TEACHING WITH SUPPORTS.

Stephen Kendall.

SUMMARY

In the spring semester of 1982, I taught an architectural design studio to students in their last or next to last design studio here in the undergraduate division of Environmental For most of these students, this was either the first or the second experience in a design studio directly focused on architecture. This article describes the course and its purpose, and provides two examples of student projects. Finally, reflections on the usefulness of teaching with supports are offered, along with some observations on the practical use of supports in the U.S. housing industry.

WRITING ABOUT TEACHING

There are at least three good reasons to write about one's teaching. First is the need to step outside the work and reflect on its worth, and its correspondence to expectations. Second, writing about one's teaching enables other faculty to know what you are doing and to give criticism that can assist in making a better course next time. Third, it is possible that some practitioners will read about the teaching and make observations and criticisms. The dialogue between the academic world and the world of design practice could not be much more dismal than now, and every effort to open up communication ought to be made.

THE COURSE

The focus of the studio was SUPPORT HOUSING. The course was organized over a fifteen week semester, in three phases. Twenty-one students signed up for the studio. On the first day, I distributed a course syllabus outlining the purpose, the theory and methods, and my expectations, followed by a description of the work to be done. I also provided a bibliography of required texts and supplementary readings: Habraken et al., Variations: The Systematic Design of Supports;Davis, The Form of Housing; and a Reader, assembled from articles in back issueds of Openhouse and other design journals. The syllabus began as follows:

Introduction

This is a studio in architectural design. It has three interrelated parts to it: THEORY, DESIGN METHODS, and CASE STUDY DESIGN. The focus of the work is the field of housing and the direct dwelling environment, with particular reference to the question of usefulness to households living there. It can be called a studio in SUPPORT HOUSING.

Purposes

My purpose in organizing the studio with these three parts is based on my conviction that a good studio will contribute not only an action oriented experience, but a kind of contact with the past and the future of the field. It will also have a theoretical content that puts the immediate problem in a challenging intellectual context, and will provide some clear ways of doing things (methods) that can be carried into other experiences in designing.

In this regard, the studio has contact with a theoretical position regarding the way built environments exist, a position that relates the 'things' of the environment to the 'powers' that act on them. The theory, and the associated design methods, suggest a paradigm (example, pattern) that is

particularly relevant to an Environmental Design education, since implicit in them is an attitude toward the whole field of actors, both professional and others, who are concerned with change in the built environment. The theory suggests that there are in fact limits to each actor's sphere of influence, on the one hand, and control on the other hand. These limits should be recognized at the outset of any intervention in the built environment. This recognition of limits is the basis for making agreements, as opposed to the process of dictating and being dictated to. There should be a realization that the agreements reached about the built environment with this attitude are at root social and organizational, not narrowly or simply technical. Yet, technical means are needed to give scope to each actor's sphere of freedom and responsibility.

Theory and Approach

The theoretical and methodological basis for this work has been under development in Holland since about 1962, at the Massachusetts Institute of Technology since 1975, and recently here at the University of Colorado in my teaching.*

The syllabus went on with an elaboration of the work of Habraken, the SAR, and others investigating issues of change and usefulness of residential environments (Turner, Lerup, Anderson, etc.). It then introduced an idea which the students seemed to have difficulty with: the idea that attached dwellings represent, at least potentially, a good and desirable kind of dwelling environment in which parents can happily raise families. Most of our students are thoroughly imbued with the notion that the only kind of dwelling environment for families is the ubiquitous single family detached kind, which is really not remarkable given our students' histories. I wrote:

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*(The list of people and institutions working with the ideas of SUPPORTS and TISSUES is probably quite long, yet it is not a list known to this writer. Perhaps OHI can begin to find out who is teaching and/or practicing with these approaches.)

The studio will investigate the ways in which the design and construction of attached dwellings can occur so as to reclaim at least some of the potential for user initiated change or cultivation traditionally associated with detached owner occupied dwellings. The assumption accompanying this is that the responsibilities of all parties acting in the process need to be clarified, from the initiator of the project through the parties responsible for long term maintenance. The principle is that democratic planning procedures should not be limited to the public sphere, but should be part of the private sphere as well.

It is interesting to realize, in relation to this problem of who controls what at which level, that a large number, perhaps the bulk of private residential developments built in this country carry with them private restrictive covenants. Many of these originated in efforts to restrict economic, racial and religious background of residents. The other dimension, related to our concerns here, is that they have distinctly limited the scope for individually initiated change in use, and change of form, within private property far more extensively than the public sphere zoning regulations could ever achieve. Many residential developments, done with professional architectural firms in control, as opposed to "unsophisticated "developers in control, are characterized by what I consider to be a profound lack of respect for the "lower level" decision makers-the households. There is, in these "designed environments," an obvious and heavily marketed effort to freeze the process of change in the site with the assertion that the resale potential of one's property is strengthened; resale values of course count heavily in a highly mobile population. This kind of phenomenon needs study-the mediating structure of corporate/developer rules (read values) increasingly replacing rules (values) growing out of the public/political processes of zoning and its variants.

The Syllabus continued:

A key concept in these ideas is to make a distinction in housing between several decision making or planning levels and their corresp-

Support Documentation

Infill Documentation

Zones and Margins
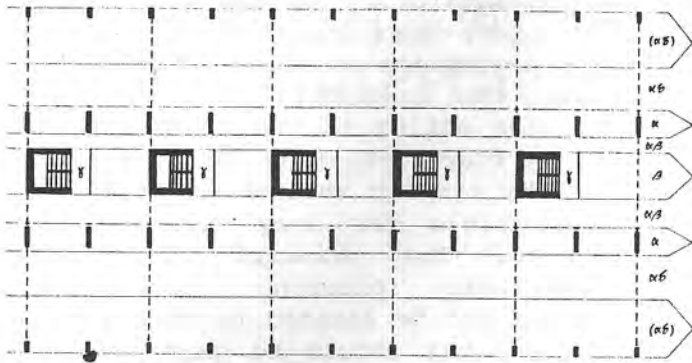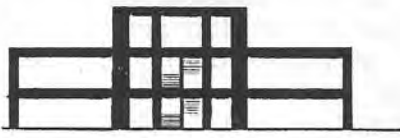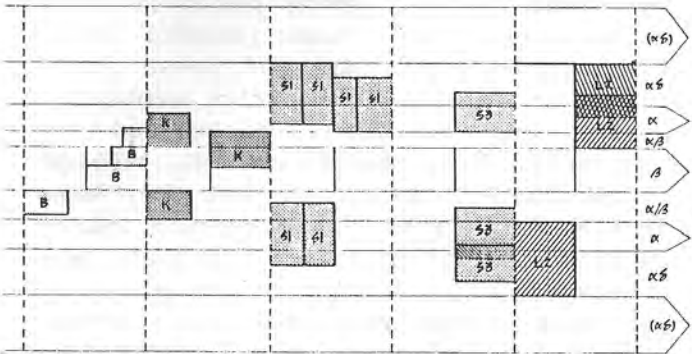
THIS DIAGRAM SHOWS THAT THE VARIOUS FUNCTIONS MOVE FROM THE β ZONE TOWARDS THE (αδ) ZONE. B AND K ARE MOST INTERIOR AND CONSIDERED SERVICE FUNCTIONS. S1 AND S3 FOLLOW, AS SPECIAL PURPOSE SPACES, IN THE INTERMEDIATE POSITION. THE GENERAL PURPOSE SPACE, L2, IS NEAREST TO THE (αδ) ZONE. THIS GENERAL PATTERN ALSO SHOWS THAT THE POSITION OF WHERE A FUNCTION IS LOCATED IS FAIRLY FLEXIBLE AND ONLY LOOSELY RESTRICTED TO A PARTICULAR ZONE.

Position Analysis of Functions
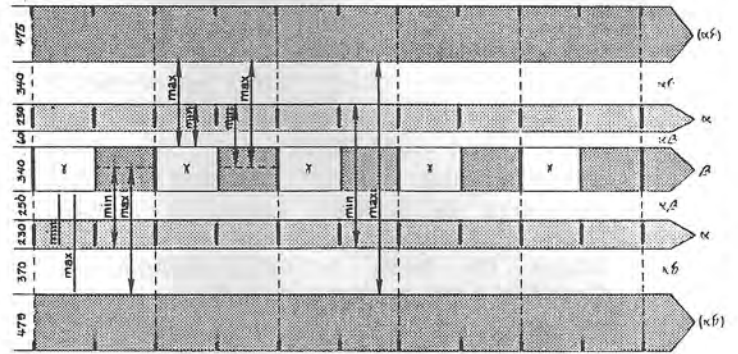
Basic Variations (existing)

• POSITION "a" IS WEST OF "b" PER LIVING AREA
• POSITION "a" EXTENDS FORWAR OF "b"
• LOGGIA SECTOR CAN OCCUR IN POSITION "a", "b", or BOTH

Sector Analysis

Sub-variations

onding physical territories and elements. A further purpose is to promote the development of .tools that professionals can use in separating these levels, and coordinating them. There are three levels of particular importance: the NEIGHBOURHOOD or TISSUE LEVEL: the SUPPORT LEVEL; and the INFILL LEVEL. The support and infill levels are the subject of our work. Supports are defined as the elements a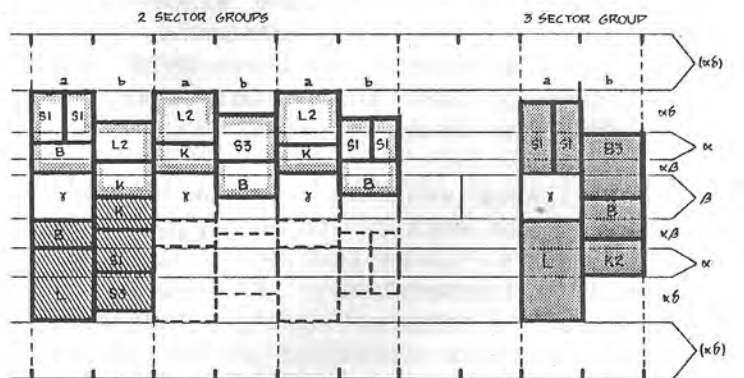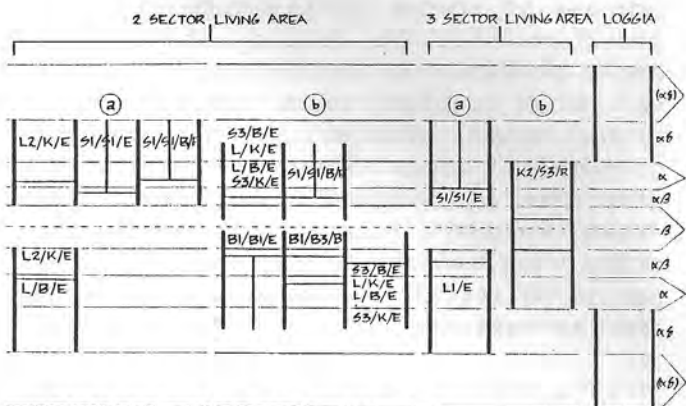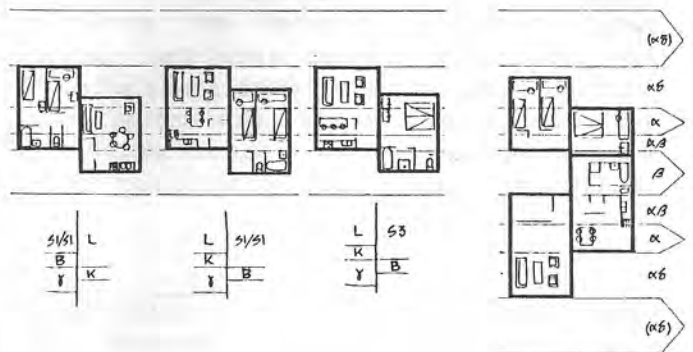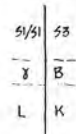nd associated rules which are common to all the individual dwellings, and that are therefore subject to a group decision making process. Infill is defined as the set of elements and their related rules for use, in the sphere of the household. Each level has its physical elements over which it has the right of decision, with the objective of achieving a better attunement of design and construction to the dynamics that are inherent in the process of housing.

This concluded the introduction of the syllabus. Students had the Reader and were studying its contents along with Variations. There were numerous intense discussions in the studio on the subject of change (initiated by whom, how frequent and at what pace; how much change, etc.); order and diversity; political power vs. individual freedom vs. corporate control; the meaning of themes in the context of design and planning; and the problem of coordination and communication among various actors.

THE SEQUENCE OF THE WORK

PHASE 1

The work was organized in three progressively more "open" experiences. For the first phase of three weeks student teams of two or three individuals undertook analytical work on existing SUPPORT projects. The purpose was to begin to understand the idea of SUPPORTS and DETACHABLE UNITS, Levels and Systems through carefully studying existing built examples. I used a number of SUPPORT case studies from back issues of Openhouse: Sterrenburg III/Holland; PSSHAK/London; Wohnen Morgen/Austria; Les Marelles/France; Haeselderveid/Holland; Papendrecht/ Holland. (Wohnen Morgen is illustrated).

The documentation of this phase took two forms:

A. A graphic part addressing the following:

1. Support documentation
2. Infill documentation
3. Position analysis and functions
4. Zones and margins
5. Sector analysis
6. Basic variations
7. Sub-variations

B. A written part addressing the following:

1. A discussion of 'actors' and 'levels' related to the project. This means a discussion of who (what groups) had what kind of role (participation) at the Support, and the Infill levels.

2. A discussion of 'levels' and 'elements' related to the projects. This means a discussion about which elements (building components, materials, parts, equipment, etc.) appeared to be part of which level (Support or Infill).

This documentation was presented by each team to the entire studio. The discussion which ensued was marked by questions of interpretation and evaluation, as well as a growing clarity about the new terminology. One question which repeatedly arose was "What is the frequency of change" of systems and elements. "How am I to understand what elements are expected to change when?"

PHASE II

Phase II, another three week period, introduced the SUPPORT design method operations, drawing directly upon Variations. The approach this time was to give case study examples of housing, taken from Sherwood, Modern Housing Prototypes, to teams of three of four, who were asked to redesign these projects as SUPPORT projects. We used Halen Siedlung/Bern; Spangen Quarter/ Rotterdam; Zomerdijkstraat Apartments/ Amsterdam; Weissenhof Apartments by Mies and by Oud/Stuttgart; Peabody Terrace Housing/Boston; Immeduble Clarte/Geneva. (The project by Oud is illustrated.)
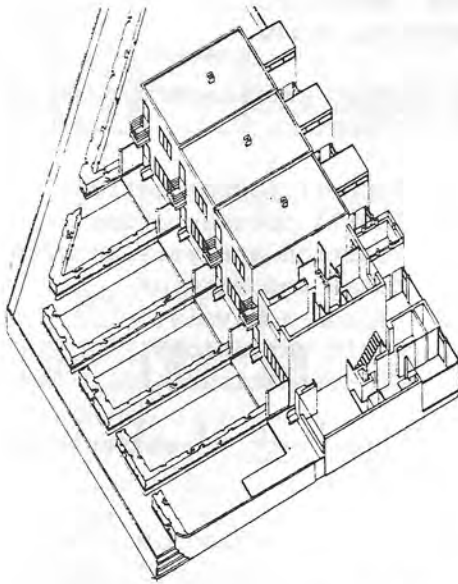
Rowhouses, Weissenhof Exhibition, Stuttgart, 1927, J.J.P. Oud

J.J.P. Oud and Mart Stam were the only two Dutch architects to participate in the Werkbund Exhibition in Stuttgart in 1927. Although there was considerable variety in the apartments that different architects designed for Weissenhof, the Stam and Oud projects were quite similar to the earlier housing projects of Oud, the rowhouses on the Hook of Holland of 1924, and the Kiefhoek project in Rotterdam of 1925. Like the earlier projects, Weissenhof consists of 2 story, repetitive rowhouses with entrance gateways on the street and small gardens behind.

Weissenhof is really just a deluxe version of Kiefhoek with a living room kitchen below and 3 small bedrooms above. Although the Stuttgart apartments have larger kitchens and added entrance courtyards with a utility wing on the front and a full bath upstairs, they are still basically like the typical Kiefhoek unit. Elevationally, the continuous surface of the street side at Kiefhoek has given way to the more highly concatenated character of Weissenhof with the utility block projecting out from the main volume of the building. This causes some problems because the main entrance from the street is into the courtyard and then into the kitchen while the living room faces the garden, the reverse of Kiefhoek.

Although the details have changed somewhat, both projects are the typical minimum Dutch workers' housing of the time—2 story, white stucco, small rooms and minimum services. Compared to the rather extravagant projects of Mies van der Rohe and Le Corbusier at Weissenhof, the Oud rowhouses are unpretentious and very clean and simple—a straightforward solution to the problem of low income housing.
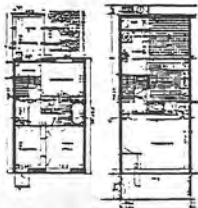
SECTOR ANALYSIS
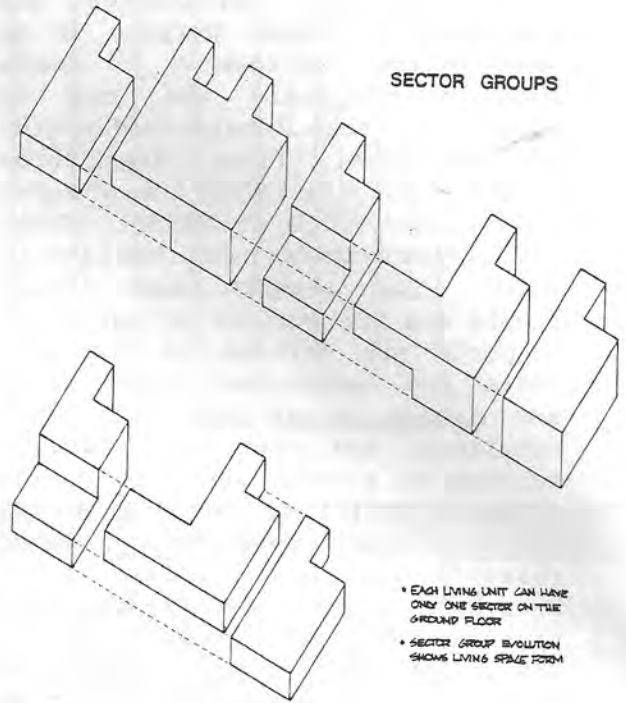
SECTOR GROUPS

• EACH LIVING UNIT CAN HAVE ONLY ONE SECTOR ON THE GROUND FLOOR

• SECTOR GROUP EVOLUTION SHOWS LIVING SPACE FORM

SUPPORT
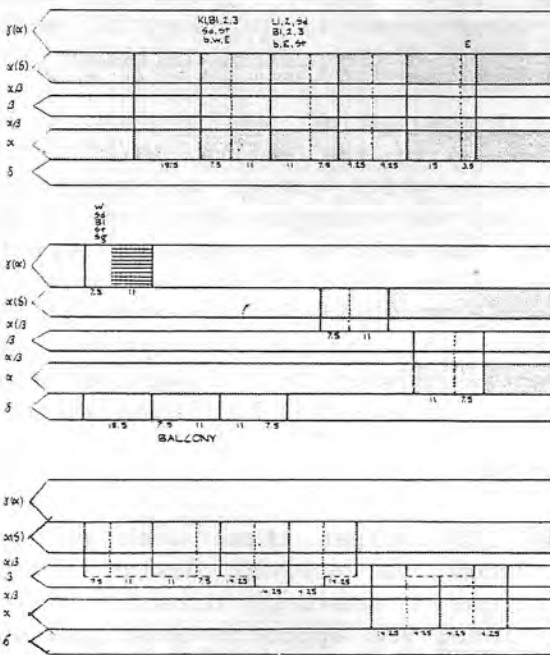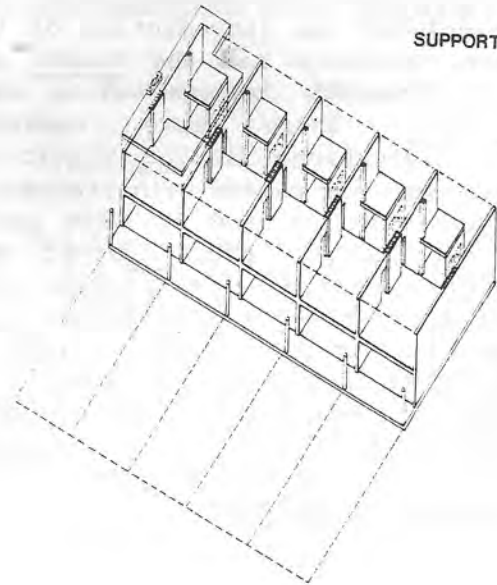
The syllabus requirements stated that the problem was to design:

a Support housing project in the context of the given housing prototype. The thematic elements of the original project must remain; otherwise, consider these buildings as starting points only (i.e. feel free to move/remove interior walls, stairs, equipment etc., and exterior elements keeping in mind that you will be expected to maintain the principle themes of the original project while transforming it into a Support project). You will be responsible for interpreting the project as to its theme(s). We should all be able to recognize the final Support project as having evolved from your given project, as opposed to another project.

Create your own scenario/program. You should address the following issues or concerns:

INFILL
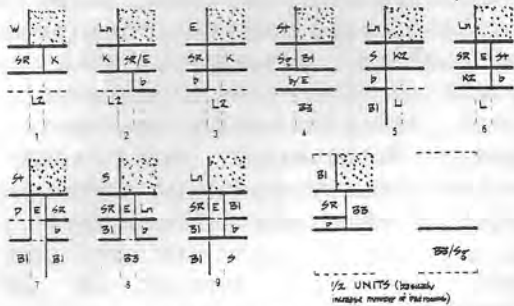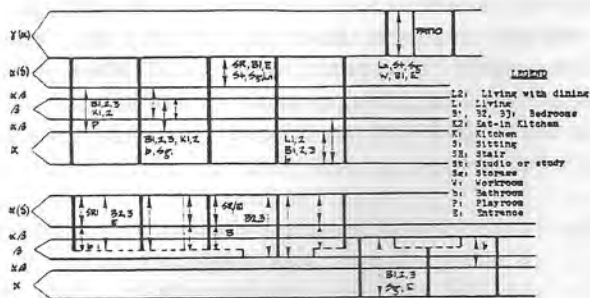
BASIC VARIATIONS

FLOOR PLAN
(SUB-VARIATIONS)

1/2 UNITS (horizontally increase number of bedrooms)

Legend
L2: Living with dining
L: Living
B(1, B2, B3): Bedrooms
K2: Eat-in Kitchen
K: Kitchen
S: Sitting
St: Stair
St: Studio or study
Sa: Storage
W: Workroom
b: Bathroom
P: Playroom
E: Entrance

total-17
tenants
unit
size

A - 1
B - 3
C - 1.5
D - 2.5
E - 2
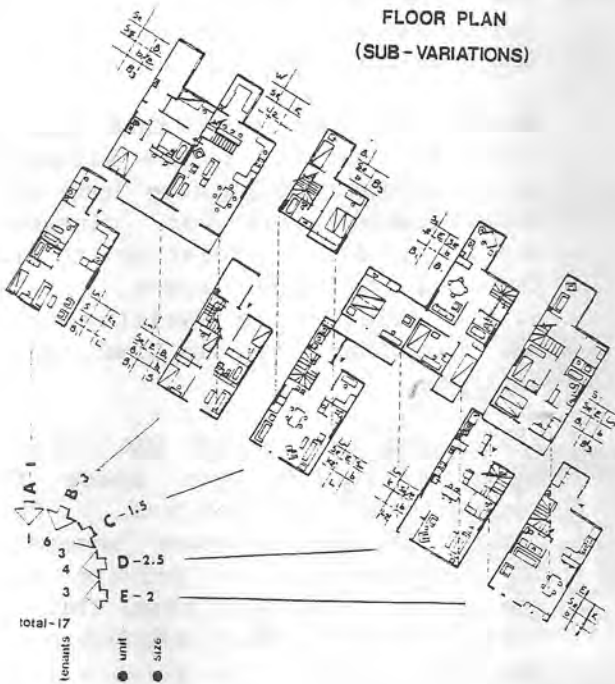
a. income level(s)
b. social/organizational ideas
c. household composition
d. 'tenture' type
e. user activities/needs
f. construction materials
g. process of 'cultivation' of
    the dwellings

This work was also presented to the
studio by each team. The key experience
of this phase was understanding the
potential of the HOUSING PROTOTYPES
from the point of view of SUPPORTS and
understanding the way the design
methods could assist in restructuring
significant housing prototypes. This
was done through the use of the design
methods which had previously been
studied in the context of other build-
ings designed as SUPPORTS. This was a
design phase, but one with a sign-
ificant level of "help" in the form of
the prototypes.
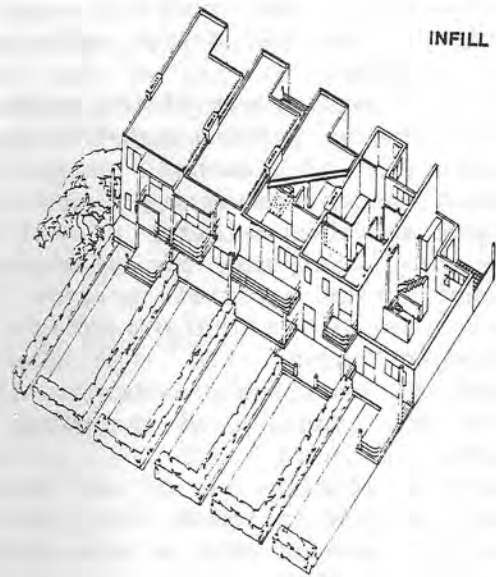
PHASE III

This was the final phase and was seven
weeks in duration. Students had been
eagerly waiting to "do individual"
work. This was therefore a high point
during the semester, which I immed-
iately tempered by insisting on the use
of a Tissue Model for each student's
site. This insistence on my part
incensed some students, who said that
their creativity was being hampered.
Others could not grasp the idea of
models at the tissue level. Fortunat-
ely, I was teaching another studio
concurrently focusing on Design with
Tissues; there was some good sharing of
problems and insights between the
groups. In retrospect, introducing the
Tissue Level needed more time, and
probably should have been introduced
earlier in the semester.

The syllabus read:

In this phase, you will each design
a Support in the context of a given
Tissue Model on the assigned sites.
The emphasis is on good dwelling
design on the basis of the Support/
Detachable Unit concept. There will
be particular emphasis in evalu-
ations on the following issues:

a) thoughtfull and thorough applic-
ation of the SAR design methods to
the problem;
b) careful working out of the relation-
ship between parking and dwelling;
c) sensitive decisions about the
relationship between private open
space and the dwelling;
d) careful analysis of appropriate
construction materials/systems that
make sense in relation to the
Support Concept (i.e. that responds
both to the physical design ideas
and the question of ownership or
rental or ...);
e) careful working out of the facade
designs in relation to the above;
f) careful working out of the problem
of access to dwelling units that do
not open on the ground level.

LOCATION MAP   SCALE 0 1000' 2000' N
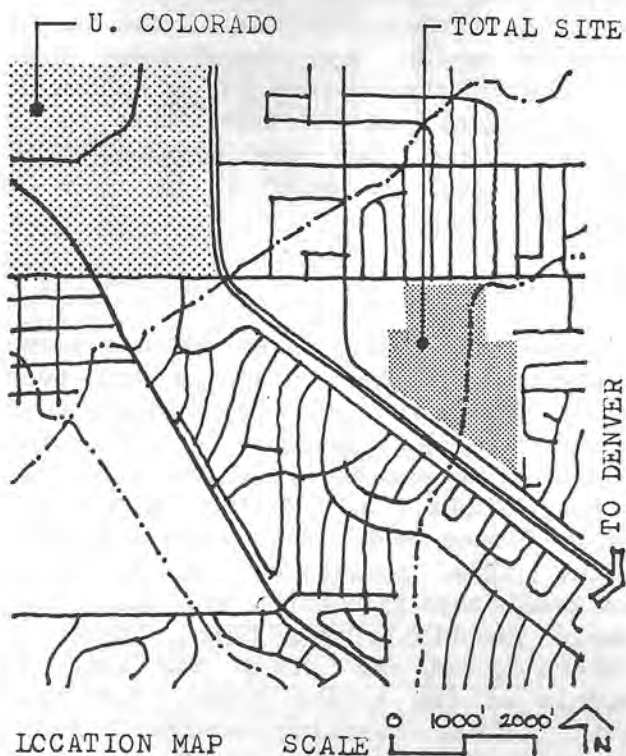
I have chosen the open parcel of land
to the east of Williams Village, a high
rise dormitory complex adjacent to the
University main campus. It is subdiv-
ided into 11 sectors. Since we have 21
students in the studio, we will have,
at the final review, two overall site
development schemes, one a result of 10
individual efforts, and the other the
result of 11 efforts. A sector has been
assigned to each student.

Two Tissue Models are being offered for
your use. They are given in both plan
and section in the attachments. They
express two different themes for the
position and dimension of built and

space elements. You will be asked to
choose one or the other as the basis
for your Support design. When this
choice has been made, work out the
sector following these guidelines and
processes:

1) Work within the assigned property
lines. Make agreements with your
neighbouring sites as to the
spatial and morphological relation-
ships of the adjacent sites and
their applied models. This process
of making agreements will take
place in the studio session, and
over the following weekend, in
group discussions and argument-
ation. Presentations of conclusions
will be made during the class.

2) Work toward a density of 15-18
du/acre (37-44 du/ha), with the
following du (dwelling unit) mix as
a basis for planning (don't forget
that over the long run, this mix
can be assumed to change): 10% 4BR;
50% 3 BR; 20% 2BR; 20% 1BR.

3) Work on the assumption that each du
needs two parking spaces allocated
to it, either in parking lots of a
concentrated sort or clustered
sort, in direct relation to the
dwelling in open space, or in
direct relation to dwelling under
the building; or some combination
of these.

4) Allocate a minimum of 10% of your
site to public open space for
recreational activities. This
percentage can increase according
to your concept of private open
space, but remember that this is
largely a 60% family neighbourhood.
The general site plan gives a large
central area to recreational act-
ivities.

The Tissue Models which I gave came to
be called the Noodles and Donuts
models. They are in fact taken from
Deciding on Density (SAR, 1977). The
decision to leave the choice of model

CLOSED   OPEN

to students proved to be the downfall
of overall site coherence, even though

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I had laid out the basic network of roads and public easements for recreation space. On the other hand, for some students it represented a kind of "real world" simulation, and in any case provided a mechanism for a critique of the idea of planning levels, and the problem of coordinating actions taken by people at the same level. Of course for me, it demonstrated the practical problem of defining a planning entity which in current professional practice could lay down a tissue model for subsequent elaboration under contracts to various architecture firms. It is a method of working which is not familiar in the United States in regard to principally residential projects, since most principally residential projects do not take the time to develop sophisticated means of distributing responsibility-they do all the work in-house and do not feel the need for systematic design of this sort. This may be changing, and I am beginning to investigate the ways in which MODELS and LEVELS are currently in use in practice on large sites with multiple contracts at multiple decision levels.

TWO STUDENT PROJECTS

The two student projects illustrated and discussed here were the most outstanding in the group. When this article was in preparation, I asked both to think back six months to their work, and write a brief description and personal evaluation of their experience.

First Student Project: Jon K. Carlson
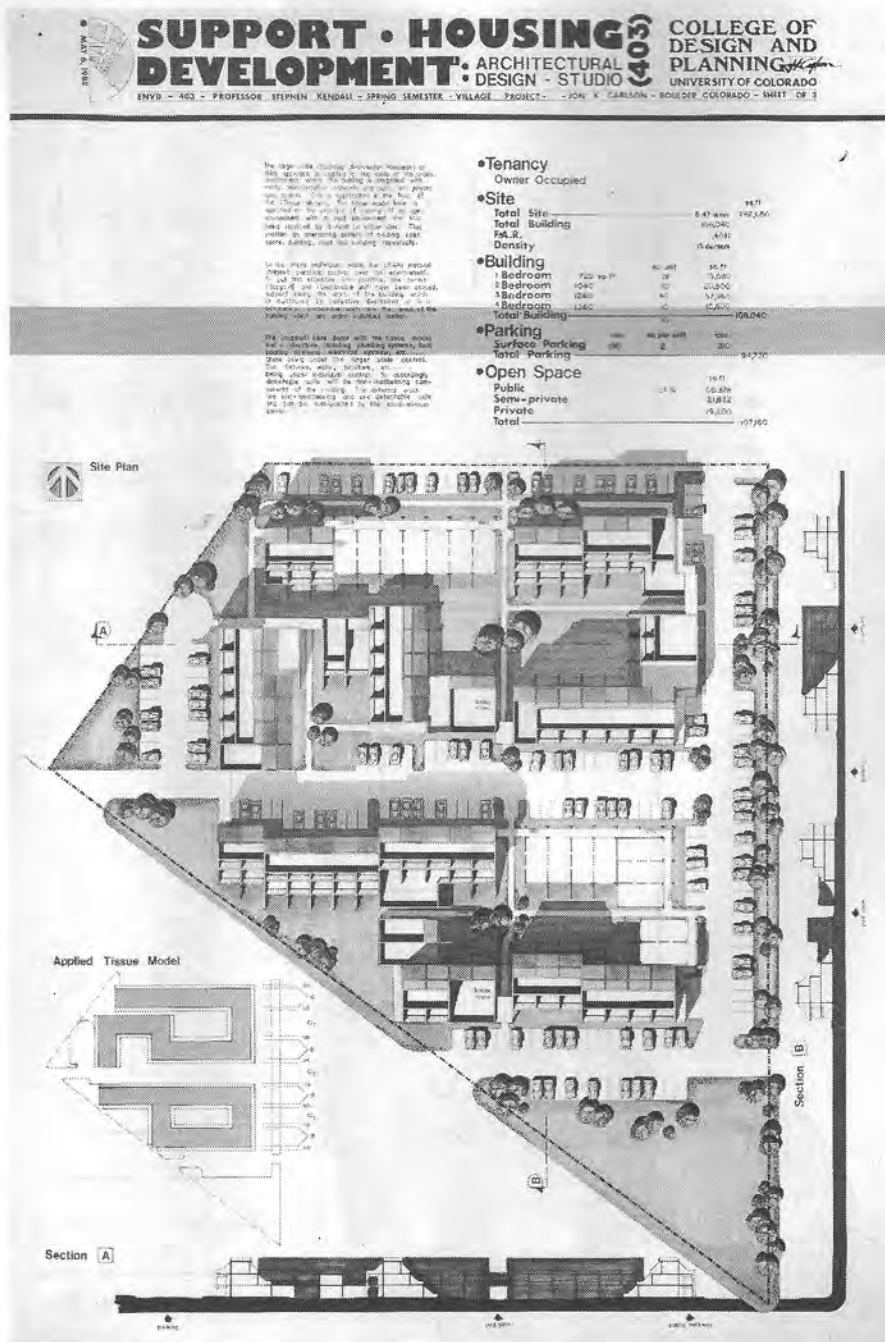
Description of the Design

"The assignment was to design a family housing development of a scale appropriate for the site. The site was approximately six and one-half acres (16 ha) located just southeast of downtown Boulder, Colorado. I chose to work with lower to moderate income housing and also a tenancy of owner occupants.

Working from the SAR method I chose the closed block tissue model, particularly because of the relationships I could establish between private, semipublic, and public open space.

The pattern was then adopted, and transformed to reflect the contours of the site, and according to how transportation networks were to interact with the open space and building space. (see site plan)

I chose to run automobile traffic around or to the exterior of the now three separate rectangles of buildings. This of course implied public space on the exterior. The pedestrian traffic runs parallel to these avenues but at median points to them, creating a flow through the interior space of the rectangles implying semi-public space.

This established a frameowrk to give the site the potential for a feeling of community. Upon this frameowrk support elements are established including

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ENVD - 403 - PROFESSOR STEPHEN KENDALL - SPRING SEMESTER - VILLAGE PROJECT - JON K CARLSON - BOULDER COLORADO - SHEET OF 3
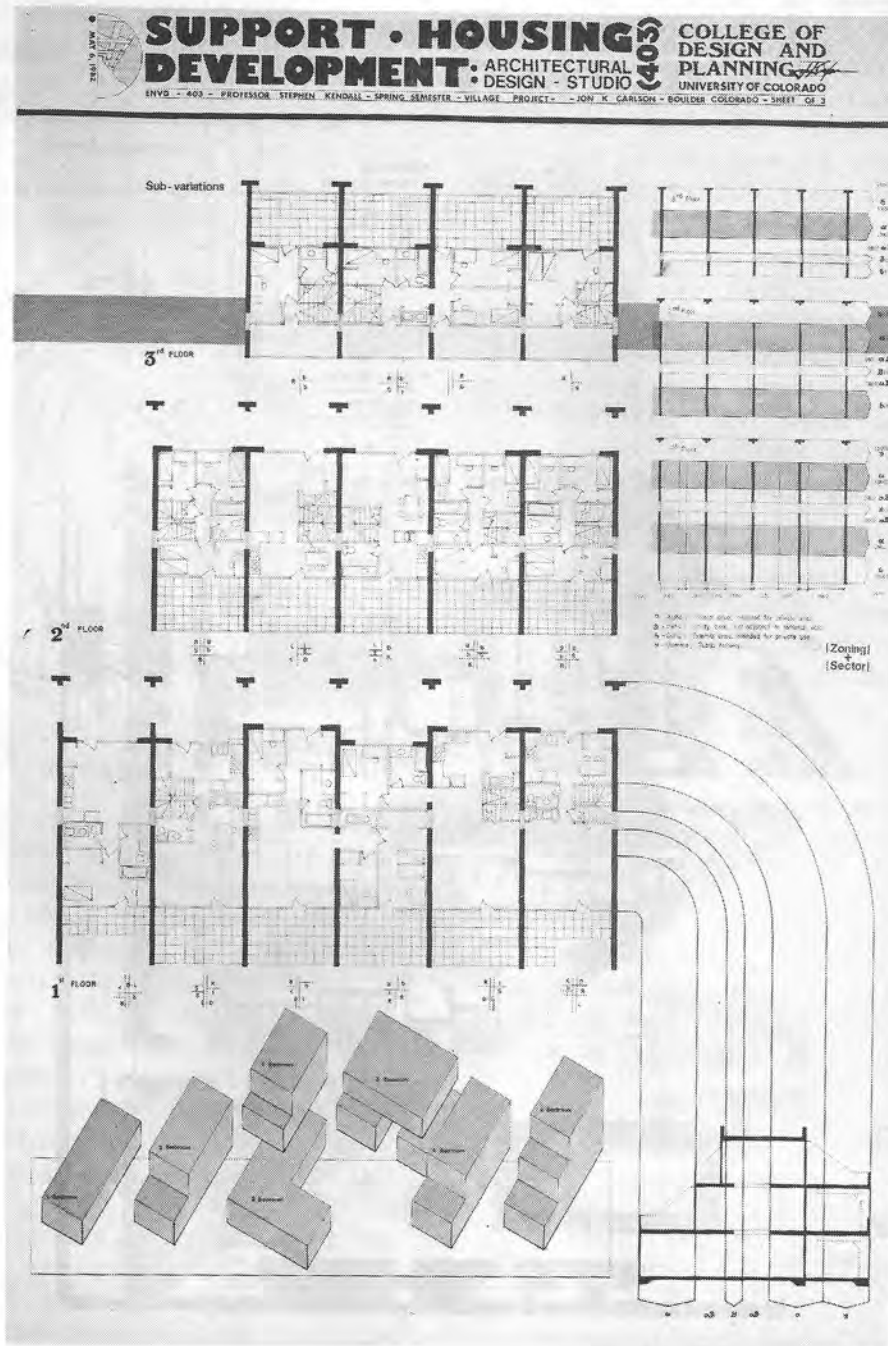
public walkways, main utilities (sewer), support walks, and public stairways, etc., according to floor plans worked out and the culmination of all the defining of the design problem including goals hopefully reached by the SAR method."

Personal Evaluation

"Students of the design profession learn a problem solution sequence that moves through three phases: programming, planning, and designing. The phases work in a somewhat logical order; the use of words to list and organize the requirements of a problem, use of diagrams to develop the list in workable relationships, and the use of drawings to develop the diagrams into communicable relationships.

The SAR system, when engaged in this process, implements a grid or matrix to work into relationships. This grid is also three dimensional and orders diagrams along emphasis on patterns. It places a student's logic into an orderly fashion. Unfortunately most individuals believe this inhibits somehow a designer's "freedom."

Students faced with a design problem and complete freedom, speaking from experience, are usually overwhelmed by the amount of information provided. Architects are data gatherers and data consumers, sometimes to an inhibiting degree. The SAR SYSTEM GIVES DIRECTION (as in a flow chart) about where a

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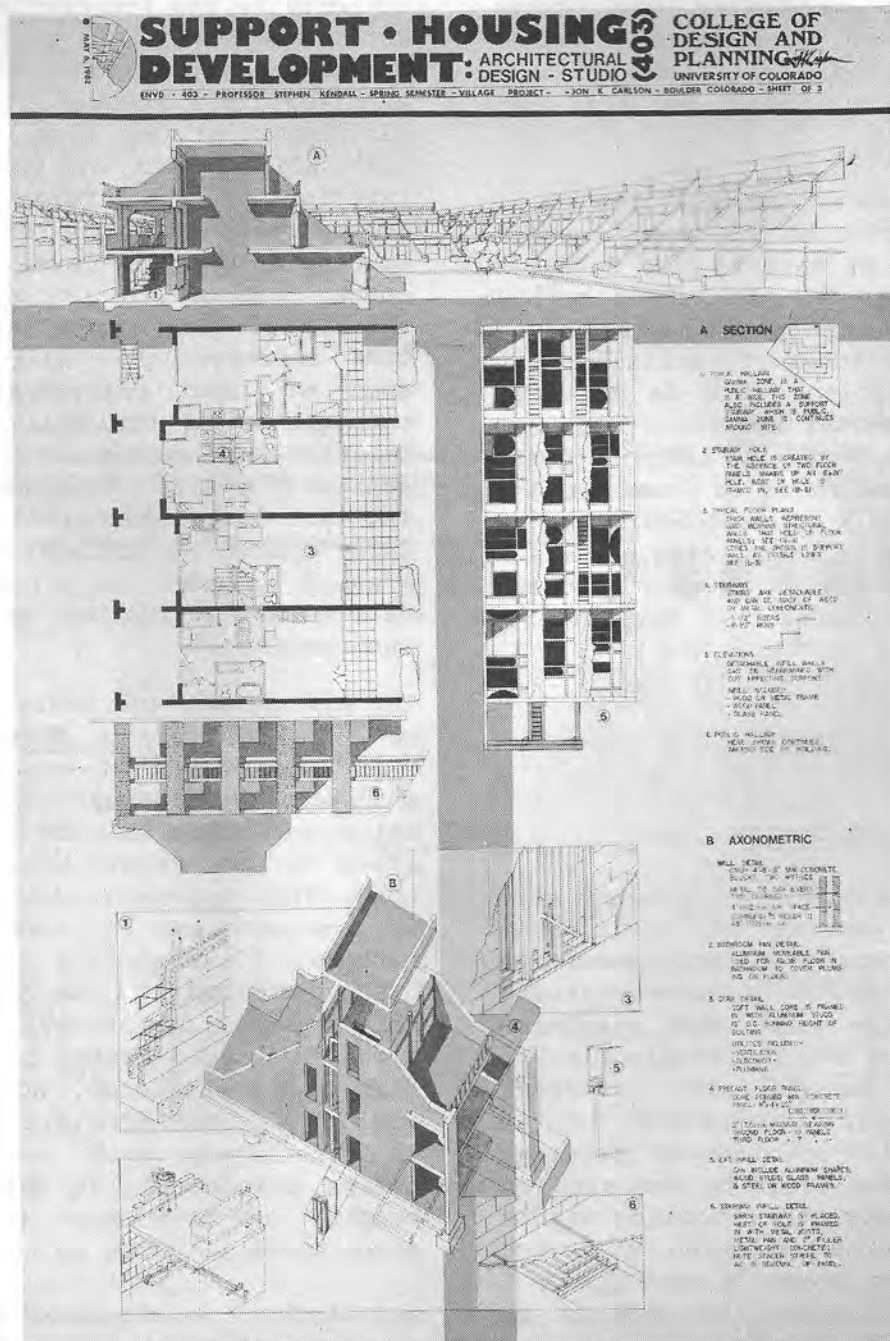
decision is made, and can help narrow the data, step by step into a logical connection. This "limiting of freedom" is most valuable in a learning experience to understand the organization of a process. And it is more closely related to a "real life" compromising environment.

A problem with the SAR system I feel is in the communicated part of the process. Drawings do not always communicate directly to lay persons. And the SAR system may be hard for them to interpret without teaching it outright to them.

The most desirable aspect of the SAR system to me is the use of the "urban tissue" model, a SAR approach to be applied at the scale of the urban environment where the (support) building is integrated with transportation networks and public and private open spaces.

Several successful applications have confirmed my interest in this "tissue" method. As can be seen by the development at Papendrecht, the tissue method demonstrates how people, living close together, can interact socially; it also solves problems such as privacy, public space, social coherence and most important safety, safety as in a feeling of a neighbourhood or community, a coherent framework of neighbours watching out for neighbours. Also, the SAR takes a serious look at the "pattern language" of Alexander, and more importantly implements it."

Second Student Project:
Catherina Verhulst

Description of the Design

"The primary goal in developing my site plan was to provide an environment which offers some of the amenities found in the typical suburban situation. For me this meant that residents would be able to own a sizeable plot of land with the usual front yard/back yard arrangement. Development of an environment which encouraged privacy, independence, and security was also an important consideration. Working within the constraints of a given site and tissue type (the closed block type), I felt it was important to develop my plot so that the arrangement of elements would work together to maximize

diversity. Another important objective was to maximize solar access. This meant that the way the units were arranged depended on whether they were oriented along the east-west or north-south axis. The result was a final site configuration composed of inward and outward facing courtyard arrangements with a connecting interior street. This concept was in part inspired by an organelle found in cell biology called the mitochondrian. The structure of this body is organized so as to encourage rapid transfer of energy from internal reactions to the surrounding cellular area. This is required so that the functions of a particular system might be carried out efficiently. This organization of my site plan offers residents some choice as to the levels of activity and interaction.

The major emphasis of the studio was architectural. However, I felt that it was important to work simultaneously with all aspects of the design: the interior of the living units, their arrangement, and the site itself. I developed a split-level unit arrangement hoping to encourage greater variety of unit types and at the same time increase opportunity for expression of user individuality. Another consequence of the split-level is the creation of multiple levels on the surrounding site. This helped in dealing with the visual problem of having a large number of automobiles in a small area. I consider the attached garage to be a necessary feature for the Suburban environment.

The arrangement and design of the units was not entirely a direct result of using the method of zoning and sector analysis. The SAR system was an organizing principle as the various specifics of the project were being developed. This approach was partly due to my inexperience in working with the methods. I was yet in the process of discovering many of the implications of this system. The actual design phase might have been easier had the project been more restricted, however it also would have been more difficult to deal as effectively with some of my own design objectives. It might have been helpful to have more time than the seven weeks allotted to this phase.

I feel that the choice of materials and a system of construction for my design solution needs more consideration. I

SUPPORT HOUSING

ENVIRONMENTAL DESIGN COLLEGE
UNIVERSITY OF COLORADO
BOULDER, COLORADO

ARCHITECTURAL DESIGN STUDIO
SPRING, 1982
CATHERINE VERHULST

MITOCHONDRIA

METABOLIC ENGINES WITHIN CELLS WHICH CONTAIN ENZYMES NECESSARY FOR ENERGY-LIBERATING REACTIONS

SUPPORT HOUSING

"What we must look for, in place of prototypes which are collective interpretations of individual living patterns, are prototypes which make individual interpretations of the collective patterns possible, in other words, we must make houses alike in a particular way, such that everyone can bring into being his own interpretation of the collective pattern." — Hertzberger

User Participation
Flexibility
Shared Infrastructure

SOLAR ACCESS
PERMANENCE

SCALE: 1/32"=1'0"

Units Developed in Elevation and Plan

N

A

Shadow pattern shown at 2:00 pm, Dec 21
Annual - cycle thermal energy storage tank.
•20' x 40'
•Collector size 3000 ft² (1/4th of the units have collectors on roof)
See sheet 3 for system details

B

1

SITE TRANSFORMATION

Model Given | Diversity of community character is encouraged by reducing courtyard size and varying conditions for degrees of activity. | Articulation of plan develops in response to solar access, interior lighting, entrances, garages, and family size.

"Tenure Type" direct ownership (urban suburbanites)
Dwelling Unit Mix 10% 4br, 50% 3br, 20% 2br, 20% 1br

SITE TOPOGRAPHY

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BEAR CREEK

SUPPORT HOUSING

ENVIRONMENTAL DESIGN COLLEGE
UNIVERSITY OF COLORADO
BOULDER, COLORADO

ARCHITECTURAL DESIGN STUDIO
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Floor Plan Development

ZONING ANALYSIS
Floor 1.5 and 2.5

ZONING/SECTOR ANALYSIS
Floor 1 | Floor 2

SECTOR GROUPS

SECTOR ANALYSIS
Floor 1.5 and 2.5

FLOOR KEY:
SCALE: 1/16"=1'0"

BASIC VARIATIONS

K1 - Kitchen, cooking
K2 - Eat-in Kitchen
L1 - Bathroom
L1 - Living, also eating
L2 - " eating
B1 - 1 person bedroom
B2 - 2 "
B3 - Master bedroom
E - Entrance
Ln - Laundry
St - Studio/Study
Sg - Storage
W - Workroom
M - Mechanical
Ba - Balcony

SUB-VARIATIONS
SCALE: 1/8"=1'0"

1 BEDROOM UNIT   675 - 753 ft²
2 BEDROOM UNIT   924 - 1155 ft²
2-3 BEDROOM UNIT   1233 - 1350 ft²
3-4 BEDROOM UNIT   1428 - 1597 ft²

SUNSPACE LOCATION IS DEPENDENT ON UNIT ORIENTATION

2-BEDROOM UNIT | 3-4 BEDROOM UNIT | 1 BEDROOM UNIT

2-BEDROOM UNIT | 3-4 BEDROOM UNIT

LOCATION OF SUNSPACE IF UNIT IS ON N-S AXIS (over garage)

FL 1.5 | FLOOR 1 | FL 1.5
FL 2 | FLOOR 2.5 | FL 2

2
ENERGY + DESIGN

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was primarily concerned with proposing a structural system that had some inherent thermal mass and therefore chose poured-in-place concrete. This may not have been the best solution as I also wanted as few interior struct-

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North Elevation

South Elevation

Interior Street Entrance

SUPPORT SYSTEMS

ural elements as possible. Choosing a particular structural system is critical because it largely determines the eventual character of the housing units.

The split-level design, the openness of the structural system, the variation in arrangement due to east-west or north-south orientation, plus the unit's relationship to an attached garage created a complex situation in which to develop the zones, margins, sectors, and subsequent variations. Essentially my brain was forced to the computer mode during this phase. It was a good learning experience however, in that it helped me understand the implications of residential floor plans and was useful in organizing a complex set of issues at this scale.

The housing I proposed is probably not readily acceptable to the middle and upper-middle income family today, but I would suggest that this system will become more useful as the current housing shortage and concern for conserving energy intensifies. I see it as an important resource for the planner and architect in the future. It is possible that some day the method can be adapted to computer technology. I think that computer-aided SAR could be extremely useful as a framework for coordinating the design process and for developing solutions which have potential to provide environments which can be meaningfully manipulated and experienced by users."

Personal Evaluation

"I consider the SAR method as an architectural planning exercise and significant to the learning process, because it allows one to deal with a set of relational issues important for many design projects. I suggest that this system is most appropriate for introduction and study at the second and third year level for the following reasons. First, considering an underlying sensitivity to user needs, this system sets up a structure for introducing fundamental planning issues to an architectural project. Second, by way of a systematic process, broad understanding of floor plans is acquired quickly, and significantly, one avoids getting locked into the "one best idea.""

An inherent danger is to get sidetracked into the methodology, which can make the creation of planning and architectural interest in students more difficult. This is particularly frust-

rating if one is used to being in control of a design product and realizes that only a precursor to an anticipated pleasing environment can be made. I propose that much of the methodological system of SAR already exists as an elementary stage of computer logistics and could eventually be incorporated in a related computer class.

I anticipate that the SAR system will gain acceptance and usefulness in this country as the current housing shortage continues to intensify, and therefore see it as an important resource for future architectural and planning design. I would suggest that the methodology requires a higher level of sophistication, possibly a system and language oriented in terms of computer technology, in order for SAR to become acceptable in actual practice in the U.S. In addition, the concept of permanence needs to gain additional emphasis before this type of design solution becomes feasible. Also, energy issues associated with solar access, appropriate materials, and emphasis on renewable resources are variables that should be incorporated within the solution process. The intent of my design solution was to deal, at least in part, with some of the issues I have mentioned."

Reflections on Teaching with SUPPORTS

In several ways, the experience of teaching with SUPPORTS was very useful from my perspective as a teacher. It was useful because in it, students began, most of them for the first time, to think about architecture in terms of LEVELS of decision making, systems and variants at several LEVELS, and the idea of change as an inevitable force in the built environment. Secondly, students began to develop the habits of thinking and designing systematically at useful times in their work; this, coupled with the problem of evaluation of variants, was apparently not a well developed way of working for most of them, and needs more care and continued attention. Third, it was a unique experience for the students because it was a contribution of theory to a practical and familiar design problem, a theoretical perspective that incorporated an action component congruent with working in the "real world".

In several other ways, the experience was not as productive as it might have been. First of all, despite the gradual way of introducing the design methods through the first two phases of the studio, many students could not master the principles or the operations. They could simply not go beyond the "operations and terminology" to inject the design problems with images, metaphors, formal ideas, or other ways of thinking about design. This could derive from several causes; inadequate prior preparation in broad design thinking; overly "technical and abstract" design methods; inadequate presentation of the methods and their appropriate "place" in design, from me; an urge by students to "do architecture of personal expression"; or other causes. Secondly, it is clear in retrospect that an earlier introduction of the TISSUE MODEL idea might have helped. As it was, the notion that there ought to be a sought-after order at the level above one's own building site was hard to comprehend by most students. It was conceptually beyond most of them to recognize that, as actors at the same "level," they all naturally must look to the higher decision levels for the "glue" that would hold their individual interventions together. There was a general resistance to any form of "glue" other than an obvious road and open space network. The two tissue models (Noodles and Donuts models) were seen as hugely restrictive when they were understood at all; or perhaps this reaction came because they were never really understood. In any case, I did not "fit the models "to the site-that was left to the students and consequently the site coherence I had hoped for did not emerge when final presentations were made.

I believe that some students learned from this failure at the "higher level," and learned that this failure can be dealt with by using the TISSUE MODEL idea comprehensively and carefully at the level above the work of individual sites. They could see that the negotiations which had to take place between individual sites, to resolve local design conflicts, were not equitable and balanced, and led only to ad-hoc solutions of atomistically defined problems.

The negotiations may well have been useful at this stage had they continued and evolved into a site-wide set of agreements about the way the tissue models should "fit in" to the larger site. Instead they stopped abruptly and produced piecemeal results. Negotiations of a limited sort may make sense between designers at the same level, and may result in specific, local solutions. But if an overall TISSUE MODEL order is sought, the negotiations must aim toward TISSUE LEVEL agreements.

As a pedagogic approach, the idea of SUPPORTS is exceptionally useful. It contributes theory and method, and provides a conceptual basis for students to explore in connected ways a wide range of issues germane to housing and building; from building technology to the organization of decision making; from questions of formal design starting points to computer aided design. It also allows students to address the tired dictate that form somehow follows immediately from function, by asking for attention to the idea of change of function over time.

On the other hand, it is not immediately apparent how the SUPPORTS concept can be useful in the U.S. to the practical problems of bringing about better housing. This is certainly not to say that there is no meaning and usefulness in the U.S., simply that it is (will be) different from that in Europe or Japan, or other countries in which government has historically been dominant in the provision of housing. The U.S. tradition has for most people been one of competing in the private market for housing, with the historical expectation (now changing significantly) of home ownership, and a dependency for choice on the decisions of builders and investors within the context of a minimal government role. Further, the housing industry in the U.S. is vast, fragmented, and characterized by small scale building companies operating locally in a small market area, following the dispersal of the purchasing power of households as the chief buyer of housing (not the government as buyer).

With the absence, in the U.S., of really long term public commitment in the question of housing provision and the quality of residential environments, the notion of permanence and change of the urban tissue is profoundly different from the European origins of SUPPORTS. The idea that the Support should last one hundred years is stacked up in the U.S. against tax laws and corporate investment policies, which encourage rapid turn-over of property to investment syndications, after initial costs are recovered and large first profits are maximized. Incentives to build well are not strong. In this way, of course, national government policies (for the most part made by businessmen and lawyers) have profound effects on the nature, quality and variety of the housing supply.

So in the U.S., the SUPPORT idea will be finding a place in a much different structure of actors, in a different organization of housing and building industries, and in a tradition that has rarely expressed concern about a lack of choice at the household level. Market principles have held sway from the beginning, with a deficiency of "social starting points." My guess is that if there is a niche in the housing process in the U.S., it is in the organization of the design/build process that SUPPORTS will find a reason d'etre, not in the realm of participatory design. Design professionals and developers, and the manufacturers of elements for housing construction, will perhaps be the first to call for more systematic design and construction practices, even on a local level, to cut costs and maintain the kind of variety the market has grown to expect. This speculation is not, of course, based on much research. The way that SUPPORTS might find, or has already found, a home in the housing process in the U.S. deserves some research.

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