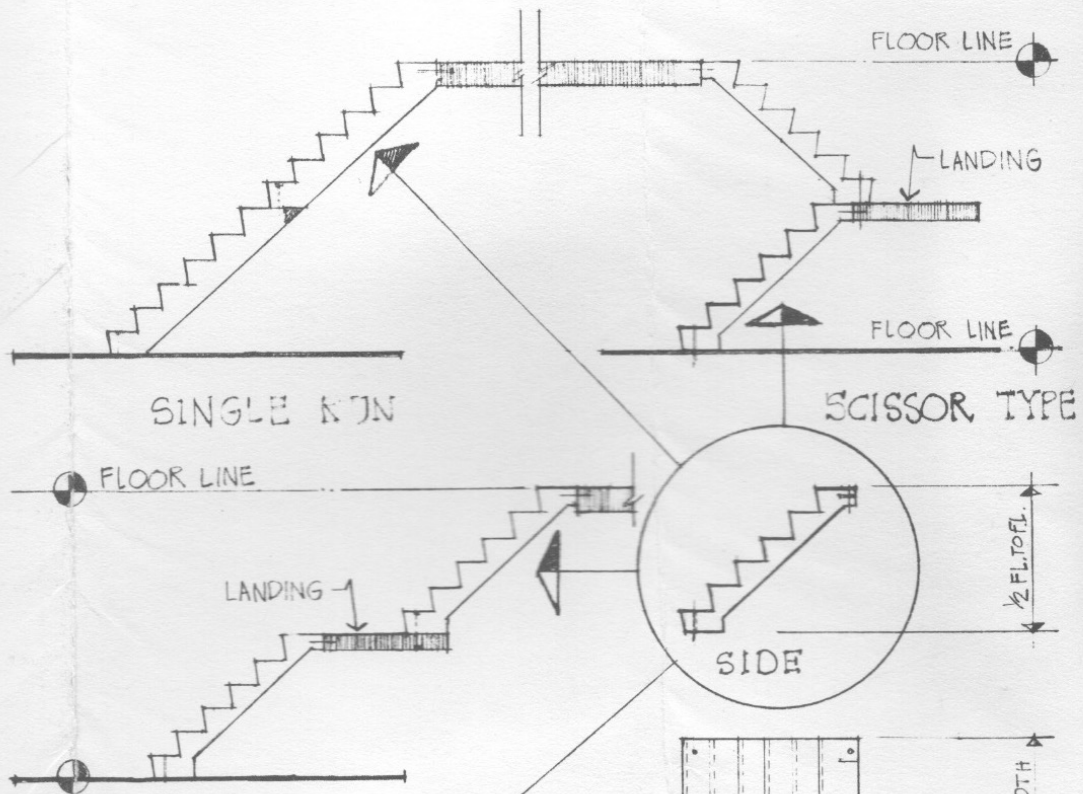
SLOT VARIATIONS



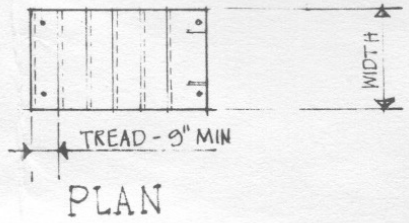
BASIC STAIR COMPONENT

STAIR COMPONENT SYSTEM

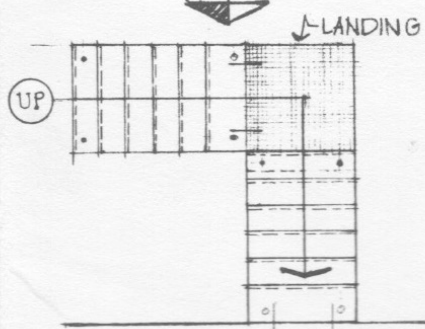




STRAIGHT RUN
W/LANDING



BASIC STAIR COMPONENT

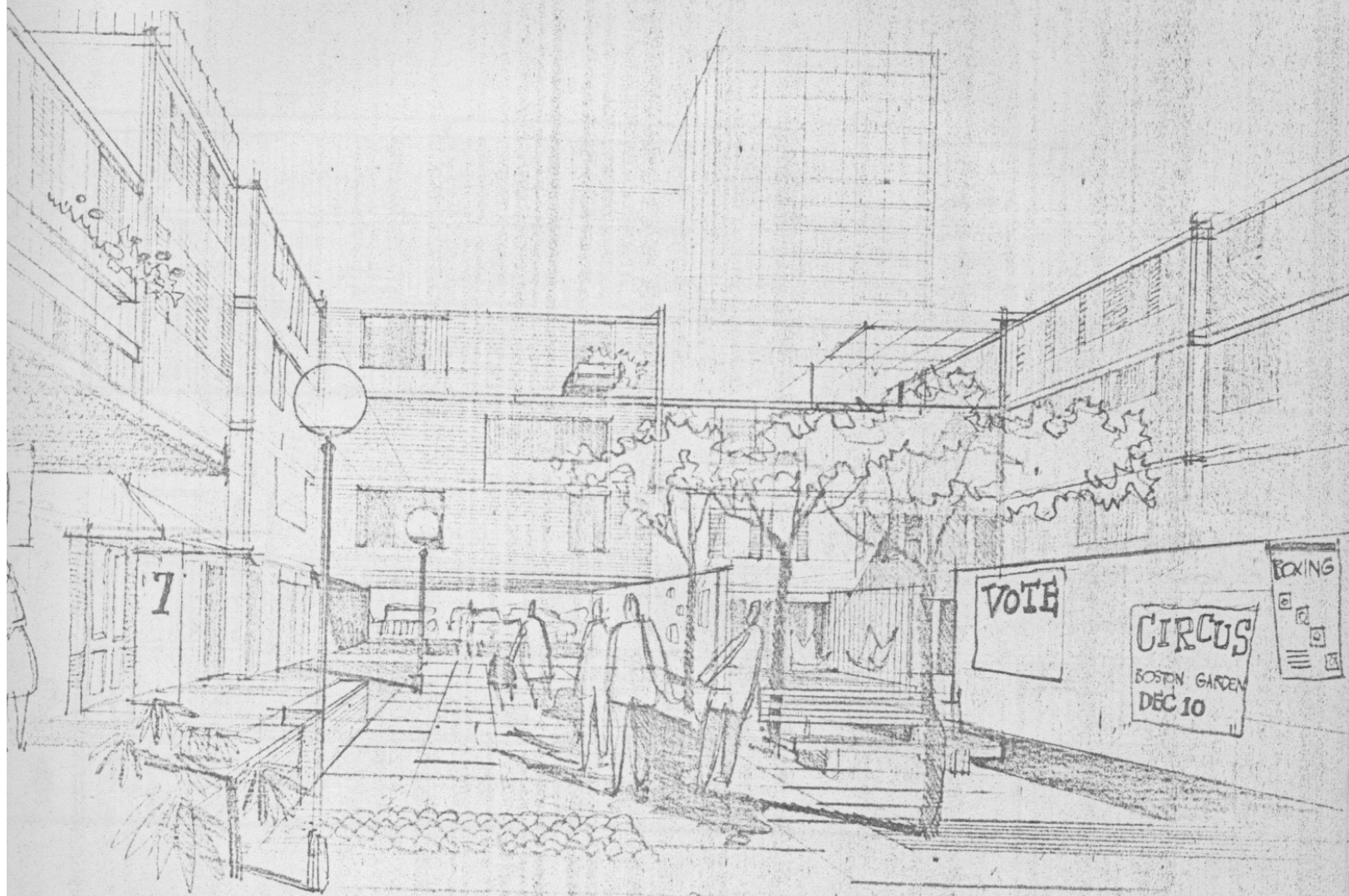


RIGHT ANGLE-LANDING TYPE
PLAN

STAIR COMPONENT SYSTEM

EXTERIOR WALLS

Although standard exterior walls will be proposed in developing the specific projects, in order to establish specific costs, the intent is to provide the framework for considerable variety within the bounds of the structural module, allowing for individual preferences in material, color, texture, fenestration and even in mass.



NEIGHBORHOOD PLAZA

