BRAD C. KOBIELUSZ
3 firestations for Sheridan, Wyoming.



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3 Firestations for Sheridan Wyoming

by

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A thesis submitted in partial fulfillment

of the requirements for the degree

of

Bachelor of Architecture

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3 FIRE STATIONS FOR SHERIDAN WYOMING

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THESIS STATEMENT

THESIS TOPIC

The program and design of three fire stations for the City of Sheridan, Wyoming.

THESIS STATEMENT

Every part of a town has it's own defineable character. Investigate how this " special character " would affect the design and function of a firestation located in each of the three areas.

INTRODUCTION

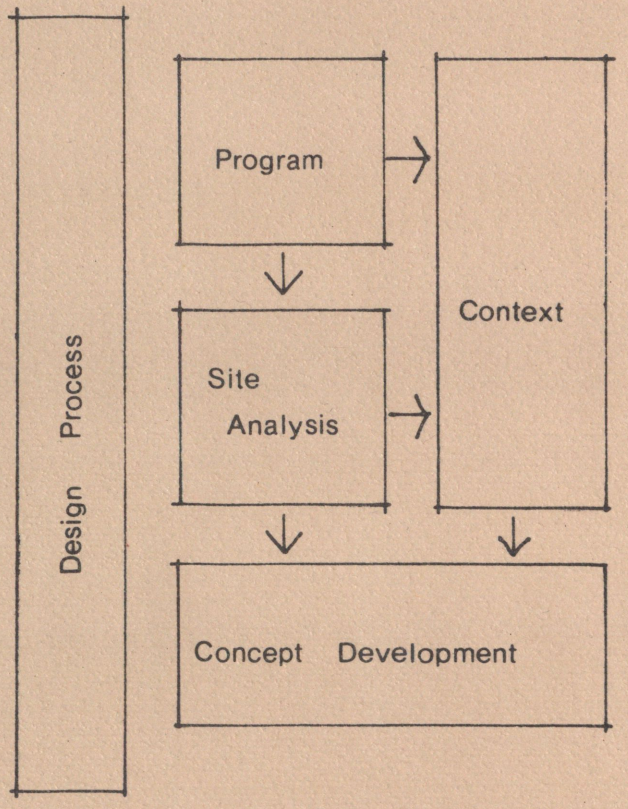
Why does a building take on the appearance that it does? This question is far more difficult to answer than first appears. There are uncountable circumstances and aspects which form the basis of the design. Many of which can be traced to the architects philosophy, contextural issues, location, sometimes pure economics, or worse the architects ego and pride. The basis of this study is to examine the external differences which manipulate the form of the buildings. The aspects which change the designs from one area to another.

The problem is taking three of five sites in different areas of the city of Sheridan, Wyoming. Discover what makes the site unique from the others, then design a singular function building on each site which responds to the differences. The building should then be appropriate to the site. This can be achieved in any of three ways. The building can be in relation to the site and its

surroundings, it can contrast the site and surroundings or it can be a metaphor of a major element present on the site or in the surroundings. Which of the three occurs will be dependent on what the site prescribes.

The focus of this study tends to be the study of the context and character of the site and its surrounding area. Still there are many other factors which will influence the designs. Therefore this study can be broken down into two parts, one the context, character study and the other being the more factual programming study. The programming will consist of the actual program and needs of each station, plus locations, environmental influences, etc, etc.

The combining of the issues will create the site plan and design for each station. This process can be placed into a diagram showing the course of the study.



Due to the functional aspect of the station, the programming aspects may be the larger influence in the final design. Much of the design of a firestation is given and the changes which occur are slight. This could lead to the functionalism making the biggest influences while the contextural issues make only moderate changes. Although there may be some areas were the contextural issues are so strong that they will be the dominant factor.

SHERIDAN'S
HISTORY

The area around Sheridan was a major battle-ground between bands of Indians and the United States Army in the 1870's. Over seventy-five percent of the U.S. Army casualties occured within seventy miles of Sheridan. Fighting was so heavy that the army built a very large fort; Fort McKenzie in the 1870's. This Fort now serves as a large V.A. Hospital and is located on the North-west side of the city.

The first settlers came to the area in 1882, and the Chicago, Burlington and Quincy Railroad followed in 1890. Several years later, the city was founded in 1893 and depended mainly on the ranching, mining and railroad for its lively hood. The railroad made Sheridan a transportation center and helped the city grow to a population of ten thousand residents by 1940. The city stabilized for the next twenty years and the population in 1960 was at eleven thousand five hundred people. The mines had started closing, the railroads importance was dying, generally the city began to

die. By 1970 the population was a little over ten thousand and then the oil embargo hit in 1973. Three large strip mines opened between 1973 and 1979, rail traffic increased rapidly and the city of Sheridan began to grow dramatically. The cities population probably fell under the ten thousand mark in 1972 and by 1980 the population had risen to fourteen thousand five hundred. By 1981 it topped sixteen thousand and this is just the beginning.

SHERIDAN PRESENT
& FUTURE

The city of Sheridan and Sheridan county is presently in the infancy stage of a major energy boom. What had been a sleepy town is being shocked into life by a staggering growth rate which has increased the population by sixty percent in the last seven years. The cause of the boom is centered on the low sulphur coal which is abundent in the low hills around Sheridan. The coal is in high demand from Washington to Florida because of its clean burning properties and the high B.T.U. output.

Sheridan's population stabilized at ten thousand residents in the 1940's and had only slight fluxuations until 1974. In 1974 a large strip mine (Decker Coal) opened to the north of Sheridan and a small existing mine (Big Horn Coal) expanded. The area railroad, Burlington Northern began a large expansion in expectation of coal hauling. The two mines and railroad were responsible for a population growth of over three

thousand residents. At present, the mines (Peter Kiewit and Sons Mining) and the railroad are the second and third largest employers in the county respectively.

In 1979 Springcreek Coal Company opened a mine to the north of Sheridan and is at present bringing in numerous residents to the city. A whole series of mines, powerplants, pipelines etcetera are in the planning in the next ten years. The number of new residents these industries will bring in is enormous. The following scenarios were compiled in 1976 and gives the projected populations for Sheridan until 1985: [1]

Scenario I	1970	1980	1985
Base Population	10,856	12,356	14,356
Scenario II			
Base Population	10,856	15,356	22,856
Scenario III			
Base Population	10,856	18,356	31,856

The scenarios were based on possible coal developments due to economy, demand, speculation, etcetera. At present the city of Sheridan is following the second scenario. The 1980 census put

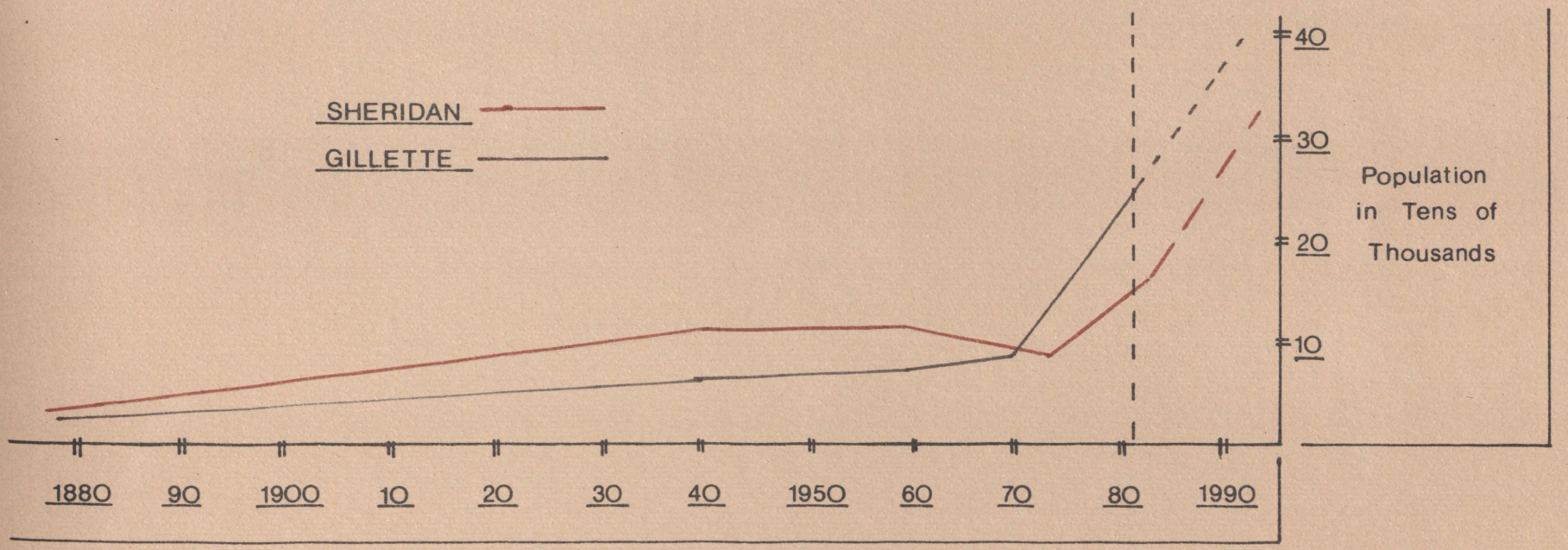
the population at fourteen thousand seven hundred which is six hundred residents shy of scenario number two. If developments occur as they appear, they might in the next ten years the actual population figure will lie somewhere between scenario two and three. Whenever a new industry appears and hires one man, ten more people will come in the form of family and service personnel. A population count at the end of 1980 put the population of Sheridan at 16,000 or 1300 more residents than the April 1980 census count.

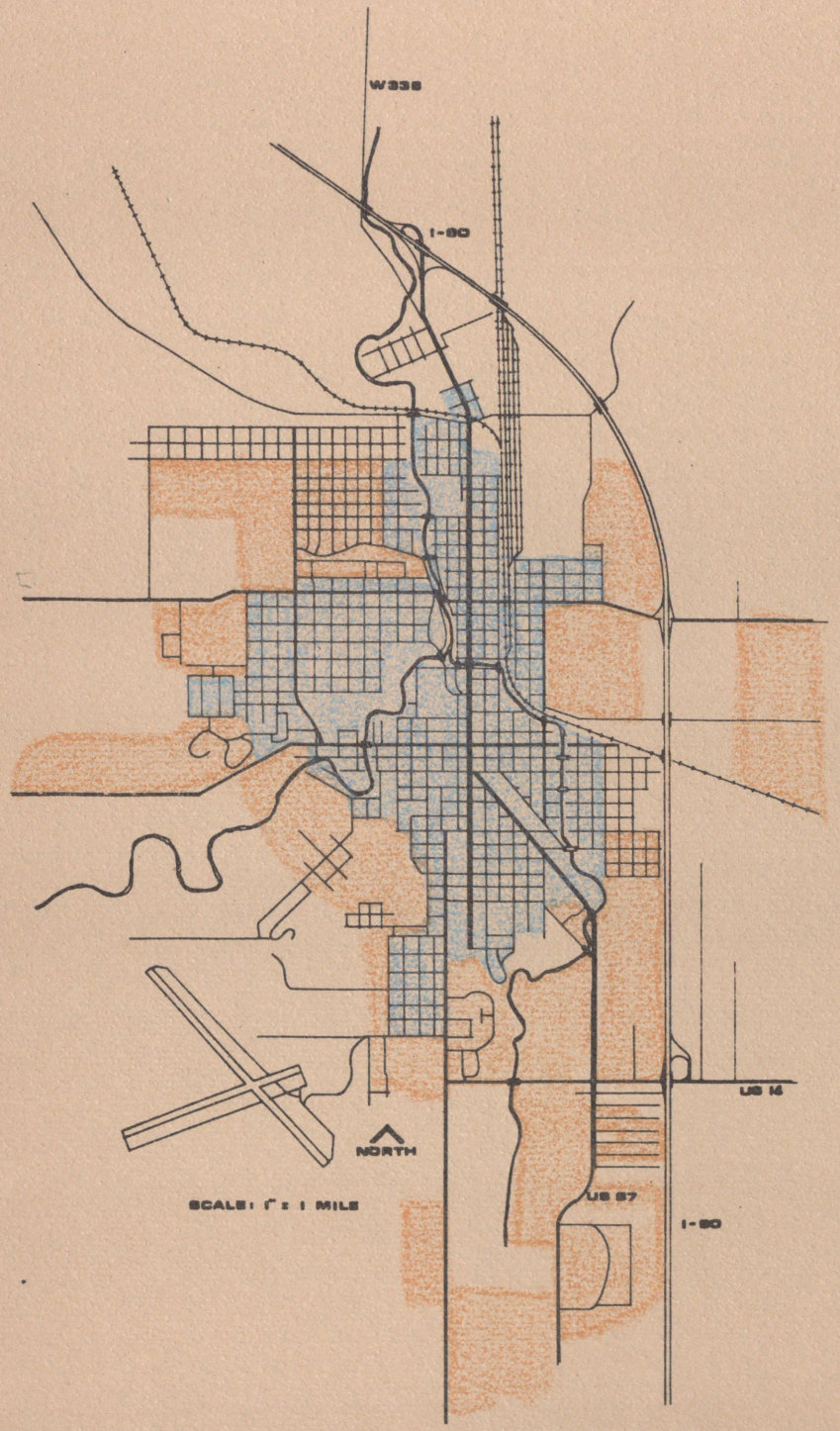
In 1981 a large commuter airline is moving its headquarters from Denver Colorado to Sheridan. NERCO (National Energy Resource Co.) is opening a large branch office in Sheridan, between these two businesses they will employ 400 people. This will create more than 4000 new residents by 1983. Decker Coal is presently expanding by opening East Decker Mine, it will also open a North Decker mine in the next few years. The two new mines will employ over 300 people - 3000 more residents. By 1985 the population of Sheridan will

easily be 23,000 people. Also in the works is a large gasification plant 18 miles south of Sheridan this plant expects to easily bring in another 6000 to 7000 residents. Plus there are three large mines in the planning stages along with power plants,pipelines, etc. Considering all these possiblities the population of Sheridan could easily approach 40,000 by 1990. The graph shows the population growth over the last 100 years plus ten years speculation. A graph of the population of Gillette Wyoming (100 miles east of Sheridan) is also shown. Gillette has the same growth problem as Sheridan only their growth began about 5 years earlier. Sheridan County is also showing the same rapid growth as the City of Sheridan. Almost all of the population growth in Sheridan County seems to be centered around the City.

The population of Sheridan County is @ 25,000. Of the 25,000 residents 16,000 live in Sheridan, 6000 of the remaining 9000 live within 3 miles of Sheridan. The remaining 3000 live in the surronding towns. This distribution of the population has held true for many years and will probably do so in the future. Taking

this at face value the county population by 1990 will be approximately 55,000 residents with somewhere between 10,000 and 12,000 people living within 3 miles of the city limits of Sheridan. Already the city has zoning and subdivision powers that extend 3 miles past the city limits.





SHERIDAN CITY LIMITS

June 1973

March 1981

SHERIDAN FIRE
DEPT HISTORY



SHERIDAN CITY FIRE STATION

The first fire dept was a volunteer fire dept organized when the city was founded in 1893. A hand pulled hose cart and a hand pulled, operated pumper was the mainstay of the department.

In 1910 the fire department moved into the present station and became a full time paid department. Equipment was modernized to include a motorized hose and ladder truck and a horse drawn steam powered pumper. The city fire dept stayed essentially the same for the next 70 years except for occasional new equipment and changing faces.

In 1977 the City and County joined forces to try to provide better service. The county remodeled their station to provide room for 1 city truck and 3 men. Both city and county men and equipment responded to calls in the southern part of the city as well as the county. A year and a half later the city scrapped the plan because of the poor location of the county station.

At present the city has 19 paid men who work 24 hours of the day 10 days a month. 3 of the men (the Chief and 2 assistants) work 9 to 5 shifts Monday thru

Friday. The Equipment has been upgraded recently and consists of the following. First run trucks - 1979 Pierce 1000 Gallon Per Minute (G.P.M.) pumper, 1977 Combination 100 ft aerial and 1250 G.P.M. pumper, and a 1969 Superior 1000 G.P.M. pumper. Reserve pumpers include a 1952 Seagrave 750 G.P.M. pumper and a 1944 American La France 750 G.P.M. pumper. 3 service vehicles are also available and are as follows, 1978 Chevrolet pickup, 1977 Ford sedan, and a 1965 International Harvester pickup.

COUNTY FIRE
DEPT HISTORY



SHERIDAN COUNTY FIRE STATION

The County Fire Department had its beginning in 1942 when the County Commissioners decided there was a need for Rural fire protection. The county purchased one truck and hired two men to work alternate twenty-four hour shifts. The department worked with the philosophy that the county would supply the fire truck with one man. The residents would have to supply the additional help needed at the fire. The county fire truck and men were housed in the city fire station until 1960 when a county station was built at the airport to help protect the commercial flights. As was stated, the station was remodeled in 1977 and housed a city truck until 1978. After the city moved out more equipment was purchased and filled the space. At present the county employs four full time and one part time firefighter. They work twenty-four hour shifts, fifteen days a month. The equipment is all specialized equipment and is as follows: 1978 Emergency One 250 G.P.M. Brush Pumper, 1975 Seagrave 1000 G.P.M. Pumper(structure), 1975 Fire Ex 250 G.P.M. Airport Crash Rescue Pumper and a 1968 Ford Tanker (1250 gallons)

FIRE DEPT
PROBLEMS

At present the Sheridan Fire Department (S.F.D.) has been given an insurance rating of seven by the I.S.O. this stands for Insurance Service Organization.[2] They rate departments on their abilities on a scale of one to ten. One being the best, ten the worst. The ratings provide the insurance industry a guide for figuring fire insurance for all of the structures in a city. The lower the rating, the smaller the fire insurance premiums paid by the residents. Consequently businesses and residents of Sheridan are paying higher insurance costs because of the department inadequacies. At the time of the last ratings the main problems were insufficient equipment, manpower, water supply, poor training, only one station in a poor location.

At present, the water supply problem is the only one which has been fully corrected. Training has been improved somewhat but is limited because of a lack of facilities to properly train in. The manpower available is still severly limited. At present, a major fire would draw nineteen paid and

three volunteer city fireman, plus five county firemen. Twenty-seven firemen are totally insufficient for any major fire. They tire fast because of extreme work loads and possibility for injury is greatly increased. At present a program aimed at getting twenty-five volunteer firemen has produced only three acceptable members.

Equipment has been upgraded in the last three years by the purchase of two large first run trucks. Although neither is being used extensively at present because they cannot be safely or quickly removed from the station. The 1977 Seagrave 100 Aerial would not fit into the station. When it was first purchased the truck was too high to fit into the station and too long to easily pull out into the street. The floor of the right stall had to be lowered six inches and the sidewalk on the opposite side of the station had to be removed. Even with the modifications done to the street and station, the difficulty of removing the truck is extreme enough to greatly limit it's use.

The pumper which was delivered in November 1979, will barely fit into the station. There is a one and a half inch clearance on each side of the truck, several antagonizing minutes are required to remove the truck from the station. Therefore 250,000 dollars worth of equipment sits idle because of poor planning and an obsolete fire station. Consequently the fire department still uses a thirteen year old fire truck for it's first run aparatus.

The worst problem by far is the lack of fire stations and the poor response times which are prevelant. The I.S.O. sets a one mile radius for the coverage of any fire station. The one mile radius is not a random number, it is the approximate distance a fire truck can respond in a four minute time limit. Fire trucks only respond at an average speed of twenty-three miles per hour. It usually takes from thirty seconds to one minute for a fire-truck and crew to leave the station. This leaves three to three and a half minutes travel, which is

apporximately one mile. The four minute limit is set by the fire itself.[3] Once a fire begins, there is about four minutes of a slow burning phase. After the first four minutes the fire will begin to burn freely and more actively. It is essential to be at the fire scene in the four minute time period if fire losses will be held to a minimum.

At present some areas are four miles from the fire station and in one area a high dollar, high life loss condition exists. The city fire department began recording response times and in several instances recorded responses of over ten minutes. This is two and a half times the acceptable maximum limit set by the I.S.O. if one or two new stations were constructed the response would become much faster and thereby help lower the I.S.O. rating.

The I.S.O. rating for the county fire department is ten, the worst possible rating. Problems are: manpower, equipment, water supply, poor training, poor station location, and only one station.

Realistically the county fire department will never be able to provide sufficient protection for

all areas because of the great distances involved. The county has therefore tried to provide some protection without great burdens being placed on the taxpayers. Therefore any improvements that will be made will still be far short of what is needed to provide full protection for the county. Some of the problems listed have been corrected. Water supply was somewhat corrected with the purchase of a large truck that was converted to a water tanker (capacity 1250 gallons). This provides enough to take care of the water supply for ninety-eight percent of the fires. Equipment has been greatly improved, there is specialized equipment for all different types of calls. There is a special truck for airport calls, a separate truck for brush and vehicle fires and a truck set up for structure fires. What is lacking in manpower is somewhat made up in equipment.

The worst problem is the distances traveled, the average call is six miles one way. The average response time is ten minutes or over. Most of this

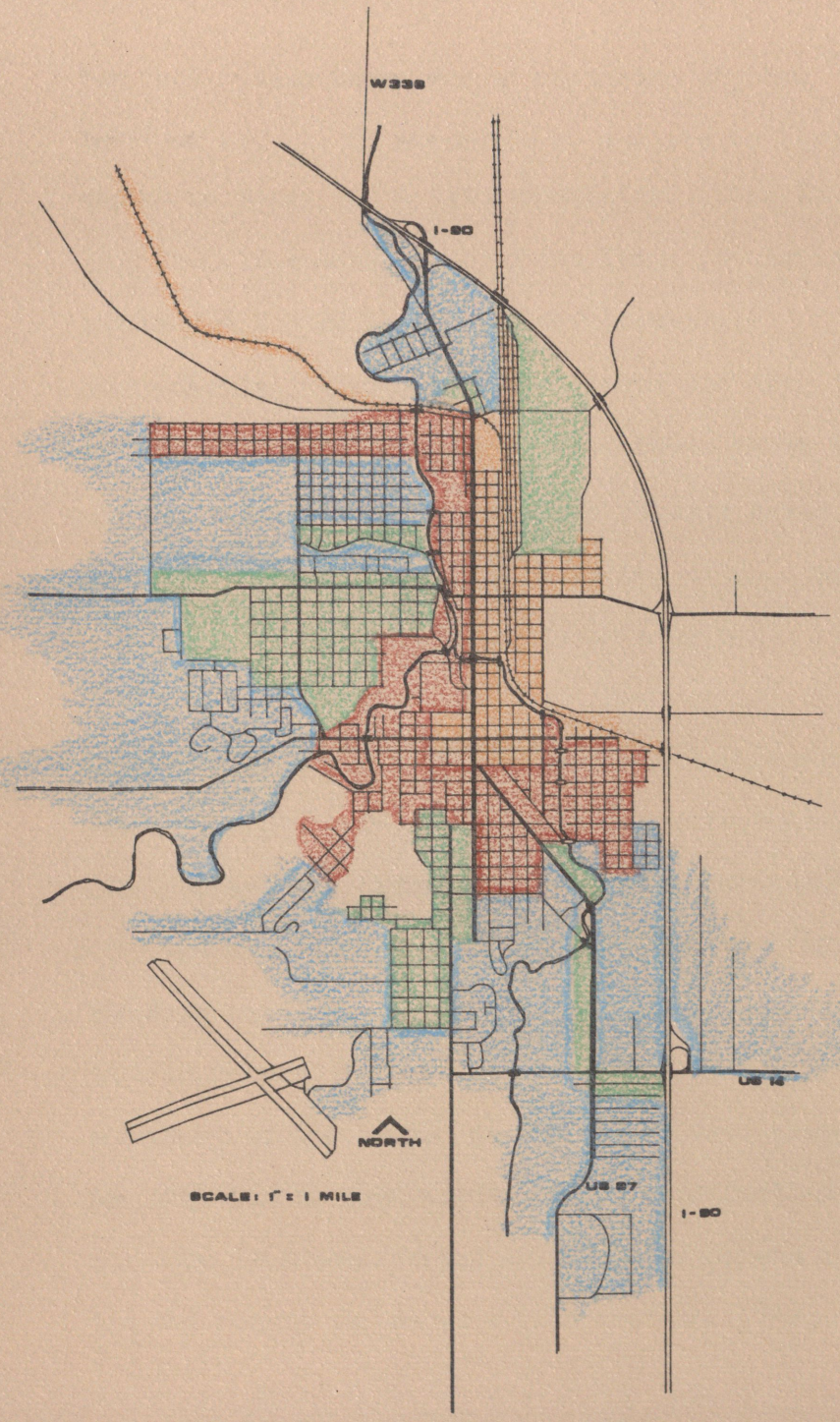
problem could be corrected by the building of one more station. For a county call west or north of Sheridan takes a five mile trip just to get out of the city limits. A station in this area would greatly reduce response times. The existing station is also in a bad location. To respond to calls the trucks have to travel into the city limits and out again to arrive at the scene. Limited manpower will always be a problem as there is only a minor increase of manpower seen in the future.

NEEDS

As has been stated both Sheridan and Sheridan county fire departments are problem riddled. There are many causes for the problems and invariably only one or two solutions.

The real problem started somewhere in the 1940's or 1950's. The city fire department at that time had enough manpower, modern equipment and the coverage was much smaller. (map #2) During this time the suburban spread began. Each family needed their one large home and private yard. So the cities area grew rapidly even though the population raised only a small amount. The expansion of the city fire department should have occurred by the 1960's but they were not able to because of a lack of money. Therefore the town spread while the fire department stayed the same, this left much of the city vulnerable.

By the late sixties, it was evident the city was beginning to die, all the lifeblood industries were closing. The population dropped over fifteen hundred people between the 1960 and 1970 census.



GROWTH PATTERN

- 1880 – 1893 918
- 1893 – 1940 923
- 1940 – 1960 910
- 1960 – 1980 919

For this reason there was no expansion of fire services because it seemed to be a waste to largely expand services for a dying community. Then in 1973 the oil embargo started the large population influx due to the large coal developments. Consequently the city fire department and city officials were caught unprepared. Seven years later a fire department master plan was finally drawn up to give some sort of direction to the city. By this time the department was taxed even more. The worst area is residential fire. Residential fires have progressively increased over the last several years. In the 1979 to 1980 comparison residential fire losses have increased one hundred percent.[4]

The county fire department was affected by the same problem. At the time of its beginning in 1942 several thousand people lived on the periphery of the city. As the cities area grew, the city limits were pushed further and further out. By 1960 the Federal Aviation Agency was pushing the county to set up a fire station. There-

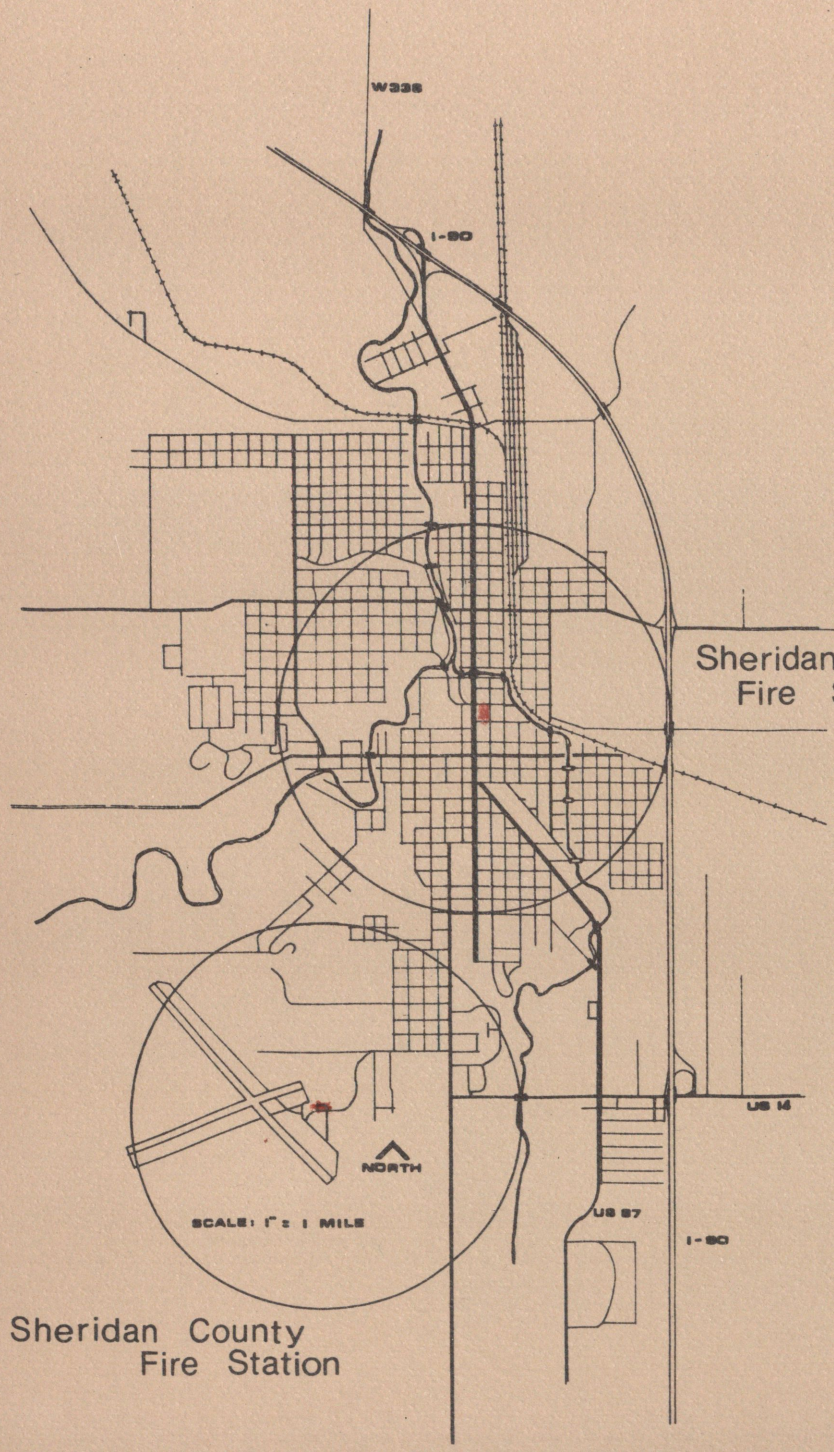
fore it moved the existing truck from the city station to its present location at the airport. This move created even longer runs for almost all areas of the county.

Now more and more building is being done outside the city limits to avoid city zoning and codes. The perimeter population at present is between five thousand and six thousand residents and will grow substantially. Cheaper housing can be built outside the city limits for many reasons; land costs, permits, hookups, and codes all add to the costs. Recently the city acquired the power to enforce its codes and zoning for a three mile perimeter around the city limits. As a result, developers are starting subdivisions three and a half to four miles from the city limits. Already Sheridan's powers encroach within a mile of a nearby town - Big Horn. The Wyoming Highway Department is planning to build another interstate exit several miles south of the southern Sheridan exit. The exit is to serve the large numbers of people in that area.

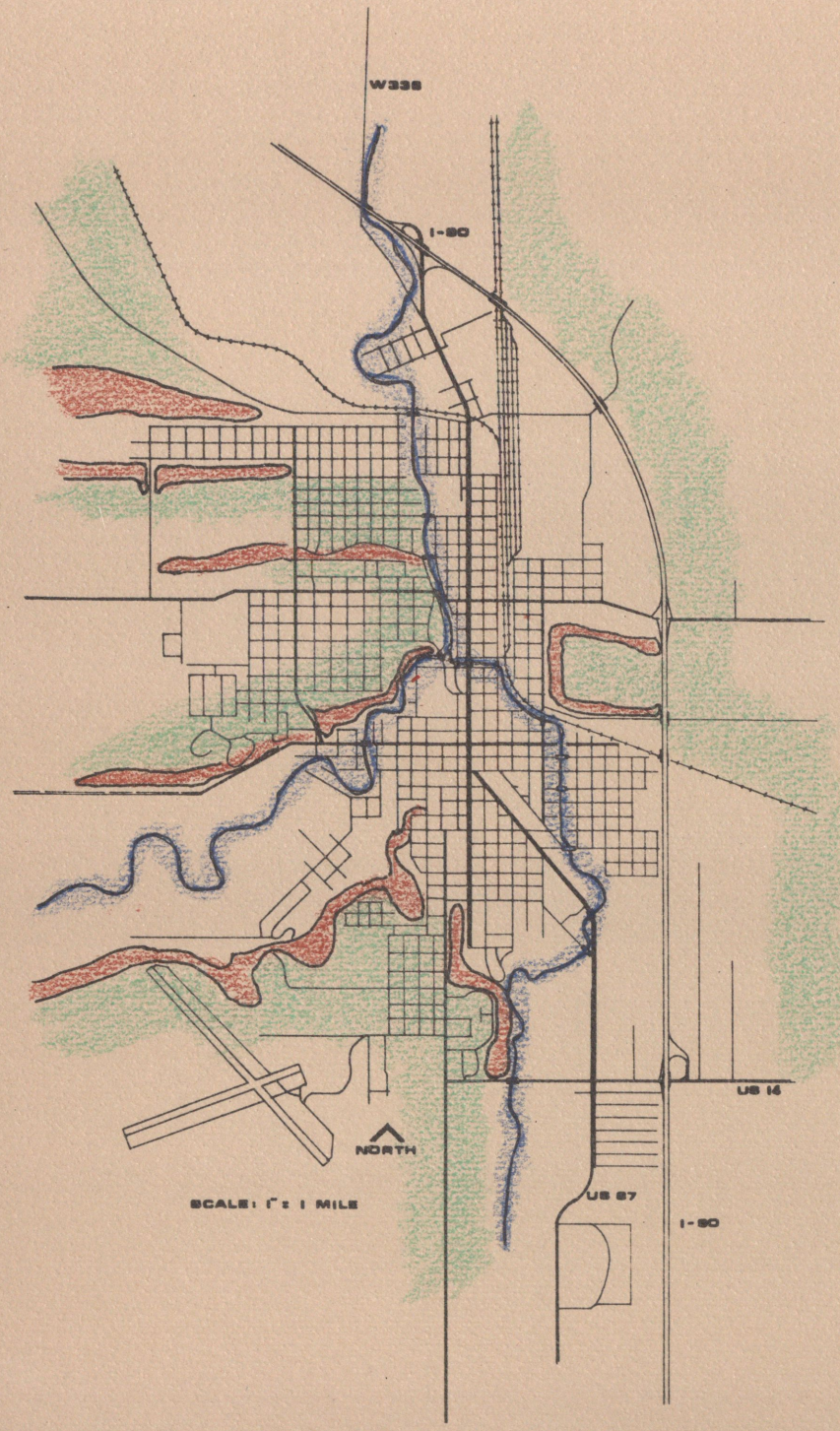
The following maps show the problems that are relevant to Sheridan at this time and into the future. Map #3 shows the location of the present stations with their one mile coverage area. Also shown are the physical barriers which impede responses. All the hills are very steep, in the winter several of the roads are closed because they are too hazardous to opperate in. As can be seen, the city only covers approximately one third of the cities area. The county covers a small area and they do not respond into the city on first alarms.

Map # 5 shows the areas where high life loss could occur in a short time. These areas include theaters, government buildings, medical buildings, and schools. As can be seen, a majority of the areas are out of the coverage area. The school and nursing home near the county station are important enough to warrant first alarm responses by the county fire department.

High risk areas are shown in map #6. These are areas where major fires could easily occur. All



EXISTING FIRESTATIONS

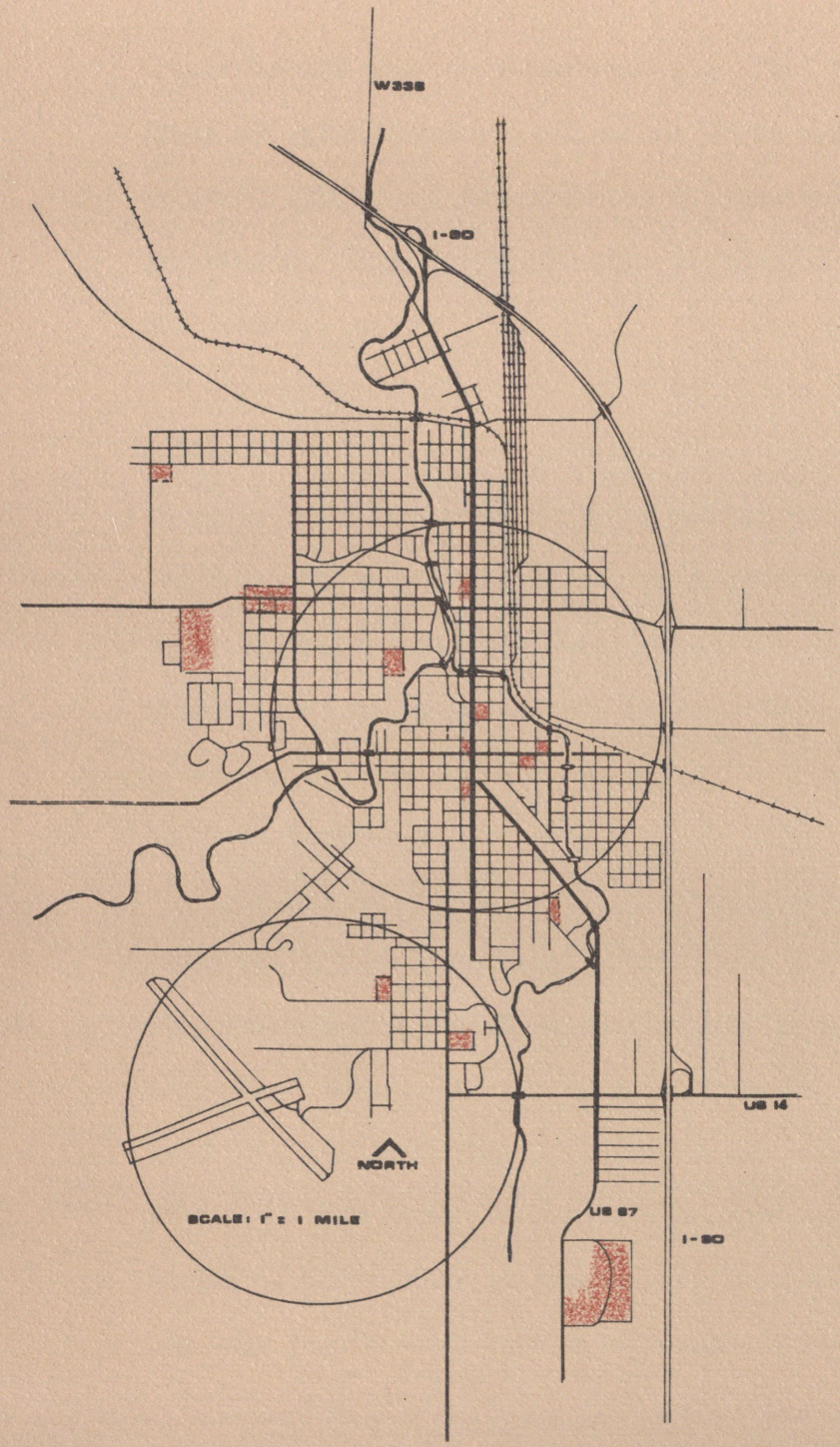


PHYSICAL PROPERTIES

Hilltops

Impassible Grades

River Valleys

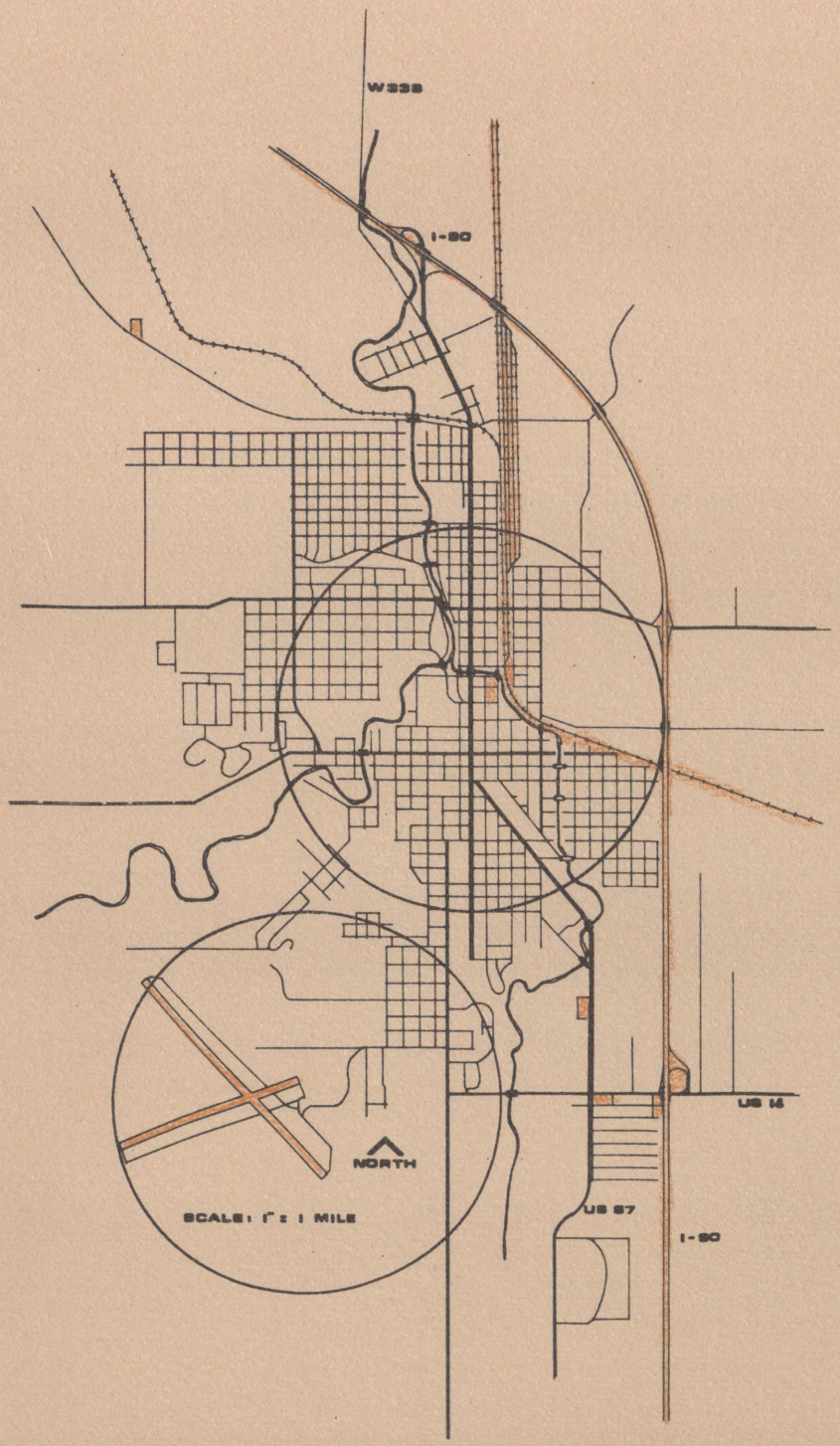


High Life Loss Areas

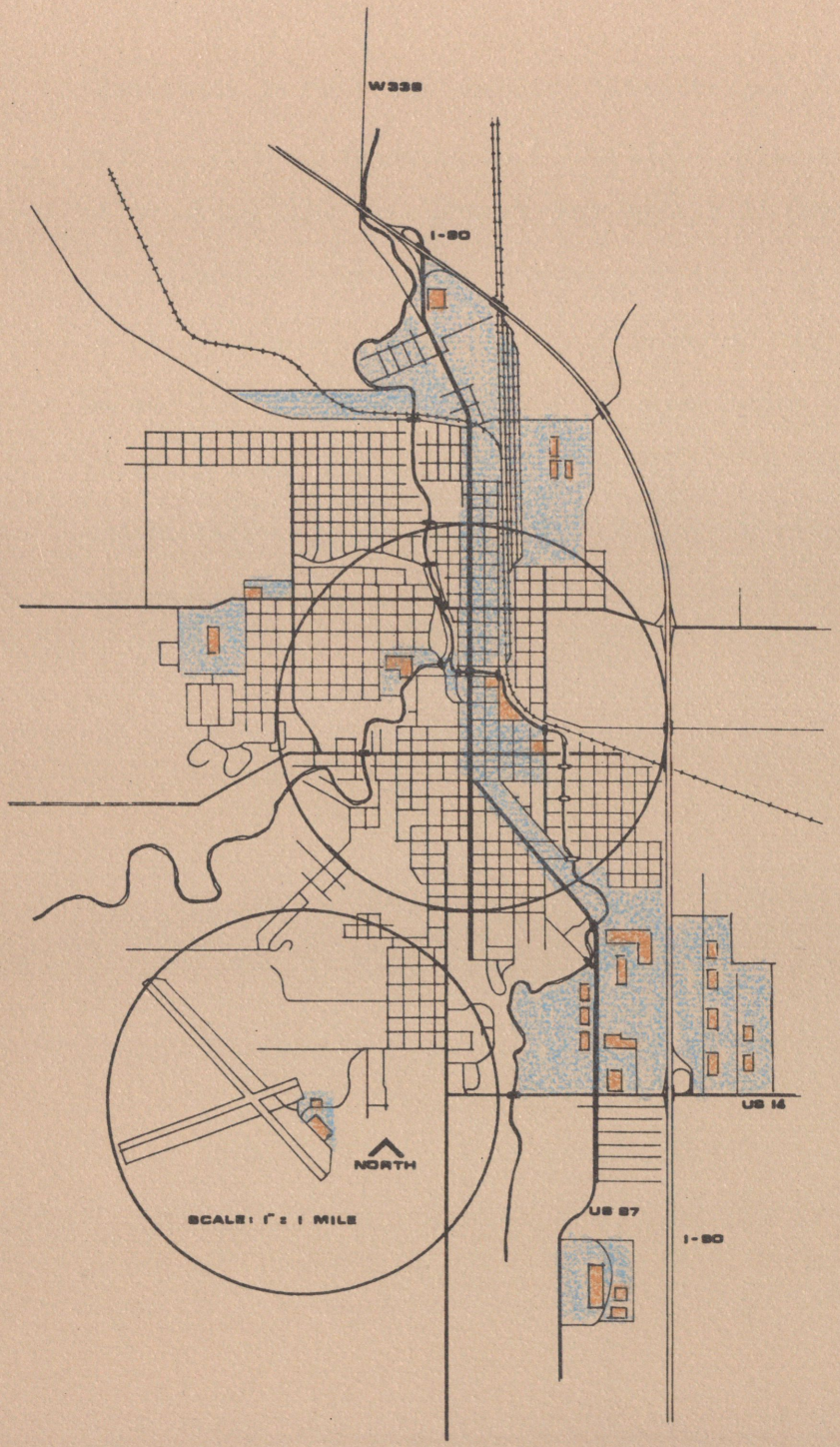
trasportation areas are included plus fuel storage areas and grain storage. Fires in these areas could be overwhelming and hazardous to the present department. Once again coverage of these areas fall short.

Map #7 shows the high valve districts present in the city plus major buildings where large amounts of water and the aerial would be needed to control the fire. Only a small amount of the areas and buildings fall under the coverage area. Also the city and county would be hard pressed to be able to supply high gallonages needed to fight fires in those buildings.

Finally map #8 shows the present growth areas. Areas which have been heavily developed in the last five years and areas where development is in the beginning stages. As can be seen, most of the growth is occurring mostly to the south and west. The interstate seems to create a natural barrier growth to the north, to the east it is a minimum. The only place where growth is occurring past the



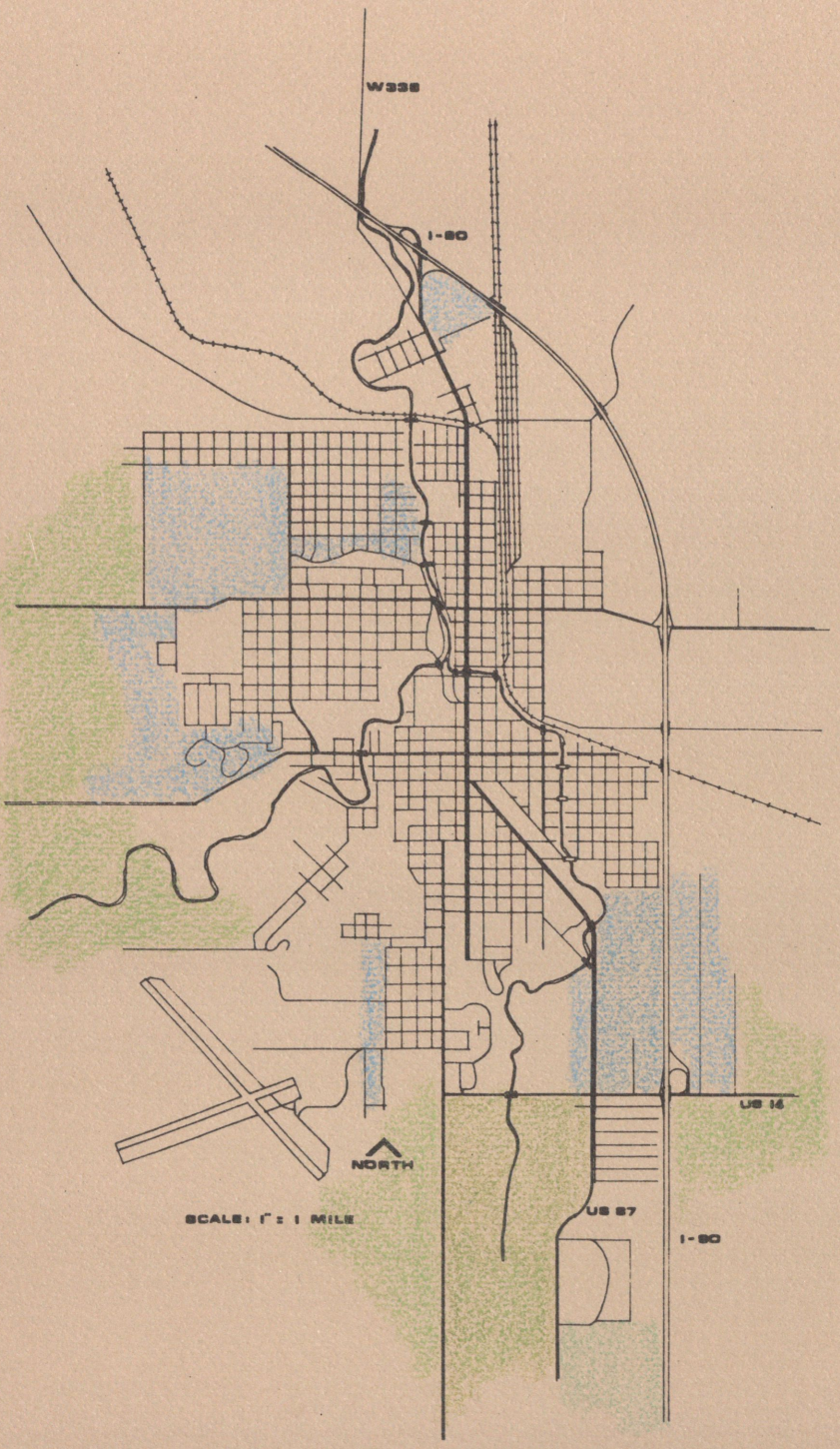
High Risk Areas



High Value District

High G.P.M. Buildings

interstate is near the southern interchange. This area is growing quite rapidly for eight or nine miles along U.S. 14. Even though growth is heavy the chance of this being annexed into the city is slight for a various number of reasons. As can be seen, the city and county fire departments are covering areas way beyond their ability. A large undertaking will be needed just to keep up with the growth.



GROWTH AREAS

Present Growth 919

Future Growth 913

5 STATIONS,
5 SITES

The question arises "How can five fire stations be justified for Sheridan?" For Sheridan at present it is hard to justify three let alone five, but this project is based on the master plan for the Sheridan fire department. The plan is more concerned with the fire department situation in the next ten to fifteen years than it is with the present. The rapid increase of population is taxing the fire department to large limits. Mainly in the area of quick responses and the amount of manpower and equipment at the fire scene. As the city grows the response times will become longer and longer. This allows the fire to burn hotter and longer which leads to heavier damage, more injuries, life loss etcetera. A point is reached where response times are no longer tolerable. For the county fire the response is already intolerable. A five to ten minute response time is required just for the fire truck to get out of the city limits when calls are to the north or west. The city fire department logs response times of over ten minutes[5] to areas presently in the city limits, as the city

grows in leaps and bounds this will get worse.

At present the city fire department responds with one fire truck and five men. If more stations were constructed, the response may still be five men, maybe six, but there would be at least two trucks, twice the fire power. The main reason only one truck responds to calls now is the fact that only one truck can be moved out of the station with any ease.

At present, two or three "new" stations will take care of the immediate problem while they will not help the future problem. The city is expected to grow anywhere between 30,000 to 50,000 by 1990. This is only nine years away. With the population growing this fast, planning must take on an almost feverish pitch. More problems arise from the fact that the new areas coming into the city are of low density and are quite ambiguous. The map shows the hodpodge annexation patterns which are developing. This comes from the city trying to acquire as much control over as much surrounding area as possible. This gives them the power to control

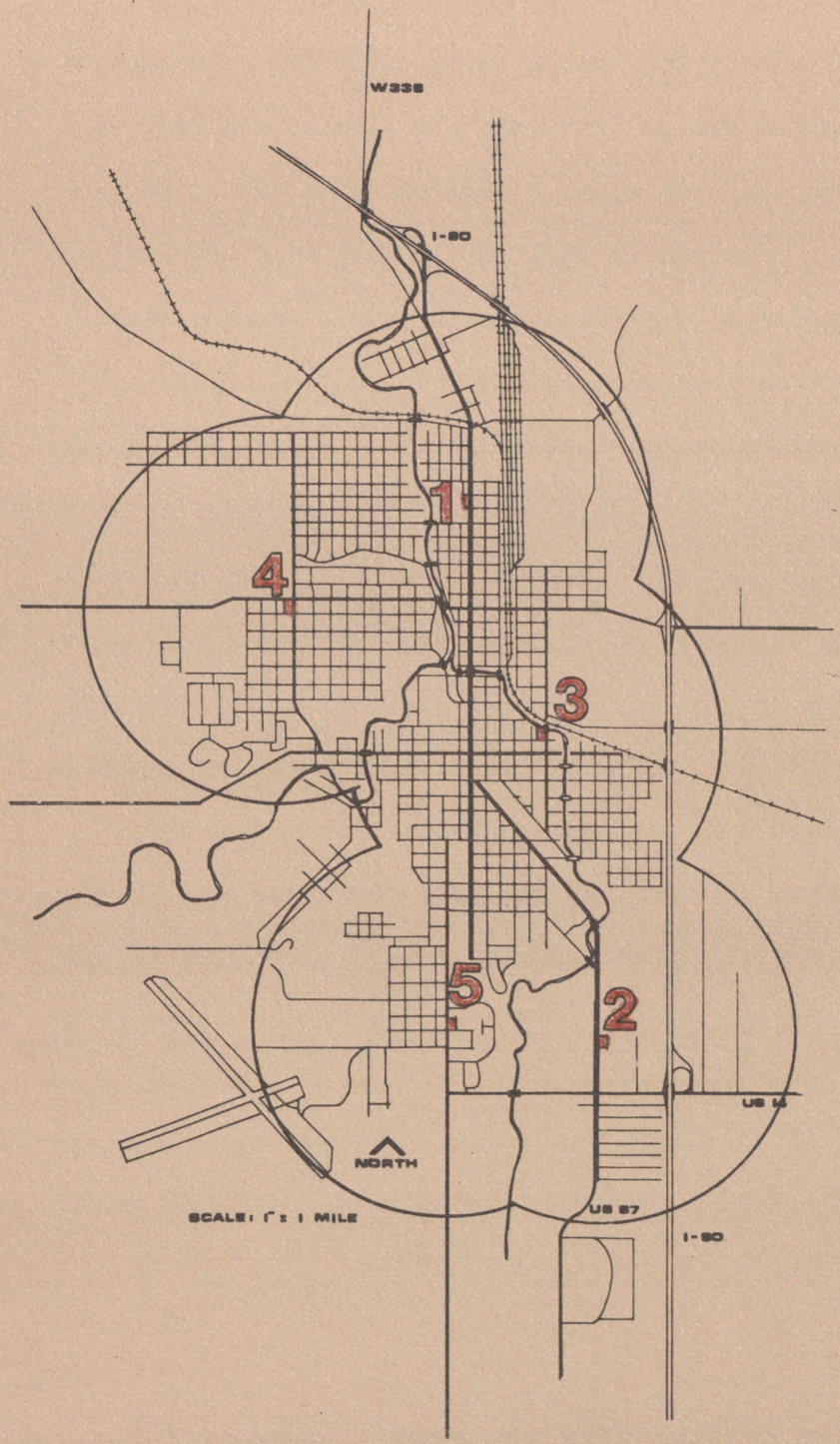
sewer, water, enforce code and zoning. This could control the unorganized growth which can lead to tent cities, unsanitary wells and drinking water. This type of growth has occurred in both Gillette Wyoming and Rock Springs Wyoming with disasterous effects. Most of the problems occurred because of insufficient planning.

Five stations are planned because of the thirty to fifty thousand population. The stations can be built as they are needed, if one or two are never built the costs for planning are minor . If three are planned and five are needed, site acquisitions can be difficult and expensive and possibly undesirable if the situation becomes critical. At present, Billings Montana has a population of 63,000 people and has six fire stations. Casper Wyoming has a population of 65,000 and has six stations. These two cities have adequate fire facilities. A ratio of 10,000 population to one fire station is relevant. Sheridan on the other hand has one station for 16,000 people and no new station

until at least 1982 or1983. By this time the population will probably be near 20,000, therefore the city will be keeping up but not ahead of the fire planning.

The five sites (map #8)were picked to provide intense protection for the main city area while allowing for infill. The furthest distance between sites is approximately four miles travel distance. All of the sites are located on main arterials. This way the city can expand along the roads and still receive major protection. The response time is much quicker on these roads because trucks can easily accelerate to forty or fifty miles per hour, not the twenty-three miles per hour through town driving. All of the arterials have thirty miles per hour speed limits while some are forty-five miles per hour a short distance from the site. This way an acceptable response can be two or more miles from the station.

Site #1 and#2 will be both city and county ventures. These sites are desirable for the county



5 SITES

for the main reason of quick access out of the city plus the benefit of interstate access nearby. Site #1 to the north is near a large area of growth outside the city limits. Site #2 is near the fastest growing areas, straight south on Wyoming 337, U.S.87 and U.S. 14. All have heavy growth for several miles. Interstate access is important because there are a large amount of vehicle accidents and fires which are responded to. Also they provide access to several small towns around Sheridan which depend on Sheridan county for additional help in large fires.

The sites were chosen by the fire department for their importance, size and location. Three of the sites already belong to the city, these are # 1, 3, and 4. Sites " 2 and 5 are noncity but are important areas. Either station could easily be pushed further south but for the sake of this study they will be examined at their present location.

3 SITES

For the purpose of this study three of the five sites were chosen for final design solutions. Sites two, three, and four were picked.

Site two is basically a strip development which has come into existence in the last ten years. This will be a joint Sheridan City, County Fire Station with full training facilities. Site three is a small City Fire Station in a mixed use area. The area has been in existence for over ninety years. Finally site four is also a small Sheridan City Fire Station in a strong institutional area which has been developing since the 1950's

The three sites provided a diverse range of environmental, program, and contextural issues for use in this study.

DEFINITION OF A FIRESTATION

A firestation can be defined as a publicly owned and operated structure which houses the fire apparatus and a sufficient number of fire-fighters to safely and efficiently operate equipment during an alarm.

Basically firestations are a single function building. That is they contain men and equipment for suppression of fires once they start. The prevention lies more in the hands of the officers who are part of the administrative operations of the city.

PSYCHOLOGY OF A FIREFIGHTER



Associated Press

Flint firefighter Charles Fay, left, is held by fireman Carl Adams after Fay returned to shore of Flint River after swimming 40 yards in the cold water to suscitate a stricken youth. Two other men died in the rescue effort.



Firemen die

FLINT, Mich. (UPI) — Two young firefighters who joined the force together exactly three years ago died in their attempt to help a 6-year-old boy who had fallen into the frigid waters of the Flint River.

The boy survived but was reported in critical condition at a local hospital.

The two firefighters, Roger Campbell, 22, and Matthew Young, 25, slipped beneath the river surface in a swift current Friday while a third firefighter looked on helplessly from the opposite bank.

Searchers found both firefighters about 8½ hours later some 100 feet from where they were last seen, officials said.

The ordeal began when firefighters responded to a call near the Rolling Wood Manor apartments in Flint that two children had fallen into the river and needed help.

Firefighter Charles Fay said when the three s... and a sn... river. He ... and slowly s... swim safely an... Lafayette, cardiov...

The boy's fathe... and a neighbor already from the water and gotten...

When Campbell tried across, he ran into trouble, sai... Detective Sgt. Ronald Ignash.

"He (Campbell) got into the m... the river and complained of his leg m... hurting," explained Ignash.

Young jumped into the water ... fort to help Campbell, but both sl... the water's surface while tri... back to shore, Ignash said.

DA...

Firem... injurec... in Frid... blaze

2 firemen killed

Firefighters work has often been described as living on the razors edge. The outcome of any day is totally unpredictable. A day of total monotany can in a split second become a horror story full of death, tragedy, and personal sacrafice. The wide range of physical and emotional tests can be unbearable to many firefighters. Heart attacks, mental stresses, marriage problems, and job frustration all account for a high turnover rate. At present the average Sheridan firefighter has been on the job only five years.

An average day for a firefighter may follow this pattern. You arrive at the station at 7:30 or 8:00 A.M. You usually won't be late because the other firemen cannot leave the station until you arrive to replace them. The first half hour is socializing, a cup of coffee, maybe a quick glance at the newspaper. Then it is time to move to the apparatus room to check out the trucks. The water, oil, fuel are checked, pumps are tested, engines started and the body is wiped down.

This can take anywhere from half an hour to two hours depending on how thoroughly the job is done. Paper training follows: memorizing commercial businesses, streets, fire hydrant location and hydrolics. After an hour lunch, it is one or two in the afternoon. The rest of the day is spent doing inspections, driving practice, repairs, heavy training etcetera. Dinner is usually between 5:00 or 6:00 After dinner the rest of the day is left for the individuals; working on projects, hobbies, watch television or any other types of activities such as these. Bedtime is between 10:00 P.M. and 1:00 A.M. depending on how good the late movie is. Then it is time to sleep for the rest of the night (a good sleep is near impossible) 6:30 rolls around, rise and shine, another cup of coffee. You wait for your replacement (with a half a prayer that you don't get called out ten minutes before your shift ends) and your on your way home. Wow, what a long twenty-four hours. This can be a typical day, but not always. Days will occur when training won't occur, meals will be missed,

sleep not to be found.

The routine can and is frequently interrupted by calls. In the summer, two, three, four calls a day can occur. In the winter sometimes two weeks will pass without a call.

The policy for the fire departments is the 8:00 A.M. to 5:00 P.M. as the working hours. This time is devoted to fire department needs. 5:00 P.M. to bedtime is for the firefighters private time. The theory is to keep the time fairly regimented to help control boredom and other stresses which occur.

Stresses are a particular problem for the department, both physical and mental. The physical stress is the most obvious. Fighting fires is one of the most demanding jobs around. The physical strain can be intolerable at times bad enough to hospitalize or kill the firefighter. Firefighters have the most dangerous job in the United States at present. Between 700 and 800 firefighters die annually while fighting fires.

Every one out of ten fire related deaths is fire-
man. The injury rate for firemen is sixty percent.
There are twenty-four firemen in Sheridan's
department and in the last year thirteen injuries
were recorded or a fifty-five percent injury rate.
When a call is received, an alarm alerts the station.
The alarm itself jolts the firemens adrenalin
system. Heart beats can race to 130 to 140 beats
a minute, blood pressure will rise from 120/80 to
150/70. The adrenalin also increases a firemans
strength. Many injuries are recorded by fireman
doing feats with incredible strength. The heart
strain is strong and many fireman die every year
from heart attacks while fighting blazes.

Mental stress can even be more devestating.
The wide range of emotions can be difficult to
handle, from pure boredom to extreme excitement.
During slow times the station can become a prison,
especially in the winter. Tensions become high
and nervous energy is abundent which can be diff-
icult to handle. Marriage problems can result

from the long separations because of the twenty-four hour shifts and from the danger of the job. Many firefighters have quit the fire department to save their marriages. Another problem is the waiting for a call which can cause anxiety problems. This can cause short tempers and tension problems in general.

The design of the firestations should be considerate of the mental and physical stress involved. The atmosphere of the station should be as relaxing as possible, and stress inside the station should be kept to a minimum. Therefore rooms should be spacious and lively to avoid tensions, recreation areas should be available to break boredom and pass the time. The area could almost take on the atmosphere of a club. This could relieve many pressures and keep the job enjoyable in bad times. This could help reduce job turnover rates and many mental problems which are prevelant.

ENVIRONMENTAL CONDITIONS

Sheridan has a drastic weather change between winter and summer conditions. The highs in july and august can be 105 degrees while the lows in january can be -40 degrees below zero. The monthly average temperatures are as follows.

January 15.7 degrees

April 43.8 degrees

August 71.1 degrees

November 32.5 degrees

Precipition is scarce, an average of 16.6 inches of moisture falls on Sheridan every year. Of this @ 7 inches comes in the form of 69 inches of snow-fall.

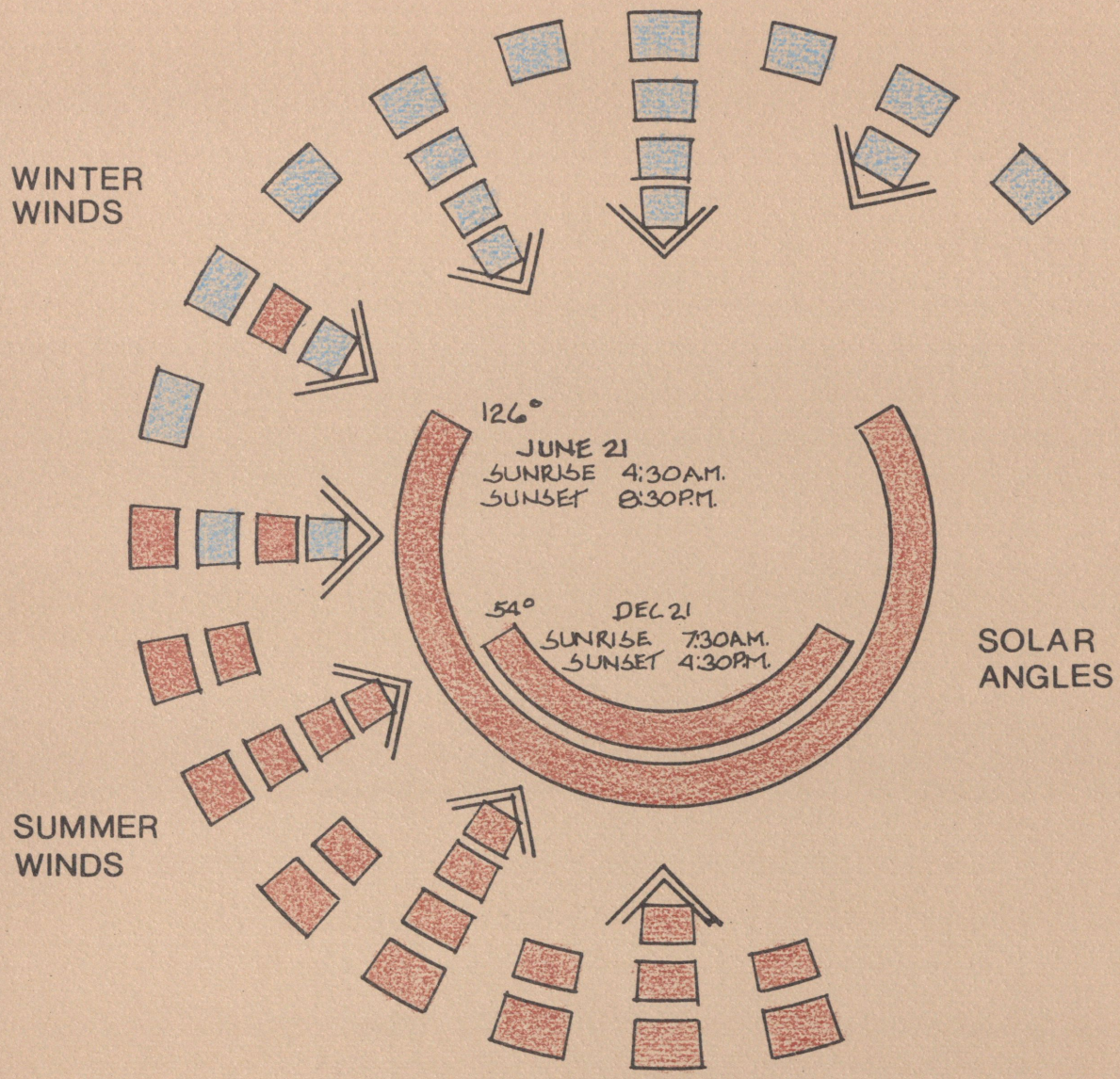
Winds average only 7 mph with up to 80 or 90 mph winds registered in early spring or late fall. The winter winds come mostly from the northwest. Some wind occur from the west and bitter cold winds from the north, rarely winter winds come from the south or east.

Summer wind are dominant from the west, south west. Hot dry winds occasionally come from the

south or southeast, eastern winds are rare in both summer and winter.

Sheridan lies just south of the 45 degree north latitude line. The following chart shows the relative angles of the sunrise and sunset for december 21 and june 21.

The altitude angles range from 68 degrees on june 21 to 46 degrees on march - september 21 to a low of 22 degrees on december 21.


WINTER
WINDS
126°
JUNE 21
SUNRISE 4:30A.M.
SUNSET 8:30P.M.
54°
DEC 21
SUNRISE 7:30A.M.
SUNSET 4:30P.M.
SOLAR
ANGLES
SUMMER
WINDS

SOLAR

The use of passive solar energy in a firestation is very practical. The stall areas do not require strict control of the temperature, therefore temperatures can very anywhere from 55 degrees to 90 degrees with out any problems. The materials in stall area adapt well for solar use. Alot of brick, tile and concrete is used because of their low maintainence. These materials store considerable amounts of heat and could drastically lower the heating requirements for the station.

The living quarters could easily use tile and brick as primary coverings. Water walls could also be used in this area to gather and store solar heat. Firefighters are usually around to control the manually operated devices such as curtains and shutters which are inherent to passive systems.

Active systems could be used to preheat water for hot water use. Hot water is used extensively for showers and cleaning trucks and equipment. Since there is such a high hot water use it may be

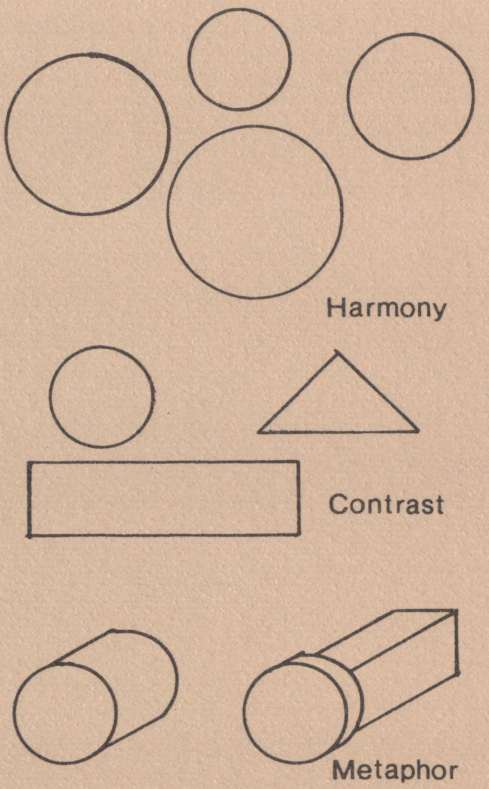
possible to save considerable amounts of money by using an active system.

Considerable energy savings could be had by a little sensible planning of the stations. Fire-stations adapt well to solar heating and it should be used to the maximum.

CONTEXT

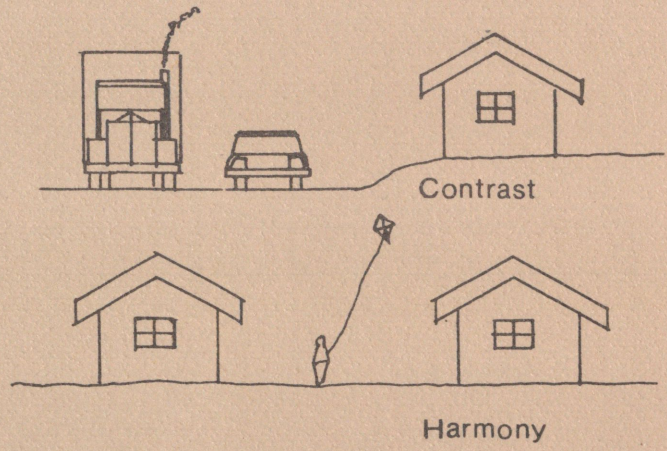
Context in architecture is a relatively unexplored field. For decades many architects could have cared less what surrounded a site. The new buildings that were constructed were often abusive to its surroundings. The new built form neglects, overpowers, or destroys much of the character which had been created for many years. In the last few years interest has been growing towards architecture which is sensitive to its surroundings. Preservation, public interest, and a growing attitude towards a sensitive architecture have created a concern for the context of an area. The following is a description of the process which was used to systematically analyze the contextural the issues of each site and the way built forms fit into the area. For the purpose of this study, context in architecture will be broken into two major areas: How a built form fits into a given area and how the surrounding are described.

The description of how buildings fit into a contextural area maybe broken into two or three categoies or relationships, contrasting, harmonious, and/or metaphorical. Simply described buildings which fit harmoniously into an area share the architectural characteristics already present. Buildings which have a contrasting relationship to their context exhibit architextural opposition to the existing character of the area. Buildings which exhibit metaphorical relationships to their context may take a strong idea or architectural element in an area or subject and use it as a major design element.



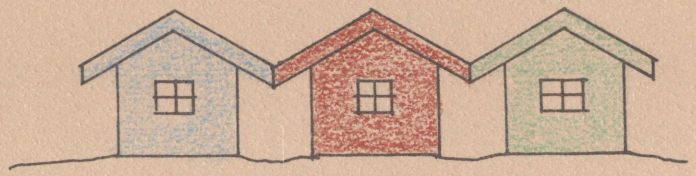
The contextural description of built forms will be broken down into four elements. These elements will be activity color, light, and form. Each element has definite effects on the character of a given area. Following are brief descriptions of each element and how through being sensitive to these elements, new additions to the built environment are in relationship by being contrasting, harmonious, and/or metaphorical.

Activity is defined as any movements at or near the site. The activity can either be in the form of wind, water, vehicles, people, etc. It is important to find out how strong the effect of activity can be to the site. Extensive activity may need to be blocked or it may be used to enhance the site.

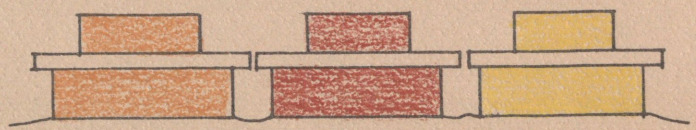


The role of color is very important in contextural studies, color will enhance or abusive, devastating or enlighting to its surroundings.

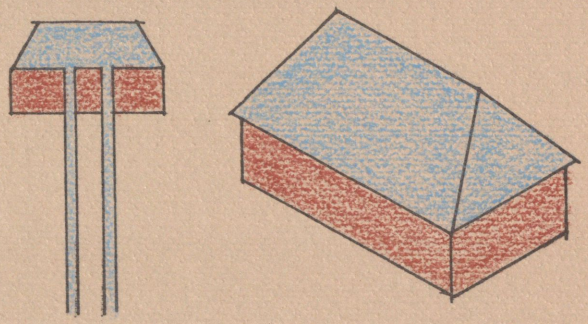
Imagine an area with homes of natural earth tones and in the middle is a house painted bright red. The home stands out because of the high contrast that was created. Now take the same color and apply it to a building in a strip development. The building no longer stands out because it is now in relation to the other strong colors on the strip. The use of color can create metaphors, such as the use of color tc make the building a large sign for advertising.



Contrast



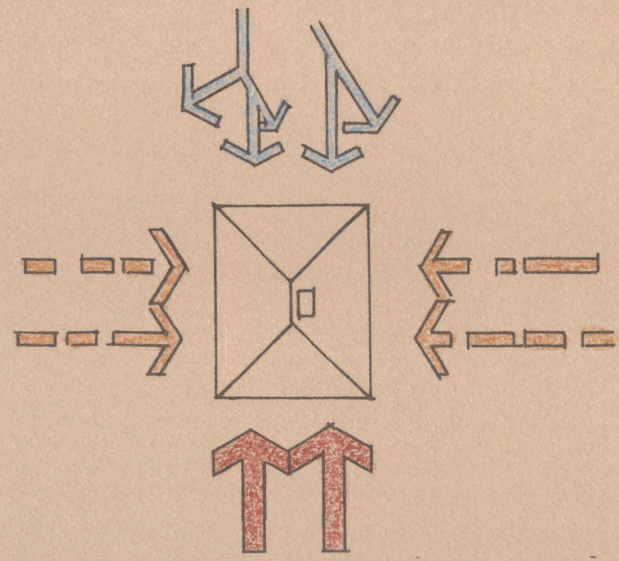
Harmony



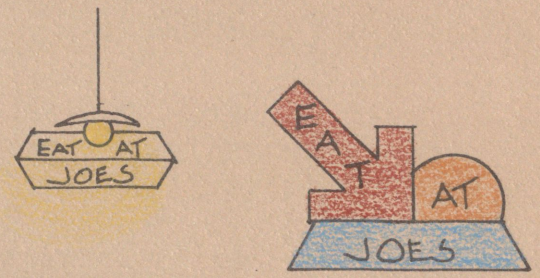
Metaphor

The affects of light on a site are important for the moods which can be created. Areas with heavy sunlight can be stressful or delightful depending on the time of day. Shaded areas will draw large crowds in the summer, but will be bare in the winter and spring. Artifical light or the lack of it will cause other emotions. Numerous flashing lights may cause happy moods, very dark areas will cause fear and nervousness.

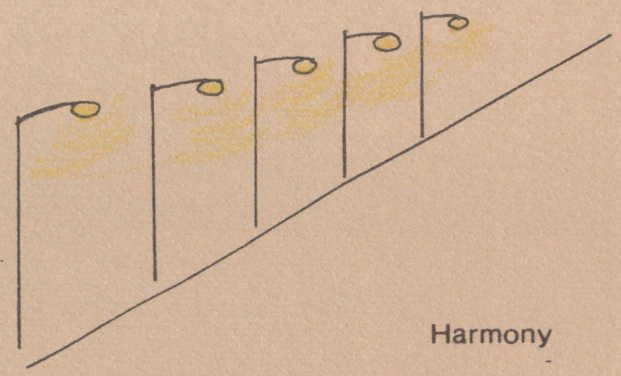
Contrasting lights and lights in relation to each other are dependent on the number, color, size, flashing, etc of the lights in a given area. Gas station signs are in contrast to the lights in a residential nieghborhood while it is in relation to the large flashy signs of a strip area.



Natural Light



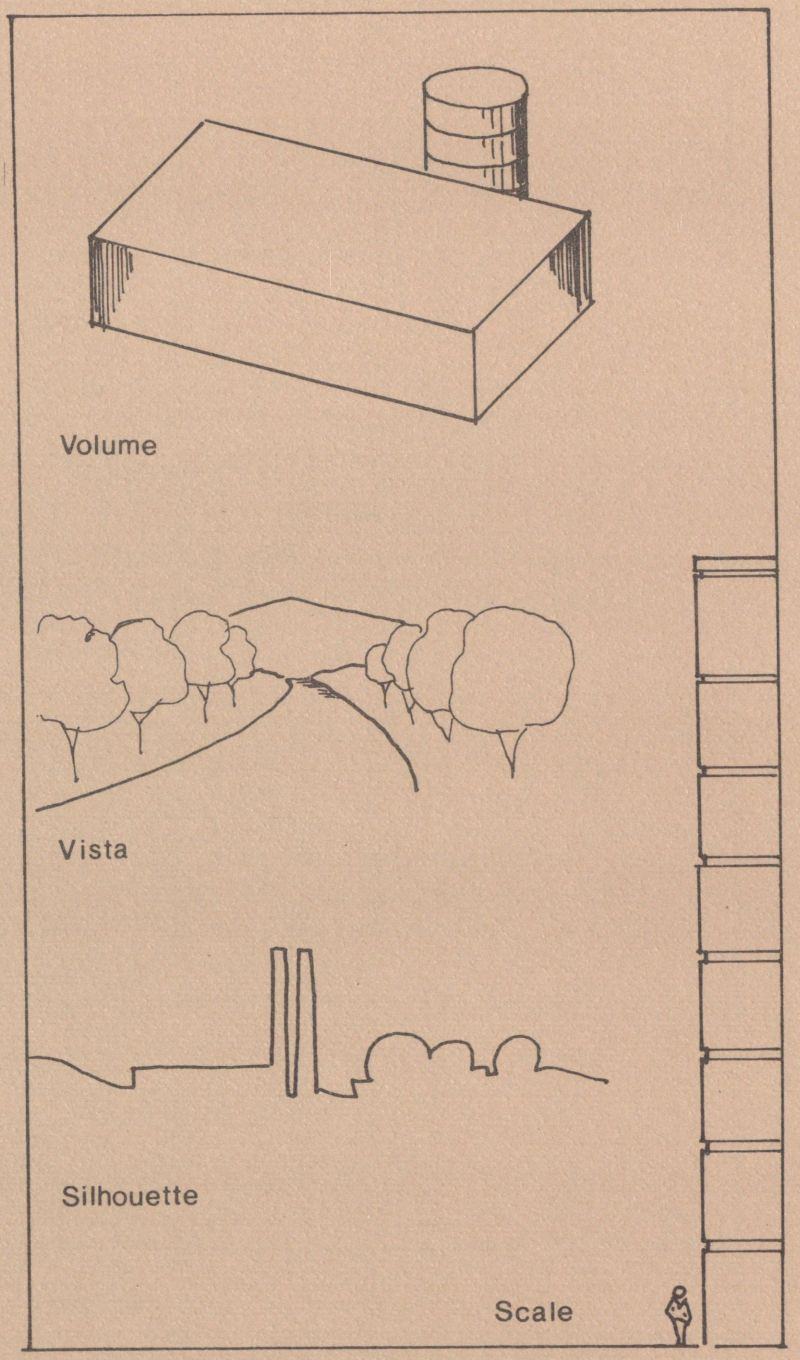
Contrast

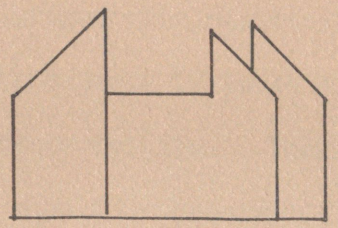


Harmony

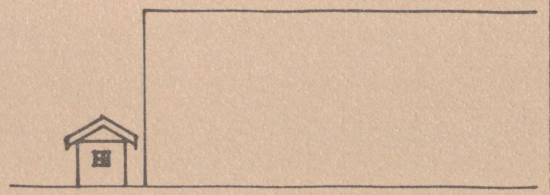
Forms are the most obvious area of the context study and it contains many parts. The parts cover a wide range of ideas in the study. The following areas are being studied for use in the site analysis.

Forms will create contrasts, relationships, and/or metaphors with the surrounding built forms. The illustrations show how several different ideas can create the above mentioned .

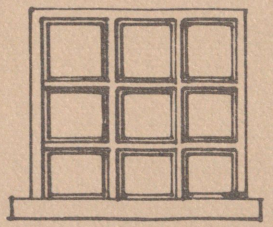




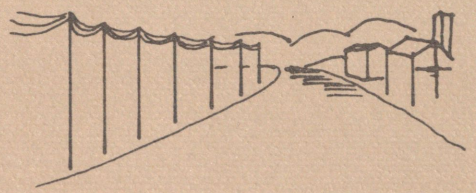
Forms



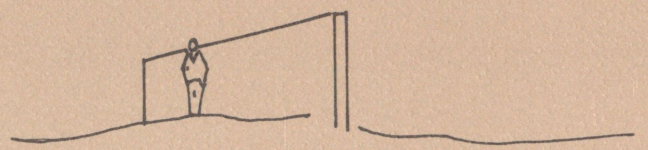
Bluntness



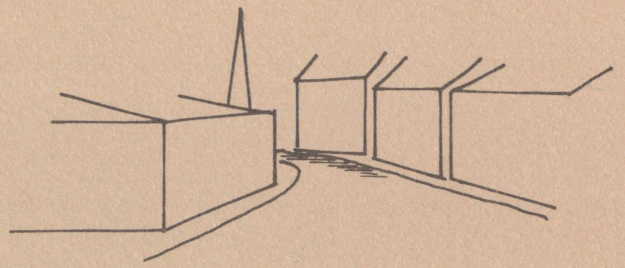
Detail



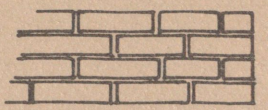
Texture

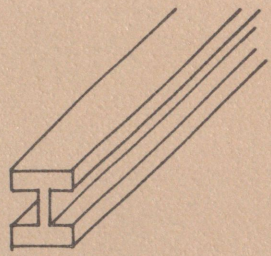


Edge

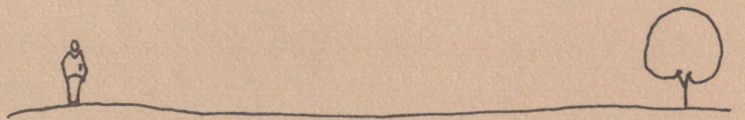


Anticipation





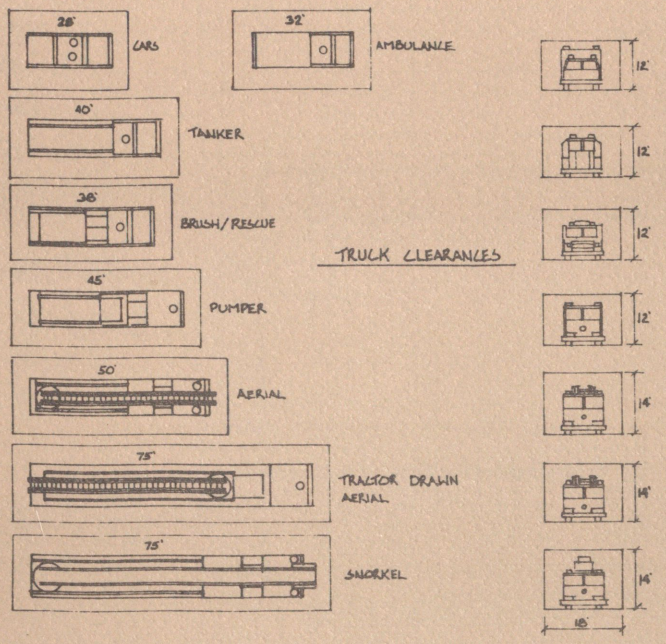
Materials



Open Space

The program for stations 3 and 4 are the same. Each station needs to house 3 to 6 men, 2 pumpers, and a service vehicle. Parking for 6 vehicles on the site should be provided. Both of these stations are owned by the city.

PROGRAM
STATION 3&4



Area: DRYING TOWER

Function: FIRE HOSE DRYING

User: FIREFIGHTER

Quanity: 2000' HOSE

Orientation: TO THE BACK OF THE APPARATUS ROOM, TO EASE LOADING AND UNLOADING

Equipment: LADDER, PULLEYS, ROPES

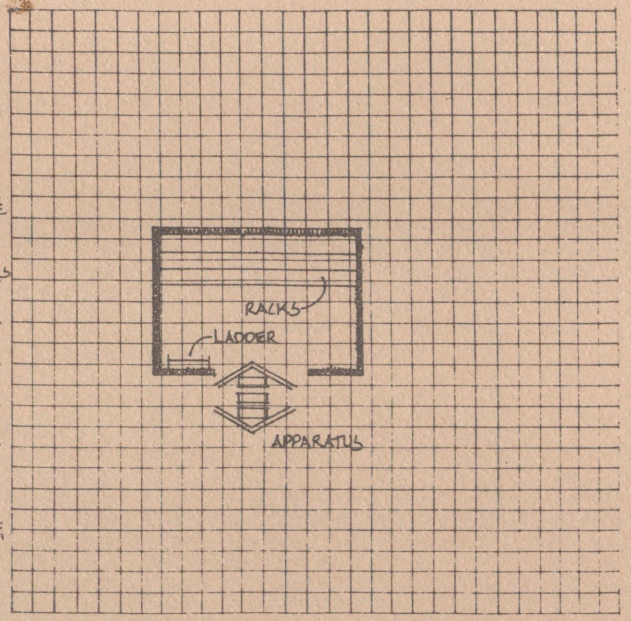
Visual: ONLY TO STALLS

Acoustical: NONE

Mechanical: NONE

Solar: ?

Comments: PURE FUNCTIONAL HOSE CAN BE HUNG IN 50' OR 25' LENGTHS



Area Required: 30'-70' sq FT

Station No: 2 3 4

Area: WORKSHOP

Function: MINOR REPAIR AREA

User: FIREMEN

Quanity: HEAVY USE IN DAYTIME

Orientation: EITHER OFF TO ONE SIDE OF THE STALLS OR IN A SEPERATE ROOM

Equipment: WORK BENCH, SHELVES, TOOLS, CLOSED STORAGE.

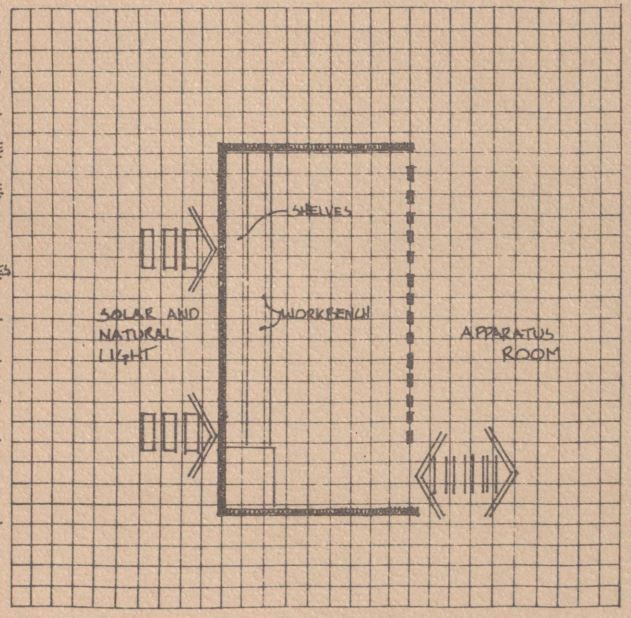
Visual: STRONG TO APPARATUS

Acoustical: NONE

Mechanical: HIGH LIGHT, VENT

Solar: COULD BE USED FOR BOTH GATHERING AND STORAGE

Comments: NEEDS TO BE NEAR TRUCKS.



Area Required: 50-100 sq FT

Station No: 2,3,4

Area: APPARATUS ROOM

Function: INTERIOR TRUCK PARKING

User: SEMI-PUBLIC

Quanity: 2 PUMPERS

Orientation: FACING STREET HEART OF THE STATION

Equipment: RACKS, DRAINS, POLES

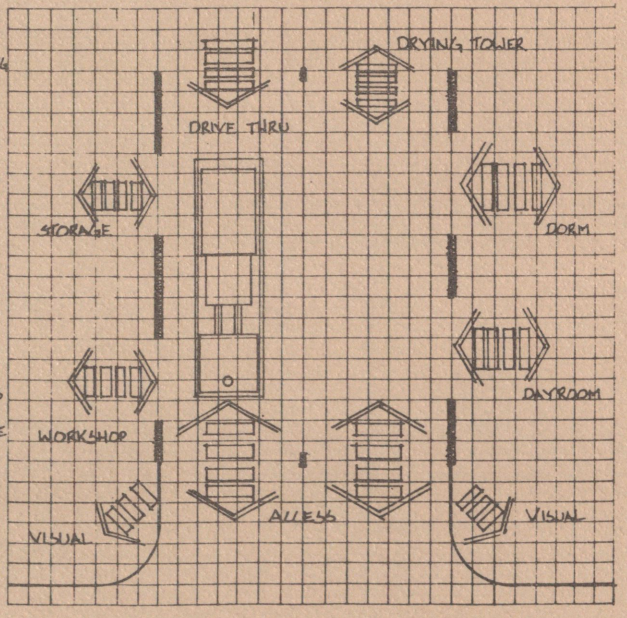
Visual: 30' SETBACK FROM STREET

Acoustical: NONE

Mechanical: HEATING, 14'x14' DOORS

Solar: COULD BE A MAJOR STORAGE AREA

Comments: TRUCK CLEARANCE PUMPERS: 16'x50' VEHICLES: 16'x28' 14' CEILING CLEARANCE



Area Required: 1800-2000 sq FT

Station No: 2,3,4

Area: DORM

Function: SLEEPING

User: FIREMEN

Quanity: 3-6 BEDS

Orientation: EMPTY DIRECTLY TO THE APPARATUS ROOM

Equipment: 6 BEDS BUILT IN LOCKERS

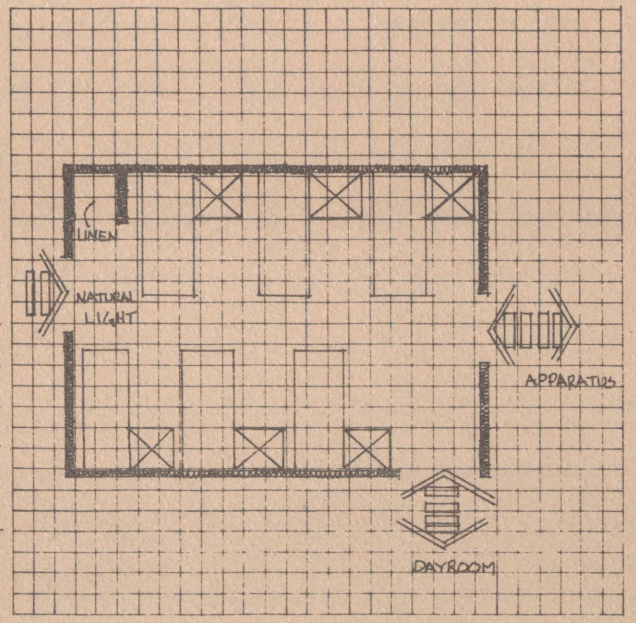
Visual: SOME WINDOWS FOR NATURAL LIGHT + VENTILATION

Acoustical: SOME

Mechanical: LIGHTS HVAC

Solar: ?

Comments: BEDS SHOULD FOLD INTO WALL SO SPACE COULD BE OPENED UP



Area Required: 450 SqFt

Station No: 2,3,4

Area: TOILET SHOWERS

Function: HYGIENE

User: FIREMEN

Quanity: 2 MAX

Orientation: ALLEYS FROM LIVING AREA - POSSIBLE FROM STALLS

Equipment: SHOWER, SINKS TOILET, MIRRORS

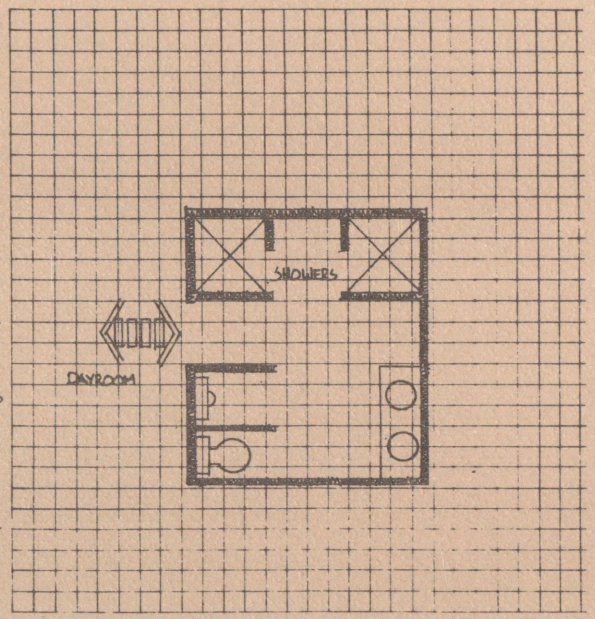
Visual: NONE

Acoustical: NORMAL

Mechanical: LIGHTING, HVAC, FANS

Solar: NONE

Comments: EASILY CLEANED MATERIALS



Area Required: 150-200 SqFt

Station No: 2,3,4

Area: DAYROOM

Function: RELAXATION, REC

User: 3 TO 6 FIREFIGHTERS

Quanity: HEAVY EVENING USE, MEALS

Orientation: OPEN TO STALLS AND OUTSIDE

Equipment: LOUNGE CHAIRS, TV, STEREO, TABLE, CHAIRS, SHELVES.

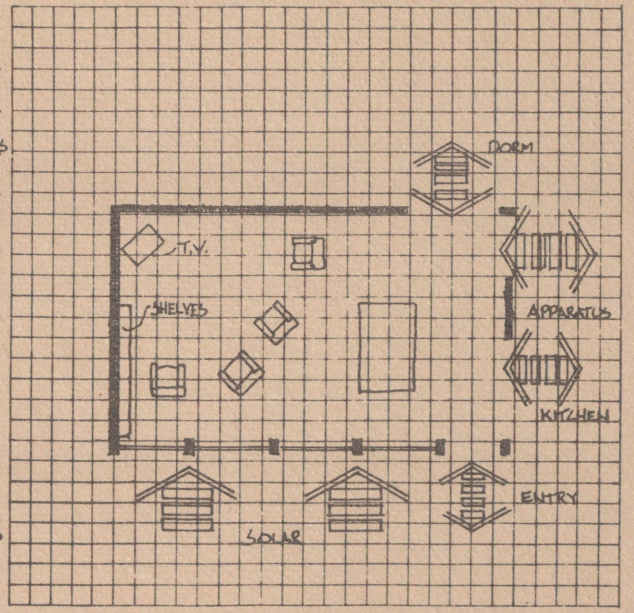
Visual: GOOD OUTSIDE VISION

Acoustical: SOME

Mechanical: LIGHTS, HVAC

Solar: PASSIVE. MATERIALS ADAPT WELL IN THIS AREA

Comments: IMPERATIVE TO HAVE THIS AREA NEXT TO STALLS



Area Required: 350-500 SqFt

Station No: 2,3,4

Area: KITCHEN

Function: MEAL PREP

User: FIREFIGHTERS

Quanity: 2 AT A TIME

Orientation: OFF DAYROOM

Equipment: STOVE, REFRIG, SINK

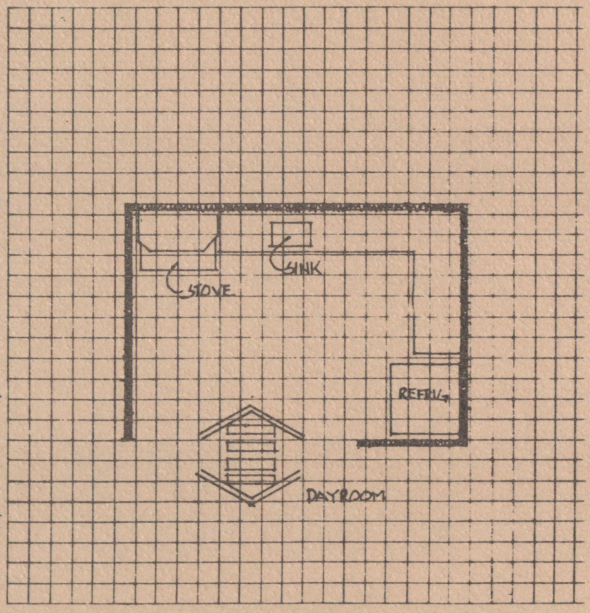
Visual: ?

Acoustical: NONE

Mechanical: FANS, LIGHTS, HVAC

Solar: ?

Comments: NEEDS TO BE LARGE ENOUGH TO ALLOW 2 MEN TO WORK AT TIME



Area Required: 200-300 SqFt

Station No: 2,3,4

The program for station 2 is basically the same as stations 3 and 4 only on a larger scale. This station is a joint city and county fire station which also houses the county wide ambulance service. This facility is the largest of the stations and houses the fire departments training center. The additional spaces needed are as shown and the other spaces are enlarged as indicated. The station will house 12 to 18 men, 3 pumpers, aerial or snorkel, tanker, brush truck, and 2 ambulances. Parking for 15 vehicles should be provided on the site.

PROGRAM
STATION 2

Area: STORAGE

Function: PERSONNAL + STATION STORAGE

User: FIREFIGHTERS

Quanity: 10-15 LOCKERS

Orientation: OFF APPARATUS ROOM

Equipment: LOCKERS, SHELVES

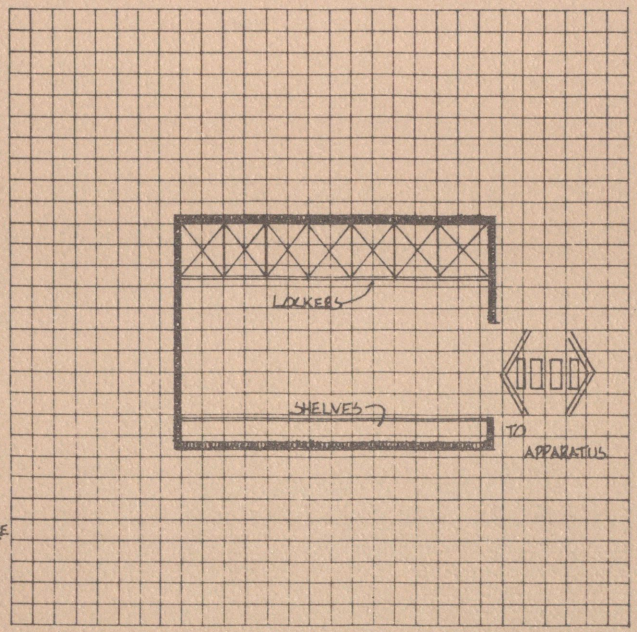
Visual: NONE

Acoustical: NONE

Mechanical: LIGHTS, HEAT

Solar: COULD BE USED TO STORE

Comments: HEAVY + CUMBERSOME EQUIPMENT STORED NEEDS EASY ALLESS



Area Required: 300-400 SQ FT

Station No: 2,3,4

Area: RECREATION

Function: COMBAT BOREDOM PHYSICAL

User: FIRE FIGHTERS

Quanity: 1 TO 6 MEN

Orientation: WHERE EVER USEFULL

Equipment: BASKETBALL HOOPS ETC

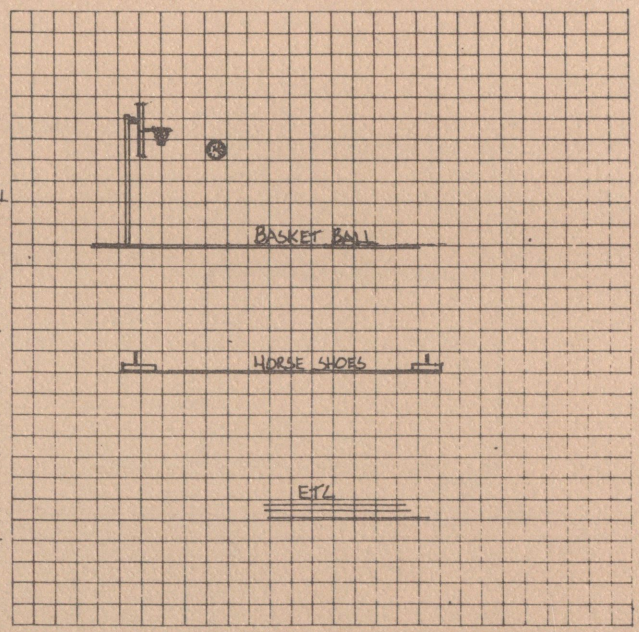
Visual: ?

Acoustical: ?

Mechanical: ?

Solar: ?

Comments: BOTH INDOOR AND OUTDOOR AREAS SHOULD BE PROVIDED



Area Required: ?

Station No: 2,3,4

Area: WATCH ROOM

Function: PAPER WORK

User: OFFICERS

Quanity: 1 MAN AT A TIME

Orientation: OFF THE APPARATUS OR DAYROOM

Equipment: DESK, TYPEWRITER, FILING CABINET SHELVES

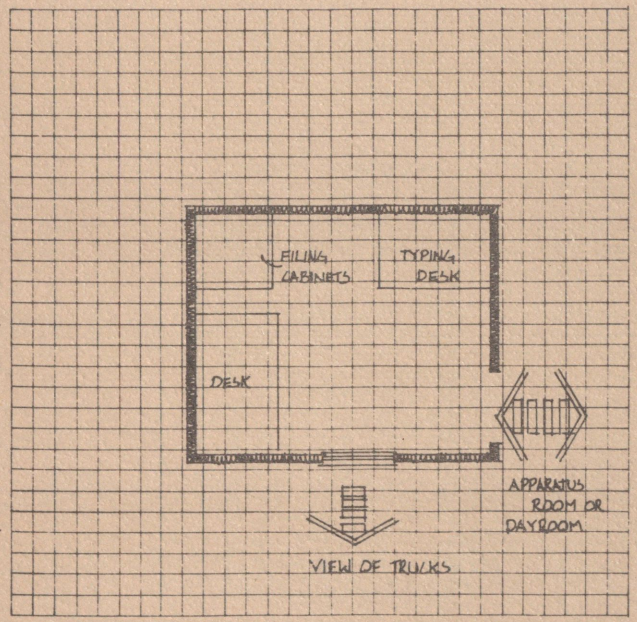
Visual: GOOD TO TRUCKS

Acoustical: NONE

Mechanical: LIGHTING, HEATING

Solar: ?

Comments: PRIMARLY FOR REPORT, STORAGE

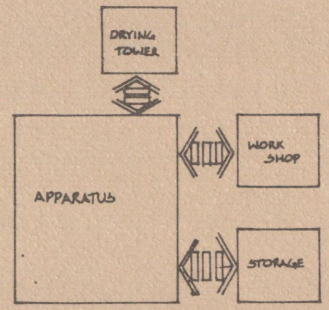


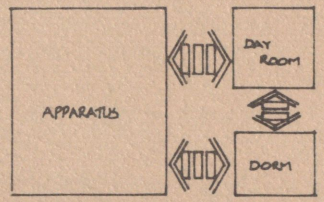
Area Required: 200 SQ FT

Station No: 2,3,4

PROGRAM CONSTANTS

AREA RELATIONSHIPS WHICH SHOULD NOT BE CHANGED

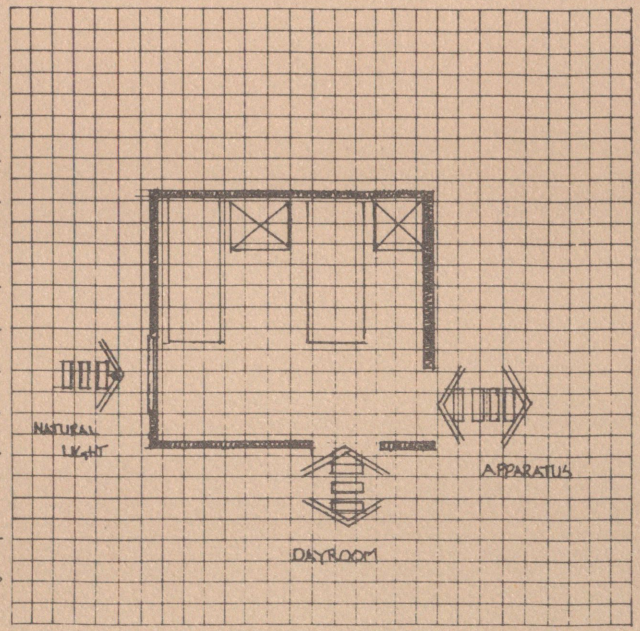




Area: AMBULANCE CREW DORM
Function: SLEEPING
User: FIREFIGHTERS / EMTS
Quanity: 2 MEN
Orientation: OFF DAYROOM

Equipment: BEDS LOCKERS
Visual: ?
Acoustical: ISOLATED
Mechanical: LIGHTING HVAC
Solar: ?

Comments: THEY NEED TO BE ISOLATED BECAUSE OF THE LARGE AMOUNT OF NIGHT CALLS



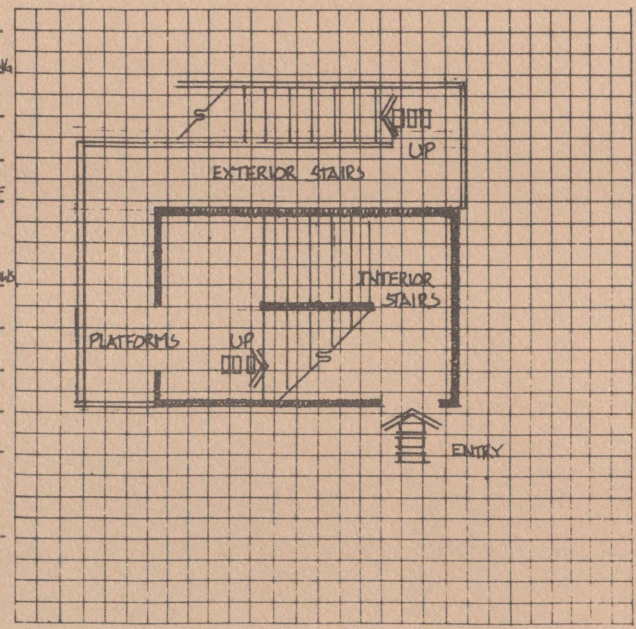
Area Required: 200 Sq Ft

Station No: 2

Area: TRAINING TOWER
Function: FIRE FIGHTER TRAINING
User: FIREFIGHTERS
Quanity:
Orientation: TO THE REAR OF THE BUILDING

Equipment: STAIRS, DOORS, WINDOWS
Visual: ?
Acoustical: ?
Mechanical: ?
Solar: ?

Comments: SHOULD BE 3 TO 5 STORIES HIGH



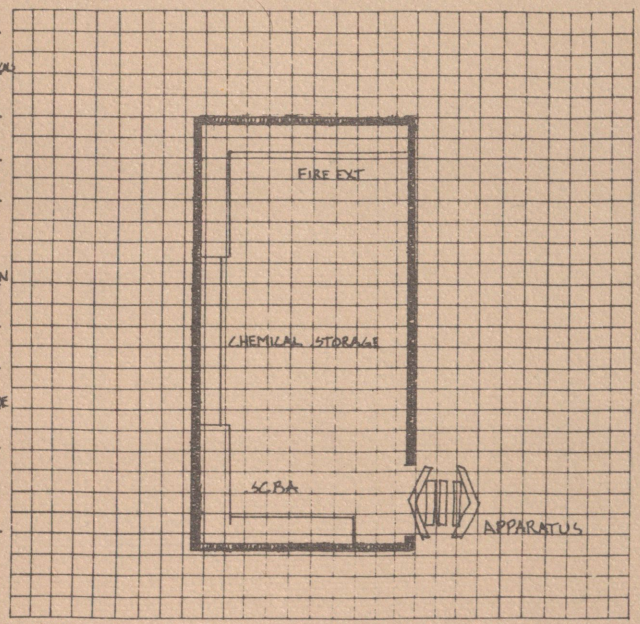
Area Required: 200 - 400 Sq Ft

Station No: 2

Area: SERVICE AREA
Function: SERVICE AREA FOR FIRE EXT., SCBA + CHEMICALS
User: FIREMAN
Quanity: TWO
Orientation: OFF APPARATUS

Equipment: COMPRESSOR, NITROGEN RACKS, TABLES
Visual: NONE
Acoustical: NONE
Mechanical: DIRECT VENT OUTSIDE
Solar: NONE

Comments: SHOULD BE ABLE TO BE TOTALLY CLOSED OFF



Area Required: 250-300 Sq Ft

Station No: 2

EXPANDED AREAS:

APPARATUS: 6 STALLS 5000 - 6000 Sq Ft

DRYING TOWER: 70 - 100 Sq Ft

WORKSHOP: 250 - 400 Sq Ft

DAYROOM: 2 OR 3 TOTAL Sq Ft 1200 - 1500 Sq Ft

DORMS: 2 FIREFIGHTERS DORMS 350 - 450 Sq Ft EACH

KITCHEN: 250 Sq Ft - 400 Sq Ft DINING 200 Sq Ft

TOILET/SHOWERS: MINIMUM 2 PER FLOOR 100 - 250 Sq Ft EACH

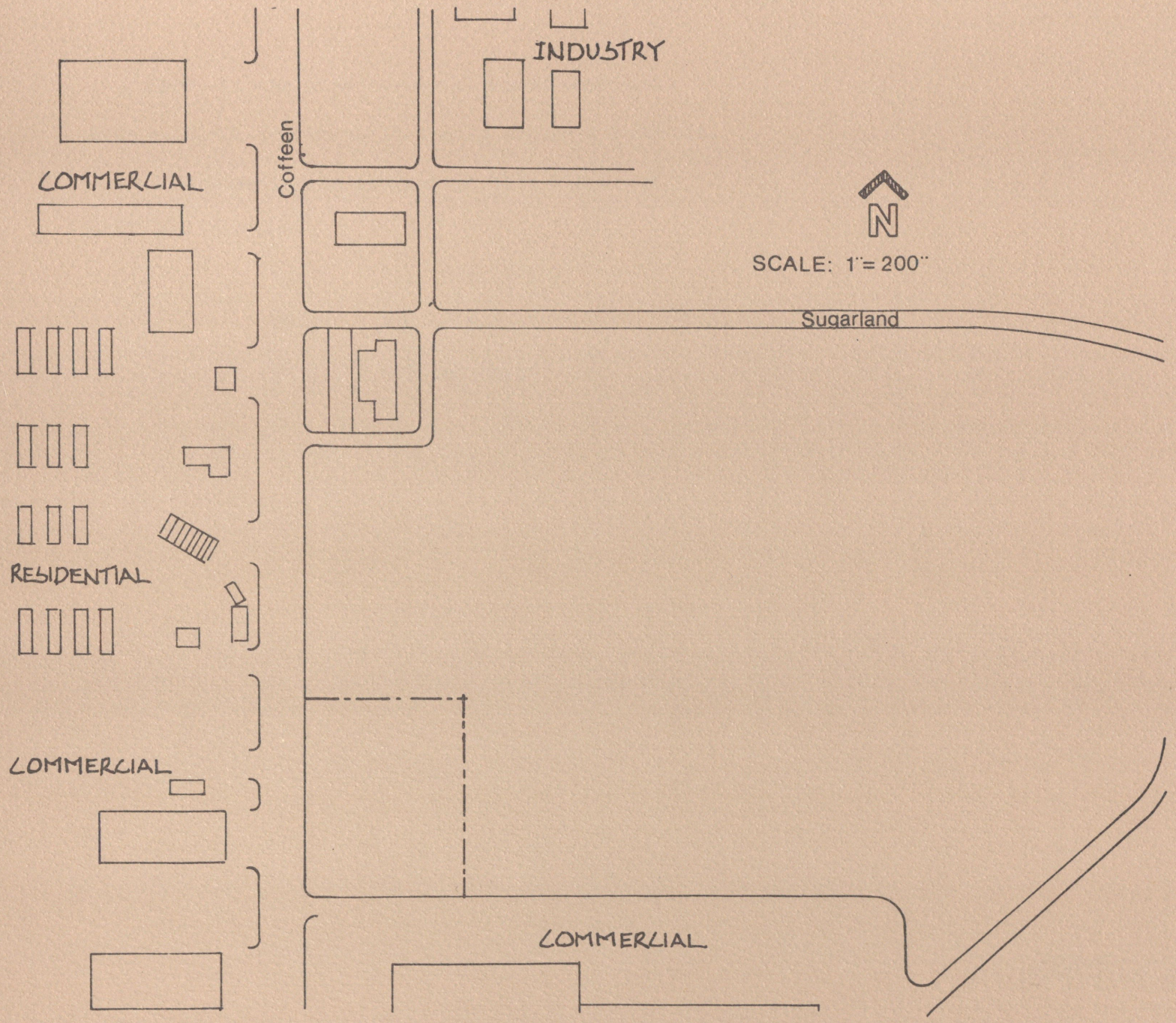
STORAGE: 2 or 3. Total 250 - 400 Sq Ft

OFFICE/WATCH: 250 Sq Ft - 400 Sq Ft.

SITE 2

The map shows the usage of land that surrounds the site.

USAGE


INDUSTRY
Coffeen
COMMERCIAL
N
SCALE: 1"= 200"
Sugarland
RESIDENTIAL
COMMERCIAL
COMMERCIAL

Shown is the major arterial roads near the site on which trucks would travel during a response. Also indicated is the percentage that the trucks will use the roads.

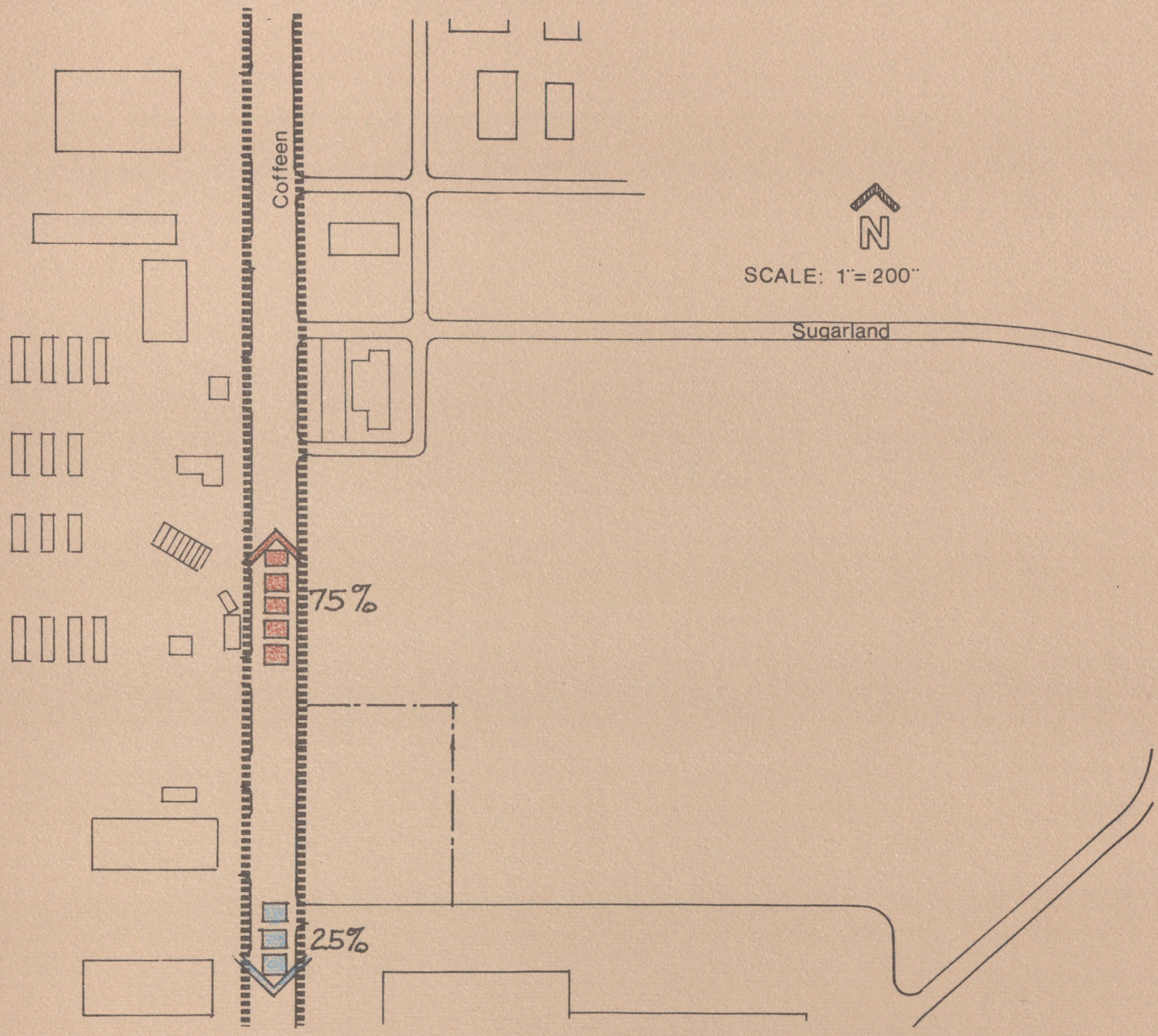


Less than 30%

30% to 60%

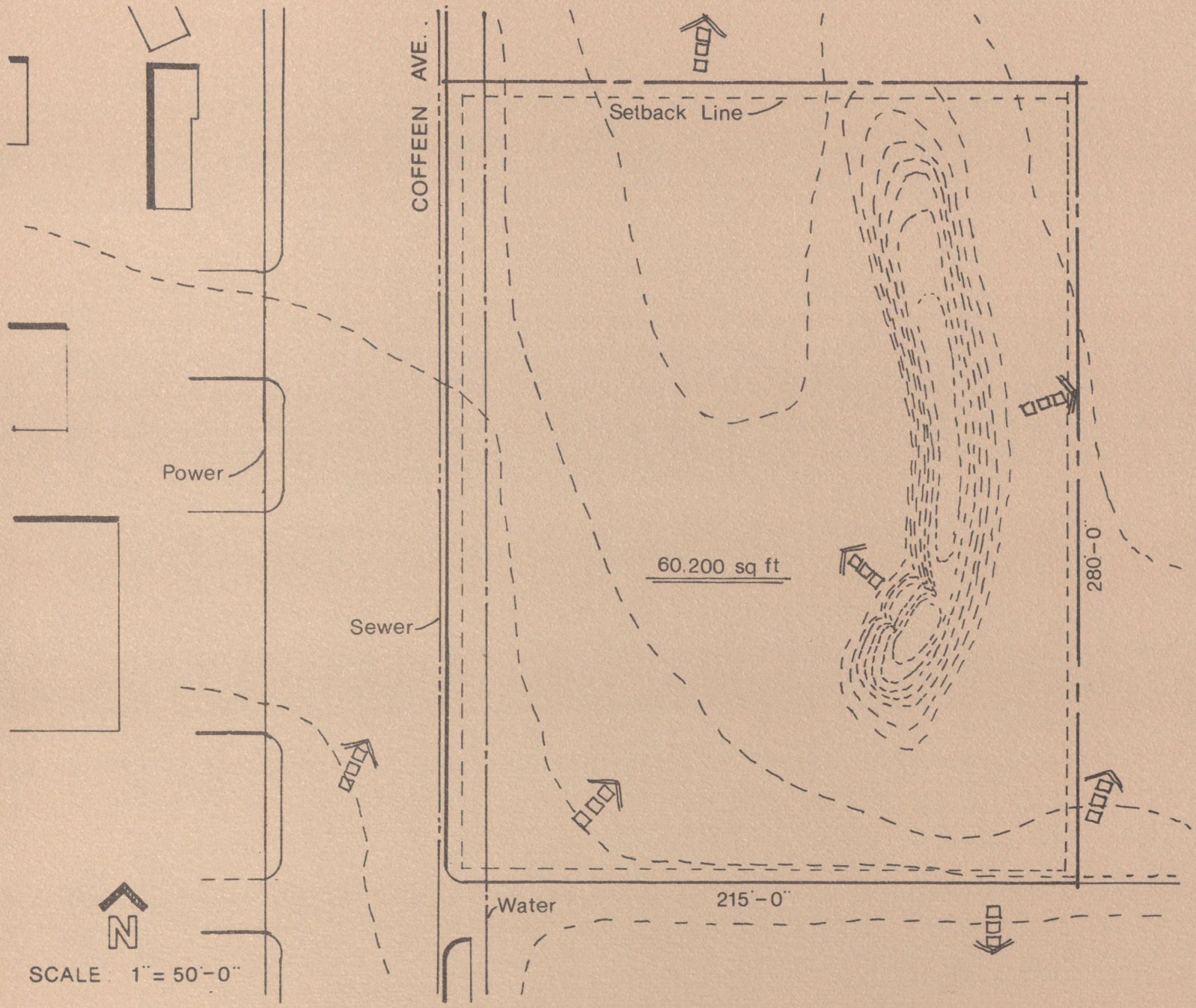
60% and over

RESPONSE


Coffeen
N
SCALE: 1"= 200"
Sugarland
75%
25%

This shows the Physical characteristics of the site as well as site drainage and nearby utilities.

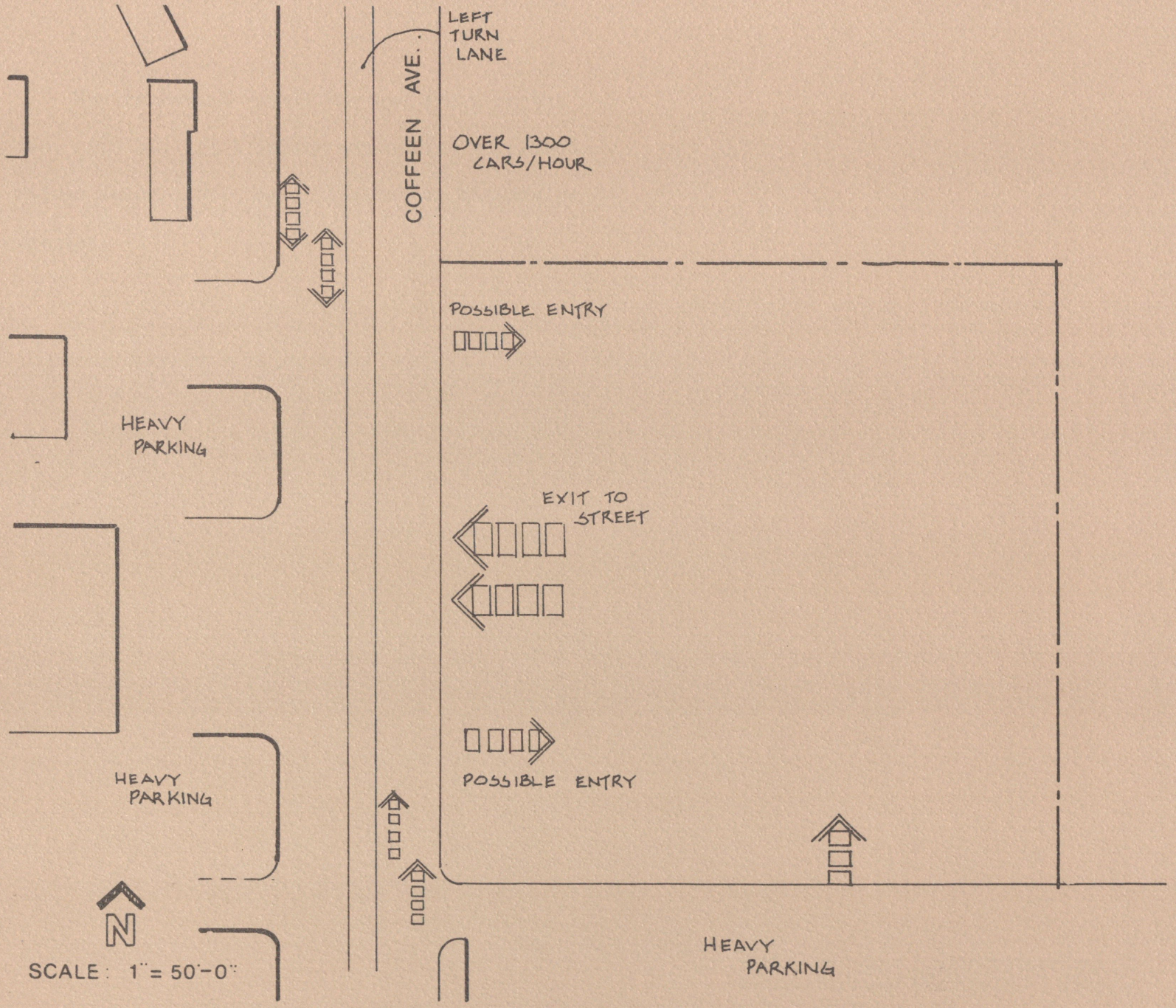
PHYSICAL


COFFEEN AVE.
Setback Line
Power
Sewer
60,200 sq ft
280'-0"
Water
215'-0"
N
SCALE 1" = 50'-0"

On site and nearby traffic patterns are given.

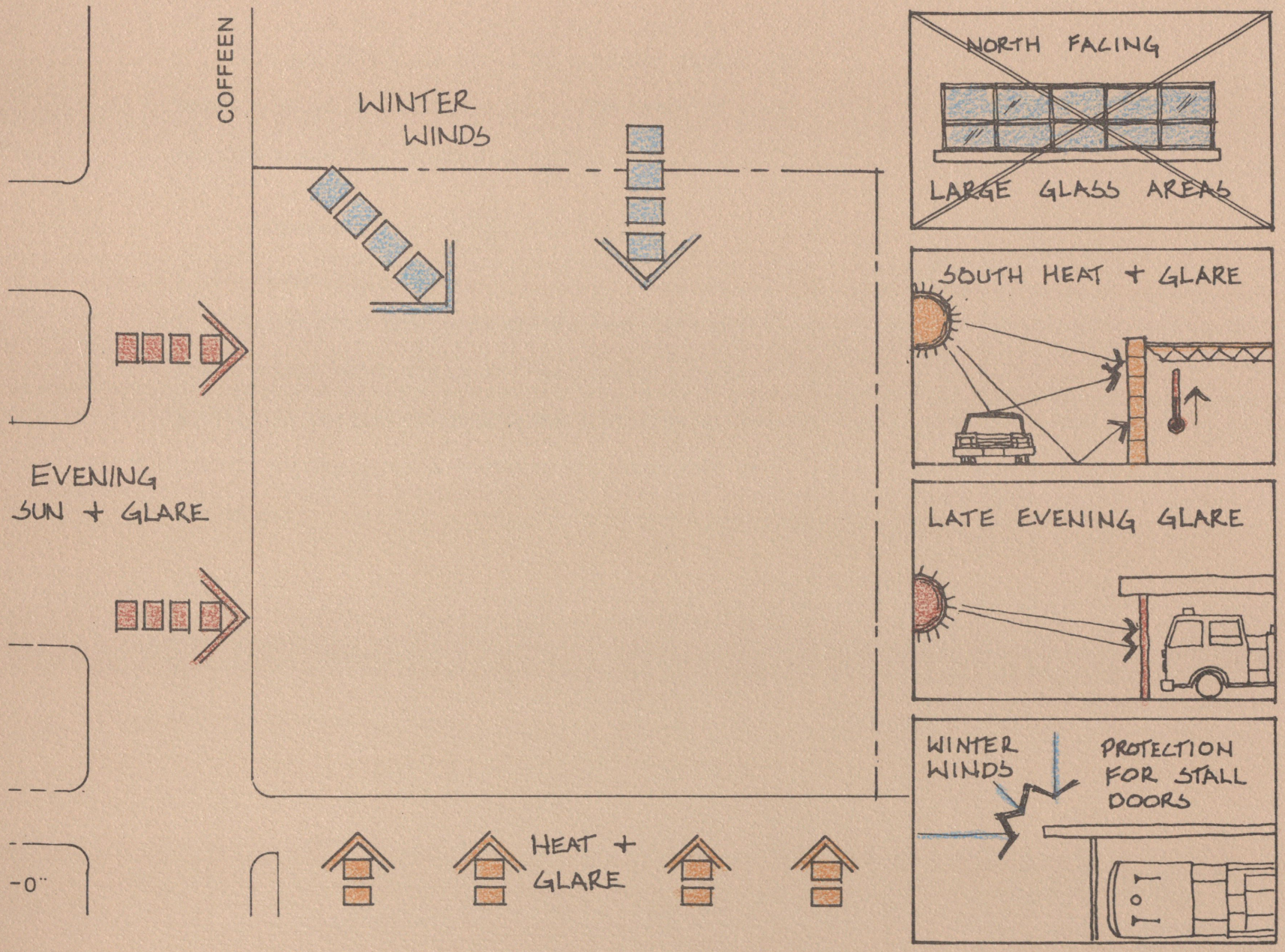
Traffic counts are indicated for the arterial roads.

CIRCULATION


LEFT TURN LANE
COFFEEN AVE.
OVER 1300 CARS/HOUR
POSSIBLE ENTRY
HEAVY PARKING
EXIT TO STREET
POSSIBLE ENTRY
HEAVY PARKING
HEAVY PARKING
N
SCALE: 1" = 50'-0"

Environmental conditions are shown on the map. In the right column are design recommendations which should be considered in the design process.

ENVIRONMENTAL


COFFEEN
WINTER
WINDS
EVENING
SUN + GLARE
-0"
HEAT +
GLARE
NORTH FACING
LARGE GLASS AREAS
SOUTH HEAT + GLARE
LATE EVENING GLARE
WINTER
WINDS
PROTECTION
FOR STALL
DOORS

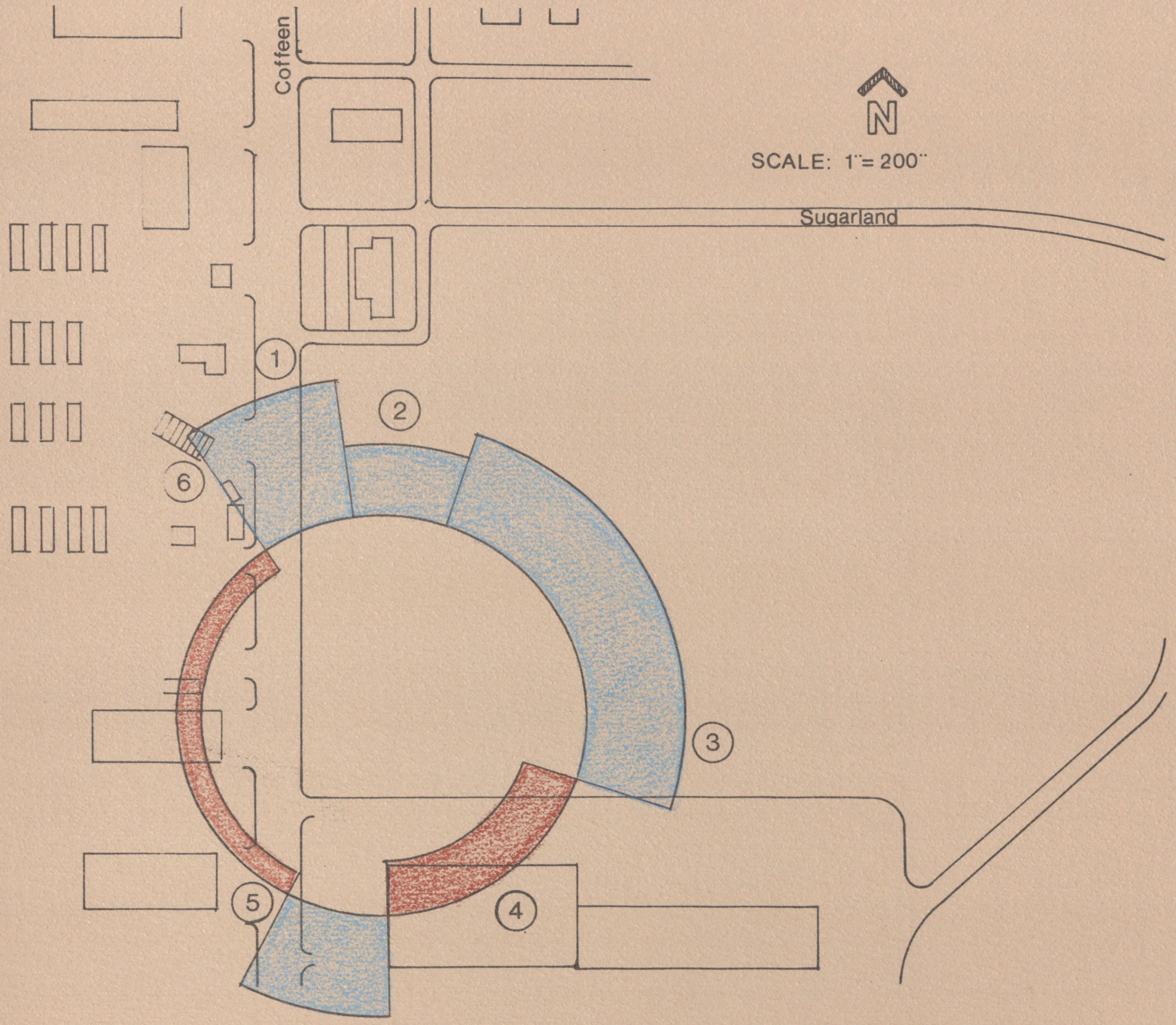
The map shows the areas of extended vision and edges created around the site. The depth of each section shows its prominence to the site.

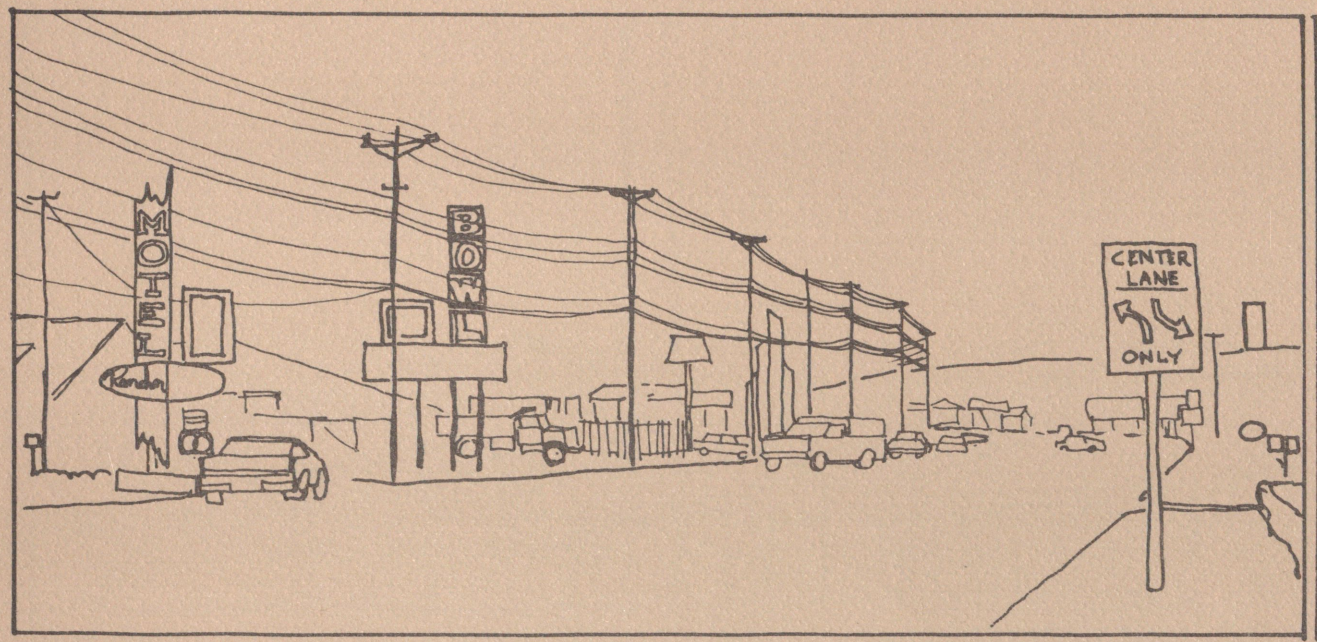
Extended views 

Edges 

The numbers near each section corelate with the drawings which follow. Each drawing is described in the contextural terms that make it important to the overall contextural, character of the site.

CONTEXT STUDY

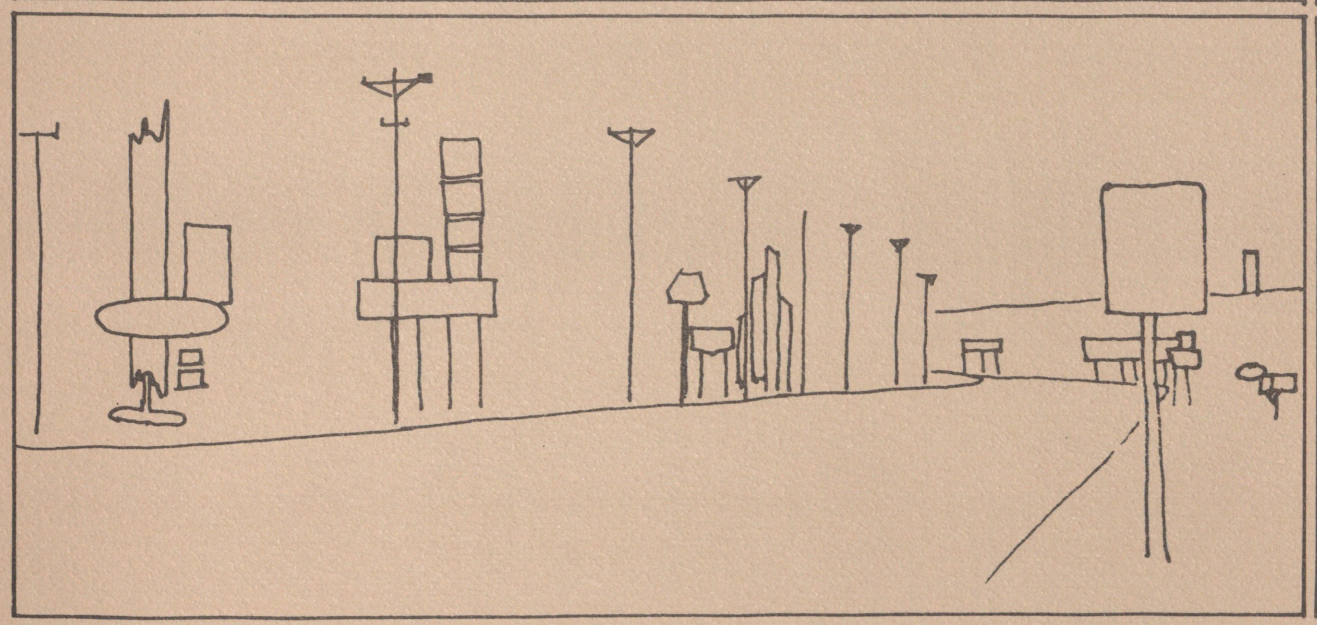

Coffeen
N
SCALE: 1"= 200"
Sugarland
1
2
3
4
5
6



Texture

Activity

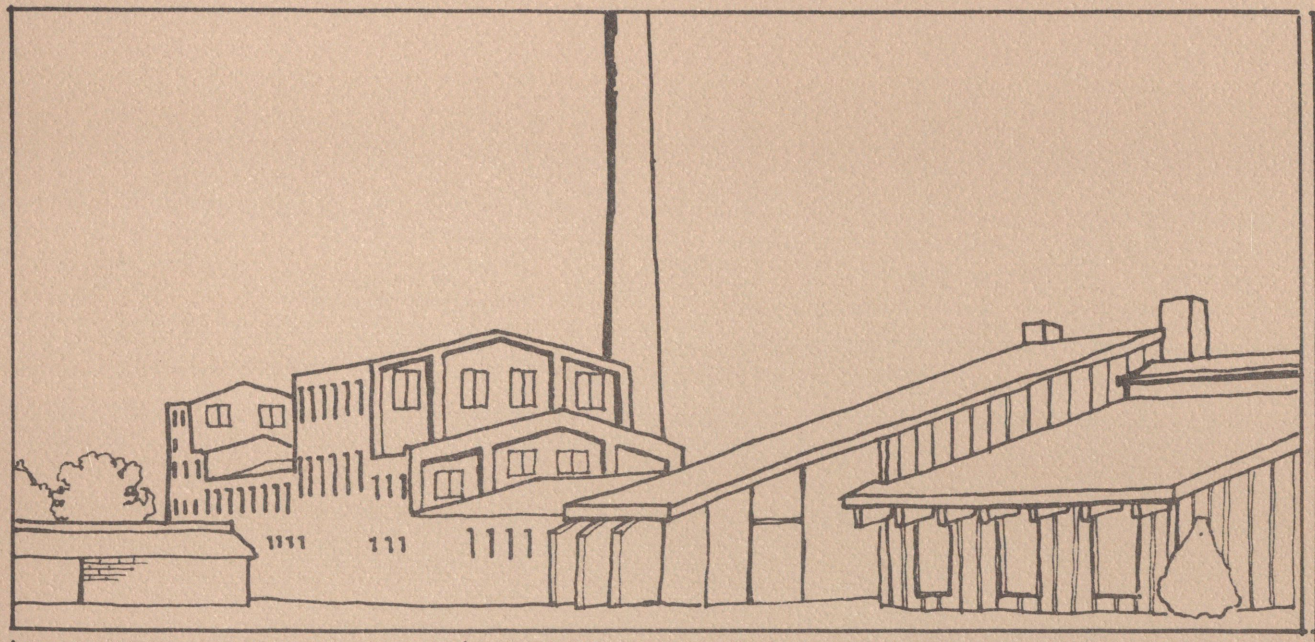
1



Scale

Color

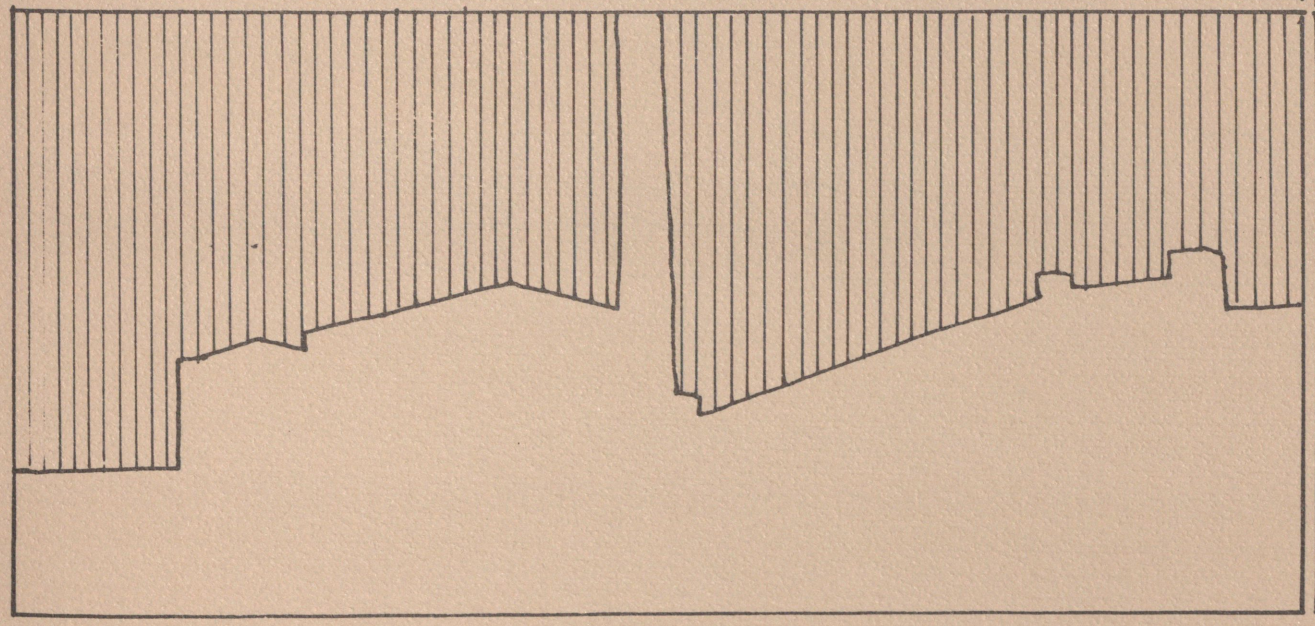
1



Scale

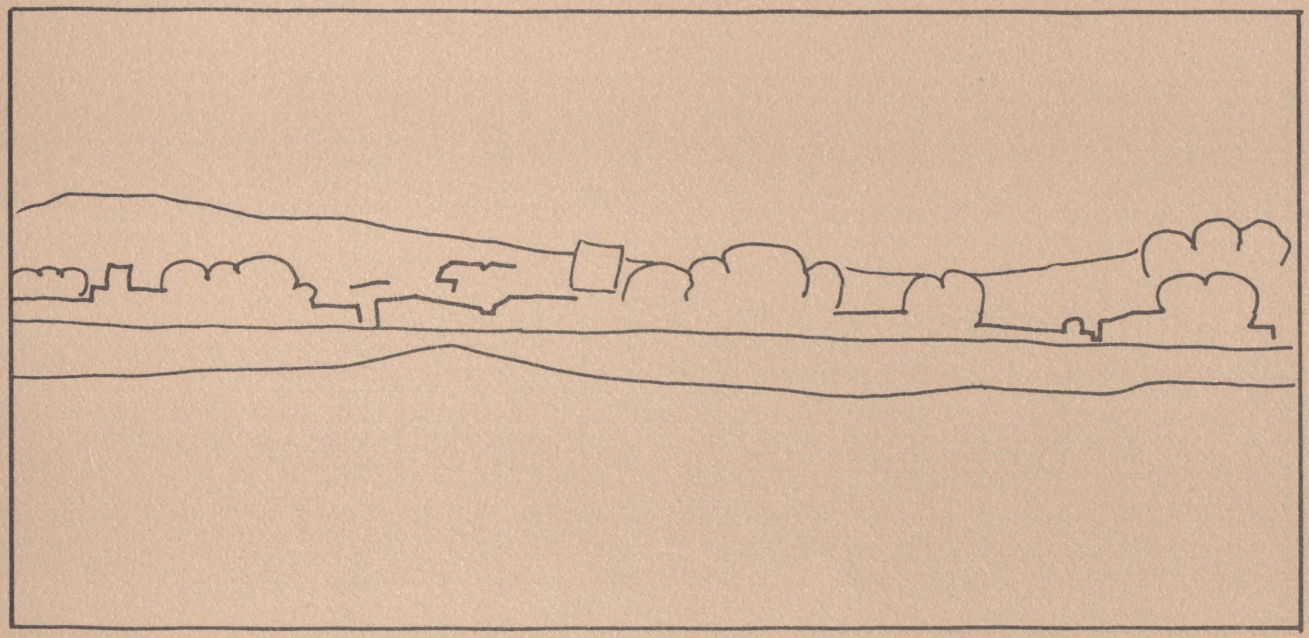
Materials

2



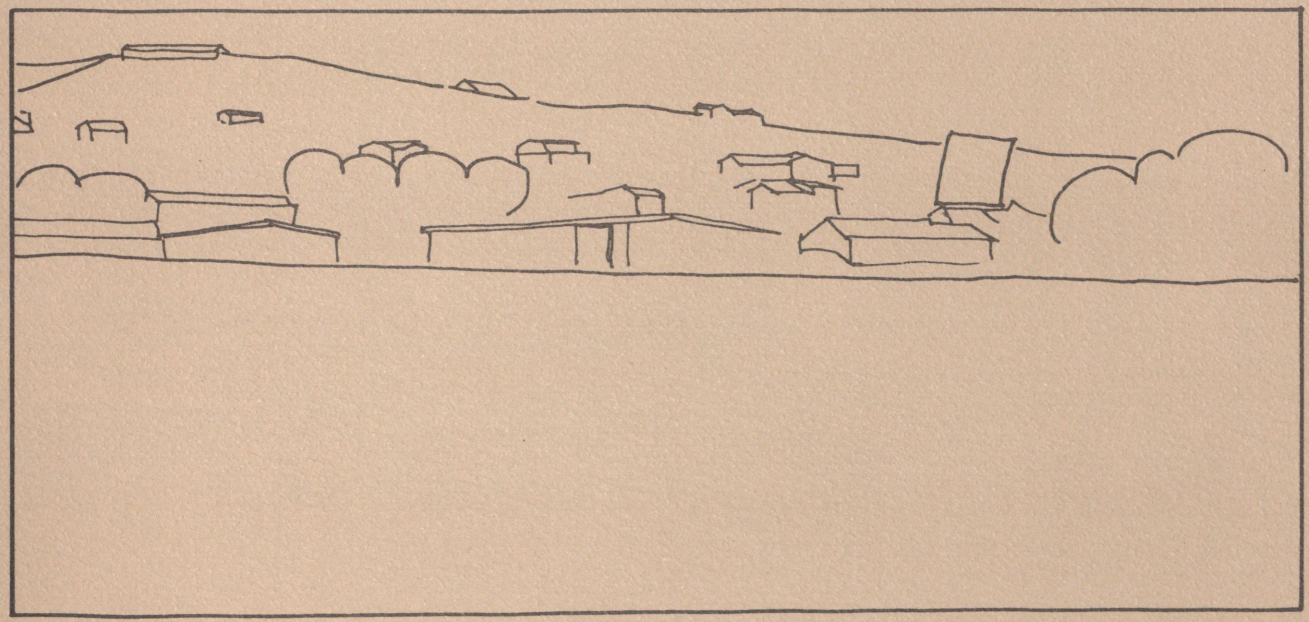
Silhouette

2



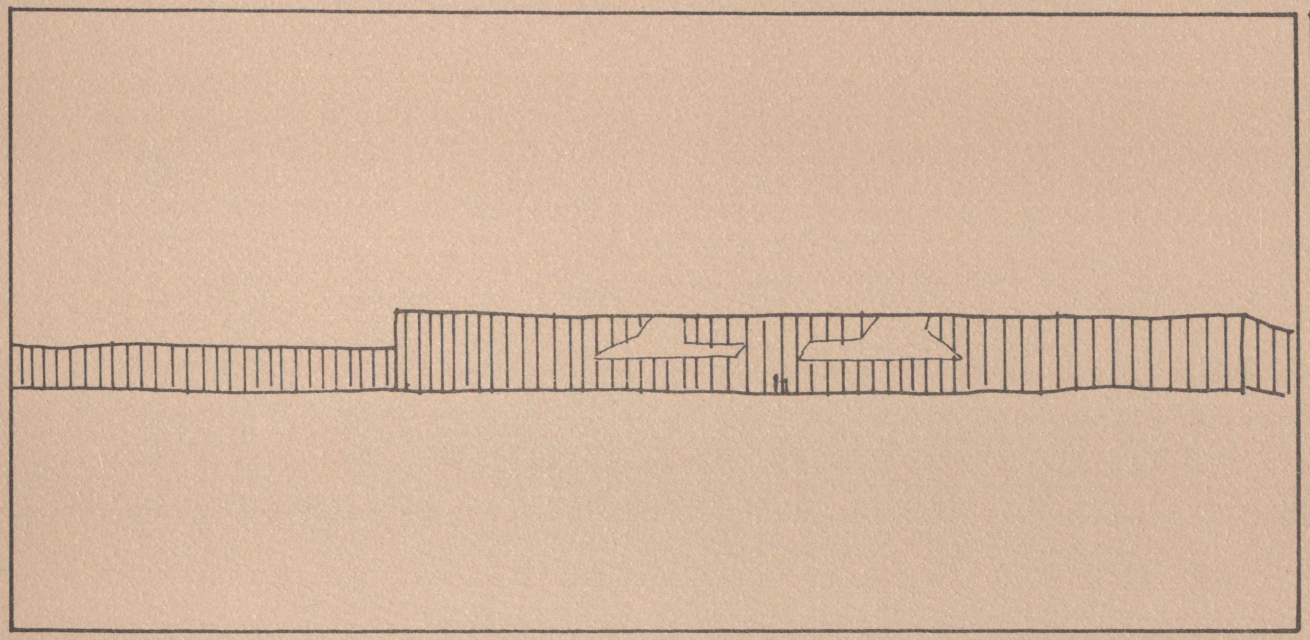
Closed Vista

3



Open Space

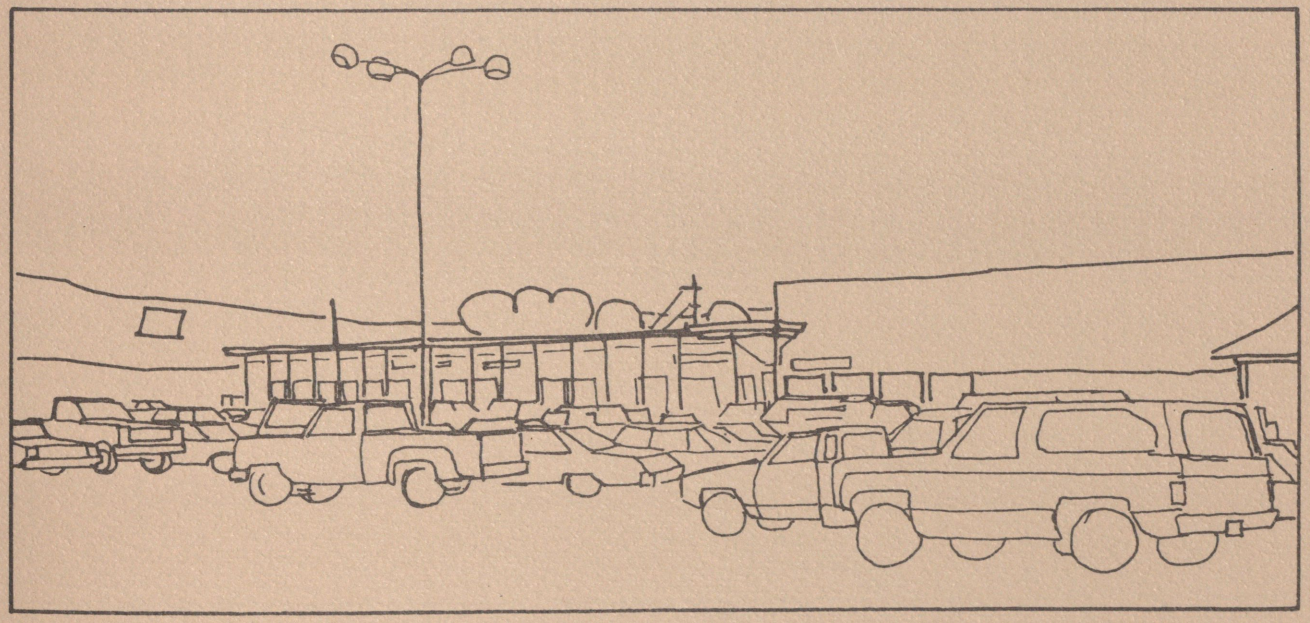
3



Volume

Scale

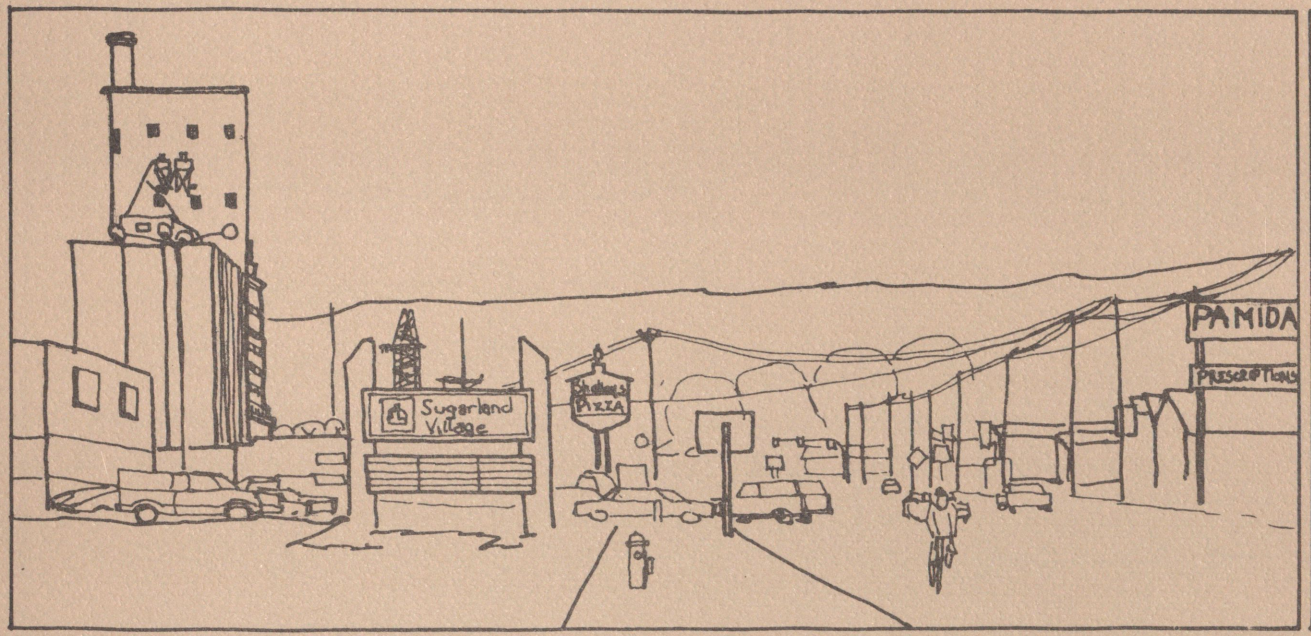
4



Bluntness

Color

4

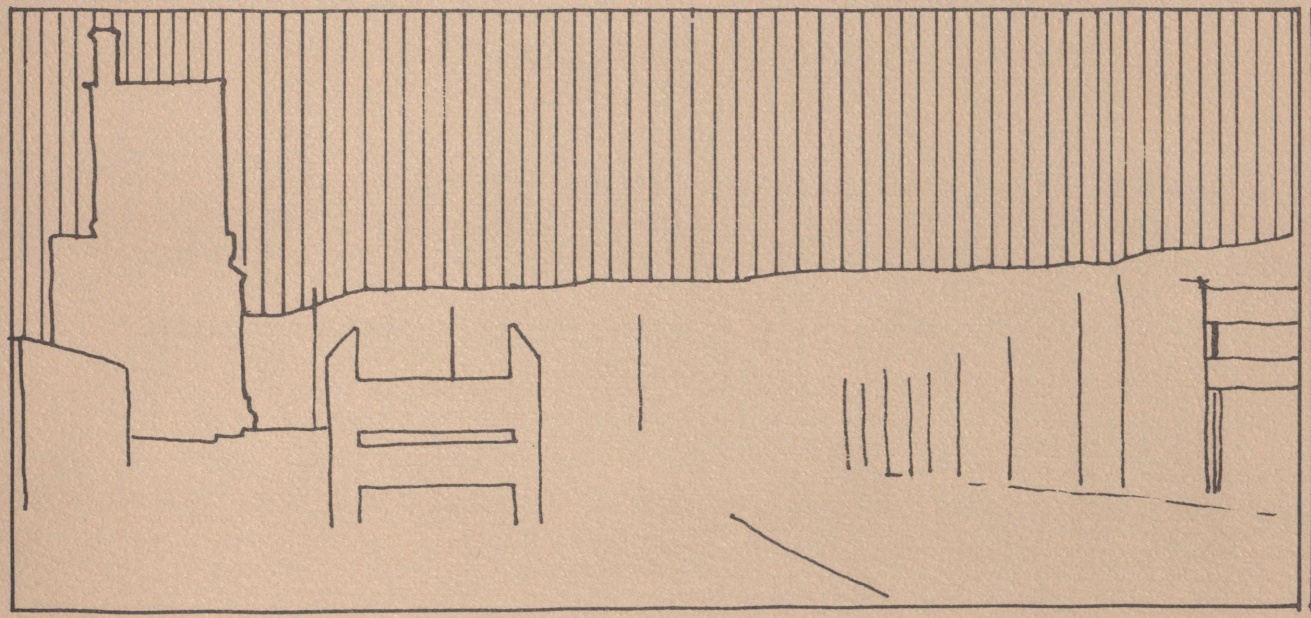


Texture

Vista

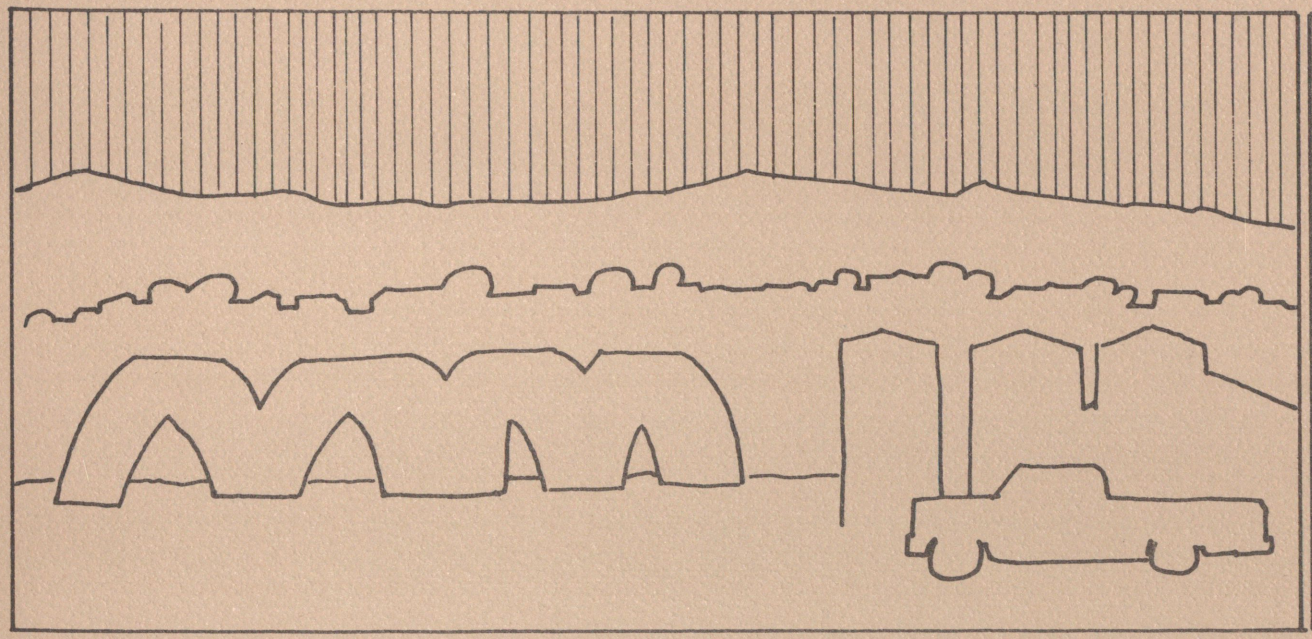
Color

5



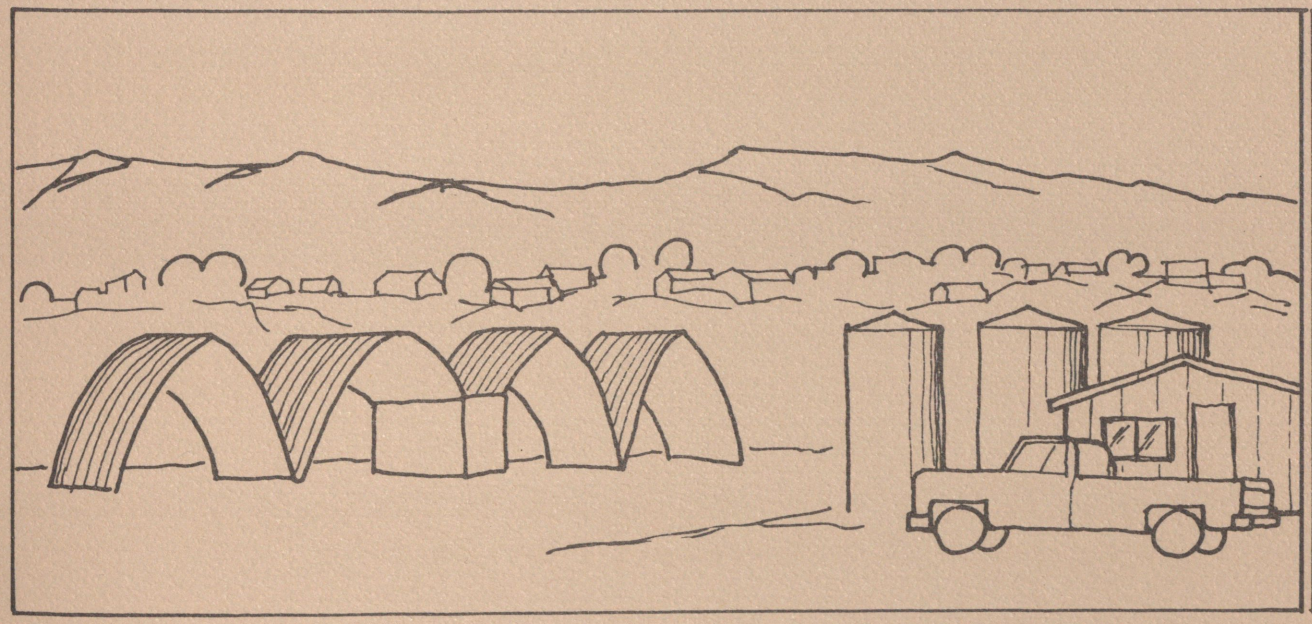
Silhouette

5



Silhouette

6



Forms

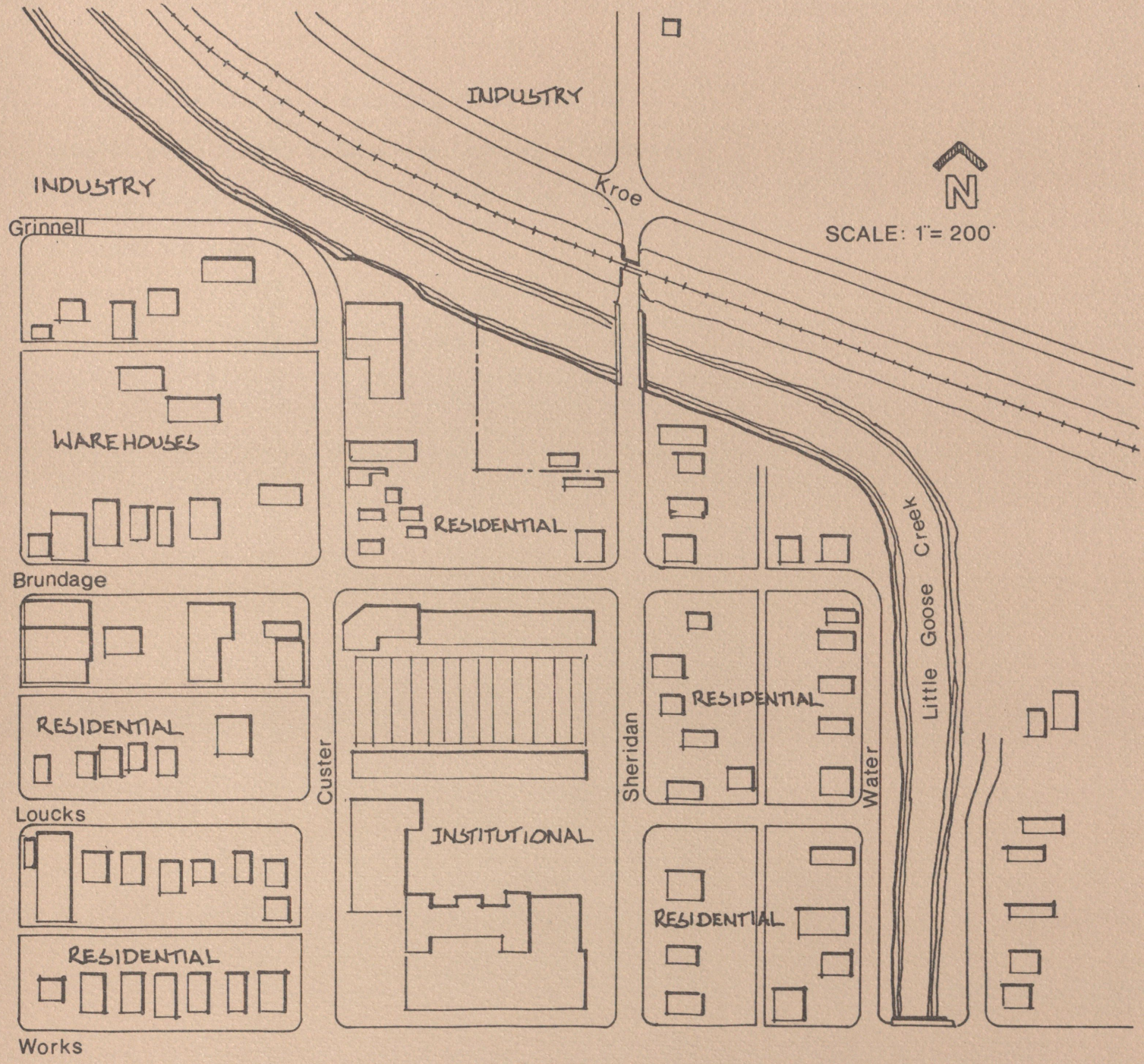
Materials

6

SITE 3

The map shows the usage of land that surrounds the site.

USAGE


INDUSTRY
INDUSTRY
Kroe
N
SCALE: 1"= 200'
Grinnell
WAREHOUSES
RESIDENTIAL
Brundage
RESIDENTIAL
Loucks
Custer
INSTITUTIONAL
Sheridan
RESIDENTIAL
Water
Little Goose Creek
RESIDENTIAL
Works

Shown is the major arterial roads near the site on which trucks would travel during a response. Also indicated is the percentage that the trucks will use the roads.

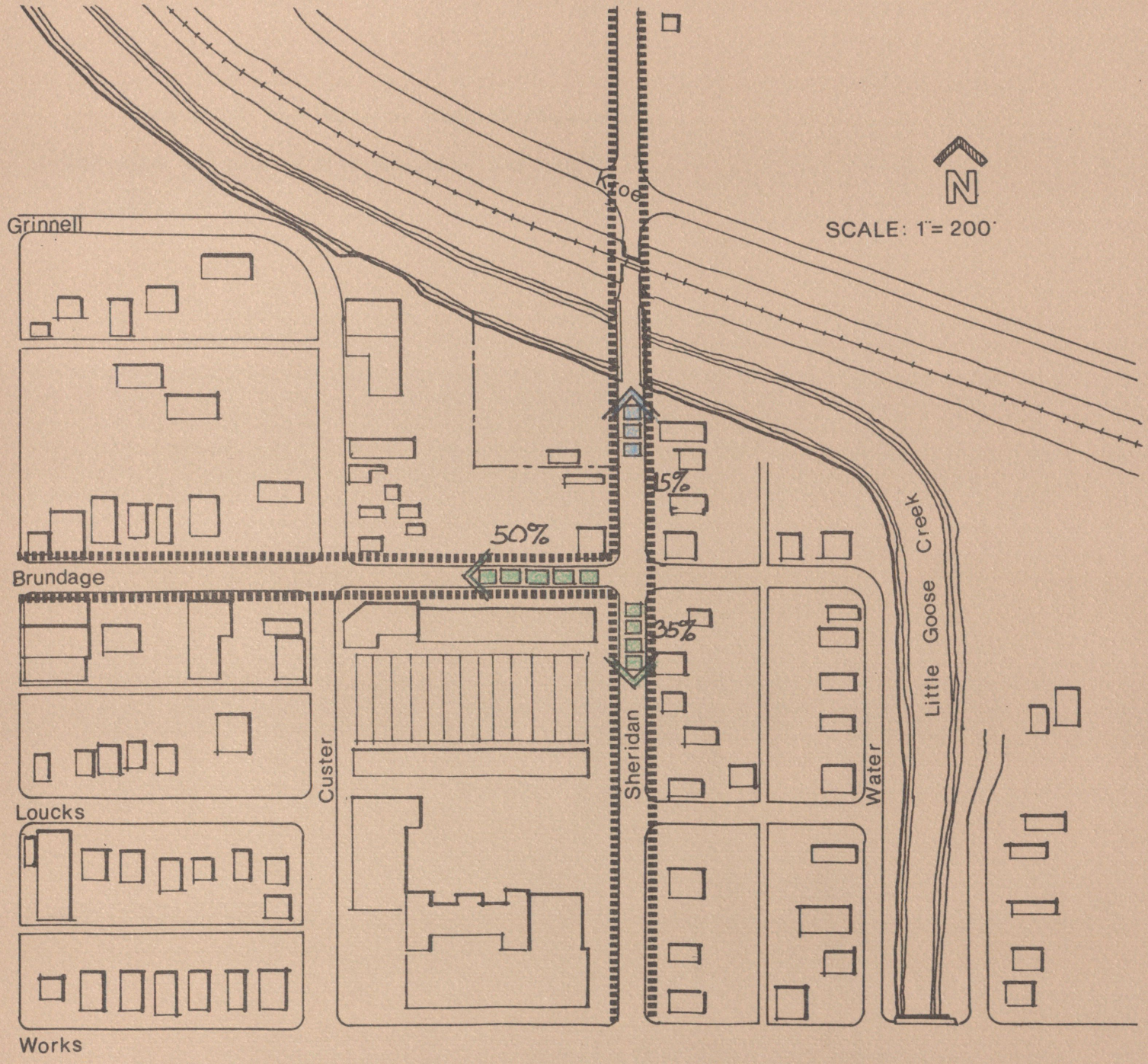


Less than 30%

30% to 60%

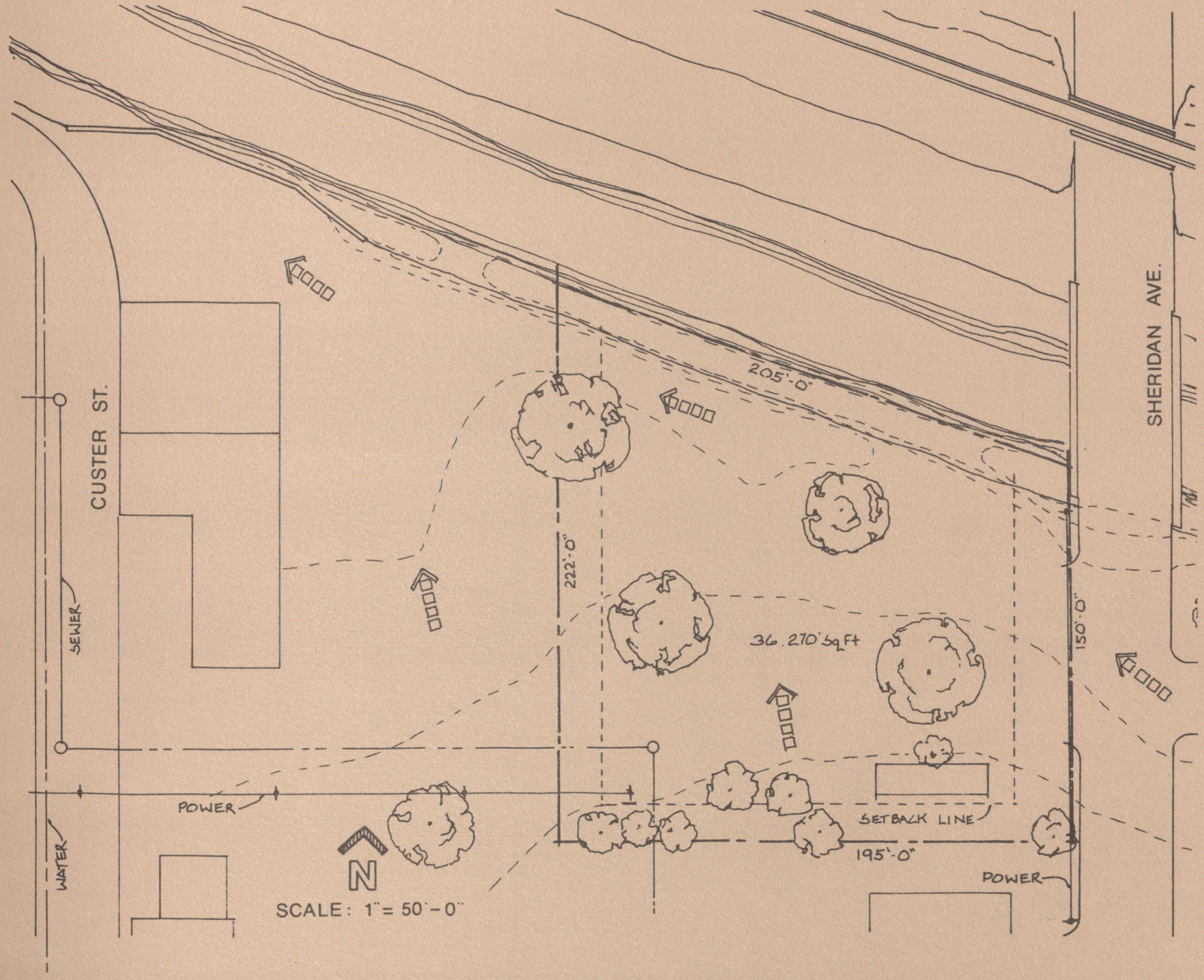
60% and over

RESPONSE


Grinnell
Brundage
Loucks
Works
Custer
Sheridan
Water
Little Goose Creek
Kroe
50%
5%
35%
N
SCALE: 1"= 200'

This shows the Physical characteristics of the site as well as site drainage and nearby utilities.

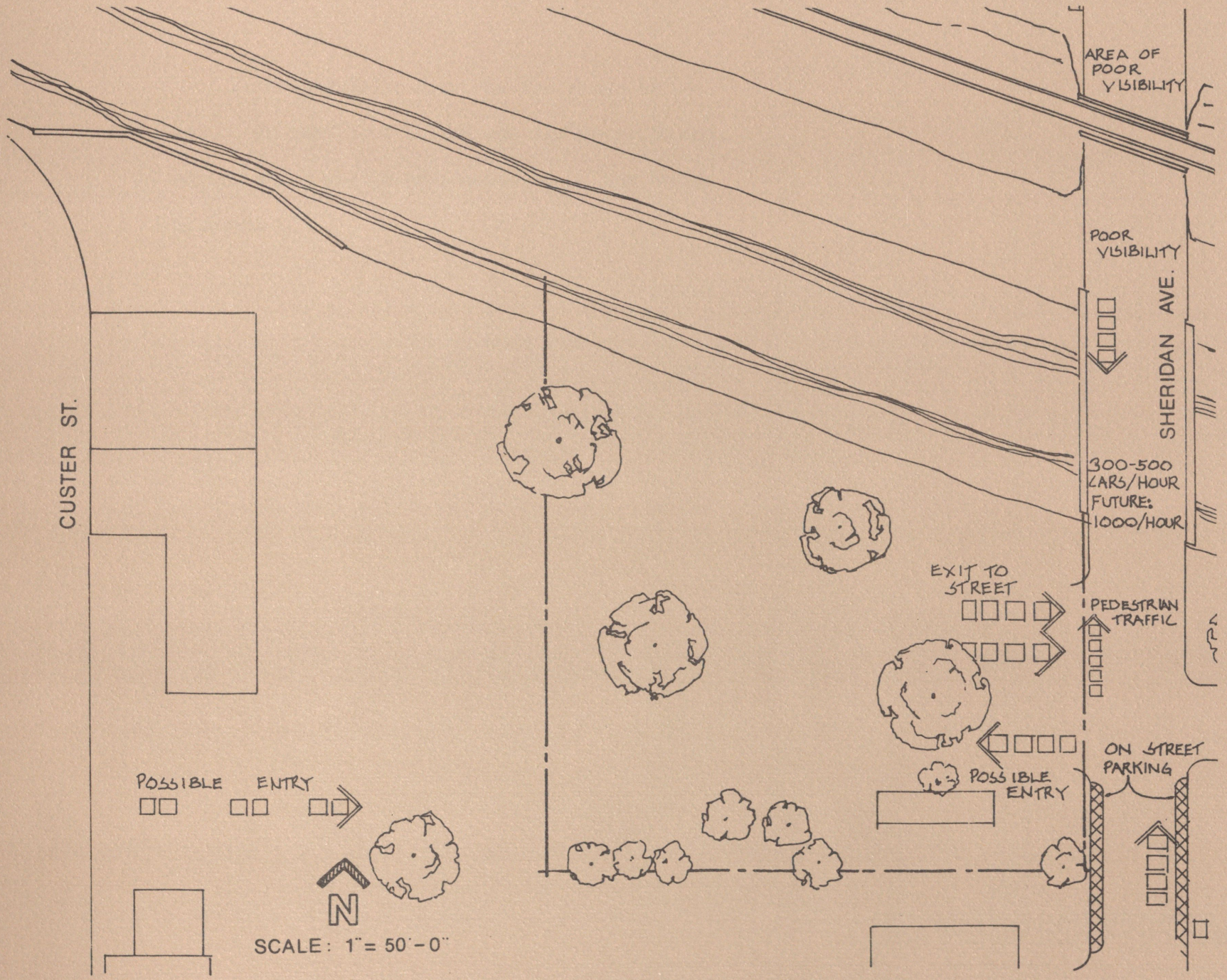
PHYSICAL


CUSTER ST.
SHERIDAN AVE.
205'-0"
222'-0"
150'-0"
36,270 Sq Ft
SEWER
POWER
WATER
SETBACK LINE
195'-0"
POWER
N
SCALE: 1" = 50'-0"

On site and nearby traffic patterns are given.

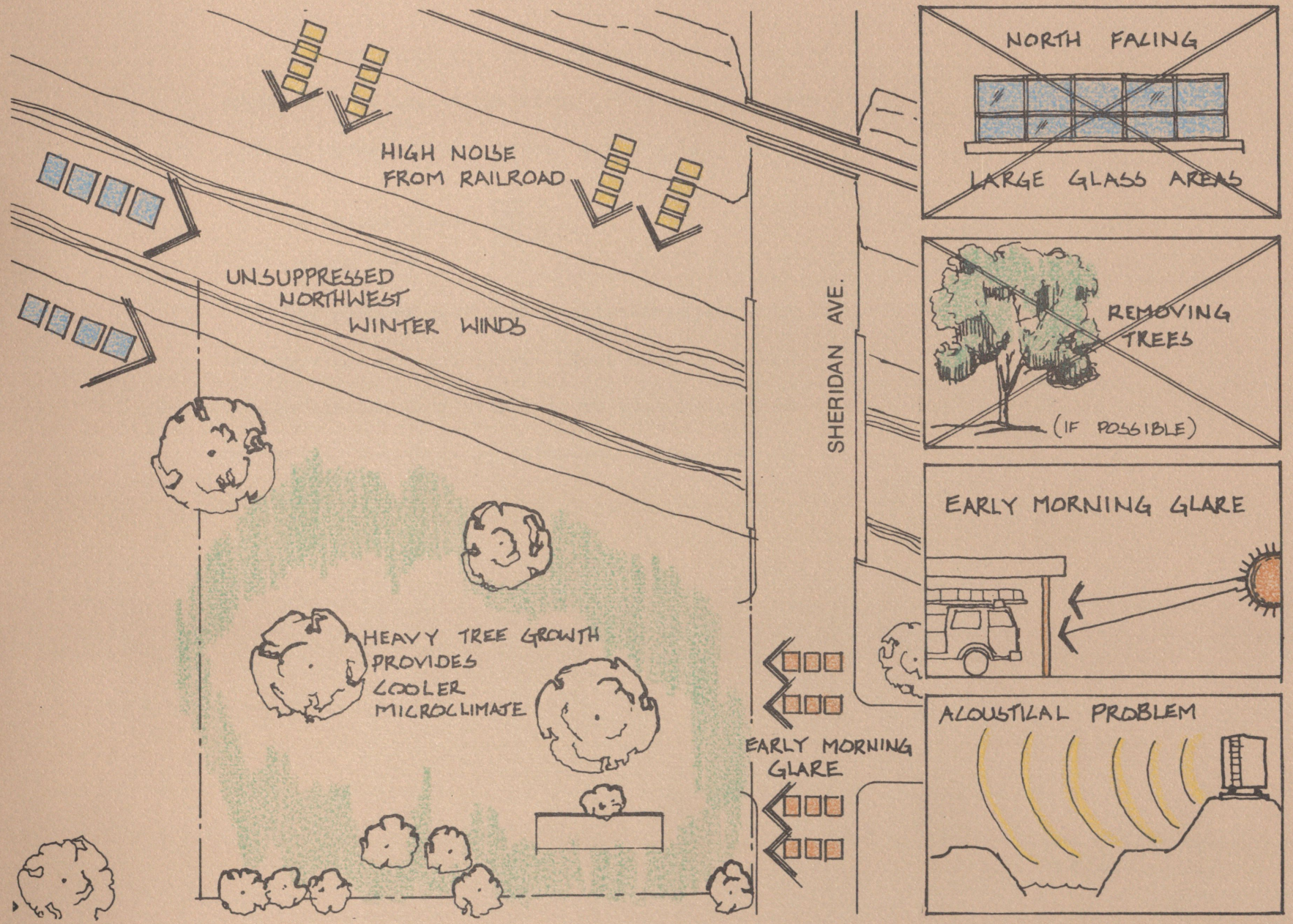
Traffic counts are indicated for the arterial roads.

CIRCULATION


AREA OF POOR VISIBILITY
POOR VISIBILITY
SHERIDAN AVE.
CUSTER ST.
300-500 CARS/HOUR
FUTURE: 1000/HOUR
EXIT TO STREET
PEDESTRIAN TRAFFIC
ON STREET PARKING
POSSIBLE ENTRY
POSSIBLE ENTRY
N
SCALE: 1"= 50'-0"

Environmental conditions are shown on the map. In the right column are design recommendations which should be considered in the design process.

ENVIRONMENTAL


HIGH NOISE FROM RAILROAD
UNSUPPRESSED NORTHWEST WINTER WINDS
SHERIDAN AVE.
HEAVY TREE GROWTH PROVIDES COOLER MICROCLIMATE
EARLY MORNING GLARE
NORTH FALING
LARGE GLASS AREAS
REMOVING TREES
(IF POSSIBLE)
EARLY MORNING GLARE
ACOUSTICAL PROBLEM

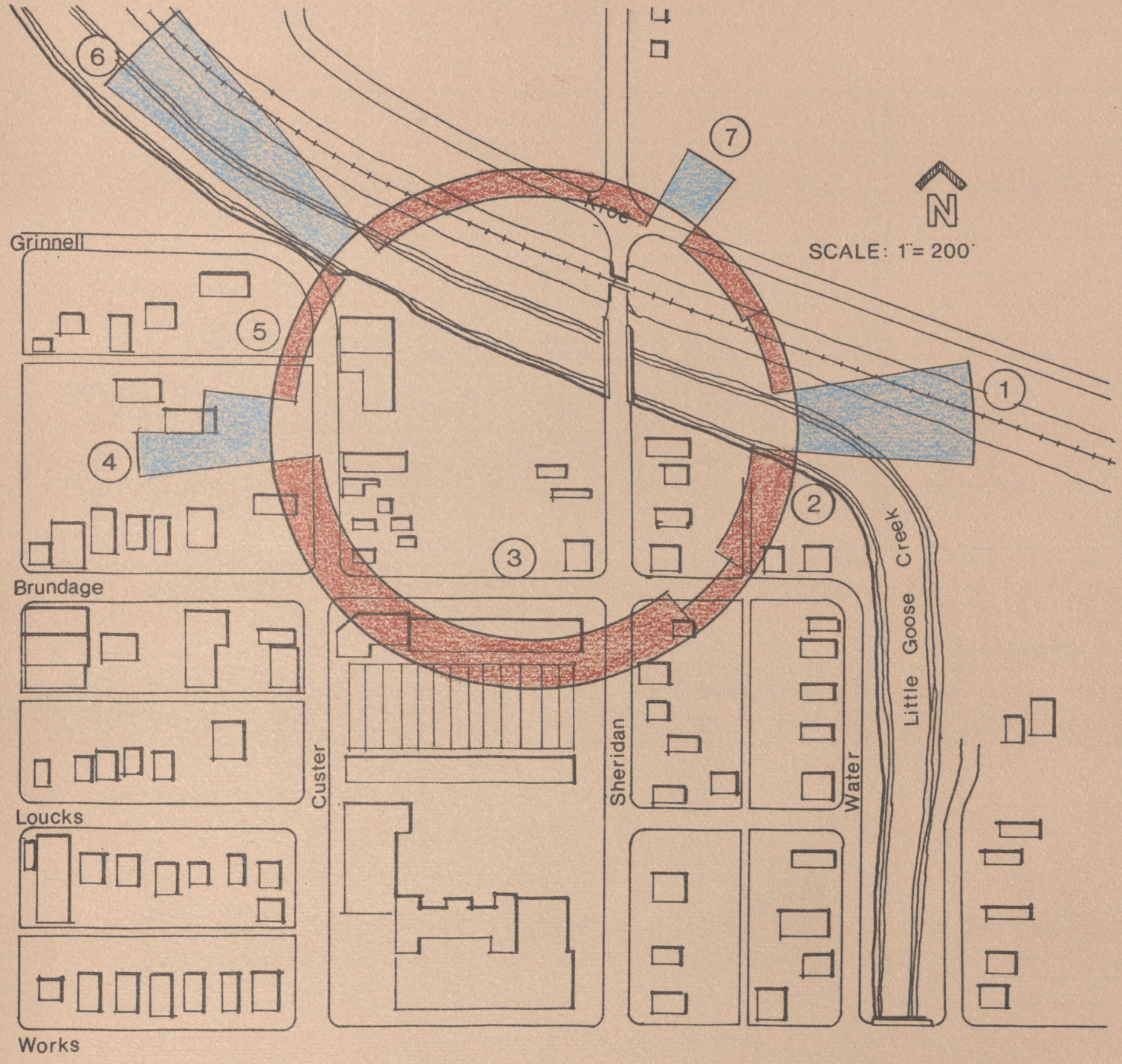
The map shows the areas of extended vision and edges created around the site. The depth of each section shows its prominence to the site.

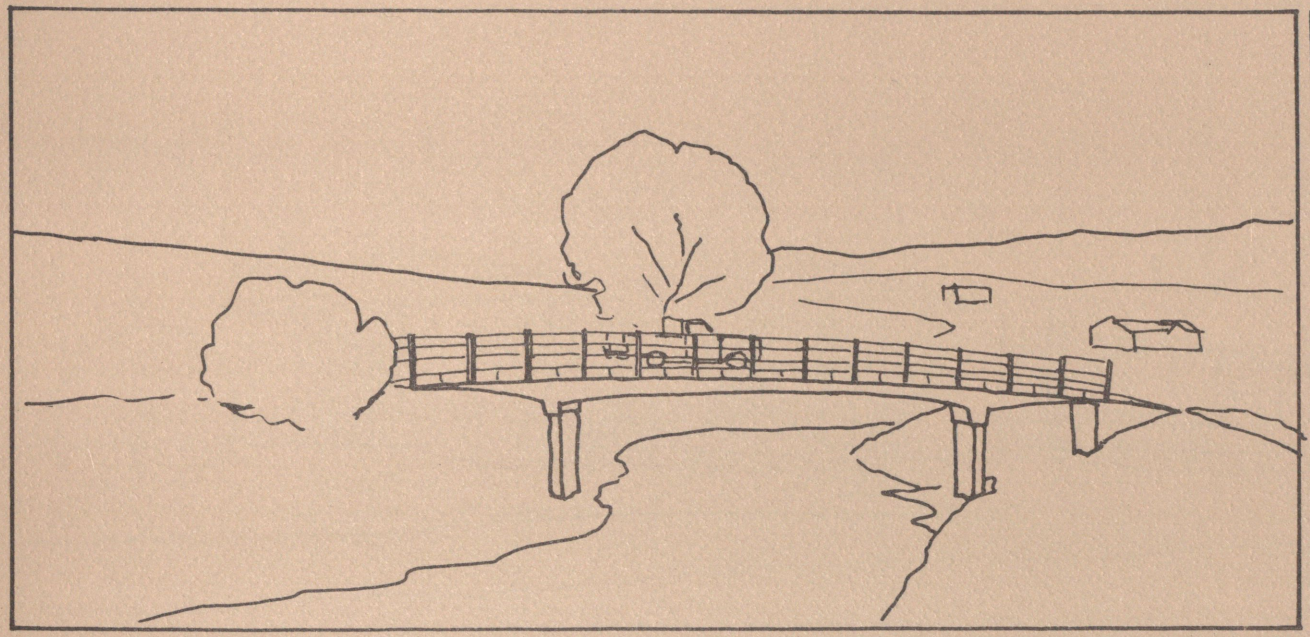
Extended views 

Edges 

The numbers near each section corelate with the drawings which follow. Each drawing is described in the contextural terms that make it important to the overall contextural, character of the site.

CONTEXT STUDY

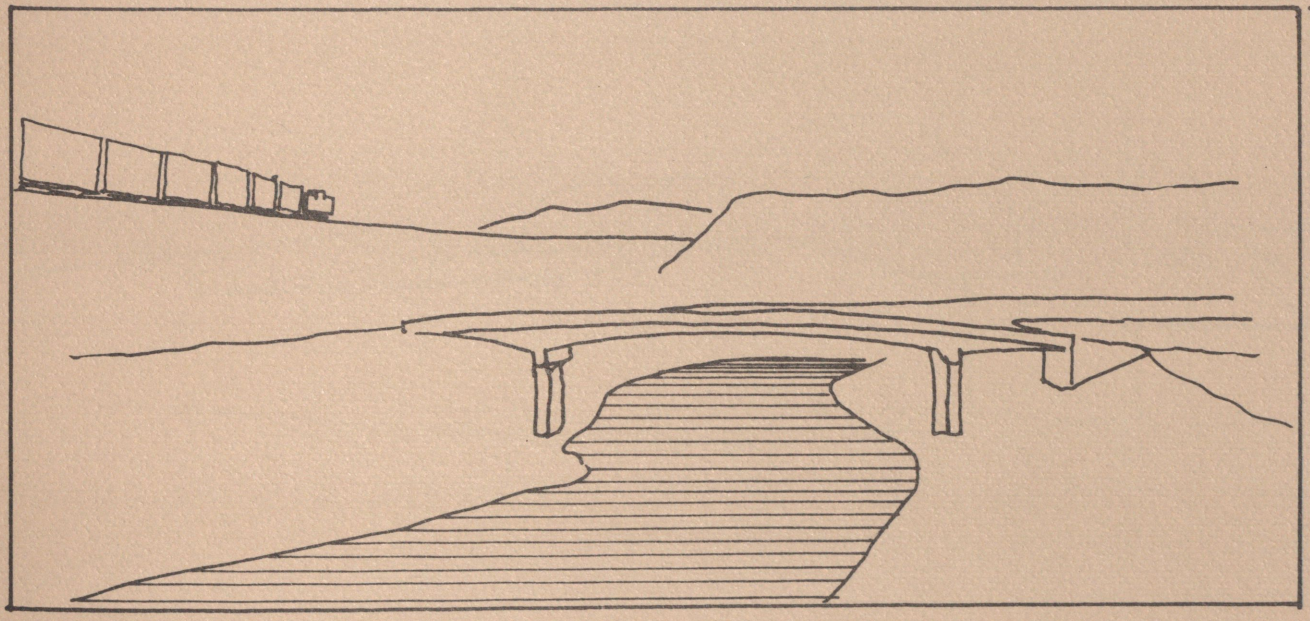

6
7
Kroe
N
SCALE: 1"= 200'
Grinnell
5
1
4
2
3
Brundage
Little Goose Creek
Custer
Sheridan
Water
Loucks
Works



Closed Vista

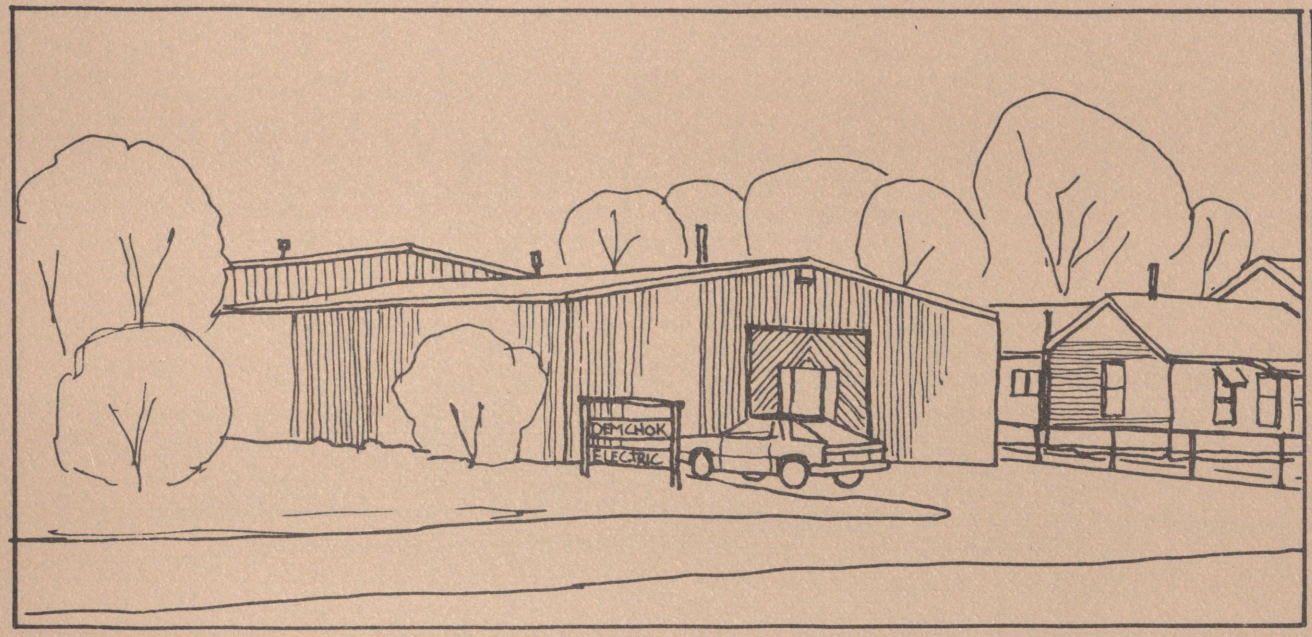
Forms

1



Open Space

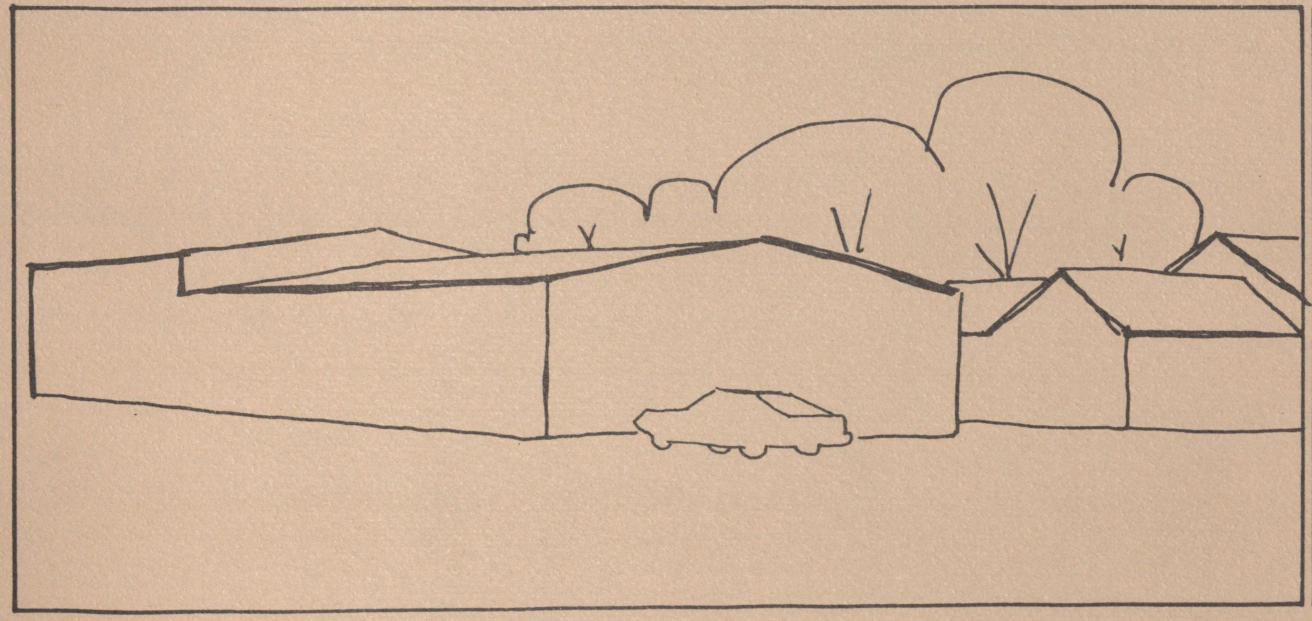
1



Bluntness

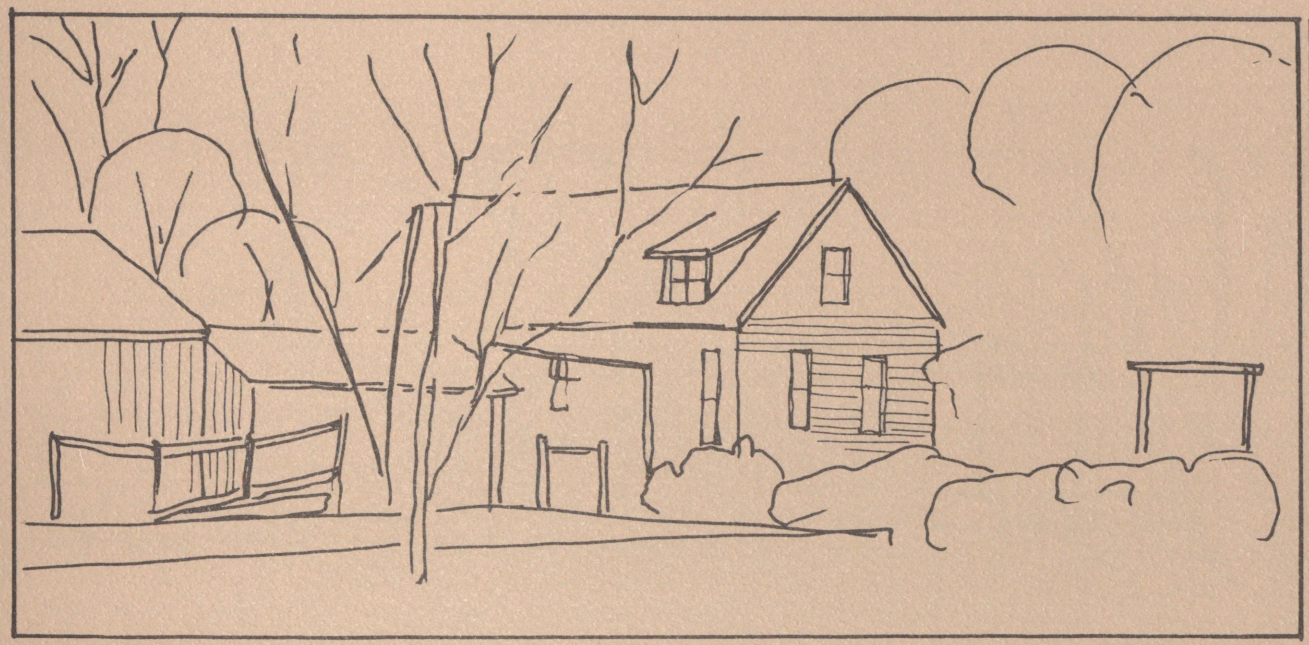
Color

2



Volume

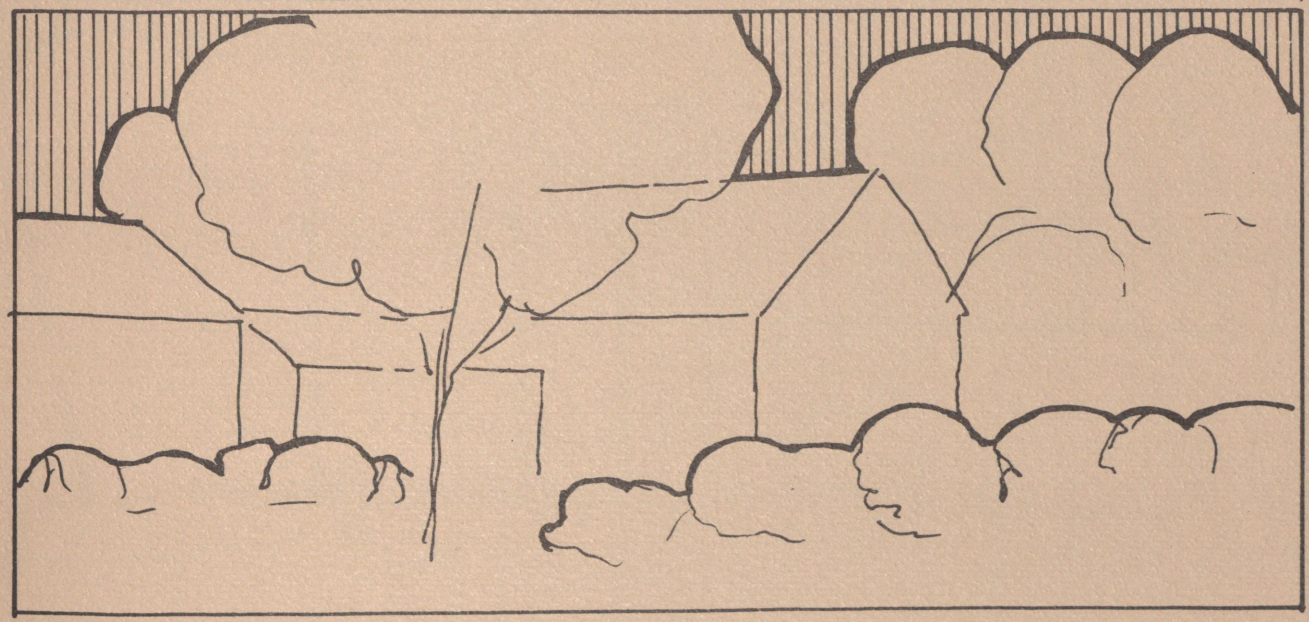
2



Materials

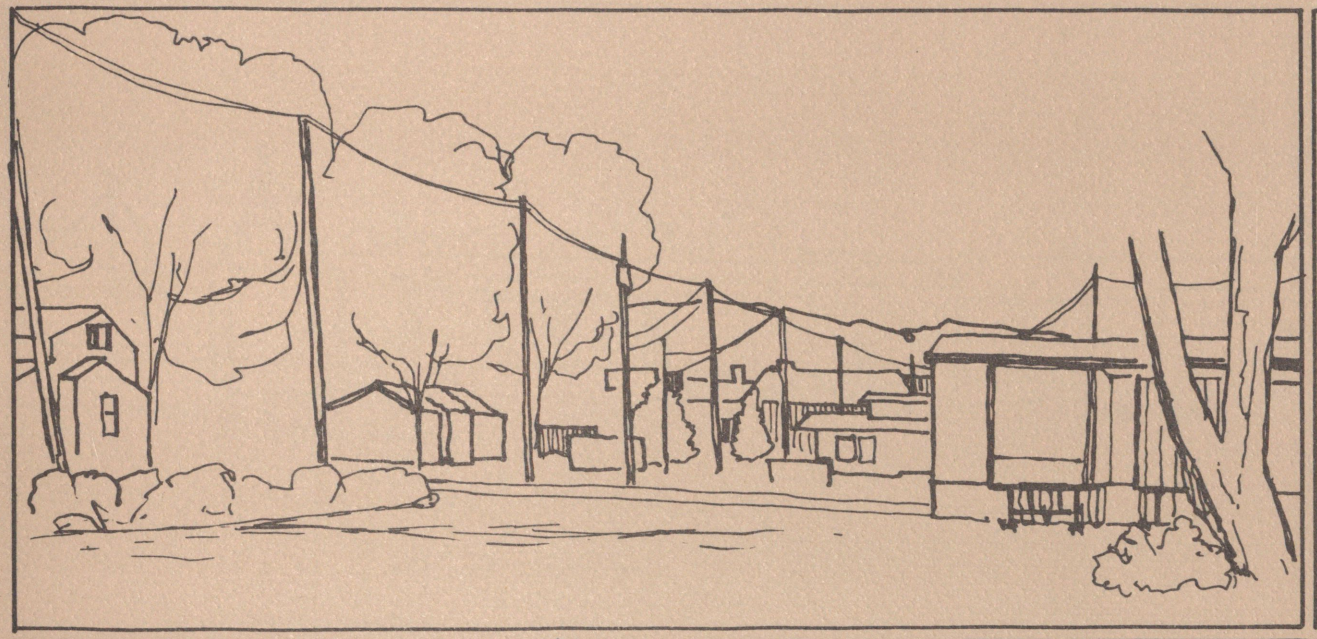
Interest

3



Edge

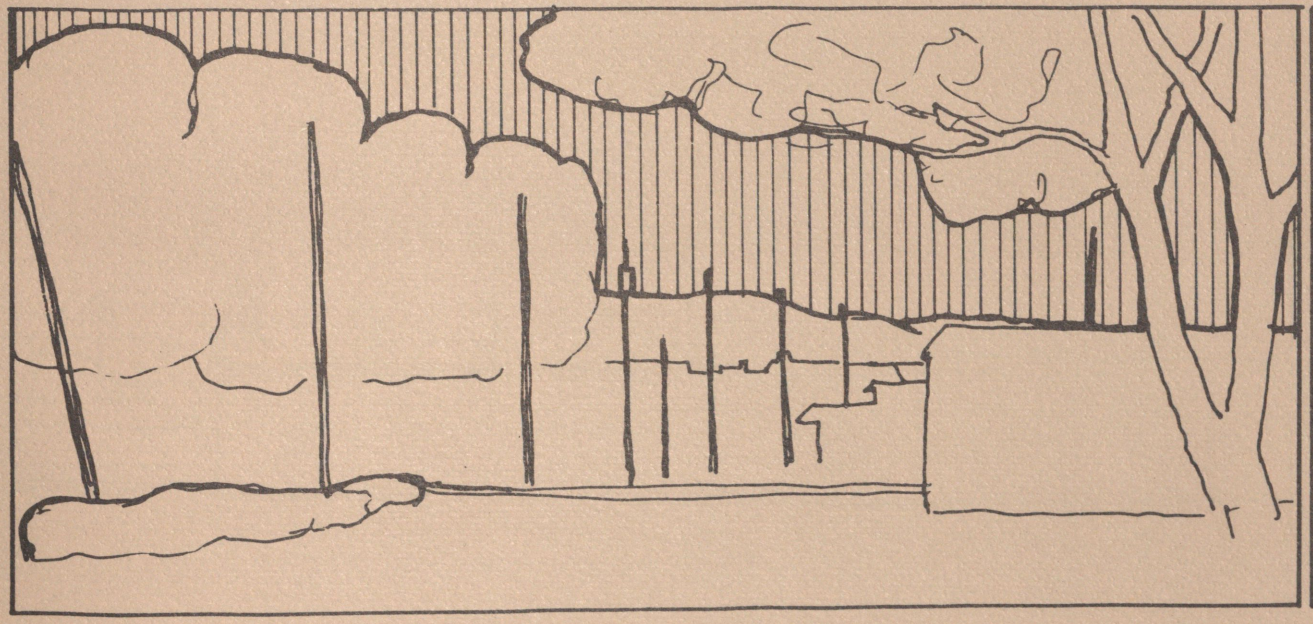
3



Texture

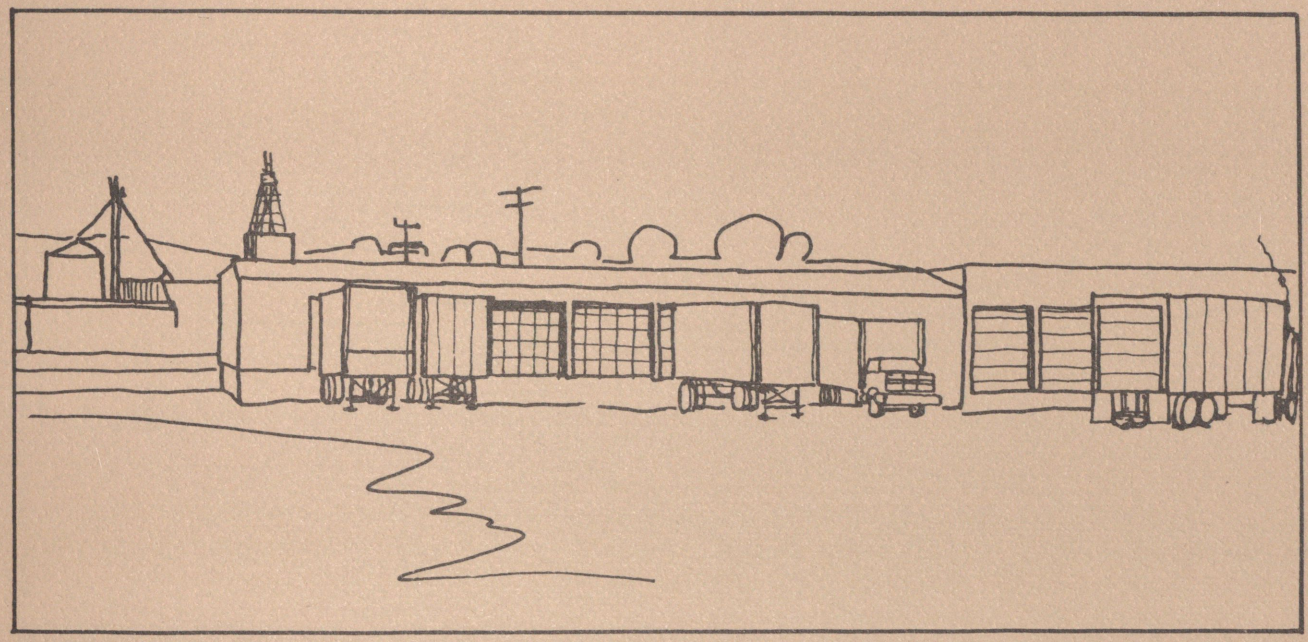
Vista

4



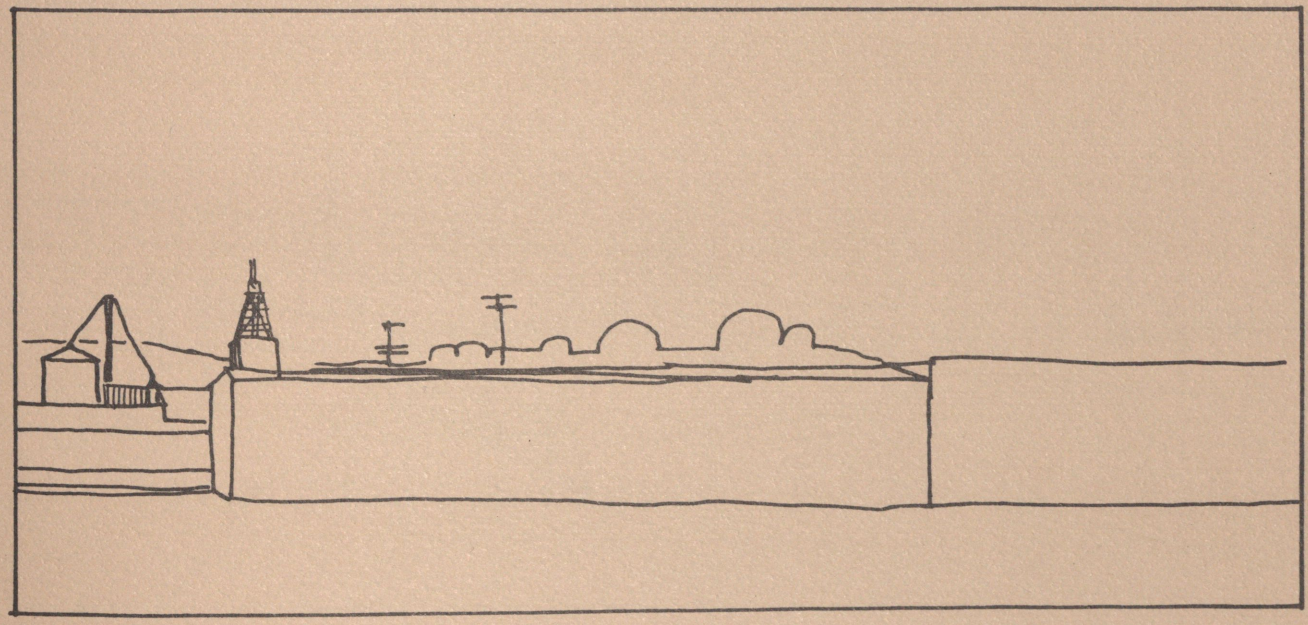
Edge

4



Activity

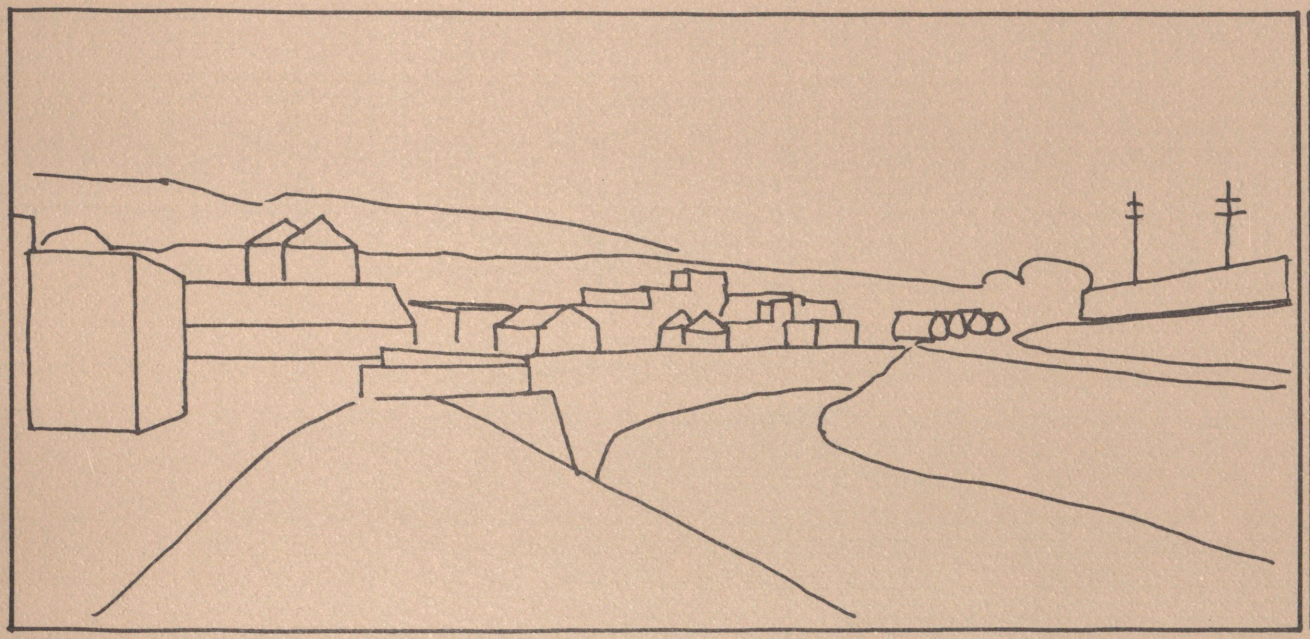
5



Volume

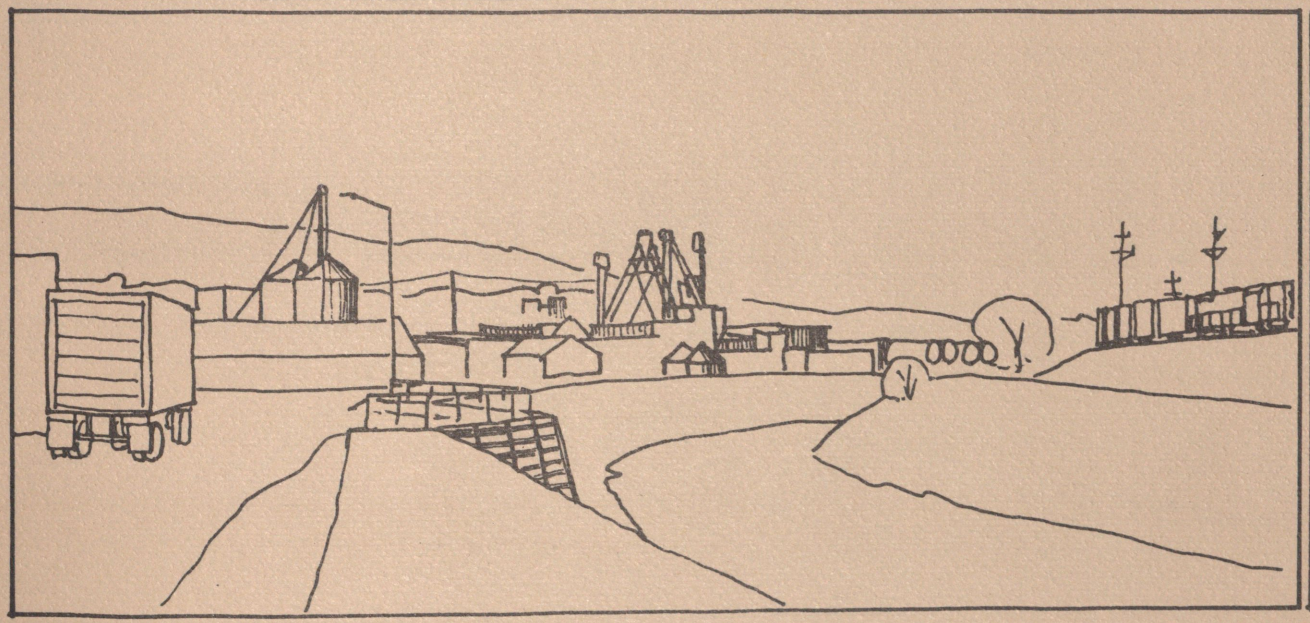
Bluntness

5



Volumes

6

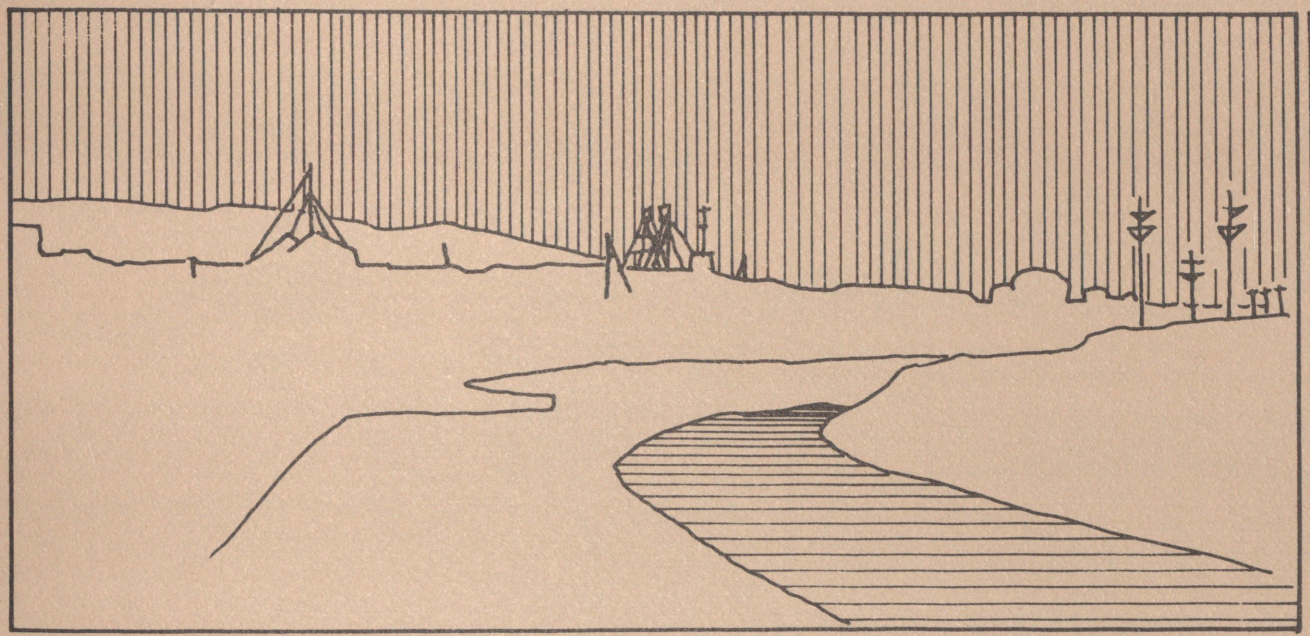


Interest

Detail

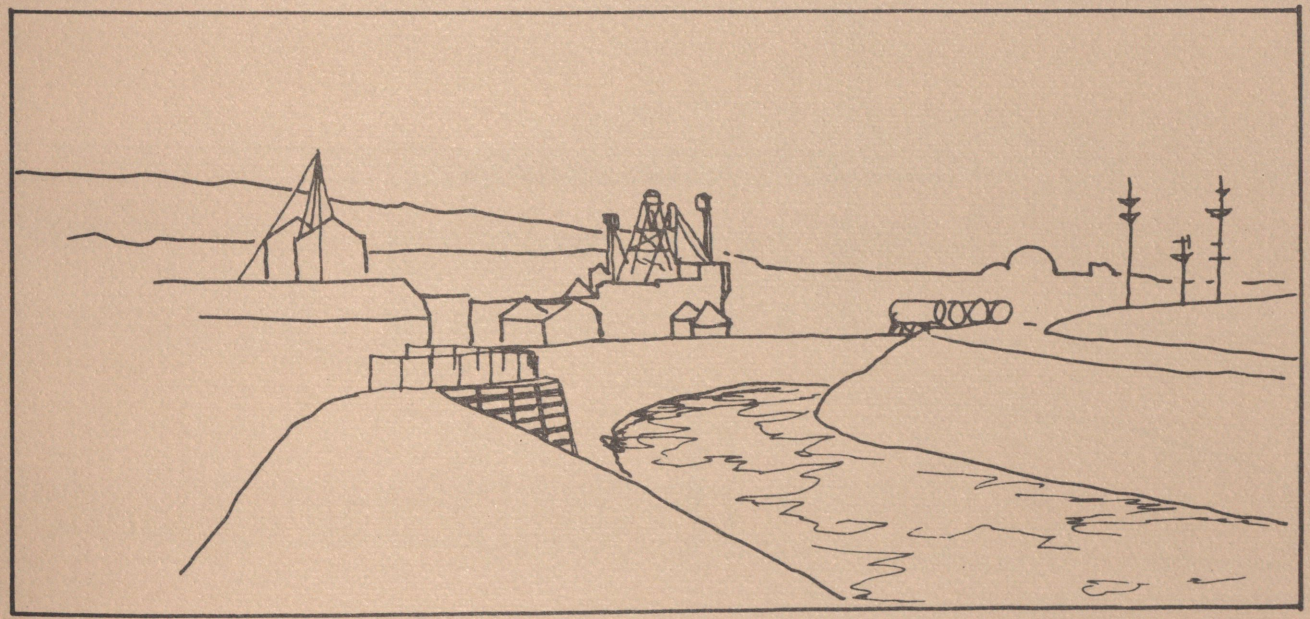
Vista

6



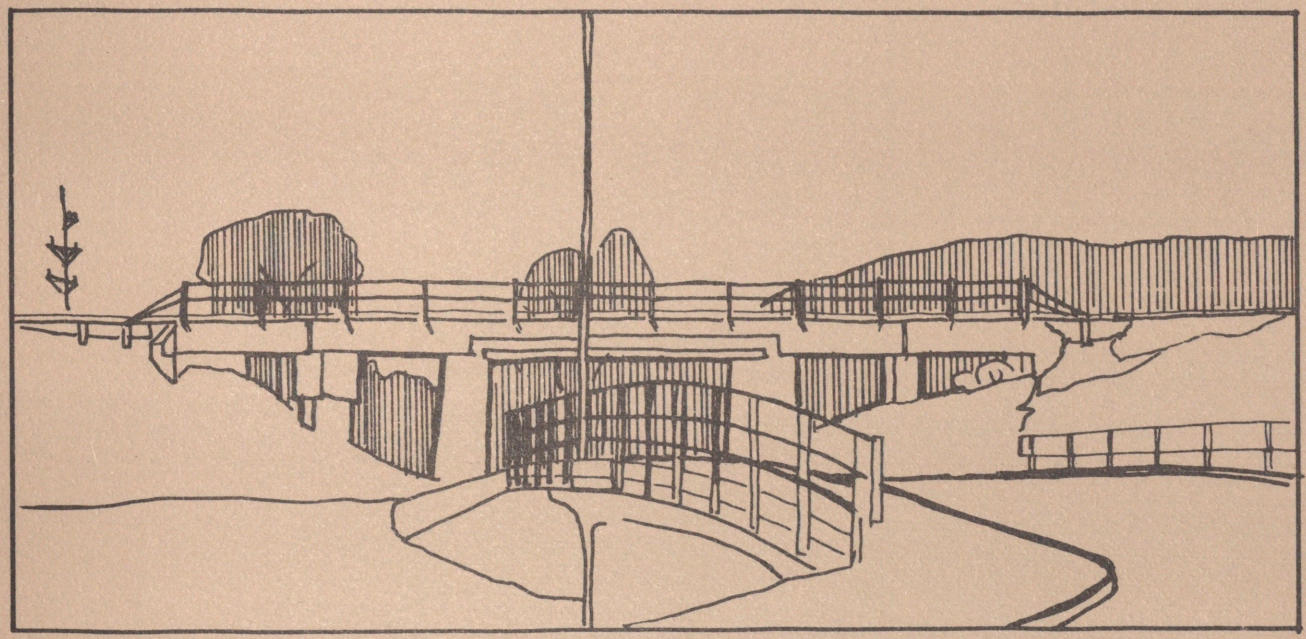
Silhouette

6



Forms

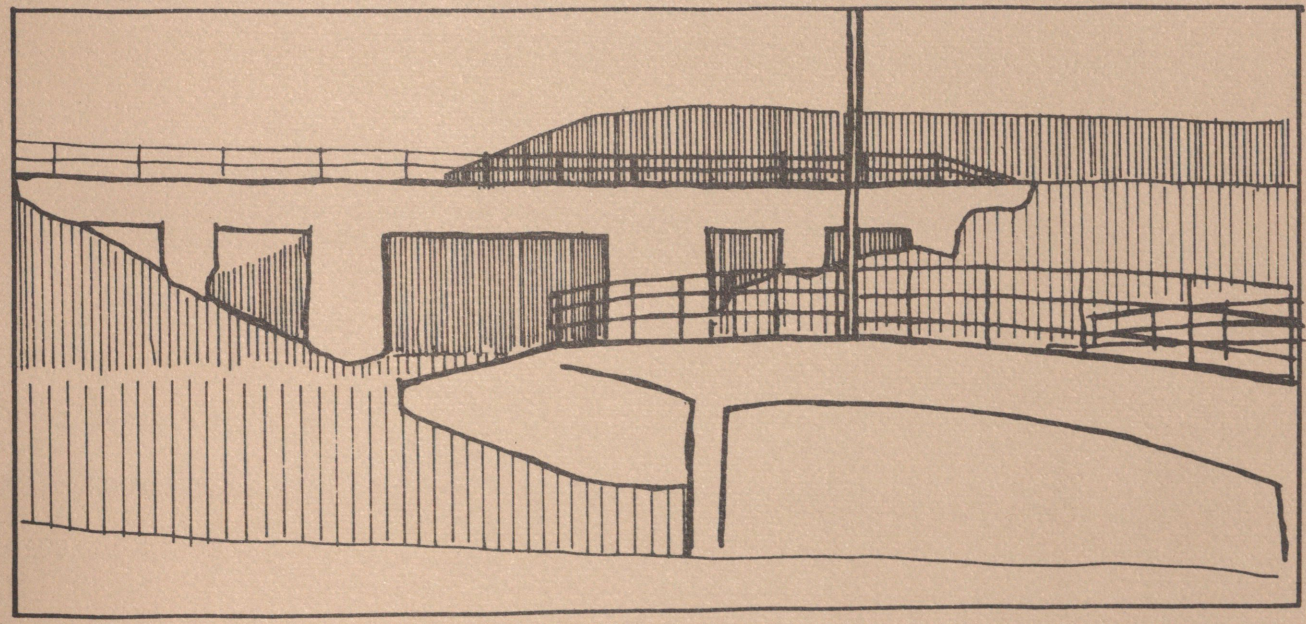
6



Anticipation

Interest

7



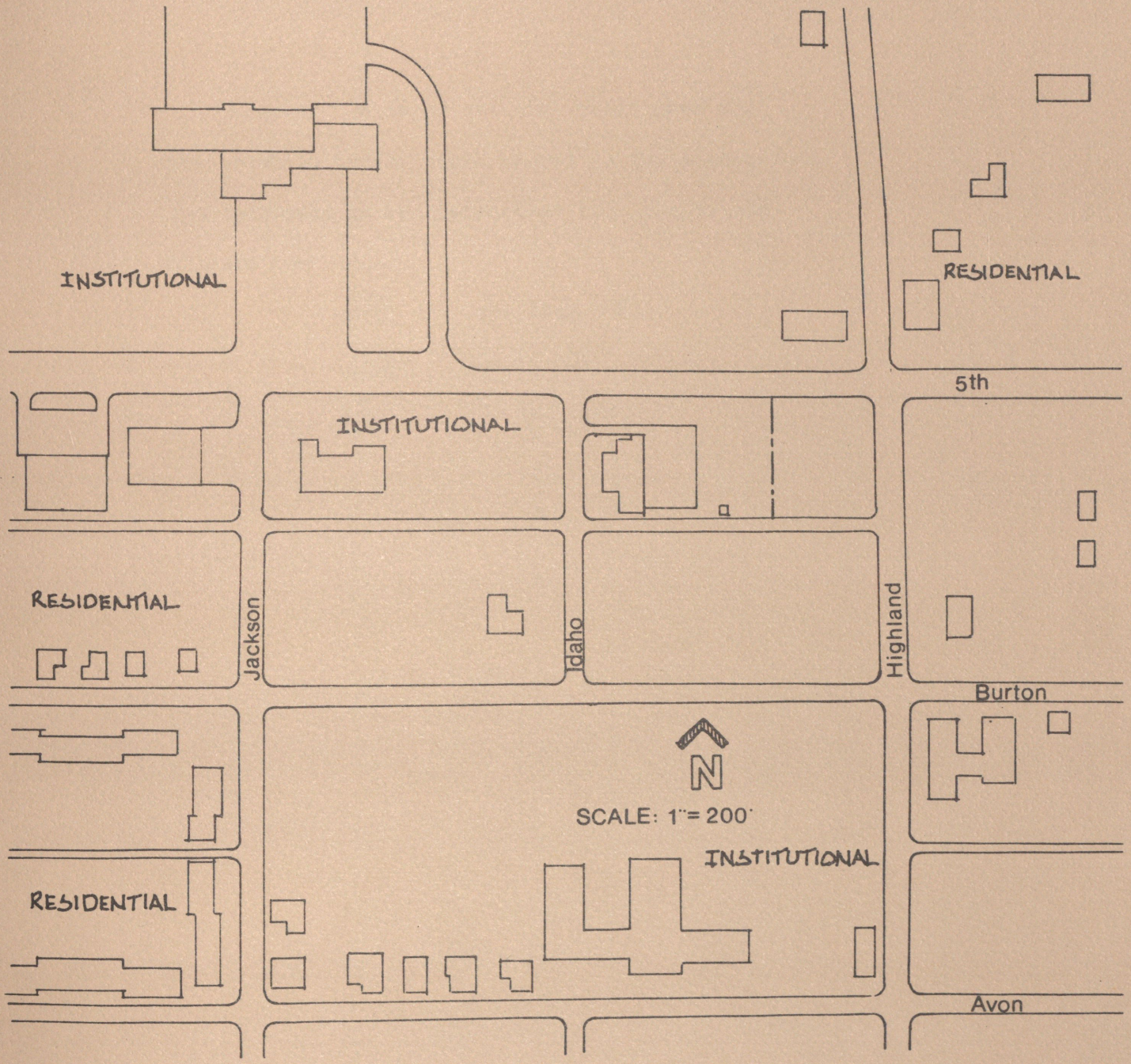
Forms

7

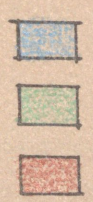
SITE 4

The map shows the usage of land that surrounds the site.

USAGE


INSTITUTIONAL
RESIDENTIAL
5th
INSTITUTIONAL
RESIDENTIAL
Jackson
Idaho
Highland
Burton
N
SCALE: 1" = 200'
INSTITUTIONAL
RESIDENTIAL
Avon

Shown is the major arterial roads near the site on which trucks would travel during a response. Also indicated is the percentage that the trucks will use the roads.

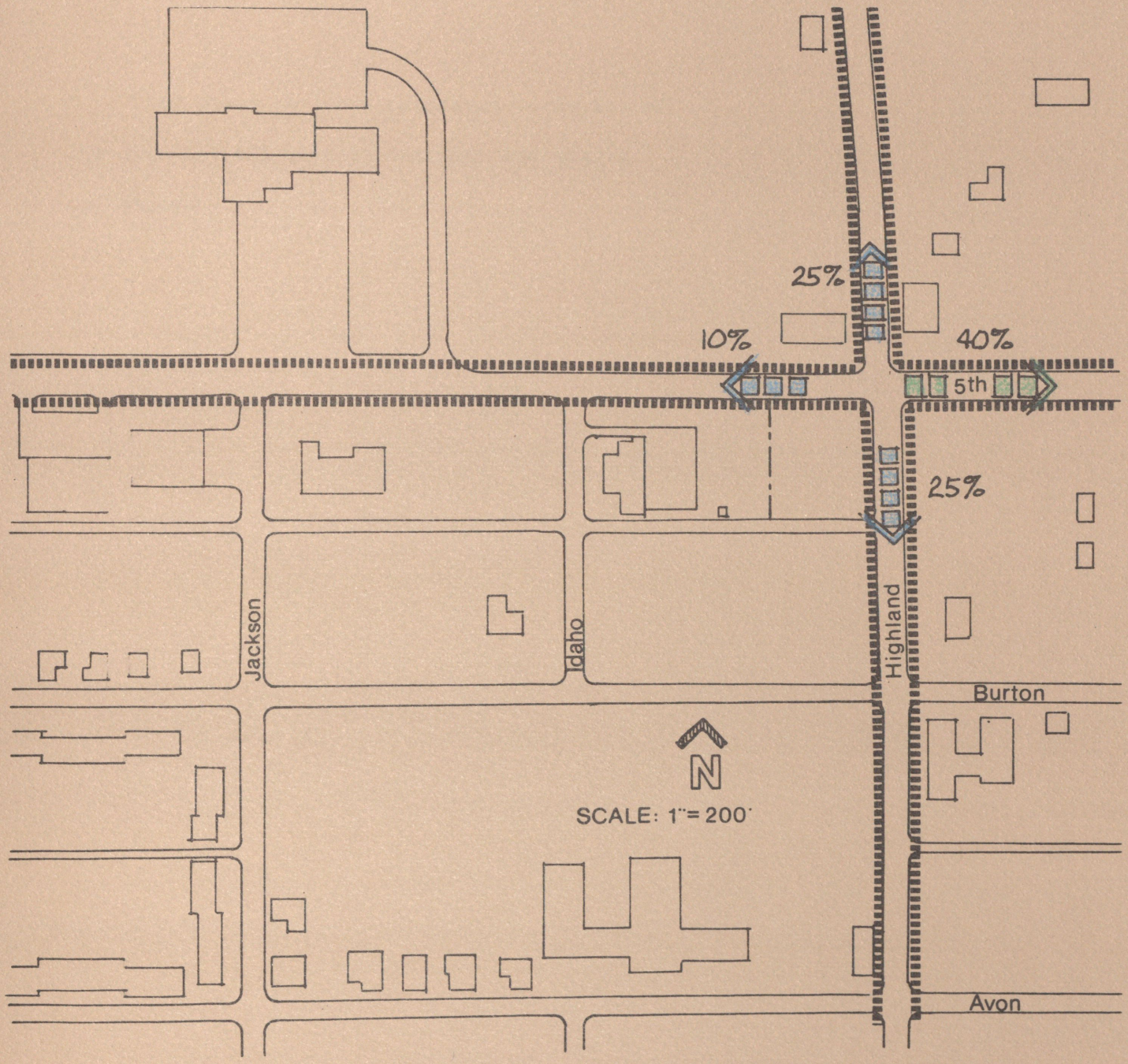


Less than 30%

30% to 60%

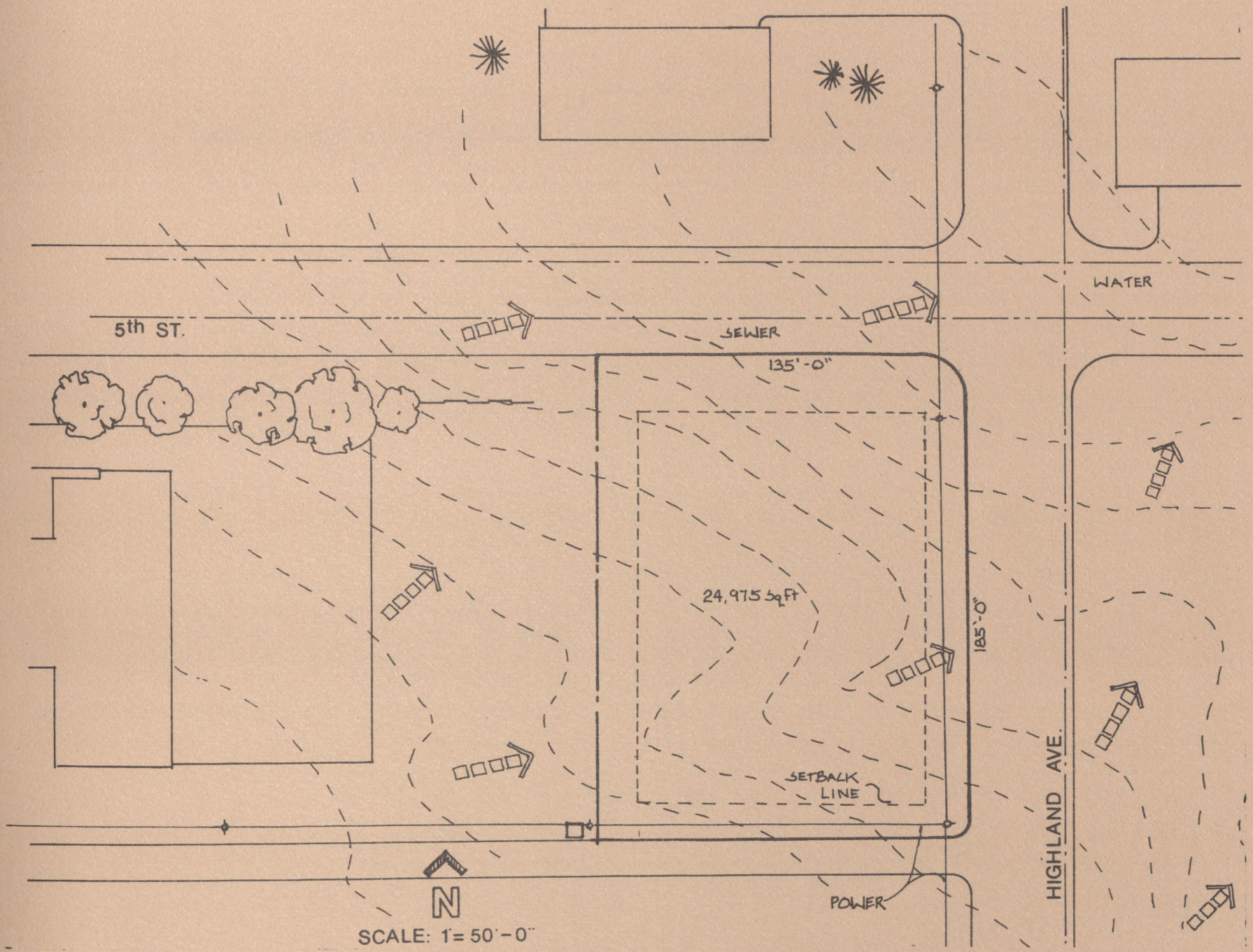
60% and over

RESPONSE


25%
10%
40%
5th
25%
Jackson
Idaho
Highland
Burton
Avon
N
SCALE: 1"= 200'

This shows the Physical characteristics of the site as well as site drainage and nearby utilities.

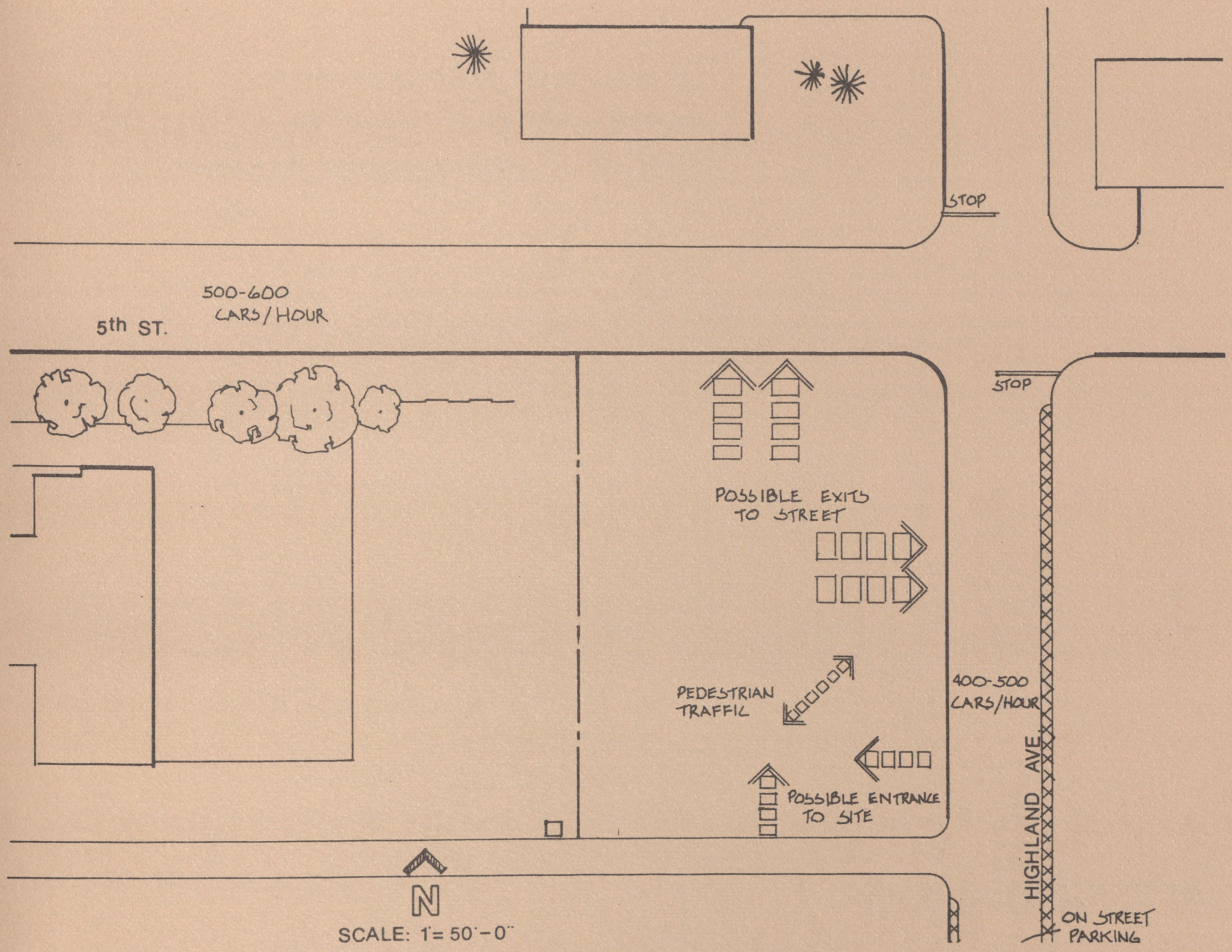
PHYSICAL


5th ST.
SEWER
WATER
135'-0"
185'-0"
24,975 Sq Ft
SETBACK LINE
HIGHLAND AVE.
POWER
N
SCALE: 1"= 50'-0"

On site and nearby traffic patterns are given.

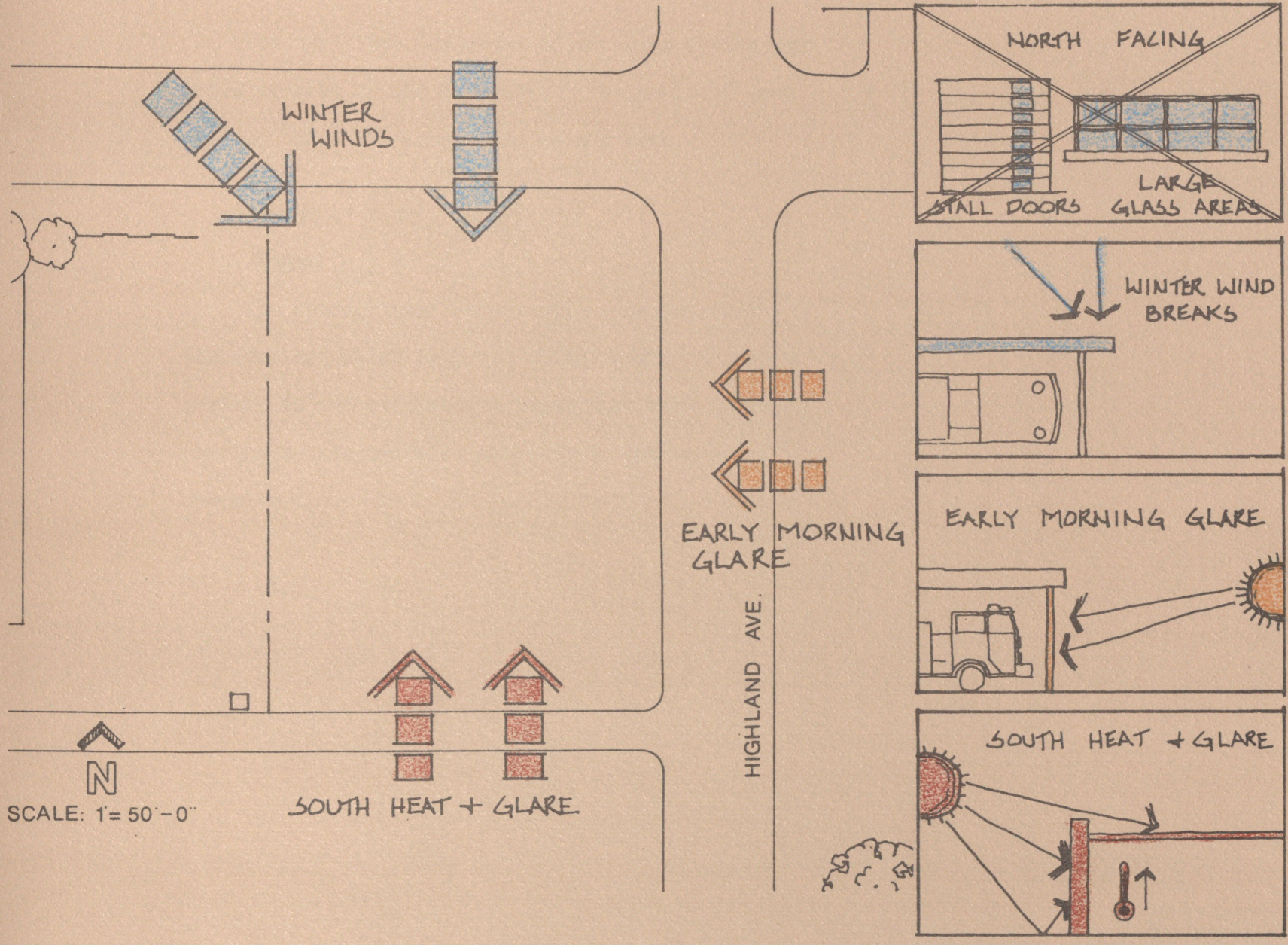
Traffic counts are indicated for the arterial roads.

CIRCULATION


STOP
500-600
CARS/HOUR
5th ST.
STOP
POSSIBLE EXITS
TO STREET
PEDESTRIAN
TRAFFIC
400-500
CARS/HOUR
HIGHLAND AVE.
POSSIBLE ENTRANCE
TO SITE
ON STREET
PARKING
N
SCALE: 1"= 50'-0"

Environmental conditions are shown on the map. In the right column are design recommendations which should be considered in the design process.

ENVIRONMENTAL


WINTER WINDS
N
SCALE: 1"= 50'-0"
SOUTH HEAT + GLARE
EARLY MORNING GLARE
HIGHLAND AVE.
NORTH FACING
LARGE GLASS AREAS
STALL DOORS
WINTER WIND BREAKS
EARLY MORNING GLARE
SOUTH HEAT + GLARE

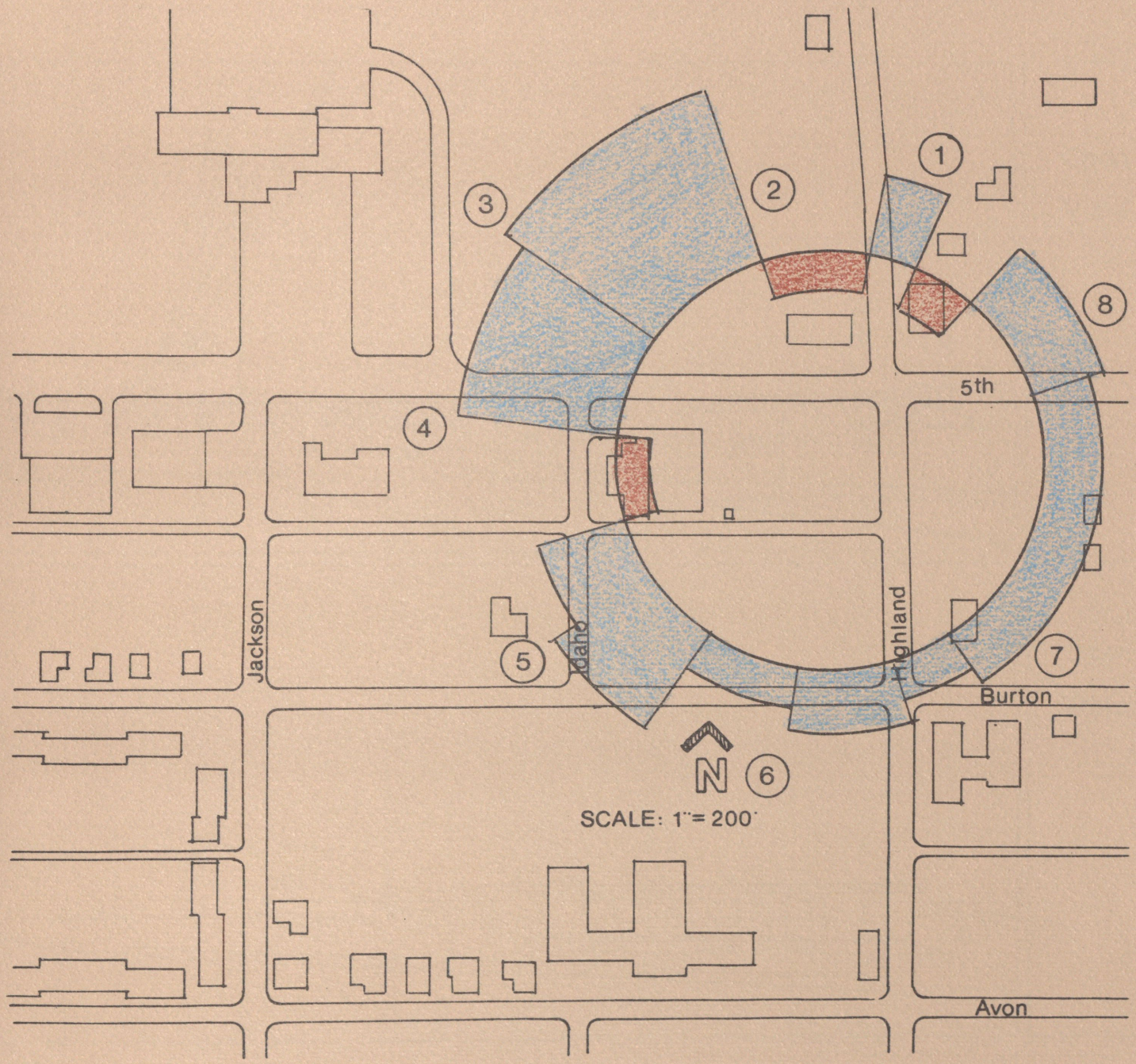
The map shows the areas of extended vision and edges created around the site. The depth of each section shows its prominence to the site.

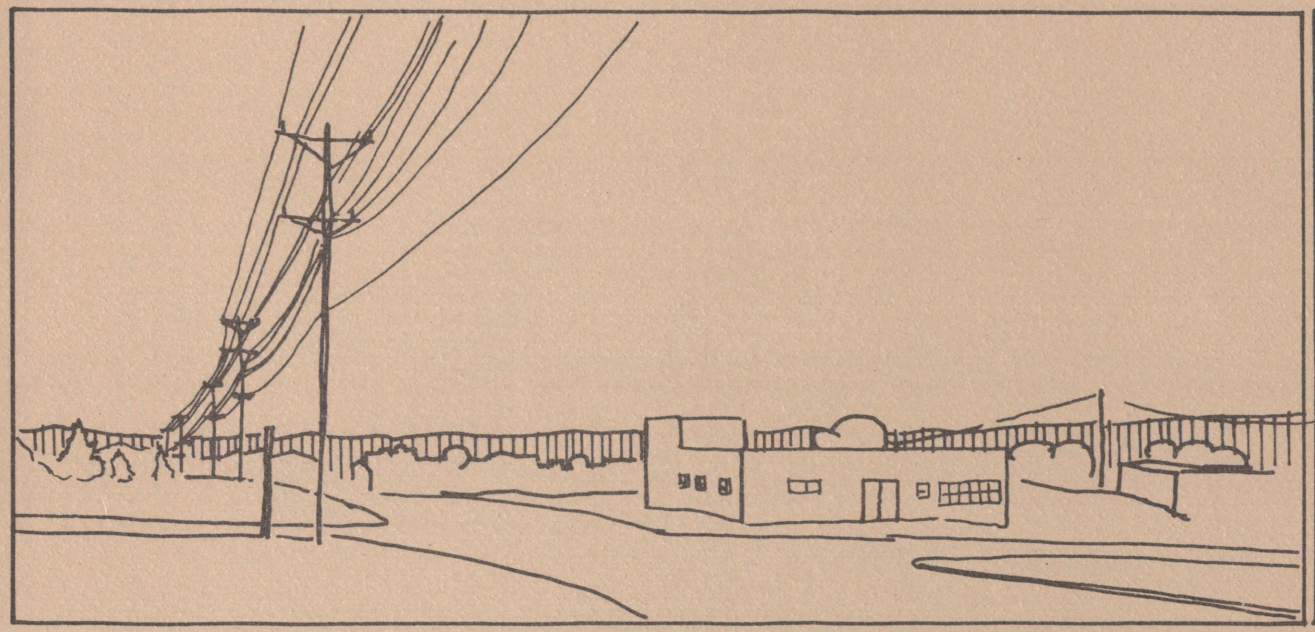
Extended views 

Edges 

The numbers near each section corelate with the drawings which follow. Each drawing is described in the contextural terms that make it important to the overall contextural, character of the site.

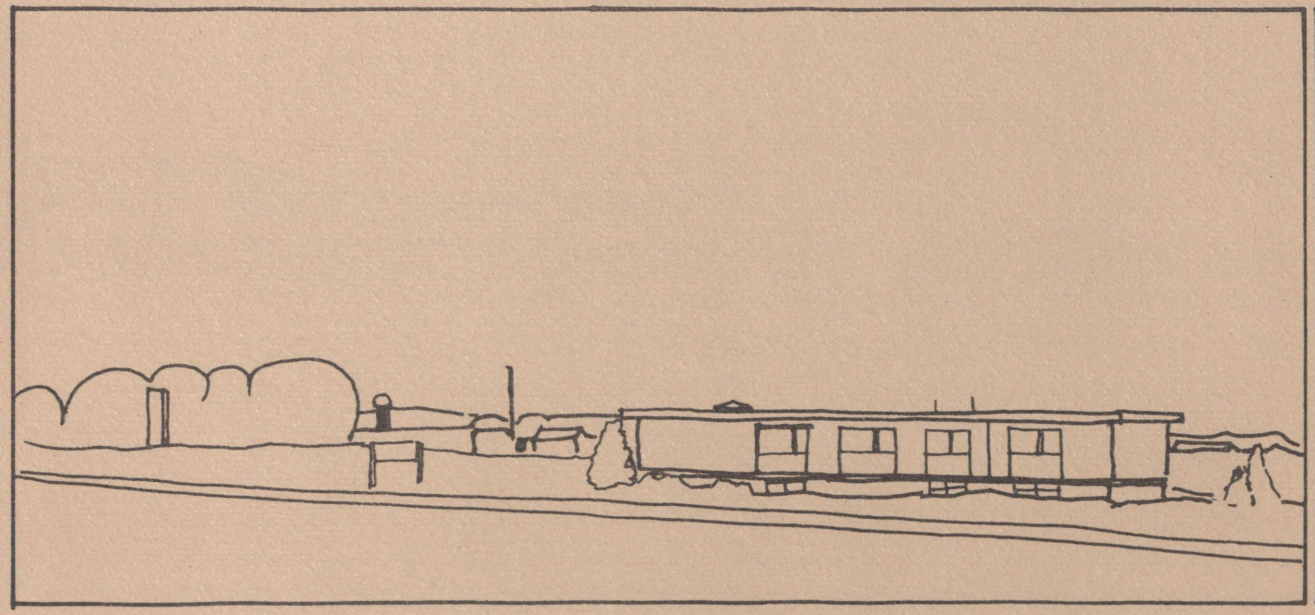
CONTEXT STUDY


1
2
3
4
5
6
7
8
5th
Jackson
Idaho
Highland
Burton
Avon
N
SCALE: 1" = 200'



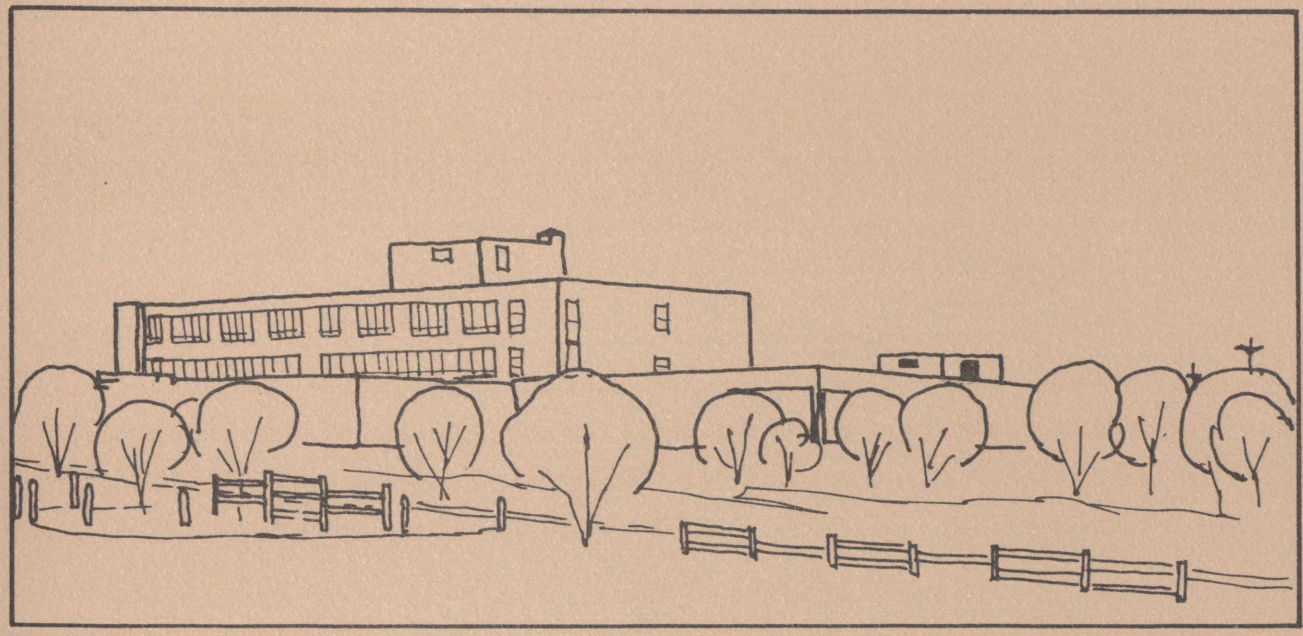
Open Space
Vista

1



Open Space
Materials

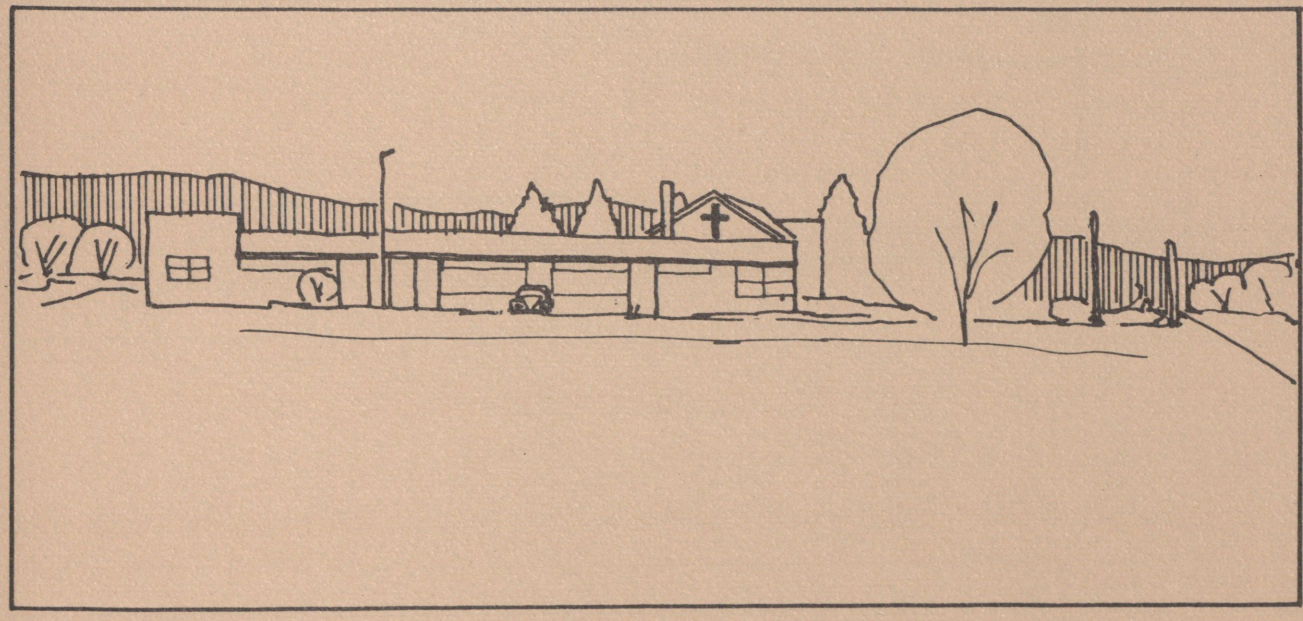
2



Open Space

Materials

3

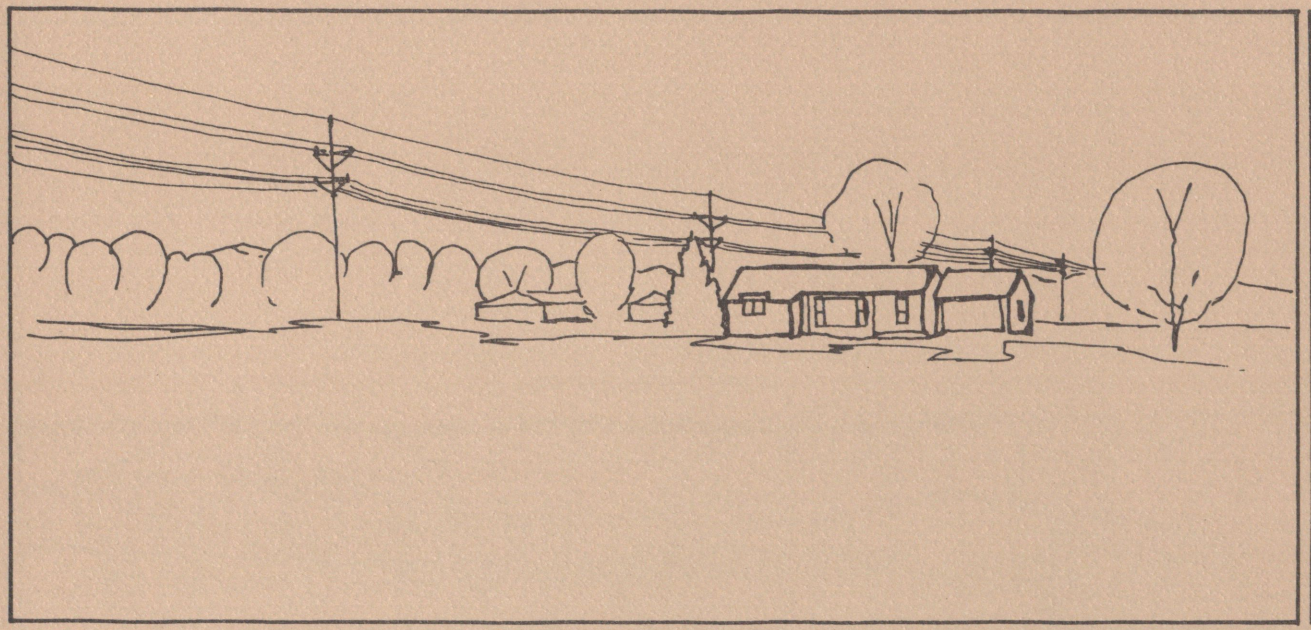


Open Space

Materials

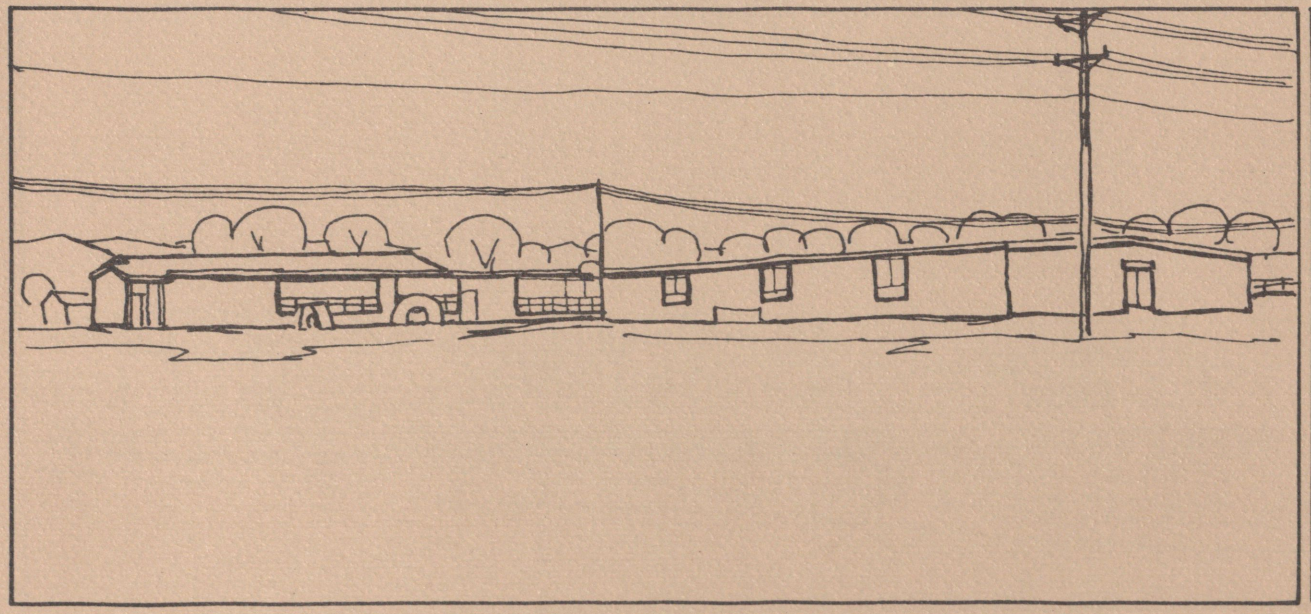
Vistas

4



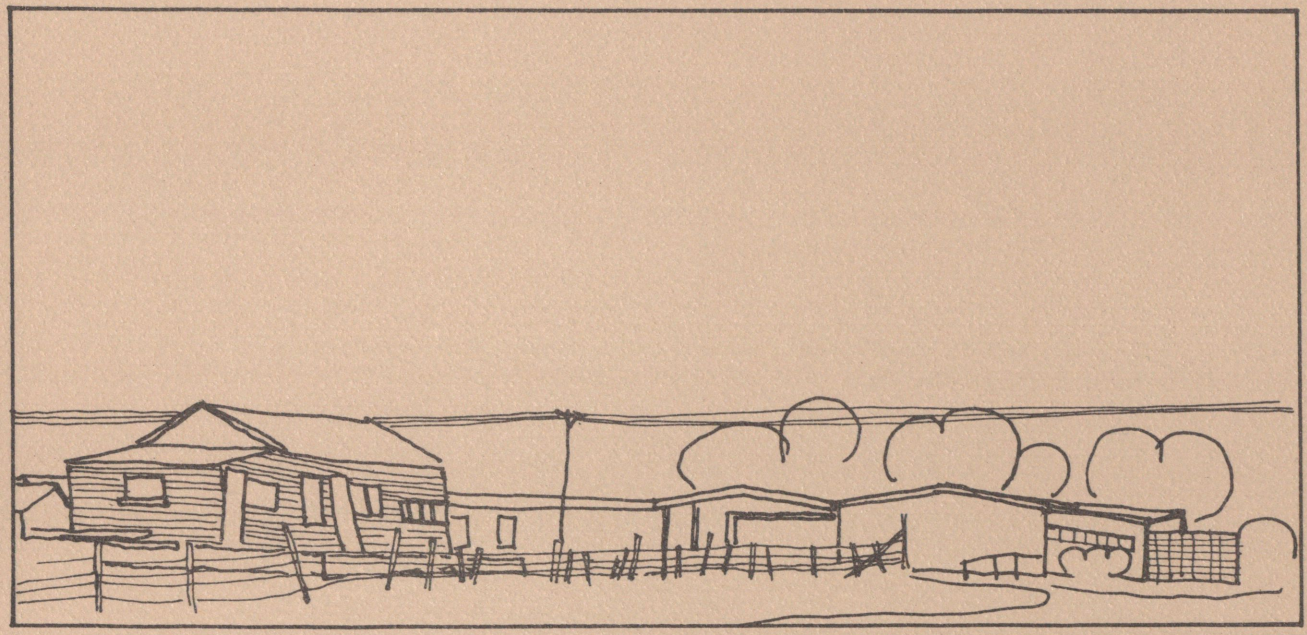
Open Space
Materials

5



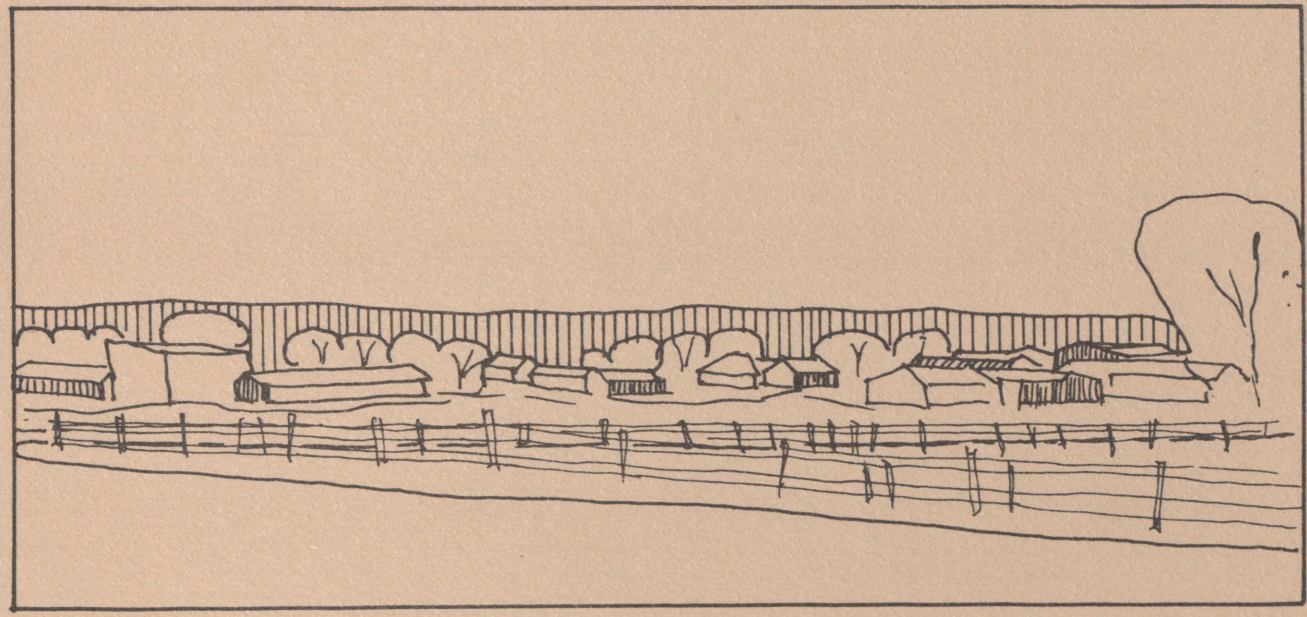
Open Space
Materials
Activity

6



Open Space
Materials

7



Open Space
Vista

8

DESIGN PHILOSOPHY

A firestation is a symbol of fire protection for the residents of the city and county. Therefore the firestation should be easily recognizedto the public - it should convey its importance.

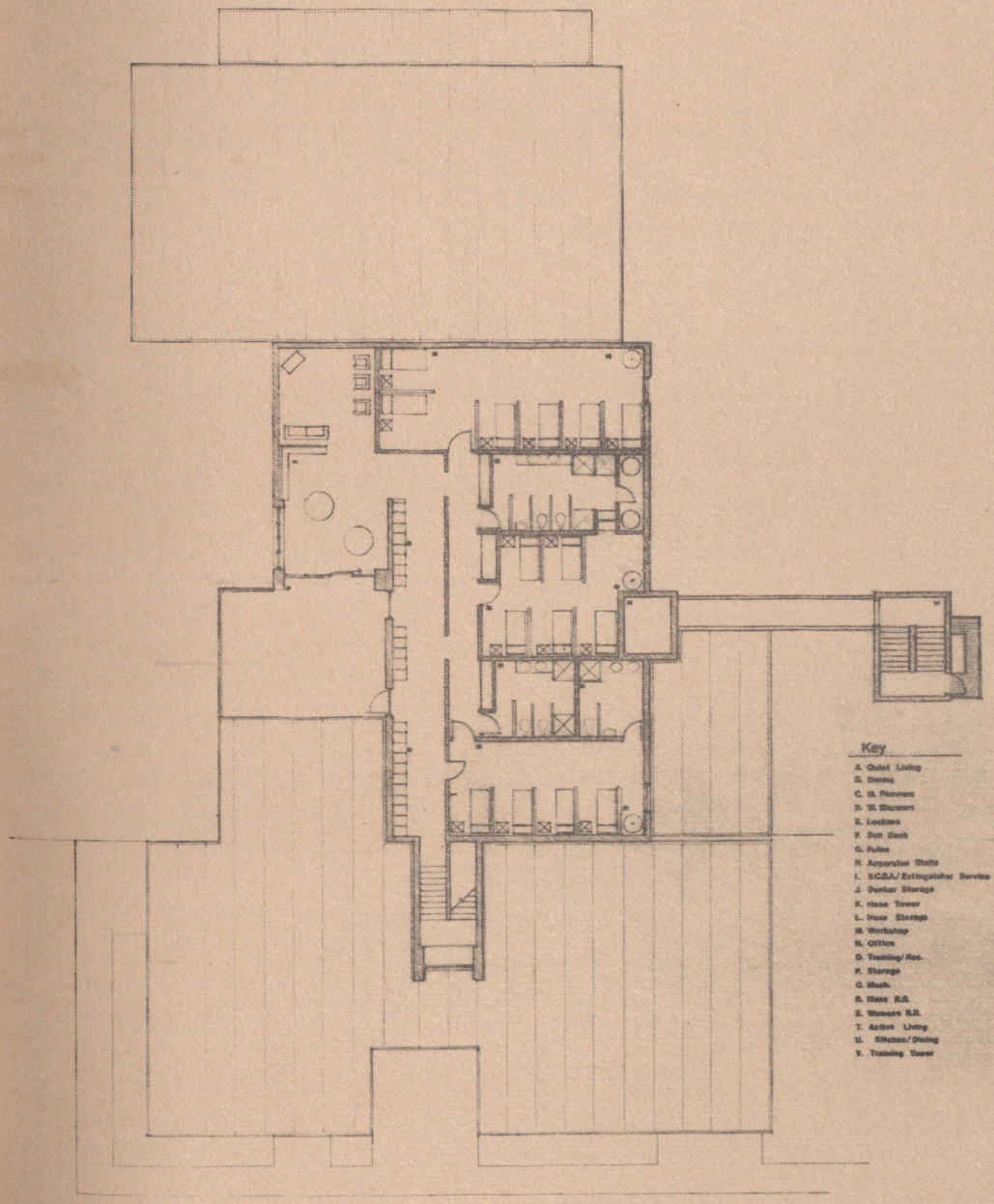
The surrounding area should help dictate its overall exterior treatment and the scale of the project. The station should be constructed in a manor safe from most fires. This is symbolic of what a firestation is present for - the prevention and suppression of fires.

The station should be easily maintained and cleaned therefore materials used should have this characteristic.

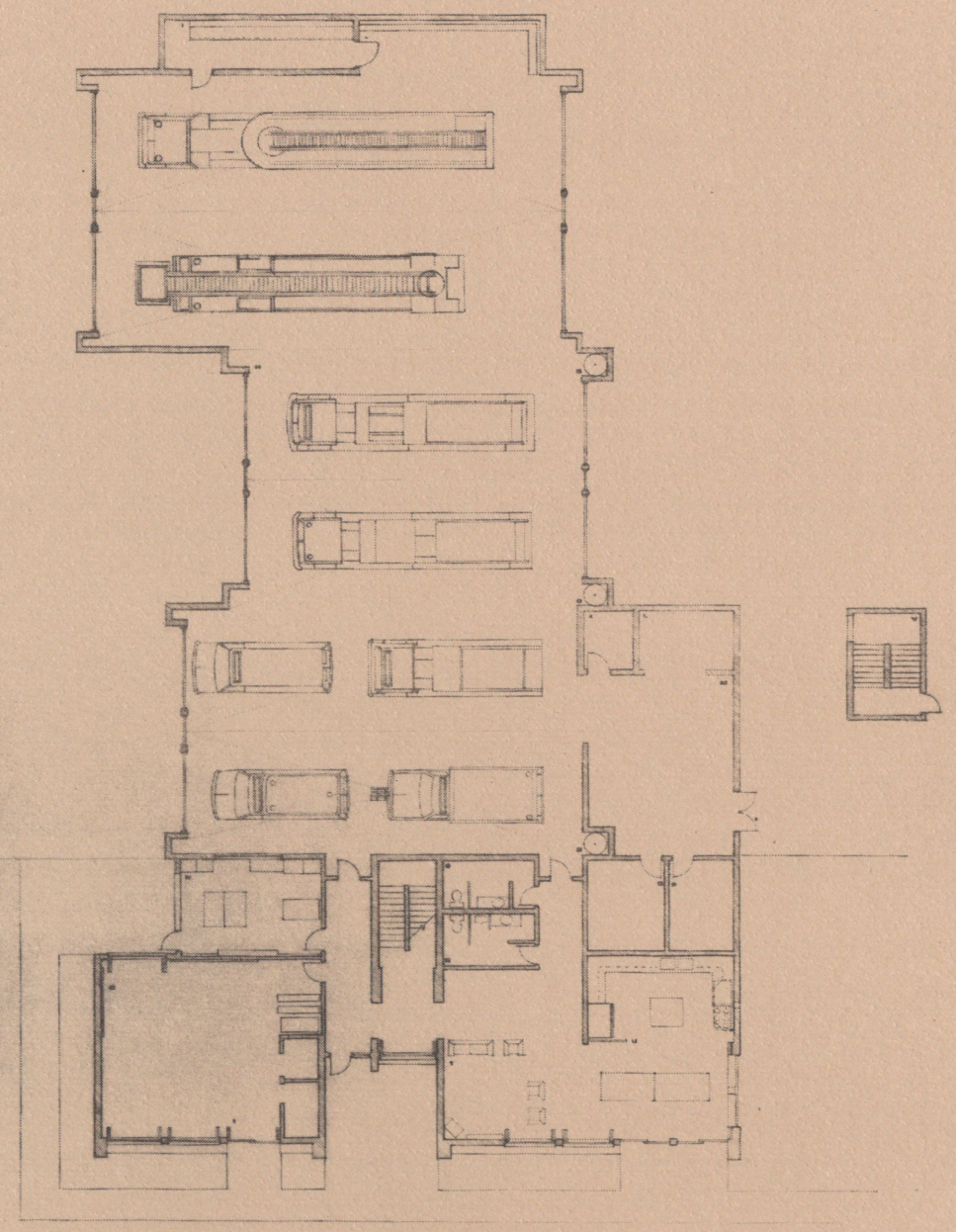
The living spaces should be comfortable spaces, easily maintained , and have a pleasent atmosphere.

Finally the station should be a energy efficient as possible. A public owned building should try to be as energy conscious as possible, to help set standards for the city.

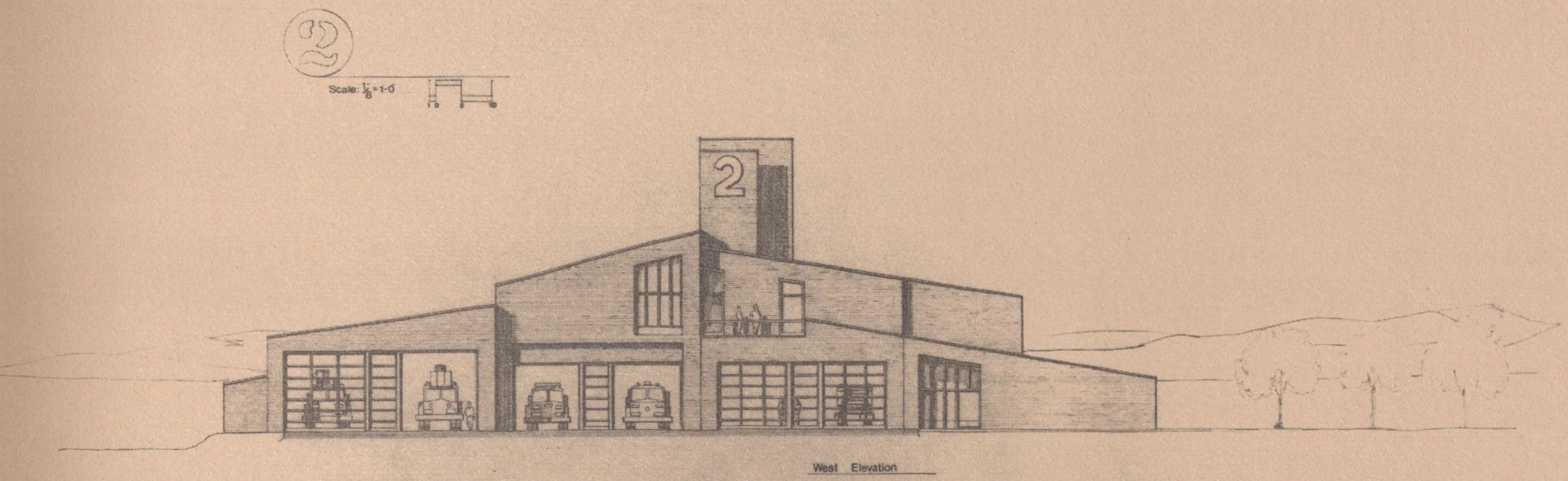
STATION 2



Second Floor

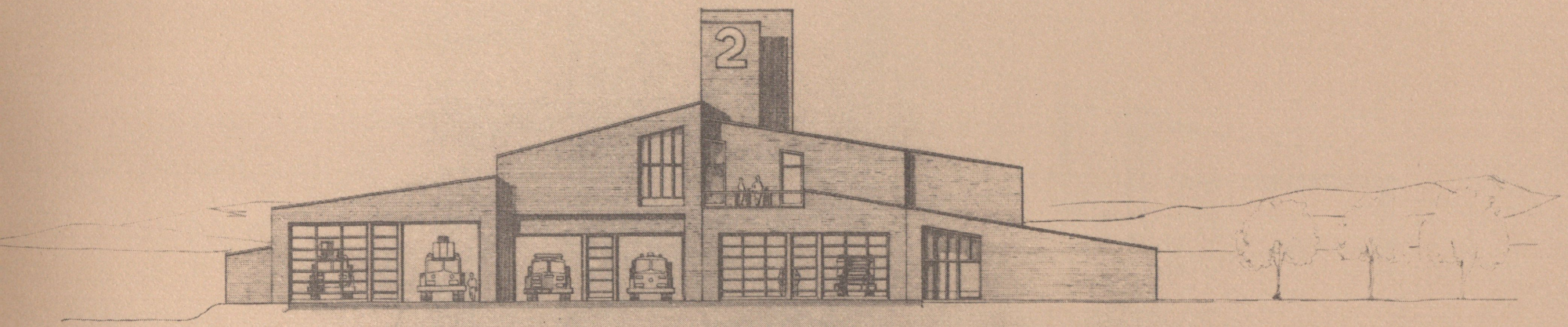


First Floor



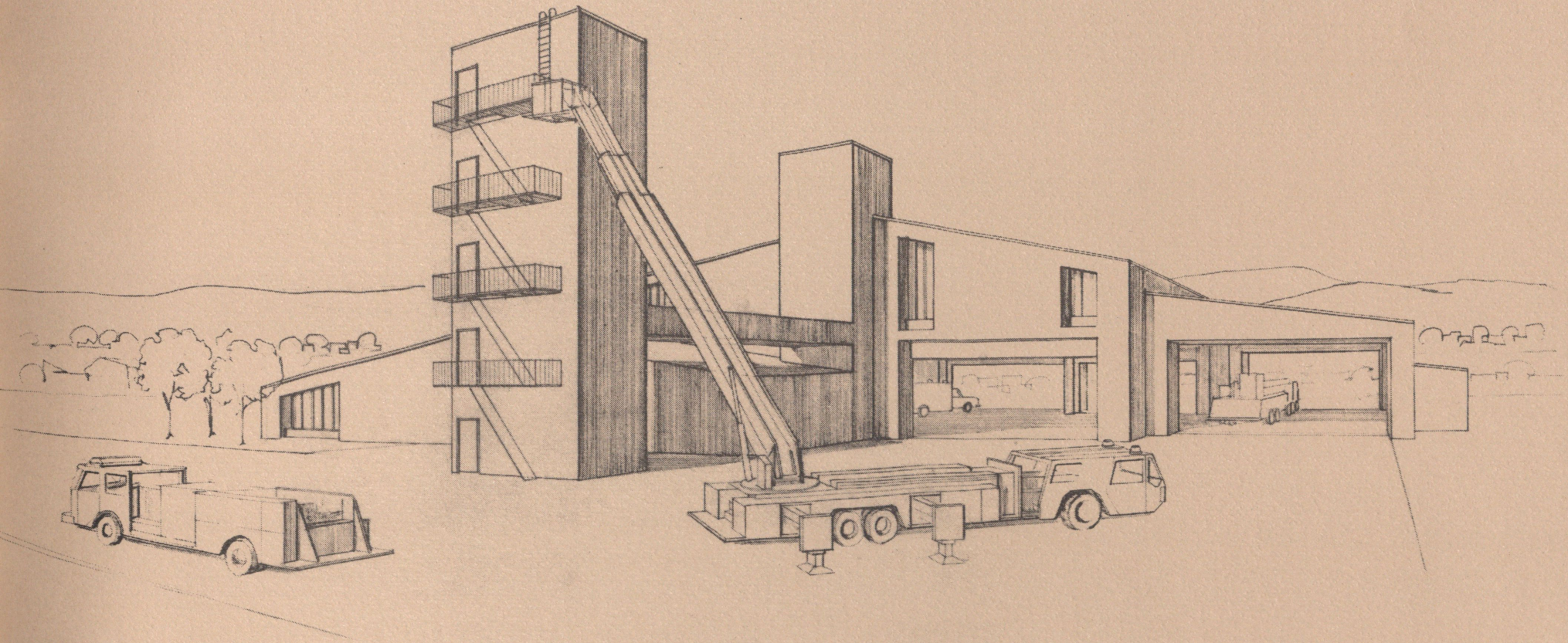
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West Elevation

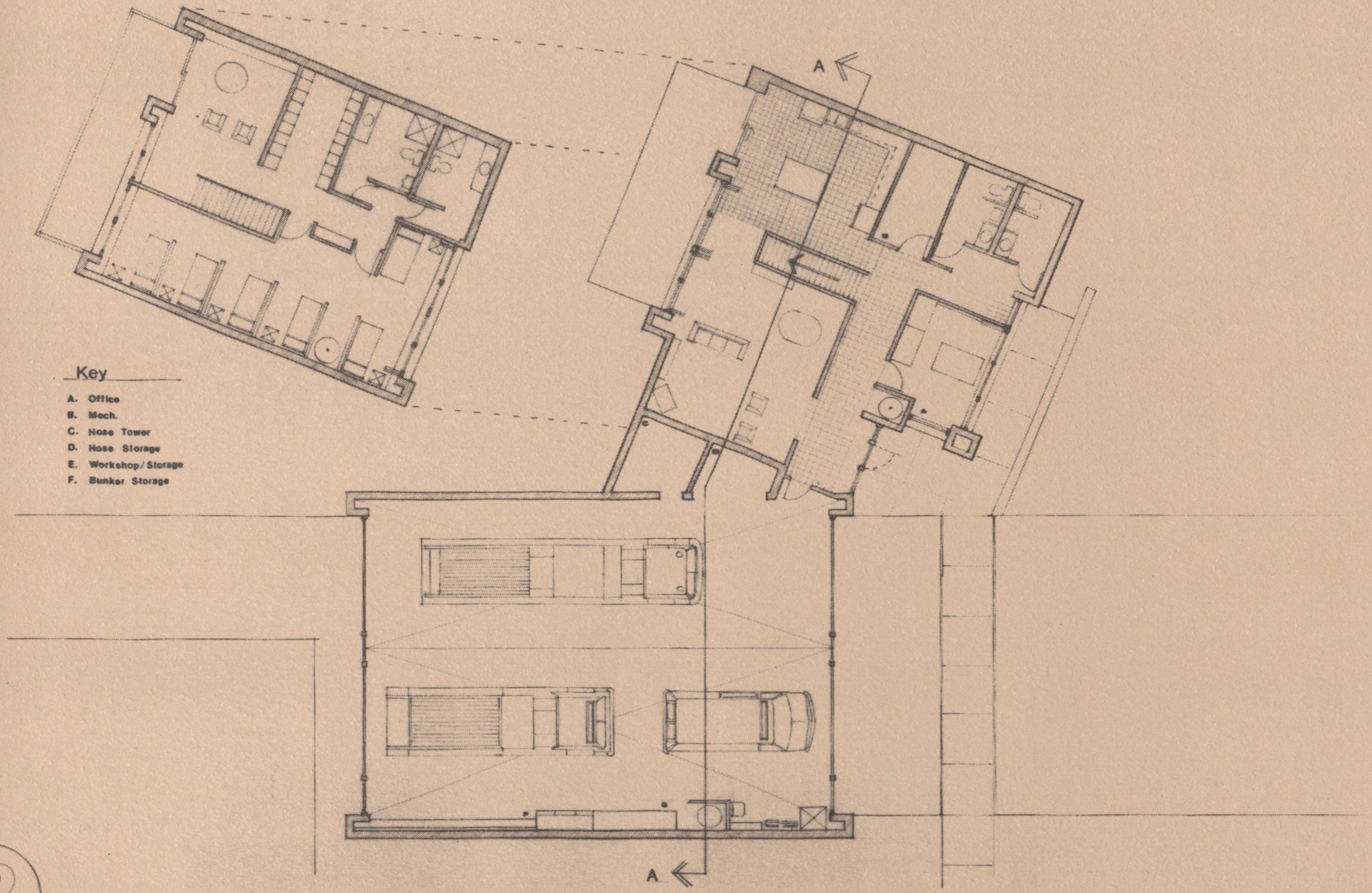


Scale: $\frac{1}{8}$=1-0

West Elevation



STATION 3



Key

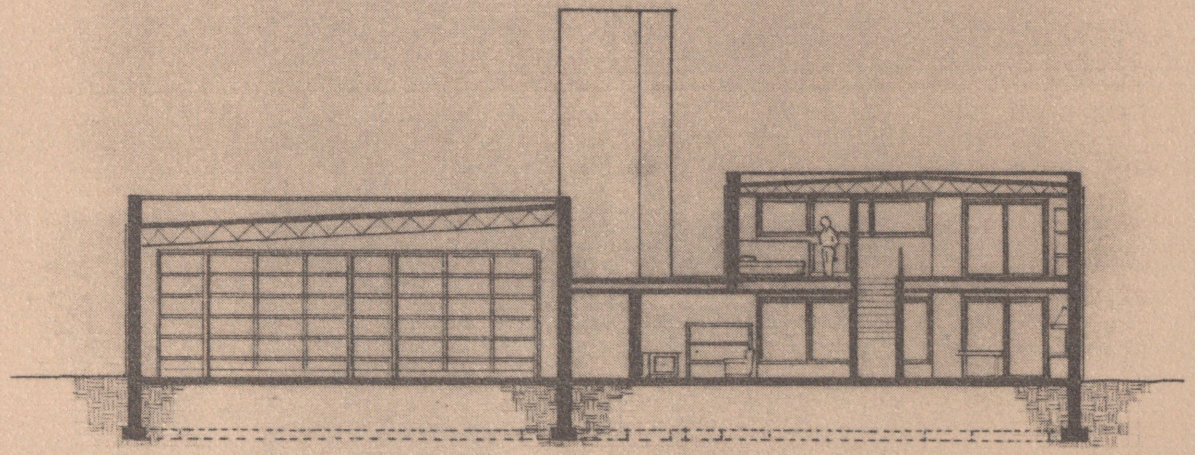
A. Office
B. Mech.
C. Hose Tower
D. Hose Storage
E. Workshop/Storage
F. Bunker Storage

Floor Plans

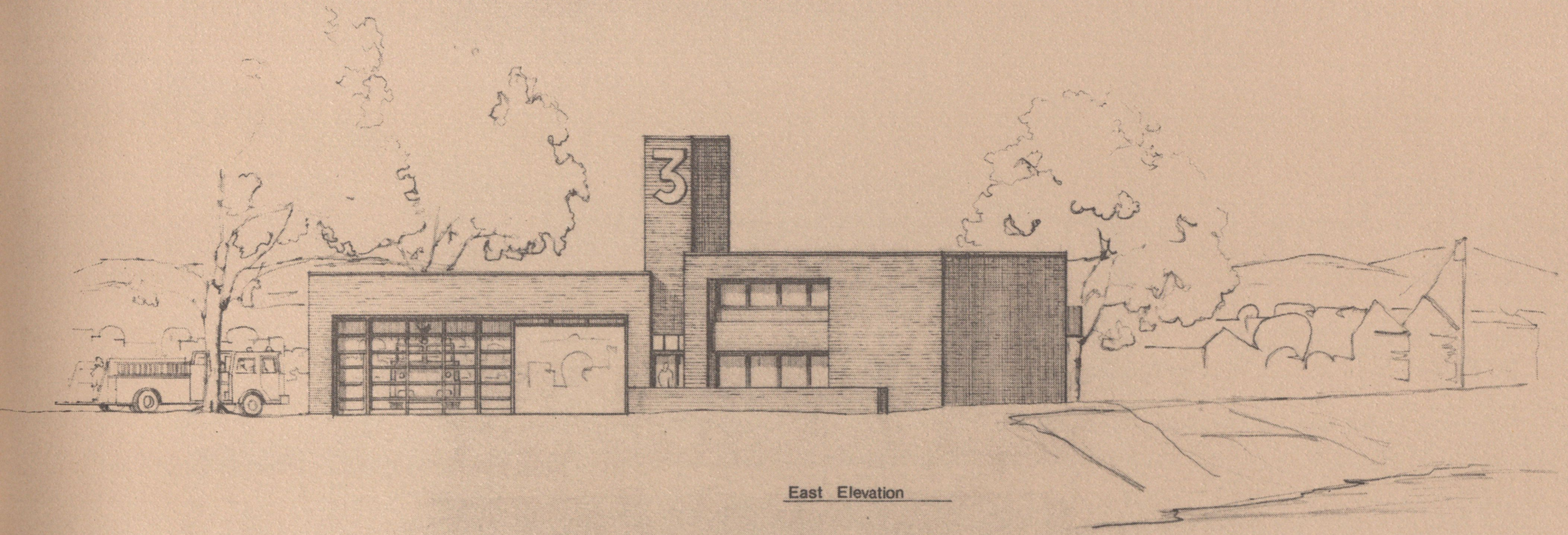
33

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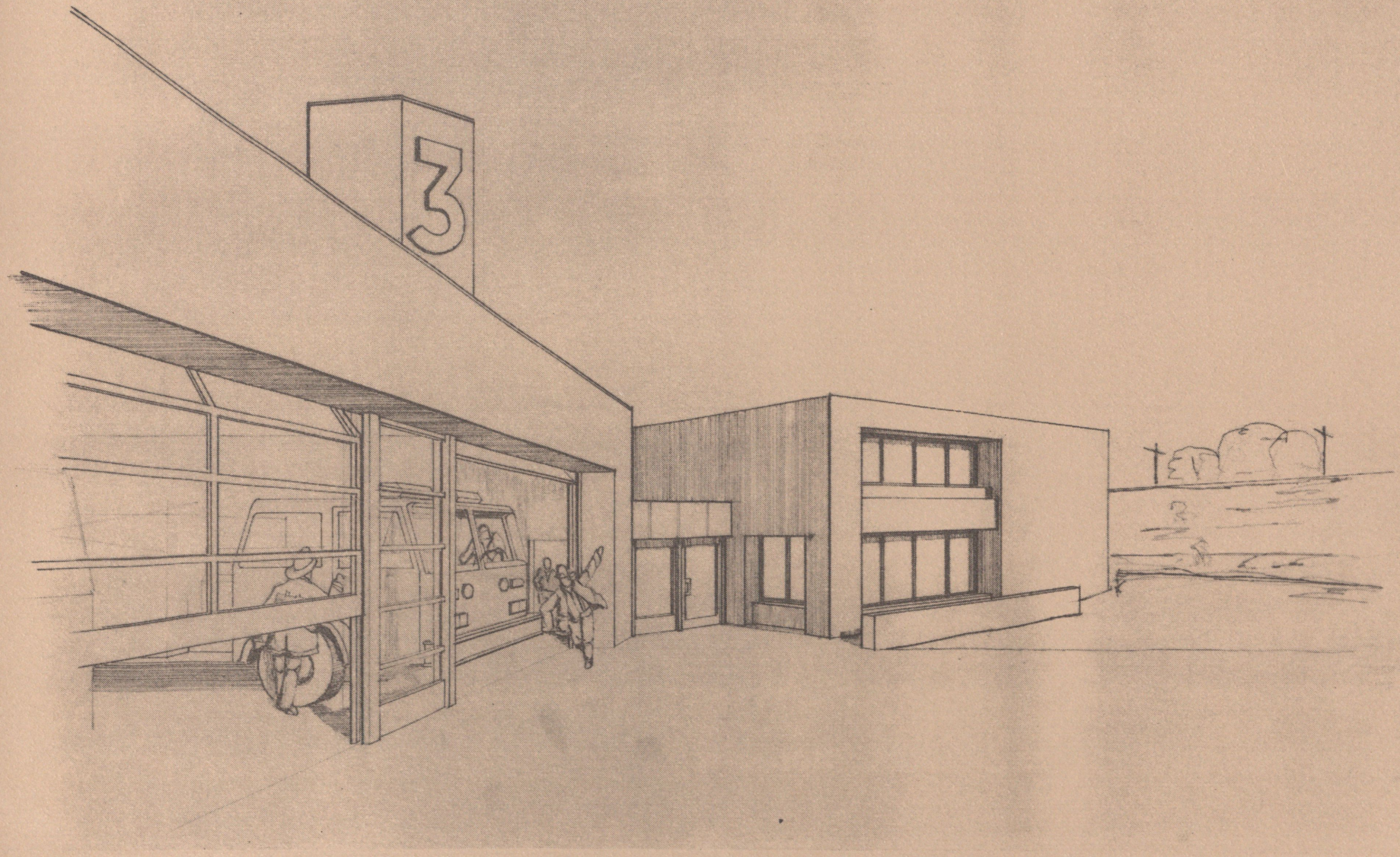
1 0 5 10



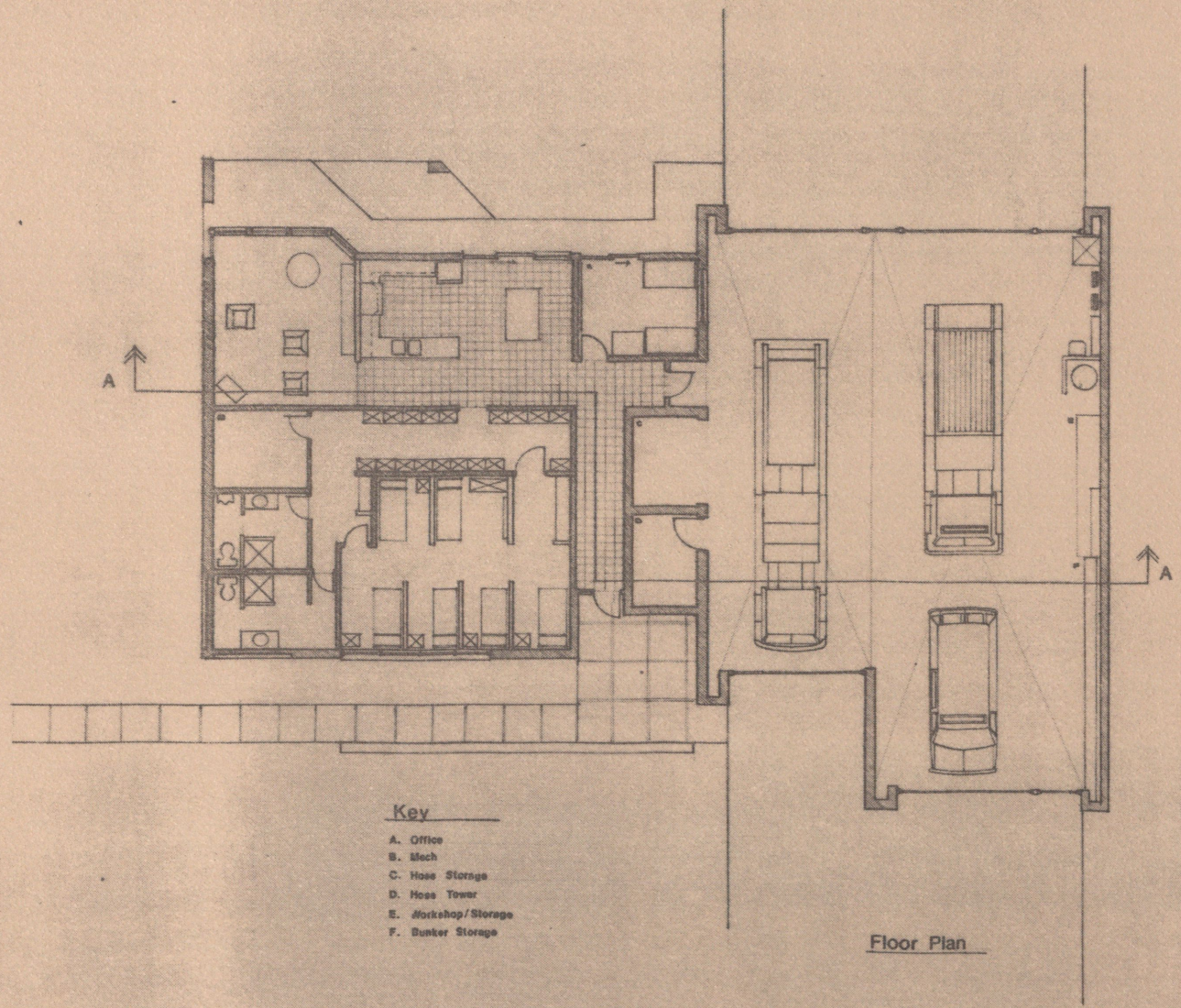
Section AA



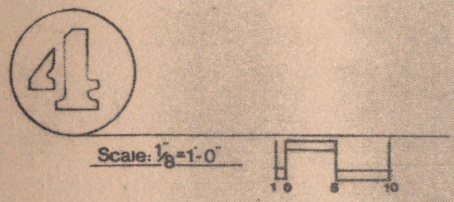
East Elevation


3

STATION 4

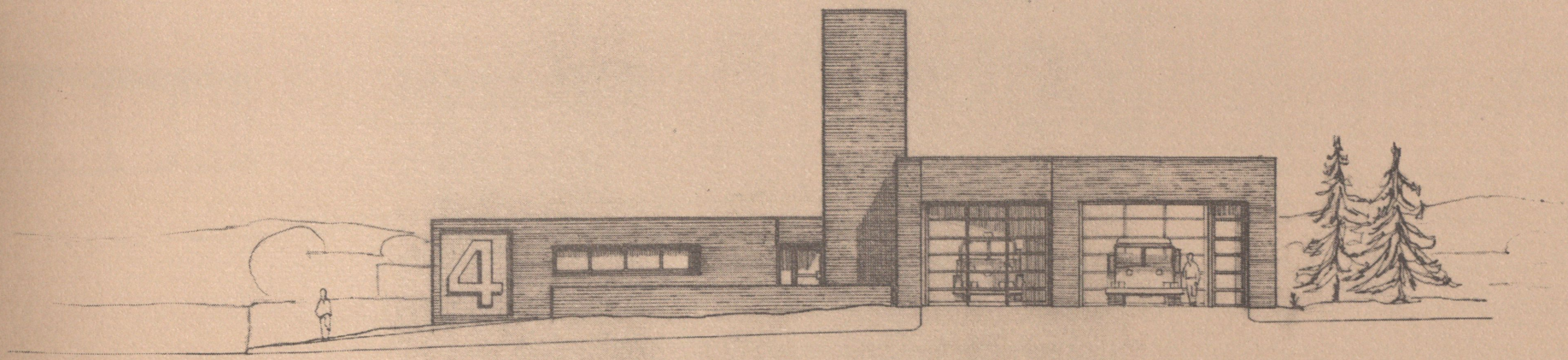

A
A
Key
A. Office
B. Mech
C. Hose Storage
D. Hose Tower
E. Workshop / Storage
F. Bunker Storage

Floor Plan

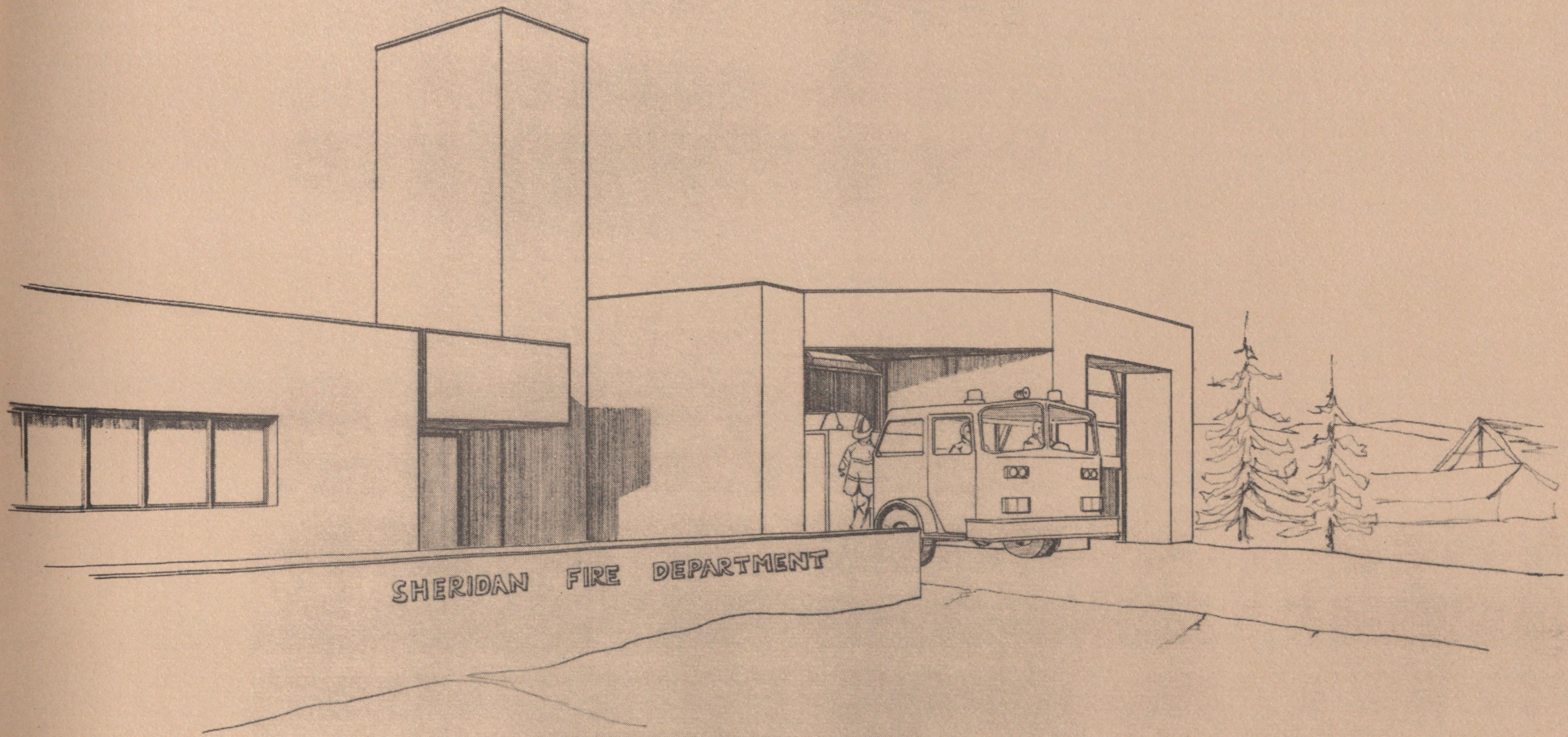


Scale: 1/8"=1'-0"

Section AA



North Elevation


SHERIDAN FIRE DEPARTMENT

Foot Notes

1 Aaron Holst, " Basic Fire Protection Master Plan for Sheridan, Wyoming " March 1980,.

2 Aaron Holst, " Basic Fire Protection Master Plan for Sheridan, Wyoming " March 1980.

3 Warren Y, Kimball Fire Attack 2 (Boston, Mass: National Fire Protection Assoc, 1976)

4 Aaron Holst, " Sheridan Annual Fire Department Report 1979 " January 1980,.

5 Aaron Holst, " Basic Fire Protection Master Plan for Sheridan, Wyoming, March 1980.

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2. Kimball, Warren Y. Fire Attack 1, National Fire Protection Association, Boston, Mass., Copyright 1968.

3. Dober, Richard P., Environmental Design, Van Nostrand Reinhold Co. New York, N.Y., Copyright 1969.

4. De Chiara, Joesph, Time Saver Standards for Building Types, Mc Graw Hill, New York, N.Y., Copyright 1973.

5. Mazria, Edward, The Passive Solar Energy Book, Rodale Press, Emmaus, Pa., Copyright 1979.

6. Brolin, Brent C., Architecture in Context, Van Nostrand Reinhold Co, New York, N.Y. Copyright 1980.

7. Cullen, Gordon, The Concise Townscape, Van Nostrand Reinhold Co, New York, N.Y. Copyright 1961.

8. Hoiland - Zucconi, Proprosed Firestation Program and Design, Hoiland - Zucconi, Great Falls, Mt. Copyright 197?

9. Holst, Aaron, Sheridan Fire Department Annual Report 1979.

10. Holst, Aaron, Basic Fire Protection Master Plan for Sheridan Wyoming, 1980.

11. Denise Scott Brown, Steven Izenour, and Robert Venturi, Learning from Las Vegas, M.I.T. Press Cambridge Mass., Copyright 1972.

12. Paul Goldberger, "Fire Training Center, NY, NY." Progressive Architecture, Febuaury 1976, pp. 64-68.

13. D. Morton, "Nanticoke Central Fire Station." Progressive Architecture, Febuaury 1976, pp. 69-71.

14. "East Cambridge Fire Station." Architecture Record, April 1980, pp. 101.

15. D. Morton, "Central Fire Station, Olean, N.Y." Progressive Architecture, July 1980, pp. 66-69.

16. Fire Station Number 4: Columbus Indiana." Werk, July- August 1977, pp.22-23.

17. "Two Machines (Municipal Fire Station in Corning N.Y." Progressive Architecture, March 1977, pp. 58-61.

18. R.L. Miller, " New Haven Fire Station by Venturi & Rauch" Architectural Record, June 1976, pp. 111-116.

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3 firestations for Sheridan, Wyoming /
CA
3 1762 00157858 0

NA [redacted]40
420 6
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