

A CULTURAL EXCHANGE CENTER
FOR FAIRBANKS, ALASKA

Charles D. Morgan
Spring Semester 1968

A CULTURAL EXCHANGE CENTER
FOR FAIRBANKS, ALASKA

Charles D. Morgan

An architectural thesis submitted in partial
fulfillment of the requirements for the degree
of Bachelor of Architecture, Texas Technological
College, May 24, 1968.

OUTLINE OF CONTENTS

- I. Introduction
- II. Site Selection
 - A. Relationship to City
 - B. Flood Plain Conditions
- III. Explanation of Design Decisions and Considerations
 - A. Intermediate Temperature Zone
 - B. Interior Water/Ice Feature
 - C. Relationship of Functions
 - D. Structure and Construction
 - E. Mechanical System
- IV. Conclusion
- V. Reproduction of Design Solution

INTRODUCTION

The first part of the written material concerning the Cultural Exchange Center for Fairbanks, Alaska, dealt with the evolution of the idea and explanation of underlying physical factors bearing on the nature of the project. The functions which the center was to contain were selected and a general program was derived as a basis for determination of a physical size for the project. The program also served as a springboard from which to proceed toward a design solution.

The final written portion is an explanation of how and why the many design decisions were made in arriving at a physical product conducive to the performance of the functions outlined in the program. Alterations and adjustments of the ideas based on the program are explained and aspects of the final solution are examined.

SITE SELECTION

Because of the importance of the site to the overall value and effectiveness of the Cultural Exchange Center, further study was necessary before a specific selection could be made. For this reason, a site was not selected during the programming phase. Consequently, one of the early steps of the design development was the selection of a site.

Relative importance of factors to be evaluated in site selection was a prime consideration. Factors to be evaluated included the location of the site in relation to those elements of the Fairbanks population to be served by the center. These included: military personnel at Fort Wainwright and Eielson Air Force Base, students and faculty of the University of Alaska, and the civilian population of the city. The listing of these elements makes it obvious that the center will be serving the entire population of the Fairbanks area.

Accessibility having been established as a major aspect to be considered, the downtown area of Fairbanks was selected as the best location for the Cultural Exchange Center. A downtown

site would offer the following immediate advantages:

(1) All bus service routes converge in the general vicinity of downtown, facilitating general convenience of use by military personnel and students from the University of Alaska.

(2) Warehouse facilities and other retail establishment services are readily available near the downtown area.

(3) The business district of Fairbanks is centrally located in relation to all residential areas of the city, and consequently is the logical place for a function designed to serve the entire population.

(4) Correctly designed, the center would serve as a major gateway to the downtown business area for those persons utilizing the bus service as a primary means of transportation, while at the same time serving those, who are in the downtown area daily, as a place in which to eat and enjoy a short respite from the routine environment.

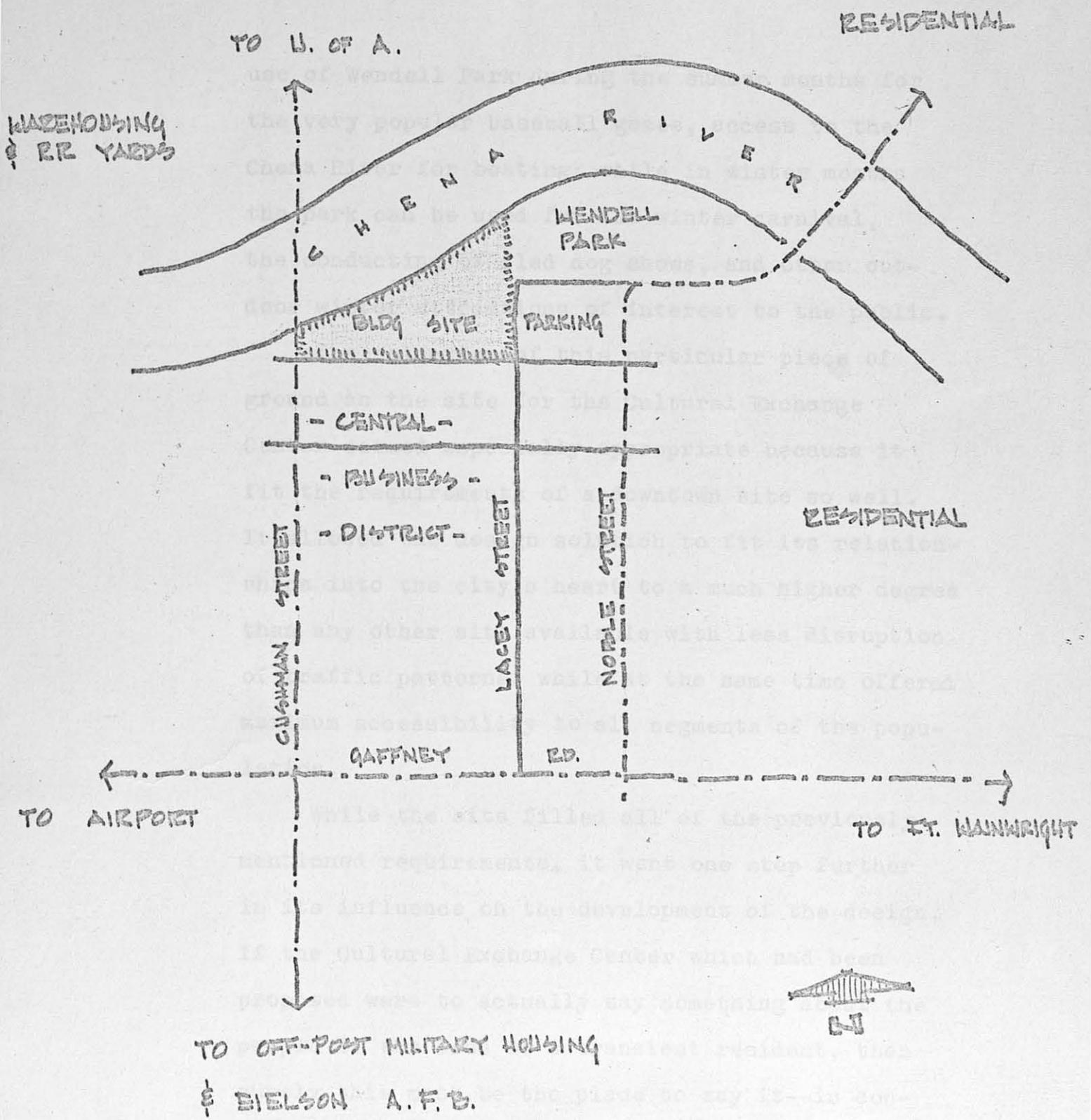
(5) The Cultural Exchange Center can function in the manner intended only if patronized by a large cross section of the population, and then

only if patronized in sufficient numbers to be an economic success. Location in the downtown area facilitates this patronage.

With these advantages in mind, an examination of the downtown vicinity revealed several possibilities. The most promising of these sites was an area immediately to the north of the most concentrated part of the business district. Located on land owned by the city of Fairbanks adjacent to the Chena River and also adjacent to currently unused Wendell Park (see site selection schematic), the site is presently occupied by a log cabin, from which the Chamber of Commerce operates, and by a dilapidated structure housing low-rent office space.

The advantages offered by this site include all those previously listed, in addition to the added opportunity of utilizing the Chena River as a feature of the Cultural Exchange Center. Across a little-used section of Lacey Street is a small vacant block which is currently used as parking and could be further developed as parking in conjunction with the Cultural Exchange facility.

The development of the parking block in connection with the center will facilitate advantageous



----- CIRCULATION ARTERIES

SITE SELECTION SCHEMATIC

use of Wendell Park during the summer months for the very popular baseball games, access to the Chena River for boating; while in winter months the park can be used for the winter carnival, the conducting of sled dog shows, and other outdoor winter attractions of interest to the public.

The selection of this particular piece of ground as the site for the Cultural Exchange Center seemed especially appropriate because it fit the requirements of a downtown site so well. It allowed the design solution to fit its relationships into the city's heart to a much higher degree than any other site available with less disruption of traffic patterns, while at the same time offered maximum accessibility to all segments of the population.

While the site filled all of the previously mentioned requirements, it went one step further in its influence on the development of the design. If the Cultural Exchange Center which had been proposed were to actually say something about the people of the area to a transient resident, then surely this must be the place to say it--in contact with the major influences on the culture of

the people; the never-ending struggle against nature for survival, the necessity of communication with one's fellow man, and the overpowering sense of being a part of the adventure of survival in one of the last places on earth where survival is still a satisfaction within itself. In short, it was a unique site which offered the possibility of a unique solution to a unique problem.

The city of Fairbanks is located on a flood plain between the Tanana River and the smaller Chena River inside the city. The disastrous flood of August 1967, during which the Chena River crested at 18.84 feet (six feet above flood level), inundated the entire plain with the exception of two areas. The first of these two areas was the Fairbanks International Airport built on a four foot fill and the municipal power plant, also constructed on a man-made fill.

Since there is virtually no topographic change on the plain between the two rivers, any building site within the city is subject to nearly the same flood hazard. The site selected on the bank of the Chena River was scarcely two feet lower than any other building site available. Conse-

quently, the possibility of working with a fill in order to overcome the flooding problem became an early consideration in the design solution. It immediately occurred to me that it would be very feasible to use some of the washed gravel gold dredge tailings, which fill an area only three to five miles from the city, to accomplish the necessary fill. With these decisions made, the way was open to proceed with further development of the design of the Cultural Exchange Center.

One of the major problems in building design in Fairbanks is that of exterior to interior transition. When there is a severe temperature difference, as is frequently the case because of common low temperatures of minus forty degrees Fahrenheit and lower, the problem of entering a heated area from outside is complicated and severe. The warm air in a heated area is quickly replaced by a tremendous rush of cold air through the lower eighteen to twenty-four inches of the door opening. To overcome this air rush requires a supreme effort in door closing.

An additional problem in outdoor to indoor transition is the physical discomfort experienced by the individual making the transition. The temperature difference between a plus seventy degrees Fahrenheit interior and a minus forty degrees Fahrenheit exterior is enough to be almost overwhelming.

The solution to these problems in the past has been to provide a small entry area and double sets of doors. This works fairly well for the air rush problem, unless both sets of doors are opened at the same time. It does not, however, provide

much relief for the pedestrian, since the distance between the doors is usually very short and the space very small. He does not have sufficient space to remove or replace heavy outer clothing such as his parka or arctic mittens; and neither does he have sufficient time to become acclimated to the intermediate temperature.

In the Cultural Exchange Center, it was felt that some better solution to this problem should be attempted. The design of an intermediate temperature zone to function as a transition between interior and exterior temperature extremes would be a valid consideration and worthy of some effort in the design process.

The approach to the design of this intermediate temperature zone in the final design solution was to take advantage of several existing conditions to create and maintain such an area.

Since the river is adjacent to the site, and should somehow be clearly related to the Center, from the interior as well as from the exterior, a good solution appeared to be the inclusion of some part of the river in the form of a body of water in the interior space which was to form the

intermediate temperature zone. The interior body of water would, through its tendency to remain at a fairly stable temperature, tend to stabilize the temperature of the transition zone.

At this point it became clear that this body of water should serve a multi-purpose function. Due to heavy snowfall in the area, ice skating areas on exposed ponds and streams are not readily available. The common practice is to run water onto a flat area of ground and allow it to freeze for an afternoon of skating.

Since the intermediate temperature zone was to be a relative sort of thing, the temperature could be controlled to maintain a frozen surface on which free admission ice skating could be available to all. In addition to ice skating, provisions were made for the increasingly popular sport of curling, an activity picked up from Scandinavian countries, to be conducted on the ice surface at scheduled times.

A reasonable temperature range to be maintained is as follows:

	<u>Outside</u>	<u>Intermediate</u>	<u>Inside</u>
Minimum °F	-50°	0° to 20°	68°
Maximum °F	0°	20° to 30°	70°

This intermediate temperature zone will be maintained through a combination of systems. To keep the temperature down in case of rising temperatures, the body of water was designed to maintain a depth of three feet, with part of the body of water extended to the exterior. When the need arises, the water is circulated by pumps between the two areas to transfer excess heat to the outside. Since it is only necessary to maintain a twelve inch depth of ice to safely support skaters, a two foot depth of water is left for circulation purposes. In addition to water circulation, the skating area is covered by two umbrella structures, each equipped with a two-way fan system for more positive control of air temperatures above the ice surface. In the case of overheating in the intermediate temperature zone, positive forced warm air systems feeding into the area are shut off and warm air, which has collected in the pyramid-shaped

upper portion of the umbrellas, is exhausted through the fans in the chimney structures. The process is then reversed and cold air is drawn in from the outside to bring the temperature down to the desired level.

Heating of the intermediate temperature zone is accomplished by warm air spill-out from the heated areas opening into the zone and by a positive forced air system from two sides; one from the movie theatre area and one from the side along the store fronts on the east side of the skating area.

Special requirements for the maintenance and function of the skating and curling area of the ice surface are few. A small surfacing machine for the ice is kept in the area beneath the elevated walkway between the movie theatre and restaurant. Wood surfaced platforms are provided for skaters to put on and take off skates and for periods of rest. This approach to providing facilities for the skaters was taken to provide an experience similar to that of going to a small pond for an unsupervised skating session.

Because curling, especially, and skating to

some extent, are spectator as well as participation sports, seating on benches along the edge of walkways has been provided. These benches, in combination with the ability of spectators to view activities on the ice from within adjacent shops and the restaurant provide an informal and leisurely atmosphere to the pace within the Cultural Exchange Center. The unhurried and casual atmosphere will be easily experienced by the newcomer to Fairbanks. This casualness is an important aspect of life in the area and one of the most difficult for the newcomer, accustomed to life on the outside, to understand.

Another advantage to having an interior body of water or ice in the intermediate temperature zone should be explained at this time. Although the subsidiary structures around the intermediate zone will have a controlled climate, the problem of extremely low relative humidity exists throughout the year in the Central Basin area of Alaska. The ice surface in the winter and water surface in the summer will add needed humidity to the atmosphere in both the intermediate and interior temperature zones, making the Center

an even more pleasant relief from normal surroundings.

After the decision to use an interior body of water was made, the next step was to determine the relationship of this body of water to the river and to spaces which it was to serve. In order to elevate the buildings on the site to a point above high-water levels, it was determined through examination of flood records that the floor level of functions on the site needed to be six feet above existing grade level. However, it was felt that the elevation of the water surface inclosed in the structure should be somewhere between floor level and river level. Since the water level of the river is subject to frequent fluctuation, the solution was to pump water up from the river to maintain the level of the interior water surface at an elevation of twelve feet above the river bed, and four to six feet above the level of the river water surface. This left the difference between required floor level and interior water level at six feet. This difference is accomodated in the final solution by an overall fill of one foot on the entire site

and by raising the buildings on a further fill of gold dredge tailings five feet in depth. This level difference of five feet between waterside walkways and floor levels is easily negotiated by steps throughout the Cultural Exchange Center and is used as a design element to enhance the excitement of the area.

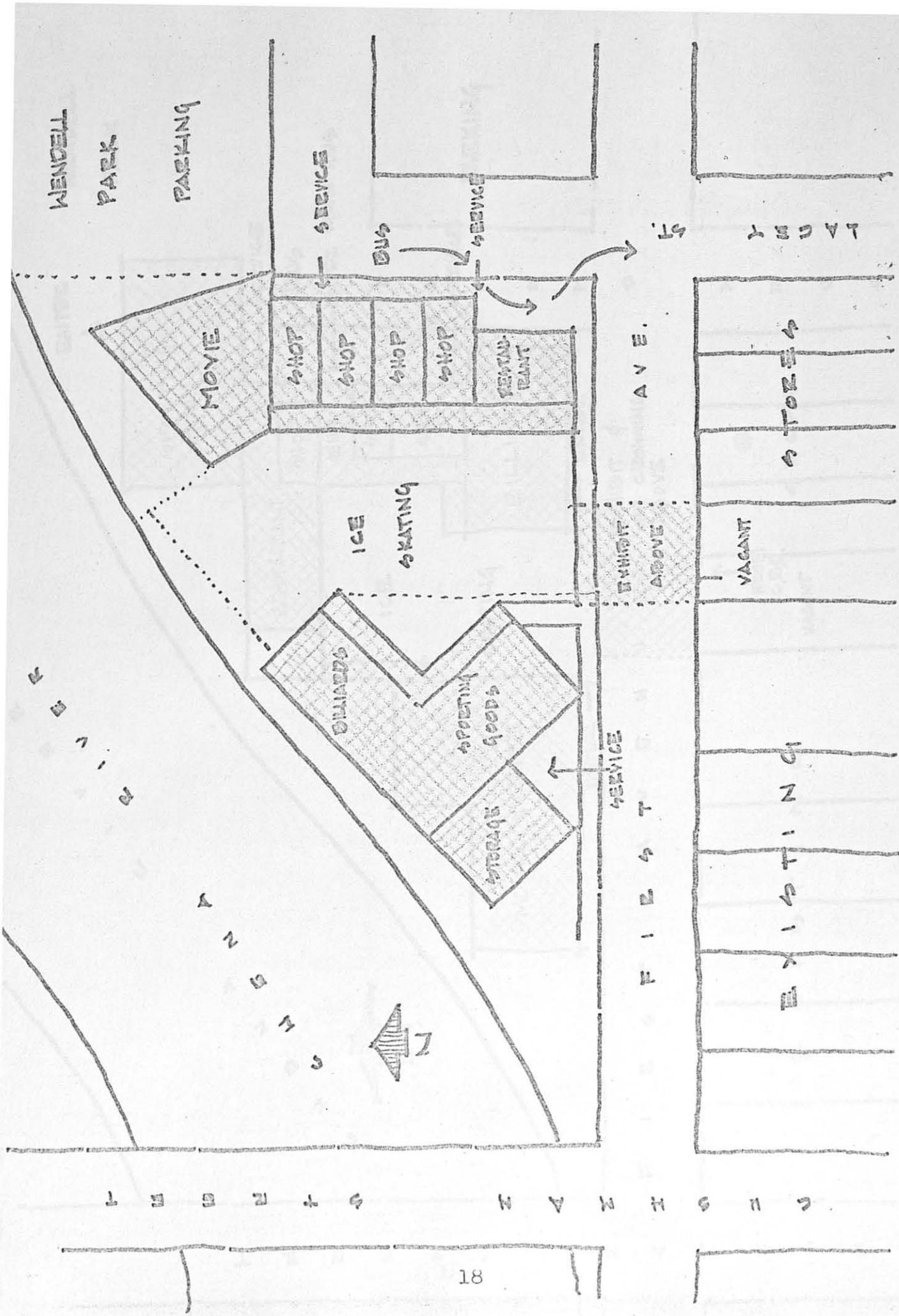
With the ideas of using the interior water/ice feature and raising the other functions on a five-foot fill, the next step was to proceed with the design of the areas which were to function with the interior water feature. Since these functions were derived and explained in the program phase of this project, they will only be listed here for reference purposes.

1. A Small Movie Theatre
2. A Billiard Hall and Game Room
3. A Sporting Goods Store
4. A Small Gift Shop
5. A Fur Shop
6. An Information Center
7. Restaurant
8. Delicatessen
9. An Exhibit Area
10. City Bus Facilities

EXPLANATION OF DESIGN DECISIONS
AND CONSIDERATIONS

The original scheme for working the functions in conjunction with the water feature is explained by a sketch on the following page. Although it contained some ideas which were retained in the final scheme, it also presented several undesirable conditions. It should be pointed out that between the original scheme and the final solution were many stages of innovation. Only the two are shown for reference purposes.

The method employed in the original scheme to move persons from the Cultural Exchange Center into the downtown area was by means of a portion of the building spanning First Avenue and containing a circulation spine. This circulation spine is terminated at the building line across the street as the extent of this project, however, it is projected that the increased value of this property across the street will facilitate the continuance of the spine through the adjacent block and onto Second Avenue. The portion of the structure which spans the street also contains the exhibits of Alaskan culture and local arts and crafts. The purpose of this arrangement was the promotion of interest in the exhibits. It



ORIGINAL SCHEME

was felt that this was a valid approach, and consequently, this part of the original scheme was carried into the final solution.

Other changes made between development of the initial scheme and final solution can best be understood through an explanation of the final solution and the reasoning behind it.

The movie theatre was located on the west side of the intermediate temperature zone (referred to hereafter as the circulation space) for several reasons. The first was that it required only light service, which could be accomplished during the day through the front of the building, with cleanup personnel working through the rear exit facing First Avenue. Another reason for its location was to provide a clear means of egress in case of fire or panic. Finally, the movie theatre was one of the few functions in the complex that could operate in a relatively self-sustained area, without depending on the impulse of pedestrian traffic to thrive.

The restaurant and delicatessen were designed to function from a single kitchen, since the variety of food offered by the two was so nearly the same.

Emphasis was placed on the restaurant's having a view of both the ice area and the river development..

From initial concept, the billiard hall was to be an important part of the complex, designed to function in a manner similar to the court house square of Texas county seats. Consequently, it was placed in a prominent place so that patrons could observe and be near the main flow of traffic in the circulation space. This, in combination with the casual recreation offered within will make the billiard hall a place desirable for that group of people it was designed to serve.

The sporting goods store offered a different range of possibilities than the other retail functions. By virtue of the unique character of the area, the range of merchandise in this establishment would be an attraction within itself. Such items as snow buggies; mountain climbing equipment; hunting, fishing, and camping equipment; plus a selection of dog sled equipment would be offered for the area resident. Camera equipment, skating and skiing items, and a selection of heavy clothing would be available to those persons who only

occasionally venture into the world of the sportsman. With the function of the establishment in mind, it was designed to be accessible directly from an outside parking area, the river, and at the same time from within the complex.

The rest of the retail shops, smaller in size and dependent to a greater extent on the circulation space for patronage were arranged along the major circulation spine with service from screened areas at the two ends of the enclosed bus loading shelter.

A final consideration, although of no less importance, was the method of entering the complex for the city bus patrons. The solution was to bring these persons into the heart of the complex, through a combination waiting and circulation area from which the delicatessen and information center/bookshop could both function. This area is near the restaurant and opens directly onto the major circulation spine.

The overall effect of the circulation spaces and shops working together is reminiscent of the compact nature of some of the more quaint arrangements in the city; while at the same time

allows the newcomer to gradually and pleasantly become acquainted with the way of life in Fairbanks. This summation fairly well describes the overall approach taken in the design of the Cultural Exchange Center; make it thoroughly Alaskan, but in such a way that it can be understood and appreciated by a person who is not thoroughly Alaskan.

In selecting materials for use in construction of the Cultural Exchange Center, there were many peculiarities of the locality which had to be considered.

Since wood is the most readily available and most widely used material in the area, it was the first considered. However, since the National Building Code classified the proposed building as class "B" occupancy in a class "A" fire zone, all structural materials had to be of non-combustible material. Also, a four-hour fire rating was required on exterior walls in many areas. As a result, the use of wood was limited to paneling and mullions between glass panels and between translucent fiberglass panels.

A major consideration in the selection of materials and a method of construction was the time element involved in building. Since the growing season in Fairbanks is only eighty-nine days, the construction season is obviously not much longer. The final solution to this problem was the use of a system in which columns and vierendeel trusses are precast and pre-tensioned in a heated warehouse during the winter months

for quick erection during the construction period.

The truss system is then decked with a system of pre-stressed concrete hollow-core planks laid flat on top of the trusses to become a part of the structural system through integral fastening.

It was decided that air-entrained concrete would be used throughout the complex for several reasons. The strongest point in favor of air-entrained was its ability to withstand severe weathering. Also, through use of small size aggregate in the concrete, no strength is sacrificed. This quality fit well with the use of available washed gravel gold mine tailings as exposed aggregate for a finish on exposed concrete.

The mechanical system in the complex consists primarily of heating. The availability of steam as a utility from the city of Fairbanks eliminates the need for on-site boilers and simplifies the heating system. A combination of systems was selected for use in the Cultural Exchange Center. The slab is heated to a temperature of sixty-five degrees to overcome heat loss through the slab and to provide maximum comfort. The main element of the heating system is a central converter unit

which converts the steam heat into heated water. The heated water is then pumped to fan-coil units in the various zones as indicated on the design drawings.

Since there are a few weeks in the summer when cooled air in addition to ventilation would be highly desirable, the coil units double as cooling units. The maximum ground water temperature in Fairbanks is thirty-five degrees Fahrenheit, and a simple pump system will circulate this cool ground water through the fan-coil units. After a single cycle, the water is then returned to the ground, making an actual cooling compressor unit unnecessary.

CONCLUSION

It is felt that the addition of the Cultural Exchange Center to the Fairbanks area would prove to be a valuable tool in facilitating understanding and communication between all segments of the population. The state of Alaska and the Fairbanks area offer unlimited opportunity to new citizens, and the center would provide a place where the excitement and unlimited opportunity could be encountered in an atmosphere conducive to acceptance.

For those persons who have no intention of taking permanent residency in the area, the center would offer a means of quickly but gently orienting oneself and encountering a truly unique society.

As for the system used in construction of the facility, it is felt that this is a valid approach to the one-season construction project. It allows much of the work to be done in winter months, when employment is not as plentiful for the construction worker. It would also amount to an economic savings, in that costly overtime during as many as two or three construction seasons could be avoided.

A CULTURAL EXCHANGE CENTER

FOR

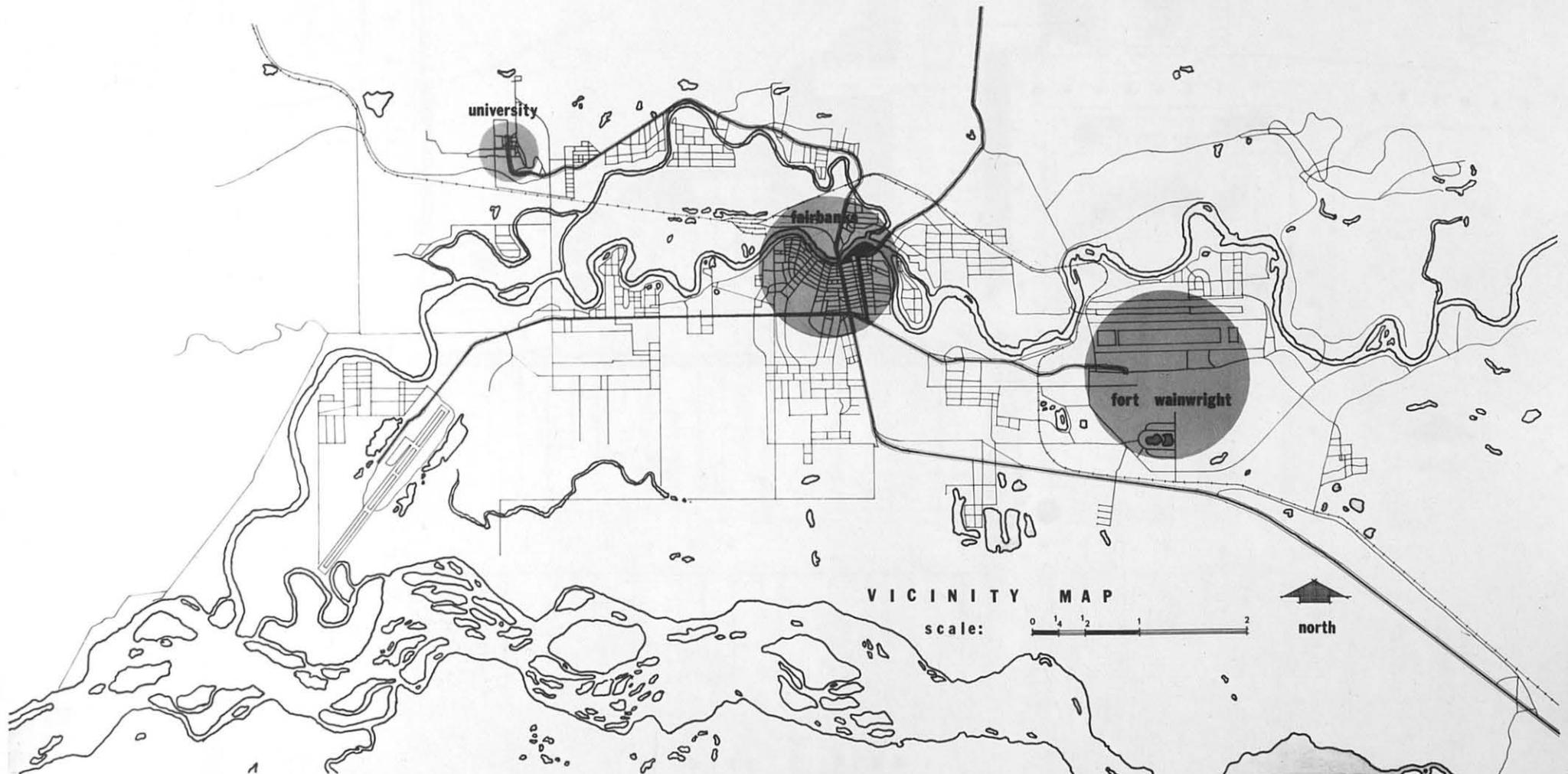
FAIRBANKS, ALASKA

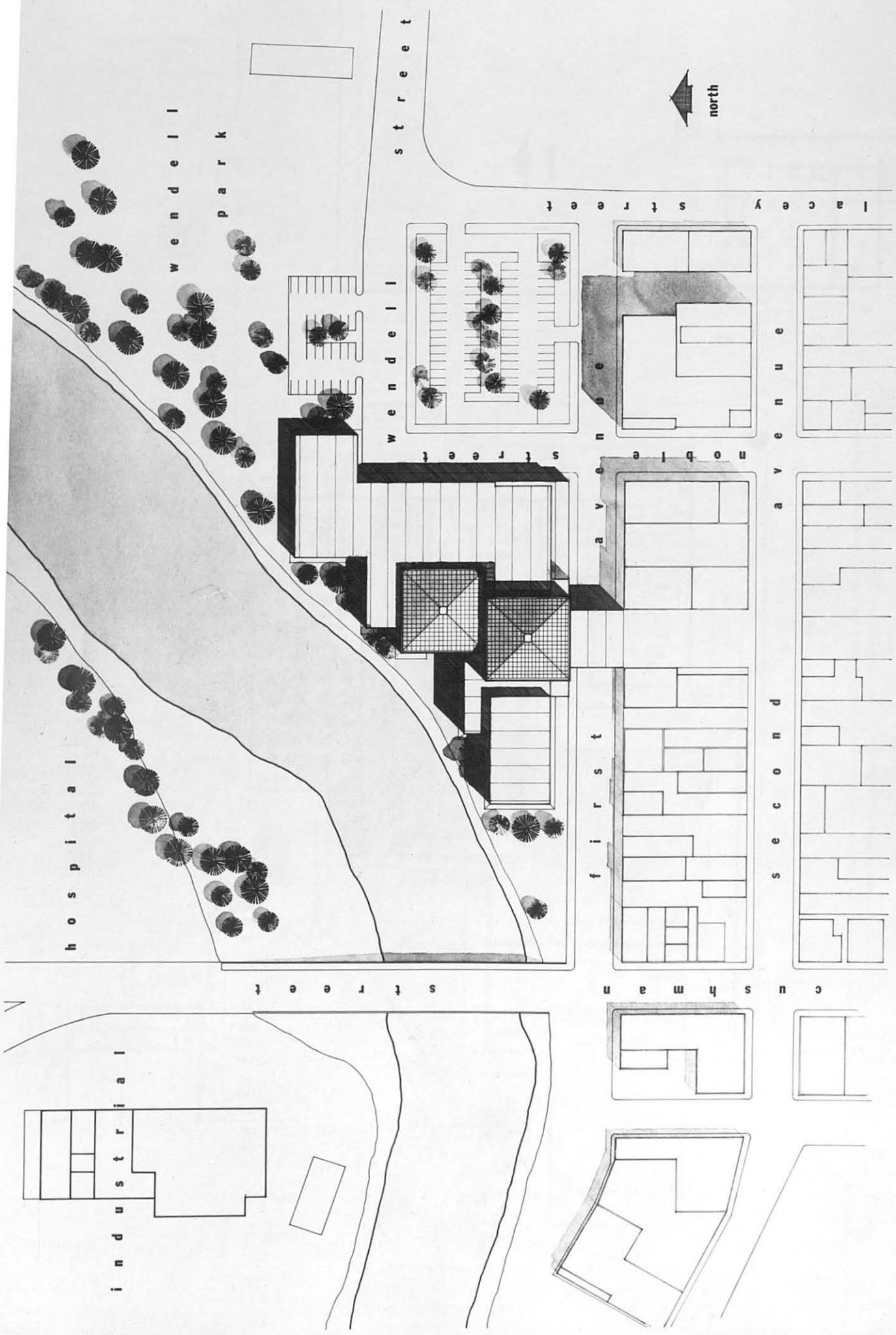
CHARLES D. MORGAN

TEXAS TECHNOLOGICAL COLLEGE

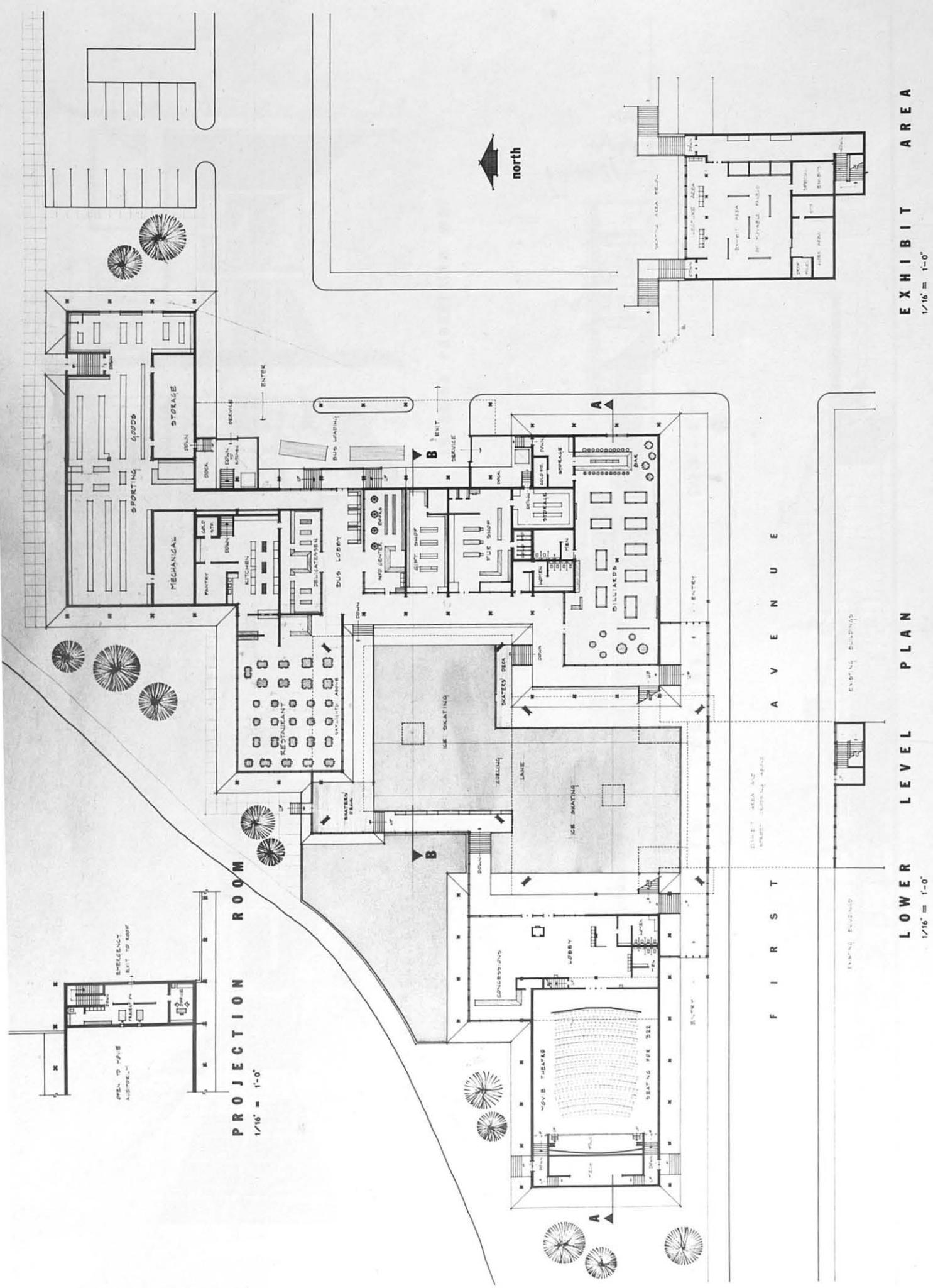
ARCHITECTURE 461

MAY 1968





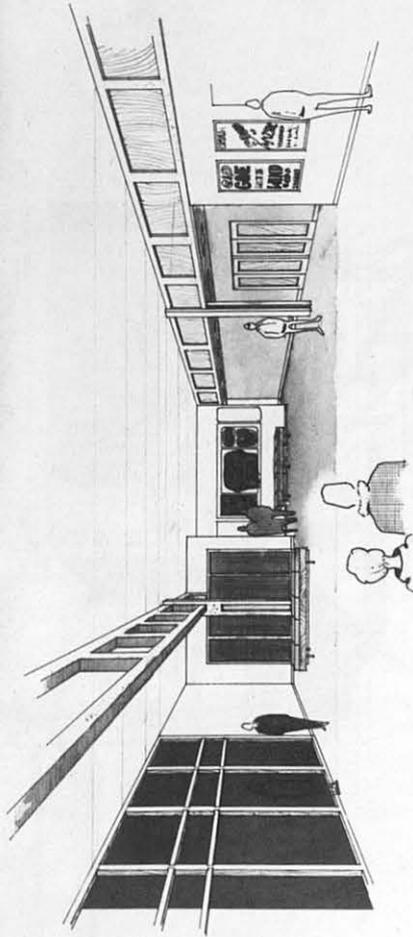
SITE PLAN
1" = 40'



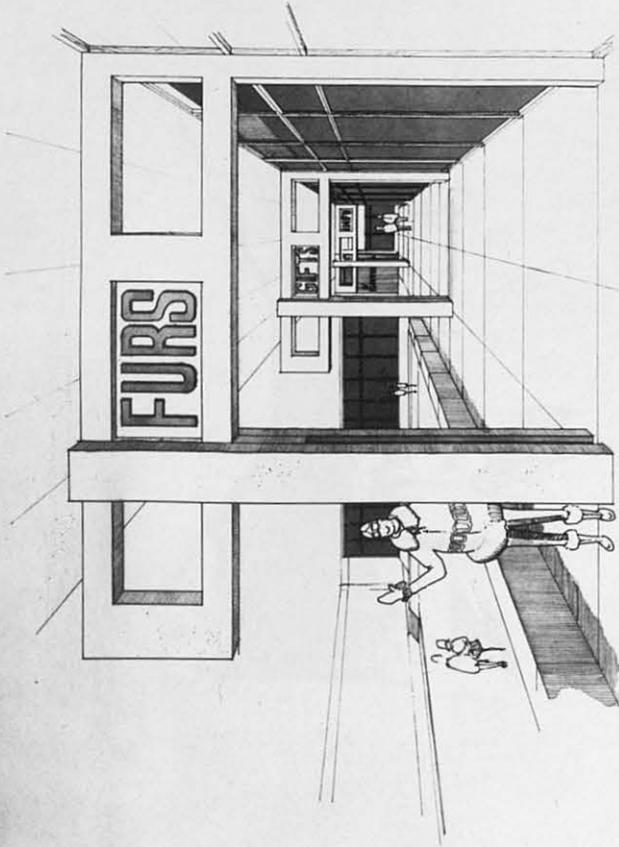
PROJECTION ROOM
1/16" = 1'-0"

LOWER LEVEL PLAN
1/16" = 1'-0"

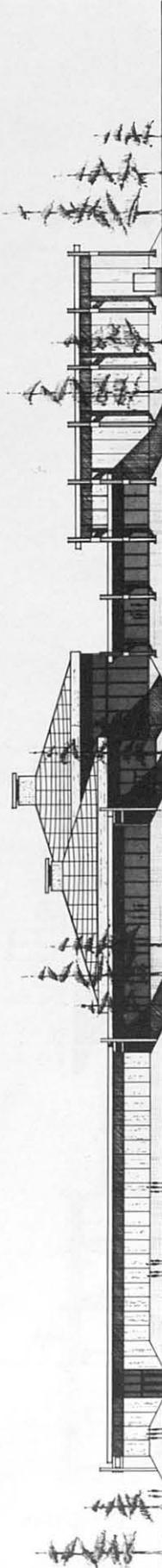
EXHIBIT AREA
1/16" = 1'-0"



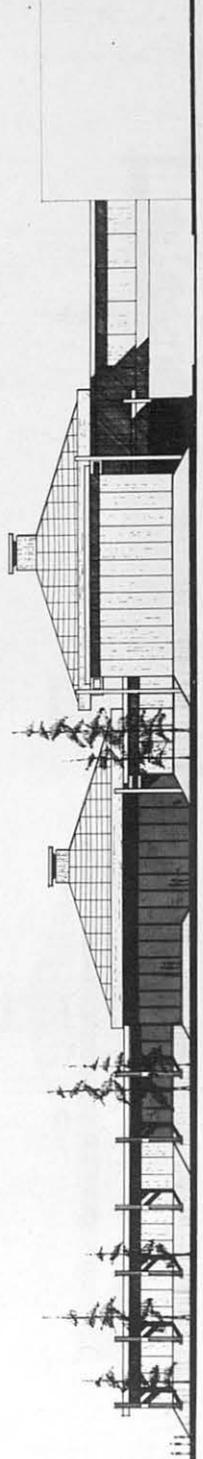
MOVIE THEATRE LOBBY



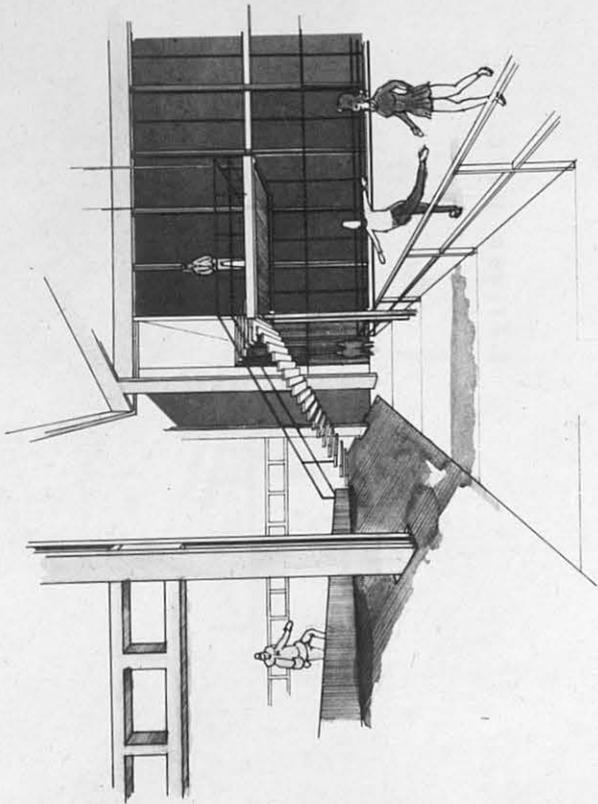
INTERIOR PEDESTRIAN WAY



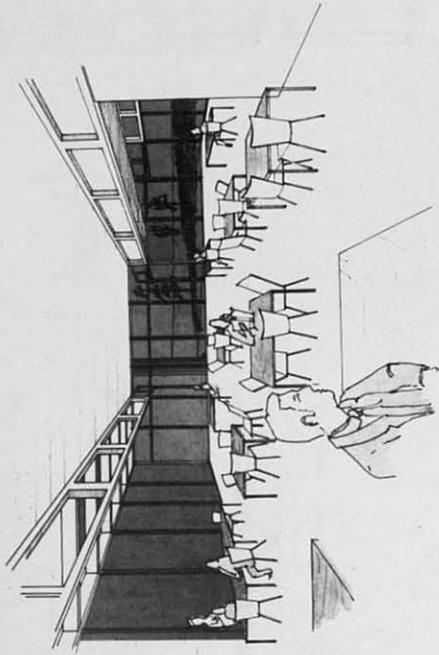
NORTH ELEVATION 1/16" = 1' - 0"



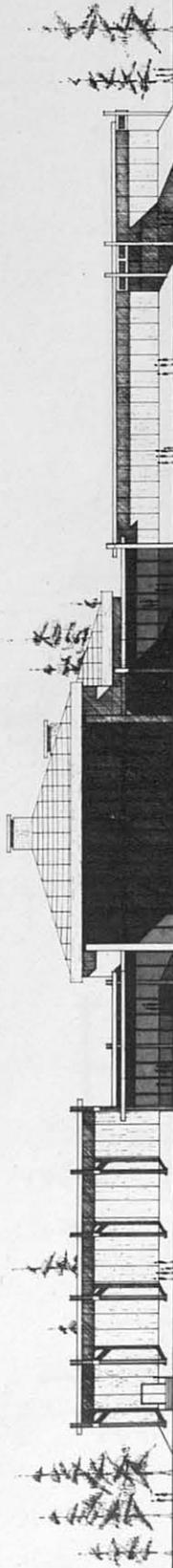
WEST ELEVATION 1/16" = 1' - 0"



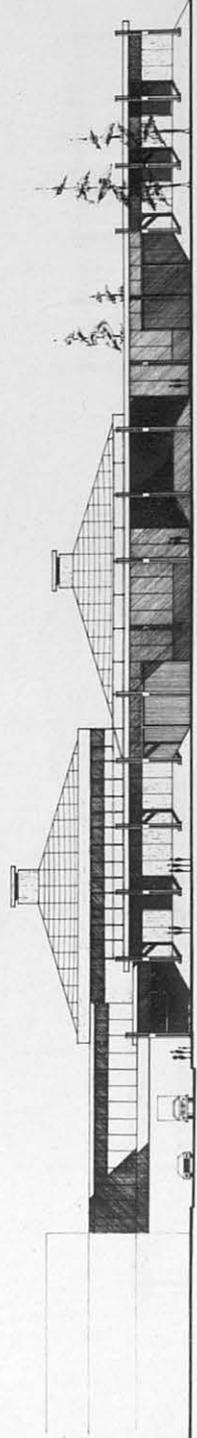
VIEW AT ICE LEVEL



RESTAURANT VIEW



SOUTH ELEVATION 1/16" = 1'-0"



EAST ELEVATION 1/16" = 1'-0"

Bibliography

- Adams, Ben Alaska: The Big Land. New York: Hill and Wang, 1959
- Foster, William S. "A Sub Arctic City Moves Forward," American City, 69:80-83 (December 1954)
- Gensert, Richard M. "Cable Roof Structures," Bethlehem Steel 1968
- Hart, Robert G. McKay's Guide to Alaska. Baltimore: Johns Hopkins Press, 1962
- Katz, Levin, and Herbert Hamilton. "Traditions of Research on the Diffusion of Innovation," American Sociological Review, 28:237-252 (April 1963)
- Kiely, Vernon R. Economic and Business Situation in Alaska, The University of Alaska and The Small Business Administration, 1960
- Lerch, William "Basic Principles of Air-Entrained Concrete," Chicago: Portland Cement Association, 1960
- Merrill, Francis E. Society and Culture. 3rd ed. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1965
- Rogers, George W. The Future of Alaska. Baltimore: Johns Hopkins Press, 1962
- Rowan, Jan C. "The Psychological Dimension of Architectural Space," Progressive Architecture, XLVI (April 1965), 159-167

Thompson, S. F. "Construction in Permafrost,"
Western Construction, volume 28, No. 10, PP 63-65
(1963)

Workman, William H. Treatise - Seismic Consideration
for Buildings, 1966

United States Army, Alaska Building Alaska with the
U. S. Army, 1867-1962, Headquarters USARAL, 1962

United States Department of Commerce. Climatic Summary
of the U. S. Through 1965, Washington: U. S.
Government Printing Office, 1965

United States Department of the Interior. Physiographic
Divisions of Alaska, Washington: U. S. Government
Printing Office, 1965

Acknowledgements

I wish to gratefully acknowledge the continuous assistance of my faculty advisor, Mr. Carl Childers, throughout the development and completion of this project. Additional information and aid were generously supplied by Mr. C. R. Morgan, AIA, and Mr. Douglas Ackley, Alaska Engineering Company, of Fairbanks, Alaska.

A CULTURAL EXCHANGE CENTER
FOR FAIRBANKS, ALASKA

Charles D. Morgan

An architectural thesis submitted in partial
fulfillment of the requirements for the degree
of Bachelor of Architecture, Texas Technological
College, May 24, 1968.

OUTLINE OF CONTENTS

- I. Introduction
- II. Site Selection
 - A. Relationship to City
 - B. Flood Plain Conditions
- III. Explanation of Design Decisions and Considerations
 - A. Intermediate Temperature Zone
 - B. Interior Water/Ice Feature
 - C. Relationship of Functions
 - D. Structure and Construction
 - E. Mechanical System
- IV. Conclusion
- V. Reproduction of Design Solution

INTRODUCTION

The first part of the written material concerning the Cultural Exchange Center for Fairbanks, Alaska, dealt with the evolution of the idea and explanation of underlying physical factors bearing on the nature of the project. The functions which the center was to contain were selected and a general program was derived as a basis for determination of a physical size for the project. The program also served as a springboard from which to proceed toward a design solution.

The final written portion is an explanation of how and why the many design decisions were made in arriving at a physical product conducive to the performance of the functions outlined in the program. Alterations and adjustments of the ideas based on the program are explained and aspects of the final solution are examined.

SITE SELECTION

Because of the importance of the site to the overall value and effectiveness of the Cultural Exchange Center, further study was necessary before a specific selection could be made. For this reason, a site was not selected during the programming phase. Consequently, one of the early steps of the design development was the selection of a site.

Relative importance of factors to be evaluated in site selection was a prime consideration. Factors to be evaluated included the location of the site in relation to those elements of the Fairbanks population to be served by the center. These included: military personnel at Fort Wainwright and Eielson Air Force Base, students and faculty of the University of Alaska, and the civilian population of the city. The listing of these elements makes it obvious that the center will be serving the entire population of the Fairbanks area.

Accessibility having been established as a major aspect to be considered, the downtown area of Fairbanks was selected as the best location for the Cultural Exchange Center. A downtown

site would offer the following immediate advantages:

(1) All bus service routes converge in the general vicinity of downtown, facilitating general convenience of use by military personnel and students from the University of Alaska.

(2) Warehouse facilities and other retail establishment services are readily available near the downtown area.

(3) The business district of Fairbanks is centrally located in relation to all residential areas of the city, and consequently is the logical place for a function designed to serve the entire population.

(4) Correctly designed, the center would serve as a major gateway to the downtown business area for those persons utilizing the bus service as a primary means of transportation, while at the same time serving those, who are in the downtown area daily, as a place in which to eat and enjoy a short respite from the routine environment.

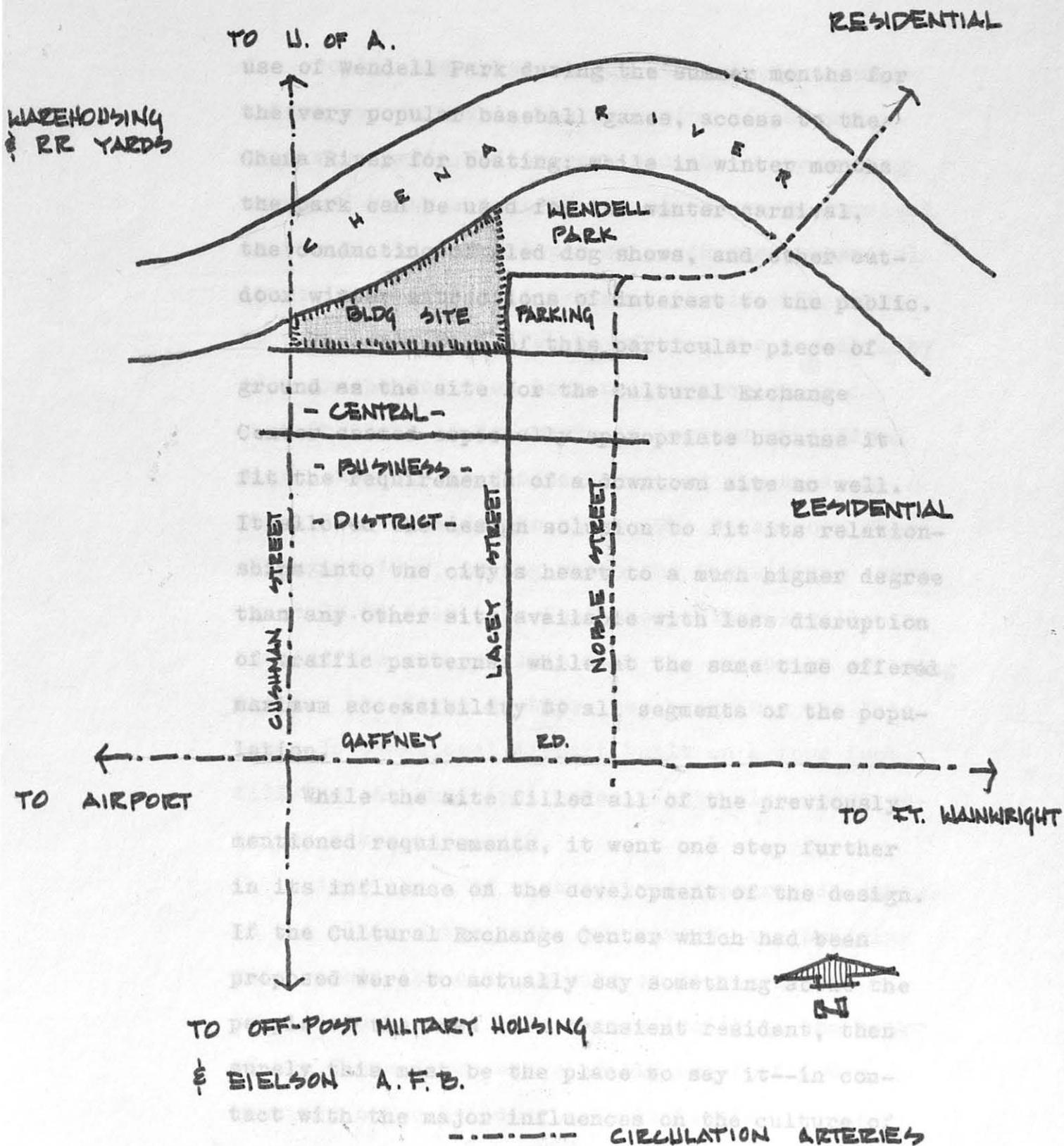
(5) The Cultural Exchange Center can function in the manner intended only if patronized by a large cross section of the population, and then

only if patronized in sufficient numbers to be an economic success. Location in the downtown area facilitates this patronage.

With these advantages in mind, an examination of the downtown vicinity revealed several possibilities. The most promising of these sites was an area immediately to the north of the most concentrated part of the business district. Located on land owned by the city of Fairbanks adjacent to the Chena River and also adjacent to currently unused Wendell Park (see site selection schematic), the site is presently occupied by a log cabin, from which the Chamber of Commerce operates, and by a dilapidated structure housing low-rent office space.

The advantages offered by this site include all those previously listed, in addition to the added opportunity of utilizing the Chena River as a feature of the Cultural Exchange Center. Across a little-used section of Lacey Street is a small vacant block which is currently used as parking and could be further developed as parking in conjunction with the Cultural Exchange facility.

The development of the parking block in connection with the center will facilitate advantageous



SITE SELECTION SCHEMATIC

use of Wendell Park during the summer months for the very popular baseball games, access to the Chena River for boating; while in winter months the park can be used for the winter carnival, the conducting of sled dog shows, and other outdoor winter attractions of interest to the public.

The selection of this particular piece of ground as the site for the Cultural Exchange Center seemed especially appropriate because it fit the requirements of a downtown site so well. It allowed the design solution to fit its relationships into the city's heart to a much higher degree than any other site available with less disruption of traffic patterns, while at the same time offered maximum accessibility to all segments of the population.

While the site filled all of the previously mentioned requirements, it went one step further in its influence on the development of the design. If the Cultural Exchange Center which had been proposed were to actually say something about the people of the area to a transient resident, then surely this must be the place to say it--in contact with the major influences on the culture of

the people; the never-ending struggle against nature for survival, the necessity of communication with one's fellow man, and the overpowering sense of being a part of the adventure of survival in one of the last places on earth where survival is still a satisfaction within itself. In short, it was a unique site which offered the possibility of a unique solution to a unique problem.

The city of Fairbanks is located on a flood plain between the Tanana River and the smaller Chena River inside the city. The disastrous flood of August 1967, during which the Chena River crested at 18.84 feet (six feet above flood level), inundated the entire plain with the exception of two areas. The first of these two areas was the Fairbanks International Airport built on a four foot fill and the municipal power plant, also constructed on a man-made fill.

Since there is virtually no topographic change on the plain between the two rivers, any building site within the city is subject to nearly the same flood hazard. The site selected on the bank of the Chena River was scarcely two feet lower than any other building site available. Conse-

quently, the possibility of working with a fill in order to overcome the flooding problem became an early consideration in the design solution. It immediately occurred to me that it would be very feasible to use some of the washed gravel gold dredge tailings, which fill an area only three to five miles from the city, to accomplish the necessary fill. With these decisions made, the way was open to proceed with further development of the design of the Cultural Exchange Center.

One of the major problems in building design in Fairbanks is that of exterior to interior transition. When there is a severe temperature difference, as is frequently the case because of common low temperatures of minus forty degrees Fahrenheit and lower, the problem of entering a heated area from outside is complicated and severe. The warm air in a heated area is quickly replaced by a tremendous rush of cold air through the lower eighteen to twenty-four inches of the door opening. To overcome this air rush requires a supreme effort in door closing.

An additional problem in outdoor to indoor transition is the physical discomfort experienced by the individual making the transition. The temperature difference between a plus seventy degrees Fahrenheit interior and a minus forty degrees Fahrenheit exterior is enough to be almost overwhelming.

The solution to these problems in the past has been to provide a small entry area and double sets of doors. This works fairly well for the air rush problem, unless both sets of doors are opened at the same time. It does not, however, provide

much relief for the pedestrian, since the distance between the doors is usually very short and the space very small. He does not have sufficient space to remove or replace heavy outer clothing such as his parka or arctic mittens; and neither does he have sufficient time to become acclimated to the intermediate temperature.

In the Cultural Exchange Center, it was felt that some better solution to this problem should be attempted. The design of an intermediate temperature zone to function as a transition between interior and exterior temperature extremes would be a valid consideration and worthy of some effort in the design process.

The approach to the design of this intermediate temperature zone in the final design solution was to take advantage of several existing conditions to create and maintain such an area.

Since the river is adjacent to the site, and should somehow be clearly related to the Center, from the interior as well as from the exterior, a good solution appeared to be the inclusion of some part of the river in the form of a body of water in the interior space which was to form the

intermediate temperature zone. The interior body of water would, through its tendency to remain at a fairly stable temperature, tend to stabilize the temperature of the transition zone.

At this point it became clear that this body of water should serve a multi-purpose function. Due to heavy snowfall in the area, ice skating areas on exposed ponds and streams are not readily available. The common practice is to run water onto a flat area of ground and allow it to freeze for an afternoon of skating.

Since the intermediate temperature zone was to be a relative sort of thing, the temperature could be controlled to maintain a frozen surface on which free admission ice skating could be available to all. In addition to ice skating, provisions were made for the increasingly popular sport of curling, an activity picked up from Scandinavian countries, to be conducted on the ice surface at scheduled times.

A reasonable temperature range to be maintained is as follows:

	<u>Outside</u>	<u>Intermediate</u>	<u>Inside</u>
Minimum °F	-50°	0° to 20°	68°
Maximum °F	0°	20° to 30°	70°

This intermediate temperature zone will be maintained through a combination of systems. To keep the temperature down in case of rising temperatures, the body of water was designed to maintain a depth of three feet, with part of the body of water extended to the exterior. When the need arises, the water is circulated by pumps between the two areas to transfer excess heat to the outside. Since it is only necessary to maintain a twelve inch depth of ice to safely support skaters, a two foot depth of water is left for circulation purposes. In addition to water circulation, the skating area is covered by two umbrella structures, each equipped with a two-way fan system for more positive control of air temperatures above the ice surface. In the case of overheating in the intermediate temperature zone, positive forced warm air systems feeding into the area are shut off and warm air, which has collected in the pyramid-shaped

upper portion of the umbrellas, is exhausted through the fans in the chimney structures. The process is then reversed and cold air is drawn in from the outside to bring the temperature down to the desired level.

Heating of the intermediate temperature zone is accomplished by warm air spill-out from the heated areas opening into the zone and by a positive forced air system from two sides; one from the movie theatre area and one from the side along the store fronts on the east side of the skating area.

Special requirements for the maintenance and function of the skating and curling area of the ice surface are few. A small surfacing machine for the ice is kept in the area beneath the elevated walkway between the movie theatre and restaurant. Wood surfaced platforms are provided for skaters to put on and take off skates and for periods of rest. This approach to providing facilities for the skaters was taken to provide an experience similar to that of going to a small pond for an unsupervised skating session.

Because curling, especially, and skating to

some extent, are spectator as well as participation sports, seating on benches along the edge of walkways has been provided. These benches, in combination with the ability of spectators to view activities on the ice from within adjacent shops and the restaurant provide an informal and leisurely atmosphere to the pace within the Cultural Exchange Center. The unhurried and casual atmosphere will be easily experienced by the newcomer to Fairbanks. This casualness is an important aspect of life in the area and one of the most difficult for the newcomer, accustomed to life on the outside, to understand.

Another advantage to having an interior body of water or ice in the intermediate temperature zone should be explained at this time. Although the subsidiary structures around the intermediate zone will have a controlled climate, the problem of extremely low relative humidity exists throughout the year in the Central Basin area of Alaska. The ice surface in the winter and water surface in the summer will add needed humidity to the atmosphere in both the intermediate and interior temperature zones, making the Center

an even more pleasant relief from normal surroundings.

After the decision to use an interior body of water was made, the next step was to determine the relationship of this body of water to the river and to spaces which it was to serve. In order to elevate the buildings on the site to a point above high-water levels, it was determined through examination of flood records that the floor level of functions on the site needed to be six feet above existing grade level. However, it was felt that the elevation of the water surface inclosed in the structure should be somewhere between floor level and river level. Since the water level of the river is subject to frequent fluctuation, the solution was to pump water up from the river to maintain the level of the interior water surface at an elevation of twelve feet above the river bed, and four to six feet above the level of the river water surface. This left the difference between required floor level and interior water level at six feet. This difference is accomodated in the final solution by an overall fill of one foot on the entire site

and by raising the buildings on a further fill of gold dredge tailings five feet in depth. This level difference of five feet between waterside walkways and floor levels is easily negotiated by steps throughout the Cultural Exchange Center and is used as a design element to enhance the excitement of the area.

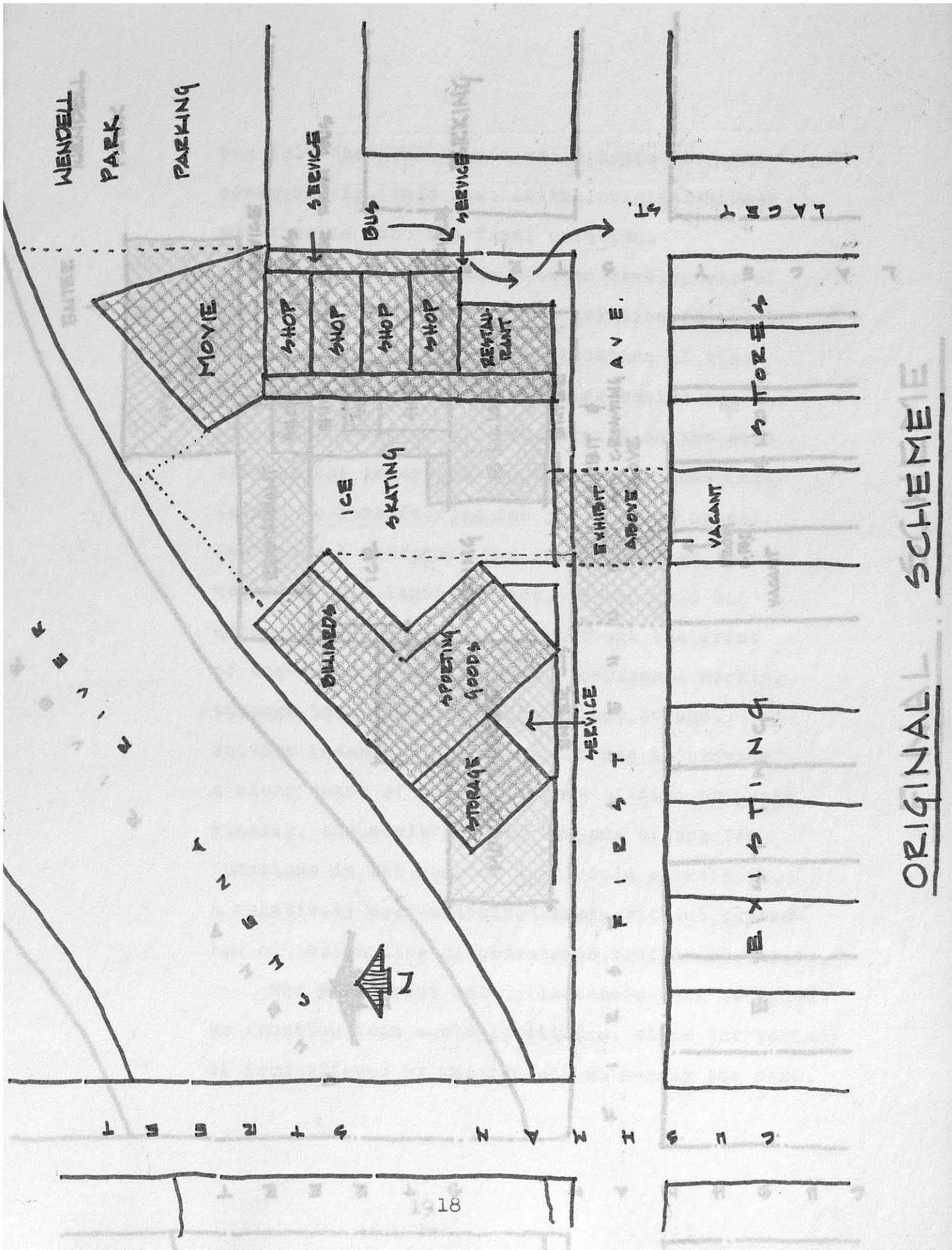
With the ideas of using the interior water/ice feature and raising the other functions on a five-foot fill, the next step was to proceed with the design of the areas which were to function with the interior water feature. Since these functions were derived and explained in the program phase of this project, they will only be listed here for reference purposes.

1. A Small Movie Theatre
2. A Billiard Hall and Game Room
3. A Sporting Goods Store
4. A Small Gift Shop
5. A Fur Shop
6. An Information Center
7. Restaurant
8. Delicatessen
9. An Exhibit Area
10. City Bus Facilities

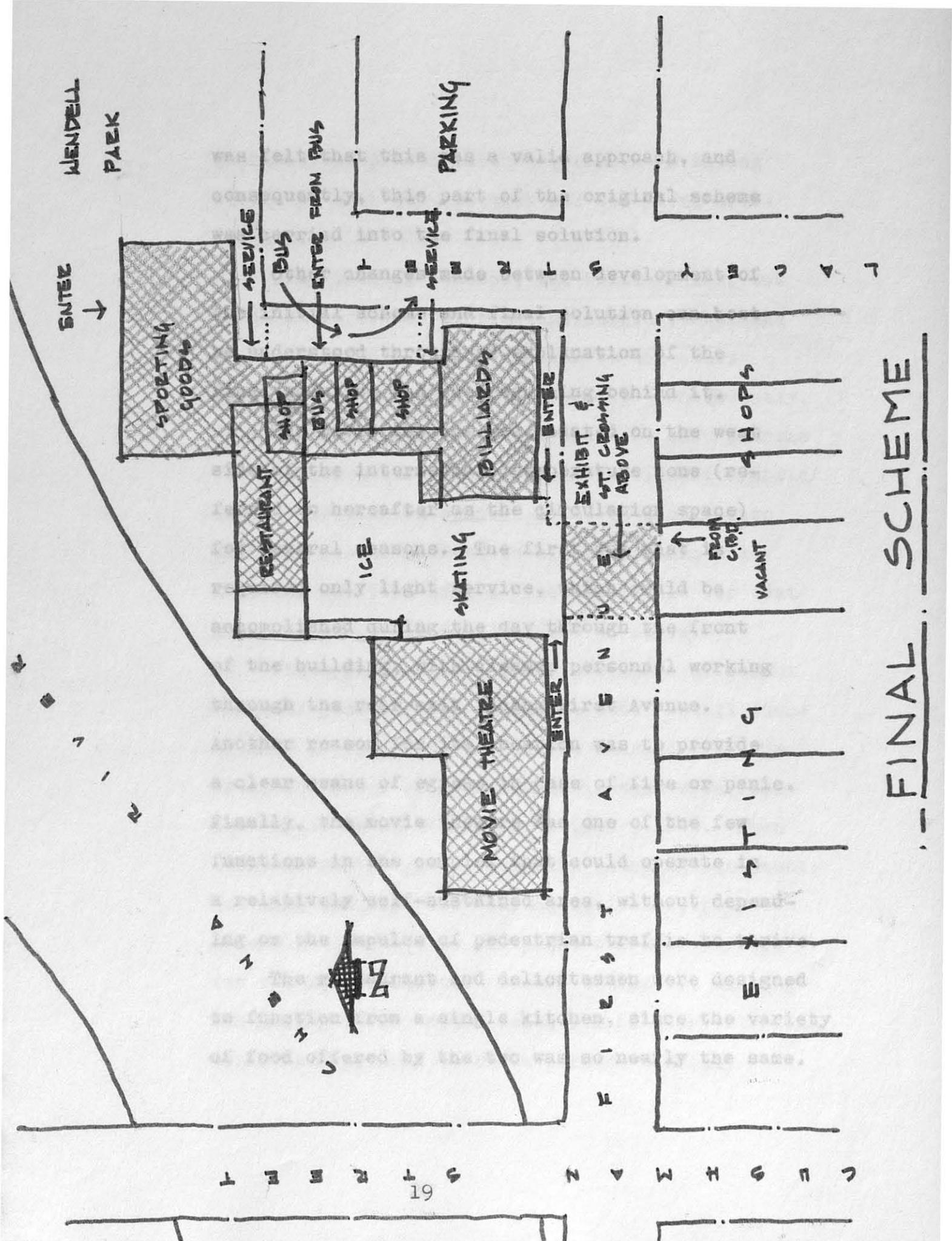
EXPLANATION OF DESIGN DECISIONS
AND CONSIDERATIONS

The original scheme for working the functions in conjunction with the water feature is explained by a sketch on the following page. Although it contained some ideas which were retained in the final scheme, it also presented several undesirable conditions. It should be pointed out that between the original scheme and the final solution were many stages of innovation. Only the two are shown for reference purposes.

The method employed in the original scheme to move persons from the Cultural Exchange Center into the downtown area was by means of a portion of the building spanning First Avenue and containing a circulation spine. This circulation spine is terminated at the building line across the street as the extent of this project, however, it is projected that the increased value of this property across the street will facilitate the continuance of the spine through the adjacent block and onto Second Avenue. The portion of the structure which spans the street also contains the exhibits of Alaskan culture and local arts and crafts. The purpose of this arrangement was the promotion of interest in the exhibits. It



ORIGINAL SCHEME



FINAL SCHEME

was felt that this was a valid approach, and consequently, this part of the original scheme was carried into the final solution.

Other changes made between development of the initial scheme and final solution can best be understood through an explanation of the final solution and the reasoning behind it.

The movie theatre was located on the west side of the intermediate temperature zone (referred to hereafter as the circulation space) for several reasons. The first was that it required only light service, which could be accomplished during the day through the front of the building, with cleanup personnel working through the rear exit facing First Avenue. Another reason for its location was to provide a clear means of egress in case of fire or panic. Finally, the movie theatre was one of the few functions in the complex that could operate in a relatively self-sustained area, without depending on the impulse of pedestrian traffic to thrive.

The restaurant and delicatessen were designed to function from a single kitchen, since the variety of food offered by the two was so nearly the same.

Emphasis was placed on the restaurant's having a view of both the ice area and the river development..

From initial concept, the billiard hall was to be an important part of the complex, designed to function in a manner similar to the court house square of Texas county seats. Consequently, it was placed in a prominent place so that patrons could observe and be near the main flow of traffic in the circulation space. This, in combination with the casual recreation offered within will make the billiard hall a place desirable for that group of people it was designed to serve.

The sporting goods store offered a different range of possibilities than the other retail functions. By virtue of the unique character of the area, the range of merchandise in this establishment would be an attraction within itself. Such items as snow buggies; mountain climbing equipment; hunting, fishing, and camping equipment; plus a selection of dog sled equipment would be offered for the area resident. Camera equipment, skating and skiing items, and a selection of heavy clothing would be available to those persons who only

occasionally venture into the world of the sportsman. With the function of the establishment in mind, it was designed to be accessible directly from an outside parking area, the river, and at the same time from within the complex.

The rest of the retail shops, smaller in size and dependent to a greater extent on the circulation space for patronage were arranged along the major circulation spine with service from screened areas at the two ends of the enclosed bus loading shelter.

A final consideration, although of no less importance, was the method of entering the complex for the city bus patrons. The solution was to bring these persons into the heart of the complex, through a combination waiting and circulation area from which the delicatessen and information center/bookshop could both function. This area is near the restaurant and opens directly onto the major circulation spine.

The overall effect of the circulation spaces and shops working together is reminiscent of the compact nature of some of the more quaint arrangements in the city; while at the same time

allows the newcomer to gradually and pleasantly become acquainted with the way of life in Fairbanks. This summation fairly well describes the overall approach taken in the design of the Cultural Exchange Center; make it thoroughly Alaskan, but in such a way that it can be understood and appreciated by a person who is not thoroughly Alaskan.

In selecting materials for use in construction of the Cultural Exchange Center, there were many peculiarities of the locality which had to be considered.

Since wood is the most readily available and most widely used material in the area, it was the first considered. However, since the National Building Code classified the proposed building as class "B" occupancy in a class "A" fire zone, all structural materials had to be of non-combustible material. Also, a four-hour fire rating was required on exterior walls in many areas. As a result, the use of wood was limited to paneling and mullions between glass panels and between translucent fiberglass panels.

A major consideration in the selection of materials and a method of construction was the time element involved in building. Since the growing season in Fairbanks is only eighty-nine days, the construction season is obviously not much longer. The final solution to this problem was the use of a system in which columns and vierendeel trusses are precast and pre-tensioned in a heated warehouse during the winter months

for quick erection during the construction period.

The truss system is then decked with a system of pre-stressed concrete hollow-core planks laid flat on top of the trusses to become a part of the structural system through integral fastening.

It was decided that air-entrained concrete would be used throughout the complex for several reasons. The strongest point in favor of air-entrained was its ability to withstand severe weathering. Also, through use of small size aggregate in the concrete, no strength is sacrificed. This quality fit well with the use of available washed gravel gold mine tailings as exposed aggregate for a finish on exposed concrete.

The mechanical system in the complex consists primarily of heating. The availability of steam as a utility from the city of Fairbanks eliminates the need for on-site boilers and simplifies the heating system. A combination of systems was selected for use in the Cultural Exchange Center. The slab is heated to a temperature of sixty-five degrees to overcome heat loss through the slab and to provide maximum comfort. The main element of the heating system is a central converter unit

which converts the steam heat into heated water. The heated water is then pumped to fan-coil units in the various zones as indicated on the design drawings.

Since there are a few weeks in the summer when cooled air in addition to ventilation would be highly desirable, the coil units double as cooling units. The maximum ground water temperature in Fairbanks is thirty-five degrees Fahrenheit, and a simple pump system will circulate this cool ground water through the fan-coil units. After a single cycle, the water is then returned to the ground, making an actual cooling compressor unit unnecessary.

CONCLUSION

It is felt that the addition of the Cultural Exchange Center to the Fairbanks area would prove to be a valuable tool in facilitating understanding and communication between all segments of the population. The state of Alaska and the Fairbanks area offer unlimited opportunity to new citizens, and the center would provide a place where the excitement and unlimited opportunity could be encountered in an atmosphere conducive to acceptance.

For those persons who have no intention of taking permanent residency in the area, the center would offer a means of quickly but gently orienting oneself and encountering a truly unique society.

As for the system used in construction of the facility, it is felt that this is a valid approach to the one-season construction project. It allows much of the work to be done in winter months, when employment is not as plentiful for the construction worker. It would also amount to an economic savings, in that costly overtime during as many as two or three construction seasons could be avoided.

Bibliography

- Adams, Ben Alaska: The Big Land. New York: Hill and Wang, 1959
- Foster, William S. "A Sub Arctic City Moves Forward," American City, 69:80-83 (December 1954)
- Gensert, Richard M. "Cable Roof Structures," Bethlehem Steel 1968
- Hart, Robert G. McKay's Guide to Alaska. Baltimore: Johns Hopkins Press, 1962
- Katz, Levin, and Herbert Hamilton. "Traditions of Research on the Diffusion of Innovation," American Sociological Review, 28:237-252 (April 1963)
- Kiely, Vernon R. Economic and Business Situation in Alaska, The University of Alaska and The Small Business Administration, 1960
- Lerch, William "Basic Principles of Air-Entrained Concrete," Chicago: Portland Cement Association, 1960
- Merrill, Francis E. Society and Culture. 3rd ed. Englewood Cliffs, New Jersey: Prentice-Hall, Inc., 1965
- Rogers, George W. The Future of Alaska. Baltimore: Johns Hopkins Press, 1962
- Rowan, Jan C. "The Psychological Dimension of Architectural Space," Progressive Architecture, XLVI (April 1965), 159-167

Thompson, S. F. "Construction in Permafrost,"
Western Construction, volume 28, No. 10, PP 63-65
(1963)

Workman, William H. Treatise - Seismic Consideration
for Buildings, 1966

United States Army, Alaska Building Alaska with the
U. S. Army, 1867-1962, Headquarters USARAL, 1962

United States Department of Commerce. Climatic Summary
of the U. S. Through 1965, Washington: U. S.
Government Printing Office, 1965

United States Department of the Interior. Physiographic
Divisions of Alaska, Washington: U. S. Government
Printing Office, 1965

Acknowledgements

I wish to gratefully acknowledge the continuous assistance of my faculty advisor, Mr. Carl Childers, throughout the development and completion of this project. Additional information and aid were generously supplied by Mr. C. R. Morgan, AIA, and Mr. Douglas Ackley, Alaska Engineering Company, of Fairbanks, Alaska.

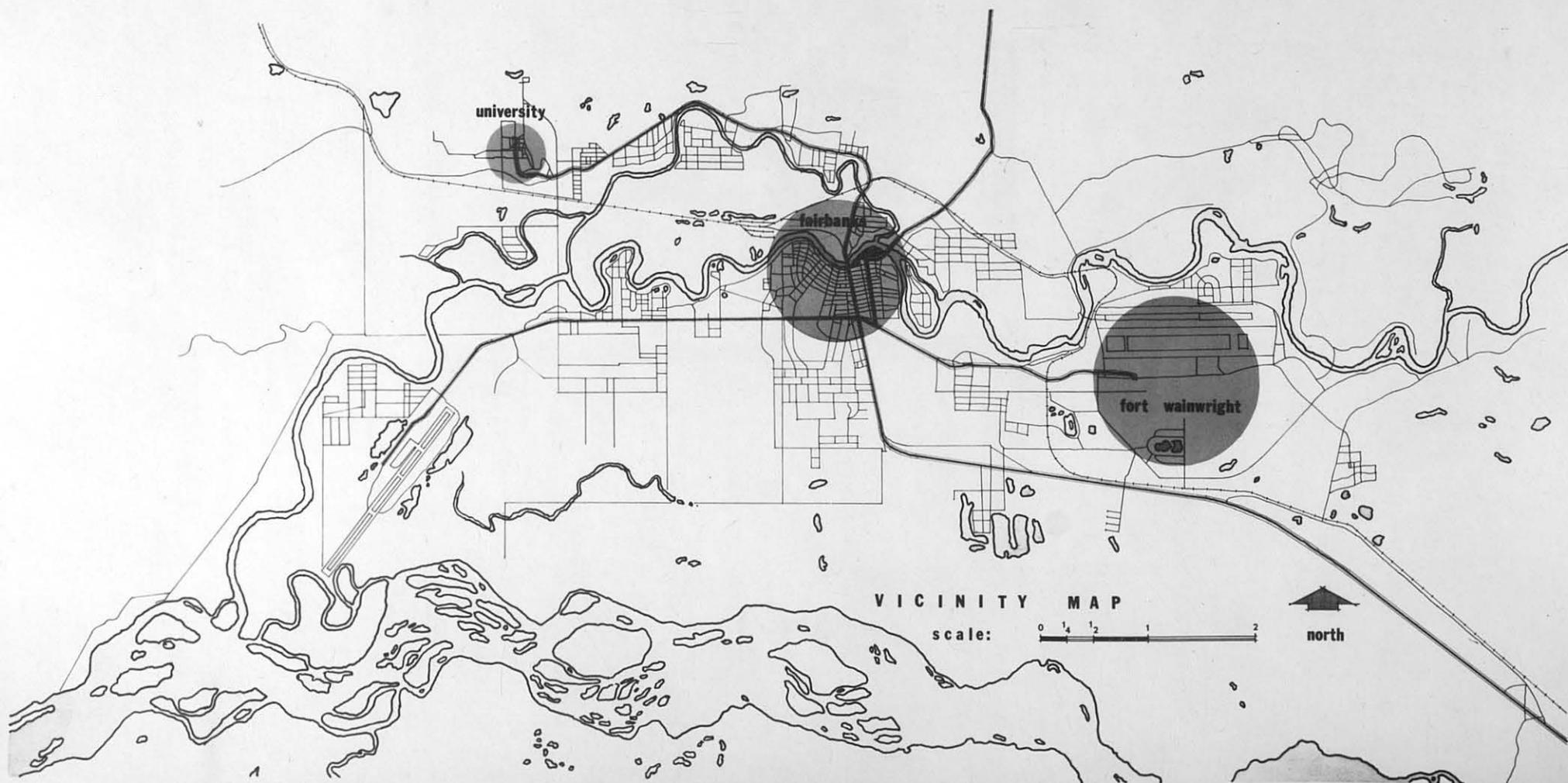
A CULTURAL EXCHANGE CENTER

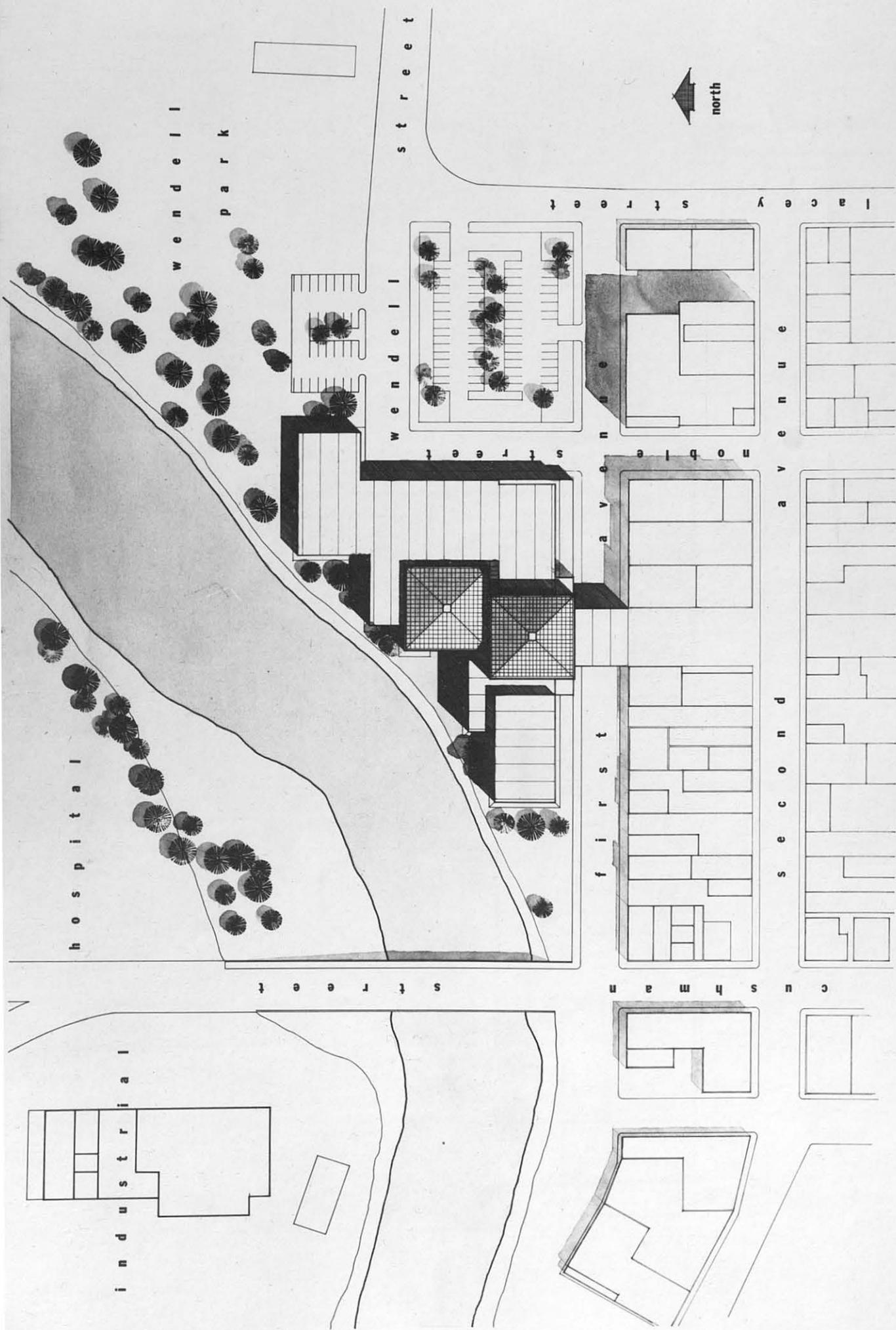
FOR

FAIRBANKS, ALASKA

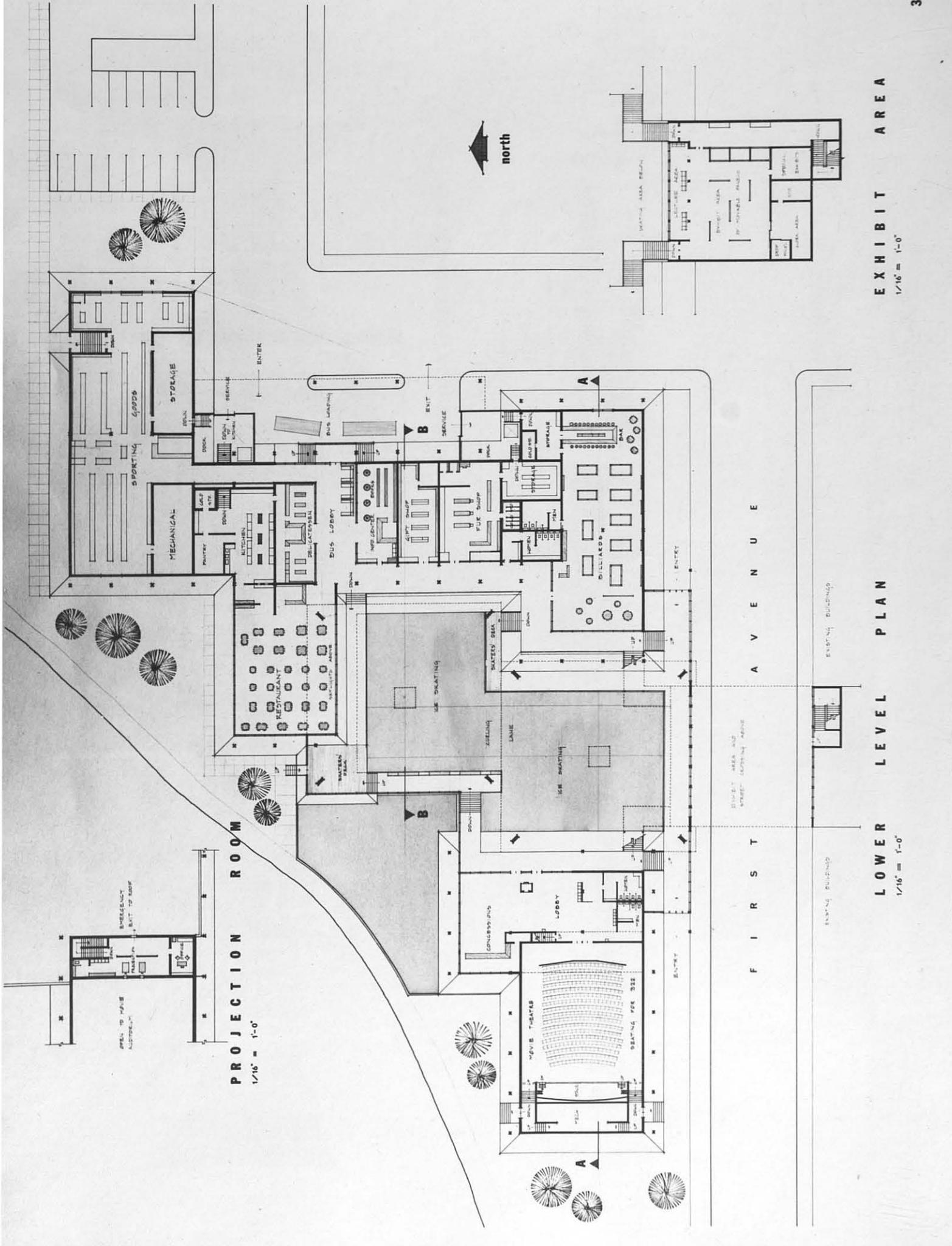
CHARLES D. MORGAN
TEXAS TECHNOLOGICAL COLLEGE

ARCHITECTURE 461
MAY 1968





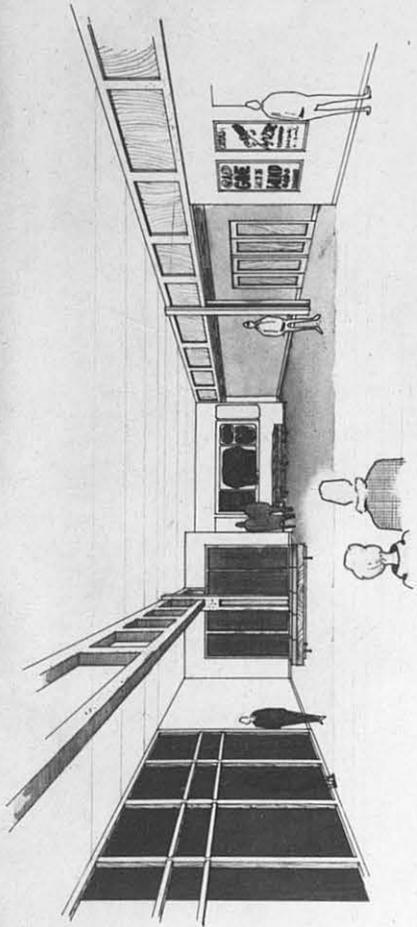
SITE PLAN
1"=40'0"



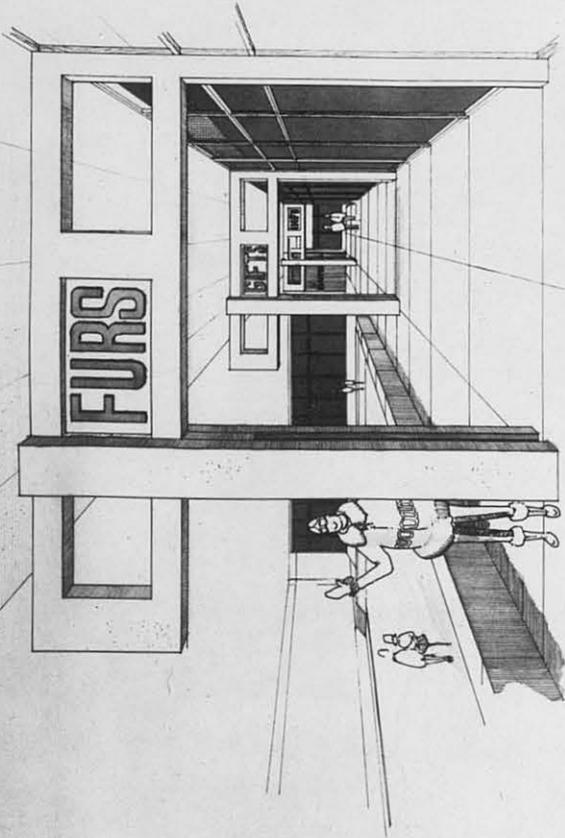
PROJECTION ROOM
1/16" = 1'-0"

LOWER LEVEL PLAN
1/16" = 1'-0"

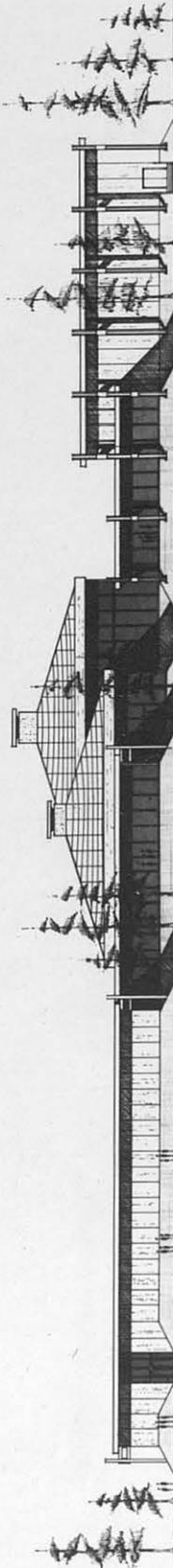
EXHIBIT AREA
1/16" = 1'-0"



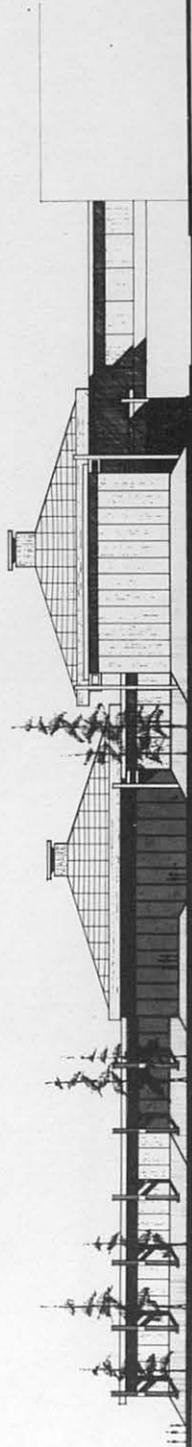
MOVIE THEATRE LOBBY



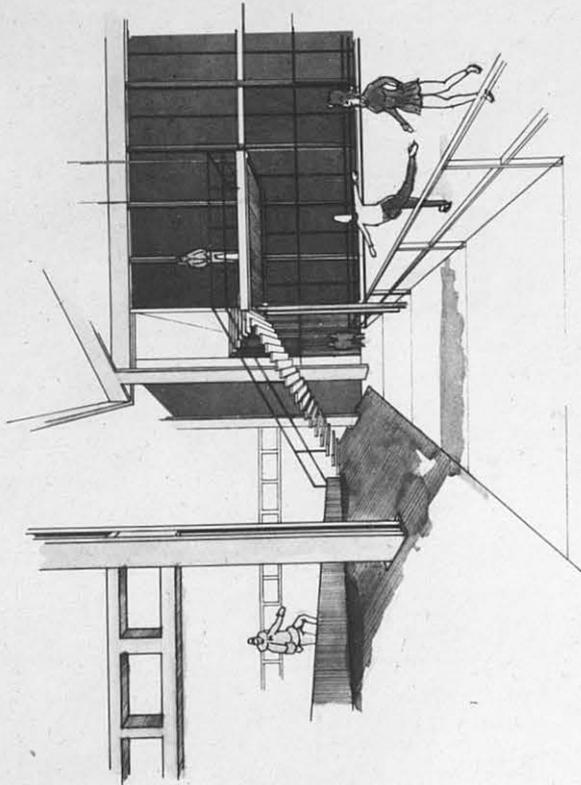
INTERIOR PEDESTRIAN WAY



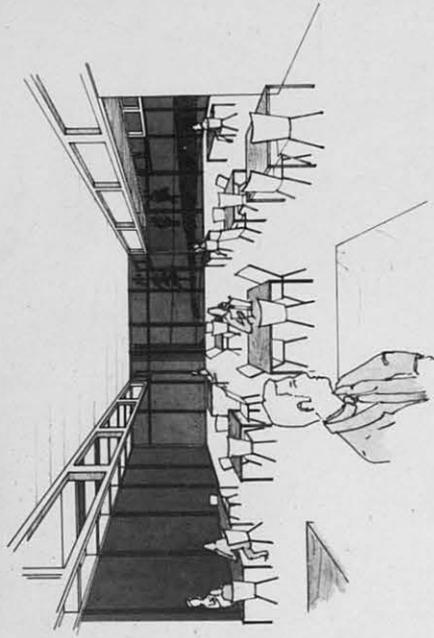
NORTH ELEVATION 1/16" = 1' - 0"



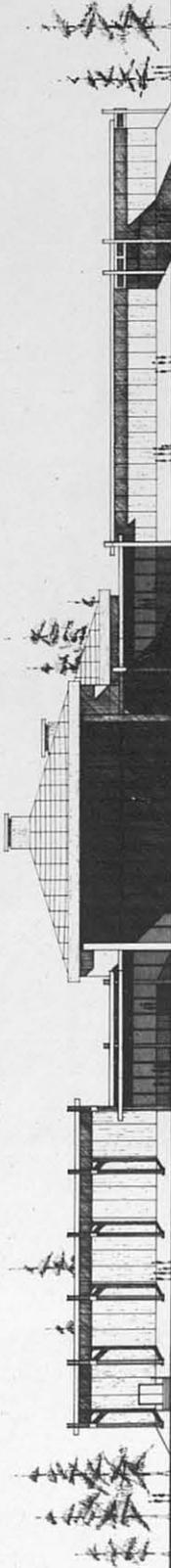
WEST ELEVATION 1/16" = 1' - 0"



VIEW AT ICE LEVEL

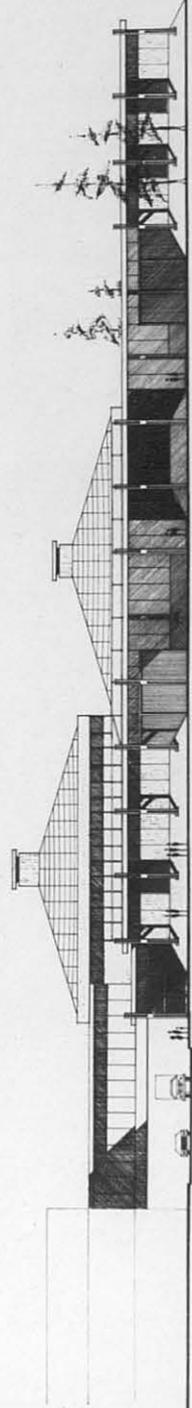


RESTAURANT VIEW



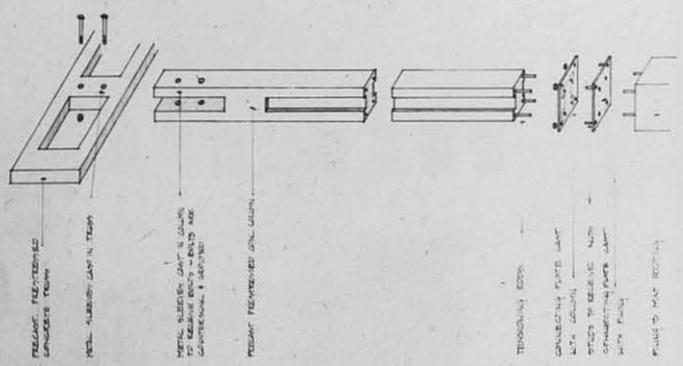
SOUTH ELEVATION

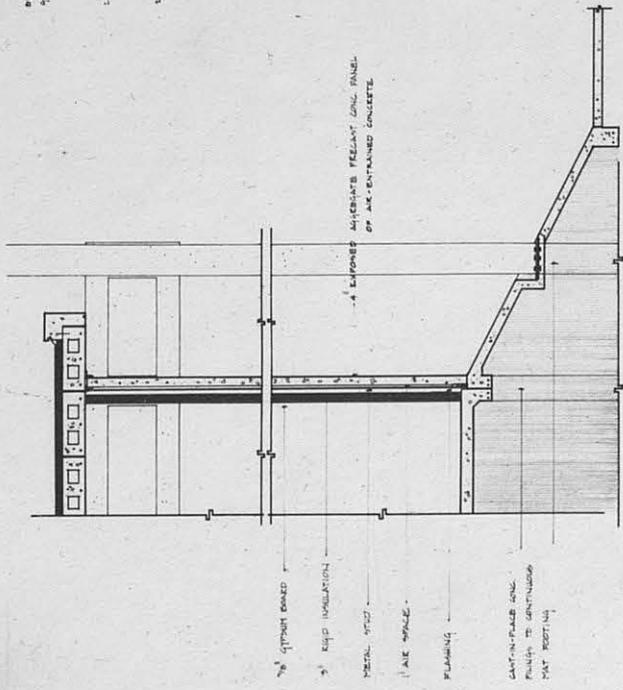
1/16" = 1'-0"



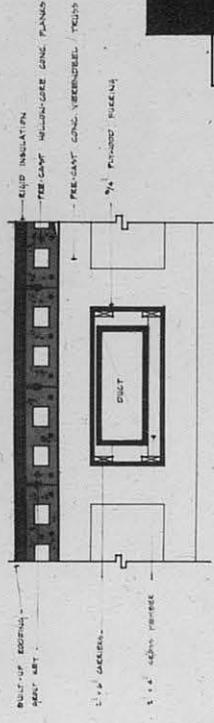
EAST ELEVATION

1/16" = 1'-0"

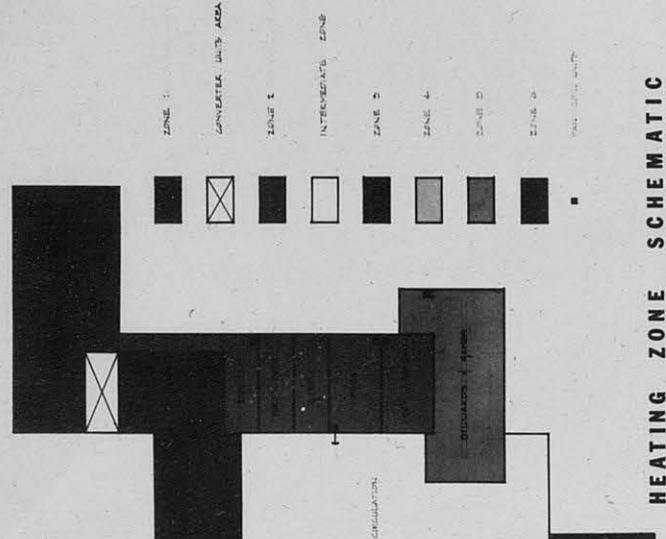




WALL SECTION
1/4" = 1'-0"



DUCT HOUSING DETAIL
3/4" = 1'-0"



HEATING ZONE SCHEMATIC
1/4" = 1'-0"

