HOUSING FOR BOZEMAN
BY
JACK ARTHUR RINGDAHL

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HOUSING FOR BOZEMAN

UNDERGRADUATE THESIS IN ARCHITECTURAL DESIGN

by

JACK RINGDAHL

Submitted to the School of Architecture as
partial fulfillment of the requirements
for the degree of Bachelor of Architecture

at

MONTANA STATE UNIVERSITY

Bozeman, Montana

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J. RINGDAHL

JUNE 1977

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SUBMITTED TO THE SCHOOL OF ARCHITECTURE
AS PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF

BACHELOR OF ARCHITECTURE

AT

MONTANA STATE UNIVERSITY
BOZEMAN . MONTANA
JUNE , 1977

ADVISOR: John N. DeStaas, Jr.

DIRECTOR:

PREFACE.

ARCHITECTURE IS PROVIDING.
ARCHITECTS PROVIDE.
IF ALL IS PROVIDED IT IS GOOD.

THANKS MUST BE GIVEN TO MY WIFE MARJORIE FOR WITHOUT HER HELP AND UNDERSTANDING ARCHITECTURE FOR ME WOULD NOT BE.

IT IS GOOD

INTRODUCTION.

THERE HAVE BEEN MORE ADVANCES IN SCIENCE AND TECHNOLOGY MADE IN THE PRECEDING TWENTY YEARS THAN IN ALL OF THE REMAINING YEARS IN THE HISTORY OF MAN.

THESE DEVELOPMENTS WERE MADE POSSIBLE THROUGH THE DIVISION AND SPECIALIZATION IN TASKS AND RESPONSIBILITIES.

ARCHITECTURE HAS, AT TIMES, NARROWED ITS SCOPE TO A POINT WHERE SPECIALIZATION LIMITS THE QUALITY OF OUR BUILDINGS.

ARCHITECTS WHOSE WORK ATTITUDE IS UNI-DIMENSIONAL (FUNCTIONALISM OR HUMANISM FOR EXAMPLE) ARE SPECIALIZED AND THE RESULTS CAN BE DISASTEROUS.

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□ TO UNDERSTAND HOW ARCHITECTURE CAN AFFECT POSITIVE CHANGES IN BEHAVIOR □



PURPOSE :

THE INSPIRATION FOR POSITIVE EFFECTS ARCHITECTURE IN THESIS IS MY BELIEF THAT ARCHITECTS, WITHOUT A WORKABLE APPROACH TO SENSITIVE DESIGN, CANNOT INCORPORATE THEIR SENSITIVITY INTO REALITY.

REASON → ECONONOMICS, HISTORY, CODIFICATION, STYLE, ETC..

THROUGH A STUDY OF BEHAVIORAL EFFECTS AND THEIR RELATIONSHIP TO PROJECT DEVELOPMENT AND DESIGN I WILL HOPEFULLY DEVELOPE A WORKABLE SENSITIVITY AS PART OF MY DESIGN PHILOSOPHY.

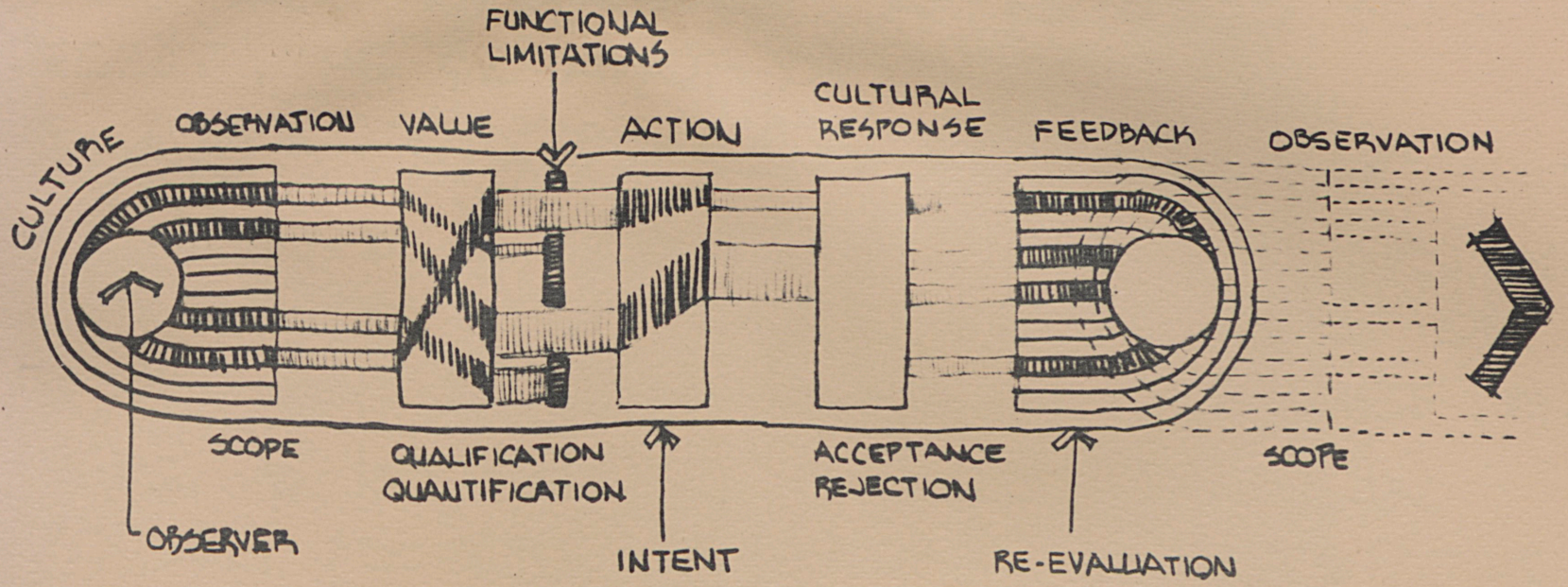
OBSERVATION IN CULTURE

ALL INDIVIDUALS OBSERVE CULTURE IN THEIR OWN WAY. THE VIEW OF CULTURE IS NARROW IN SCOPE WITH THE MAGNITUDE AND DIRECTION OF A MANS SCOPE BEING THE PRODUCT OF KNOWLEDGE, INTEREST, NEED, ETC.. THE INPUTS GAINED THROUGH OBSERVATION ARE GIVEN VALUE BY QUANTIFICATION AND QUALIFICATION. THEY ARE GIVEN DEGREES OF IMPORTANCE AND JUDGED AGAINST THE OBSERVERS IDEALS (WHICH ARE USUALLY CONSISTANT WITH THE IDEALS OF HIS CULTURE). INPUTS NOT RELEVANT TO ACTION (GENERAL OR SPACIFIC) HAVE SOME FUNCTIONAL LIMITATIONS AND ARE ELIMINATED. THE REMAINING INPUTS MAY INDUCE ACTION BASED UPON INTENT. THE INTENT IS IN REACHING THE IDEAL. THE ACTION IS IN THE ATTEMPT. FOR EACH ACTION THERE WILL BE A RESPONSE.

RE-EVALUATION GIVES NEW INPUTS ABOUT ACTION ACCEPTANCE OR REJECTION. THE RE-EVALUATION IS THEREFORE NEW OBSERVATION. THE SYSTEM IS A CYCLOID CONTINUUM.

SEE FIGURE 1 (FLOW CHART OF OBSERVATION IN CULTURE).

THE IMPORTANCE OF UNDERSTADING OBSERVATION IN CULTURE IS IN THE PROCESS OF DESIGNING FOR OTHERS. EVALUATION OF USER NEEDS FROM USER VIEWS IN CULTURAL OBSERVATION CAN-NOT BE DONE WITHOUT UNDERSTANDING.



FLOW CHART OF OBSERVATION IN CULTURE

FIGURE. 1

(A MODEL DEVELOPED BY THE AUTHOR)

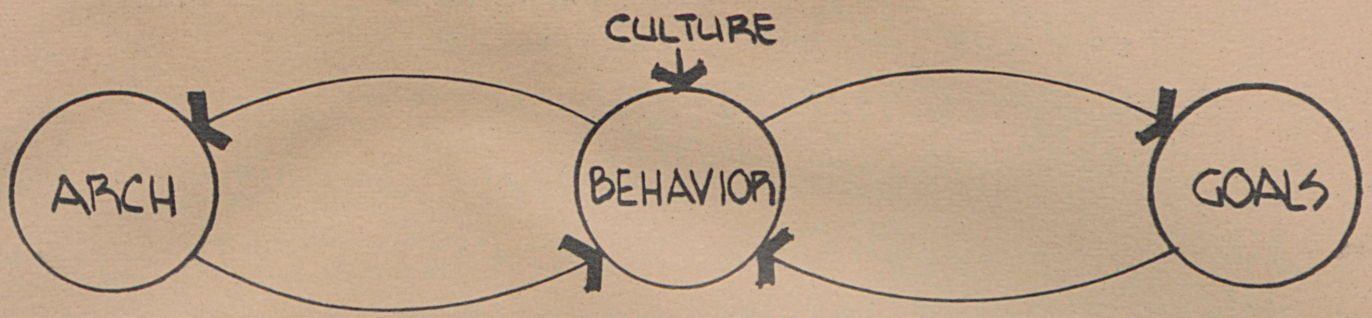
BEHAVIORAL EFFECTS ARCHITECTURE

MANS BUILT ENVIRONMENT AFFECTS, TO SOME DEGREE, THE BEHAVIOR OF THE USER.

BEHAVIOR → A PERSONS ATTITUDES & ACTIONS.

ex: INDIVIDUALS SUBJECTED TO A NON-POSITIVE ENVIRONMENT FOR EXTENDED PERIODS OF TIME SHOW MODIFICATIONS IN BEHAVIOR.

THERE IS NO DESIGN PROCESS THAT CAN PRODUCE POSITIVE BEHAVIORAL EFFECTS. THE WAY TO ASSIST IN AFFECTING POSITIVE BEHAVIOR IN ARCHITECTURE IS THROUGH SENSITIVE DESIGN. SENSITIVITY IN DESIGN COMES FROM AN UNDERSTANDING OF CULTURAL GOALS AND THE BEHAVIOR WHICH INFER THEM. WE CANNOT OBSERVE GOAL ACHIEVEMENT WE CAN ONLY OBSERVE BEHAVIOR.



BASIC GOALS IN OUR CULTURE SUCH AS EQUALLITY, HEALTH, THE PERSUIT OF HAPPINESS, ETC., PROVIDE THE BASIS FOR WHAT IS POSITIVE IN BEHAVIOR. BEHAVIORAL EFFECTS WHICH ARE CONDUCIVE TO CULTURAL DEVELOPMENT CONSISTANT WITH GOAL ACHIEVEMENT ARE POSITIVE.

IN DESIGN, POTENTIAL BEHAVIORAL EFFECTS CAN BE DIVIDED INTO TWO CATAGORIES. THESE WILL BE TITLED EXPLICIT AND IMPLICIT EFFECTS ARCHITECTURE →

EXPLICIT EFFECTS ARCHITECTURE

EXPLICIT EFFECTS ARCHITECTURE DEALS WITH AN ARCHITECTURE WHICH IS CONDUCIVE TO INDIVIDUAL DEVELOPMENT AND GOAL ACHIEVEMENT.

THE IMPLICATION OF THIS ARCHITECTURAL TYPE IS THAT IS PRIMARILY NON-NEGATIVE AND THEREFORE POSITIVE.

THERE ARE TWO PRIMARY STEPS IN THE DEVELOPMENT OF EXPLICIT EFFECTS ARCHITECTURE

1. CONDITIONS ANALYSIS
2. EFFECTS EVALUATION

CONDITIONS ANALYSIS:

CONDITIONS ANALYSIS IS THE PROCESS USED TO IDENTIFY AND LIMIT FACTORS RELEVANT TO THE DEVELOPMENT OF DESIGN (PROJECT) GUIDE-LINES. THE IDENTIFICATION PHASE CONSISTS

OF; USER PROFILES, USE ANALYSIS, TIME MATRIX, CONTEXTURAL EVALUATION AND THEME IDENTIFICATION.

USER PROFILE: THE TYPE(S) OF USERS; ELDERLY, CONSUMERS, LABORERS →

USE ANALYSIS: THE TYPE(S) OF USES; HOUSING, EDUCATION, RECREATION →

TIME MATRIX: THE DURATION OF USE.

CONTEXTURAL EVALUATION: THE DEFINITION OF PROJECT SURROUNDINGS; RECREATION/ RURAL/ RESIDENTIAL. [HISTORY]

THEME IDENTIFICATION: THE MAJOR PROJECT CONCERN; SECURITY, ENERGY, TECHNOLOGY, ENVIRONMENT ——→

EFFECTS EVALUATION IS THE CONTINUING EXAMINATION AND VALUATION OF PROPOSED SPACE AND FORM THROUGHOUT THE DESIGN PROCESS WHERE CONDITIONS ANALYSIS BECOMES A TOOL.

THE EXAMINATION IS DONE TO ANTICIPATE THE POTENTIAL CHARACTER OF A SPACE IN TERMS OF BEHAVIORAL EFFECT.

THE VALUATION OF THE SPACE IS THE COMPARISON OF THE ANTICIPATED CHARACTER WITH GOAL ACHIEVEMENT CRITERIA.

SPACE CHARACTERISTICS:

POSITIVE; WARMTH, SECURITY, FREEDOM, UNDERSTANDING

NEGATIVE; COLD, CONFINEMENT, FEAR, REJECTION, CONFUSION.

IMPLICIT EFFECTS ARCHITECTURE

IMPLICIT EFFECTS ARCHITECTURE DEALS WITH AN ARCHITECTURE WHICH RE-ENFORCES OR IS REPRESENTATIVE OF CULTURAL TRENDS SUCH AS EQUALITY, ENERGY CONSERVATION →

THE IMPLICATION OF THIS ARCHITECTURAL TYPE IS THAT IT IS POSITIVE AND DIRECTING. → FASHION – STYLE.

THE IMPORTANCE OF IMPLICIT EFFECTS ARCHITECTURE IS THE FACT THAT IT IS SUPPORTIVE OF LONG RANGE CULTURAL GOAL ACHIEVEMENT.

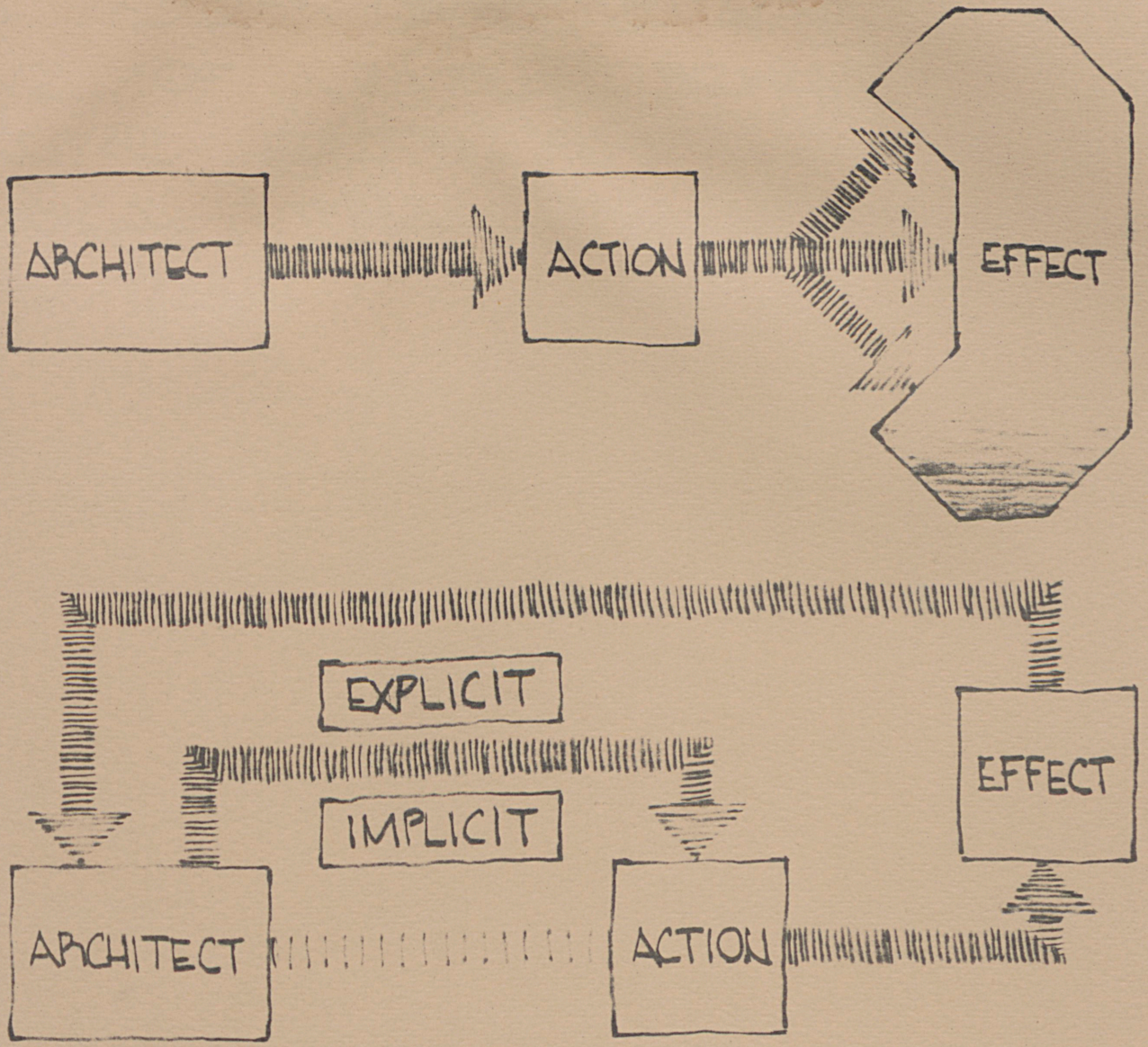
CULTURAL TRENDS, SUCH AS ENERGY CONSERVATION OR ENVIRONMENTAL PROTECTION, DO HAVE GOAL ACHIEVEMENT IMPLICATIONS SINCE THE NEGLECT OF SUCH CONCERNS POTENTIALLY

COULD BE DETRIMENTAL TO GOAL ACHIEVEMENT AND THEREFORE BEHAVIOR.

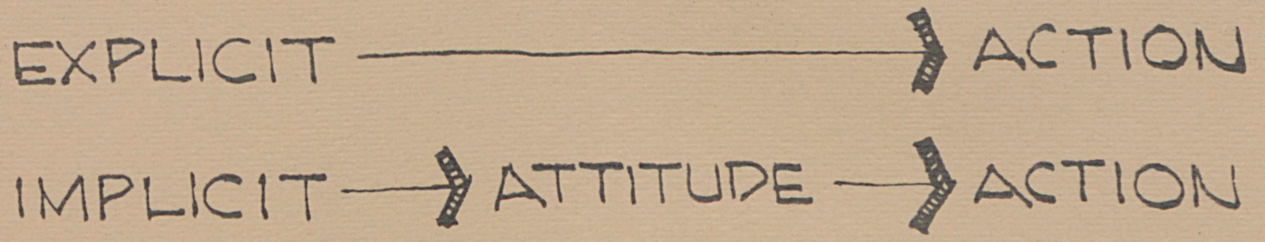
THE PURPOSE OF IMPLICIT EFFECTS ARCHITECTURE IS TO DEVELOPE POSITIVE ATTITUDES WHICH IN TURN WILL AFFECT POSITIVE BEHAVIOR.

THE IDENTIFICATION OF CULTURAL TRENDS IS ACHIEVED PRIMARILY THROUGH SENSITIVITY AND CULTURAL AWARENESS.

IN IMPLICIT EFFECTS ARCHITECTURE THE ARCHITECT NOT ONLY DESIGNS WITH CONCERN BUT ALSO IN SOME WAY REFLECTS THIS THROUGH HIS WORK.


ARCHITECT
ACTION
EFFECT
EXPLICIT
IMPLICIT
ARCHITECT
ACTION
EFFECT

THE PROCESS OF GOAL ACHIEVEMENT, ON THE LEVEL OF INDIVIDUAL BEHAVIOR, SUGGESTS MENTAL HEALTH, POSITIVE ATTITUDES AND PHYSICAL WELL BEING.



PROJECT DEVELOPMENT

THE NEED FOR A MEDIUM DENSITY HOUSING DEVELOPMENT FOR BOZEMAN IS ASSUMED. THE SIZE, OR DENSITY, OF THE PROJECT WAS NOT DEFINED UNTIL A SITE WAS SELECTED.

BECAUSE OF THE TREND TOWARD SPRAWL IN NEW RESIDENTIAL DEVELOPMENT AN MY OWN CONCERN FOR DOWNTOWN RE-VITALIZATION, THE STUDY AREA FOR SITE SELECTION WAS LIMITED TO THE URBAN CORE.

THE SITE WAS SELECTED ON THE BASIS OF PROXIMITY TO THE COMMERCIAL CENTER, THE CONDITION OF EXISTING UNITS AN ZONING. MAPS SHOWING ZONING, HOUSING CONDITION ARE INCLUDED IN APPENDIX "A".

THE LOCATION OF THE SITE AS WELL AS A SITE

SUMMARY ANALYSIS ARE ALSO IN APPENDIX "A".

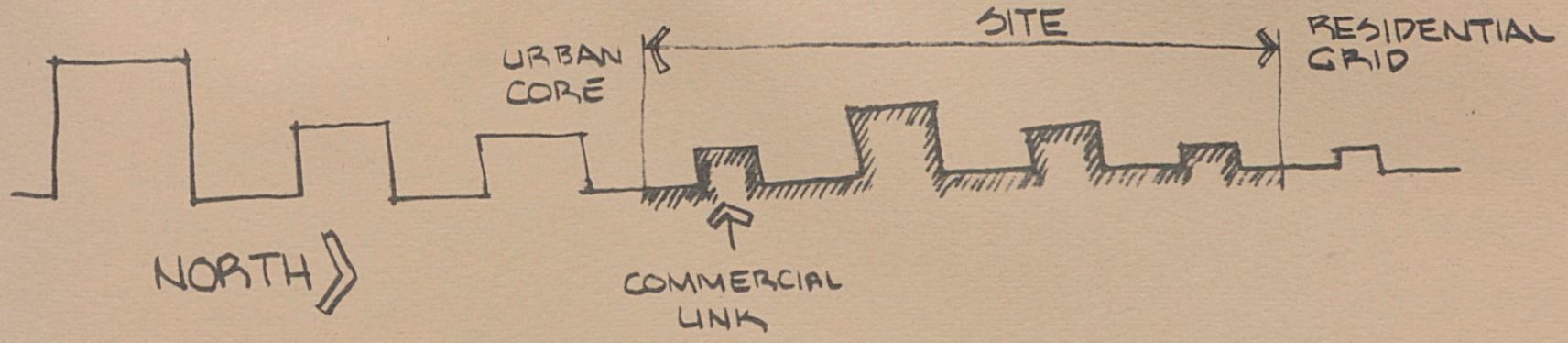
SUMMARY ANALYSIS: THE SITE INCLUDES AN EXISTING PARK, A NATURAL WATERWAY AND IS BORDERED BY COMMERCIAL, RESIDENTIAL PROPERTIES AND A MAJOR VEHICULAR ARTERIAL. THE PRIMARY VIEWS ARE FROM NORTH-NORTHWEST TO NORTH-NORTHEAST.

THE EXISTING PARK AND A NEW PARK WHICH IS TO INCLUDE THE NATURAL WATERWAY ARE CONNECTED BY A PEDESTRIAN LINK.

BUFFERS ARE USED TO SOFTEN THE RESIDENTIAL/COMMERCIAL INTERFACE AND TO ISOLATE THE PROJECT FROM THE TRAFFIC BARRIER.

BECAUSE OF THE VARIATION IN ZONED LAND USE A COMMERCIAL STRIP AND DECREASING

RESIDENTIAL DENSITY STRIPS WILL BE EMPLOYED. THIS SITE DEVELOPMENT LINKS THE URBAN CORE WITH THE RESIDENTIAL GRID WITH A MINIMUM OF CONFLICT.



RESIDENTIAL UNIT DEVELOPMENT:

AS INDICATED ON THE SITE ANALYSIS CONCEPT IN APPENDIX "A" THERE ARE THREE GENERAL RESIDENTIAL UNIT TYPE GROUPS : HIGH DENSITY, MEDIUM DENSITY AND LOW DENSITY. FROM THIS THE HIGH DENSITY AND LOW DENSITY TYPE HOUSING WILL BE EXAMINED IN MORE

DETAIL THAN THE MEDIUM DENSITY WHICH WILL ONLY BE EXAMINED IN CHARACTER AND MASS.

LOW DENSITY RESIDENTIAL: WITHIN THE BEHAVIORAL CONTEXT, PRIMARY THEMES IN UNIT DESIGN WERE INITIATED AND DEVELOPED.

ALL LOW DENSITY UNITS WILL BE ATTATCHED IN GROUPS OF FOUR. THE QUADRIPLEX DESIGN WAS A RESULT OF AN EXAMINATION OF PROBLEMS WHICH AROSE IN SIMILAR DEVELOPMENTS.

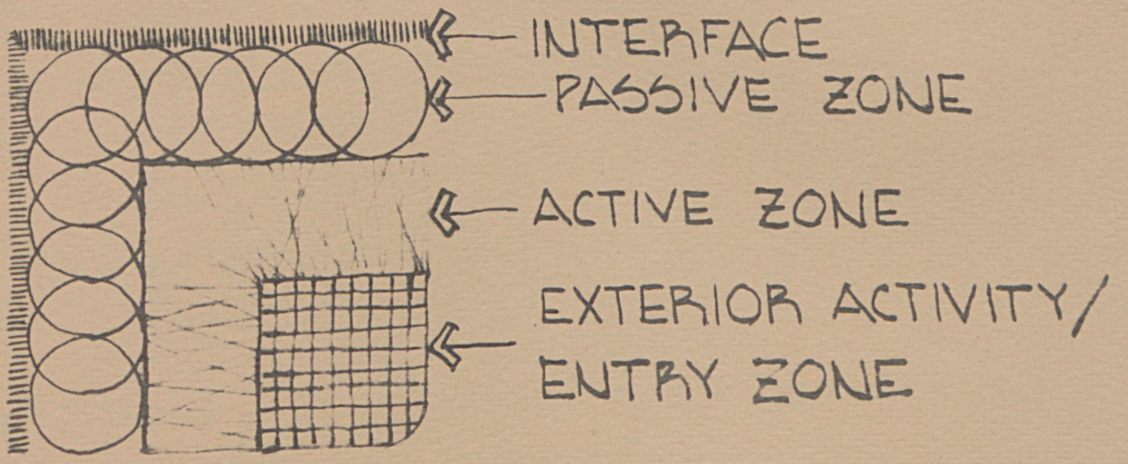
SOME OF THE PROBLEMS WHICH I INVESTIGATED WERE:

INTRA-UNIT NOISE ISOLATION
ENTRY
FRONT YARD / BACK YARD
DEFINITION OF UNIT BOUNDRY

THE FIRST STEP IN THE DEVELOPMENT OF FORM IN MY DESIGN WAS A SCHEMATIC TO ASSIST IN

NOISE PRODUCTION AND ISOLATION. MY INITIAL SCHEMATIC, APPENDIX "A", WAS DEVELOPED FOR A LINEAR DEVELOPMENT.

THE QUADRIPLEX OR FOUR-QUADRANT UNIT USES A MODIFIED VERSION AS SHOWN BELOW:



THE NEXT STEP WAS THE DEVELOPMENT OF A PLAN WHICH WOULD REFLECT THE SCHEMATIC. THE DEVELOPMENT BEGAN WITH ROOM TYPES BEING CATAGORIZED AS EITHER ACTIVE OR PASSIVE.

PASSIVE ZONE SPACES

BEDROOM
BATHROOM
CLOSET
DEN
STUDY ⟶

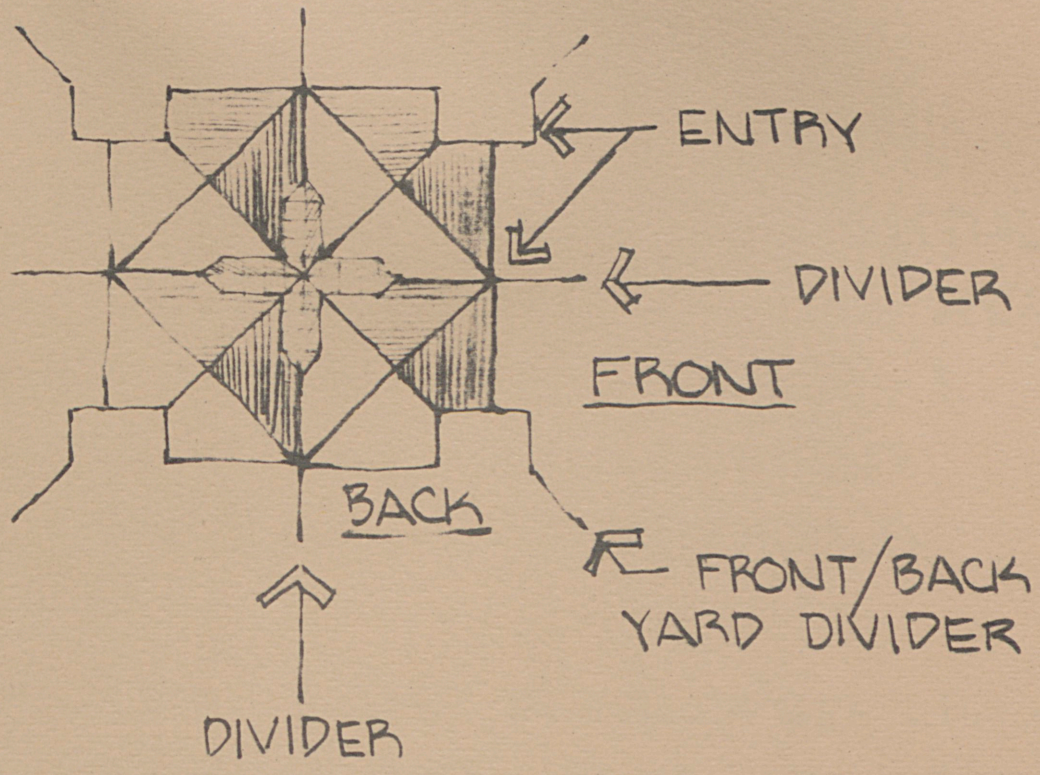
ACTIVE ZONE SPACES

KITCHEN
DINING ROOM
LIVING ROOM
FAMILY ROOM ⟶

THE DESIGN OF LIVING UNITS FROM THIS POINT WAS FAIRLY EASY FROM AN INTERNAL PLAN VIEW. THE PRIMARY OR MOST COMMON UNIT IS THE THREE BEDROOM TYPE, SEE APPENDIX "B". THIS UNIT IS REDUCED OR ENLARGED IN SIZE BY REVISING THE GRID SIZE.

BY DESIGNING THESE UNITS IN THIS WAY WE HAVE REDUCED INTER-UNIT CONFLICT AND HAVE PRACTICED EXPLICIT EFFECTS ARCHITECTURE THROUGH USE AND USER ANALYSIS.

THE ILLUSTRATION SHOWS HOW THE EXTERIOR OF THE QUADRIPLEX HAS BEEN DESIGNED TO PROVIDE DEFINED SPACE.



QUADRIPLEX
ROOF PLAN

THE INCORPORATION OF A LATICE FOR SOLAR CONTROL IS CONSIDERED IMPLICIT EFFECTS ARCHITECTURE. THE REASON FOR THIS IS THAT THE INTENTION OF THE LATICE WAS TO SHOW SOLAR CONTROL AND THEREFORE ENERGY CONSERVATION.

HIGH DENSITY RESIDENTIAL: THE INITIAL CONCEPT FOR THE DEVELOPMENT OF THE HIGH DENSITY UNITS WAS URBAN INTERFACE. I DEFINED A BASE FOR THE DEVELOPMENT BY PLACING THE HOUSING UNITS UPON A PLAZA / PARKING LEVEL.

THE UNITS THEMSELVES WERE DEVELOPED UPON AN IMPLICIT EFFECTS CONCEPT. THIS CONCEPT DEALT WITH FAMILY UNIT INTERACTION. IT SHOWS A RECOGNITION OF THE NEED FOR

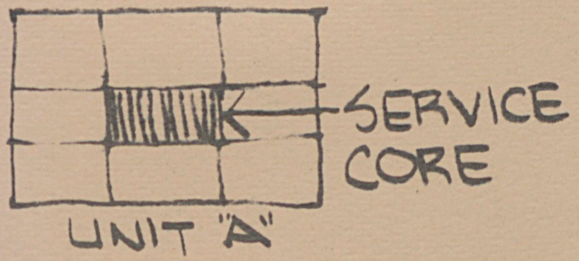
EXPRESSION AND PRIVACY BY ALL MEMBERS OF A FAMILY.

THE ADDITION OF EXTERIOR LIVING SPACES OR TERRACES IN AN URBAN SETTING ASSISTS IN EXPANDING THE DEFINED LIMITS OF THE UNITS.

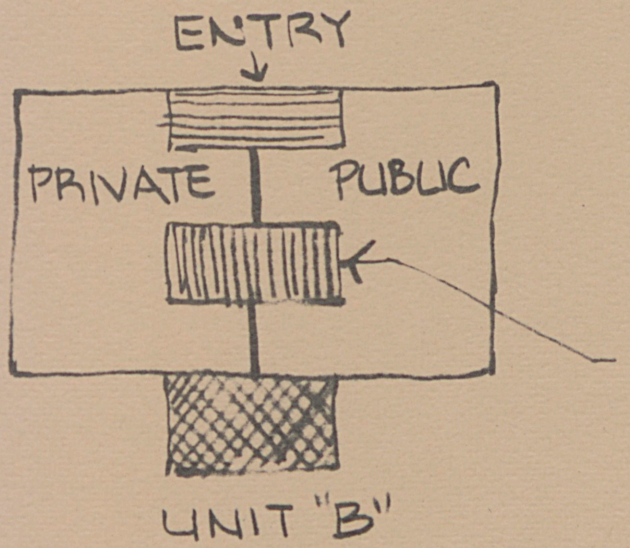
IN SCHEMATIC FORM THE LAYOUT OF THE LIVING UNIT WOULD BE SHOWN WITH THE FOLLOWING RELATIONSHIPS PRESENT.

1) AN UNBROKEN LINK BETWEEN THE SLEEPING AND PUBLIC SPACES.
2) A DIRECT LINK BETWEEN THE SLEEPING AND DRESSING SPACES.
3) SERVICE CORE CENTERED WITHIN EACH UNIT.
4) THE INCLUSION OF PRIVACY SPACES ADDITIONAL TO PRIVACY SECTOR.

THE PHYSICAL CENTER OF THE FAMILY UNIT IS THE VERTICAL SERVICES CORE. THIS ALLOWS FOR RADIAL OR BROKEN RADIAL DESIGN IN PLAN AS SHOWN BELOW.



FROM THIS SCHEMATIC I DEVELOPED THE SCHEMATIC (UNIT "B") INCORPORATING TERRACE AND ENTRY. THE ENTRY/ TERRACE UNITS SHOULD SERVE BOTH PRIVATE AND PUBLIC FUNCTIONS



THE PRIVATE SECTOR, AS WAS INDICATED EARLIER, IS TO BE DESIGNED WITH SPECIAL RELATIONSHIPS AND CONDITIONS. THE SLEEPING ROOMS DO NOT PROVIDE CLOSET, STORAGE OR VANITY. IT IS A SLEEPING/MEDITATING/STUDYING/PRIVATE SPACE. THE DRESSING FUNCTIONS WITHIN THE UNIT SEMI-COMMON FOR ALL FAMILY MEMBERS. THIS ALLOWS FOR INDIVIDUAL EXPRESSION IN FURNISHINGS AND PERSONAL PRIVACY SPACE. THE COMMONALITY OF THE BATHING/DRESSING SECTOR IS A DESIGNERS EFFORT TO INFLUENCE ATTITUDE THROUGH IMPLICIT EFFECTS ARCHITECTURE. THE DESIRED EFFECT IS A RE-UNITING OF THE FAMILY UNIT ON A FUNCTIONAL PRIVATE LEVEL, HOPEFULLY, TO STRENGTHEN THE FAMILY UNIT.

CONCLUSION:

THIS THESIS WAS PRIMARILY AN INVESTIGATION INTO SENSITIVITY IN DESIGN.

IT SEEM TO ME THAT A WILLINGNESS TO ACCEPT, OR AT LEAST USE, INFORMATION ABOUT THE USERS IN A DESIGN PROCESS, SENSITIVITY WILL BE APPARENT IN THE PRODUCT

THE DIFFICULT PART OF MY PROJECT WAS THE NARROWING OF VARIABLES. THE BROAD CHARACTERISTICS OF THE DESIGN MADE CONTINUITY WITHIN THE DESIGN IMPOSSIBLE.

APPENDIX "A" :

28 ZONING

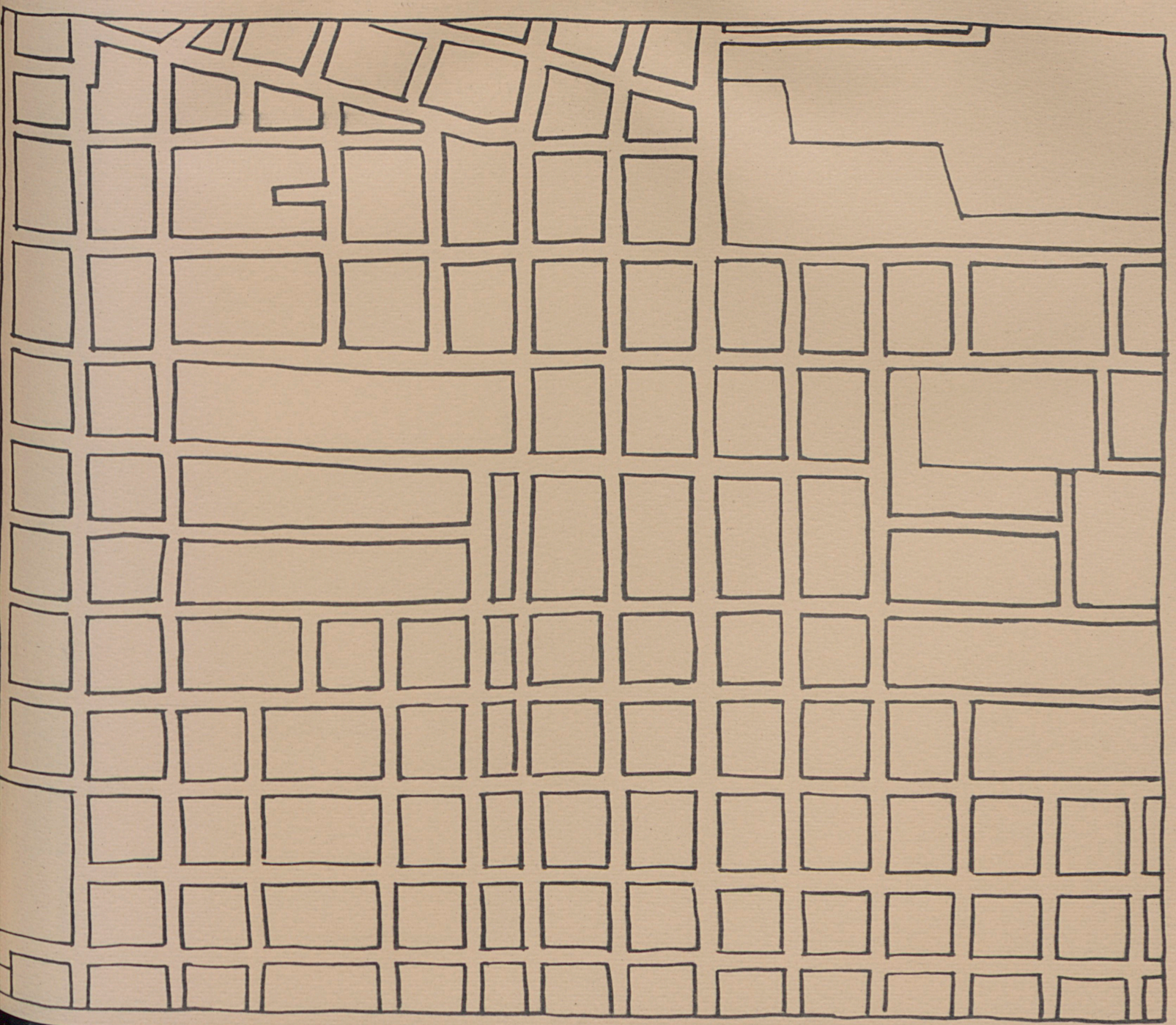
29 HOUSING CONDITION

30 SITE LOCATION

31 SITE IDENTIFICATION

32 VEHICULAR CIRCULATION

STUDY AREA



ZONING

- PL1
- R2
- R4
- R5
- B2
- B3
- M1

NORTH

STUDY AREA

HOUSING CONDITION



>33% SUBSTANDARD

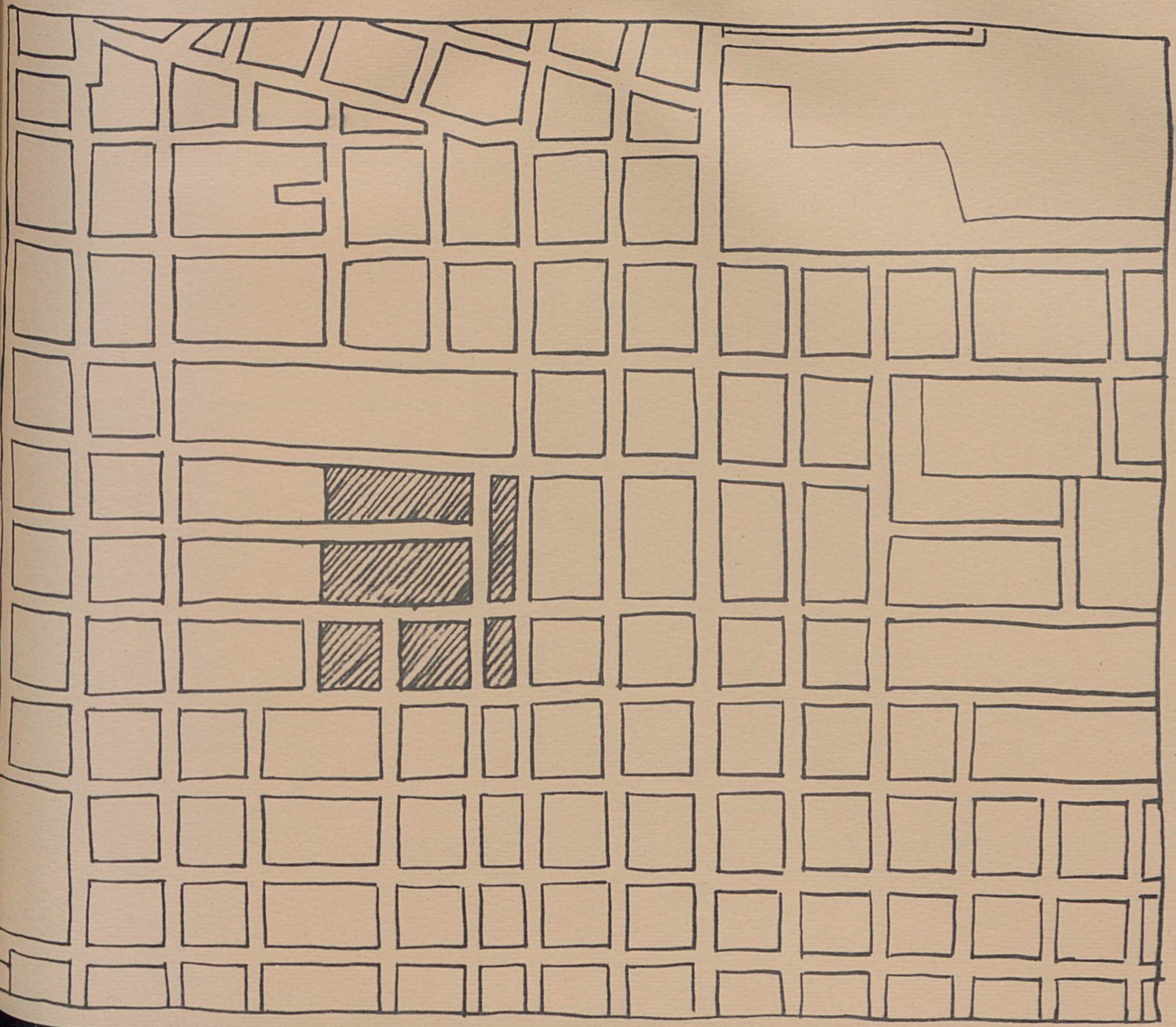
< 33% SUBSTANDARD

< 66% SUBSTANDARD

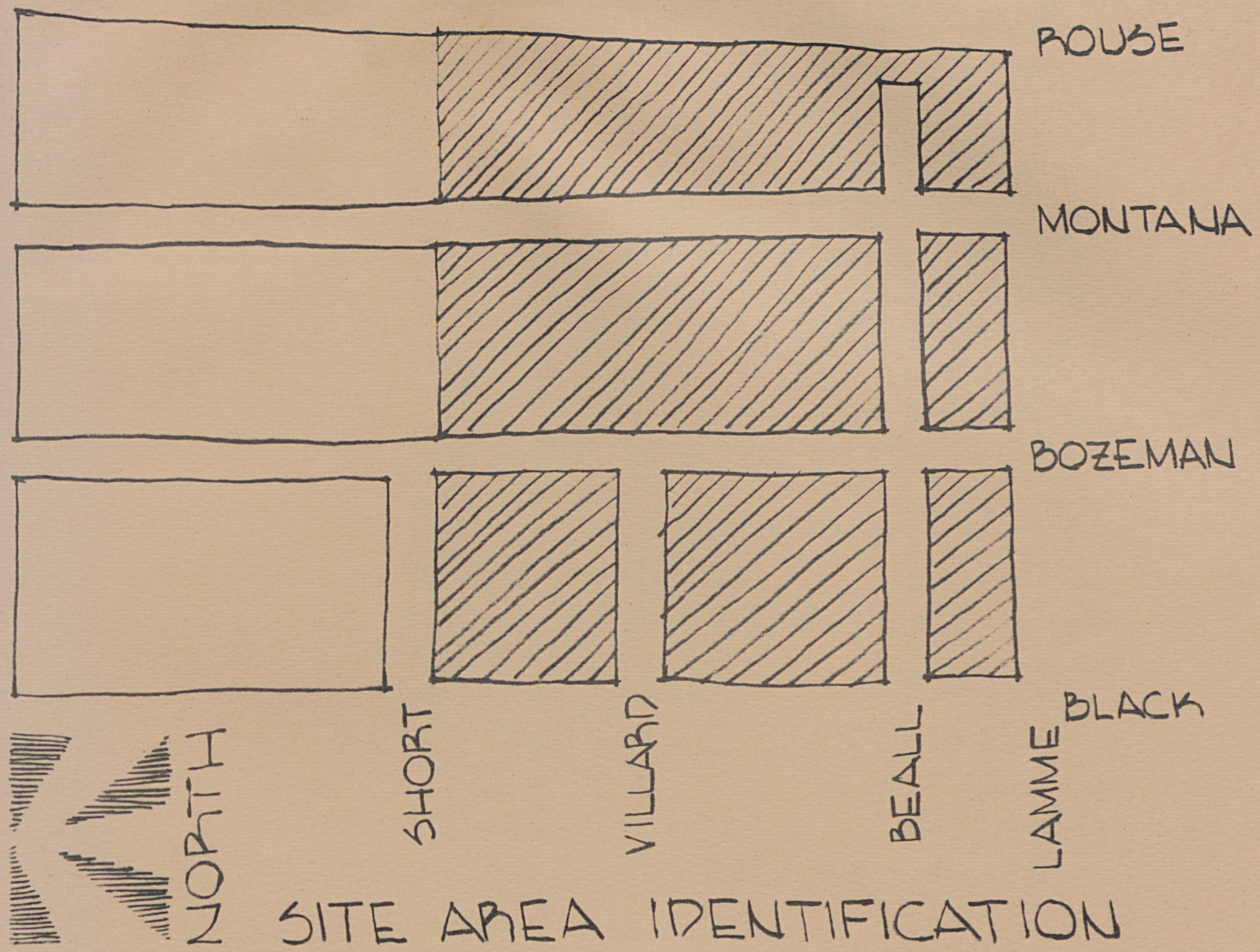
NORTH

STUDY AREA

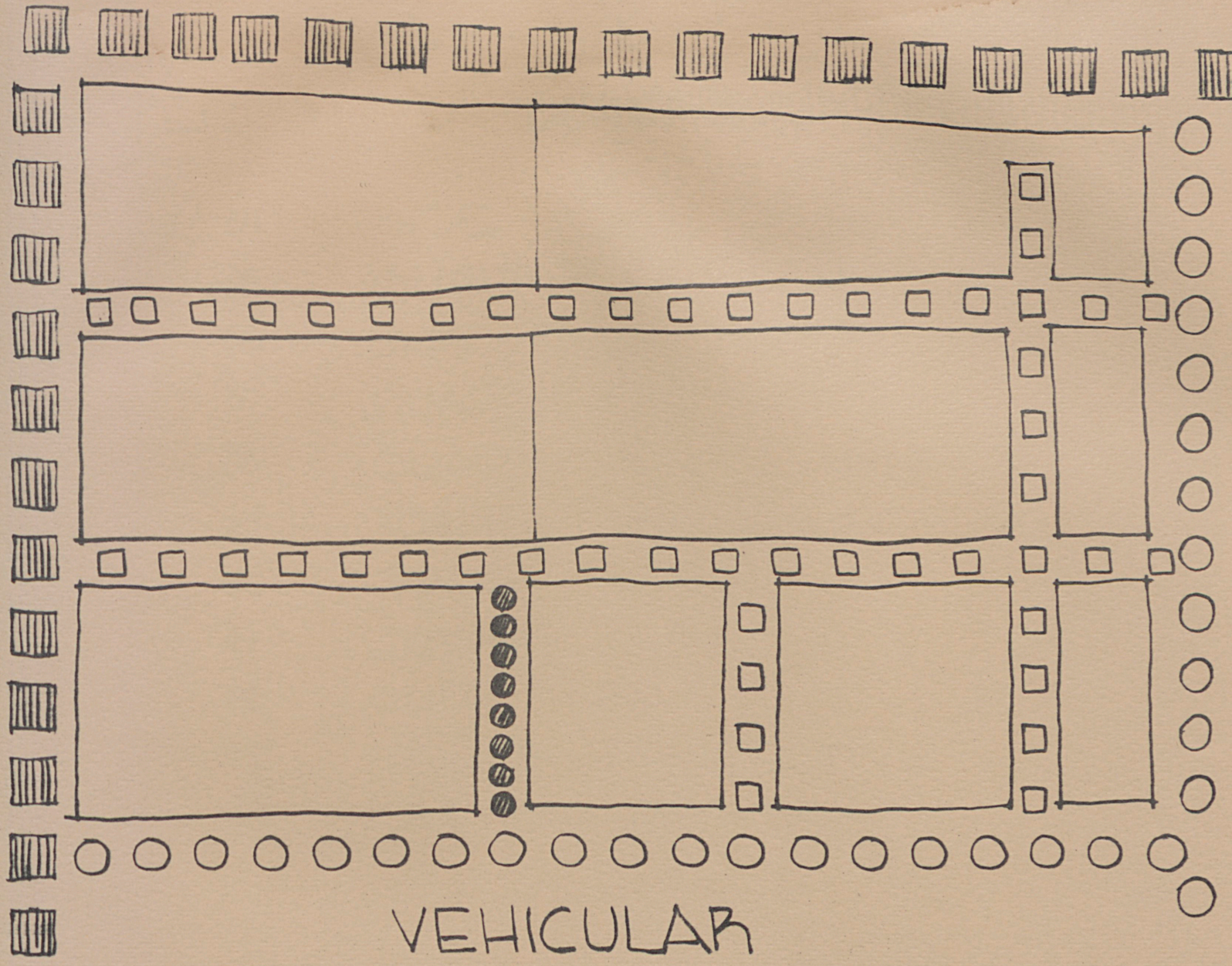
SITE LOCATION







SITE AREA IDENTIFICATION


VEHICULAR
PRIMARY
RANDOM
SECONDARY
LINK

APPENDIX "B"

34 SITE
35 QUADRIPLEX PLAN
36 UNIT PLAN
37 QUADRIPLEX ROOF PLAIN
38 QUADRIPLEX ELEVATION
39 TOWER PARKING
40 TOWER PLAZA
41 TOWER PLAN
42 UNIT PLAN
43 TOWER PERSPECTIVE
44 SECTION DETAILS



BOZEMAN CREEK ESTATES

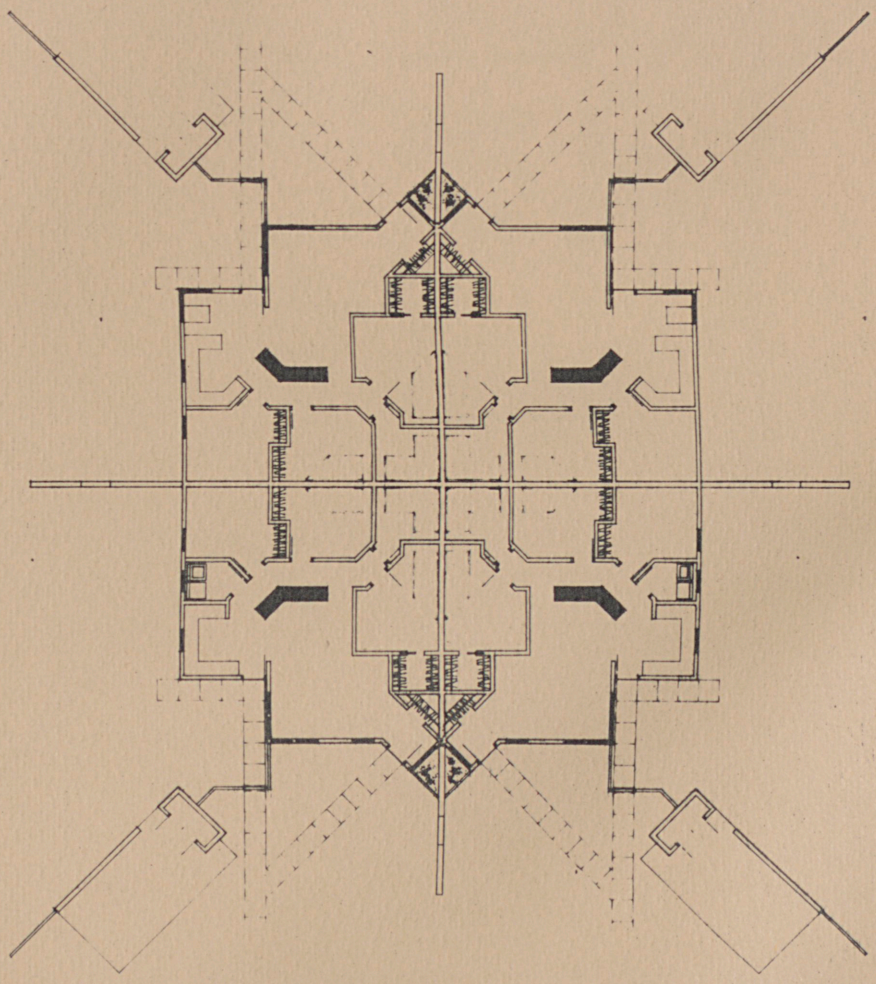
A RESIDENTIAL DEVELOPMENT PLUS

BOZEMAN, MONTANA

SITE PLAN

SCALE: 1:200

NORTH



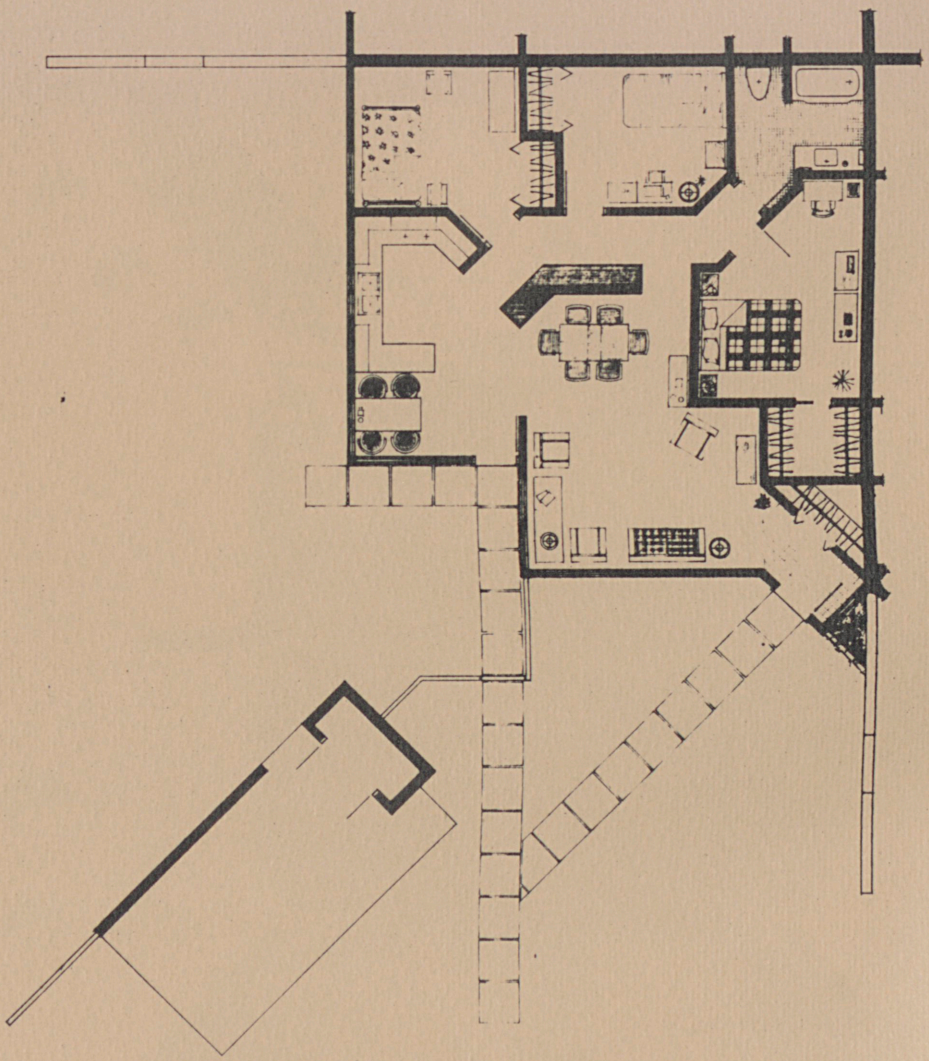
PLAN
QUADRUPLEX
SINGLE LEVEL

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

BOZEMAN CREEK ESTATES

A RESIDENTIAL DEVELOPMENT PLUS

BOZEMAN, MONTANA



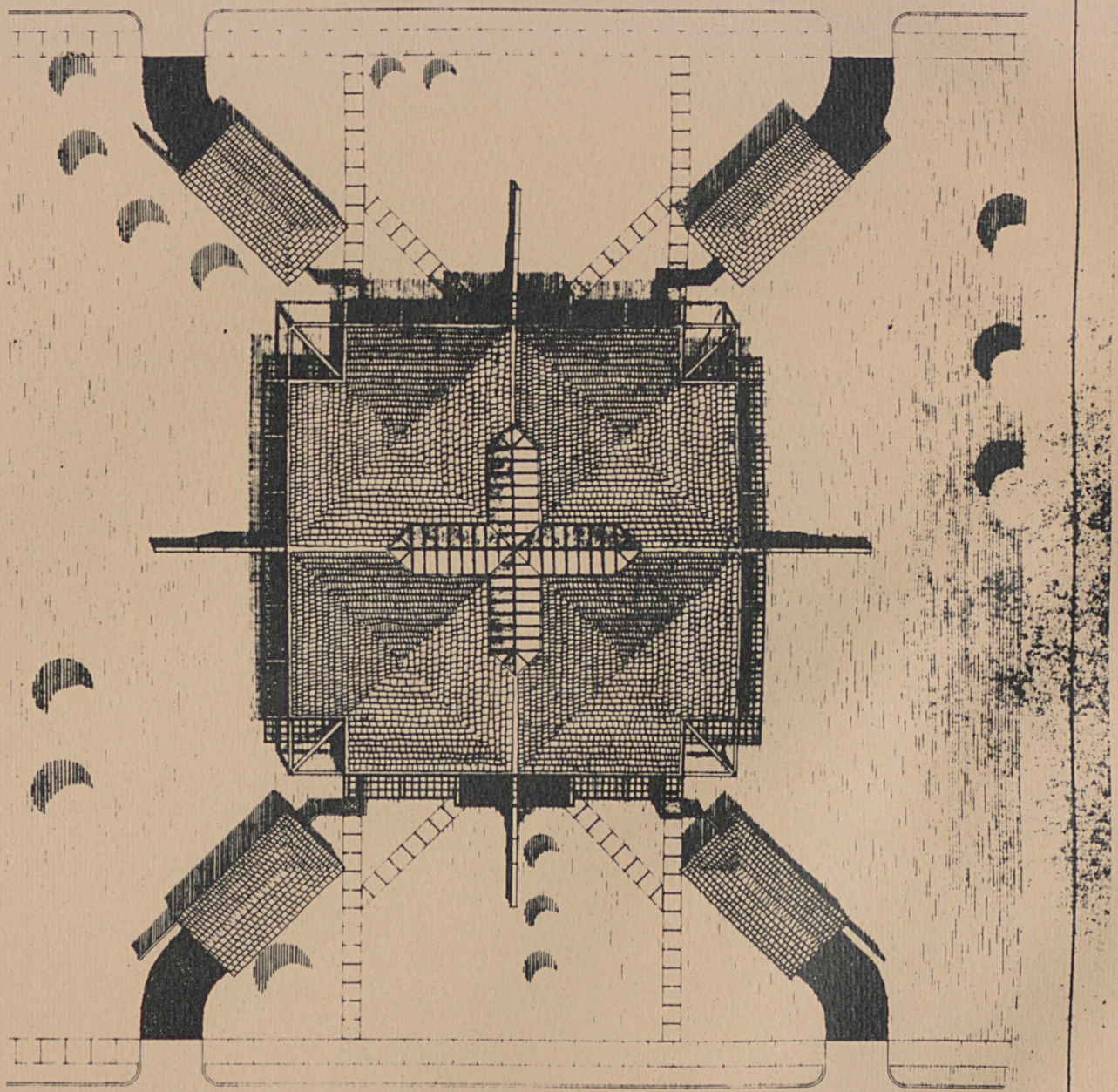
UNIT PLAN 1
QUADRIPLEX
FURNISHED

SCALE: 1/4"=1'-0"
1 0 FEET

BOZEMAN CREEK ESTATES

A RESIDENTIAL DEVELOPMENT PLUS

BOZEMAN, MONTANA



SITE
QUADRAPLEX
ROOF PLAN
SCALE 1/8"=1'-0"
ALL DIMENSIONS ARE IN FEET

BOZEMAN CREEK ESTATES

A RESIDENTIAL DEVELOPMENT PLUS

BOZEMAN, MONTANA

BOZEMAN CREEK ESTATES

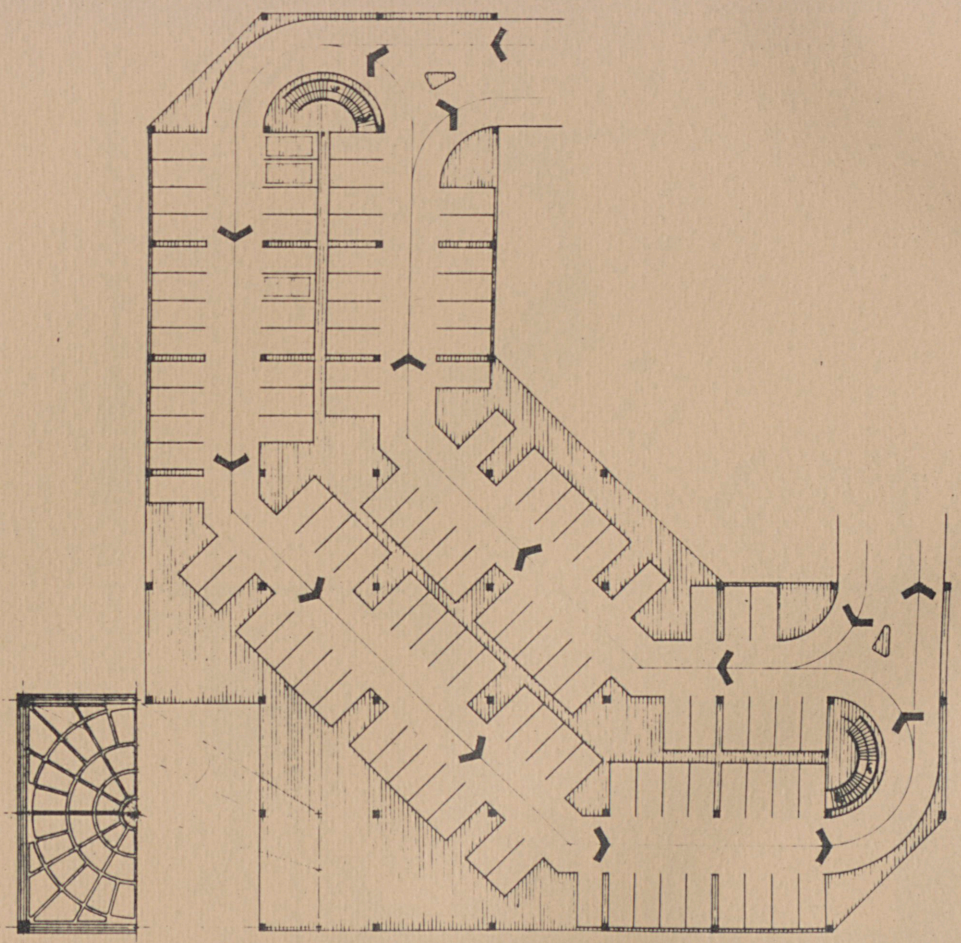
A RESIDENTIAL DEVELOPMENT PLUS

BOZEMAN, MONTANA

ELEVATION
QUADRAPLEX
SECTION

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

FEET



TOWERS
PARKING
6TH LEVEL

SCALE 1"=80'-0"
FEET

BOZEMAN CREEK ESTATES

A RESIDENTIAL DEVELOPMENT PLUS

BOZEMAN, MONTANA

NORTH

NORTH

BOZEMAN CREEK ESTATES

A RESIDENTIAL DEVELOPMENT PLUS

BOZEMAN, MONTANA

TOWERS PLAZA
+8 FT. LEVEL

SCALE: 1/16"=1'-0"
FEET

BOZEMAN CREEK ESTATES

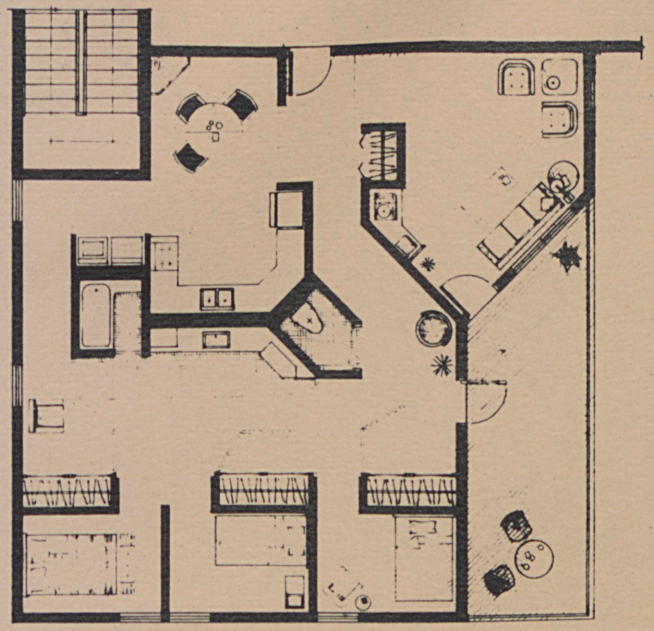
A RESIDENTIAL DEVELOPMENT PLUS

BOZEMAN, MONTANA

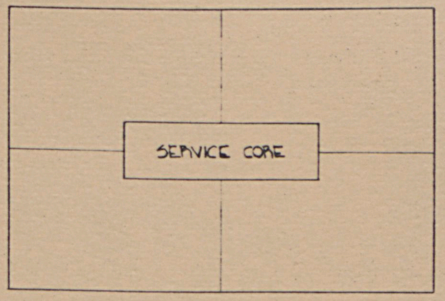
TOWER
PLAN
SCHEMATICS

SCALE 1"=20'-0"

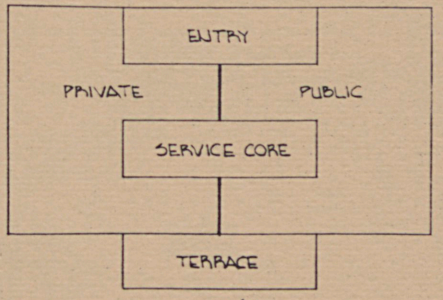
FEET



PLAN



UNIT "A"



UNIT "B"

BOZEMAN CREEK ESTATES

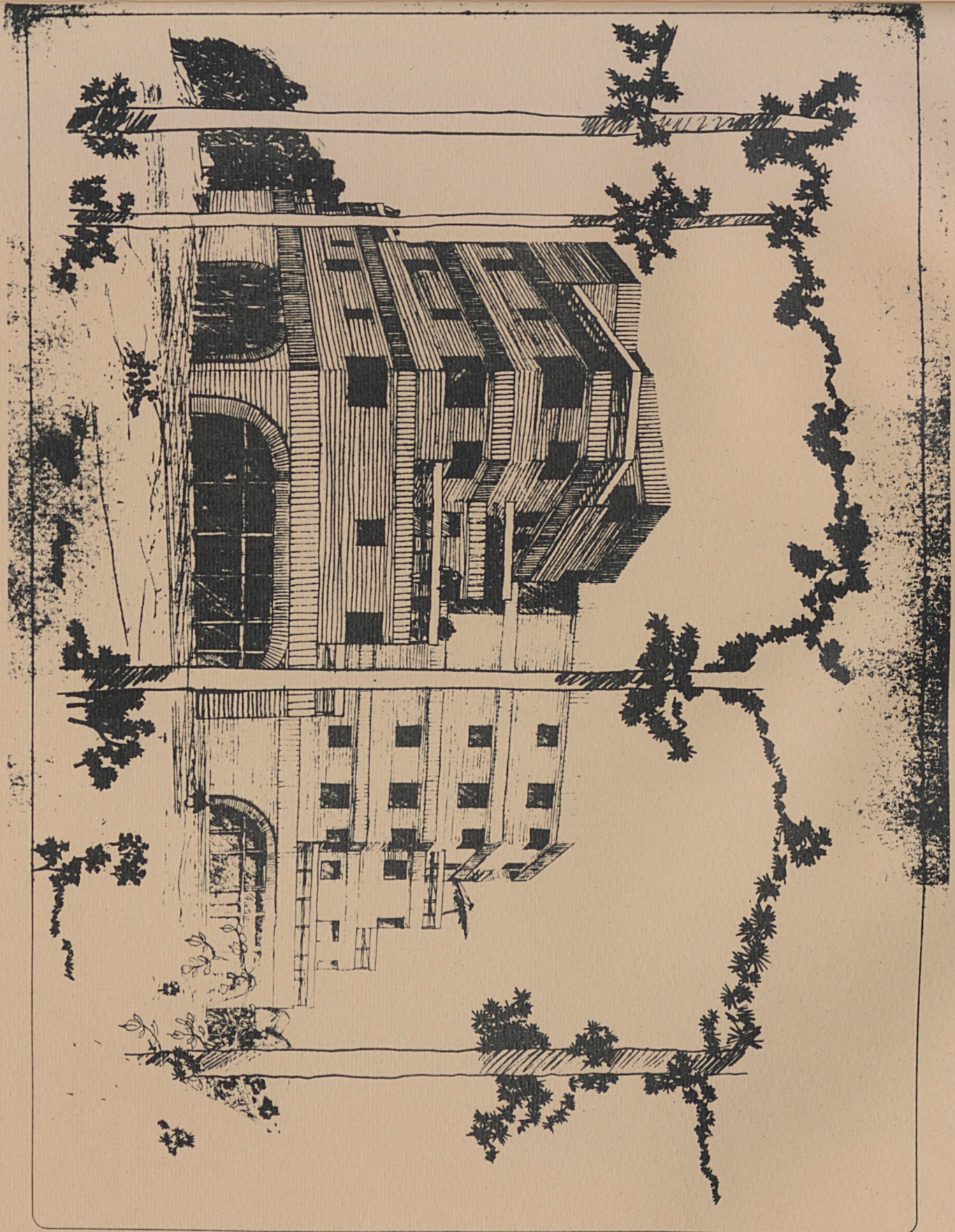
A RESIDENTIAL DEVELOPMENT PLUS

BOZEMAN, MONTANA

PLAN TOWER SCHEMATICS

SCALE 1/4" = 1'-0"

0 4 8 FEET



TOWER PERSPECTIVE

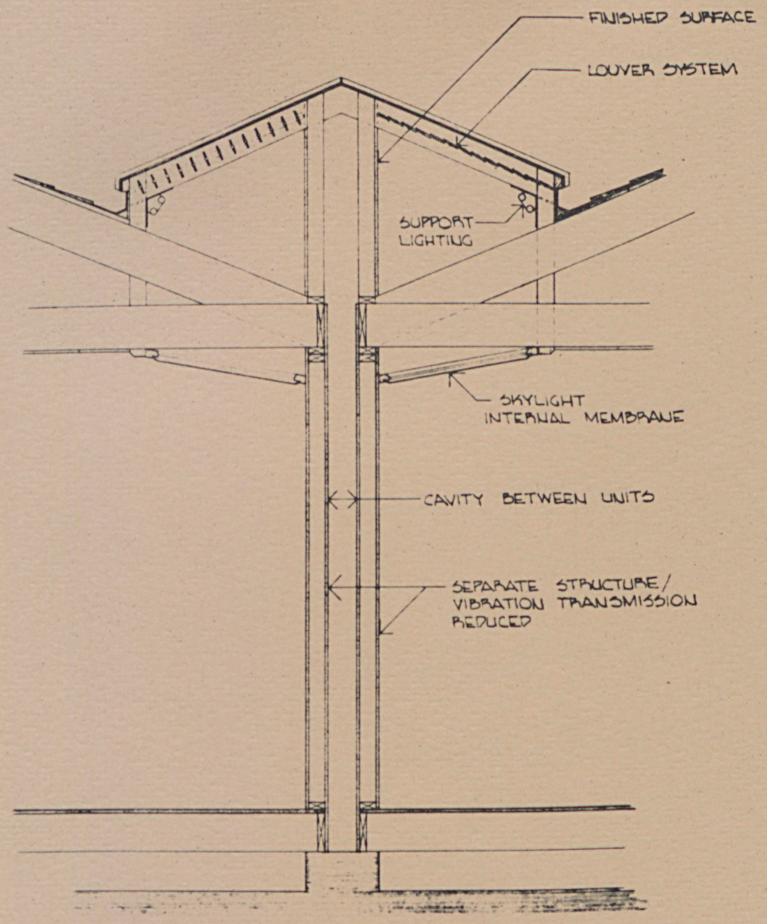
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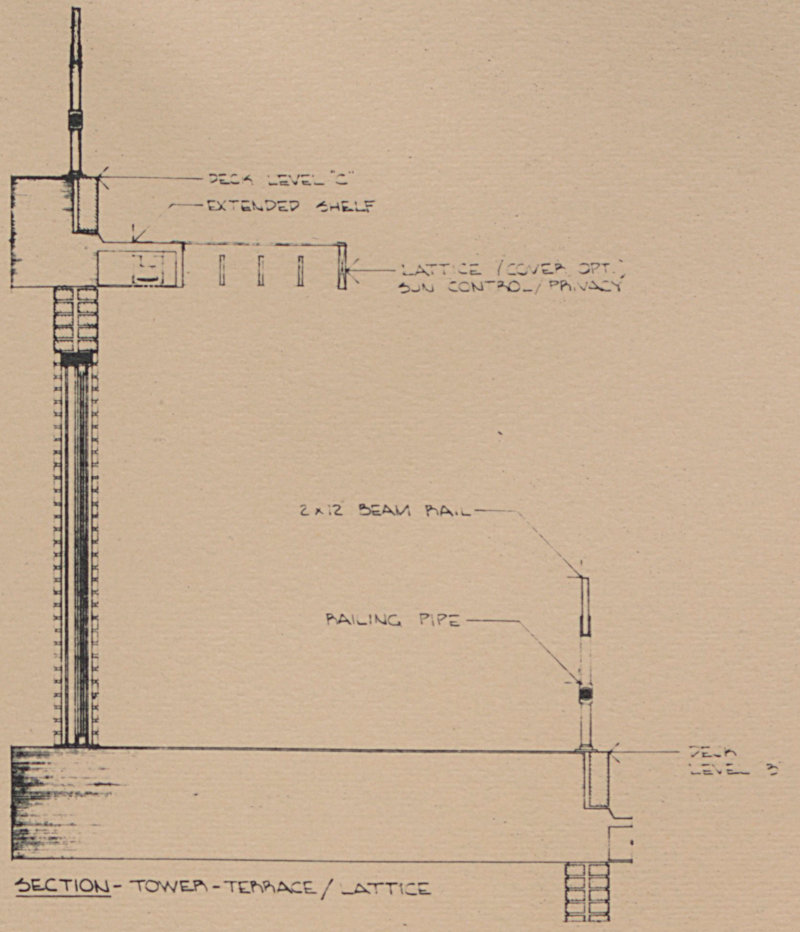
BOZEMAN CREEK ESTATES

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SECTION - QUADRIPLEX - INTERFACE/SKYLIGHT



SECTION - TOWER - TERRACE / LATTICE

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SECTIONS

SCALE: 1/8"

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