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TERMINAL PROJECT [ON SHOPPING
CENTERS]

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Montana State University
BOZEMAN

ACKNOWLEDGEMENTS

TERMINAL PROJECT

by

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TABLE OF CONTENTS

	Page
INTRODUCTION	1
THESIS	4
DESIGN CRITERIA	5
BOZEMAN ANALYSIS	21
SHOPPING CENTER ANALYSIS	26
ORGANIZATION OF SPACE.	35
TRANSPORTATION	42
ENERGY CONSERVATION	43
SITE	52
CLIMATOLOGY	54
DESIGN PROCESS	
Criteria to Form	56
Structure	59
Mall	60
Landscape	62
CONCLUSIONS	63
BIBLIOGRAPHY	64

INTRODUCTION

the gym is practically unusable due to excessive glare).

In other cases, man has not yet developed a means to occur-

I am aware that architecture is not the panacea for the world problems, but, in order to evaluate architecture we must establish the ultimate role of the architect. It is my contention that the primary function of architecture is to satisfy the technological, physiological, sociological and psychological needs of the user, owner and the community. To fulfill these needs the architect becomes the assemblage of the pertinent arts and sciences in the design process. The arts and sciences which I consider essential are: programming, psychology, sociology, physiology, masterplanning, drawing, sculpture, soil analysis, engineering, building technology, product analysis, law, accounting, speech and research.

Without an adequate knowledge of these components, one's design will lack a portion of the total design process which I consider necessary for "good architecture." We may or may not be aware of deficiencies due to missing design components. In some cases the overall design solution may overshadow relatively minor omissions and mistakes (e.g., IIT has been proclaimed by many as being great architecture; however, the architecture department at IIT found it necessary to tape cardboard over the windows to block out the solar heat.

The gym is practically unuseable due to excessive glare). In other cases, man has not yet developed a means to accurately measure the end results of design decisions (e.g., the effects of ceiling heights and room sizes on social patterns). Whatever evaluation is done is generally subjective rather than objective.

It is because no one man can be expected to be proficient in all the required arts and sciences that I have termed the architect an assembler. He may work as a unit in a design team or draw upon the expertise of other professionals. Nevertheless, the architect's job is to compile the available data which is integrated with his creative ability to develop a unified design.

In conjunction with my primary design philosophy I will concede to a secondary philosophy which I consider the theses of architecture. The thesis is therefore seldom more than a statement of intent assumed as a premise for designing (e.g., "less is more", "less is not more", or the desire to contrast the old with the new). Generally speaking, I consider these irrelevant in the evaluation of architecture, but quite frequently they are instrumental in the design process.

During the assembly process we are often confronted with conflicting data without an imperical means of resolving the problem. There are also subject areas without sufficient

THESIS

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data necessary for making an objective decision. At this point it seems reasonable that a statement of intent becomes the basis for subjective decision making. Intuitive design then becomes a means of making subjective decisions in lieu of objective facts.

Our economic structure has given the average citizen more leisure time than ever known before. Due primarily to an energy crisis our mobility is temporarily being impacted. Therefore, we are passing from a period of mobility into an era which will demand an increased social awareness. Never before has one man's actions been felt so hard by so many. Increased crowding has forced man to live on top of one another, to man has withdrawn into a cocoon. Our modern technology has, for the past ten years, made man basically independent of the community. It is more imperative now than ever before that we learn to live in harmony with our fellow man and the environment.

Physical form can encourage social interaction which is imperative to social awareness.

PROJECT AREA

Shopping center, Bozeman, Montana

THESIS

CRITERIA

The American society is presently in a state of rapid flux. The desire to conquer the West is a thing of the past. Our economic structure has given the average citizen more leisure time than ever known before. Due primarily to an energy crisis our mobility is temporarily being impeded. Therefore, we are passing from a period of mobility into an era which will demand an increased social awareness. Never before has one man's actions been felt so hard by so many. Increased crowdedness has forced men to live on top of one another, so man has withdrawn into a cocoon. Our modern technology has, for the past ten years, made man basically independent of the community. It is more imperative now than ever before that we learn to live in harmony with our fellow man and the environment.

THESIS

Physical form can encourage social interaction which is imperative to social awareness.

SUBJECT AREA

Shopping center, Bozeman, Montana

DESIGN CRITERIA

The initial stage of this design project will consist of an analysis of the requirements of the client. In many instances, particularly buildings which deal with the public, the client becomes three distinct groups: the owner, the user, and the community. It will become apparent during the breakdown of the needs of the clients that some requirements will be common to several groups. The basic needs of which will be discussed are the technological, physiological, sociological, and psychological needs of the client.

Of these, the technological and the physiological needs are the easiest to pinpoint and evaluate. The technological needs are those which are necessary for the physical construction and the financial continuation of the complex. The physiological needs deal with the basic human requirements necessary for physical comfort.

The psychological and sociological needs are somewhat more difficult to evaluate because they are difficult to qualify. Sociological needs are those which are related to the part one plays within our society. Psychological needs on the other hand, pertain to one's own feelings, desires and behavior. Though these needs are common to most homo sapiens, their degree of pertinence to any individual can not be

readily determined. It becomes further complicated, due to the changing hierarchy of needs within each individual. The resolution of these conflicts are not within the scope of this project but indicate the generalizations being made. In these cases, subjective decisions based on an architectural thesis become the architect's tool for resolving such problems.

Environmental needs consist of the factors which permit man to live in harmony with nature. In the past, the designer has been aware of the many environmental factors which are impinged upon by their designs. It has been man's way to allow his knowledge of technology to conquer these environmental considerations. Only in this decade have we become aware of the acute problems this creates and the necessity that man live in harmony with nature.

Since most architects do not have the expertise in all of the above needs it is time for them to assemble data from the specific fields. For my terminal project I will rely primarily on my own intuitive knowledge of technology and man's relation with nature to assist me in the analysis of the technological and environmental needs. As a consultant for man's psychological and sociological needs, I will depend heavily on Peggy Petterson's synopsis of writings on the subject.

Technological Needs	compliance with city ordinances compliance with uniform primary code compliance with construction budget durability infrequent maintenance harmonious interaction with nature
Physiological Needs	food and water human waste elimination harm avoidance thermal comfort
Sociological Needs	affiliation nurturance succorance
Psychological Needs	security order frame of orientation solitude autonomy identity exhibition dominance infavoidance defence counteraction achievement prestige aggression rejection abasement deference play variety enrichment understanding meaningfulness in life self actualization aesthetic

TECHNOLOGICAL NEEDS

1. Need: Compliance with city ordinances (as pecified by Bozeman, MT, District B3).

Description: Specific rules are set up by the city to protect its citizens in the areas of health, safety and welfare.

Design Implications:

1. minimum lot area--no restrictions
2. minimum lot width--no restrictions
3. lot coverage--entire lot exclusive of required yards and parking
4. floor area--no restrictions
5. minimum front yard--no restrictions
6. minimum side yard--no restrictions
7. minimum rear yard--no restrictions
8. minimum parking requirements

Use	Parking spaces / 1000
Department & clothing stores	2.5
Furniture stores	1.0
General Business	
Grocery, Drugstore, Sporting goods, Hardware, variety	3.6
General Business	1.5
Bakery, Paint stores, Upholstery, mail order houses	
Offices, Banks, Utility companies	4.5
Barber, Beauth shops	
Public eating and drinking establish-ments	8.0
Theaters	35.0

2. Need: Compliance with uniform primary code.

Description: Specific codes are set up by a national board to set a basic standard for the health, safety, and welfare of the people of any city or state which adopt the code.

Design Implications: Refer to the 1973 edition of the Uniform Building Code, Group F Occupancy.

3. Need: Compliance with construction budget

Description: Most people interested in the development of a piece of property specify a budget which is primarily based on the rentable value of the shops.

Design Implications: Consider all materials and construction methods available to reduce costs: concrete block, precast concrete, panels, open web steel joists, generalizing mechanical facilities.

4. Need: Durability

Description: The life span along with the rentable value of the complex are factors in the determination of the initial investment. It might be profitable to invest an additional 25% if the complex will last twice as long.

Design Implications: Durable or easily replaceable materials should be used where excessive wear can be expected.

5. Need: Infrequent maintenance

Description: A large portion of one's income can be eaten up by high maintenance and replacement of broken articles. It may be cheaper in the long run to install more maintenance-free but more expensive components.

Design Implications: Brick veneer becomes competitive because of low maintenance.

6. Need: Harmonious interaction with nature

Description: A balance between the man-made, man-controlled and the natural order in nature.

Design Implications: Today, more than ever before, we must regulate the degree of man's impingement on nature. We must also find a more efficient means of consuming those natural resources which we need.

PHYSIOLOGICAL NEEDS

1. Need: Food and water

Description: This is one of the basic human needs for which there is a daily minimum requirement.

Design Implications: Alloting space for eating and drinking facilities (breakfast, lunch, dinner and/or bar). Facilities should be included to supply food at the time of the day which the complex will be in use. Eating facilities may also be a drawing card to create evening activity. Negative aspects of eating facilities could be that eating facilities would create a crowded complex at a time when it is primarily used for shopping.

2. Need: Human waste elimination

Description: Men and women need to urinate and excrete solid wastes.

Design Implications: The complex should have one lavatory for every people; one toilet for people. Toilet rooms should be located close to eating and drinking facilities. Toilets should be easy to locate and easily accessible.

3. Need: Harm avoidance

Description: This need is really a self-protecting device; it implies avoiding pain, physical injury, escaping a dangerous situation, and taking precautionary measures. Freud believed that all human behavior was determined by the principle of avoiding pain and seeking pleasure.

Design Implications: Separation of man and motor. Definitive changes of level. On the other hand, the fact that man needs to avoid harm may indicate that he will take care of himself and that it is not necessary to remove all dangers, often tending to make a sterile environment.

4. Need: Thermal Comfort

Description: There is a biological temperature zone which various groups have become adjusted to. This zone varies depending on the race and region we discuss.

Design Implications: It has become common to control the heating and cooling of spaces mechanically. We should become more aware of methods of regulating the thermal comfort zone by taking advantage of natural environmental conditions (wind, rain, snow, sun angle, humidity, etc.).

SOCIOLOGICAL NEEDS

1. Affiliation

Description: This category includes the need for vying with others--a desire to please and win affection, to remain loyal to a friend, to enjoyably cooperate or reciprocate with another who resembles or likes the subject. Affiliation has been related to many things, even anxiety seems to diminish as affiliation increases.

Design Implications: Convenient indoor and outdoor gathering places. Loitering must be encouraged. Spots where one can watch things happening without having to participate himself. Human and non-human activity--an active space.

2. Need: Nurturance

Description: These terms encompass the needs to give sympathy and gratify the needs of a helpless object, to assist an object in danger, to feed, help, support, console, protect, comfort, nurse and heal. In short, the need to feel that one is needed and wanted by another human being or by society.

Design Implications: People need to be accessible to one another; therefore, boundaries should not be distinct and complete privacy is undesirable. This and the affiliation need might be put to good use and gratified by letting individuals participate meaningfully in the design and construction of facilities for themselves and others. Such activities might consist of the elderly assisting with a child care center within the complex; or design and construction of a designated space.

3. Need: Succorance

Description: This is the opposite of nurturance. It is the need to have one's needs gratified by the sympathetic aid of an allied object, to be nursed, supported, sustained, surrounded, protected, loved, advised, guided, indulged, forgiven, consoled, to remain close to a devoted protector, to always have a supporter.

Design Implications: People need to be accessible as for nurturance. Warm, accepting, cozy, and supporting environment. Small, intimate spaces, enclosed and sheltered.

PSYCHOLOGICAL NEEDS

1. Need: Security

Description: This is a desire to be free from fear, anxiety or care, risk or danger.

Design Implications: Paths and routes well defined and marked. Stability sequences discernible, allowing choice and assurance. Intended meaning and use of space well defined. Use of colored duct work to direct traffic flow.

2. Need: Order

Description: A need to put things in order, to achieve cleanliness, arrangement, organization, balance, neatness, tidiness and precision.

Design Implications: Unity to surroundings; harmonious relationship of parts. On the other hand, the environment should not be rigid so that the individual may take the opportunity to give it order as he sees fit.

3. Need: Frame of Orientation

Description: This category includes many related ideas, Man needs a consistent and stable way of perceiving and comprehending the world; he needs to feel he belongs to the world and is a part of it. The mature man needs a philosophy of life as a unifying force and orientation.

Design Implications: Stable permanent landmarks that give bearing, consistency, and a sense of form and place. Stable and distinctive features that mark the place and set it off from others. A meaningful terminus. Understructure that is discernible and stands out.

4. Need: Solitude

Description: This is the complement of the need for affiliation; people need to have some time alone.

Design Implications: Maximal audio and visual privacy. Intimacy, detained, almost abstract interest, elements with enclosure and shelter.

5. Need: Autonomy

Description: This is a need to get free, shake off restraint, break out of confinement; to resist coercion and restriction; to avoid or quit activities prescribed by domineering authorities; to be independent and free to act according to impulse; to be unattached, irresponsible; to defy convention; to determine one's own behavior.

Design Implications: Many choices available. Many types of experiences to choose from. As few restrictions as possible. Those that are necessary should be explicit and reasonable.

6. Need: Identity

Description: Each individual needs to know who he is and recognize himself as a human being distinct from others and his surroundings. He needs to be unique. Identity formation is a continuous process; however, adolescence is a particularly important stage in its formation.

Design Implications: Areas and objects that can be personalized through decoration and personally added features. Areas and objects that can be, implicitly or explicitly known as belonging to, or part of someone. Variety of distinguishing features in the environment.

Adolescents may relate to a high activity level, with loud music and eating areas. They need larger gathering spaces than older groups. College students relate to the high activity level but congregate around bars. The elderly need a much lower activity level and relate to gardens and private visual activity.

7. Need: Exhibition

Description: A need to make an impression; to be seen and heard; to excite, amaze, fascinate, entertain, shock, intrigue, amuse or entice others. To assert one's self.

Design Implications: Speaker's platform, forums, plazas, circulation focal points. Informal gathering places.

8. Need: Dominance

Description: These terms indicate a need to control one's environment; to influence or direct the behavior of others by suggestion, seduction, persuasion or command; to dissuade, restrain or prohibit. A desire to be superior, to dominate.

Design Implications: Ability to manipulate and dominate and environment. Environment must not be so rigid that the individual feels powerless and can do nothing to change it.

9. Need: Infavoidance

Description: This is a rather passive solution to the problem of humiliation. It is a need to avoid humiliation; to quit embarrassing situations or to avoid conditions which may lead to belittlement: the scorn, derision, or indifference of others; to refrain from action because of the fear of failure.

Design Implications: Environment should not include horribly empty spaces, features that cannot be related to because of inappropriate "extrahuman" scale, or areas that are "indifferent" (areas that lack warmth and human detail).

10. Need: Defenceance

Description: Here we have a more active defense of the self against assault, criticism, and blame; a need to conceal or justify a misdeed, failure, or humiliation; to vindicate the ego.

Design Implications: Assertive features--masculine, firm, enduring. Strong form and line qualities. Sculptural or architectural landmarks through which people can reassure themselves.

11. Need: Counteraction

Description: This is an active striving to obliterate a humiliation by resumed action; to master or make up for a failure by re-striving. It includes a need to overcome weakness, to repress fear; to efface a dishonor by action; to search for obstacles and difficulties to overcome; to maintain self respect and pride on a high level.

Design Implications: Jagged, rockh, wild features which invite action and involvement. Provision of obstacles to overcome. Provision of opportunities to develop skills. Challenges to physical and mental powers.

12. Need: Achievement

Description: This is a need to accomplish something difficult; to master, manipulate, or organize physical objects, human beings, or ideas, and to do this as

rapidly as possible, to overcome obstacles and attain a high standard; to excell oneself; to rival and surpass others; to increase self regard by the successful exercise of talent.

Design Implication: Elements that are flexible and invite manipulation. Challenging elements. Competitive areas and activities.

13. Need: Prestige

Description: This is the positive side of the humiliation coin. People need to have the respect of others and themselves; recognition.

Design Implications: Personalized elements and areas. Prestigious elements.

14. Need: Aggression

Description: This is a need that people often deny and repress. It is the need to overcome opposition forcefully; to fight, to revenge an injury, to attack, injure or kill another, to oppose forcefully or punish another.

Design Implications: Opportunity for active sports. Areas where "anything goes" (throw, kick, hit, yell, jump, run). Opportunities for throwing and hitting.

15. Need: Rejection

Description: This is a need to separate oneself from a disliked object; to exclude, abandon, expel, or remain indifferent to an inferior object, to snub or jilt an object. In short, it is the need to be able to show disapproval.

Design Implications: Choices so one can avoid or reject certain areas or objects. Objects that can be thrown

away or destroyed. Areas, such as sign boards, where rejection can be expressed for the whole world to see.

16. Need: Abasement

Description: These terms encompass the need to submit passively to external forces; to accept injury, blame, criticism, punishment; to surrender; to become resigned to fate; to admit inferiority, error, wrongdoing, or defeat; to confess and atone; to blame, belittle or mutilate the self; to seek and enjoy pain, punishment, illness, and misfortune.

Design Implications: Windy, cold, exposed environments. Rough ground surfaces, rugged terrain. Environments that force submission to them; inability to change or improve them.

17. Need: Deference

Description: People have a need to admire and support a superior, to give praise, to honor, to eulogize, to yield to the influence of an allied other, to emulate an exemplar, and to conform to custom. This is a complement of autonomy and aids the prestige of others.

Design Implications: Awe inspiring design. Speakers' platforms and areas. Areas for honorary monuments and memorials.

18. Need: Play

Description: This is a complex need that is just beginning to be understood. It is a need to act for "fun" without further purpose; to like to laugh and make jokes; to seek enjoyable relaxation of stress; to participate in games, sports, dancing, drinking parties, cards, etc. More will be said about this in a later paragraph.

Design Implications: Social places as well as places with solitude and silence. Spaces and areas that are goals in themselves--not leading to something else. Variety and "open-ended" situations that stimulate improved awareness of the environment.

19. Need: Variety

Description: People need change in their life and their environment. D. O Hebb's experiments at McGill University show that variety is not only the spice of life, but its sustaining force; within a very short time subjects went literally "out of their minds" when they were deprived of all sensory stimulation. People need to seek and enjoy sensuous impressions.

Design Implications: Maximum definition of surfaces, planes, joints, and differentiation of areas. Changing and varied environment. Maximum stimulation of all of the senses--visual, auditory, tactile, and olfactory. Maximum use of color, texture, shapes, sounds, smells, and spaces. Varied use of land, plants, wind, water, and building materials.

20. Need: Understanding

Description: This need can be thought of as a thirst for knowledge--a need to ask or answer general questions; to speculate, formulate, analyze, and generalize.

Design Implications: Features that give a "sense of place" and a feeling of establishment and endurance. Elements which exhibit improvement--such as being able to see the growth of plants.

21. Need: Self Actualization, Self Realization

Description: These terms refer to man's need to realize his full potential as a human being--to rise above his animal nature and become a creative person.

Design Implications: Personalized areas and objects. Free choice. Elements that seem to ask as well as be; that are challenging to imagination, mind, and spirit.

22. Need: Aesthetic

Description: According to Maslow this is the highest of all human needs--the desire for beauty.

Design Implications: Areas and objects that inspire, impress, intrigue, invite contemplation; that are lively, fresh, or even unpleasant, but which inspire aesthetic appreciation.

BOZEMAN ANALYSIS

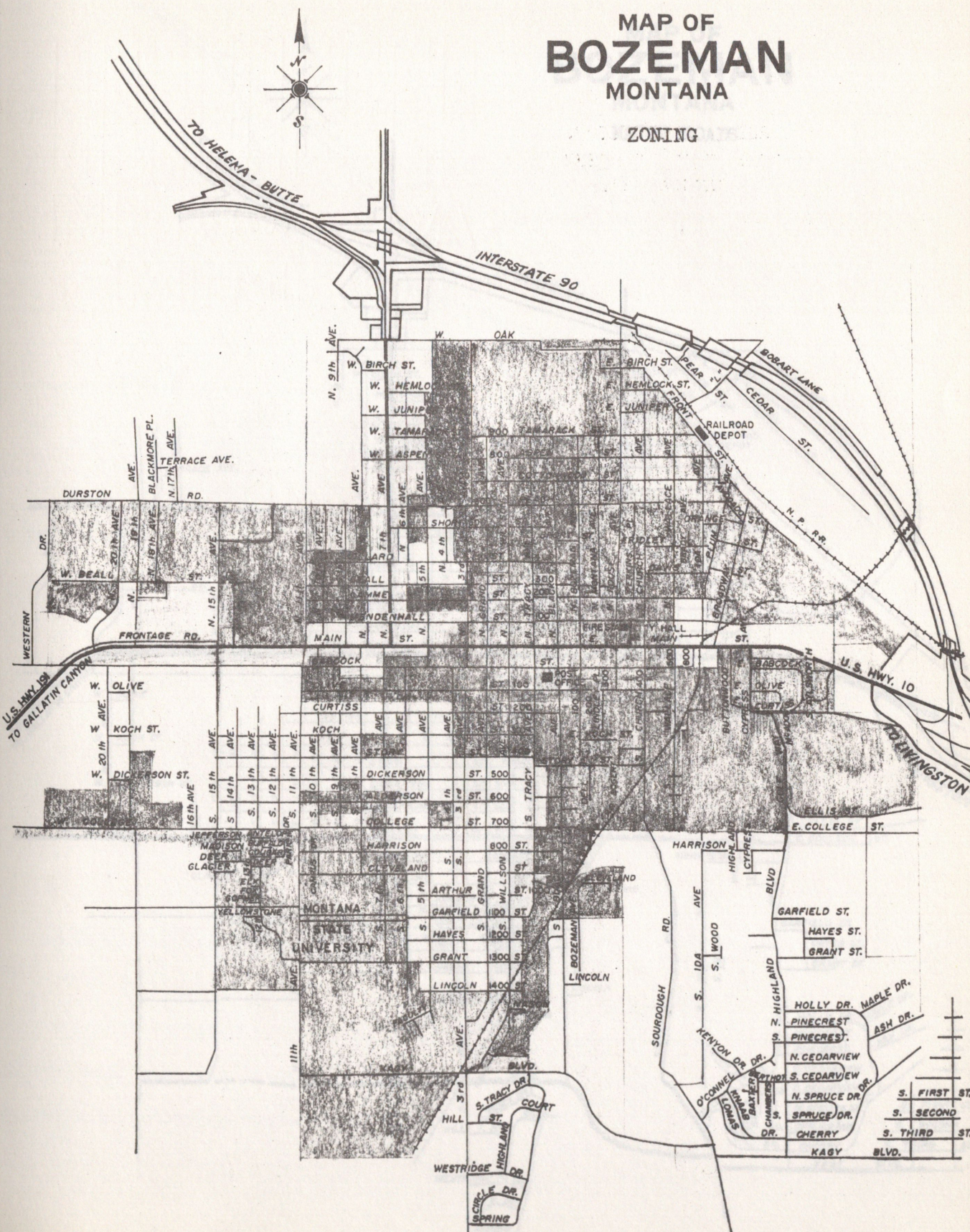
Forecasting ahead, it can be assumed that the plan to develop the Central Business District will be completed by 1980. This action will persuade other commercial nodes to re-examine their own facilities in regard to creating a more pleasurable shopping experience. This may be due to losing business to better designed commercial centers or it may come about in the process of enlarging and remodeling the center.

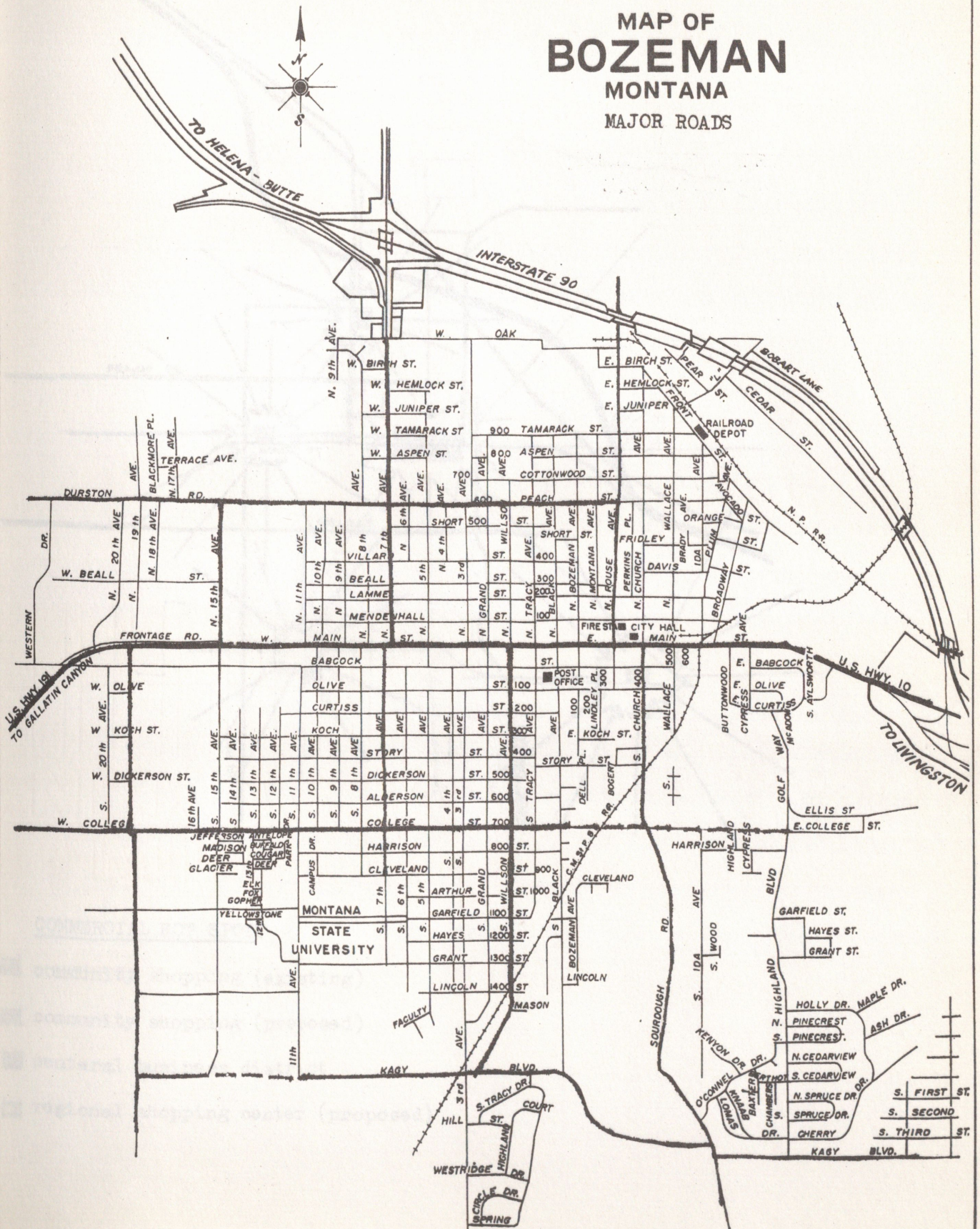
It would seem in the best interest of the Bozeman community to develop a dense city core. This would tend to curtail urban sprawl and preserve large portions of the surrounding area's rich farmland. It is obvious, if we are going to discourage massive urbanism, that the city core will have to satisfy the residents' needs to a degree that it is unfeasible for a developer to put up a shopping center right outside the city limits. Any new center would immediately encourage more developing and perpetuate urban sprawl.

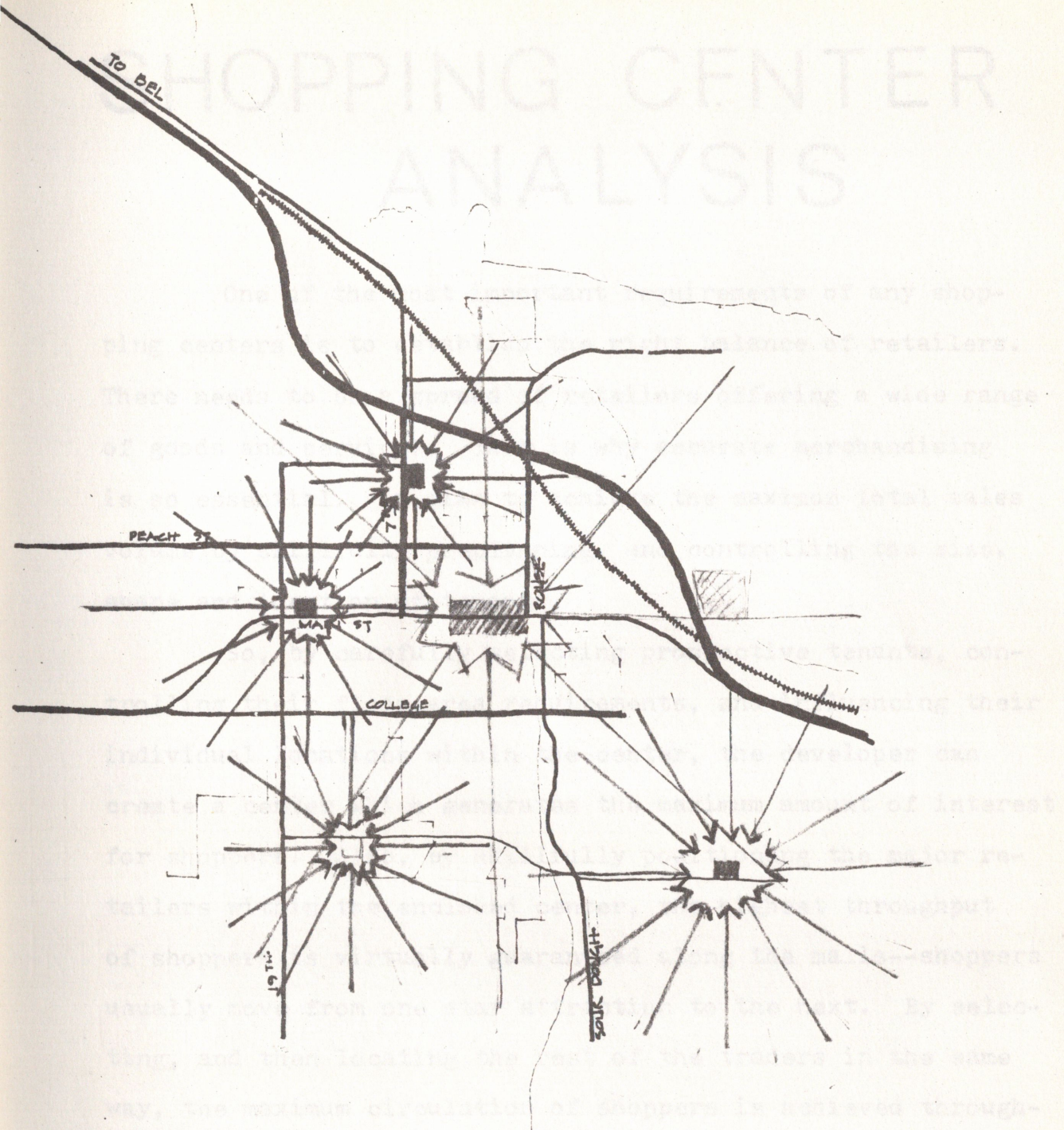
This plan is not the solution in itself. In conjunction, measures would have to be investigated as how to preserve fertile land for farming. A present method of doing this is by setting the tax base for good farm land at a minimal figure. The tax on developed farmland should then be extremely high to discourage this form of development.

In order to fulfill the physical needs of a population of 30,000 in 1990, Bozeman will have to concentrate its facilities. Attempting to be practical, I have assumed that present centers will be enlarged or re-developed. In all cases but one (Map 3) proposed commercial concentrations are on a site of an existing form of shopping. The one exception is a facility located in a rapidly developing residential area south-east of town. The concept is to create centers which will persuade a high concentration of residential living. This in conjunction with the development of a comprehensive master plan should assist in curtailing the devastation of farmlands. I have chosen the location of the existing Buttrey's for the ideal location of an expanded center. It is on the corner of a major and secondary road and is easily accessible. By placing a major node of shopping at the west end of Main I contend that this will deter the further continuation of the strip developments.

ZONING







COMMERCIAL HOT SPOTS

-  community shopping (existing)
-  community shopping (proposed)
-  central business district
-  regional shopping center (proposed)

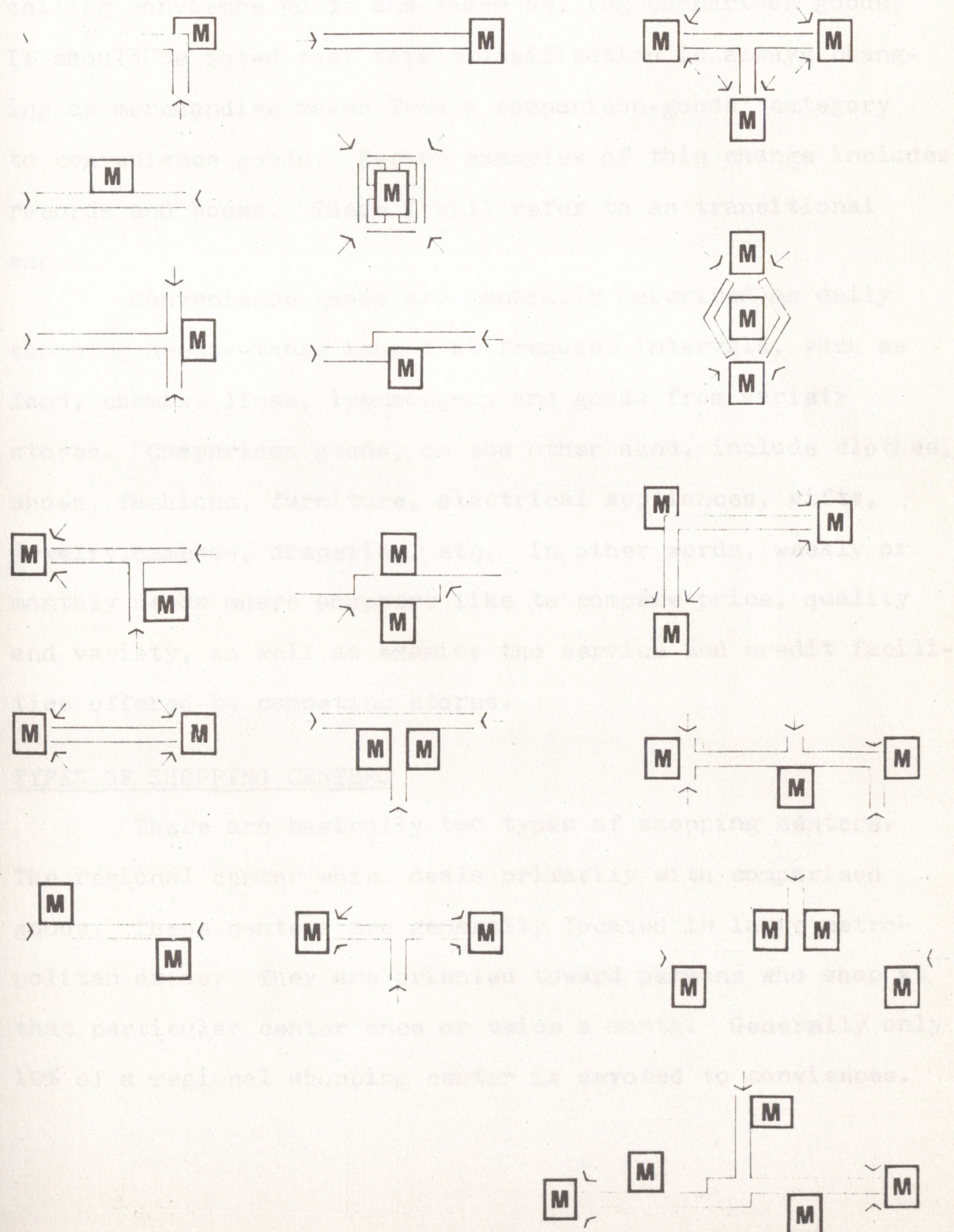
SHOPPING CENTER ANALYSIS

One of the most important requirements of any shopping centers is to establish the right balance of retailers. There needs to be a spread of retailers offering a wide range of goods and services. This is why accurate merchandising is so essential. It aims to achieve the maximum total sales volume by skillfully preplanning, and controlling the size, shape and location of tenants.

So, by carefully selecting prospective tenants, controlling their floor area requirements, and influencing their individual locations within the center, the developer can create a center which generates the maximum amount of interest for shoppers. Also, by skillfully positioning the major retailers within the enclosed center, the highest throughput of shoppers is virtually guaranteed along the malls--shoppers usually move from one star attraction to the next. By selecting, and then locating the rest of the traders in the same way, the maximum circulation of shoppers is achieved throughout the whole center. The layout is also designed to encourage "cross-shopping" and impulse buying.

TYPES OF RETAIL SHOPS

Basically there are two types of retail shops: those



TYPES OF RETAIL SHOPS

Basically there are two types of retail shops: those selling convenience goods and those selling comparison goods. It should be noted that this classification is always changing as merchandise moves from a comparison-goods' category to convenience goods. Recent examples of this change includes records and books. These I will refer to as transitional shops.

Convenience goods are generally described as daily shopping needs--those bought at frequent intervals, such as food, chemist lines, ironmongery and goods from variety stores. Comparison goods, on the other hand, include clothes, shoes, fashions, furniture, electrical appliances, gifts, jewelry, cameras, draperies, etc. In other words, weekly or monthly needs where shoppers like to compare price, quality and variety, as well as examine the service and credit facilities offered by competing stores.

TYPES OF SHOPPING CENTERS

There are basically two types of shopping centers: The regional center which deals primarily with comparison goods. These centers are generally located in large metropolitan areas. They are oriented toward persons who shop at that particular center once or twice a month. Generally only 10% of a regional shopping center is devoted to conveniences.

A district shopping center devotes as much as 50% of its rental space to convenience goods, while satisfying the demand for a more limited quantity of comparison goods. In the district shopping center, there is likely to be one or more generators for both the convenience and comparison goods.

POSSIBLE SHOPPING CENTER TENANTS

The following table gives a comprehensive list of suitable tenants for enclosed shopping centers:

Convenience goods

Supermarket/superette

Baker

Delicatessen

Chemist

Newsagent/tobacconist

Fishmonger

Off-licence

Variety store

Dairy goods

Specialty foods

Market

Confectionery

Butcher/poultry

Ironmongery/hardware

Stationery, cards

Greengrocer/fruiterer

Health foods

Grocer/provisions

Do-it-yourself

Durable/comparison goods

Perfume/cosmetics

Trousers shop

Books

Cameras

Car accessories

Electrical appliances

Lamps and shades

Women's wear

Furniture

Department stores

Baby wear

Children's clothes

Carpets

China, glass and pottery

Gas appliances

Menswear

Maternity wear

Jewellery

Linen/lace	Records/music
Sewing machines	Fabrics/material
Shoes	Beds/bedding
Sportswear	Toys
Florist	Wallpapers/paints
TV/radios	Leather goods/luggage
Hobbies/stamps/coins	Cycles/accessories
Religious goods	Gifts
Art supplies and frames	Boutique
Pets/animal foods	Furrier
Women's fashions/dresses	Separates (Women)
Fashion accessories	Hosiery (Women)
Millinery/hats	Woolen goods/wools
Souvenirs	Camping/sports goods
Silver goods	Antiques
Gloves/scarves/bags	Aquaria
Bathroom requisites	Shirt/tie shop
Lingerie/foundations	Rainwear/outdoor clothing
Boat Showroom/accessories	Discount stores
Bazaar Stores	

Service and other tenants

Petrol filling station	Bank
Cafe/snack bar	Cleaner
Driving school	Estate agent
Fish and chips	Stockbroker
Men's hairdressing	Nursery/plants/garden
Women's hairdressing	Post office
Restaurant	Shoe repairs
Travel agent	TV rentals
Launderette	Optician
Public house	Chiropodist
Photographic studio	Building society office
Insurance office	Social security office

Health club	Interior decorator
Tailor/valet	Health/welfare clinic
Doctor's surgery	Dentist's surgery
Accountant	Solicitor
Religious reading rooms	Surveyors & valuers
Architect	Key shop
Showrooms	Sports hall
Indoor bowls	Bingo
Amusements	Library
Cocktail bar	Art Gallery
Business equipment	Coffee shop/tea room
Cash and carry	Betty shop
<u>Kiosk tenants</u>	
Confectionery/tobacco	Magazines/papers
Shoe repairs/key cutting	Fruit
Gifts/souvenirs	Snack bar
Hosiery/tights/stockings	Ties & gifts
Driving school	Tourist information centre
Special promotions by charities and appeal organizations.	

SIZE, SHAPE AND LOCATION OF STORES

The size, shape, and location of stores are almost as varied as the number of different stores in the shopping center. The most desirable method of allocating space is to be familiar with each individual store, and its particular requirements during the space allocating process. In lieu of this, the designer should allow space for the different variety of stores which are likely to rent space. Some factors in the location of stores follows:

LOCATION FACTORS

Supermarkets

Adjacent to, and preferably on the same level as the car park, so that trolleys can be wheeled direct to cars. Requires a large area, but only moderate frontage. Nevertheless, the width of the store is very important because it affects the number of check-out points. In smaller centres the supermarket must be positioned so as to draw customers into and along the mall.

Food shops

Grouped around the supermarket but not in prime locations nor in highest rental positions. Requires reasonable display frontage.

Fashion and clothing

Grouped together and preferably in logical sequence, as for sales counters in the department stores; e.g., shoes, hosiery, lingerie, separates, jewelry, fashion accessories, millinery, outdoor clothing, perfume and cosmetics. These shops require prime positions, preferably in the centre of the main mall and away from the food stores. Good display frontages are vital. They also rely heavily on large pedestrian flows passing them. The best way to ensure this is to concentrate them in groups so that they form a magnet in their own right. In Parly 2, Paris, they are all most effectively grouped on one of the two levels of the centre.

Service Shops

Those likely to be used at night, such as coin-ops and launderettes, should have double-fronted units so that when the mall is closed, access to the shop can be gained from the car park outside. Alternatively, they can be just outside the enclosed mall in a strip adjoining an entrance. Service shops are generally positioned in less attractive retail locations where rents are lower and sizes of shops smaller; e.g., secondary malls and upper levels. It should be remembered that shoppers tend to seek out service shops. Only limited frontage and display space is required.

Sepecialty Shops

These shops which include those selling leather, gifts, stationery, cameras, flowers, toys and fabrics, need good, prominent locations and good display frontages. Sometimes they can be positioned to advantage in 'surprise' locations such as in the household/furniture section so as to brighten up an otherwise dull stretch of the mall. This group is particularly adaptable to size and shape of individual units.

Department Stores

These are large space users and will create their own importance. They need comparatively cheap rental space on between two and five levels. The design and layout of the centre, as has already been mentioned, will be largely

influenced by the presence--or otherwise--of the department store. They are best positioned at the end of the principal mall. Too much window space is an expensive luxury for department stores who prefer rectangular sites fronting the mall.

Restaurants

These are an important asset to a centre. They can benefit from any position with a view even though it may only be over and along the main mall. Expert opinion currently recommends locations throughout the centre and in the main square, with as much as 5 percent of the total area being allocated to this use.

Furniture, Carpets and Household Goods

This group includes most items for the home including hardware, electrical appliances, TV and radio, furniture, drapery and antiques. They can be grouped more or less in one location or split into two or more groups. The larger stores, especially the furniture shops, will require inexpensive space at the rear of a smaller entrance unit fronting on the mall. Many furniture shops need the maximum amount of wall space against which they can set a variety of displays and room settings. They are ideal tenants for L-shaped and T-shaped units where large display spaces are available.

ORGANIZATION OF SPACE

		ceiling height
Entrance		16'
Reception	1,200	14'
Waiting area	1,200	12'
Exhibition space	1,200	10'
Office	1,200	10'
Storage	1,200	15'
Restroom	1,200	14'
Telephone	1,200	12'
Shop area	1,200	10'
Transit area		16'
Drop zone	1,200	14'
Boarding	1,200	12'
Exit	1,200	10'
Waiting area	1,200	10'
Office	1,200	10'
Storage	1,200	10'
Restroom	1,200	10'
Telephone	1,200	10'
General office area		16'
Design and construction	1,200	8'
Inventory	1,200	8'
Production	1,200	8'
Marketing	1,200	12'
Research and development	1,200	12'
Human resources	1,200	10'
Finance and accounting	1,200	10'
Legal	1,200	12'
Public relations	1,200	10'
Security	1,200	8'
Information	1,200	

The stores actually chosen for the shopping center and their sizes are as follows:

<u>Convenience goods</u>	<u>sq. ft.</u>	<u>ceiling height</u>
Grocery	32,000	16'
Hardware	7,200	14'
Drug store	2,700	12'
Laundry mat	2,700	10'
Bakery shop	1,350	10'
Commercial laundry	6,700	15'
Bakery	2,700	14'
Delicatessen	900	19'
Shoe repair	900	10'
<u>Transitional goods</u>		
News stand/tobacconist	900	10'
Health foods	1,800	10'
Books	1,800	14'
Stationery/gifts	3,528	10'
Candy	1,200	10'
Fabrics	2,520	10'
HiFidelity/records	3,024	10'
<u>Comparison goods</u>		
Department store	64,800	16'
Jewelry	1,800	8'
Boutique	1,800	8'
Furrier	1,800	8'
Women's clothes	3,600	12'
Men's/women's clothes	7,200	12'
Children's clothes	2,700	10'
Fashions & accessories	2,700	10'
Uniforms	2,700	12'
Shoes	2,700	10'
Lingerie	1,800	8'

Pants etc.	5,400	12'
Leather goods	2,700	10'
Sporting goods	3,600	10'
Interior furnishings	3,600	12'
Chinaware	1,800	8'
Appliance store	1,800	12
Gifts	2,700	12'

Services

Photo studio	3,600	10'
Art renovator	3,150	10'
Theater	8,100	varies
Offices	7,200	10'
Restaurant	15,600	10'
Bar	3,600	10'
Rathskeller		10'

MATRIX OF RELATIONSHIPS

	prox. to trans.	prox. to deliveries	prox. to elevators	prox. to plumbing	prox. to lavs.	degree of activity	prob. of spon. com.	degree of spont. sales	hours open	magnetism	utilitarianism
Dept. store											
Men's store											
Women's store											
Shoe store											
Lingerie											
Gift shop											
Book store											
Camera shop											
Audio & Records											
Fabric shop											
Drug store											
Tobaccory											
Hardware											
Grocery											
Bakery											
Barber											
Beauty salon											
Laundry											
Delicatessen											
Appliances											
Restaurant											
Bar											
Theater											
Rathskeller											
Toilets & Lavs.											
Mechanical room											
Storage											
Disposal area											
Loading dock											

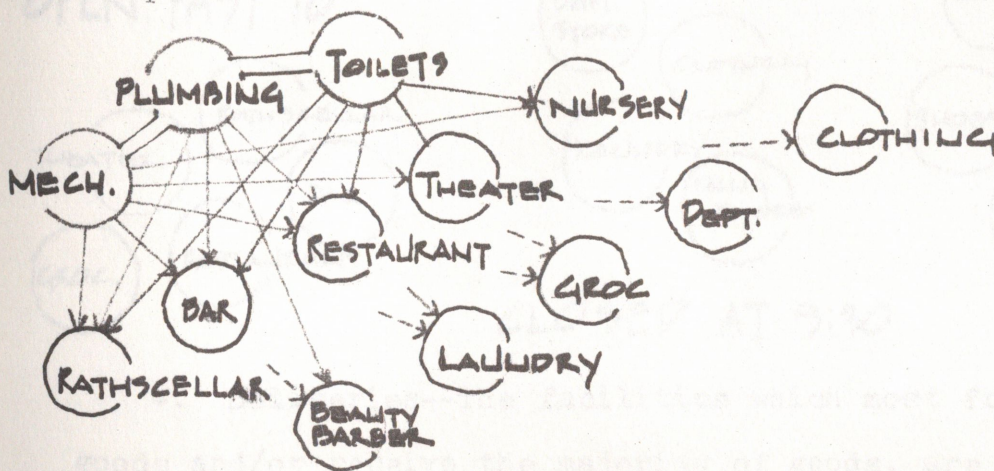
low med high

early med late

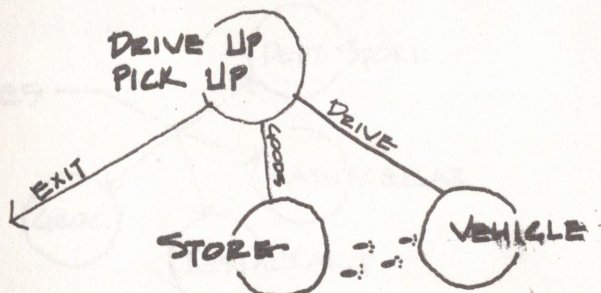


SUMMARY OF MATRIX

1. The restaurant, bar, Rathskeller, nursery and theater all require public toilets. One facility could be designed to accommodate all of the above activities or the toilets could be arranged a core to minimize plumbing. The same facilities require more fresh air changes than others in the complex.

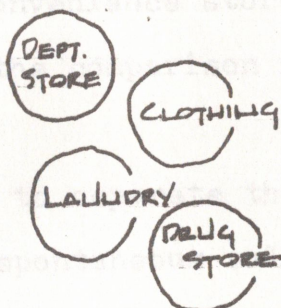
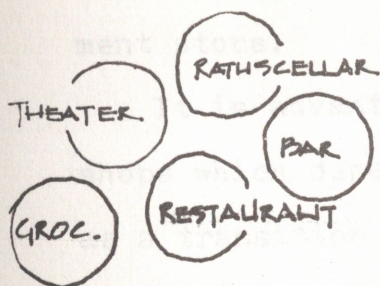


2. The convenience activities, grocery, hardware, nursery and laundry need direct access to whatever means of transportation. This may be alleviated by developing a drive-pick-up facility.

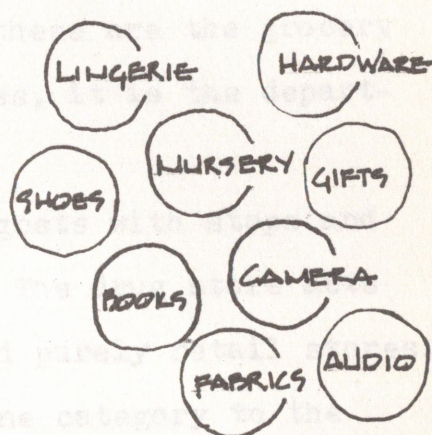


3. Security--if the complex is to be totally enclosed it may be advantageous to consider methods of securing the building. Some stores within the complex will close at 5 o'clock while others may stay open till midnight. This may be accomplished by closing off one of the floors while leaving others open to use.

OPEN PAST 10

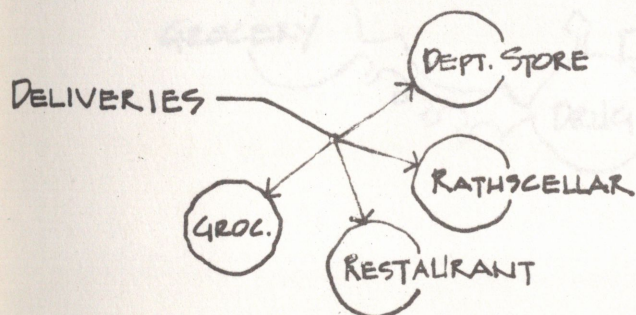


CLOSED AT 9:30

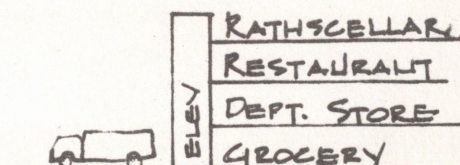


CLOSED BY 6

4. Deliveries--The facilities which most frequently receive goods and/or receive the majority of goods, are the: grocery store, restaurant-bar, rathskeller and the department store. These also tend to produce the most waste. Due to this, these facilities should be readily accessible for deliveries and waste disposal

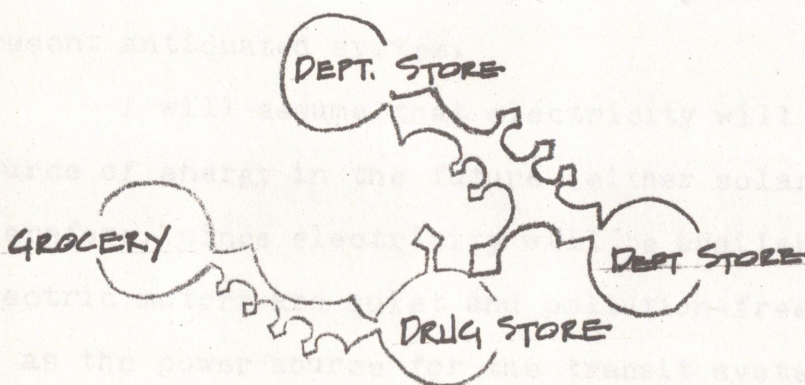


OR



5. Magnetism--In most shopping centers there are those stores which draw people to the center (magnets) and stores which depend on spontaneous sales for their business. People tend to move from one magnet to another, stopping at smaller boutique stores on their way. Since this center deals with both convenience stores and comparison stores it has both forms of magnets. For the convenience stores, these are the grocery and drug stores. For the comparison stores, it is the department store.

It is advantageous to separate the magnets with stops and shops which depend on spontaneous sales. The drug store acts as a transition between purely service and purely retail stores. It should be placed to move people from one category to the other.



TRANSPORTATION

Due to a growing energy shortage, increased pollution and congestion, created by the present day automobile, we as molders of our environment must consider and incorporate new systems of transportation into long range planning. Within the next 20 years we can expect to see both inter-continental and regional transit systems used in the United States. It is conceivable that these systems will include provisions for the movement of all transient goods (water, electricity, wastes, and freight). Though it is seldom within the scope of an architect's duties to develop future transit systems, it should be a consideration in his total design process. I do not intend to design a system for Bozeman, but I will speculate as to how a currently operable system may replace our present antiquated system.

I will assume that electricity will be the primary source of energy in the future (either solar or nuclear). Therefore, since electricity will be available and since electric motors are quiet and pollution-free, I have chosen it as the power source for the transit systems.

The new transportation system must have the potential to provide door-to-door service, yet it should function from centralized depots. The BEC (Bozeman Electric Car) I propose

would be computerized and contain an automatic steering system which follows a wire, buried underground, by sensing the flux of the AC current. It would be telephone voice activated, which would facilitate the picking up of people at specific times and locations. When the journey is completed the vehicle would be piloted to the next pick up point. The BEC would have alternate battery power for rural residents, allowing for departure from the electric cable system. At specified locations (CBD, shopping nodes, etc.) there would be vehicles parked for immediate use.. Upon departure of one vehicle, another one would be despatched from the depot.

An incentive for the implementation of BEC is it's economy. If a BEC vehicle were driven 4,000 miles a year it would cost less than six cents per mile, compared to a conventional auto which costs twelve cents per mile for 10,000 miles a year. It is conceivable that this system could replace our present day school bus as well as eliminating the necessity of Mom driving the children to the doctor's or elsewhere.

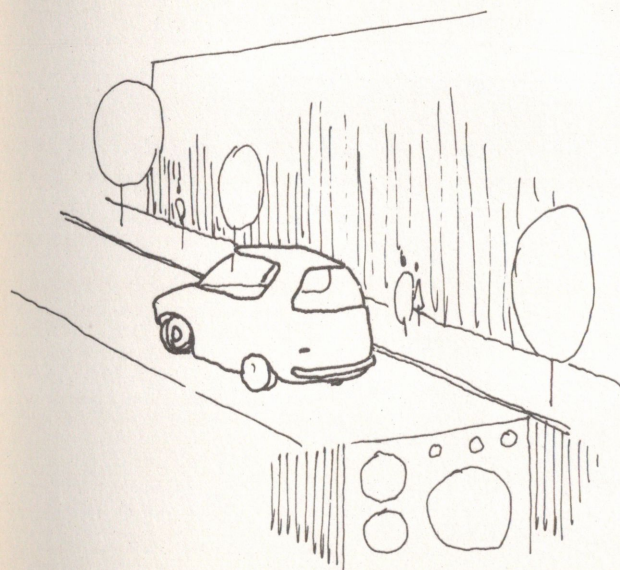
Vehicles not in use would be stored in a central depot which would keep the vehicles clean and batteries charged. This would eliminate the need for enormous parking lots, saving everyone money.

This system, which I am proposing, is not my own but very similar to a system introduced by General Electric.

EFFECTUATION

The transition from a community in which nearly every driver owns a car, to a system with public-owned vehicles, should be spread over a period of time. It is also conceivable that there will be those who will resist any change. I have suggested a new mode of transportation which simulates our car but prevents air pollution and the necessity for massive parking lots. I propose that the system be phased in over a period of fifteen years. The first five years would consist of the insulation of the system. This also allows time for people to get the idea planted into their heads.

The following ten-year period allows for the transition into the BEC system. As people need new cars, they purchase the use of the BEC. This infers that buildings designed and constructed within the next fifteen years will have to contend with all or a part of the present parking problems.



ENERGY CONSERVATION

ENERGY CONSERVATION

At this time, energy conservation is imperative that all methods of energy conservation be considered. There are basically two means available with which the architect can help alleviate the problem as it deals with the building design. These are: 1) reduction of heat loss and heat gain; 2) efficient use of energy. A prime method of reducing the energy loss is a careful selection of energy used (e.g., turn off lights when not needed, etc.).

Heat gain and heat loss can be reduced either by a thorough understanding of the effects of natural forces on a building or by placing insulating material in the way of heat transfer. With one's attention on building orientation and construction materials, it is possible to reduce the thermal loads considerably.

In winter, it is extremely important to take advantage of the sun and the building's relative orientation to it. For nine months out of a year the climatic conditions can be instrumental thermal control. This can be accomplished by:

1. orientating the building south-southeast to take advantage of the sun's radiation during the summer months. 2. optimizing the benefits of a building form (a rectangular plan, elongated in the east-west direction about 1.1 - 1.3 times as long as wide). (See drawing next page)

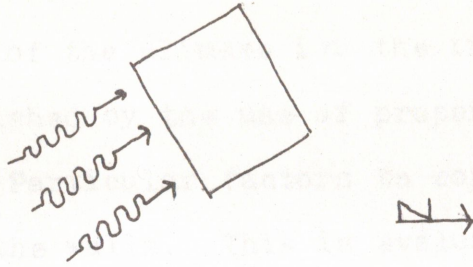
ENERGY CONSERVATION

At this time of energy shortages it is imperative that all methods of energy conservation be considered. There are basically two means available with which the architect can help alleviate the problem as it deals with the building design. These are: 1) reduction of heat loss and heat gain; 2) alternate sources of energy. A Third method of reducing the energy drain is a personal cut-back of energy used (e.g., turn off lights when not using a room).

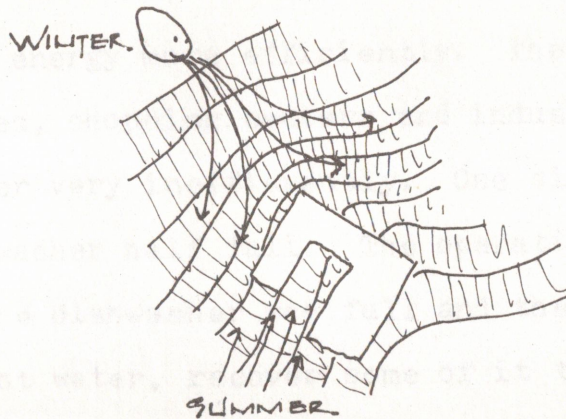
Heat gain and heat loss can be reduced either by a thorough understanding of the effects of natural forces on a building; or by placing insulating material in the way of heat transference. With one's attention on building orientation and construction materials, it is possible to reduce the thermal loads considerably.

In Montana, it is extremely important to take advantage of the sun and the building's relative orientation to it. For nine months out of a year the climatic conditions can be instrumental thermal control. This can be accomplished by:

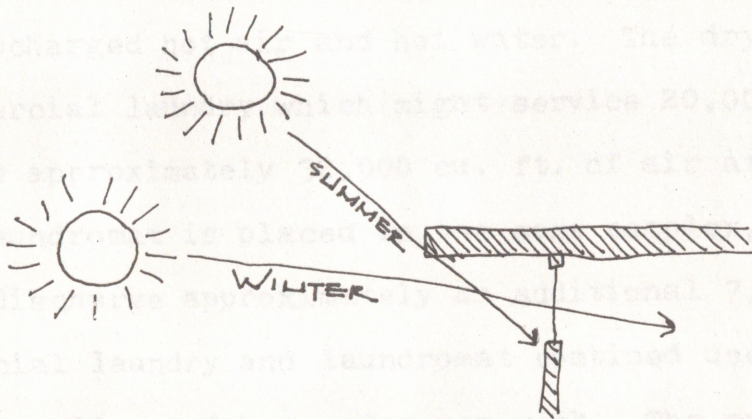
1. Orientating the building south-southeast to take advantage of the sun's radiation during the summer months. By optimizing the benefits of a building form (a rectangular plan, elongated in the east-west direction about 1.1 - 1.3 times as long as wide). (see drawing next page)



2. Shielding the building from winter winds, yet taking advantage of the cool summer breezes, as illustrated below:



3. Windows should be oriented so that they can omit the sun during the winter to assist in heating the space. Then in the summer they should block out the sun's rays to prevent overheating.



Control of heat loss and heat gain is essential to the regulation of the climate in the interior space. This can be accomplished by the use of proper materials and quality construction. Particular factors to consider are: 1) Insulation value of the walls. This is evaluated by calculating the U-factor. A respectable U-factor is which can be expected from 2) Absorption and reflectance characteristics.

4. Use energy more efficiently. There are areas within our homes, shopping centers and industry where we use sources of power very inefficiently. One simple example is running a dishwasher half full. The operation would be more efficient if the dishwasher was full and then, instead of discharging the hot water, recover some of it to preheat other water. A home laundry dryer expels approximately 300 cu. ft. of air at 120° . Why not heat the house with this?

Since there is and always will be a need to wash and dry clothes, this may be an excellent area to reclaim some of the discharged hot air and hot water. The dryers required for a commercial laundry which might service 20,000 people discharges approximately 32,000 cu. ft. of air at 140° per minute. If a laundromat is placed in the same complex, its dryers would discharge approximately an additional 7,000 cu. ft. The commercial laundry and laundromat combined use approximately 220,000 gallons of hot water per week. The average discharged water is approximately 115° .

BTU's required due to heat loss and air changes	=	8,660,000 BTU/min.
Heat gain lights	=	280,000
Heat gain people	=	<u>75,000</u>
Heat required	=	8,315,000 BTU/min.

Heat gained with laundry

2 large dryers	=	5,120,000
8 small dryers	=	<u>1,430,000</u>
		6,430,000

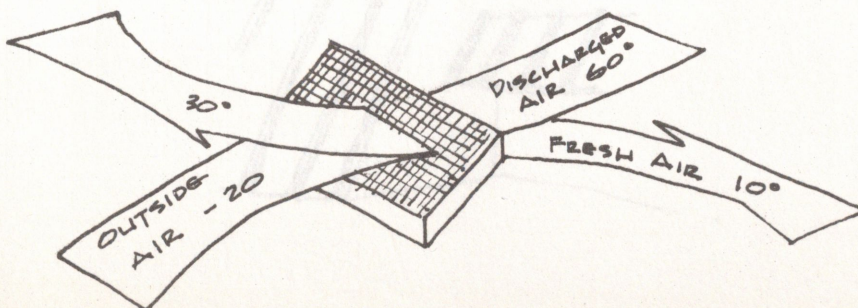
Additional heat required = 1,865,000 BTU/min.

The hot air from the dryers would require some form of dehumidifying and filtering. Since the load on the laundry is greater during the summer than in the winter, this heat could also be used in a cooling system.

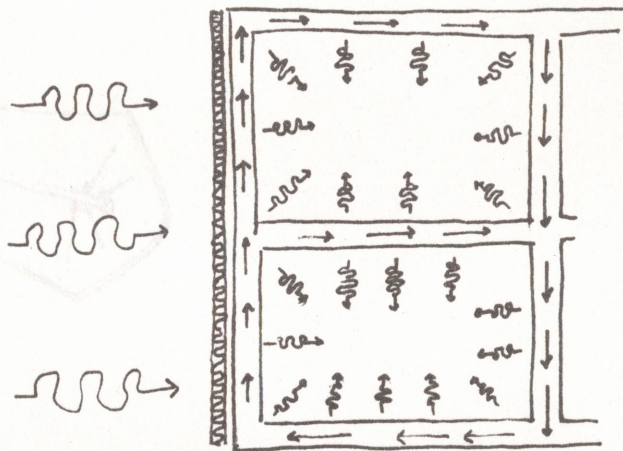
ALTERNATE SOURCES OF ENERGY

Alternate sources of energy can be considered in a variety of degrees, ranging from minimal heat gain methods to systems of generating electricity. The following are methods of reducing external energy supplies:

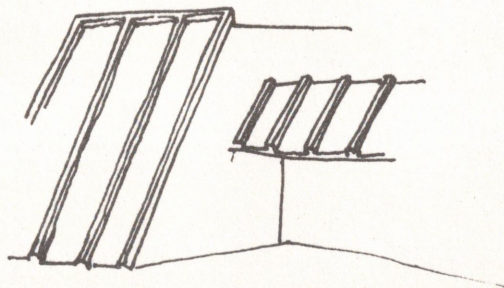
1. Instead of discharging 60 degree air, due to required air changes, why not heat the -20 degree fresh air with the discharged air. It is conceivable that the fresh air can be raised by 20-40 degrees.



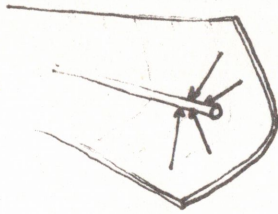
2. Using a heat absorbent material, a south wall could be equipped with circulating water which would absorb the heat during the day. It would then circulate through the floor, roof, and interior walls, giving off the absorbed heat. An insulating material would have to cover the wall at night, so as to prevent the water from cooling off excessively.



3. Use. black plate collectors. They can be installed on a complete south wall or they might become a fascia for a space frame structure. They may also be used inside a skylight. The most efficient vertical angle is 57 degrees, in the Bozeman area. The plates should face south-southeast 20 degrees. The efficiency can be increased 20% by reflecting the sun up off the ground.



4. A parabolic reflector can be used to concentrate the solar rays on a collector which then transfers this heat to some form of mechanical system. With this system it is possible to create sufficient steam to power a generator which could then supply the building with electricity.



SITE

PLOT PLAN



COMMERCIAL BUILDINGS

MAIN ST.

CHURCH

SINGLE FAMILY DWELLINGS

N. 15TH ST.

VIEW OF
SPURDUGH

PLOT PLAN

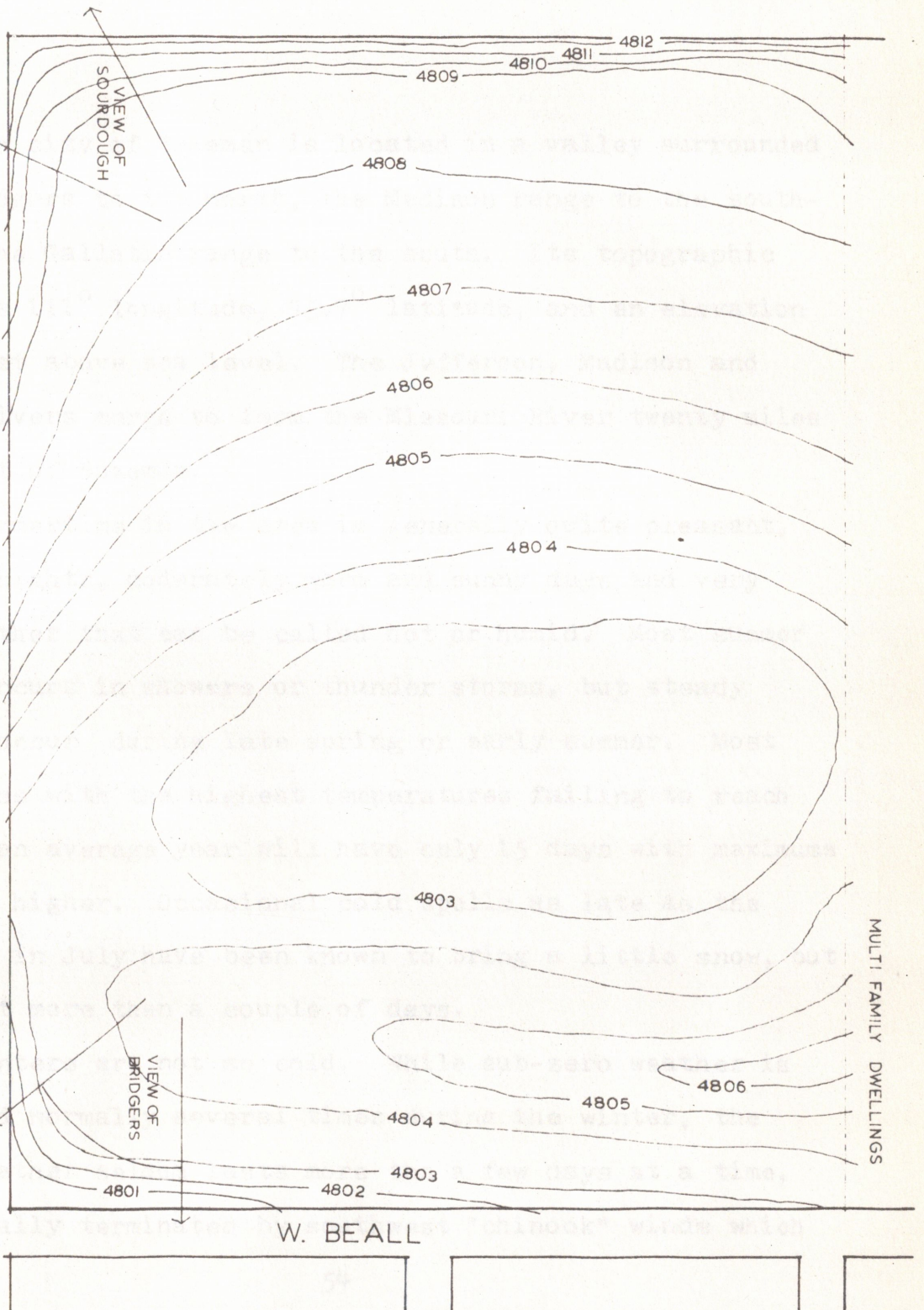
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VIEW OF
BRIDGERS

MULTI FAMILY DWELLINGS

W. BEALL

ONE - FOUR FAMILY DWELLINGS



CLIMATOLOGY

The city of Bozeman is located in a valley surrounded by the Bridgers to the north, the Madison range to the southwest and the Gallatin range to the south. Its topographic location is 111° longitude, 45.7° latitude, and an elevation of 4795 feet above sea level. The Jefferson, Madison and Gallatin rivers merge to form the Missouri River twenty miles to the west of Bozeman.

Summertime in the area is generally quite pleasant, with cool nights, moderately warm and sunny days and very little weather that can be called hot or humid. Most summer rainfall occurs in showers or thunder storms, but steady rains may occur during late spring or early summer. Most summers pass with the highest temperatures failing to reach 100° , and an average year will have only 15 days with maximums of 90° and higher. Occasional cold spells as late as the first week in July have been known to bring a little snow, but seldom last more than a couple of days.

Winters are not so cold. While sub-zero weather is experienced normally several times during the winter, the coldest weather seldom lasts more than a few days at a time, and is usually terminated by southwest "chinook" winds which

can produce sharp temperature rises of 40° or more in 24 hours.

The strong winter storms are usually from the west, with an occasional storm from the east. Storms generally only last a couple of days and seldom dump more than 8"-12" of snow, which usually melts within a couple of weeks.

The following is a chart of the means and extremes of temperature and precipitation

BOZEMAN (GALLATIN COUNTY) Lat. 45° 40' N; Long. 111° 03' W.; Elev. 4856
Means and Extremes for Period 1925-1954

Month	Temperature (°F)								Precipitation Totals (Inches)								Mean Number of Days					
	Means				Extremes				Snow, Sleet				Temperatures				Max.		Min.		Days	
	Daily Maximum	Daily Minimum	Monthly	Record Highest	Year	Record Lowest	Year	Mean Degree Days	Mean	Greatest Daily	Year	Mean	Maximum Monthly	Year	Greatest Daily	Year	Precip. .10 in. or More	90° and Above	32° and Below	32° and Below	0° and Below	Growing Season
	(a)	30	29	29	30	30	30	29	30	30	30	15	30†	30†	29†	29†	30	30	30	30	30	
Jan.	29.4	10.2	19.8	57	1939	-36	1949	1399	0.92	0.77	1942	11.5	32.0	1949	10.0	1954	3	0	16	30	8	
Feb.	34.1	14.4	24.3	63	1932	-43	1936	1149	0.77	0.88	1942	10.9	22.1	1940	10.0	1933	3	0	11	27	4	
March	40.9	20.2	30.6	70	1946	-27	1932	1063	1.43	1.01	1935	15.6	41.7	1935	12.0	1954	4	0	6	28	2	
April	54.4	31.0	42.7	80	1939	-10	1936	676	1.61	1.53	1951	5.2	27.0	1941	12.0	1941	5	0	1	16	*	
May	63.4	38.8	51.1	89	1954§	16	1954	425	2.36	2.37	1938	1.3	15.0	1938	15.0	1938	6	0	*	7	0	
June	70.0	44.5	57.3	92	1936	26	1951	242	2.91	2.08	1944	0.4	6.0	1943	6.0	1943	7	*	0	1	0	
July	81.5	51.4	66.5	100	1931	32	1950	44	1.17	0.94	1931	T	T	1952	T	1952	3	3	0	*	0	
Aug.	79.8	49.4	64.6	96	1934	31	1932	72	1.26	1.10	1936	0	0		0		4	2	0	*	0	
Sept.	68.9	41.2	55.1	95	1947	12	1926	297	1.66	1.69	1947	1.0	7.0	1933	7.0	1933	4	*	*	4	0	
Oct.	57.4	33.1	45.3	80	1927	-10	1935	606	1.51	1.66	1935	3.2	18.9	1951	8.0	1930	4	0	1	13	*	
Nov.	42.0	22.6	32.3	67	1947§	-16	1929	974	1.11	0.91	1947	9.4	25.5	1938	6.8	1940	4	0	6	26	1	
Dec.	33.9	14.6	24.3	62	1939	-35	1932	1264	0.93	0.75	1940	11.7	26.0	1945	10.5	1940	4	0	13	29	4	
Year	54.6	31.0	42.8	100	July 1931	-43	Feb. 1936	8211	17.64	2.37	May 1938	70.2	41.7	Mar. 1935	15.0	May 1938	51	5	54	181	19	115

(a) Average length of record, years. T—trace, an amount too small to measure. †Some extremes taken from years with one or more missing monthly totals. Such years are not used in "mean" columns. ‡From 19 complete and 10 partial years of record. §Also on earlier dates, months, or years. *Less than one-half. **Base 65°.

DESIGN PROCESS

CRITERIA TO FORM

When deciding the stores which I felt would promote business for this type of center, it was imperative to develop the functional relationship. I found I had two primary concerns, but since one was oriented to convenience goods and the other was comparison goods, I could not depend on traffic movement created by the opposing segments. When the square footage of the center and efficient parking were taken into account, it became self-evident that the center would be a multi-level structure. This seemed to indicate that convenience goods be placed on the level which is directly adjacent to the parking. This allows for direct access from automobile to laundry and a relatively short distance from grocery to auto. This arrangement also allowed for some separation of those shopping for convenience goods and those shopping for comparison goods.

Though I wanted to create some separation between those who are shopping for convenience goods and those shopping for comparison goods, I also wanted to create movement between the two levels of activities. This indicated to me the need for a transitional level. This level would contain the stores which sold goods which were in a transition from comparison to convenience goods.

CRITERIA TO FORM

Once deciding the stores which I felt would promote business for this shopping center, it was imperative to develop the functional relationships. I found I had two primary magnets, but since one was oriented to convenience goods and one was comparison goods, I could not depend on traffic movement created by the opposing magnets. When the square footage of the center and sufficient parking were tabulated it became self evident that the design would be a multi-level structure. This seemed to indicate that convenience goods be placed on the level which is directly adjacent to the parking. This allows for direct access from automobile to laundry and a relatively short distance from grocery to auto. This arrangement also allowed for some separation of those shopping for convenience goods and those shopping for comparison goods.

Though I wanted to create some separation between those who are shopping for convenience goods and those shopping for comparison goods, I also wanted to create movement between the two levels of activities. This indicated to me the need for a transitional level. This level would contain the stores which sold goods which were in a transition from comparison to convenience goods.

To reinforce the movement between the two primary levels, it appeared sensible to make this transition area the core of the complex. It soon developed into a very well sky-lit piazza with a view oriented toward the Bridgers.

The next order of business was to develop a rhythm and scale which could be related to on the different levels of movement. As I see them, the different levels of movement are: 1) An airplane moving overhead where no one is really paying much attention to what buildings they see on the ground, 2) An automobile on Main whose driver and passengers are driving on a developed street and are generally oblivious to the buildings, 3) The auto and its passengers on West Beall, and North 15th. They are either leaving or returning to a residential development, 4) The pedestrians on Main, W. Beall and N. 15th, all moving much slower than the auto and requiring different scale relationships. 5) The pedestrian within the center in a hurry but has to find a scarf to match her socks. 6) The casual shopper who is here to do some window shopping and to relax.

As you can see, each movement group may relate to a different scale, yet there is a necessity for there to be a rhythm between scales.

At this same time I was investigating size, shape and arrangement of the individual stores. Studies show that a rectangular space is the most flexible and efficient. I, therefore decided to use a standard module of a 30 ft. square bay

are 180 ft. square, and being stacked on top of one another, stand 45 ft. high.

where the width of the store fronts would stay the same but the depth would vary. This decision in conjunction with the discussion to use two L-shaped malls with the magnets at the center, lead me to a system of breaking down the scale of the complex.

In the same design stage I had to develop a method of going from an 8 ft. ceiling height in the underground parking lot to a 16 ft. ceiling height in the grocery store. It seemed to make sense that if the stores close to the parking lot are relatively small they should have a lower ceiling height. As the stores become larger and get closer to the core, the ceiling height increases until we have the 16 ft. for the grocery store.

By repeating the system on the second level, the oscillation of the roof is double. This has developed two functional means of breaking down the scale of the building: 1) Oscillation of the exterior walls, 2) Oscillation of the roof. This oscillation can then be varied to relate to the movement which comes in contact with it. For the movement of Main street, I have used a 60 ft. oscillating module; whereas, on W. Beal and N. 15th I used a 30 ft. oscillating module. For the pedestrian in the mall the scale of the module has been further reduced to 5, 10 and 15 ft. Yet one can still be aware of the 30 ft. module because of the exposed columns.

The most difficult scale problem was that of the exterior of the grocery and department store. These stores are 180 ft. square, and being stacked on top of one another, stand 54 ft. high.

STRUCTURE

Up to this point I had considered using either wall, post and beam or the combination of the two. Economics leaned toward a steel post and beam structure clad with brick or pre-cast concrete panels for a maintenance-free, durable. Because of fire restrictions, it seemed most realistic to use some form of concrete slab in the covered parking and in the lower mall.

The use of a steel structure clad in another structural material was not what I consider an honest expression of materials. To resolve this problem, as well as the problem of a 180 ft. long wall, I decided to use the combination of the steel structure and brick sheathing but expose the structure. This was easily done by exposing the steel columns and wrapping the brick around the back side of the column (See photo 'structure'). To contrast the vertical columns I exposed the horizontal slabs at each floor level. This broke the 180 ft. wall into 18 x 30 ft. bays. To further reduce the scale of the wall, I beamed up 12 feet in front of the wall and landscaped it in an oscillating pattern.

At this point I had a lower level of parking and convenience goods, a transitional level consisting of transitional goods, and the second floor for the second level of the department store. On the second floor I decided to put stores which are attractors themselves: children's clothing, uniforms, and a pants store. These stores do not rely on impulse purchases and therefore do not require the prime space.

The bar and restaurant are two other activities which draw their own clientele and do not depend heavily on the other generators. These, I placed above the rest of the stores to give them a better view and to remove them from the mall where facade space is so expensive. I put the offices on the same level as the restaurant, to move it to less desirable rental space.

THE MALL

The mall was derived primarily from function. It was a functional decision to create a doubly loaded corridor because this created the maximum store frontage per linear foot of mall. The sky lite was developed as a transition area between the different levels. A primary purpose of this area is to permit an individual a relation to his surroundings; therefore, the view oriented toward the Bridgers

The level changes on the Main Street mall reflect the changing ceiling heights of the lower mall. The changing ceiling heights of the Main mall reflect the changing heights of the stores lining the main mall. The pattern on the floor of both malls reflects the movement taking place. Along the storefronts there is a ten foot corridor of Terrazzo. This is because Terrazzo is a low-maintenance long-wearing material. Also in this ten-foot corridor steps have been eliminated and replaced by ramps. This permits the window shopper the freedom of concentrating on the store windows without having to be conscious of steps.

In the central portion of the mall the activity, the materials and level changes take on a different function. The activities in the central mall become more casual and personal. Spaces have been allocated for venders or groups (Boy Scouts, etc.) to use to sell wares. The materials change from terrazzo and glass to concrete, brick and plant life. Instead of the ramps which are along the storefronts, the means of changing levels through the central mall is via steps. This is to change the degree of consciousness in the central mall where sales become a personal one to one's experience. Also, throughout the central mall areas I have allocated for practical spaces for small and meal groups to sit, relax and converse.

The Main street mall as well as the piazza are naturally lit with windows at the perimeter of the roof. Adequate artificial lighting would be supplied for overcast days and night time use. The lower mall is practically lit by light wells through the main mall but would require some artificial light at all times. The parking lot is sky-lit to accommodate natural light and fresh air.

The transitional plaza incorporates space for small, medium and large groups of people. This space incorporates a bleacher section to be used by an individual or by a group for a lecture or a rally. This hopefully will promote instantaneous speeches, musical concerts, and other social interaction, which I contend will increase social awareness.

LANDSCAPE

The landscape plan was derived from functional and visual aspects. On the West side mounding and planting was incorporated to help control winter storms from the west and northwest. trees was used against the department store wall to attempt to reduce the scale of that facade-- on the northeast corner of the lot the trees were located to create vistas of the building from the street while supressing the parking. This same planting is also meant to create vistas of the Bridgers for shoppers, while again suppressing the parking. The planting on the northwest, north and northeast has been located rather loosely while hopefully giving a hint of the oscillation taking place in the building.

On the south side of the site, where the everyday function is more structured, the planting reflects that. There is a 15 ft. buffer zone placed between Main and the sidewalk. This green space contains trees planted at 60 ft. intervals to reflect the exposed columns within the complex. Between the sidewalk and the auto park there is a 10 ft. wide planter of varying lengths to define the entrance off of Main street. This planter is also used to allow fresh air and light into the underground parking, as well as assist in concealing the parking lot.

CONCLUSIONS

This Terminal project was a very systematic approach to design. With a list of the technological, physiological, sociological and psychological needs of the user, the owner and the community, I felt I knew the criteria of a good design. I am still convinced that the designer must be aware of these needs, but he needs other criteria for arbitration. In the introduction I considered the thesis to be this criteria which proved to be less than adequate. I now contend that there must be many such theses. For a shopping center, economics must be one of them.

During the later portion of the Design, I became aware of one major fault in my design. It was my intent to create a complex which would reach out and invite people in. This I attempted to do by providing and locating an electric car Depot close to the center of the shopping. I overlooked the barrier I was creating with the parking lots. Even when the automobile is removed from the site there will still remain a buffer zone between the pedestrian and the shopping. This reflects more the fabric of the urban development than Bozeman, Montana. If I had it to do over I would move the main entrance out to the property line, thereby saying "I have made every effort to come to you."

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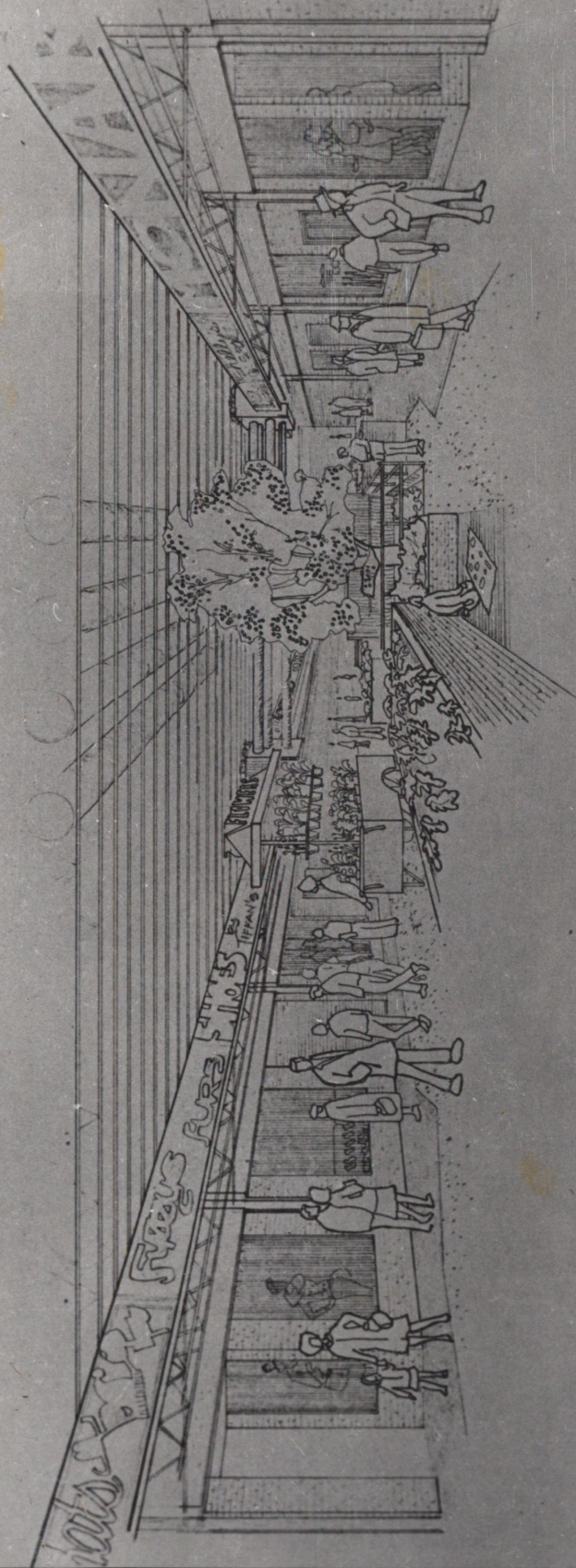
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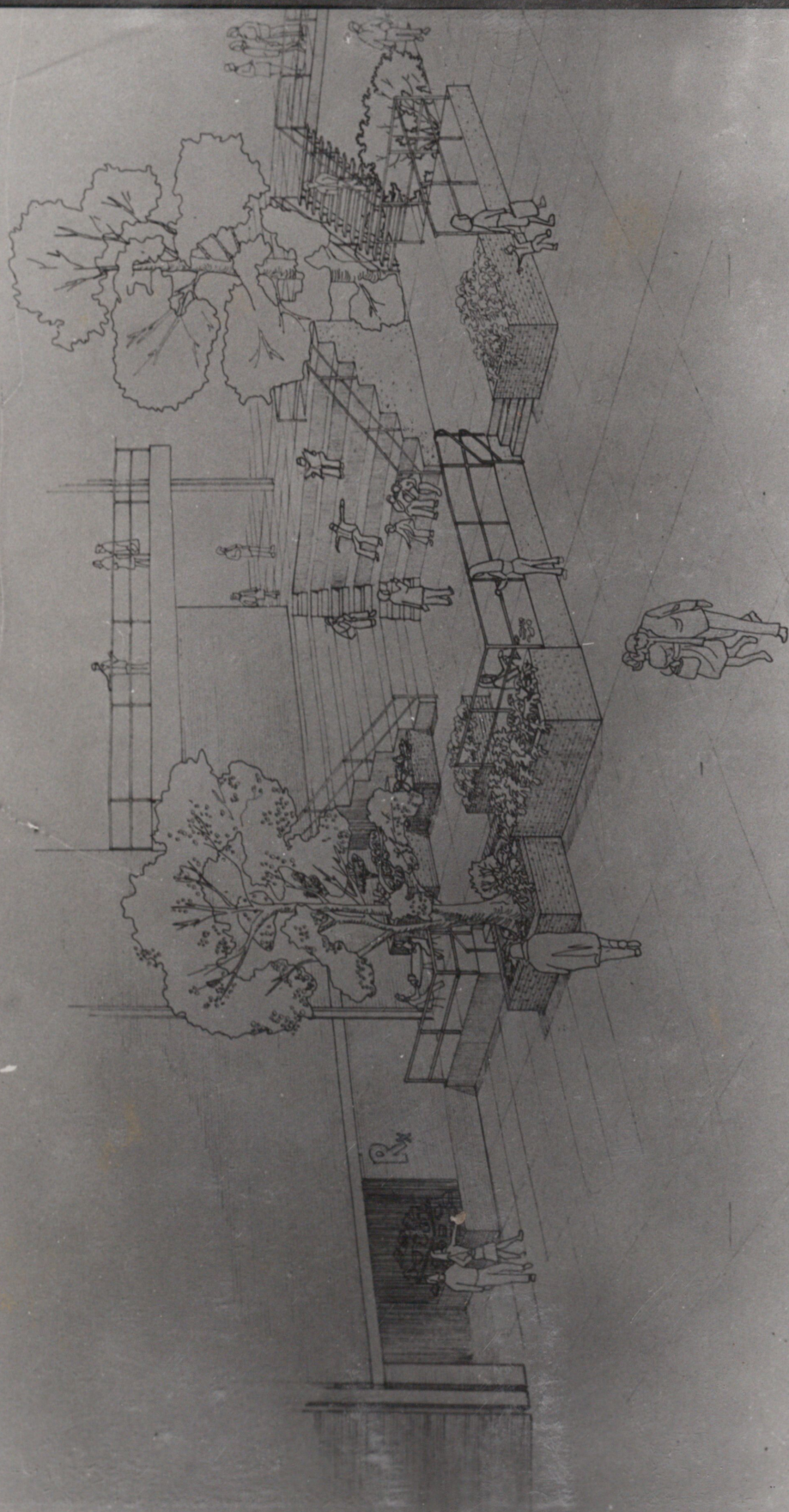
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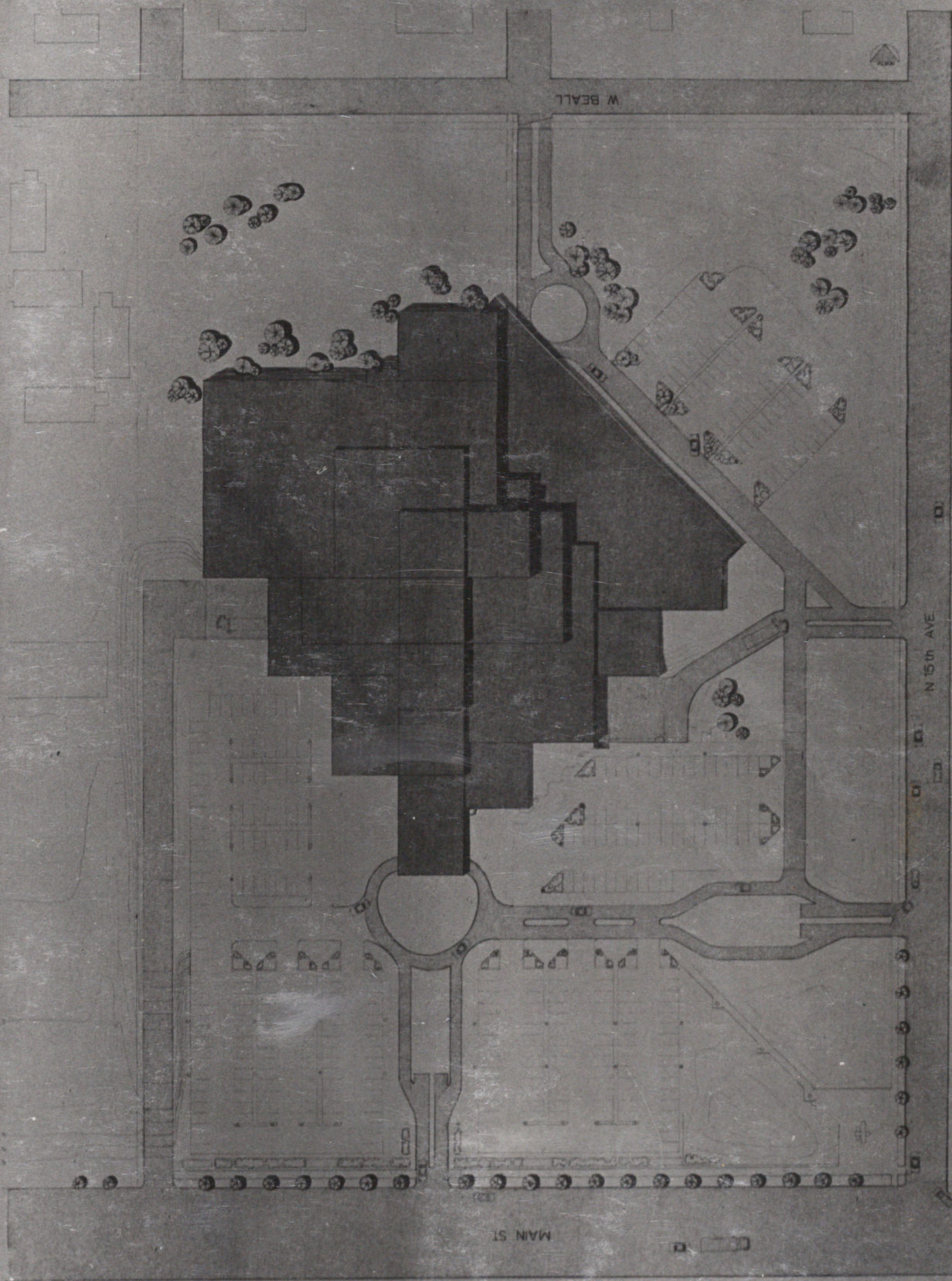
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MAIN MALL



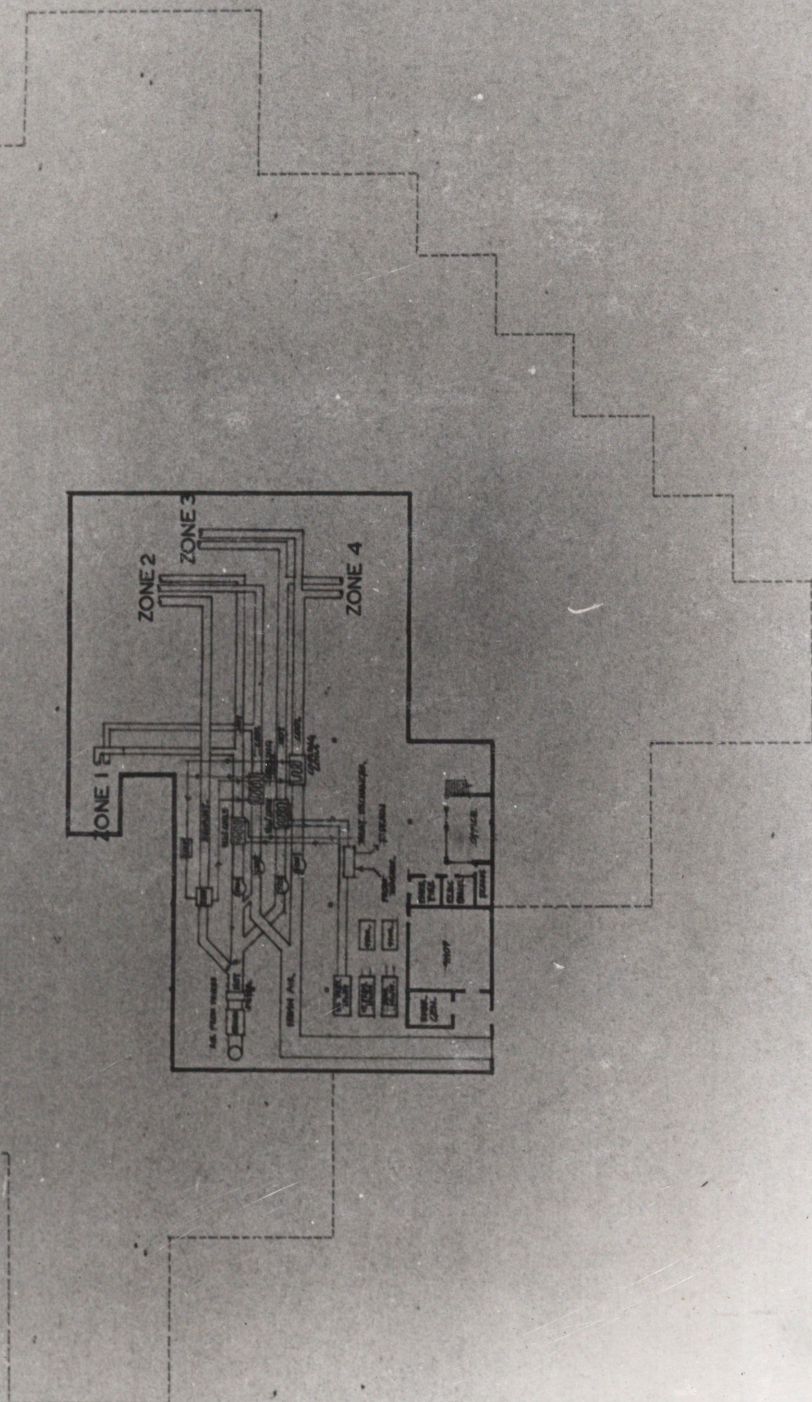


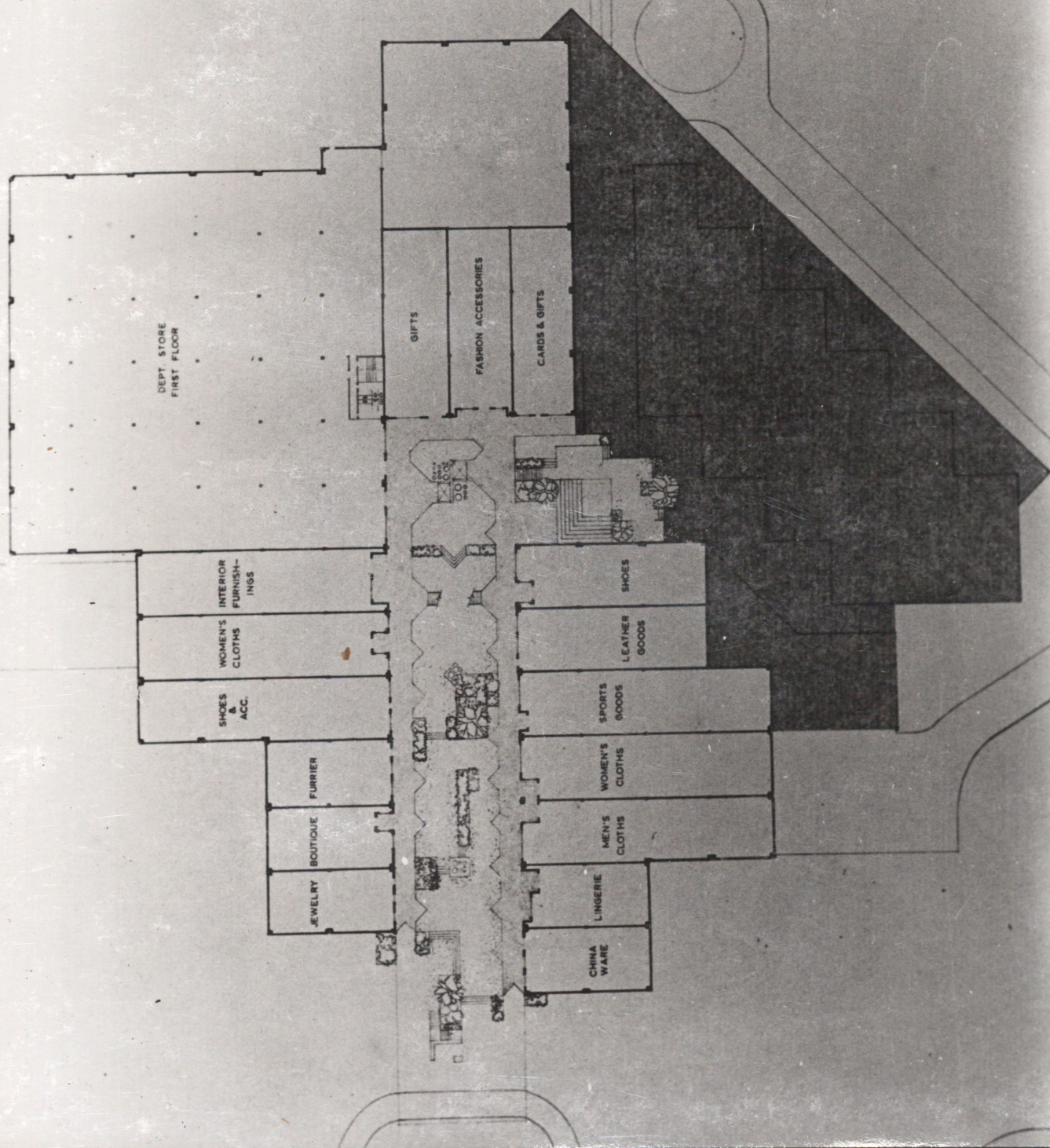
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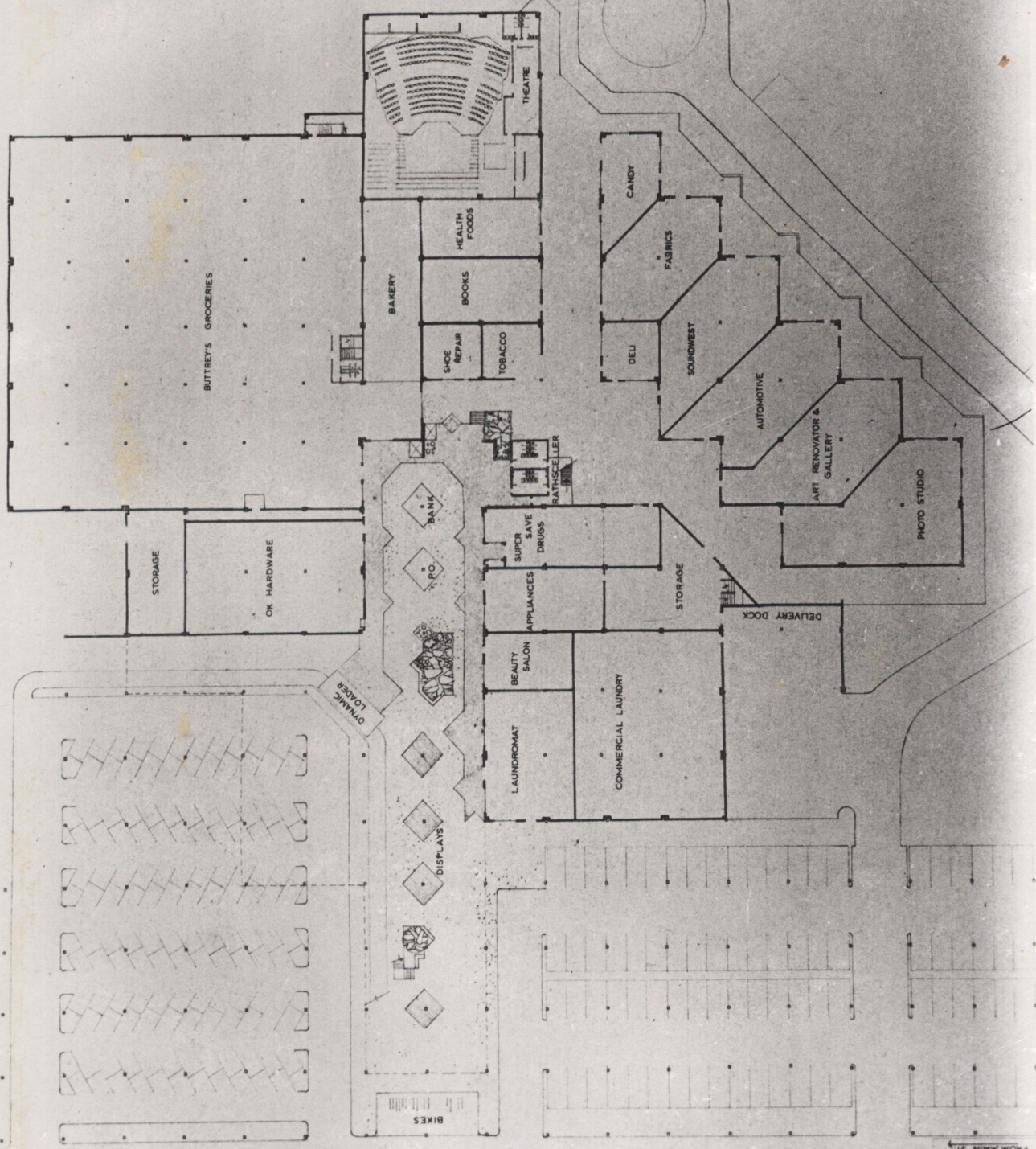
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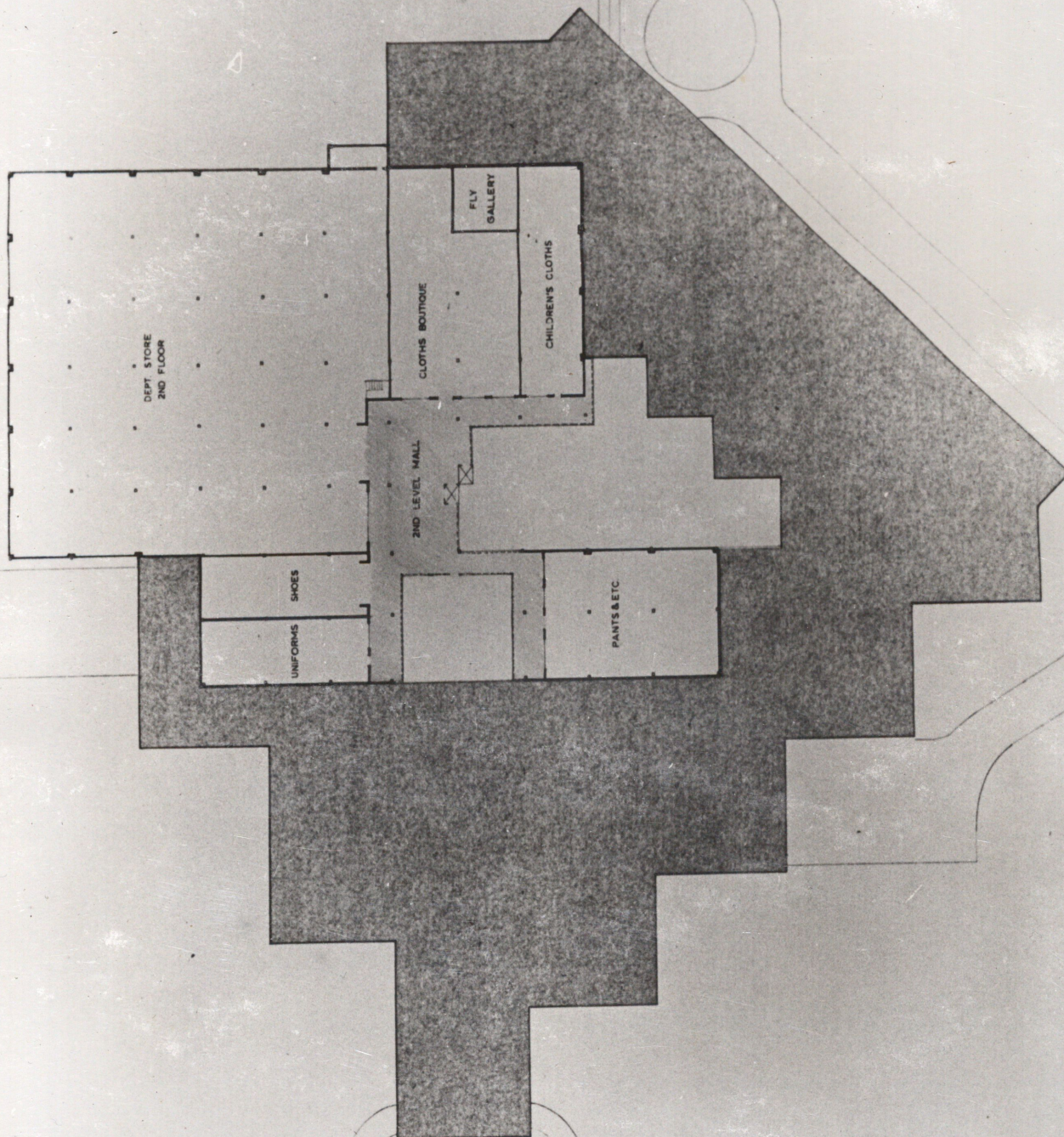
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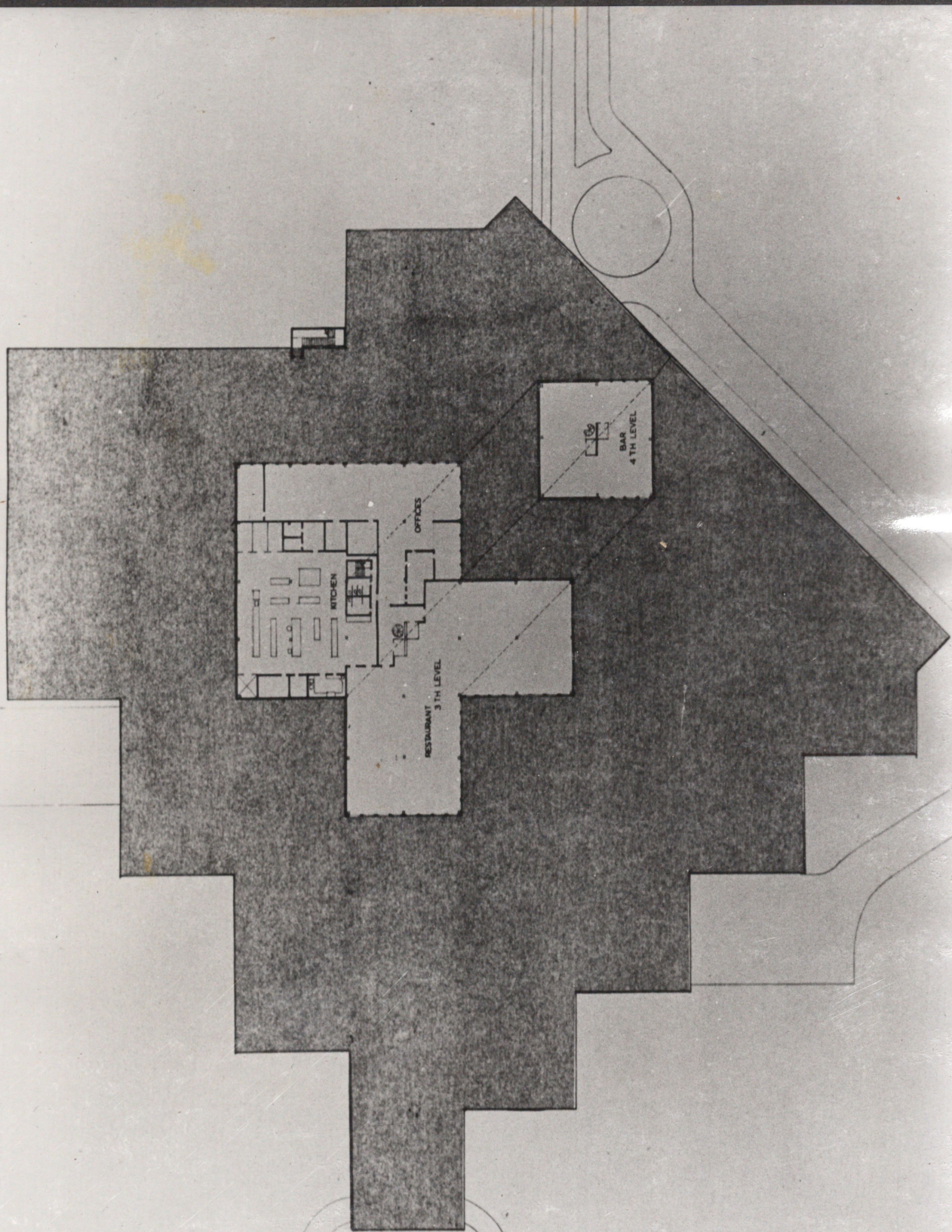


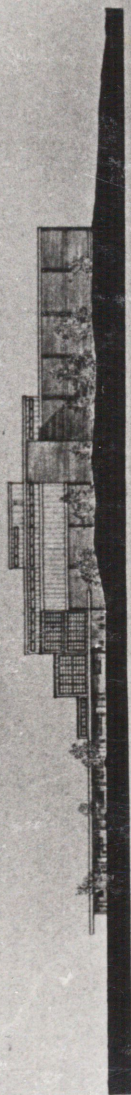




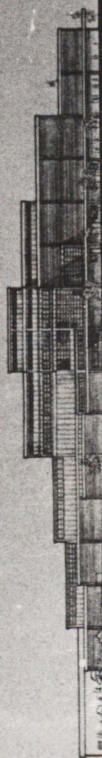
TO MAIN ST
FROM MAIN ST
OFFICE







NORTH ELEVATION



EAST ELEVATION

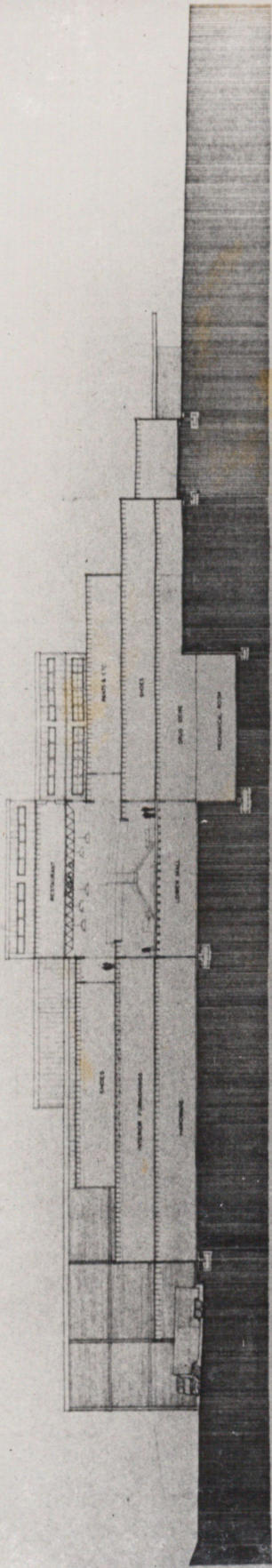


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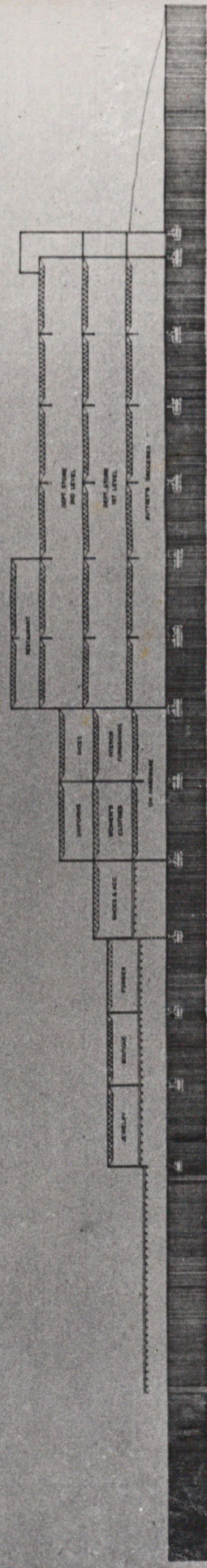


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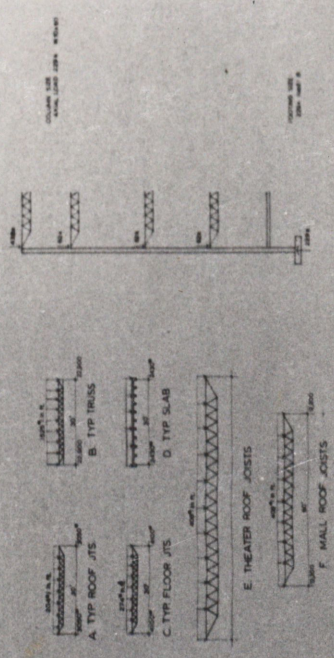
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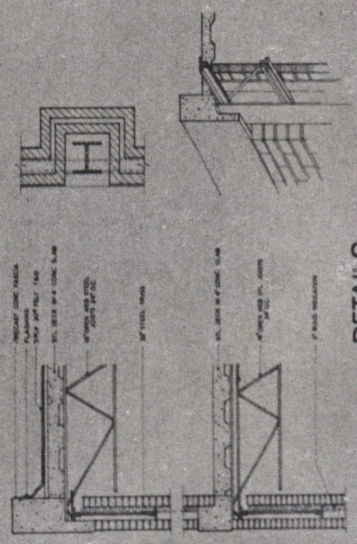
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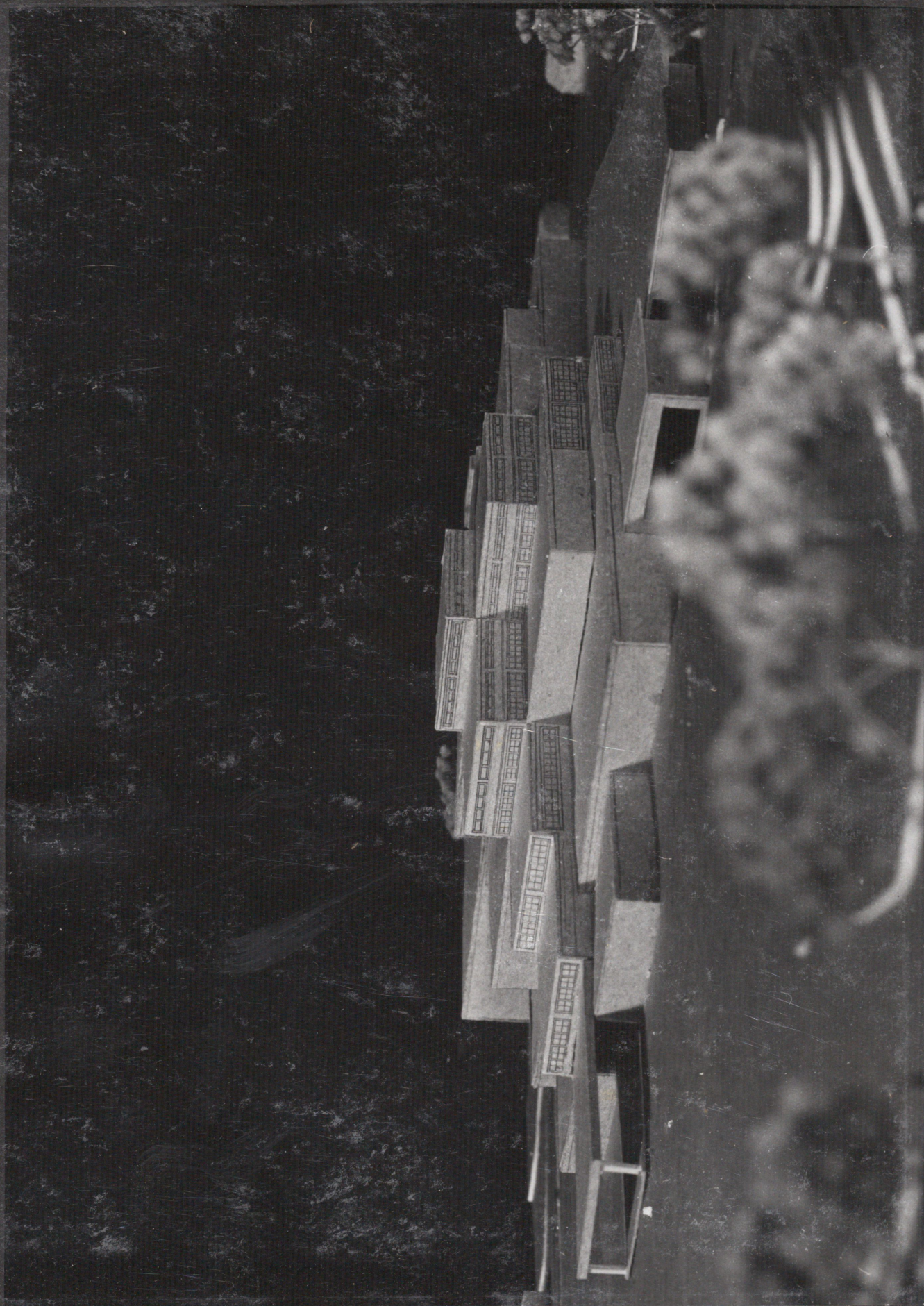
LONGITUDINAL SECTION



LIVE
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