Architectural Intensification:
Patterns of Use and Construction Assemblage
as Opportunity for Elaboration

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ABSTRACT

The loss of small scale elements and the lack of opportunity for personal elaboration has been an area of failure in contemporary buildings. These small scale elements are essential in providing human scale, enabling useful inhabitation, and giving a sense of place.

This study attempts to define a design approach in which small scale elements and details will be an intrinsic outgrowth of the building process. The fulfillment of utilitarian conditions; use patterns, structure, and construction, form the basis of this approach rather than the application of some "decoration" to the basic form. This approach calls for the intensification of design decisions, based on utility and maintaining the integrity of earlier decisions. Built intensification serves as the optional aesthetic manner in which a utilitarian distinction is made.

This theory of intensification is studied through a design of an infill system of interior elements to be used in multi-family housing. This system relies on standardized elements, shop fabricated, which can be custom assembled within each dwelling to meet the particular programmatic needs of the inhabitant. These elements, which would serve as storage, use surfaces and separation, would also be amenable to personal elaboration and rearrangement by the occupant at a later time.

One typical dwelling unit, taken from the context of a larger housing project that I designed, serves as the area to be inhabited. There are four phases of the design process of this infill system. Each of the phases is illustrated through drawings and photographs of a model. The four phases of the design process are: 1) the primary structural zone; 2) the catalogue of interior elements and their details; 3) the assemblage of these elements in the primary structure; and 4) the details, connections and further intensification of the assembled pieces.

Thesis Supervisor: Maurice Smith
Title: Professor of Architecture
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Introduction

The Human Dimension in Buildings

Human beings perceive the built environment on both the large and small scale. Spatial qualities and massing are each important to our experience of a building but it is the small qualities -- materials, textures, sizes -- that we intimately appreciate. Small-size elements help us to establish a sense of scale: we know that a doorknob, for instance, is the size of our hand. Often, these small dimensions are reflections of material sizes and hand crafting, and provide us with visual clues for understanding a particular environment. Many times, the small-scale elements are pragmatic parts of their context: chairs, benches, desks, beds. These pragmatic elements whose dimensions are based on the size of the human body are essential, enabling us to relate directly to our environment.

The Loss of the Small Scale

All too often in recent architectural history, buildings have been produced which lack in small scale characteristics. For most of the architects in the Modern Movement, and for many designers practicing today, the primary concern was on the overall form of a
building and its spatial qualities. These architects consciously chose to subordinate material distinctions and small detail in favor of a building's larger elements. In addition, modern construction methods, with an emphasis on the "gypsum building," have also served to undermine a traditional concern for fine scale details.

Elaboration: The Desire to Personalize our World

Many of today's buildings also suffer from a related problem: they are placeless and without context. Throughout history, people have elaborated utilitarian objects and buildings in order to signify ownership, convey feelings of value or place, or to commemorate an event. At its root, this process of "ornamentation" expresses a human need to personalize or make special. Often it is the elaboration of an element rather than its basic form that relates an object to a specific time, place or culture. Today, however, as a result of a singular professional attitude among architects and construction practices which stress uniformity and standardization, buildings throughout the world are remarkably similar.

The desire to personalize one's surroundings and the need for human scale references often converge; elaboration usually occurs at small scales. The application to architecture, however, must be integral; one does not first build a structure and then tack on some superfluous ornament. Rather, one should build in such a way that each design decision carries into the next, and elaboration strengthens the utility and integrity of a structure, while at the same time allowing it to develop a human scale.
Intensification of Previous Design Decisions

Elaboration is not the addition of an ornamental motif to a finished design. Rather, I believe in an elaboration based on construction and use, an elaboration which intensifies previous design decisions. As Antonio Gaudi stated: “Our furniture and buildings demand the fulfillment of an infinite number of conditions, which if clearly laid out in an adequate and organized manner already provide for the basis of ornamentation.” The basis of ornamentation, lies not in some pictorial or artistic motif, but in the rationally conceived building process itself, a process of intensifying design based on use and construction.

Patterns of Use and Construction Assemblage

A process based on patterns of use implies consideration of the dimensions of the human body, consideration of the sizes, shapes, and textures of the objects that we need to carry out our daily lives, and consideration of physical, acoustical, and visual climates that we need to conduct our personal and communal activities. Building to recognize patterns of use involves specifically an understanding of use dimensions. Vertical ones such as sitting, writing, and passage as well as horizontal ones that range from storage to inhabitation. A process based on construction considers the manner
The Design Problem: Multi-Family Housing

I chose to develop my thesis on "Intensification" in the area of contemporary multi-family housing, an area which clearly suffers from lack of elaboration and small scale detail. The dwelling units in most current housing projects suffer from numerous intrinsic problems.

Problems in Current Housing

Design Attitudes Restrict Growth - Each activity, whether it be public or private, is assigned an area of space, usually in the shape of a rectangle, and solid walls are constructed around that area. These boxes, called rooms, are arranged to form a dwelling. This design attitude gives no consideration to specific use patterns for using these spaces, nor does it allow any type of optional partial definition such as screens or openings.

Walls Hinder Human Intervention - The walls in most multi-family housing projects provide no use other than separation. The inhabitant is forced to create his or her own useful conditions through the arrangement of furniture; beds, desks, shelves, and closets, for inhabitation and internal clarity. While it is beneficial for the inhabitant to have...
some control over the use of the living environment, the wall as simple separation provides no clue to utility and actually inhibits the occupant's opportunity to intervene.

Surfaces Resist Elaboration - Walls reveal no horizontal markings, useful surfaces, or other clues to lend a human scale to a room. Generally, there are no distinctions in building materials: gypsum board runs from floor to ceiling. A paper material, such as gypsum, does not lend itself to elaboration or personalization, even to the limited extent of allowing occupants to erect shelves or hang artworks.

Layouts Defy Individuality - The layouts of multi-family dwelling units are standardized according to size or type and then repetitively stamped out. Inhabitants of these units, who have a variety of personal preferences and/or spatial requirements, are confined to a given number of rooms, of limited dimensions, in a single, restricted arrangement.

Construction Defies Revision - Because of the fixed nature of the walls in contemporary mass housing projects, any additions or changes an inhabitant may wish to make within a dwelling unit require major efforts and expense for demolition and reconstruction.

The Problem with Custom Design

The goal of this study is the creation of an architectural vocabulary which makes reference to human dimensions and which is replete with detailed, small-scale distinctions and elaboration. Historically, such a vocabulary has been possible through custom design work. The skilled hands of a craftsman can combine carefully carved and milled pieces in a way that glorifies intricate personal details. Customized built-in furniture and moldings can establish a human scale and a sense of elaboration that many of today's buildings lack.

Economics, however, prevent the widespread application of customized solutions;
skilled labor and finished materials simply cost too much money for most people. Only the very wealthy could afford a building system which relied solely on custom-designed and crafted elements.

The Premise of the Study: Custom Assemblage

My proposition, therefore, is to design a system of standardized elements which can be assembled in unique and diverse ways, and which will reveal large level of smallscale detail. These elements would come in a variety of sizes and shapes in order to meet a range of programmatic conditions, and they would be amenable to individual intensification through the addition of other elements at a later time. Only a limited amount of custom work would be done on-site in order to establish effective connections between the combinations of standard elements. All of these standard elements would be manufactured in a shop. Durable, detailed, diverse, and dynamic, the entire system would also be readily affordable.

As a premise for a model that attempts to solve the problems found in contemporary housing projects, I adopted the basic attitude of the S.A.R. Housing Group from the Netherlands, whose method calls for the inhabitants of a housing project to establish their own dwelling arrangements based on a number of optional variations. Under the S.A.R. system, the architect is responsible for designing the public spaces in a housing project, the access and circulation, and the primary "support" structures, which would be built to accept the greatest possible range of unit plans. With assistance from the architect, inhabitants would design their own unit plans, drawing on their own needs and individual preferences.
Design Process

For the purposes of this study, I am concerning myself with the design of the dwelling and its inhabitation. The context of this dwelling unit will be provided in a multi-family housing design which I previously proposed for Brookline, Mass. The site, overall building form and primary unit support are taken from this design. The design process of specific dwelling units then breaks down into four levels:

1. **Primary Support**: The architect designs a structural framework of floor slabs and some vertical containment walls. These are built with poured-in-place concrete.

2. **Secondary Infill**: The architect designs a variety of closure and infill pieces which are standardized and shop fabricated.

3. **Custom Unit Design**: The inhabitant and/or architect designs a specific living unit using on-site labor for custom assembly of the standardized secondary elements.

4. **Modification of Elements**: The inhabitants adapt and modify their units over time by moving, changing, adding to, or subtracting from the original assembly of elements.

Intensification of the design occurs at all four levels of intervention. At the primary support level: surface intensifications of the poured-in-place concrete are possible. The individual standardized elements can be intensified in the design of the secondary infill. The pattern of assemblage and the connections between elements creates an opportunity for intensification at the third level of the dwelling unit design. These assemblages can be further intensified by the inhabitants at the fourth level, by the addition of personalizing pieces and through modification.
The Housing Context

The housing design which serves as a context for this thesis was proposed as part of an earlier MIT studio under Professor Maurice Smith in 1980. Located in Brookline, Mass., the mid-rise housing was intended to provide a favorable alternative in terms of personal control and communal living, to the detached housing or high-rise slabs that currently exist in the neighborhood. The site eliminates the rectilinear block grid in favor of more intense green belts that would weave through the area, with access to the buildings provided on paved drives. The buildings orient around a series of common courts, upon which open balconies, and exposed promenades would provide view and allow access between the units and the court. The dwelling units (which are described in detail later) were developed as a concrete support structure, only as a context for dwelling. Actual inhabitation would be provided through secondary, less permanent elements under the control of the inhabitants. The schematic design of this housing then serves as the starting off point for this thesis design study of the details and assemblage of the interior elements.
The Housing Context

BUILDING SECTION & ENTRY COURT PLAN

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Concrete Intensification

Pouring the concrete for the primary system is the first step in the construction process. Intensifying this concrete is dependent on its material properties and the method involved in construction. The plastic qualities of the concrete must be handled within the constraints imposed by its method of forming.

In addition, the structural properties of the concrete must also be taken into account. Where there is high structural stress, the positioning of steel reinforcing bars place constraints on the thickness and shape of the concrete.

Because it leaves a visible impression on the finished concrete, the deposition of formwork should form the basis for any process of intensification. Numerous patterns can be created through the manipulation of the shape, type, texture, and securing method of the formwork. Points of contact, such as corners and the junctures between column and slab, require special treatment during the forming process and therefore provide special potential for intensification. As the base from which the rest of the building develops, the concrete must provide a receptive environment for the secondary infill and, at the same time, maintain the clear continuity of the overall building structure.

Imperial Hotel, Tokyo, by Frank Lloyd Wright; in James, *The Imperial Hotel*.
Concrete Intensification

DIRECT FINISHES

- Metal
- STYROFOAM

INDIRECT FINISHES

- Charged Armorplate
- Comb Rosing
- Paint Rosing: Wide
- Bush Hammer
- Sand Blasting
- Grease Rubber Lining
- Killed Surface
- Sander Saw Marked Dice
- Aggregate Transfer

FORMWORK & FINISHES

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FORMING CONSTRUCTION DETAILS
Concrete Intensification

COLUMN INTENSIFICATION - CONCRETE

VERTICAL REVEAL IN COLUMN

COLUMN INTENSIFICATION - CONCRETE
ELEVATION & AXONOMETRIC STUDY OF SUPPORT.
Concrete Intensification

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ELEVATION OF SUPPORT
The Dwelling Support

The secondary system is designed and implemented within a specific spatial zone in the primary structure. Although structural necessity places limitations on the spatial dimensions of the primary system, the support zone must be horizontally and vertically large enough to allow a variety of configurations in this secondary infill. In this proposal I select a typical concrete "support" zone as the context for the system of closure and interior definition. This context or "support" is bounded horizontally by the floor and ceiling slabs and vertically by concrete retaining walls and columns. The primary concrete structural zone is a flat slab that rests between two eight-foot wide vertical support areas which parallel each other every twenty-five feet.

This specific support zone is located on the middle level promenade of the building, approximately one and one-half stories above the street. Inhabitants reach the apartment by way of an open promenade. This promenade is reached from the entry court via an exposed stairway or by an elevator. The unit sits on a north-south axis with access on the south side adjacent to the public promenade. On the north side of the unit, exterior balconies overlook the common green space.
TYPICAL SUPPORT AT THE PERAMBULATORY LEVEL
The Support

View of southern face of dwelling support, at perambulatory access level. The large open concrete area is an optional build zone, which the inhabitant can either enclose or maintain as an open deck.

Northern face of dwelling support. Private terraces overlook the common greenspace. The middle level of the unit (plus three ft.) is shown. Only a small area of the upper floor (plus ten ft.) is part of the concrete support. The remainder of the unit is a double height "loft like" space which can be optionally inhabited with wooden platform elements.

MODEL: INDIVIDUAL SUPPORT
References

S.A.E. Variation Studies - In these studies, which he did for his book *Variations*, John Habraken introduced the concept of a dwelling unit that has a variety of potential floor plans. Dimensions of the “support” system are established only after variations of potential unit types have been tested. In the specific examples, which are based on the morphology of the Dutch row house, the support is characterized by single-height floor slabs and parallel bearing walls. The bearing walls, however, are not continuous, allowing occupants to enlarge individual units into neighboring territories.


Sub-variation diagrams of a low-rise support, in *Variations*, op. cit., p. 154.
Hertzberger's Experimental Housing at Delft

These are another example of row housing but with the important introduction of multi-level platforms which allow sectional continuity. The three half-levels allow open common spaces and create the potential for even larger spatial dimensions. As opposed to S.A.R. in which primary walls are always linear, Hertzberger employs both walls and three-dimensional concrete cores which are perpendicular to the walls. These vertical cores serve as containments for the stairs and bathrooms, and help define the spatial territories within the primary structural system.

Experimental Housing Type "Diagoon" at Delft, by Herman Hertzberger, (plans, sections, and studies), in Architecture & Urbanism, March 1977, No. 75, p. 113-114.
Catalog of Interior Elements

Inhabitants create definition within the units by arranging a series of standardized elements. These elements, arranged according to individual preference, provide separation, storage space and use-surfaces such as benches, desks, counters and shelves. Because the elements must fit into a number of different situations, they come in a variety of vertical and horizontal dimensions and can serve as a full range of separation, from full closure to operable separation to open screen.

The elements fall into eight major categories:
1. opaque and translucent wall panels of different heights and widths
2. screens and partial separations
3. free-standing and self-supporting shelving units
4. solid storage pieces such as closets, bureaus, and end tables
5. sliding and swinging interior doors, both opaque and transparent
6. floor platforms for lofts and intermediate levels
7. stair pieces
8. horizontal surfaces such as desks, tables, and benches

A similar catalog of closure elements, and bathroom, kitchen elements would also be provided but they are outside of the scope of this work.
Catalog of Interior Elements

WALL PANELS

Scale: 1/4 inch equals one foot
Catalog of Interior Elements

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CLOSETS, DOORS, & FLOOR PLATFORMS

Scale: 1/4 inch equals one foot
Catalog of Interior Elements

STAIRS

Scale: 1/4 inch equals one foot
The interior elements are designed to serve a range of functions. The vertical heights relate to the activities of sitting, writing, working, passage, maximum reach and sight. The horizontal dimensions begin with the size of material: connections to shelves (10"), larger storage of objects (2') and finally to dimensions that allow human inhabitation (3 feet or more).

A. Wall panels serve as vertical separation. Heights range from full height of 7 feet, 6 inches to low walls of 3 feet for partial closure. These vertical panels also serve as structural supports for lofts and platforms.

B. Other vertical elements (from left): storage/seating niche, door frame, lattice screen, shelving unit, and clothing storage unit.

C. Floor panels are used to build intermediate platforms and lofts. These platforms are structurally independent and would rest on beams.

D. Stair piece, shelf and clothes storage.
The basic wall panels are framed by 2" x 10" boards, giving a large useful storage dimension. The intermediate supports within the panel are 2"-wide pieces of lumber, and allow for the addition of table tops, shelving or other later elaborations. The horizontal intermediate support occurs at heights two feet-eight inches and six feet-eight inches above the floor, one for table tops and the other at passage height. The bottom of the panel is 6" above the floor, allowing for a kick space.

The singular wall panels can then be grouped together to form small areas of containment in "U" shapes. These can be securely connected and strengthened by floor platforms and sealed at the top by ceiling pieces. They can serve as niches, sitting nooks, closets, desk enclosures, or head boards.

The entire catalog of interior elements (of which not all are shown) would allow for a wide range of privacies, partial enclosures and movable passages. These elements would serve as the basis for further elaboration and custom additions.
Standardized Pieces of Traditional Japanese Residences

The residential architecture of traditional Japan offers a highly developed example of a building system based on the assemblage of standardized elements. Each component of the building system, be it the wall panel, floor panel, screen, or even decorative moldings, is mass produced to a given modular dimension. Within the standardized format a great variety of different designs is possible.

The shoji panels and lattice screens shown here are taken from a Japanese pattern book to illustrate some of the options that exist within the Japanese system. The amount of fine detail, and intricacy of design that these panels have is only feasible because of their standardized fabrication. Were similar screens to be custom built, the price would be prohibitively high.

The Victorian pattern book of doors, windows, and moldings used in the United States is a similar example of the benefits of standardized elements, which can allow for a richer, more intensified building approach, at an affordable price.

Details of Elements

Design of interior elements is based on function and construction type. Each piece is designed to accommodate its specific use and to combine gracefully with other elements from the catalog. Because pieces must serve individually and in combination, each piece is structurally self-sufficient.

Construction can proceed in one of two methods: simple fabrication or more complex "furniture-style" fabrication. In the simple case, which I have used for a number of design studies, standard nominal lumber and conventional hand tools are used to build the elements. To eliminate waste, dimensions in the simple case are based on divisions of standard sizes of available building products.

In the complex case, individual elements are manufactured and finished in a shop allowing for higher quality construction and improved joinery.

Wood was chosen as the major structural material in both cases because of aesthetics, its ease of construction, and its amenability to further intensification by unit inhabitants. A system of metal interior elements, however, is certainly feasible and might even be easier and less expensive to fabricate on a mass scale.
Details of Interior Elements

FURNITURE - PARTITION ELEMENTS

SIZE

1. STANDARD 4 FT. X 8 FT. 1/2 IN. Gypsum Board

YIELDS: Horizontally

1"

2"

3"

4"

5"

PLAN 3/8"

Principles: Need to mate edges of sheet
- Vertical continuity of edges
- Edges of each material to be maintained

CONNECTIONS:

1. Corner to corner of panels - through addition

2. Corner of panel - add a perpendicular single-piece

3. Panels intersect at center

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PANEL CONSTRUCTION & CONNECTIONS

Scale: as shown
Details of Interior Elements

PANEL OPTIONS - SCREEN & PARTIAL CLOSURE

Scale: 1/2 inch equals one foot
STUDY: COMBINING PANELS INTO NICHE

Scale: 3/4 inch equals one foot
Human Scale:

Horizontal use dimensions allow surfaces for actions to take place. Their sizes relate to the minimal action possible.
- 0"-3": Material connection.
- 3"-12": Storage of objects.
- 12"-3': Work surface, writing, eating, etc.
- 3': Area for inhabitation, sitting, standing.

Vertical use dimensions relate to the physical size of man and the comfortable height of different activities.
- 6": Kick space
- 1'-6": Sitting height
- 2'-6": Desk height, writing or a seated activity
- 3'-0": Counter height for a standing activity
- 4'-0": Low partition, partial privacy
- 6'-8": Passage, min. clearance for standing space
- 7'-6": Maximum reach.

Construction dimensions: The sizes of materials, and hardware, if expressed, will give a recognizable scale to our built pieces. The depth of a tabletop, the width of a door frame, and the size of a door handle, are elements that permit us to understand the scale of an object and the way it works.

Wright’s room elevation for Taliesan East exemplifies an understanding of all three concepts of dimensions. Vertically the activity heights are built: the kick space at 8", the bed at 1'-6", the desk top at 2'-6", the top of curtain privacy at 4'-4", and the window height at 6'-6". The dimensions of materials such as the desk top is heightened by the separation from the panel below by a space of a few inches. This creates a new height dimension of 2'-2". To register lower heights onto larger pieces, Wright uses "Virtual Use Dimensions", or moldings that represent the useful height onto another surface. The end board of the bed at right has the desk heights 2'-6", and 2'-2" marked by cross pieces even though its useful height is much taller.

Bedroom in the Hillhouse, Helensborough, by Charles Rennie Mackintosh; in Mackintosh Architecture, p. 45.

Gilmore Residence, Madison, Wisconsin, by Frank Lloyd Wright; in Global Interiors 19, p. 114.
An interior system of study carrels and work stations designed by Maurice Smith for the Architecture Department at M.I.T., utilized hand-built standardized wall panels that can be assembled in a variety of ways. The system has four components: homosote wall panels that are placed vertically and horizontally, free standing shelving units, long single height shelves, and table tops. The panels are framed with standard 2"x6" lumber, with intermediate supports of 1"x2" to be used for attaching tables and shelves.
Combinations of Elements

Pieces from the basic kit of parts are assembled to form a variety of more complex elements. In some instances, the complex assemblages would be securely fastened together to remain permanently as a single unit. In other cases, individual elements would simply rest in combination, ready for dismantling and re-assembly.

These drawings represent various possible combinations of elements based on their potential use. These specific variations are designed without a context; they are merely examples from a "pattern book" of useful configurations which might be applied to a specific apartment context.

Diagrams of possible arrangements of Tokanoma alcove, in Saburo, Washitsu Žosa Shusei, p. 33.
Combinations of Elements

OPTIONS OF PANEL COMBINATIONS

Scale: as shown
Combination of Elements

- PANEL VARIATIONS FOR SPECIFIC USES
  
  SCALE: 1/2 inch equals one foot
Combination of Elements

PANEL VARIATIONS FOR SPECIFIC USES

Scale: 1/2 inch equals one foot
Combination of Elements

The interior elements can be assembled to provide containment or total containment with the addition of closure boards at the base and at the top. The pieces will then be securely fastened to each other and to the primary concrete support to make a sturdy and stable assemblage that can withstand lateral and vertical loading. The solidity of the pieces and their connectors will also allow for greater acoustical privacy when desired. Repositioning and modification of the elements by the inhabitant will be possible with hand tools as needs change.

A. Screens and shelf units and desk used as partial containment.
B. The wall panels can serve as supports for loft platforms.
C. "Slack" or custom-built pieces will serve to affect closure between panels over any irregular dimension. Here the irregular space between the door frame and storage niche is closed with the custom solid wall or "slack" piece.

D. Elements can be combined free-standing, attached or used singularly since the endboard of the bed is located here.
A. The room is no longer conceived of as a box. Here it becomes a space where various activities can take place. Each one can have the necessary area and surfaces available specifically for that activity. No longer a simple wall everywhere; the various options of interior elements allow a range of separations that can be suited to the specific activity and lifestyle of the inhabitant.

B. & C. Secondary wooden floor platforms can be utilized as lofts or entire upper floors. These elements can also be used as intermediate height platforms. They are optional additions which can be inserted into the double-height space depending on the particular needs of the inhabitant.
Combination of Elements

CLOSURE OPTIONS

Scale: 3/16 inch equal one foot
In traditional Japanese architecture, each element is constructed in both size and material to suit a specific use. The elements are then assembled in an additive way. Each one is registered to the structural frame at one end, while the other end is left to float free.

In this example of a teahouse, the entry door is placed on the floor beam and flush against the corner post. The viewing window frame rests on the door frame and similarly is flush to the corner post. The ventilation screen is placed against the ceiling beam and next to the vertical wooden post. With each of these elements "registered" (or placed adjacent) to the wooden supports, a remaining "slack" dimension is created between the element and the next wooden post.
Options of Assemblage in the Dwelling

A variety of configurations is possible for each specific unit within the given primary support structure. Interior elements can be assembled in a number of ways to suit specific activity patterns and desired levels of privacy. Although the dimensions of the elements are based on a consistent standard, the overall system is not modular. Any uneven dimension is filled with some custom-made piece, or "slack", used to effect closure between the parts and the primary structure.

The system of elements also allows a degree of transitory adaptability. Assembled pieces can be taken apart and re-combined in different positions; new elements can be added on to existing assemblies. This flexibility is desirable when the needs of a family change over time, or when new occupants move into an apartment.

Pieces, however, are not inherently mobile, and they are not designed to be easily moved around by the occupants of a unit. The elements are to be securely fastened to one another and to the primary structural support in order to provide sturdiness and acoustical privacy when called for. Re-assembly after initial placement would require a group of semi-skilled workers.

The assembled elements not only define the walls of the separate rooms but they also provide horizontal platforms and elevated lofts. Unit masonry walls provide a secure permanent closure between adjacent apartments. Bathrooms are composed of modular pieces: a bath unit, a toilet unit, a sink/vanity unit. These will connect with a plumbing core in the concrete primary system, but can be arranged in a variety of configurations.
Options of Assemblage in the Dwelling

SECTIONS: VARIATION 1 AND BASIC SUPPORT

Scale: 1/8 inch equals one foot
Options of Assemblage in the Dwelling

SECTION VARIATIONS

Scale: 1/8 inch equals one foot

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The sequence of assemblage will progress as illustrated in photographs A-G.

A. The empty support is shown, a portion of which would be designated as the territory for inhabitation. For any particular area the support can be divided into a number of different sized units.

B. The location of bathrooms and separation walls between units would first be established. The bathrooms, composed of modular elements, will tie into a central plumbing core built into the support. The position of the bathroom elements are variable as long as they abutt the core at some point (for plumbing connection).

C. & D. With the unit separation and plumbing core fixed, the interior elements are then assembled to satisfy the activity patterns.

Custom assemblage of standardized elements allows each inhabitant the opportunity to live in an environment especially tailored for his own needs and values. For a given layout of activities in a dwelling, a number of different options of assemblage are possible. Further additions and rearrangements are also feasible as the needs of the inhabitant evolves, or as ownership changes. Here, for a given activity pattern and a fixed position of the bathroom. Various options of assemblage are shown in photographs E-P. Each of these options is based on the same diagram of activity; a private sleeping area is located to the north adjacent to the bathroom with a communal living area to the south side beyond.

E. The sleeping area in this option is a single large space with access between a bureau and a dressing alcove.

F. The single large area, similar to option E, is furthered defined here into a bed area and a sitting area, with a partial separation given by the shelving unit.

G. Access to the sleeping area occurs next to the bathroom, with a semi-private sitting area separated from the bed area by screens.
Options of Assemblage in the Dwelling

H. Two smaller single height sleeping areas rather than one larger area are shown assembled.

I. The edge of the private room is shown at its maximum depth, with the elements placed adjacent to the stairway. In the foreground the edge of the closure has moved inward, giving an outdoor terrace.

J. The terrace area, shown in option I, is here enclosed and used as a public study area which is partially screened from the living room behind it. The sleeping area is small and situated behind the study.

K. The same assemblage as option J is shown with the addition of loft platforms over the bath, and sleeping privacies. The public living and study area would retain the double height space.

L. A bridge connects the two platforms of the upper story. A study, work space or extra bedroom is possible in these upper spaces.

M. An enclosed privacy area is shown in the center of the upper platform. This enclosure defines a more open common space in the foreground. Both of these areas will be reached by a small balcony overlooking the living space below.

N. The second level loft is expanded to its maximum dimension, since it covers half of the living space as well as the sleeping areas.

P. Here the lofts are used as private sleeping areas, accessible only through the individual rooms below by ladders or steep stairs. The lower territory can then be used solely for storage, dressing and work. Under this arrangement, a greater number of sleeping areas are possible in a confined space.
Assemblage Details

After the interior elements have been designed to fit a specific use within the concrete "support", detailed drawings of the assemblages must be made. Connections between the elements themselves and between the elements and the primary system need to be reviewed in detail if they are to function effectively. In addition, sections and elevations will allow the inhabitant or architect to see how a particular assemblage fits into the totality of the interior layout, and large scale drawings will present suggestions for further intensification of the assembled pieces.
INTERIOR ELEVATION - SLEEPING AREA
Option 1
Scale: 1/2 inch equals 1 foot

ARCHITECTURAL INTENSIFICATION
CHARLES TREISTER
MASTER'S THESIS MASSACHUSETTS INSTITUTE OF TECHNOLOGY FALL 1988
MODEL: BIRD'S EYE VIEW.
MODEL: INTERIOR VIEW AT LOWER LEVEL.
MODEL: BIRD'S EYE VIEW.
MODEL: INTERIOR VIEW FROM UPPER LEVEL.
MODEL: BIRD'S EYE VIEW.

ARCHITECTURAL INTENSIFICATION

MA S T E R ' S T H E S I S M A S S A C H U S E T T S I N S T I T U T E O F T E C H N O L O G Y F A L L 1 9 8 0
Assemblage Details

MODEL: INTERIOR VIEW AT LOWER LEVEL.
Assemblage Details

Bogk Residence, Milwaukee, by Frank Lloyd Wright, in Global Interiors #9, p. 142.

Cheney Residence, Oak Park, Illinois, by Frank Lloyd Wright, in Global Interiors #9, p. 84.

STUDY: SLEEPING AREA ENCLOSURE, PLAN, SECTIONS, & ELEVATION.
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