RM LIVINGSTON

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RM LIVINGSTON

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FOR THE DEGREE

OF

BACHELOR OF ARCHITECTURE

BY

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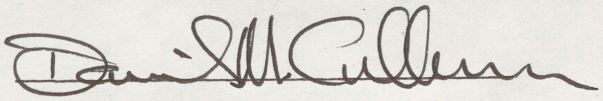
MONTANA STATE UNIVERSITY

BOZEMAN, MONTANA

AUGUST, 1976

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ACKNOWLEDGMENTS

An ability to express my true appreciation toward those who have made this possible will only be realized by the passing of time.

A special love for my Parents and Grandmother who came through with that confidence and understanding when it was most needed. My Wife Melinda, who was always quick with a smile and giving much more and wanting so little, this is for you.

. . . and, me too!

THE CONTENTS

PREFACE	1
THE PAST	2
THE PRESENT	3
THE RIVER	4
THE SITE	5
THE DESIGN	6
CONCLUSION	7
BIBLIOGRAPHY	8

SECTION

1

PREFACE

This thesis stems from an original thought, and that is Montana and its most precious natural resourse: WATER. Developing the potential for the preservation, economic uses, or even aesthetic purposes seemed a natural for the situation in Livingston, Montana. With the presence of the Yellowstone River immediately within grasp, this was the beginning of an idea. This idea grew into many phases which have themselves developed into multiples.

The people of Livingston live so close, yet are so unattached with this situation; imagine - a river flowing outside their back doors.

This thesis is a step to help the people realize the potential for at least one alternative toward an amenity of having the river flow out their front doors!

The direction of this thesis continued to branch and have taken in the consideration of not only the environmental factor of the river, yet

the goals of the people to help them best relate themselves and with this natural resourse.

Another environmental factor came into light as research and experiences grew. The presence of the wind in Livingston is one with un-parallelled potential.

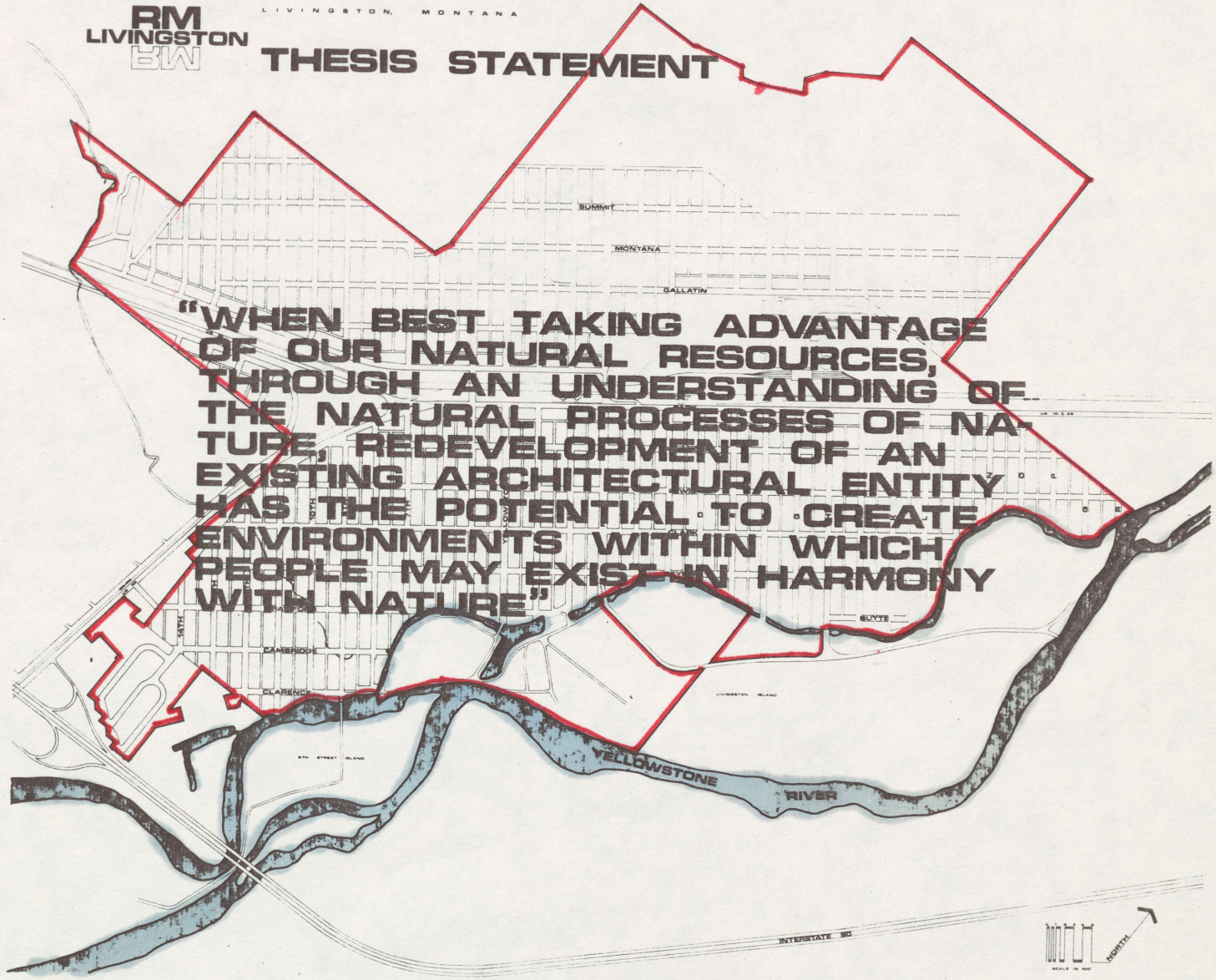
The main objective of this thesis as now understood is to understand the existing conditions and create a situation more conducive toward an enjoyable existance within the community. To create a uniqueness that can become a part of each and every person that experiences this redevelopment is as unique as the criteria it was founded by.

Although portions of the research and development stages were gathered as a joint effort, all the statements, understanding, and conclusions are totally of my belief.

RM
LIVINGSTON
MONTANA

THESIS STATEMENT

"WHEN BEST TAKING ADVANTAGE OF OUR NATURAL RESOURCES, THROUGH AN UNDERSTANDING OF THE NATURAL PROCESSES OF NATURE, REDEVELOPMENT OF AN EXISTING ARCHITECTURAL ENTITY HAS THE POTENTIAL TO CREATE ENVIRONMENTS WITHIN WHICH PEOPLE MAY EXIST IN HARMONY WITH NATURE"



SECTION

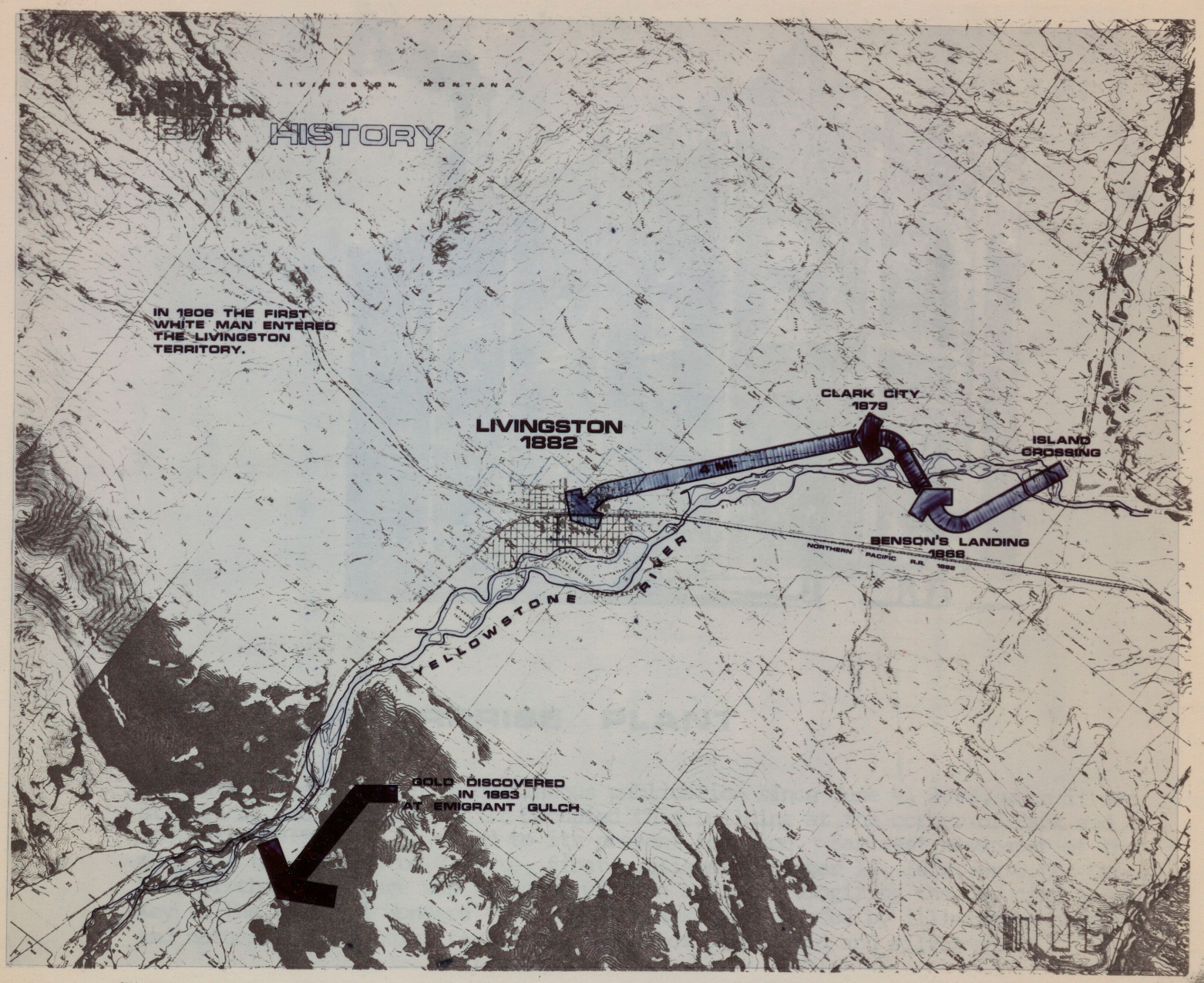
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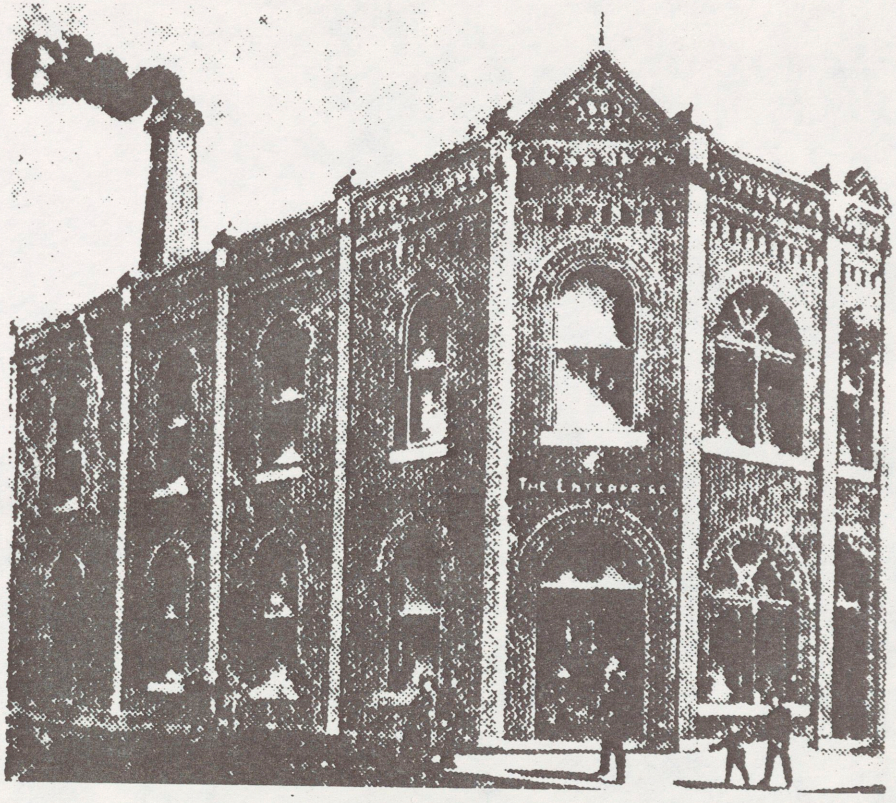
THE PAST

Livingston, Montana was officially founded in 1882, when on December 1 the Northern Pacific Railroad sent out a construction train to begin laying out the town streets. It was not until three weeks later that the plat of the new town was entered in the records of Gallatin County.

Four miles down the river a town had already begun and by the time the railroad had arrived, Clark City had a population of five hundred citizens. There were six general stores, two hotels, thirty saloons and fourteen other businesses.

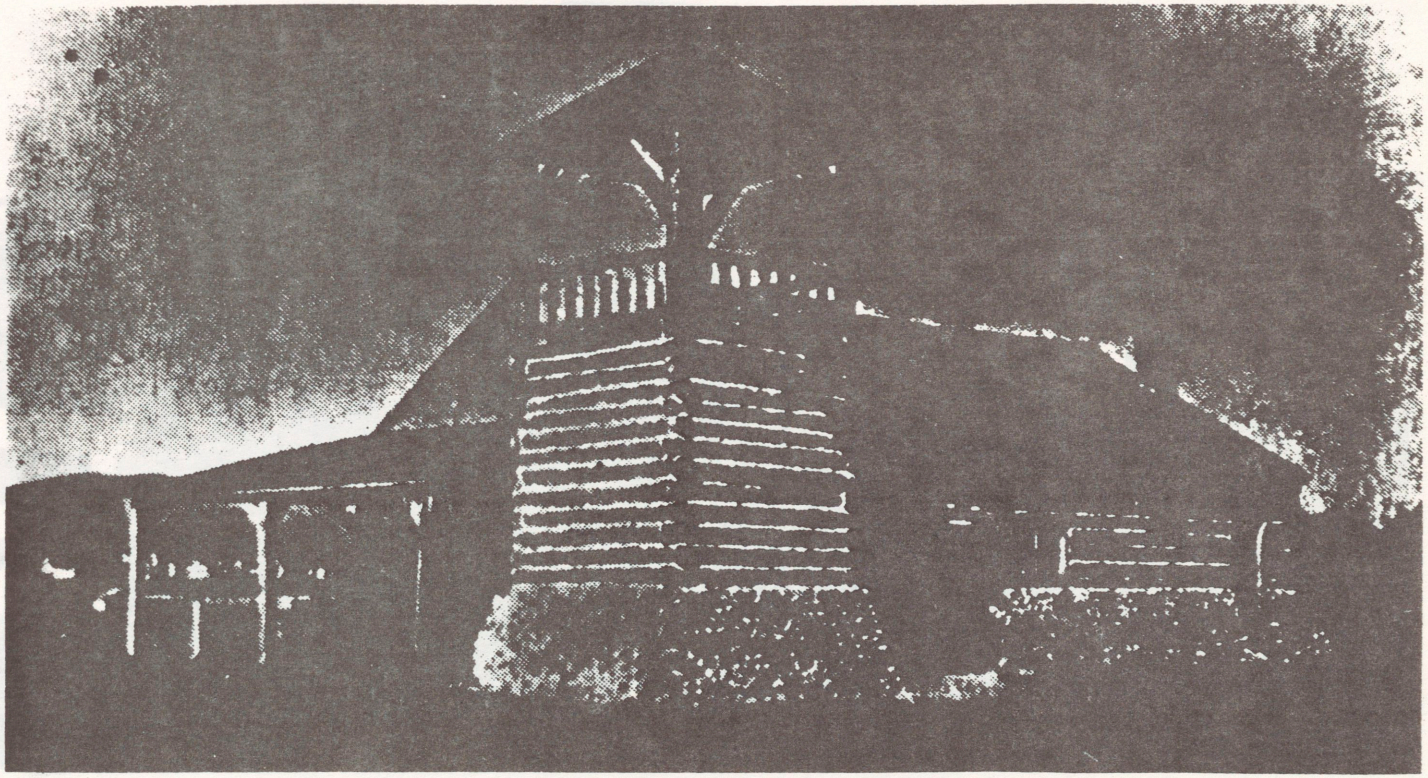
Railroad officials had definite ideas about calling their town "Livingston". It was named after Johnston Livingston, a pioneer Northern Pacific director and the main stockholder in the railroad. After all the streets were laid out most of the people from Clark City moved up river to Livingston.


LIVINGSTON MONTANA
HISTORY
IN 1806 THE FIRST WHITE MAN ENTERED THE LIVINGSTON TERRITORY.
LIVINGSTON
1882
CLARK CITY
1879
ISLAND CROSSING
BENSON'S LANDING
1868
NORTHERN PACIFIC R.R. 1882
YELLOWSTONE RIVER
GOLD DISCOVERED IN 1863 AT EMIGRANT GULCH



THE ENTERPRISE PLANT

The Enterprise has been in continuous publication since June 4, 1883, when it was started by Geo. H. Wright. It occupied this building at the corner of Park and 2nd until 1919, when it moved to its present location. Earliest newspaper of the town was the Livingston Gazette, first published December 19, 1882, by C. A. Carson. Most of the front page was taken up with an article eulogizing the new city as the Key to the World of Wonders (Yellowstone Park), surrounded by illimitable pastures, and natural supply point for mamoth fields of coal, gold and silver mines.



YELLOWSTONE GOLF CLUB HOUSE

Of this club in 1902, Rocky Mountain Magazine said, "The organization has done much for the entertainment of members and visitors and tourists who have availed themselves of the generously tendered use of the clubhouse and the links, which are the best in the West." The site, obviously rural at that period, is packed with residences now. This clubhouse at 124 South 7th, purchased by Ben Smith and remodeled on its location, is now a private residence.



FIRE, DEC. 16, 1913

An alarm turned in by the night clerk of the Park Hotel at 4 a.m. heralded one of the worst conflagrations in Livingston - burning of the Miles block. How firemen and volunteers were able to control it was a wonder, for the wind from the west hurled big chunks of wood as far as two city blocks. As shown, the banking rooms and vaults of the First State Bank remained uninjured, but Dr. S. C. Pierce lost over $600 worth of artificial teeth in his office safe.



CALLENDER STREET, 1912

Confarr's Model T stood in front of his jewelry store. Second awning marked the Grigsby Shoe Store. A Grigsby Shoe Store burned out with the 1904 Post Office block fire which heralded the building of this Park Hotel. The junior partner of the present firm is the fourth generation of Gribsby's in footwear. A century ago, before the days of factory-made shoes, great grandfather was a bootmaker, traveling with his lasts from family to family and making their supply of shoes while he lived with them. Here Jake Malin's Saloon occupied the corner to the left. Joyland was established there in 1925, and in 1951 the Vicars moved in the drugs from the location on south Main, where brothers Lawrence and James first dispensed them from a Viscars Drug Store in 1909.



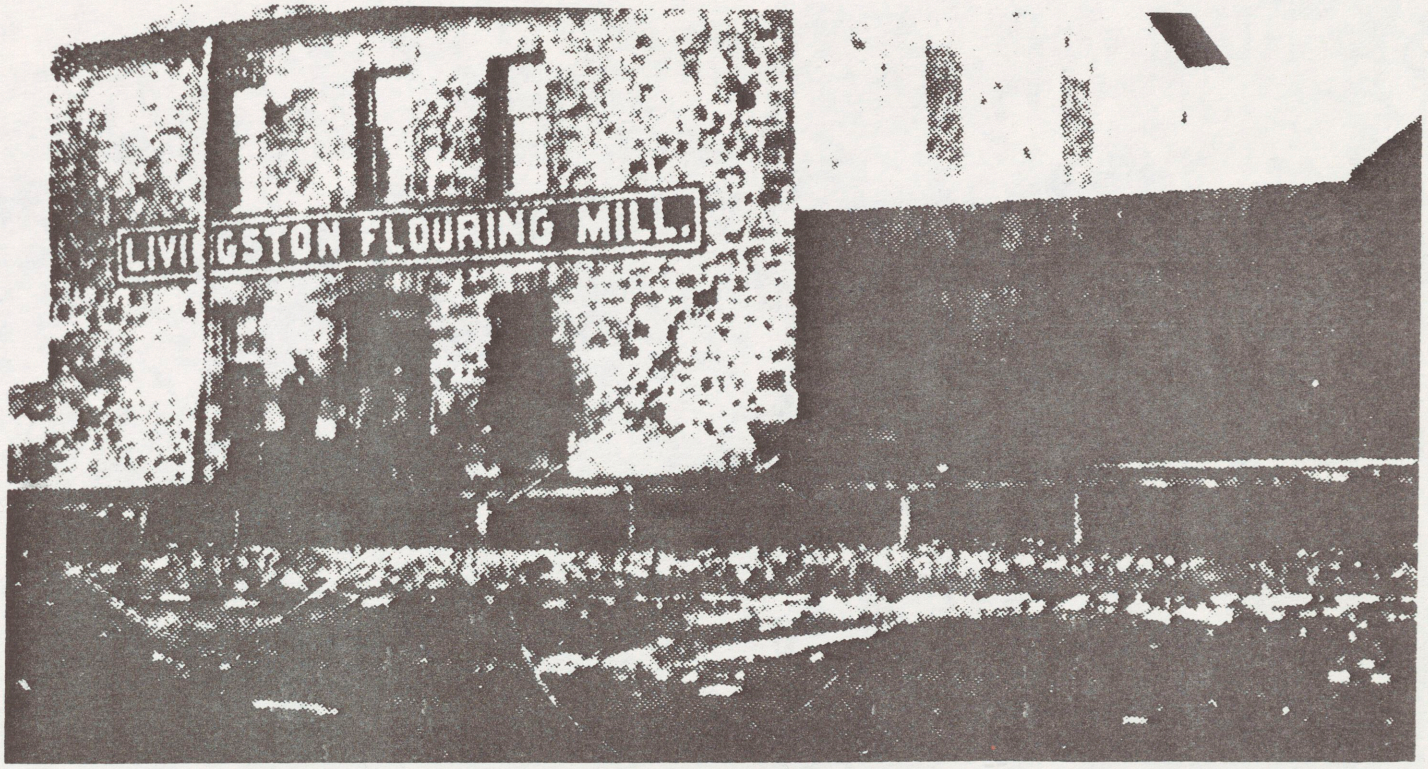
CITY HALL, 1900

In 1896 a $10,000 bond issue was floated to provide this building, which was to house the city offices and the equipment of the Volunteer Fire Co., formed the following year with Pete Nelson as the chief. The City's first fire fighting apparatus was one hand-drawn hose cart, but in 1900 the 28 volunteers had the following equipment: one team, one hose wagon, one set double harness, two hose carts, one complete hook and ladder truck and 2,200 feet of 2 ½-in. cotton hose. Livingston had many disastrous fires in early days. In 1898 note was made that the alarm was given by firing a revolver.



CORNER OF PARK AND MAIN

The most desirable site in early Livingston was occupied by the National Park Bank and the Albemarle Hotel, both among the finest buildings of their kind when erected in 1886. When, during the Panic of 1893, this bank was closed for a few months, Park County was left without a single bank. Notice was made in the paper in 1883 that Vice President Fogarty and Cashier Ward of the First National Bank (one of the first in Livingston) were kept very busy signing the notes of the bank which had arrived about a month after its opening.



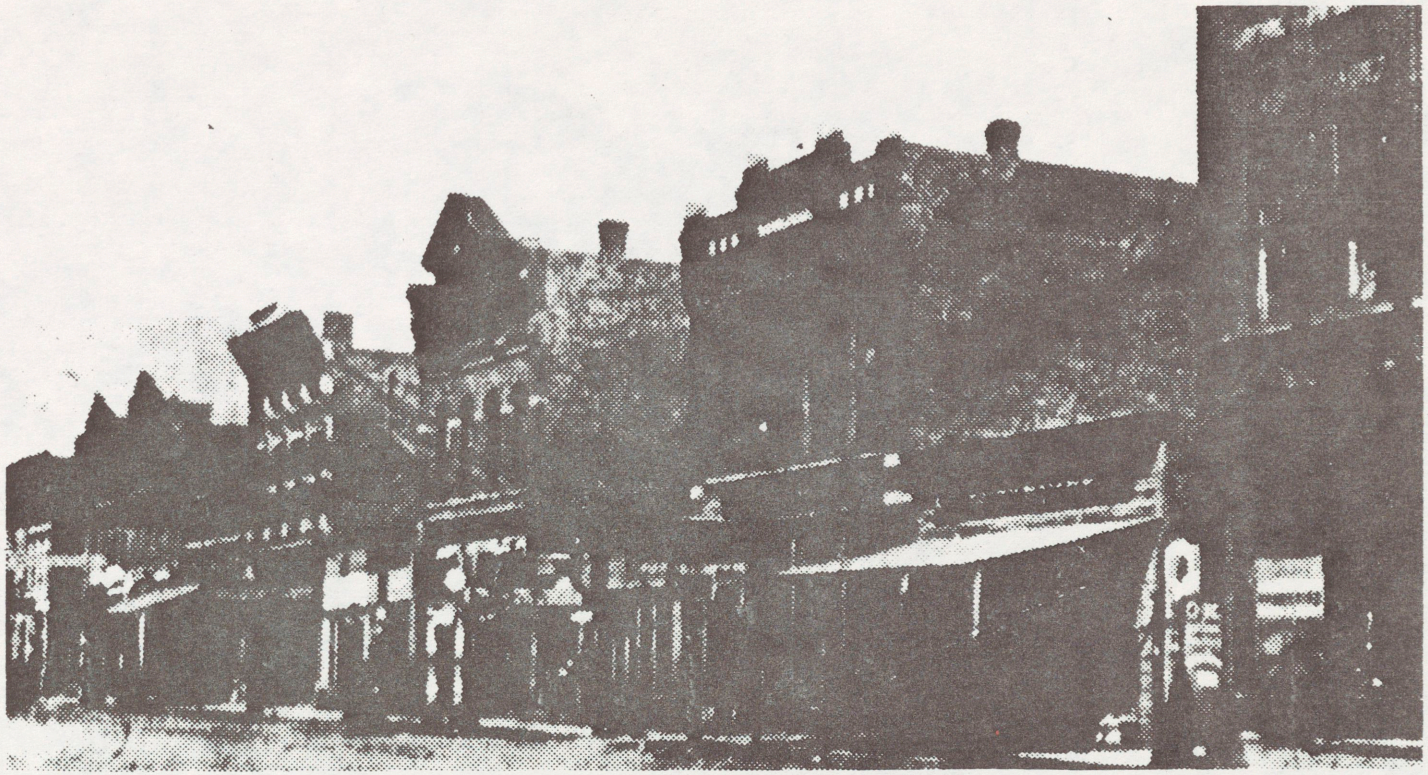
FLOUR MILL, 1900

Built during 1898 of native stone, this building housed the machinery to produce 75 barrels of flour per day. It was operated by a 40-horse electric motor in the days when steam power was the rule. Old Faithful, Yellowstone, Tourist and other brands were products of this mill under the management of A. W. Miles, Wm. Grabow and Frank Huot. In 1919 the Park Milling Company was producing 200 barrels per day of Gateway Flour.



HEFFERLIN OPERA HOUSE

C. S. Hefferlin -- who came to Livingston as ticket agent in 1883, organized the Merchants Bank in 1889, and was identified with such enterprises as the Electric Light Plant and the Livingston Fouring Mill -- constructed "This monument of beauty, convenience and comfort to the pleasure-loving public" in 1892. Among the many noteworthy programs staged here was a concert by the master musician John P. Sousa and his entire band in October, 1902. The building also housed the bank and telephone exchange.



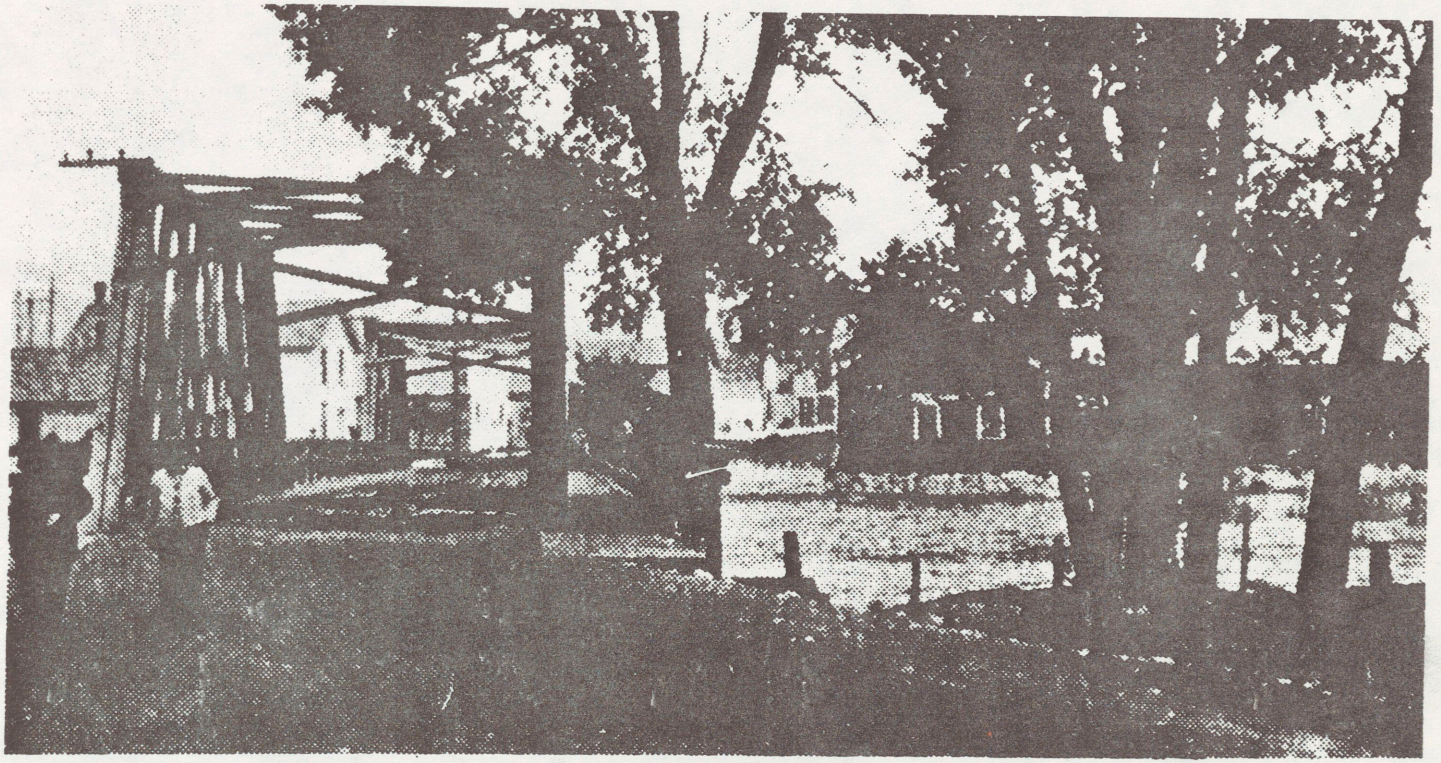
EAST SIDE OF NORTH MAIN, 1900

A look at this street today will show how many of these substantial brick structures still stand with the same facade. Fourth tall building from the right still bears a "Frank Clothing" sign, oldest business name to have stayed in Livingston, though without the Frank family. The first issue of the enterprise carried the news that Henry Frank, who moved from Clark City, shipped a stock of clothing to Cooke City. Farthest right of the stores was that of the three Hefferlin brothers who stocked groceries and dry goods. In 1898 and 1899 they established stores at Frideley and Trail Creek and carried on a mail order business. They had mining interests on the Boulder and at Castle.



WEST SIDE OF NORTH MAIN, 1900

The building to the left housed the extensive stock which the three Thompson brothers carried in groceries, dry goods and household furnishings. They also owned the Albemarle Hotel at that time. Along this street was Potter's Photographic Gallery. Midway in the area shown is the location where progress clothing was started. In 1914 Charles Landes started his clothing business and conducted for 35 years. It was in 1904 when cement sidewalks were built along here; ten years later the street was paved. Along this street 20 negro troopers from Ft. Missoula, bicycling to St. Louis, stopped in 1897 during their 4,000-mile round trip.



MAIN STREET BRIDGE, 1900

You are looking north across the bridge which, with Harvat's, accommodated all the traffic into town from the east. The Yellowstone here was carrying the main channel of water; now only a trickle of water goes through this route. Such small clearance was there between the bridge and the water that on an occasion when Dr. F. M. Nelson's horse ran away on Yellowstone Street and carried the buggy into the river, the seat of the buggy was knocked off as it floated under the bridge. The bridge was redecked and replaced many times. In 1919 there was located at the foot of the bridge a campground so attractive that tourists named it "Linger Longer".

SECTION

3

THE PRESENT

Livingston is located in southcentral Montana, forty-five miles north of Yellowstone Park. It is the county seat of Park County, much of which is devoted to farming, ranching, lumber production and recreation.

Today, Livingston is a modern community comprised of a hospital, a radio station, newspapers, churches, many industrial and commercial interests and two other natural features which can be classified as being potentially unique; the Yellowstone River and the presence of a constant wind. All of these variables are essential toward the development of the area.

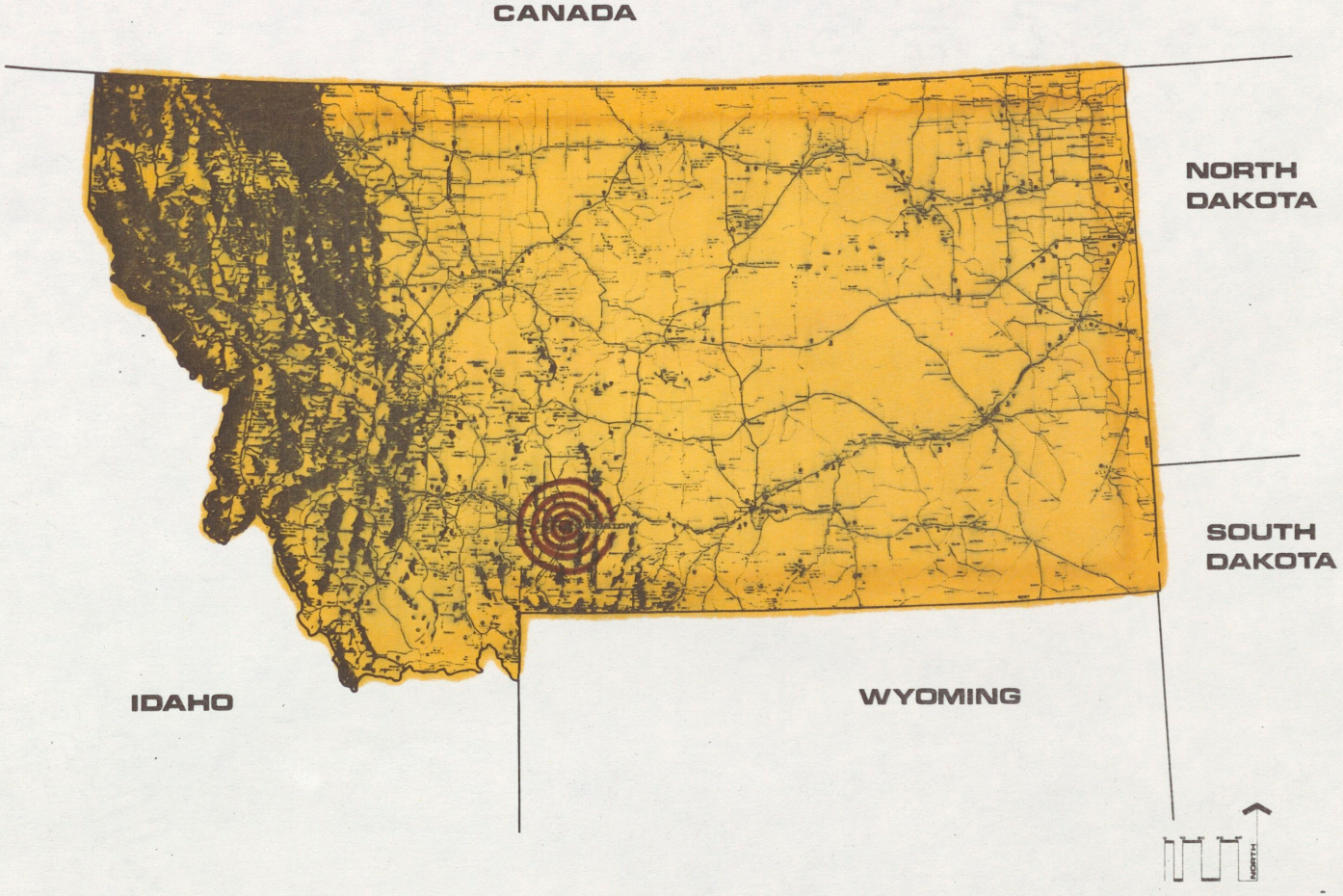
The growth of Livingston and Park County is depicted graphically in the following pages. Livingston, being the major urban center of the county, showed steady growth in population up to 1960 at a rate approximating that of the state. The most rapid

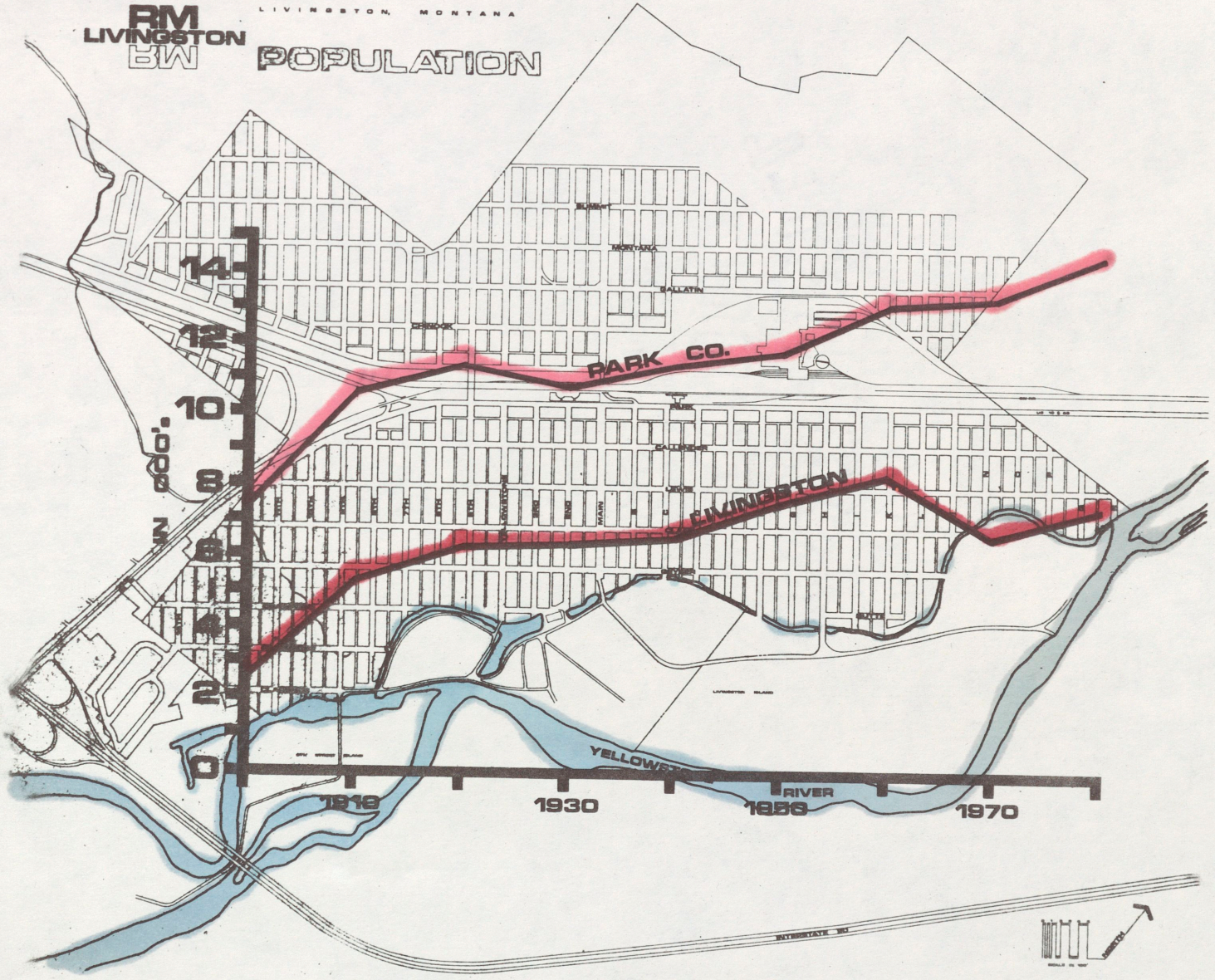
period of growth occurred between 1900 and 1910. Then, Livingston increased proportionately to the county until 1950. Since that time Livingston has shown decline, due not to a decrease in the rate of urbanization in the total county, but to an increase in suburban residential growth outside and adjacent to the city. With prosperous times returning to the community, a fresh outlook as toward it's progressive development is enevitable.

RM LIVINGSTON

LIVINGSTON, MONTANA

STATE MAP




RM
LIVINGSTON
LIVINGSTON, MONTANA
POPULATION
14
12
10
8
6
4
2
0
000's
PARK CO.
LIVINGSTON
YELLOWSTONE RIVER
1910
1930
1950
1970

RM LIVINGSTON

LIVINGSTON, MONTANA

RECREATION

FISHING ACCESS AREAS

1 MALLARD'S REST
2 LOCH LEVEN
3 PARADISE
4 EMIGRANT
5 DAILY LAKE
6 CORWIN SPRINGS
7 LINK TRACT
8 BIGHEP MOUNTAIN
9 GREY BEAR
10 NATURAL BRIDGE
11 BOZEMAN POND
12 CAMERON BRIDGE
13 FOUR CORNERS
14 THREE FORKS GRAVEL PITS
15 WILLIAM BRIDGE
16 CARDWELL
17 HARRISON LAKE
18 GREYCLIFF
19 MEADOW LAKE
20 VALLEY GARDEN
21 ENNIS
22 EIGHT MILE FORD
23 BURNT TREE HOLE
24 VARNEY BRIDGE
25 RAMSHORN

POINTS OF INTEREST

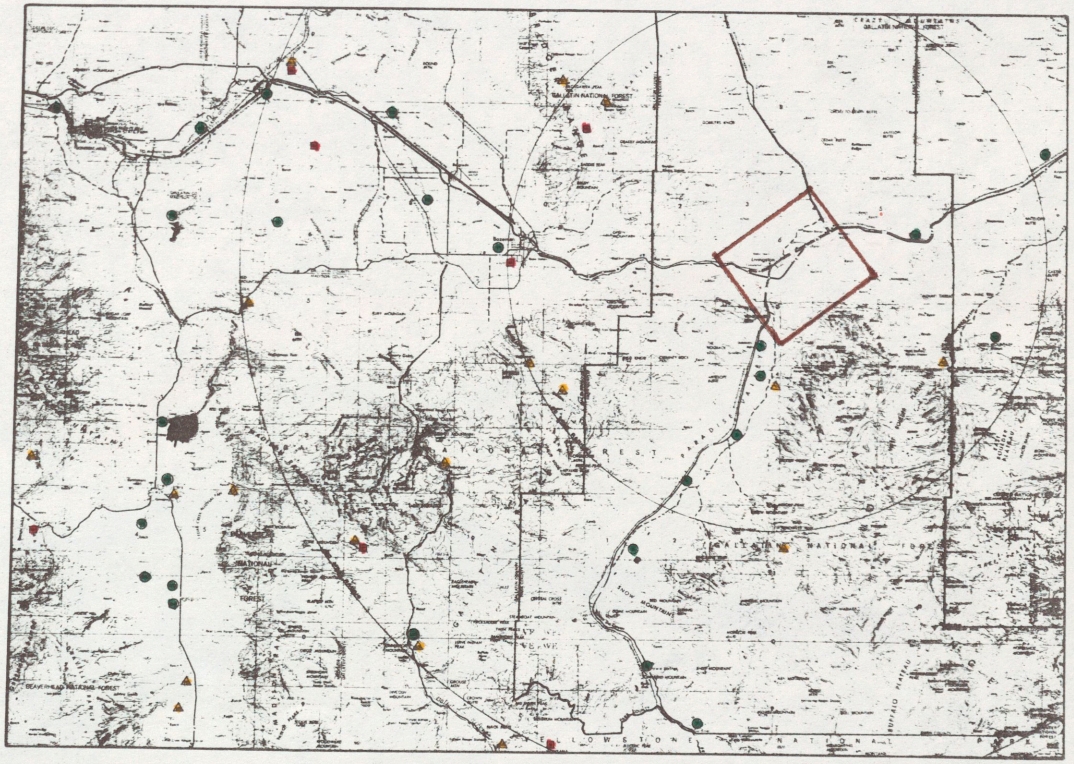
1 LEWIS & CLARK CAVERNS
2 VIRGINIA CITY
3 YELLOWSTONE PARK
4 BRIDGER BOWL (SKIING)
5 MISSOURI RIVER HEADWATERS
6 MADISON RIVER BUFFALO JUMP
7 BIG SKY, MONTANA
8 MONTANA STATE UNIVERSITY

RIVERS, LAKES & STREAMS

MINING CAMPS

CAMPGROUNDS

1 PINE CREEK
2 SNOWBANK
3 CHIPPY PARK
4 HICKS PARKS
5 BATTLE RIDGE
6 FAIRY LAKE
7 LANDOR
8 HOOD CREEK
9 SPIRE ROCK
10 GREEK CREEK
11 SWAN CREEK
12 BIG SKY
13 RED CLIFF
14 SPECIMEN CREEK
15 SOUTH MADISON
16 RUBY CREEK
17 JACK CREEK
18 ENNIS
19 MILL CREEK
20 RED MOUNTAIN
21 POTOSI
22 LEWIS & CLARK
23 HEADWATERS



SECTION

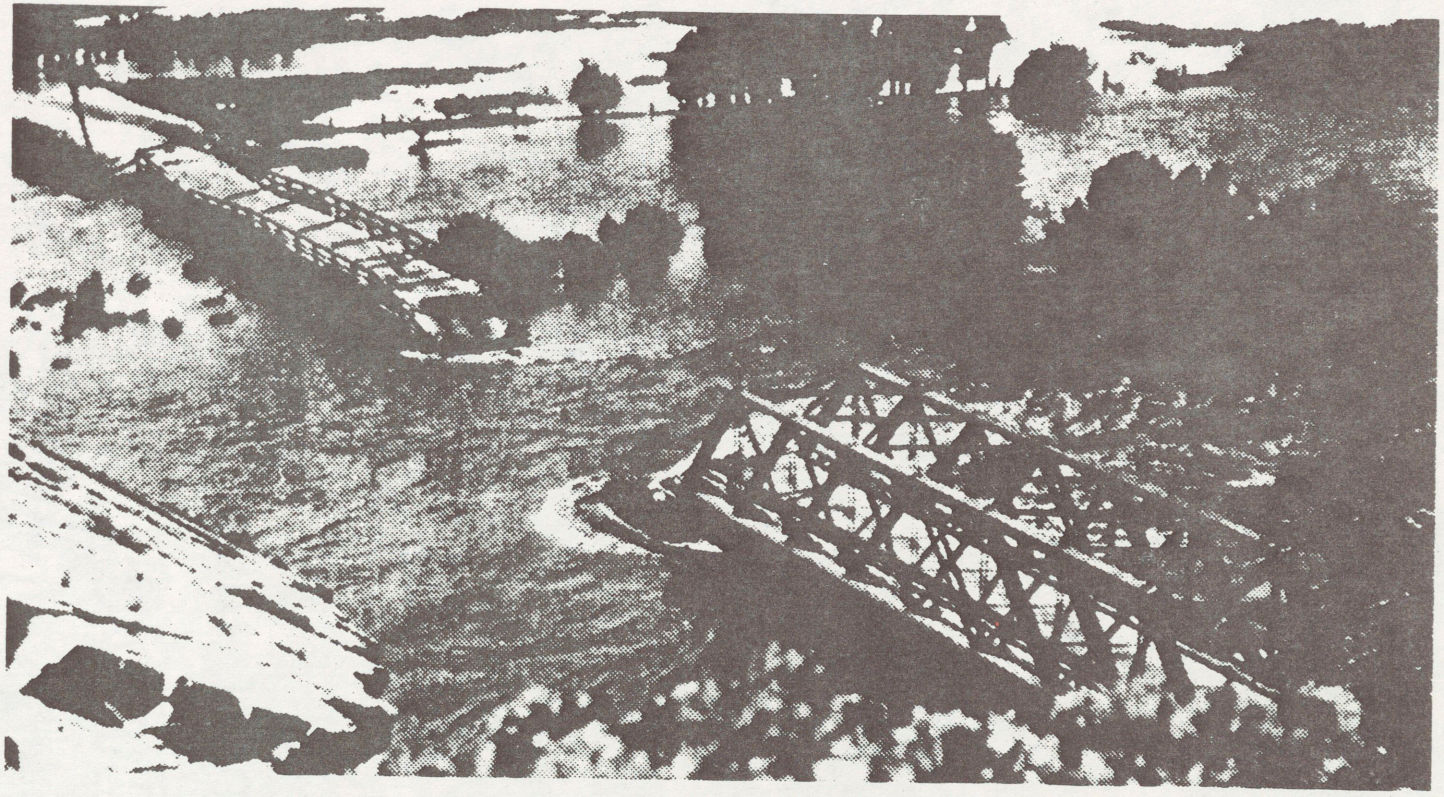
4

THE RIVER

The Yellowstone River has a length of 440 miles. The basin has a maximum width of 320 miles and an area of 70,400 square miles; which includes much of northcentral Wyoming, southeastern Montana, and a small portion of western North Dakota. It is bounded by the Rocky Mountains on the west, the Missouri Basin on the north, the Little Missouri and Cheyenne Basins on the east, and the Platte Basin on the south. The river has four major tributaries and numerous minor tributaries.

The authorized comprehensive plan for flood protection for the Yellowstone River Basin consists of thirty-one reservoirs; seven of the reservoirs are completed and in operation.

The name Yellowstone comes from a combination of tongues. The Indians called it Mi-tsi-a-da-zi or Rock Yellow River. French fur trappers used the name Roche Jaune or Pierre Jaune which means Yellow Rock or Yellowstone.



HIGH WATER, 1918

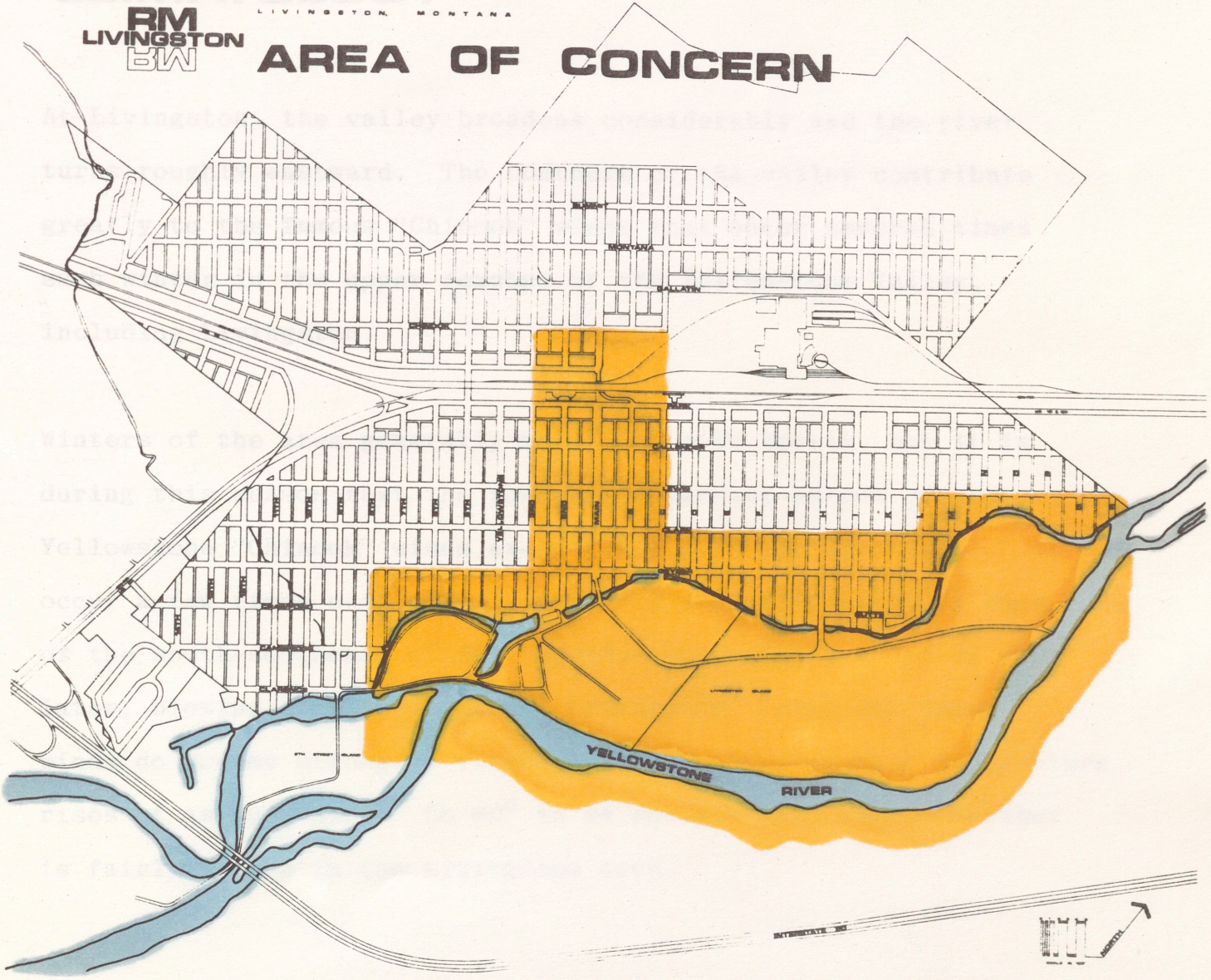
This washout of the $15,000 Harvat Bridge occurred on June 17. By it and a washout six or eight feet deep on the road between Springdale and the Springdale Bridge, the Mission Country was entirely cut off from Livingston.

SECTION

5

THE SITE

The site is located on the southeast end of Livingston, it consists of the Livingston Island and Main Street from Park Avenue to Geyser Street. Included is the surrounding areas effected by these basic set parameters. See map on the following page, and in the succeeding pages are visual graphics of the site conditions.


RM
LIVINGSTON
RM
LIVINGSTON, MONTANA
AREA OF CONCERN
MONTANA
BALLATIN
YELLOWSTONE
RIVER
NORTH

CLIMATOLOGY

At Livingston, the valley broadens considerably and the river turns roughly eastward. The contours of the valley contribute greatly to the famous "Chinook" winds that occur several times each winter in the upper reaches of the Yellowstone Valley, including Livingston.

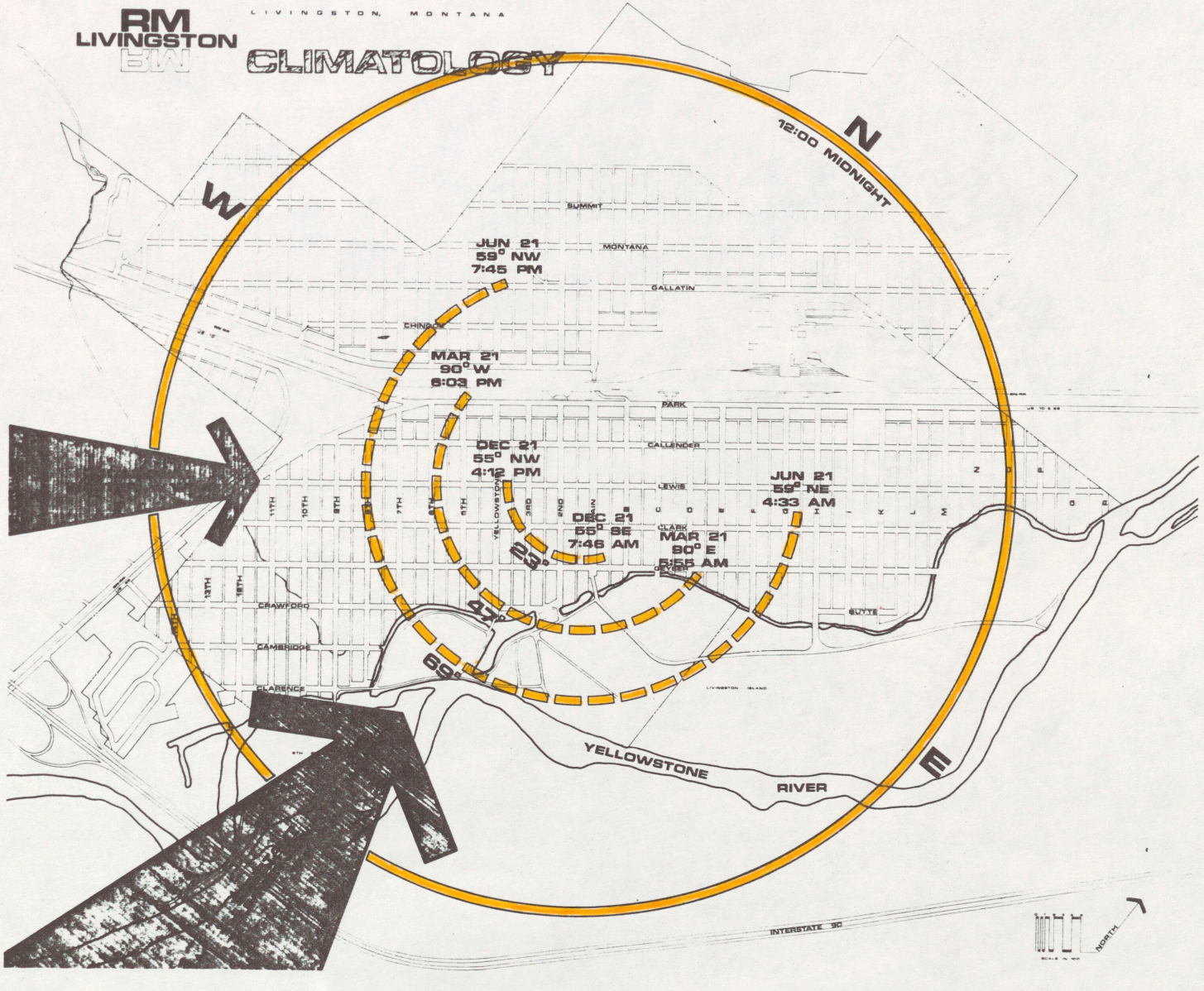
Winters of the area generally have some cold spells, but it is during this season that the remarkable warming effect of the Yellowstone "Chinook" winds are noted. Cold air invasions occur a few times each winter, but they are short-lived in face of the south-southeast winds that develop, usually a day or two later, blowing downstream passed Livingston. Although these winds do become strong at times, they sometimes produce temperature rises of as much as 50^{o} to 60^{o} in 24 hours. Mild winter weather is fairly common in the Livingston area.

Annual snowfall is not very large and due to the frequent winter "Chinooks", snow seldom lays on the ground for more than a few days at a time.

RM
LIVINGSTON
BM

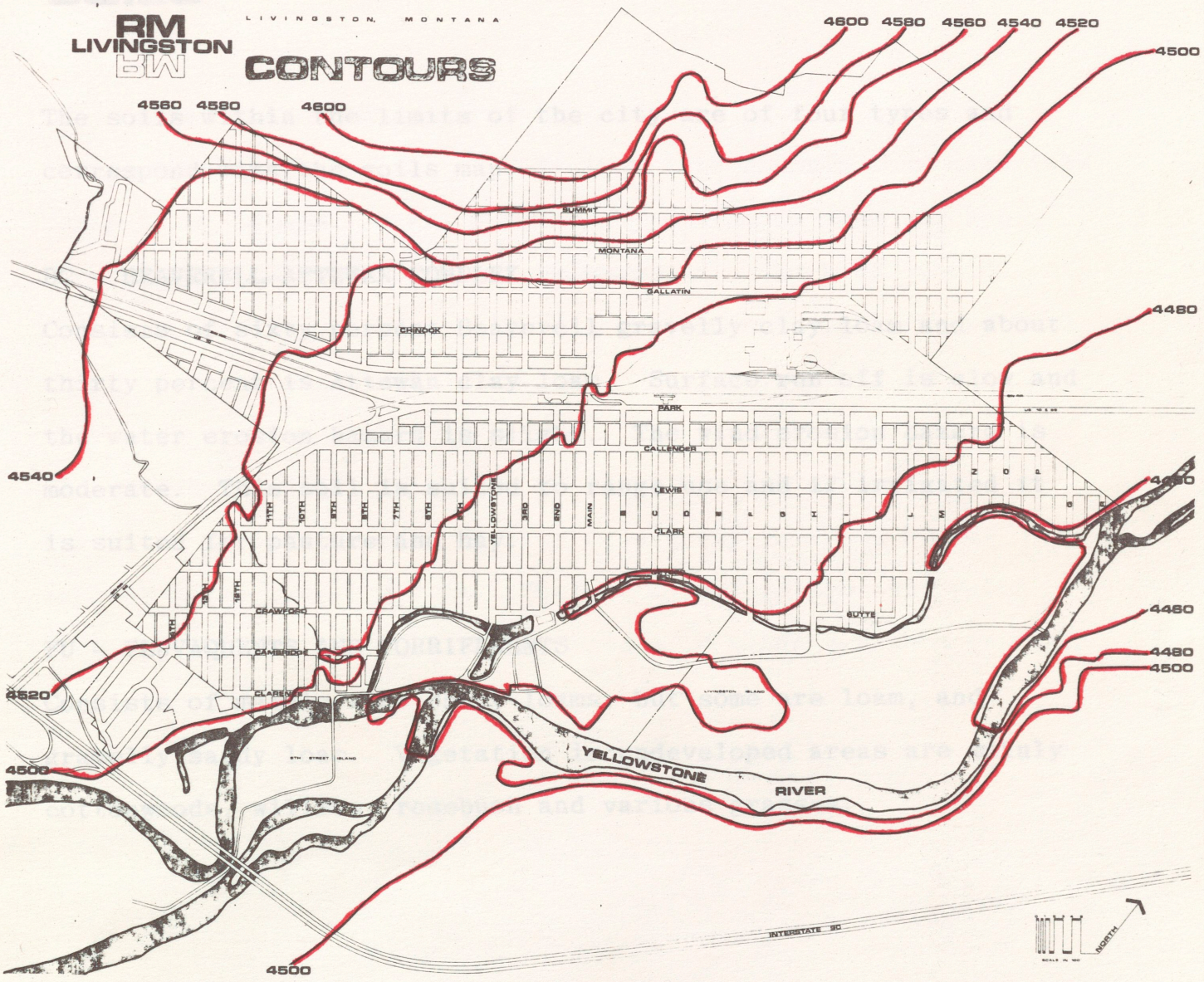
LIVINGSTON, MONTANA

CLIMATOLOGY



CONTOURS

Due to the availability of adequate maps only twenty-foot contour intervals are shown. There is a sharp eighty-foot drop in elevation on the west-northwest side of the city from Summit to Park Street. Then it flattens out with only a forty-foot drop from Park Street to the Yellowstone River.


RM
LIVINGSTON
LIVINGSTON, MONTANA
CONTOURS
4600 4580 4560 4540 4520
4500
4580 4580 4600
4480
4540
4480
4480
4520
4480
4500
4500
SUMMIT
MONTANA
GALLATIN
CROOK
PARK
CALLENDER
LEWIS
CLARK
MAIN
YELLOWSTONE
CRAWFORD
CAMBRIDGE
CLARENCE
BUTTE
LIVINGSTON ISLAND
8TH STREET ISLAND
YELLOWSTONE RIVER
INTERSTATE 90
NORTH

SOILS

The soils within the limits of the city are of four types and correspond with the soils map.

BC - BEAVERELL-ATTEWAN COMPLEX

Consists of sixty percent Beaverell gravelly clay loam and about thirty percent is Attewan clay loam. Surface run off is slow and the water erosion hazard is slight. The wind erosion hazard is moderate. This soil is suited to range use and if irrigated it is suited for pasture and hay.

FU - FLUVAQUENTS AND TORRIFLUENTS

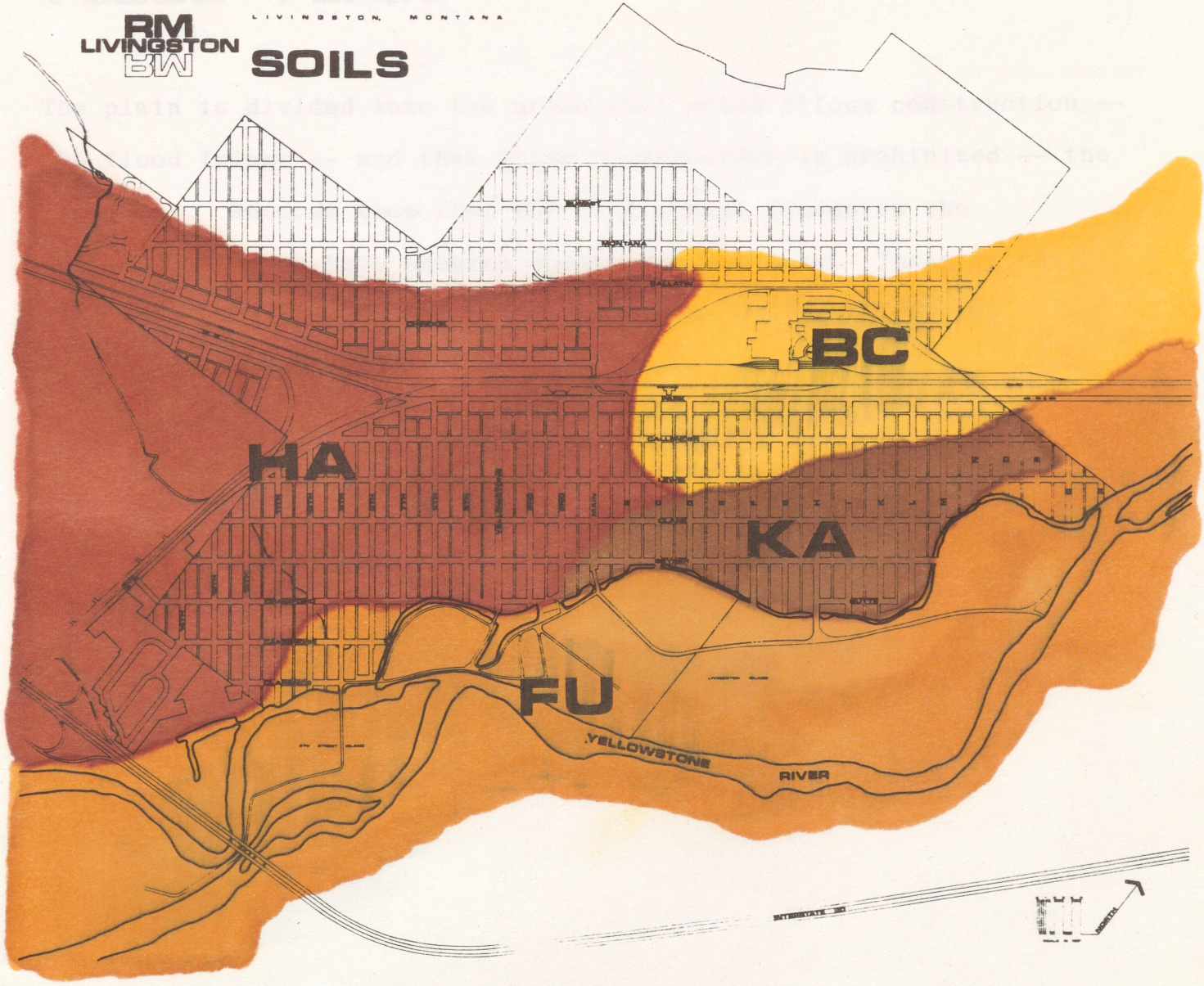
Consists of mainly fine sandy loams, but some are loam, and gravelly sandy loam. Vegetation in undeveloped areas are mainly cottonwoods, willows, rosebush and various grasses.

HA - HARLEM CLAY LOAM

The surface layer is loam or clay loam with gravely loam materials below forty inches. Surface runoff is medium or slow and the water erosion hazard is slight or moderate. The wind erosion is moderate. It is suited mainly to irrigated hay, pasture and small grain.

KA - KIWANIS-RIVERA

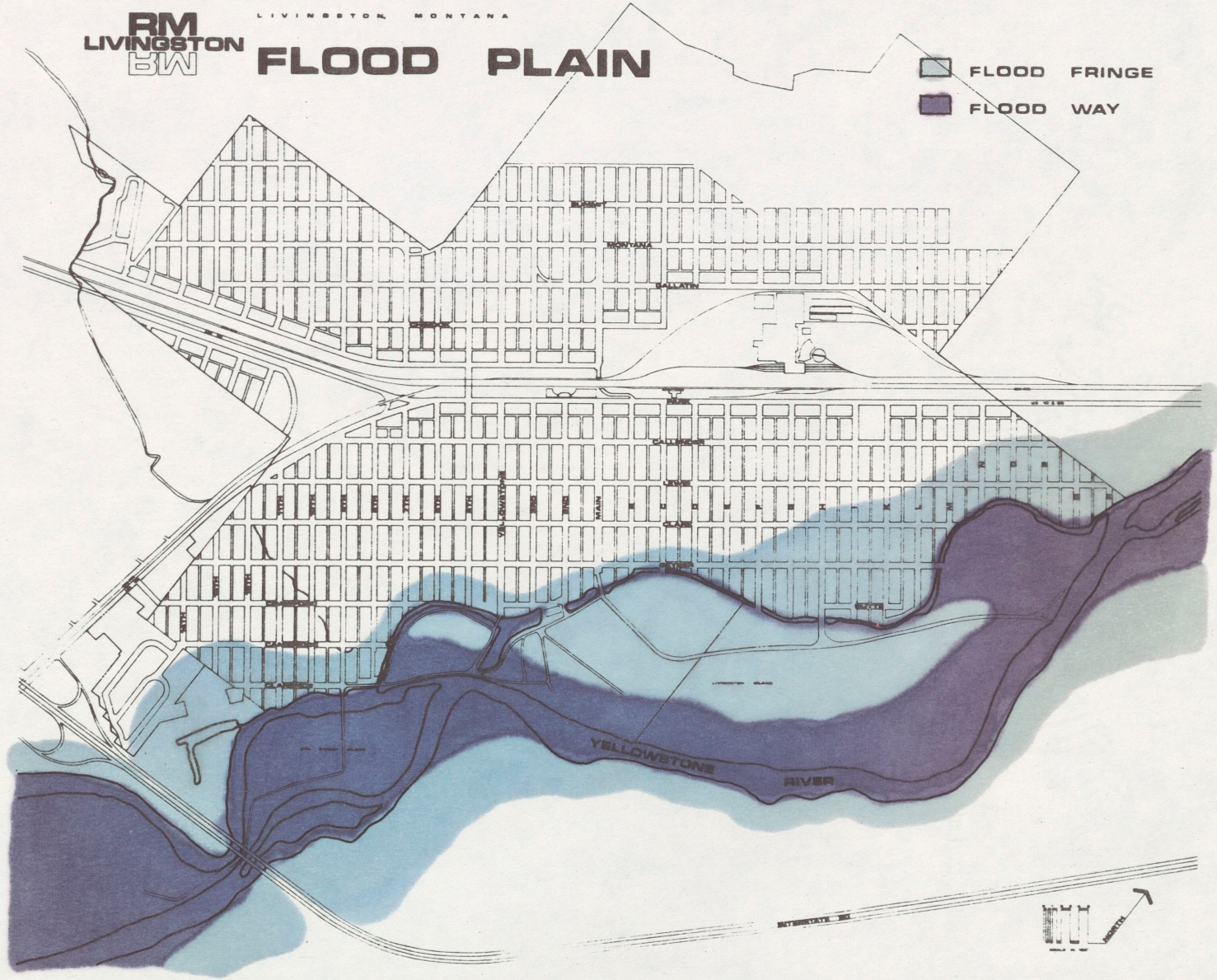
Consists of sixty percent Kiwanis fine sandy loam and thirty percent Rivra gravelly loam. Surface runoff is slow and water erosion is slight. It is suited mainly to range and tame pasture.


RM
LIVINGSTON
LIVINGSTON, MONTANA
SOILS
BC
HA
KA
FU
YELLOWSTONE
RIVER

FLOOD PLAIN

The plain is divided into two areas that which allows construction -- the flood fringe -- and that which construction is prohibited -- the flood way. Records show that the peak annual floods on the Yellowstone River have occured during May and June. These floods have been historically due to mountain snow melt supplemented in part by rainfall.




RM
LIVINGSTON
MONTANA
FLOOD PLAIN
FLOOD FRINGE
FLOOD WAY
MONTANA
BALLATIN
MAIN
CALLENDER
MAIN
YELLOWSTONE
RIVER
NORTH

ARTERIAL STREETS

The streets are classified according to the transportation and service functions they perform.

FREEWAY

Provides for efficient movement of large volumes of through traffic between communities and regions.

PRIMARY

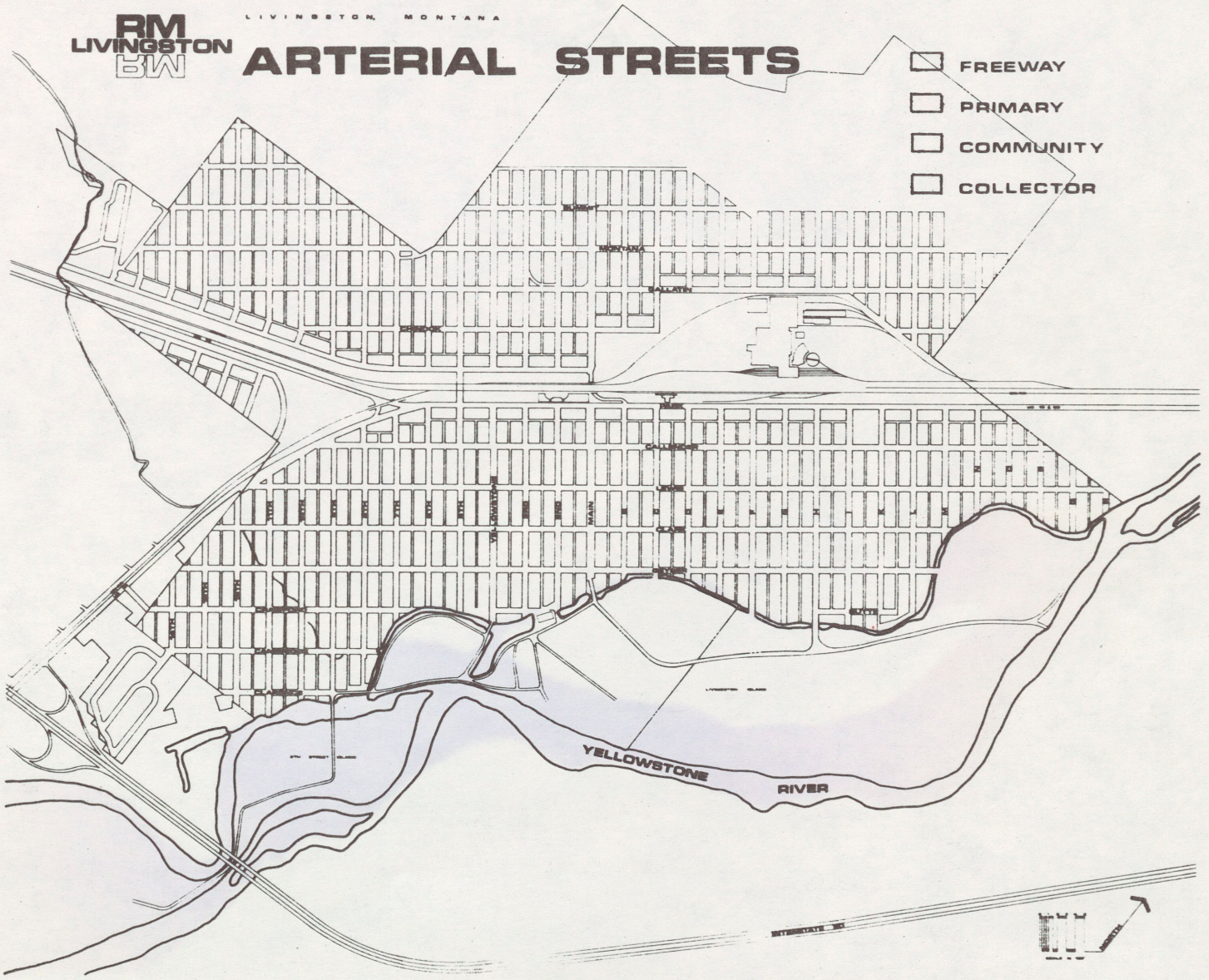
Provides for through traffic movement to and around the city along with connecting major highways and freeways.

COMMUNITY

Provides for movement within and through the city.

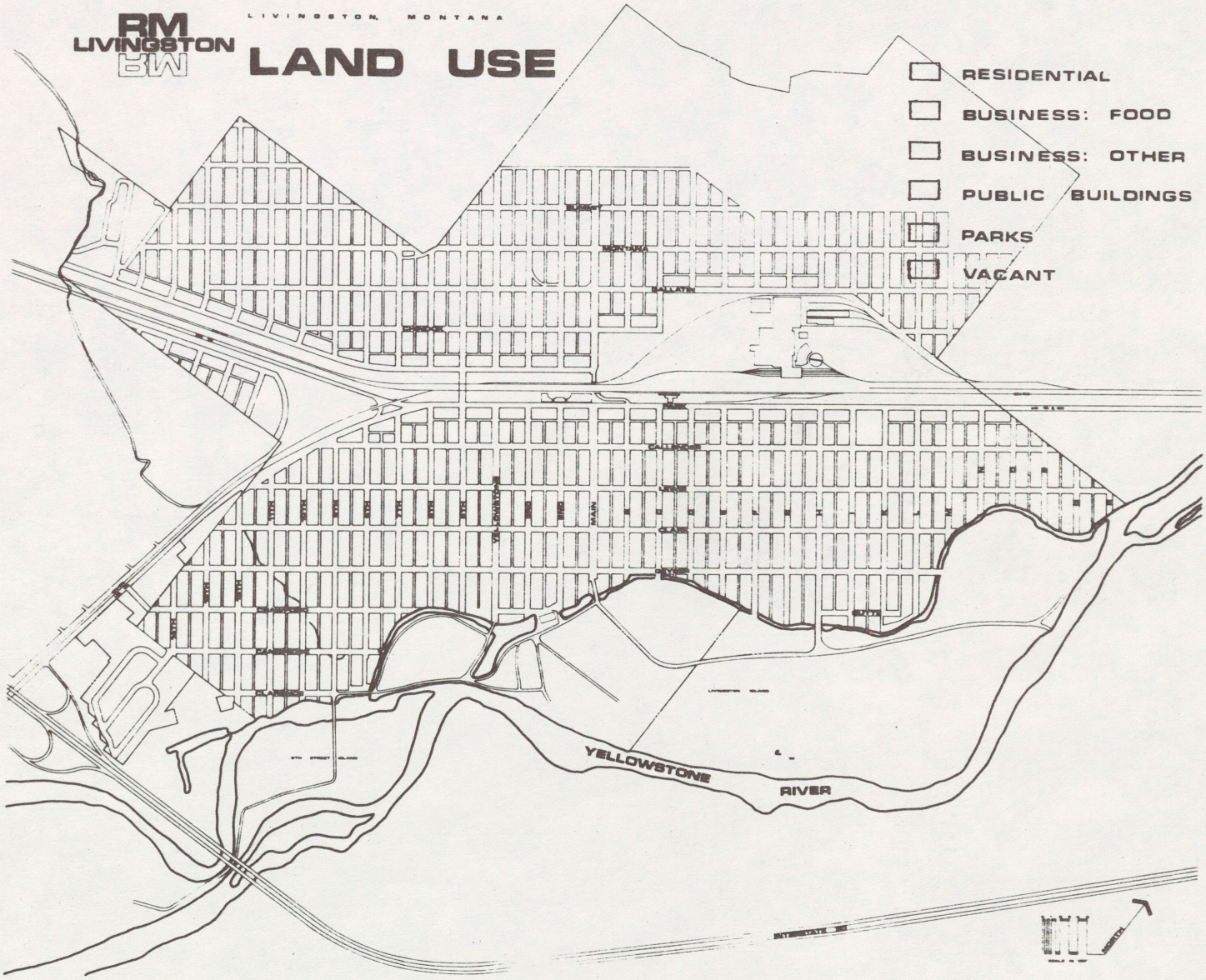
COLLECTOR

Provides for traffic movement between arterials and local streets, also provides access to abutting property.


RM
LIVINGSTON
BW
LIVINGSTON MONTANA
ARTERIAL STREETS
FREEWAY
PRIMARY
COMMUNITY
COLLECTOR
MONTANA
CALLENDER
MAIN
YELLOWSTONE
RIVER

LAND USE

Land use is the key element of planning for Livingston. It translates the goals and objectives developed by the planning board into a general guide for future development. It guides public development by locating areas where utilities and services will need to be extended in the future and by establishing the types of intensities of development in those areas. Although land use planning is primarily physical planning, the goals are often social, and range from values of health, safety, welfare and beauty.


RM
LIVINGSTON
BW
LIVINGSTON, MONTANA
LAND USE
RESIDENTIAL
BUSINESS: FOOD
BUSINESS: OTHER
PUBLIC BUILDINGS
PARKS
VACANT
MONTANA
CALLATIN
MAIN
YELLOWSTONE
RIVER
NORTH

SECTION

6

THE DESIGN

A redevelopment of the existing conditions in Livingston can be broken down into several catagories. Upon the following pages exist various facits of the total project. The Overall Redevelopment Plan for the downtown and the Livingston Island presents the whole picture. It is from this master plan that the main emphasis of the thesis work exists. The redevelopment of the downtown area, the redevelopment of the Island, the introduction of the golf course and the work done toward the development of the wind resourse are depicted individually.

The main objectives of this thesis are as follows:

To create in the Mall Area a well-defined urban setting in scale with the needs of the pedestrian and organized around a compact effective commercial core.

To provide a circualtion pattern that will permit traffic with destination in the Mall Area to reach it and circulate within it easily and without conflicts, and traffic with destination beyond the Mall area to bypass it without creating congestion or hazard.

To provide for adequate and properly located parking facilities to that people coming to the Mall Area by car may reach their destination most conveniently.

To create for the Mall Area a definite sense of place and identity by developing interesting focal points and a well defined and coordinated urban organization and scale.

To enhance and take advantage of the natural physical features adjacent to the Mall Area by making them a part of the man-made physical environment.

To retain and strenghten as much as possible the existing urban elements public and private, that constitute a major investment in physical assets.

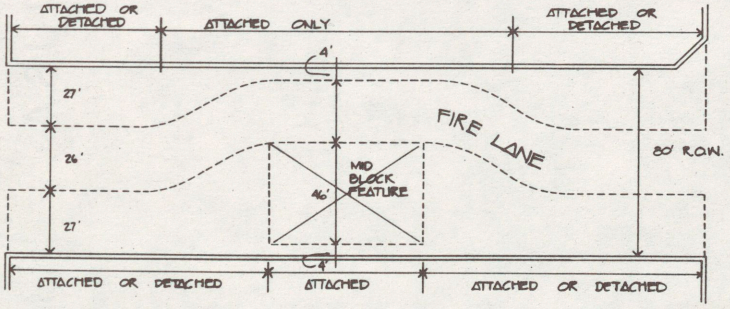
To preserve, whenever possible, existing structures and clusters of buildings which have historic or architectural significance and to attempt to give a visual variety of character to the area by the proper planning of new structures.

To provide a greater variety of residential accommodations and amenities within and adjacent to the area of concern and the Mall.

MAIN STREET
PARK STREET
10 LOUIS
TURQUOISE CONNECTION
THIEF OF BAGHDAD
YELLOWSTONE FLORIST
THE STOCKMAN
FOX
BOB'S ARMY
NEW GRAND
PRANS
ART GALLERY
JAY'S CAFE
THE MINT
THE PASTIME
ROBIN'S - BUY STORE
BRANDING IRON
COAST TO COAST
WARDS
VOGUE STORE
LIVINGSTON DRUG
EMPIRE FEDERAL
SEARS
ROY'S GROCERIES
CHANEY'S
LIQUOR STORE
MAX'S UPHOLSTERY
ZENITH RADIO
PARCO NEON
C.P. ELECTRIC
ROCKY MTN. PRINTING
ADMIRAL TV
WELDING
FARMERS GLASS
NEVIN'S
MOTOR SUPPLY
SENIOR CITIZENS CORPORATION
MONTANA MOTOR
MOOSE LODGE
ENTERPRISE
LIVINGSTON LANES
BUSES
HOUSE
WESTERN AUTO
CITY DRUG
UNITED AGENCIES
TROWERS DRUG
MOOSE A' DAY
EASTERN
SPORT
CANDY FOUNTAIN
ANTHONY'S
GAMBLES
LIVINGSTON FLORISTS
BEN FRANKLIN
NORTH
0 10 30 70 FEET

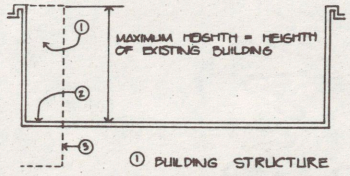
SAMPLE RESTRICTIONS FOR PRIVATE DEVELOPMENT ON THE MALL

AREAS ALLOWING PRIVATE DEVELOPMENT

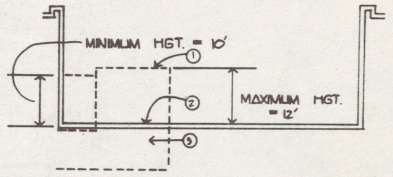


TYPICAL BLOCK

ATTACHED

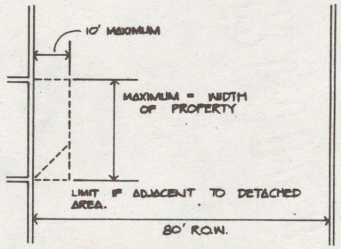


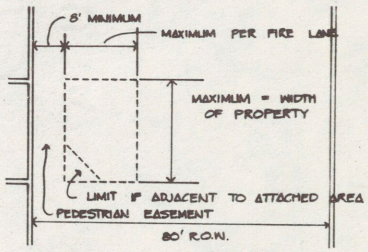
DETACHED



① BUILDING STRUCTURE
② RESTRICTED SURFACE USE
③ OPEN BASEMENT

MALL SECTIONS





MALL PLANS

MALL SITUATIONS

SIGNS

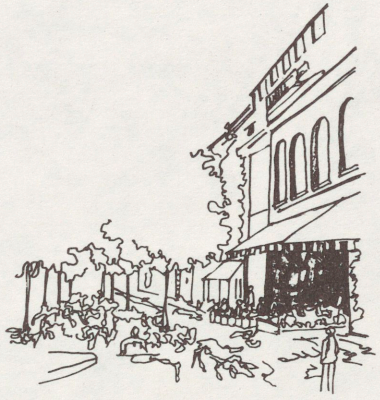


BEFORE

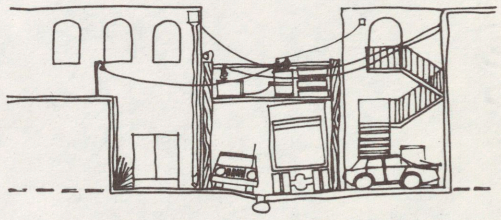


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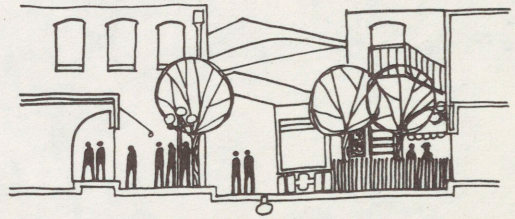
CAFE



ALLEYS



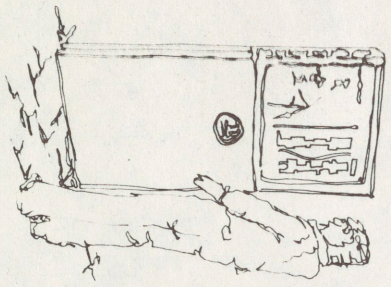
BEFORE



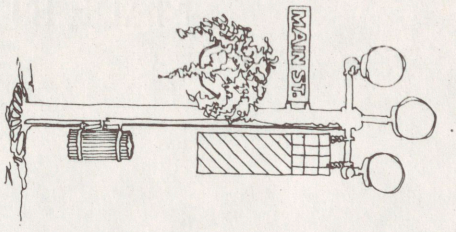
AFTER

MALL FEATURES

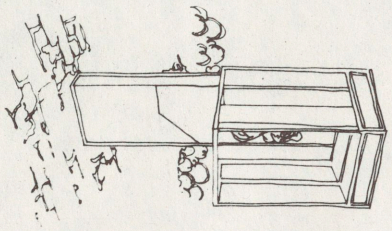
DIRECTORY



LIGHT STANDARD



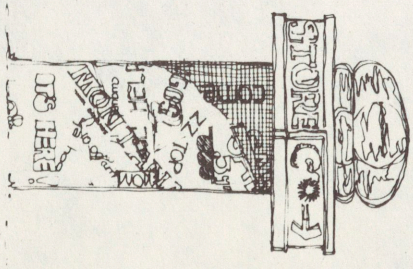
TELEPHONE BOOTH



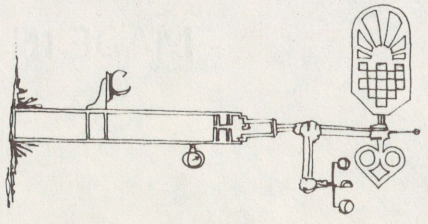
PLANTERS

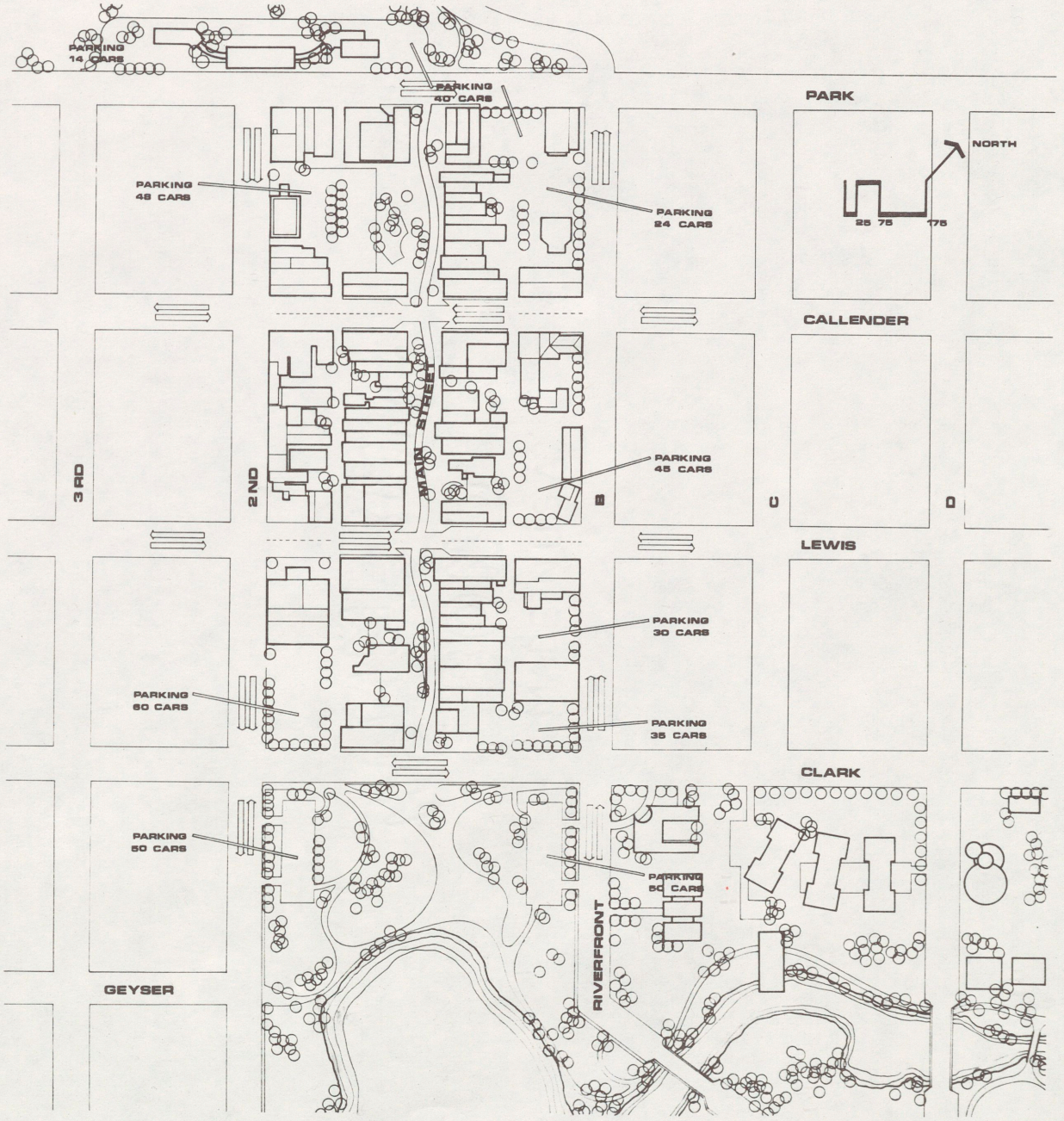


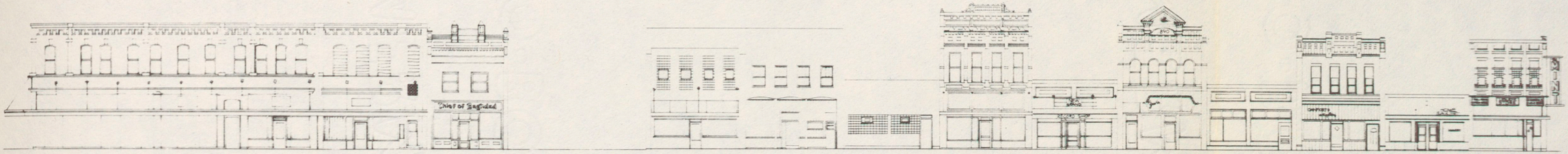
POSTING KIOSK



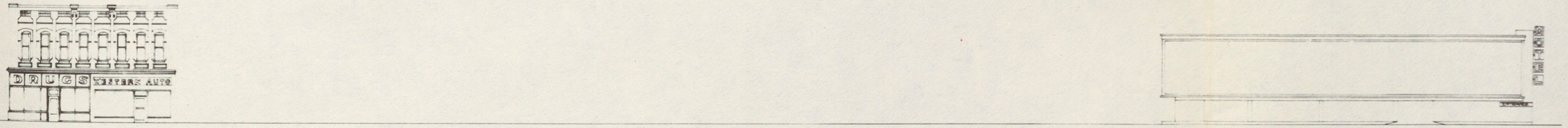
WIND AND SUN DIAL



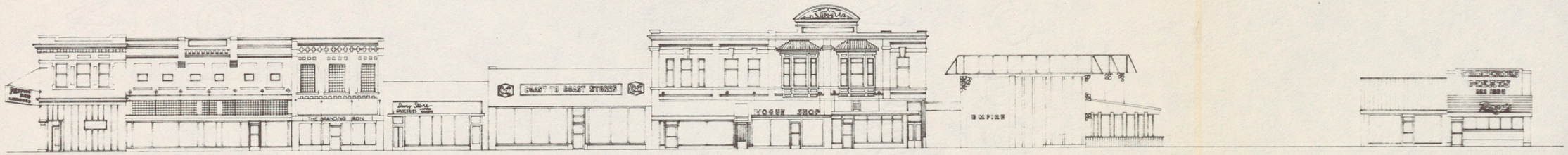

PARKING
14 CARS
PARKING
40 CARS
PARK
NORTH
25 75 175
PARKING
48 CARS
PARKING
24 CARS
CALLENDER
3RD
2ND
MAIN STREET
PARKING
45 CARS
B
C
D
LEWIS
PARKING
30 CARS
PARKING
60 CARS
PARKING
35 CARS
CLARK
PARKING
50 CARS
PARKING
50 CARS
RIVERFRONT
GEYSER



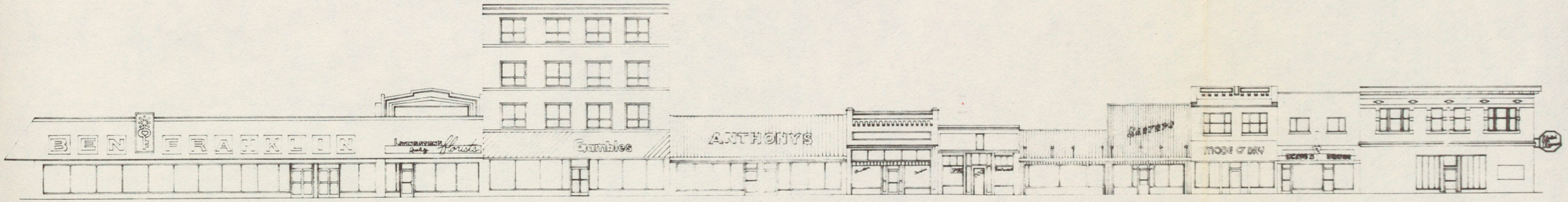
WEST SIDE 100 BLOCK OF NORTH MAIN



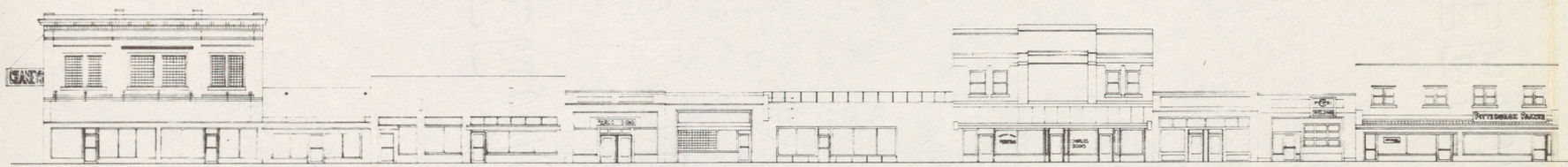
EAST SIDE 100 BLOCK OF NORTH MAIN



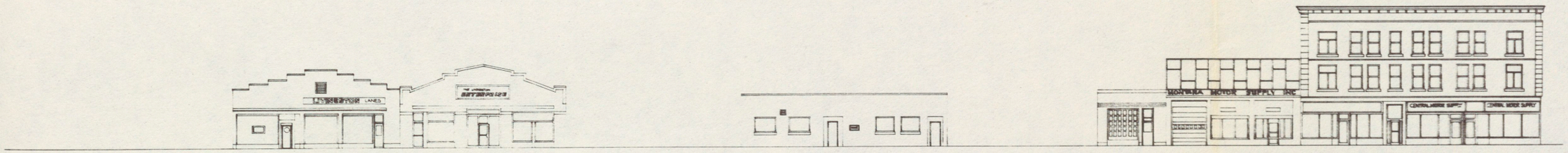
WEST SIDE **100 BLOCK OF SOUTH MAIN**



EAST SIDE **100 BLOCK OF SOUTH MAIN**



WEST SIDE 200 BLOCK OF SOUTH MAIN



EAST SIDE 200 BLOCK OF SOUTH MAIN

ISLAND

The objectives of the design for the redevelopment on the Livingston Island are the following: to provide adequate recreation and open-space facilities for each segment of the community, and to preserve the natural features and conserve the natural resources for the benefit of the community, the area and its visitors.

There has long been considerable community interest in the development of the Livingston Island, as the center for community social and recreational activities. The Island offers an outstanding opportunity to preserve and enhance the natural setting of Livingston and its relationship to the Yellowstone River. Because of the importance attached to proper development of Livingston Island the following recomendations are suggested:

City acquisition of junkyard

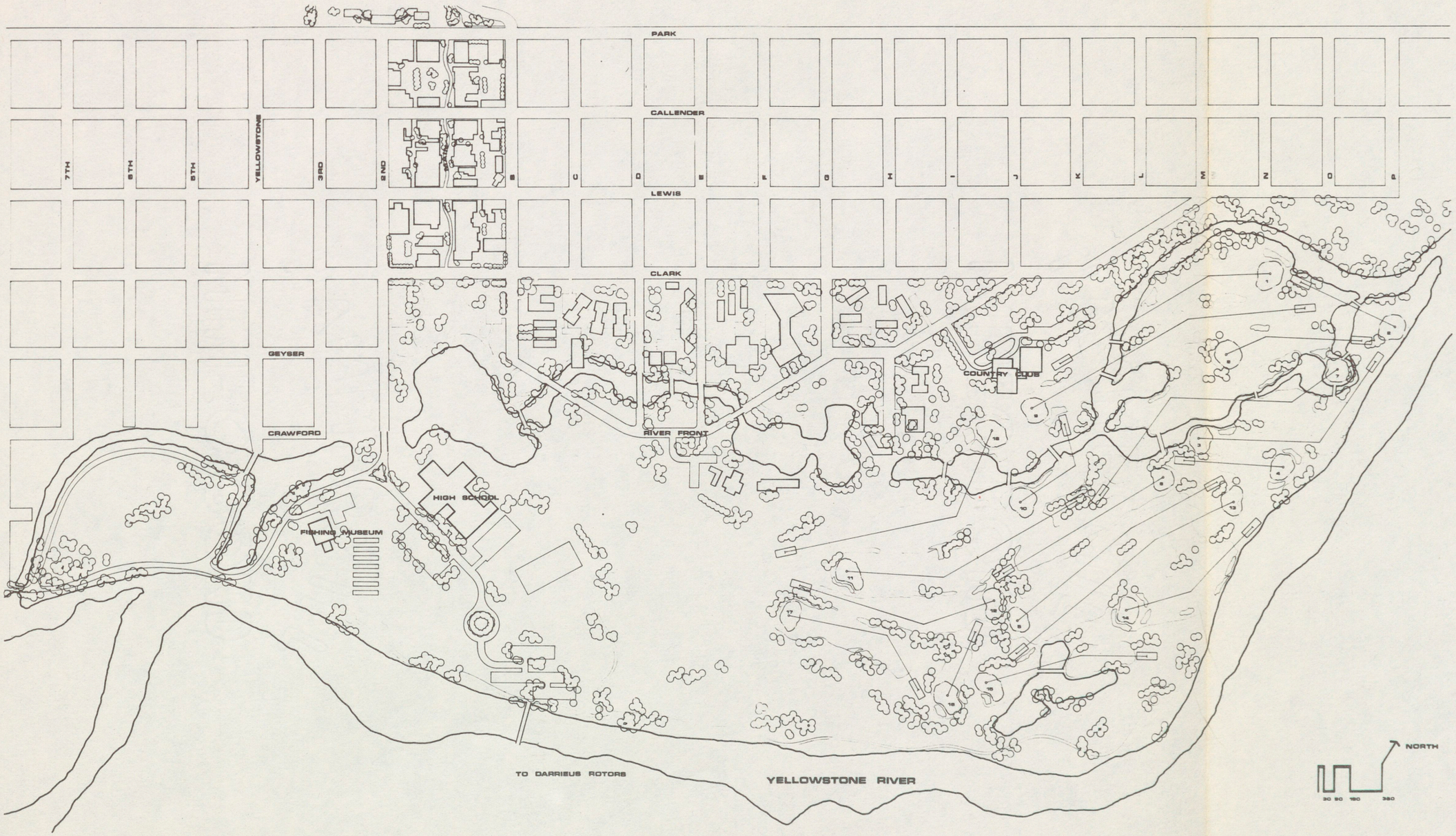
City acquisition of private campground

To cleanup and dredge the Livingston slough and then develop it with naturalistic scenic walks, bikeways and trails

To renovate the civic auditorium to serve as a community Fishing Museum and educational cultural center

Relocation of fairgrounds to the northeast side of town

expansion of the golf course to eighteen holes


PARK
CALLENDER
LEWIS
CLARK
RIVER FRONT
7TH
6TH
5TH
YELLOWSTONE
3RD
2ND
BROADWAY
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
GEYSER
CRAWFORD
COUNTRY CLUB
HIGH SCHOOL
FISHING MUSEUM
TO DARRIEUS ROTORS
YELLOWSTONE RIVER
NORTH
30 90 180 360

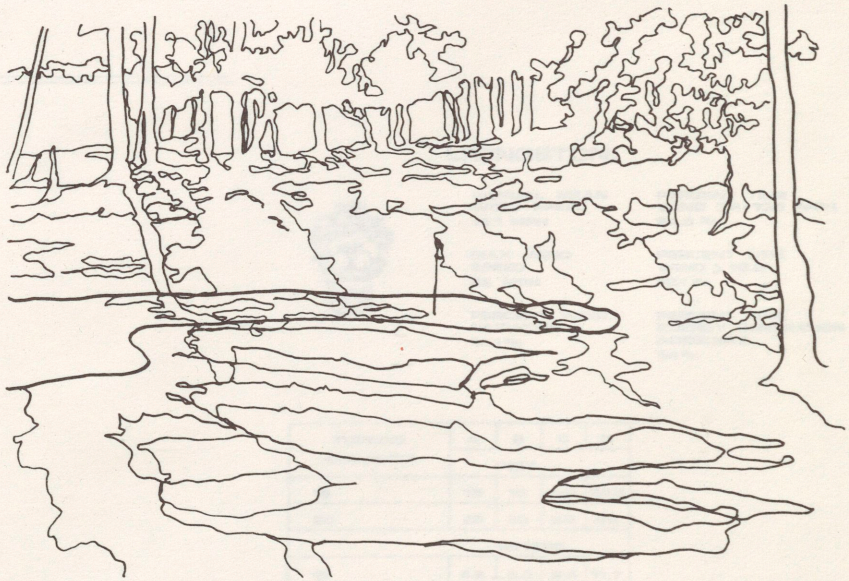
GOLF INFORMATION

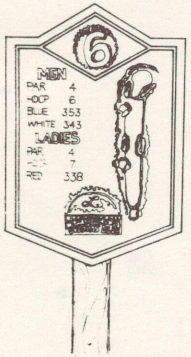
LIVINGSTON LINKS

HOLE	1	2	3	4	5	6	7	8	9	OUT	10	11	12	13	14	15	16	17	18	IN	TOTAL
YARDS	444	190	407	187	488	383	558	282	660	3450	182	488	385	524	303	382	135	337	484	3150	6600
PAR	4	3	4	3	4	4	5	4	5	36	3	4	4	5	4	4	3	4	5	36	72

SCORE CARD

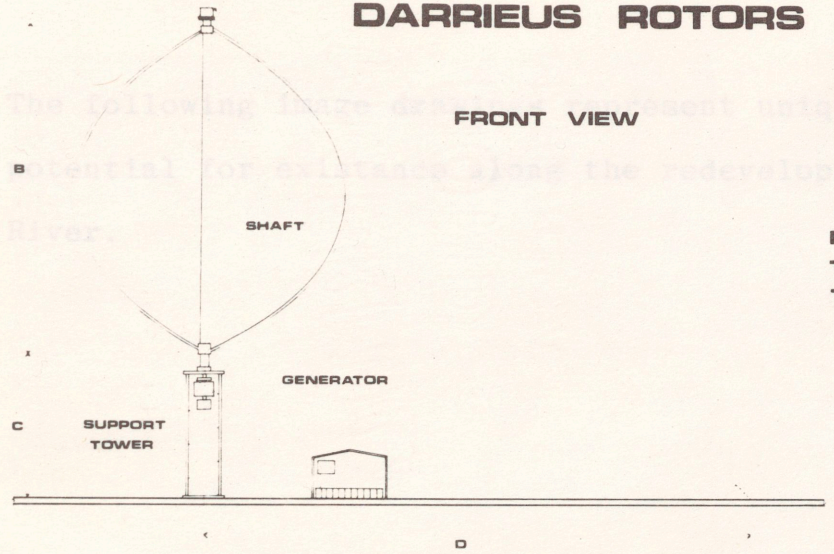
GREEN





TEE MARKER

DARRIEUS ROTORS



POWER DEVELOPED IS PROPORTIONAL TO THE CUBE OF THE WIND SPEED IS TWICE THE WIND = 8 TIMES THE POWER $2^3 = 8$

LIVINGSTON:



ANNUAL MEAN WIND SPEED
14.1 MPH

PERCENT TIME WIND 3.4 - 10.5 MPH
64.5 %

MAX WIND SPEED
88 MPH

PERCENT TIME WIND > 10.8
12.1 %

PERCENT WIND VARIATION
14.1 %

PERCENT TIME ENERGY GENERATION ADEQUATE
54 %

TURBINE DIAMETER	A	B	C	D
	FEET			
15	15	18	8.0	38.3
20	20	30	8.0	45
	METERS			
15	4.6	5.5	2.4	11.7
20	6.0	9.1	2.4	13.7

RIVERWALKS

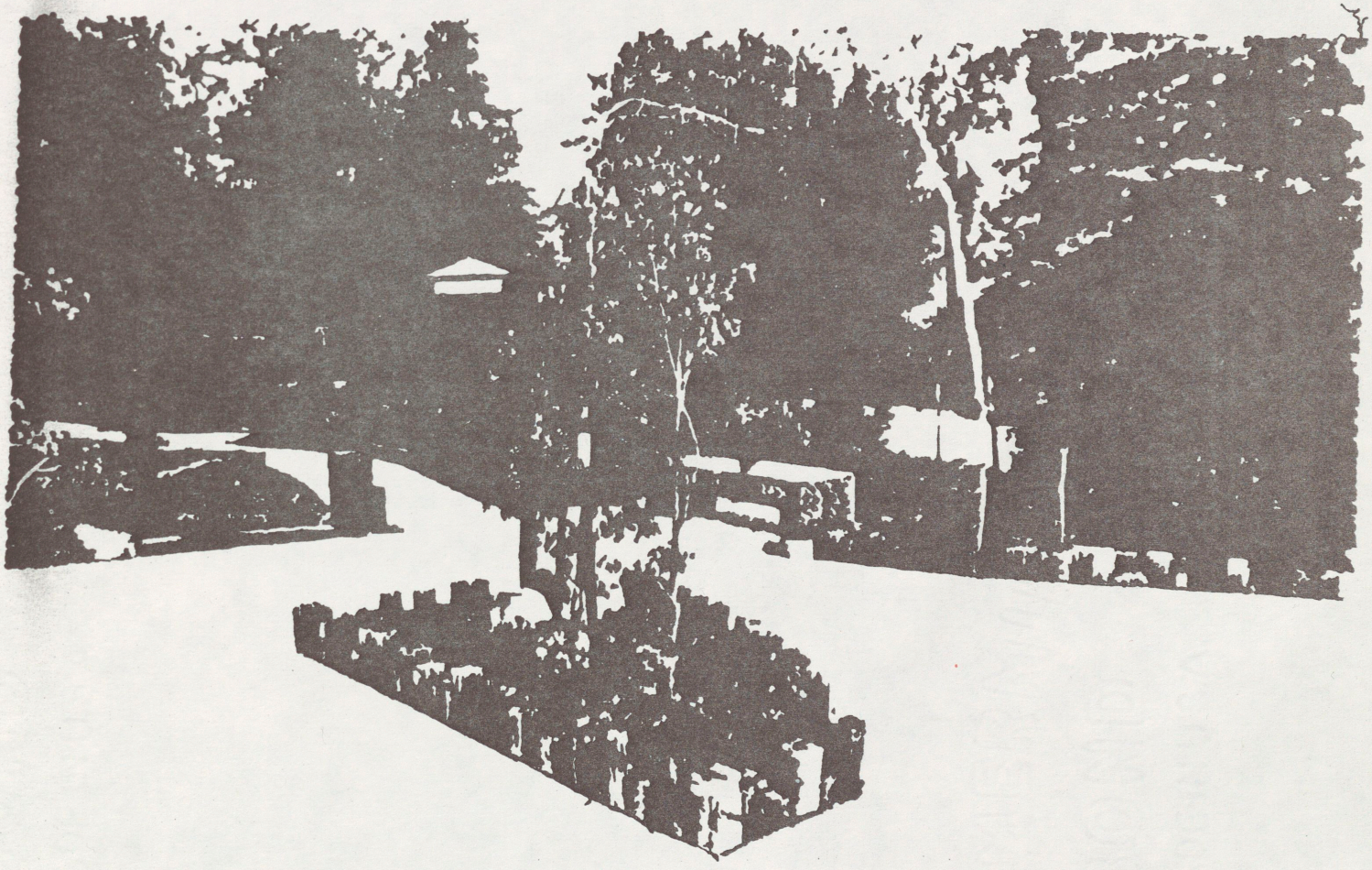
The following image drawings represent unique conditions which have the potential for existance along the redeveloped area of the Yellowstone River.











SECTION

7

CONCLUSION

The knowledge gained while participating with the potential of this thesis is one that is satisfying and greatly rewarding. Time will continue to reveal the value it has given to me.

Hopefully some of the guidelines, concepts, and ideas expressed will be utilized someday. They were all intended to portray a real and life-like situation capable of present existance.

Expression of ideas and drawings only skimmes the surface toward the representation of how this thesis could continue to evolve. People in their environment: it is a design criteria we as architects are continually attempting to understand.

Above all it was fun!

SECTION

8

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