North Dakota State University
Graduate School

Title

THE FUTURE OF EDUCATION: COMBINING LIBRARIES AND MUSEUMS

By

Mark Alan Geiss III

The Supervisory Committee certifies that this ***thesis*** complies with North Dakota State

University's regulations and meets the accepted standards for the degree of

MASTER OF ARCHITECTURE

SUPERVISORY COMMITTEE:

Stephen Wischer

Thesis Coordinator

Regin Schwaen

Primary Advisor

Approved:

05/10/2024

Date

Department Chair

THE FUTURE OF EDUCATION: COMBINING LIBRARIES AND MUSEUMS

A Thesis Paper
Submitted to the Graduate Faculty
of the
North Dakota State University
of Agriculture and Applied Science

By

Mark Alan Geiss III

In Partial Fulfillment of the Requirements
for the Degree of
Master of Architecture

School of Design
Architecture
May 2024

Fargo, North Dakota

ABSTRACT

Archives and their specializations have existed within our societies for hundreds of years, adapting alongside their communities until the advent of the digital age where their physical presence was thrown into question. Can archives such as libraries and museums be integrated through a system that overlaps these specializations in way beyond sharing a structure? In modern times, these spaces compete with businesses in providing a neutral location to further oneself outside of the context of work or home. Exacerbated through problems in American developments lacking third places, especially free to access ones, what facilities that are accessible may be able to be reassessed to increase the effectiveness of public archives and businesses alike. Analyzing precedent cases, historical uses, and artwork, a new combination system is created to integrate library shelves into spaces shared with museum exhibits. Creating a space that elevates the modern understanding of learning, socialization, and recreation.

ACKNOWLEDGMENTS

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1. INTRODUCTION

What is the current state that our libraries and museums are in, are they desolate and nearly abandoned facilities, or are they flourishing centers for learning and interaction? This was a common question circulating during the advent of the digital age. When people could access a nearly impossible amount of information, the physical collections of things were thrown into a state of jeopardy. Now, some modern designs challenge the idea of a physical collection like the Theodore Roosevelt Presidential Library being designed by the firm, Snohetta.

Both libraries and museums have existed for centuries and are traditionally places used to store a physical collection, whether it be archive or artifact, they share this commonality. They have been redesigned and seen spaces added or removed to fit the time the structure serves. In today's world of rampant digitalization, do archive spaces still require a physical collection to meet their objectives, or are new programs being tested and transforming the way we see these facilities? Could these two typologies be combined into a single specialization that elevates their effectiveness?

1.1. Problem Statement

Neither fully a library nor a museum, this new building will be referred to as an archive, as the two specializations of libraries and museums are both still types of archives. According to an experiment done by OCLC Research, a similar facility was referred to as a LAM, or "Library Archive and Museum (Waibel, 2009, p. 2)". A workshop to investigate the collaboration of the three facilities. Where OCLC Research focused on how these three institutions could work together, this thesis investigated the complete union of each into a single center and how compatible these spaces are.

A museum is a great facility for a city to showcase the area's history and culture and increase tourism. However, it struggles with the city's population in generating repeat visits. When artifacts are on display for long periods of time, a person will be less likely to return and view the same exhibit. For this reason, museums host events and rotate or change certain exhibits to ensure that visitation numbers do not stagnate.

Science museums have an advantage in this regard as their exhibits are more interactive than those of a traditional museum. With an educational focus, a science museum is aimed primarily at children and functions as a sort of playground you can learn in. Interactive, interesting, and fun experiences generate repeat clients for museums. The exhibit or artifacts within a museum require a physical presence for the most success, and their role is not questioned. However, this interpretation is not shared within libraries.

Accounting for the growing trends of digitalization, the requirements for a library to provide a physical collection has been called into question. The need for librarians or other archivists to find and allocate materials will exist if the modern concept of a library exists, but the method of retrieval will change to best fit the needs of the time. The current justification for the educational center to provide a physical collection of books is attached to the building use of a museum.

To sufficiently combine both spaces into a single facility, the collections will need to be stored and treated similarly. The collections require a type of conversation between each other to be successful, without a collection of books, the artifacts could command a total presence and the educational center would be a museum with a digital archive.

An archive of this type should provide a physical collection of both reading materials and cultural artifacts. Leveraging spaces that promote interaction between people could further drive knowledge sharing on a person-to-person level in addition to a center to person level that libraries and museums have traditionally operated at. Beginning research with questions into how both libraries and museums operate, their similarities and differences and how spaces promote conversations between visitors to the center.

There is also the issue of other buildings or facilities that draw away potential visitors to the center. Both libraries and museums are commonly civic institutions. They are paid for and maintained through funds allocated by their governing superiors so their success and popularity can fluctuate depending on how benevolent the current government is. They fulfill a critical role to provide third spaces to cities that could be enjoyed without the requirement of paying to use a space. Commercial spaces that are not confined to the same bureaucratic constraints can target the same niches, being more convenient even though some form of a transaction is required to use their space.

A place with a rotating collection of artworks on display competes with a dedicated museum of art. The museum could be entirely of modern art while a different place focuses on renaissance works and the competition for visitors is vague while both places target niches of the broader idea of art. If a business offers what the educational facility lacks, users will seek alternatives. "During interviews, many students expressed a strong preference for the coffee shop over the library, stating the ability to drink coffee, people-watch, take a break and have a conversation, listen to music, and just avoid what they perceived as a sterile library atmosphere. (Waxman, 2006, p. 47)"

Altering the atmosphere in some spaces could draw these users back but at the risk of alienating those who prefer what people from the coffee shop study refer to as "sterile". What equipment would be required to provide ease of access to information and navigation for all individuals, and how would this impact education. What would these spaces look like and what configurations are more habitable for conversations? Visitors should be able to learn from the collection of books, the exhibits on display, the interactive installations, the staff hosting events, or each from each other. To be successful, the design of this facility argues in favor that libraries still require a physical collection.

1.2. Objective

To investigate the degree to which a library and museum can co-exist within the same space will allow for a successful design solution. While it is possible to join the typologies under the same roof yet separated to different wings, this does not achieve the goal of combining the archival spaces. The program will require different facilities to service the needs of a user depending on the nature of their visit. Determining what spaces will need to be more isolated or more connected to their adjacent spaces will reveal how woven together the fabric of library and museum can be.
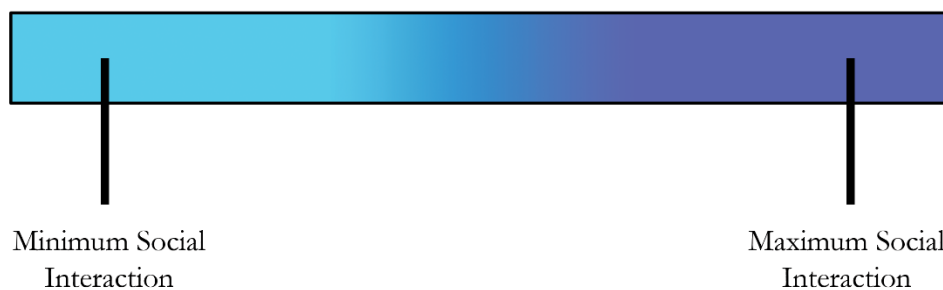
Figure 1. Social range spectrum

The design should strive for a level of connectedness that blurs the boundaries between the typologies to determine if it is possible to identify where one ends and the other begins. Library resources like quiet study rooms, breakout spaces, or printing facilities will see different users than locations where an artifact or exhibit will be displayed. This can best be understood as a spectrum of socialization, users with a need to quietly work on their projects will likely converse less than user's there to look at or engage with collections.

This will inform the building program on how to accommodate a person's needs based on their likelihood of engaging in conversations. Viewing the various needs as a spectrum will allow for a range of spaces to successfully meet the needs of any visitor to the archive. Through this approach, programming the design will provide a solution that is interconnected and overlapping. The defining boundaries between each type of archive become less distinguishable, and closer to being a single facility.

1.2.1. Where to Converse and Where to Study

The conditions under which individuals can carry out a conversation vary from place to place. For example, the couch in your friend's living room is much easier to hear and communicate with each other than on the corner of a street in Manhattan. Within a given space in the education center, the goal of whether to promote conversation or studying will also vary.

In design, this can be controlled with elements to aid the goal in a particular area. If the facility as a whole unit is a space at a macro scale, then the diverse range of spaces at the micro scale are the units where these elements are implemented. The arrangement of furniture, framing of the space, levels of light, and nearby noise are all factors that could make the space more or less desirable depending on the goal.

Figure 2. Representation of a least social individual

Through the design, this goal can be suggested through factors like the inclusion of a table, and its height or shape. In the modern age, another important factor is the accessibility of outlets. For those working online, this is a lifeline but for sociability, this is a killer. "To that end, she resisted providing outlets for laptops to discourage solitary computer work and encourage conversation. (Waxman, 2006)" The more environmental factors that can be adjusted by the user will create spaces more desirable to someone searching for a place to study or work.
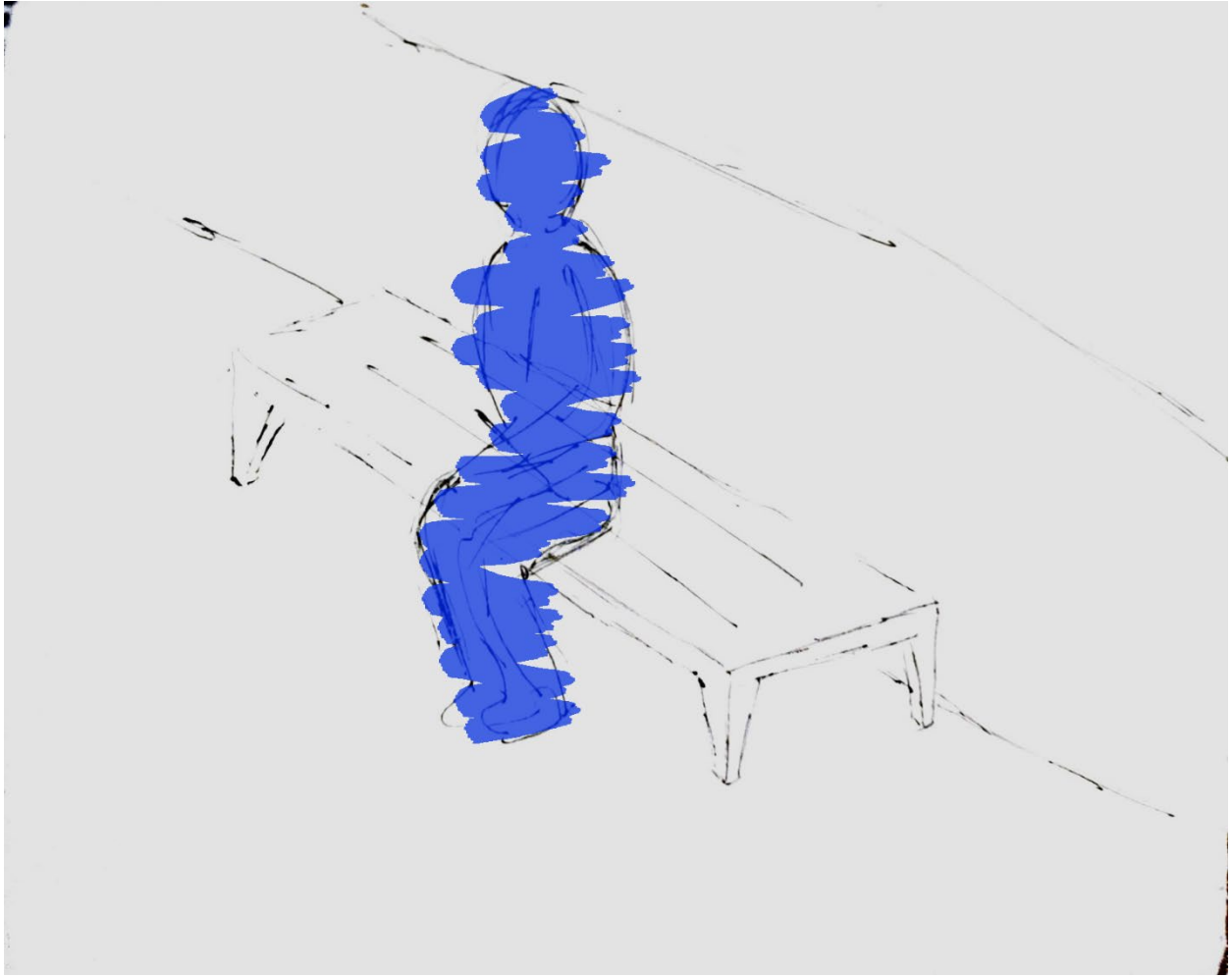
Figure 3. Representation of a most social individual.
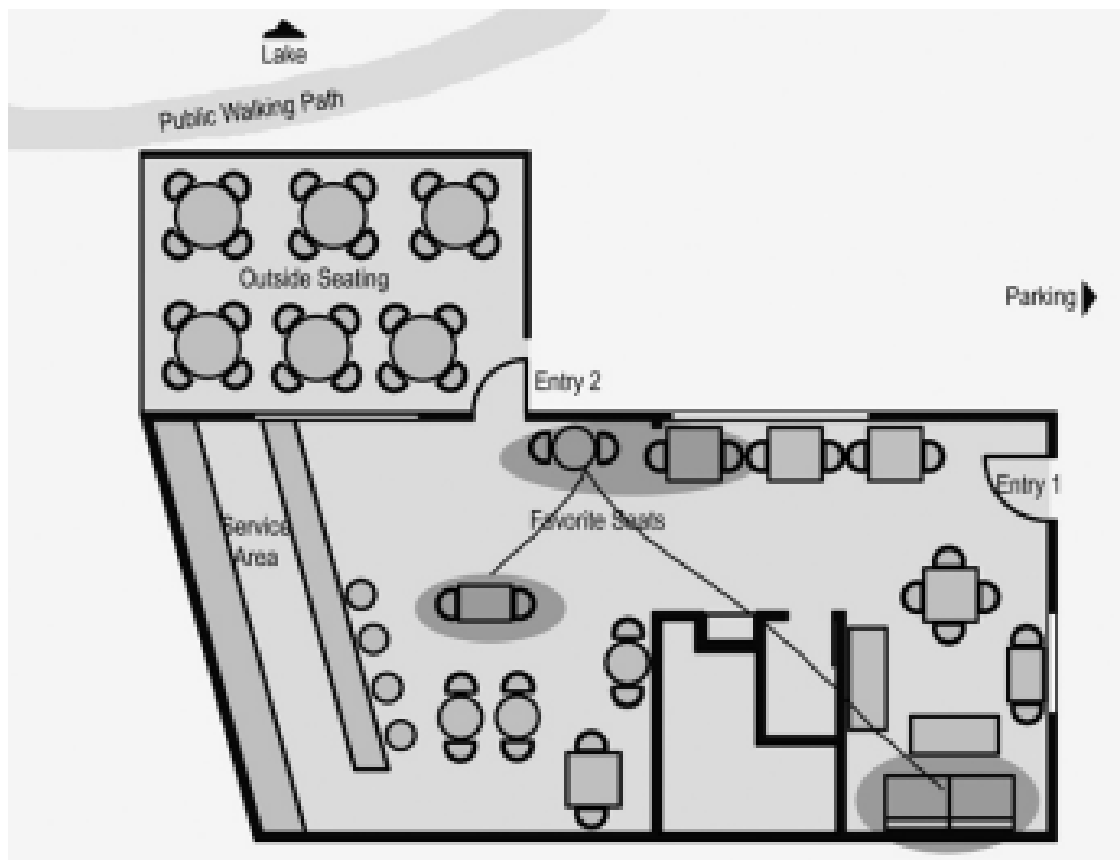
Figure 4. Coffee shop two floorplan (Waxman, 2006)

In a coffee shop, the balance between brief and extended patrons is delicate with the limited space provided. Waxman's study has shown two distinct groups, one that visits a coffee shop with a goal to be social, and another with the goal to further their tasks within the preferred environment that a coffee shop provides. Libraries and museums are capable of being much larger than coffee shops on average and with the larger size comes more design opportunities. Users can have a space catered to their needs, whether that is to work in isolation, people watch, or openly converse with other users.

1.2.2. An Archive's Role as a Third Place

"Third Place" is a term coined by Ray Oldenburg in his book, *The Great Good Place*. In this book, Oldenburg outlined three broad locations. One where you live, another where you work, and a third where everything else happens. "The third place is a generic designation for a

great variety of public places that host the regular, voluntary, informal, and happily anticipated gatherings of individuals beyond the realms of home and work. (Oldenburg, 1991, p. 16)" When he defined the third place, Oldenburg referred to locations such as coffee shops, cafes, and taverns. Any location has the capacity to become a third place, it could be a bowling alley, theater, restaurant, or an amusement park. Any destination where people gather to meet with friends and socialize or create new connections through interactions with strangers.

All these examples suffer from the same weaknesses in an American setting. Because most of our cities adhere to a sprawling, car centric development pattern, every one of the examples above are spread out in islands or pockets of accessible places that are only reachable through access to an automobile. Remove the vehicle as a means of transit and the available number of third places is drastically reduced.

There are few places that are exceptions to this development, and they can be found in dense, largely populated cities or urban centers such as downtowns. Means of accessing places becomes far easier in settings where walking is possible, or multiple options of transportation are accommodated such as buses, trains, or bike paths. "Where third places remain vital in the lives of people today, it is far more because they are prolific than prominent. (Oldenburg, 1991, p. 17)" Unfortunately, large areas within American cities make it difficult for third places to be prolific, leaving few successful locations as prominent destinations within their communities.

A second issue that plagues third places and their engagement with the public is that the three examples listed by Oldenburg, and every other, is that they require a monetary fee to access. It is impossible to meet with friends in a coffee shop without conducting a purchase from the counter, unless a friend is generous enough to cover. A third place as a location to meet with friends is not a requirement, it is possible to instead meet at either living place, and this choice of a

rendezvous seemingly saves a penny-pinching individual from the monetary fee that would have otherwise been required. However, this choice is not as effective when meeting new people. After all, how many strangers would be receptive to an invitation to the home of someone they just met?

Thankfully, free alternatives do exist despite their equally troubled problem of scarcity. Public spaces such as plazas, squares, parks, and archives are often free to visit. "The forums, colosseums, theaters, and amphitheaters were grand structures, and admission to them was free. (Oldenburg, 1991, p. 17)" Some archives such as libraries and museums may charge admission but there are examples as civic institutions that exist to better their communities without requiring payment. These examples are the focus of this thesis, the combination of a free to access library and museum into a new type of archive that is an accessible third place to an American community.

2. BACKGROUND

While libraries and museums are similar in function as a facility that archives and displays artifacts, the people using these facilities go to those places to meet different objectives. People visit libraries to meet, learn, or work on their own personal projects. People attend museums to observe exhibits and interact with the displays to the degree that those museums allow. A science museum or center is focused on the engagement of patrons with their exhibits, while a museum may choose to encase or rope around a display to prevent any direct engagement with the artifacts.

For this project to be successful, the degree of integration between these spaces will need to be more than sharing a common roof. While it is possible to create this education center and dedicate the library to the west wing, confine the museum to the east wing, and join the two with a shared hallway and front desk it does not adequately join the spaces or meet the objective of the

10

thesis. There will be instances where spaces are incompatible, such as a hall to host events or a large interactive exhibit being adjacent to quiet study rooms.

2.1. Various Roles of Archival Facilities

Why do people visit libraries or museums? They are buildings that are more than just warehouses to archive, store, display, or issue collections and in the modern world, they have many roles to offer to the communities they contribute to. As mentioned earlier, the most applicable context of these facilities is as public, civic institutions. Exceptions exist, such as university or private collections that are more exclusive to gain access to but aside from the differences in ownership, the roles are the same.

For centuries, both specializations of archival spaces have provided a place to store a collection where visitors may either borrow an item or interact with a book or exhibit in its halls. They are houses of knowledge and information where people go to learn. This has not changed, and the archive of this thesis could be described as a public house to gather and learn. The second role is as one of the precious *third places* that Ray Oldenburg discussed. As a public space to meet, people from every walk of life and economic status can meet and interact with each other.

They are places to meet friends and catch up on events of their lives or enjoy the company of those close to you. Third places enrich lives and offer access to resources that people might not otherwise have access to. In the modern world, this includes computers and internet connection, printers, and other machinery. In recent years, libraries have started to provide 3-D printers as part of the equipment that visitors can use.

This role has become more important to archive as access to the internet is increasingly becoming a requirement to succeed in society. Some equipment can even be borrowed or rented,

11

much like a book has been for decades. Even the spaces at libraries and museums can be rented to host events such as parties or the organization itself might host seminars and workshops. While seminars or workshops might require fees to attend, they are important opportunities to share knowledge or enhance skills.

Providing so many resources and a public space available to everyone for individuals or groups who otherwise would not access or the knowledge to use or operate the various equipment on their own. Libraries and museums can act as places of refuge, either for those simply seeking shelter from storms or other environmental dangers or for those who may not have places to stay, rest, or learn.

Museums have long met the role of teaching history through artifacts or showcasing culture. It is fun to see objects that would otherwise only be accessible through images and descriptions. Interacting with installations in science museums blurs the line between education and play, fostering interests in history, art, and science.

2.2. User Groups and Types of Space Arrangements

Even among individuals that would use traditional public library spaces, there is a conflict between those who are there to further work or research either reading a book or accessing computer, and those who are there to meet with other people, either in an established meeting or through informal conversation with other patrons. "For many students, particularly the campers, the coffee shop is an alternative to the library. (Waxman, p. 47)" A coffee shop also meets the objectives as a public space to either work or meet. However, with limited space there is little to separate the users depending on the reason for their visit which can lead to types of conflict between the visitors. Without the space to meet each customer's needs, this can negatively affect someone's experience.

When designing the education center, there should be sufficient space to meet each user's need, no matter if the reason for an individual's visit is to read in a quiet room or discuss the recent chapters from a book club. The previous figure of a social range spectrum could be used to determine that visitors to the educational center may either visit for the purpose of quiet research, or to meet and converse with people; and anywhere in between. So, the problem with attaching additional uses to building becomes a question of what spaces are similar enough to be adjacent or intertwined, and what spaces need to be separated to offer the greatest experience?

Spaces will need to be provided to meet the needs of any visitor on that social spectrum. This can be achieved through a varied implementation of various room and furniture arrangement types and choosing to provide fixtures to allow people to modify the environmental factors in their immediate area. Some spaces will have sound dampening to reduce interfering nuisance, and be completely enclosed, safe places to work or study.

Others will be as open as a small arrangement of furniture or a bench along a wall in a hallway. This establishes a need to identify the factors that are conducive to either quiet productivity or conversation. The following examples are only spaces that are accessible to the public, those only accessible by staff will not be included.

Figure 5. Study space example (Harvard University, n.d.)

A space to meet the needs of someone at the most isolated end of the social range, a study room is not a new concept to libraries. An enclosed room that can be reserved for periods of time with the ability to either support individual or group work needs sufficient room for both. Outfitted with plenty of outlets, and a whiteboard, a tv that can be connected to, are all modern requirements for a study room. Further design decisions for human wellbeing would include a window for natural light, with operable blinds for a user's control, light switches to further adjust lighting levels, a thermostat to adjust the temperature of the room, and options to either provide a wall or glass partition to provide some visible connection to the rest of the center.

Figure 6. Study desk example (Haverford College Library, n.d.)

An example of the next space along the social range, rows of individual work desks in an open space. The design signals a user's desire to work alone while retaining a small connection to other people or adjacent archival spaces. Individuals seeking this format may not stay as long as those in study rooms, and likely are visiting alone. The space is smaller, and seating may not be as comfortable. The ability to turn or move the furniture to interact with those nearby exists in this layout.

The number of amenities is smaller in number, and a person in this space has less control over their environment. The desks could be partitioned units or rows of chairs along a long table. A single light and outlet at each seat are the limits of control a user would have here. Factors such as temperature, noise, or surrounding lighting are determined by the time and amount of people around the study desks.

Figure 7. Variable study, and interaction space (Yarmey, 2010)

Artifacts encased for their own protection or preservation should share a space with the stack shelves to house books, possibly even coordinating the artifacts to assist in indicating the genre of books down its row. Breakout spaces or conference rooms should be provided as quiet spaces for individuals or groups to meet and work. Less formal and open arrangements of furniture should be provided to allow for people-watching or spontaneous conversation.

In this example, shelves or other display format for archived items exist adjacent to places for visitors to rest, work, or converse. It is a space large enough to accommodate people individually, several small groups, or a large group. In this format and all previous ones, the focus is placed on people. Whether they are searching for a place to rest and work or simply carry out conversations, the spaces provide amenities to assist those goals without adding distractive elements.

Figure 8. Lobby and circulation spaces (The University of Texas at Dallas, n.d.)

Two types of spaces that are similar enough to be considered one category, lobbies, and primary circulation spaces. This example will see plenty of traffic and could be quite loud compared to previous examples. Being a large and open space connected to many other places within the building, this example might closely resemble a university commons area. Providing several options of furniture or brief use, this format might not see much use from those looking to study unless they desire to people watch or interact. Even though this example could be a lobby, it is important to provide plenty of seating for users of all ages or levels of mobility.

Figure 9. Science museum exhibit example (St. Louis Science Center, 2018)

Transitioning now to examples found primarily in museum type archival facilities, the interactive exhibits associated with science museums are potentially the loudest type of space among all the examples, centered around a topic, the exhibit is meant to be interacted with to experience the topic and provide real world examples of it. They are fun and typically aimed towards engaging children. Given the level of noise these spaces can produce, adjacencies will most likely be circulation or similar exhibits and may require to be partitioned from the quieter facilities in the educational center.

Figure 10. Traditional museum exhibit example (Laprelle, 2013)

While this example itself ranges depending on what type of artifact is being displayed, it is summarized as this single type. Like the previous example, it is meant to be interacted with, although not touched. These exhibit spaces may provide seating such as benches for brief periods of rest before resuming a visit to see other exhibits and essentially neutral to conversations. Nothing about the design of this example prohibits or promotes engaging with those around you and that makes this example versatile, it can be combined with many of the other types to augment itself.

Figure 11. Library shelf example (Hamar Public Library, 2014)

The final example, shelves or rows used to store books are also a versatile entry to this list. Traditionally organized in rows for ease of locating specific titles, more experimental arrangements can also provide seating or be combined with exhibits for artifacts or other spaces. Another neutral space that does nothing to promote or prohibit people from having conversations, it may be distractive to converse in these spaces as it could hinder the speed at which someone can locate a title. Design opportunities based on what spaces could be combined with this example or adjacencies make the final two entries to this list as the most desirable candidates for integrating libraries and museums into a single space.

3. Methodology

Within a lifetime, the city of Williston has seen industrial booms that have greatly strained the infrastructure of the area. The city was forced to quickly grow to accommodate the needs of everyone now living in the area and left to maintain the new construction in the following busts as the end of the cycle. The most recent oil boom of the early 21st century was more prepared for and had more people choose to remain in the community.

One of the most prominent changes to Williston after this time was the construction of a new airport, northwest of the city. Once operations moved to the new location, a now unused area near some of the most developed sections became prime real estate to build on. An area that is roughly six percent of the land now within the boundaries of Williston. Only a small corner of this new area, designated Williston Square has been developed, with plans and proposals for the central portion, and speculation for the rest.

3.1. Site Analysis
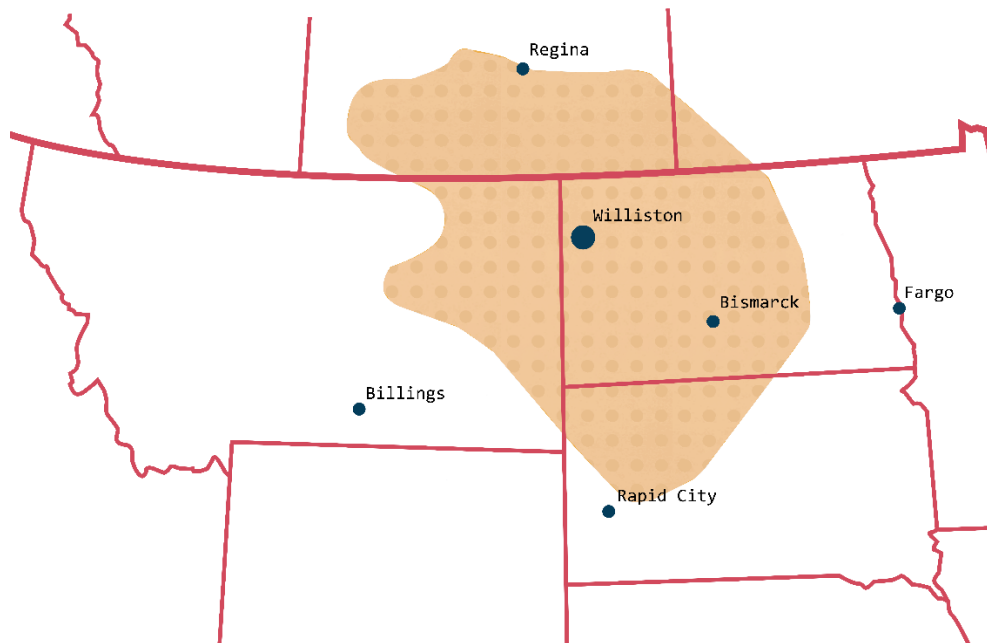
Figure 12. Map of the region around site

The area chosen as the site for the design half of this thesis is western North Dakota. A region in the center of the Bakken oil shale formation that exists mainly in North Dakota but extends to South Dakota, Montana, Saskatchewan, and a small part of Manitoba. At the time of settlement, the primary industry in this location was agriculture, with the most produced crop being wheat. By the 1950's, oil was discovered, and the city of Williston experienced its second large influx in population growth. The first being when the city was founded in 1887.

The most recent surge in population growth began in 2006, alongside the discovery of the Bakken oil shale. It was this latest increase in people moving to the area that resulted in much strain on the city's resources, and encouraged Williston to expand what it could to accommodate its new residents. The largest of these expansion projects being the new airport and now one of the largest planned developments within the city on the airport's old grounds, Williston Square.
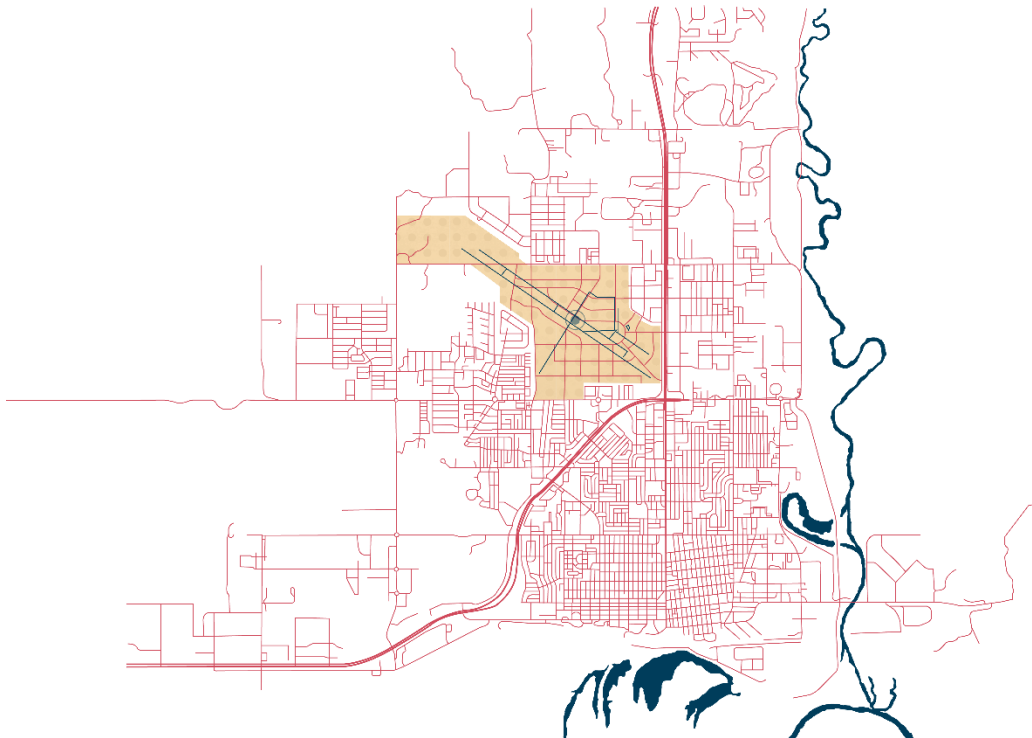
Figure 13. Map of Williston with Williston Square highlighted (Adapted from Google Satellite Imagery, 2024)

Figure 14. Development map of Williston Square (Williston Economic Development, 2022)

The project design will be located within a development in Williston, North Dakota identified as "Williston Square". The square is an ongoing construction district within the city on the site of the former Sloulin Field International Airport. As of writing this paper, the district is developed only along the East edge, denoted in the grey color. With construction of the remaining development being primarily roads, the city is currently dividing plats. The specific site, which is highlighted in red, exists where the primary runway for the old airport was, See figure 11 below.

Figure 15. Highlighted site and roads throughout the Square (Adapted from Google Satellite

Imagery, 2024)

As the Square forms, greenspace to the south of the site would remain constant, unlike in

the Innovation Zone. This should lead to interesting dialogue between the center and planning

where direct light could be used to its advantage and may allow for the archive to expand and

impose on this park to some extent.

3.2. Precedent Studies

Precedent studies for this thesis were chosen from factors such as similarity, organization,

or showcases elements of culture that this thesis design will attempt to show in a similar way.

The scale and age of the studies vary, being unique works of art or architecture, their context is

different. Not every aspect of each place is studied, only select elements that relate to the

research and design.

3.2.1. Laurentian Medici Library, Florence Italy

Figure 16. Stairs of the vestibule (Renna, 2017)

The Laurentian Library is the most historic building of this study. From its conception as a library, to its current use as a museum, it is a stellar example of the similarities between both types of facilities. It proves a direct connection between both typologies and shows that the connection could be pushed further. A building of historic significance being a part of the museum's collection needs only a collection of books to be a successful example this thesis seeks to explore. To design an archive that acts as both, there is much to learn. An area of particular importance are the steps that are used beyond their intended purpose as a space to linger. It provides another great example of how configurations of space could promote interaction, and service some of the needs required by various formats for seating.

Figure 17. The Medici Library (Die Museen Von Florenz, n.d.)

The whole of the library is well ornamented, designed by Michelangelo and given plenty of creative freedom. The library wonderfully showcases the wealth of the Medici family and its enormous collection in the hall shown in the figure above. It is well organized and allows for easy circulation throughout both the library space and the vestibule. The desks on each side of the aisle also fulfill the role of shelves or lecterns to store the books in the collection. Its arrangement is unorthodox by modern standards, to read from a book of a row, a person must move to the desk necessary to read from the books stored there. Instead of selecting books from a shelf, and moving to a different location to read, a visitor must move to where the book already is and read it there. This approach to finding a specific book is far more efficient than the rows of shelves commonly used today. It may be possible to suggest topics located within bookshelves by relating adjacent artifacts to the works stored close by.

Figure 18. Bookshelves and desks (Die Museen Von Florenz, n.d.)
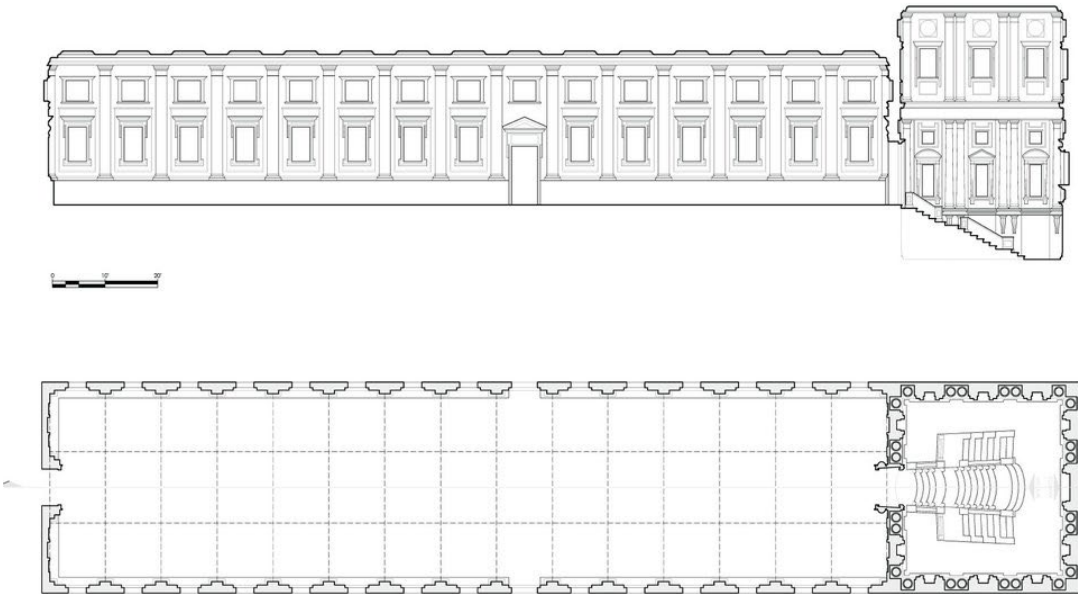
Figure 19. Laurentian Library floorplan and section (Bailey, n.d.)

3.2.2. Seattle Public Library, Seattle Washington

Figure 20. Seattle Public Library, Seattle WA (Swimmer, 2013)

The Seattle Central Library is an effective example of circulation. The arrangement throughout the floors enables the library to easily adapt to the nature of a section growing or shrinking over time. Even the spiral shape itself is an interesting overlap seen in the Gugenheim Museum, the location of another precedent study for this thesis. It is also worth noting the shape of the building could be seen to resemble loose hardcopy books stacked on top of each other, visible in the figure above.

The skin of the Seattle Library is almost entirely glass, and the configuration of its sloped walls create enormous interior spaces used primarily for seating or circulation. There is no shortage of natural light within these spaces. The program of the library enables fluid transitions between spaces to read or converse, and the storage shelves for the collections.
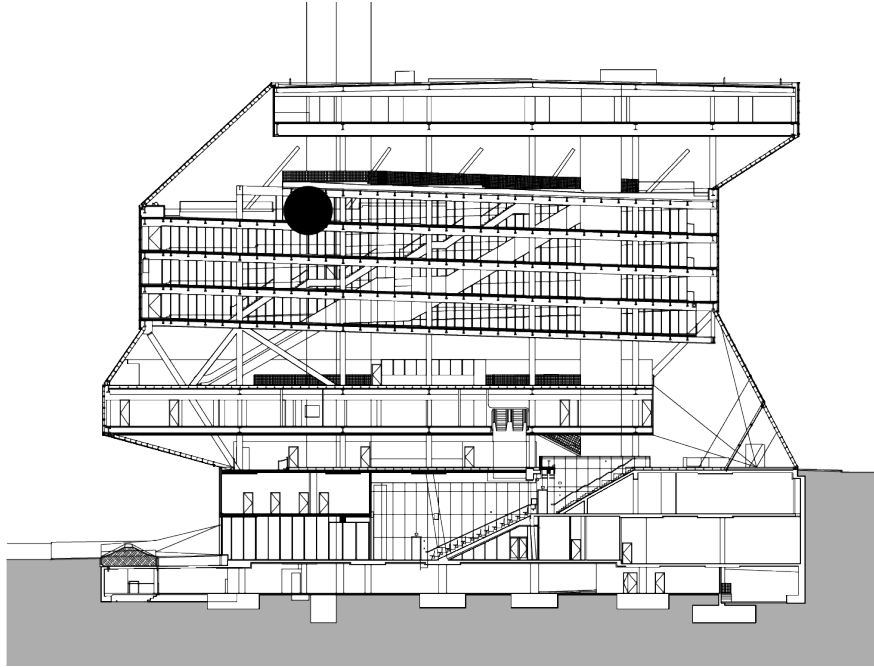
Figure 21. Seattle Public Library section (The Ohio State University Pressbooks, n.d.)
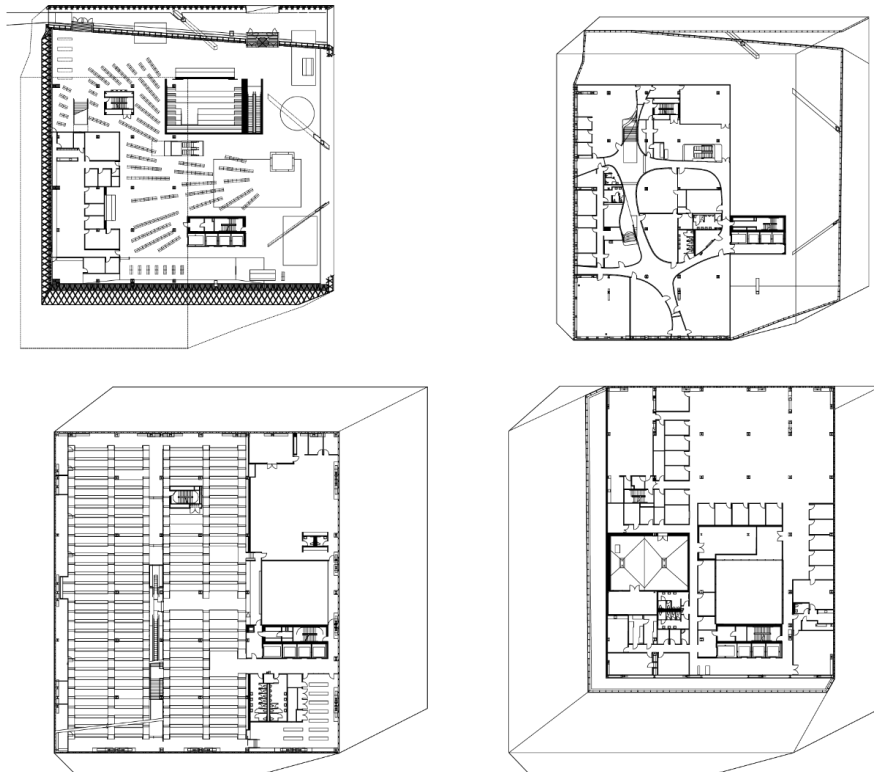
Figure 22. Seattle Public Library floorplans (The Ohio State University Pressbooks, n.d.)

Figure 23. Circulation and seating spaces (The Ohio State University Pressbooks, n.d.)

The circulation spaces along the outer edges of the library are wide and offer clear visibility to other sections of the facility. The skin appears to be nearly all glass, but the metal support frames provide a lattice to reduce glare and diffuse light. The adjacent metal shelves are angled to point across the walkway to places to sit in the immediate vicinity of where books may have been selected.

Figure 24. Circulation and Seating Space second example (The Ohio State University Pressbooks, n.d.)

3.2.3. Discovery Center, Springfield Missouri

Figure 25. Discovery Center, Springfield MO (Babcock, n.d.)

The Discovery Center of Springfield is an addition since its typology breaks from the

previous entries as it is a science museum. As a science museum, it focuses on hands on

interaction that promotes learning about the sciences. Science center's deliver a way to continue

learning through a process that blurs the boundaries between education and play. Where

traditional libraries or museums would sometimes include a playground to provide a location for

children to unleash their energy in a way that does not disturb other patrons, this facility type

takes advantage of that energetic nature. Using curiosity and a desire to interact or play, energy is

expended in a productive way. The interactive nature of a science museum could be leveraged in

the educational center to heighten the experiences of younger individuals or allow for ease of

access terminals for better organization and navigation.

Figure 26. Educational floorspace (KC Parent Magazine, n.d.)

Figure 27. Cable bike ride (KC Parent Magazine, n.d.)

Very little of the space within the Discovery Center is unused. Bright colors and interactive displays are everywhere, and the open connections between different levels allow visitors to see other displays before entering their space. The concept allows for a different mode of learning, and the level of interaction that it provides makes repeat visits more rewarding than traditional museum displays.

3.2.4. Kimbell Art Museum, Fort Worth Texas

Figure 28. Kimbell Art Museum, Fort Worth TX (Muncie, 2015)

The Kimbell Art Museum expertly balances natural light and how it interacts with a collection. Both artifacts and books will need to be shielded from direct light to avoid damage. There are many details in this building that were designed with consideration beyond their basic needs. A minor but personal favorite detail is the use of travertine tile. As a porous tile, it has acoustic qualities that can aid a space where volume should be dampened, so as not disturb others. While most travertine tiles are sourced from Italy, there are more local options that are quarried here in the Unted States. The acoustic design highlights an opportunity to choose material finishes depending on the use of the appropriate space.

Figure 29. Display showing natural and artificial light use (Shaer, 2023)
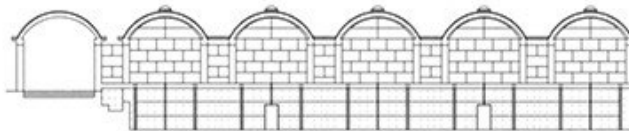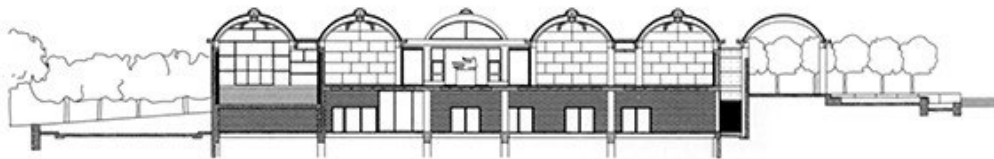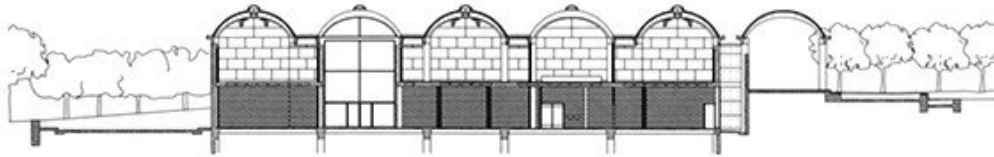
Figure 30. Kimbell Art Museum elevations (Kahn, n.d.)

Figure 31. Kimbell Art Museum exhibits (Shaer, 2023)

The construction of the ceiling and repeating modular sections seem as if they could expand as the museum requires to house additional artifacts. The balance of materials and careful consideration of how every human sense interacts with the displays shows the detail of Kahn's designs. A great design solution emphasizes the elements placed within it, a crucial necessity of an archival space and the Kimbell Art Museum achieves this throughout the facility.

3.2.5. James Turrell Artwork

Figure 32. James Turrell, Sky space (M HKA Ensembles, 1994)

While not a single piece of art or architecture, much of the art created by James Turrell works with concepts such as light and space, the former being the most eye-catching element of his pieces. The mechanics that enable his displays are often not exposed to viewers. An idea that starkly contrasts modern trends in architecture to reveal structural or mechanical elements that make the space possible.

His work Sky space is notable for the hard to perceive transition between ceiling and sky, through the way the roof tapers to an extreme edge. The installation bathes the space in natural light, creating a memorable experience in a facility otherwise used for circulation to other facilities. Turrell's work often interacts with celestial objects, connecting the space of a building or the planet to its larger context in space itself. No work shows this better than the Roden Crater in Arizona.

Many of his installations have open roofs that he refers to as skyscapes. At the Roden Crater site, the scape is the sky and the stars. By using the built environment, Turrell's work in

Arizona seeks to draw a person's eyes to observe stellar phenomena and watch it interact with the artwork in the foreground. By using displays and art that interacts with the space around it, it creates a form of ornamentation for the modern world. Grand public structures of the past would feature ornate sculptures or frescos, so a modern public space should strive to also have art in the fabric of its construction.

Figure 33. Staircase exit from the crater (Holzherr, n.d.)

3.2.6. Mark Dion Artwork

The displays created by Mark Dion perfectly highlight the essence of combination that this thesis design contains the goal of for libraries and museums. Each piece is framed around a conversation of science and exchanging information. Topics that are shared with this thesis design and are essential to the success of the educational center. Architecture is often said to exist at the intersection of art and science, Mark Dion proves that sculpture can share the same description. In some ways, architecture could be seen as type of art installation.

Figure 34. Library for the Birds, close up (Tanya Bonakdar Gallery, 2018)

At face value, the way that books or other artifacts are displayed allows for the branches of the tree in the installation to fulfill the role of a wall or shelf. It physically supports its display and contents, although in way that might be sustainable to the tree if it were real in this exhibit. Dion challenges the conventional way we organize and obtain our information. The traditional way of shelving is clean, and efficient to achieve its purpose but becomes sterile and tedious to sift through.

A deeper analysis of Dions work, the Theatre of the Natural World in particular, unveils his critiques on human tendencies to overpower nature. We use resources to our immediate benefit with little regard for what comes after. If nailing pictures to a branch and simultaneously using it to shelve books or tools suites human needs, then that is what is conducted, often without considering how such behavior would affect the growth of the tree in question.

Figure 35. Theatre of the Natural World, by Mark Dion (Tanya Bonakdar Gallery, n.d.)

Figure 36. Theatre of the Natural World image two (Mandelli, n.d.)

Figure 37. Theatre of the Natural World close up (Bell, n.d.)

3.3. Justification

The city of Williston has seen two libraries throughout its history, and both structures are still used today. The first, a Carnegie era library, but not funded through the wealth of Andrew Carnegie, is a structure designed by the architect Richard Frost in 1911. It received an expansion sometime in the fifties and continued to serve as the city library until 1983 while the surrounding community grew rapidly. Today, it exists as the James Memorial Art Center and hosts art shows, seminars, and theater events.

This first institution was created through the efforts of the Women's Civic League and donations from Willis D. James, both the namesake for the library and the city itself. Within the basement of this library, for a brief period of two days, it also served as a museum. "On April 6 and 7, 1927, Library Hall was the scene of an outstanding art exhibit put on by the Women's Civic League. (Diamond Jubilee and Fair, 1962, p. 105)" Unlike the goal of combining libraries and museums but still a notable precedent. In this instance, the museum collection was separately displayed within the basement, and only temporarily.

Figure 38. James Memorial Art Center

This was followed by the Community library, built in 1961 and is the active library currently serving the city. The building is now approaching the end of its first life cycle and is seeking funds for maintenance to both interior and exterior elements. The nearby recreation center was replaced in 2016 by a modern facility that adequately meets the needs of the community. Given the boom-and-bust cycle past that Williston has experienced twice now, and that the oil industry that created these booms is still active, it is a reasonable assessment that another industrial boom will affect the city again.
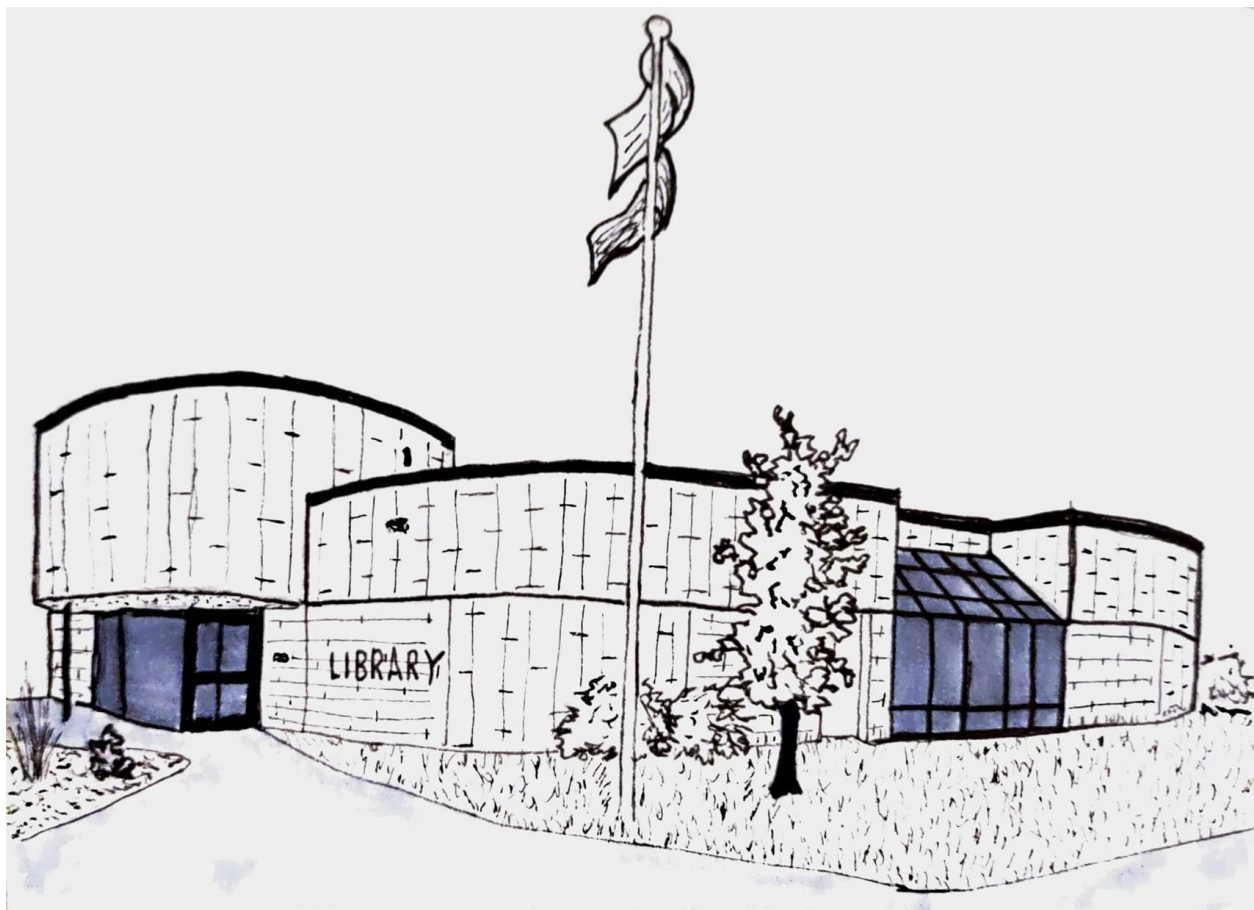

Figure 39. Williston Community Library exterior

The shape of the current public library suggests a layout less conventional than what the interior provides. It is an aging utilitarian facility that met the needs of the community as an economic response. Unlike many of the precedent studies, it is comprised of relatively low hung

ceilings with natural light only gracing the space at the entrances and minimal locations provided

for windows.

Figure 40. Williston Community Library interior (Williston Herald, 2022)

Its location near other public facilities such as Davidson Park and the old recreation

center provided a great civic center for the city before the nearby recreation center was replaced

with a new facility on the campus of Williston State College. Now the community library is

approaching the end of its lifecycle in an already developed part of town. With its only nearby

uses being the park, houses, and very few businesses, a more successful location for a similar

facility would be better suited in a location within a development that offers more adjacencies

than just housing and recreation.

The figure below shows a satellite image of the area around the community library with

adjacent uses highlighted. Most of the land around the library is zoned residential, highlighted in

green. The region in yellow shows Davidson Park, which the library is a part of. Blue shows

commercial with one building in purple that represents mixed-use. The last color red shows city

services such as the hospital, a fire station, and schools.

Figure 41. Community Library site plan showing adjacent typologies (Adapted from Google

Satellite Imagery, 2024)

Better connections with a greater number of public and civic facilities, a new park, and

housing and business uses alike would create conditions to further drive economic growth and

the tourism industry within Williston. Accounting for trends in development patterns within the

city, a location within Williston Square would provide a more central location to the larger

community as the city continues to grow.

With other industries emerging in the area, and Williston continuing to grow, it is only a

matter of time before the infrastructure of the city is overwhelmed again. The current library

would be better utilized if renovated and a modern library facility constructed. The addition of

museum spaces to the same building would further drive tourism and enable Williston to pioneer

a state-of-the-art facility and flagship typology. The center of the Williston Square development

being comprised of civic spaces with hotels, event centers, and an auditorium would further

prime economic development with the addition of this proposed facility.
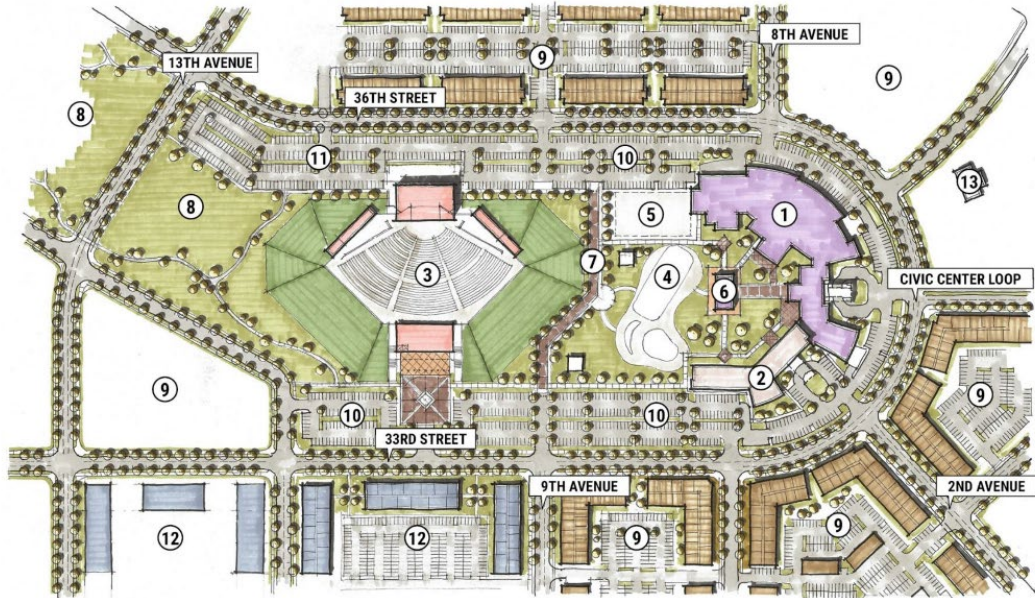
Figure 4.18 - Civic Center Conceptual Site Plan

(1) Convention/Exhibit Center	(5) Future Expansion	(9) C-3/R-3 Mixed-Use	(13) Existing Terminal Building
(2) Hotel	(6) Kiosk	(10) Parking	
(3) Event Center	(7) Pedestrian Spine	(11) Overflow Parking	
(4) Outdoor Ice Skating Rink & Amenity	(8) Open Space/Park	(12) R-3 Multi-Family Residential	

Figure 42. Civic zone masterplan (City of Williston, n.d.)

The city of Williston has released a comprehensive masterplan for the civic zoned center of the square. The proposed site for the educational center is in the location labelled "11", a space set aside as overflow parking for all the facilities within the civic zone. The nearby innovation zone allows for the construction of libraries, but the proposed facility is more than just a library and would better fit the context and community within the civic zone.

The overflow parking would only be necessary situationally, and rarely used at an annual level. Parking needs could be satisfied elsewhere, and a taxable structure would both benefit the city far more, and culturally enrich the citizens or visitors. Parking could be easily kept in an underground facility beneath the educational center.

3.4. Materials and Scale

The Williston Square site currently has both retail and hospitality buildings, with medical, residential, and recreational spaces to follow. The city of Williston already has a public library but no museums. Functionally replacing the existing library and adding additional uses to the building, the design should be considerably larger than the current public library. To separate facilities within, the archive will be two floors, reducing the footprint and increasing the total amount of square feet for the building.

While it is one of the goals of this thesis to combine libraries and museums, some of the facilities within these specializations will better fulfill their functions with some degree of separation. For example, an auditorium would be better located in a separate area from the children's section, or a mechanical room better suited in an area where it would not share a wall with a conference room.

A steel structural system is favored with the design decision to not imbed columns in walls. Concrete would clash with some of the finishes creating an environment that could be viewed as brutalist or monolithic with heavy and frequent use of stones. Finishes will vary depending on the space. However, glulam structural elements will be present in some of the spaces within the archive. Chosen for its warmth and inviting characteristics, wood will is not limited to use in framing.

Areas that will see high foot traffic will have tile flooring such as travertine for its porous and sound dampening characteristics. The exterior finish will include Hebron brick to connect with the previous library buildings within the city but will not totally be comprised of the local material.

46

3.5. Timeline

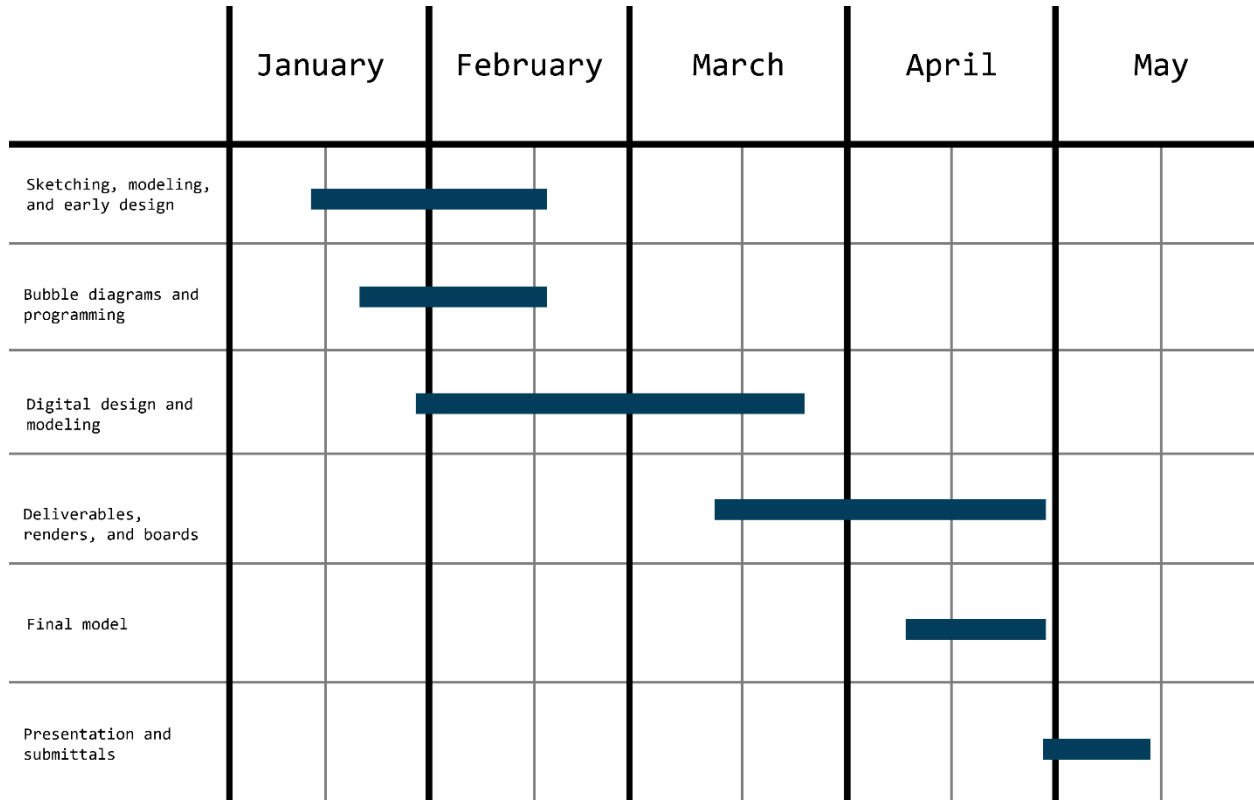|	January	February	March	April	May
Sketching, modeling, and early design					
Bubble diagrams and programming					
Digital design and modeling					
Deliverables, renders, and boards					
Final model					
Presentation and submittals					

Figure 43. Timeline

The timeline in the figure above shows the phases for the thesis throughout the spring semester. All throughout the fall semester, September through December, was the primary phase for research but this stage continued until March. The spring was dedicated to the design half of this thesis and those stages are shown in figure 43.

3.6. Program

Both the archive and park are open to the public for a large quantity of time during the day and evening hours. It is standard for parks within the city of Williston to close at sunset, and the operating hours for the archive would be unlikely to differ from the current hours enforced at the community library. However, it should be discussed that as everyone follows a unique schedule, there is a percentage of the population that is most active during hours when a library would close. No study was conducted to measure the percentage here but could provide an

additional research opportunity into spaces that cater to the needs of individuals who follow an

abnormal schedule. Internal facilities to serve the community are located throughout the space.

	Lobby	Circulation	Collections	Archive	Offices	Auditorium
Area	3,371 ft²	17,962 ft²	18,104 ft²	4,267 ft²	1,426 ft²	1,945 ft²
Percentage	5.95%	31.68%	31.93%	7.53%	2.51%	3.43%
	Mechanical	Makerspaces	Lavatory	Café & Store	Other	
Area	4,125 ft²	813 ft²	2,449 ft²	1,597 ft²	635 ft²	
Percentage	7.28%	1.43%	4.32%	2.82%	1.12%	

Table 1. Building program

Being a facility that is a combination of a library and a museum, a large percentage of the

space within the design is allocated to the collections of books and artifacts. As a public

resource, the archive seeks to achieve an inviting building form that is attractive to possible

visitors, residents, and tourists alike. The entire sum of the area allocated to the collections

contains varying degrees of integration between library shelves and museum artifacts. There is

no location within the archive that is completely dedicated to one or other, enabling the design to

fulfill its objective of combination between the two archival specializations.

Located along the border of a new park and replacing a section of parking spaces for the

civic area, the archive will directly connect with the section of parking space within the same

block. Even with space potentially reserved within the park to serve as a future expansion, the

archive does not capitalize on using this space for permanent installations. On the site for the

Kimble Art Museum in Fort Worth, Texas, the facility takes advantage of extending its

collections to the outdoor space around the building itself. Bakken Cultural Archive could have

made a similar decision, but the region is more restrictive with its climate than Texas. Weather permitting conditions would lead to an inconsistent utilization of these outdoor installations in poor weather or cold conditions.

Alongside the lobby, the circulation space, comprised of corridors and stair cores, consumes a large percentage of the available area. A successful solution could have been derived from a strategy using a smaller number but to ensure that the archive is easy to navigate and operate with a high capacity of visitors, the main corridors are fifteen feet wide with multiple seating options lining the borders along exterior walls. This enables the archive to extend its inviting design within each wing and towards the smaller, intimate spaces of its facilities or collections.

The decision was made to reserve a space for a store on the first floor, and a café on the second floor. Operating as a public space, funding for the archive is likely sourced from taxation or grants from the government. Setting aside the notion of public donations, the inclusion of a store allows visitors to contribute funds through their own decision in exchange for products related to the subjects of its collection. The café on the second floor is sized to the scale of a coffee shop, providing food or drinks to visitors on extended visits. This attempts to recover the campers from Waxman's study, providing a similar environment that those in the study reported as contributing to their choice to utilize a coffee shop instead of a library.

The remaining uses within the program retain smaller percentages and are located on both floors of the archive, except for the archive and mechanical spaces. The mechanical room is confined to the basement, an area only open to the staff. Also located in the basement is the storage space allocated to the archive, with the primary archive space being located on the first

floor. This allows visitors to interact with archivists in some capacity and observe the processes of their work.

3.7. Design Process

With the opportunities enabled by the site selection process, the design is derived from the history of the site. The lands previous use as an international airport bleeds into the new classification as Williston square, evident in the city's decision to adapt the terminal facility, and the location of several roadways along the path of the airport's runways or tarmacs. The parti for Bakken Cultural Archive also takes advantage of this history and extrapolates the footprint of the design through an exercise beginning with the footprint of the old XWA airport.

Visible in the figure below, is the complete process of exploration to arrive at the shape that was applied to the site to create the footprint of Bakken Cultural Archive. The footprint of the airport, comprised of the runways, tarmacs, taxiways, and terminal was drawn as the first step in the process. It was then simplified, subtracting redundant information to find the reduce the shapes to the primary paths before the third step, translation further modified the shape.

The remaining steps saw the process bend the bottom right leg of what represents the east-west runway upwards to create the shape of the letter Y on its side. The size of the taxiways where reduced and repositioned at the bottom of the slope along one of the branches. The final step massed the shape, creating blocks of space alongside the altered paths of the runways and transformed the lines into a negative space relative to the massing. Denoting what would become the primary corridors, the process concluded with the runways transforming into hallways, a use reflective of the airport runways. Wings for the archive were positioned and the remaining space framed by the altered taxiways became the lobby area and location of the main entrance.

Other design motifs connecting the airport include the use of a slanted wood structure ceiling over the primary corridors to emulate concepts like *lift* and *landing*. In an architectural setting, this is most closely related to Frank Lloyd Wright's ideas of compression and release throughout spaces in his designs. The corridors long expanses and low slope of the ceiling progress at a gentle pace either higher or lower, depending on the direction of movement.

This gradual slope relates to the slow curve aircraft must follow to ensure smooth landings and takeoffs. The highest points of this wood ceiling are at the convergence of the three wings and slope downwards towards the ends their respective paths. This establishes a theme within the more public spaces having higher ceiling heights, and within the furthest and most secluded areas is the ceiling height found at its lowest arrangements.
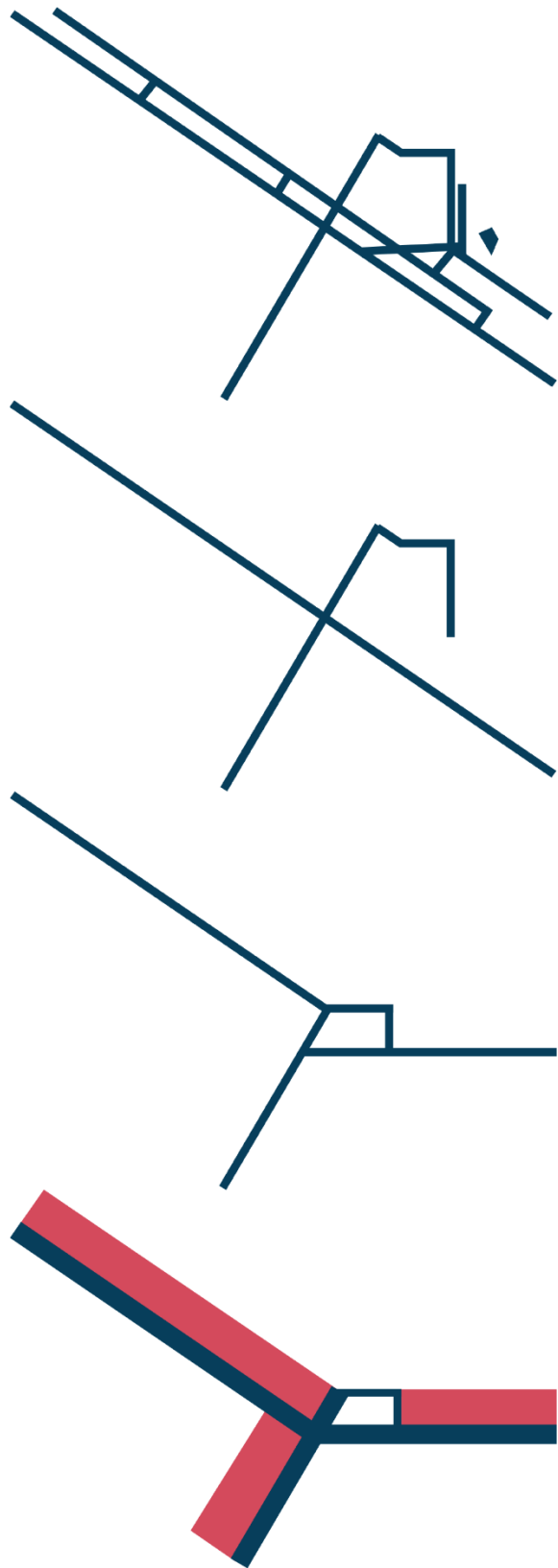
Figure 44. Parti building form process.

3.7.1. Collections and Arrangement Types

Beginning with the observations gained from case studies, the approach to creating the four distinct arrangements of Bakken Cultural Archive began with Mark Dion's installation, Library for the birds; please refer to figures 34 and 35. With this strategy, each area allocated to the collections of the archive features these arrangement types. Previously mentioned in the programming section, no area of the collections is dedicated as space for library shelves of books, or installations of museum exhibits or artifacts. Instead, each space is a combination of both.

The following figures show the four arrangement types, with colors representing the archival type that the space within the arrangement represents. Blue to represent a library, space used to store books or other media traditionally found within the rows of shelving space in a library. Red to represent a museum, space comprised of exhibits, artifacts, or other displays traditionally arranged in a museum.

Figure 45. Integrated arrangement

The figure above shows the first example of arrangement types, integrated. Here, the combination is based off a library shelf. The most commonly used library shelf is a modular system that can be repeated to extend each component to a desired length or height. Figure __ is a shelf four rows tall and three rows wide. The easiest way to combine libraries and museums within the same space is allocate a percentage of the shelf module to one format or the other.

To retain this combination, the most extreme ratio of these boxes is 1:12. Of twelve total boxes, one must be assigned a format different from the rest. The figure shows a ratio of 1:6 with the top center two boxes representing a museum exhibit, and the remaining boxes used to store a section of the books collection.

Figure 46. Integrated arrangement alternatives

Figure 47. Across arrangement

The second type of arrangements, Across, highlights a different approach on a larger scale. Instead of combining the collections within a single row of shelves, this type frames opposite ends of a space with a format on each end. This example demonstrates the relationship between the two formats across a space and could be understood as a common way that either a library or museum may choose to incorporate elements of the other in their current context. It is not abnormal for a library to also house a small collection as a museum. Previously discussed was the instance where for two days the James Memorial Library housed an exhibit in its basement for two days (Diamond Jubilee and Fair, 1962, p. 105)

Other examples include the Germans from Russia Heritage Center which defines its own space within the NDSU main library. A row of shelves exists on the left side of the figure, and an installation exists on the right side. The void between the two masses represents a corridor where people circulate between the configuration and may choose to interact with one side within a specific moment. This arrangement could be mirrored but otherwise does not allow a wide range of freedom in arranging collection types.
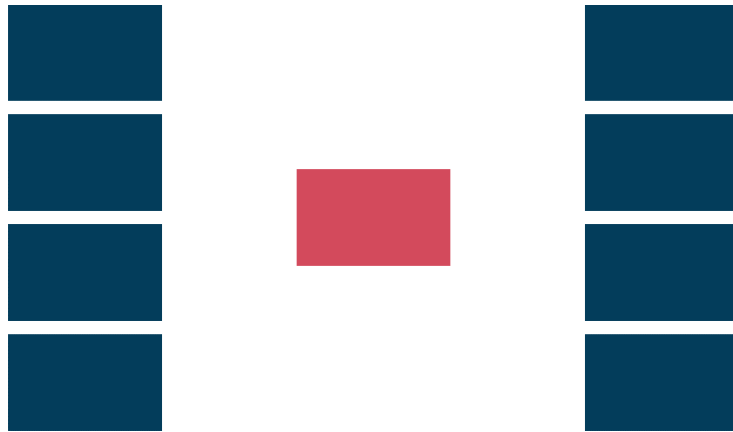
Figure 48. Surround arrangement

The figure above shows one configuration of the third arrangement type, Surround. In this example, two rows of shelves frame the border of a space with an installation in the center. Different applications of this arrangement type could be used to frame a space along a minimum of two sides, and a maximum of four. It could be interpreted that this approach is reflective of the previous arrangement type, Across but this example allows for more variety rather than a strict binary configuration, shown in the figure below.

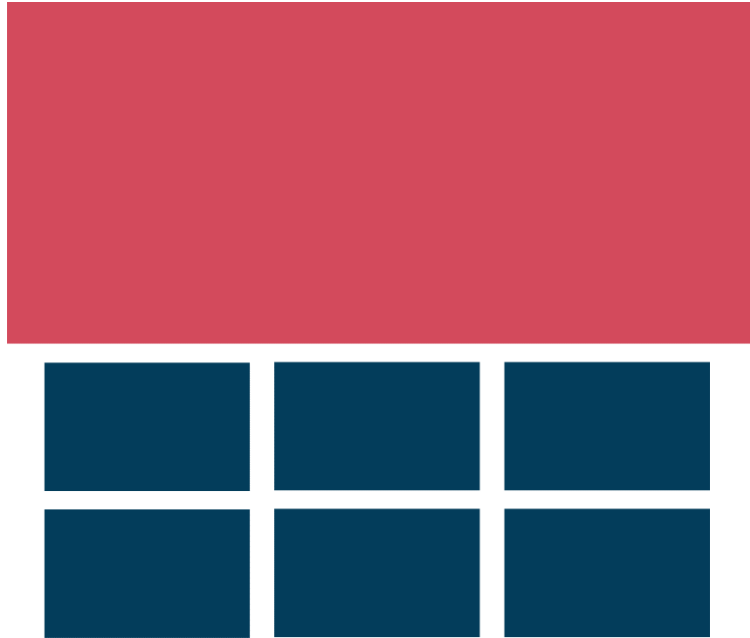Figure 49. Surround arrangement alternatives

Figure 50. Interruption arrangement

Like the first configuration in appearance, the final example in the figure above differs in execution. Instead of being constructed directly into the module system of a library shelf, the interruption arrangement type shares a border and transitions from one format to the other. The shelving module ends after two rows, where an exhibit occupies the remainder of the space in a dimension that does not comply with the module below. Alternative arrangements may place the exhibit along the bottom or cap opposite ends of a row of shelves.

Figure 51. Interruption arrangement alternative

4. RESULTS AND CONCLUSION

Through the decisions of locating the site within the civic area of the Williston Square development, providing open and inviting spaces connecting to other public spaces, and incorporation of the four arrangement types for the archive's collections, Bakken Cultural Archive exists as a new specialization that fully intertwines traditional formats of both libraries and museums.

Arranged on its site in a way that enables the shortest wing to extend through an addition and its current footprint structure being free from its walls, allows the interior arrangements to reconfigure alongside the shifting needs of the facility for longer periods of time than any previous library iteration than Williston has seen. There may arrive a time when the inclusion of physical copies of books is phased out, but that decision is still being weighed by designers and archivists seeking to predict the future of these facilities.

Whatever the decision, the design of Bakken Cultural Archive provides Williston with a new interpretation and the ability for the community to apply changes quickly and cheaply as they see fit. Providing every variety of seating options to meet the needs of visitors alongside the duration of their stay, the design allows for the recovery of individuals tele-commuting or studying for long periods of time within coffee shops without completely compromising on the same atmosphere of a coffeeshop with the inclusion of a café space on the archives second floor.
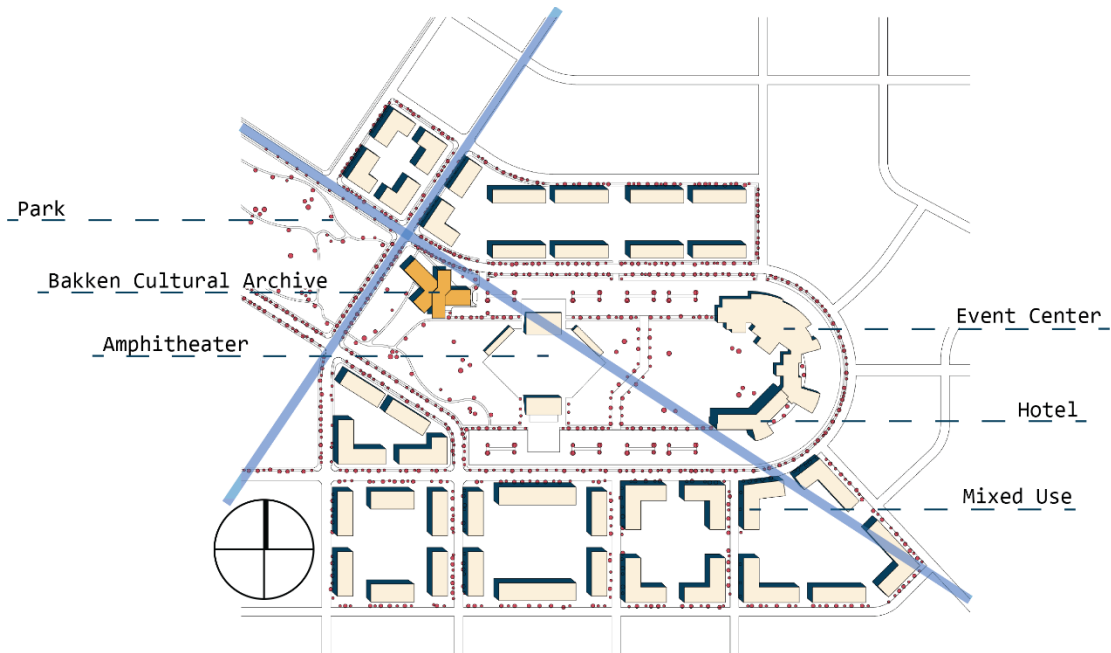
Figure 52. Site plan

The site plan above shows the position of the archive at the western end of the civic area. The blue cross shape traces the position of the old airport's runways, connecting at the intersection to the northwest of the archive. This influenced the decision to choose this area as the site along with forming the basis for the parti as discussed earlier. As of the creation of this thesis project, most of the development of Williston Square is hypothetical and exists in various stages of design along with the comprehensive plans created by the city.

The only visible context around the archive are the blocks of proposed mixed-use structures, and the planned amphitheater, hotel, and event center. The area proposed as an expansion for the archive extends from the shortest, southwest wing, framed along both sides by paths of sidewalk through the section of park that fills the remainder of land within the civic area. The Y shape of the archive is capped with a raised roof section in a shape resembling a Z, creating a total footprint of thirty-seven thousand three hundred seventy-two square feet.

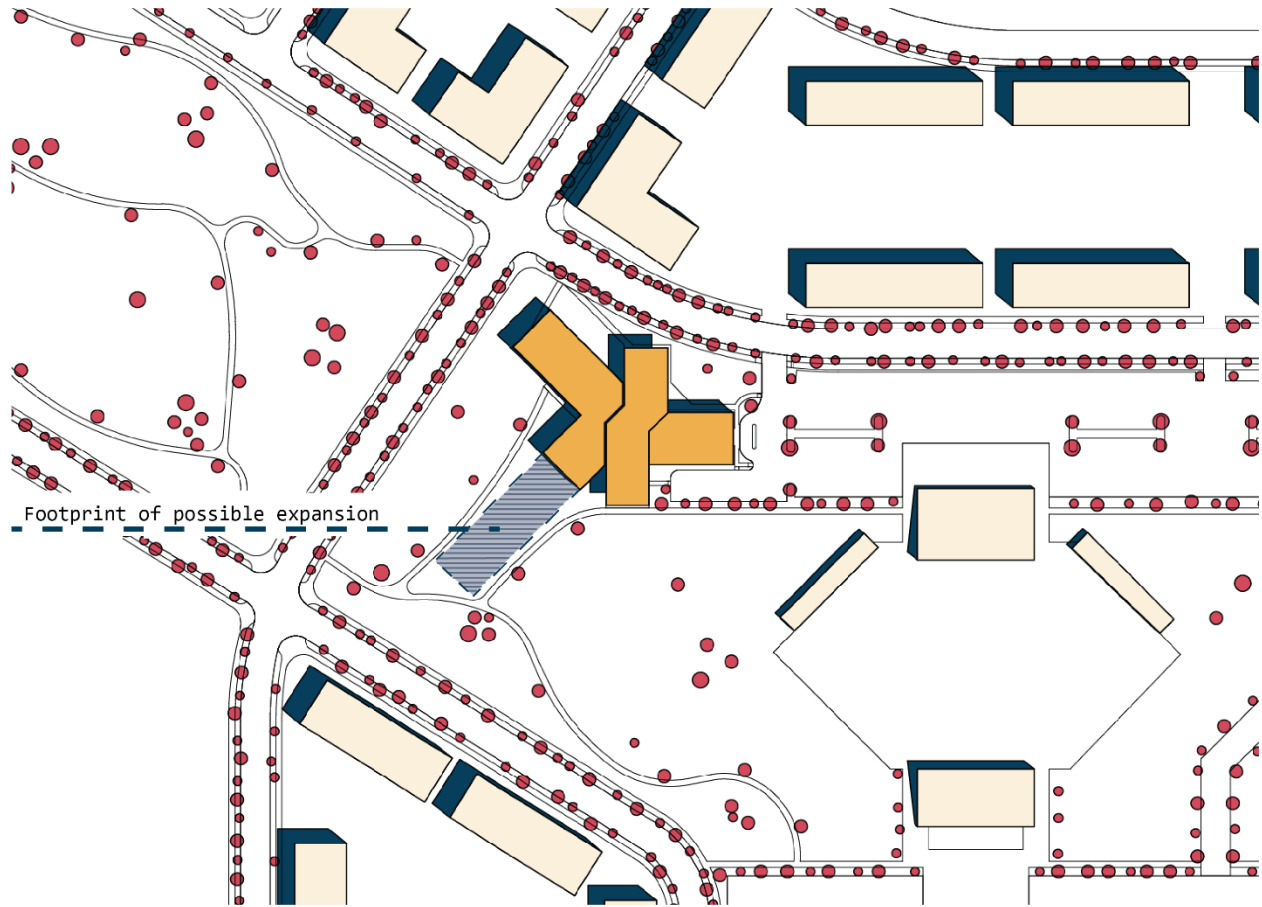Footprint of possible expansion

Figure 53. Site plan close up showing area for expansion

The raised section of roof covers the lobby and main entrance, and on the opposite side of the structure, the secondary entrance that connects with the park. Seen in figure 49 below, the metal panel roof extends as a covered patio held up by a mass timber support in the middle of the cantilever. This section of the roof extends fifty feet beyond the exterior walls of the archive, and cantilevers thirty-one feet at its corner. This roof tapers to a thinness of a few inches along its edges, creating an inviting open space that is visually eye catching, drawing people towards the archive to interact with the building form and other people nearby.

Figure 54. View of main entrance from across the street

The remainder of building materials that compose the exterior are a brick base up to the height of the floor plate for the second floor, where the material transitions to a zinc panel. Framed between these sections exist large curtain wall sections of glass stretching from floor to ceiling across both floors on every wing and the lobby bathed in light. As the final material on the exterior, a perforated metal screen arranged in rectangular shapes on the north faces of the building, and inversely large expanses with rectangular holes along the south faces. Visible in figure 50 is the extreme thinness of the roof, which slopes to a thickness of three feet out of the view of an individual observing the structure from the ground plane.

Figure 55. View of south entrance connecting to park

The total area of the archive, analyzed in each section within the programming section, total an area of fifty-six thousand six hundred ninety-four square feet across its two full floors and partial basement beneath the east wing. The configuration with restrictions of the site, scale, and to meet requirements to accommodate the program is expanded beyond the image of the final step in the parti process diagram. This is most apparent in the east wing where the primary corridor snakes and transitions towards the center of the mass instead of comprising the south face as originally implied.

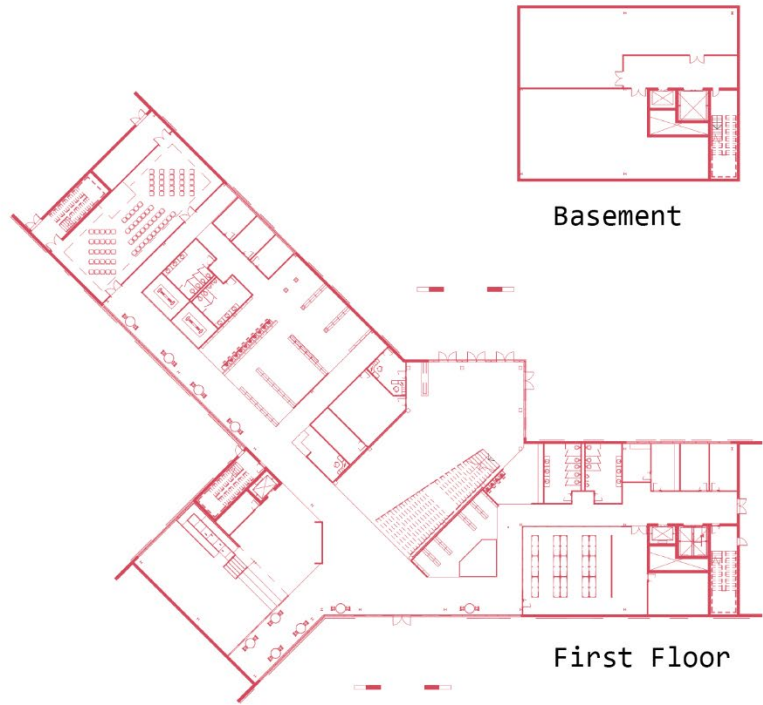**Second Floor**

Basement

First Floor

Figure 56. Floorplans

It is within this design, site location, configuration of spaces, arrangement of collections, and services provided, that the archive achieves its goal as an accessible third space that combines libraries and museums and an alternative resource to so called campers. Within a one block radius of the archive there exists places for recreation both indoor and outdoor, a variety of housing options, and different typologies of businesses.

Catalyzing the civic center of Williston Square and trailblazing the predominant development pattern, the archive exists as a space capable of meeting the needs of its community. Bakken Cultural Archive is provided with options incorporated into the design process enabling both expansions and reconfigurations of its interior spaces without risking lengthy and expensive reconstruction projects.
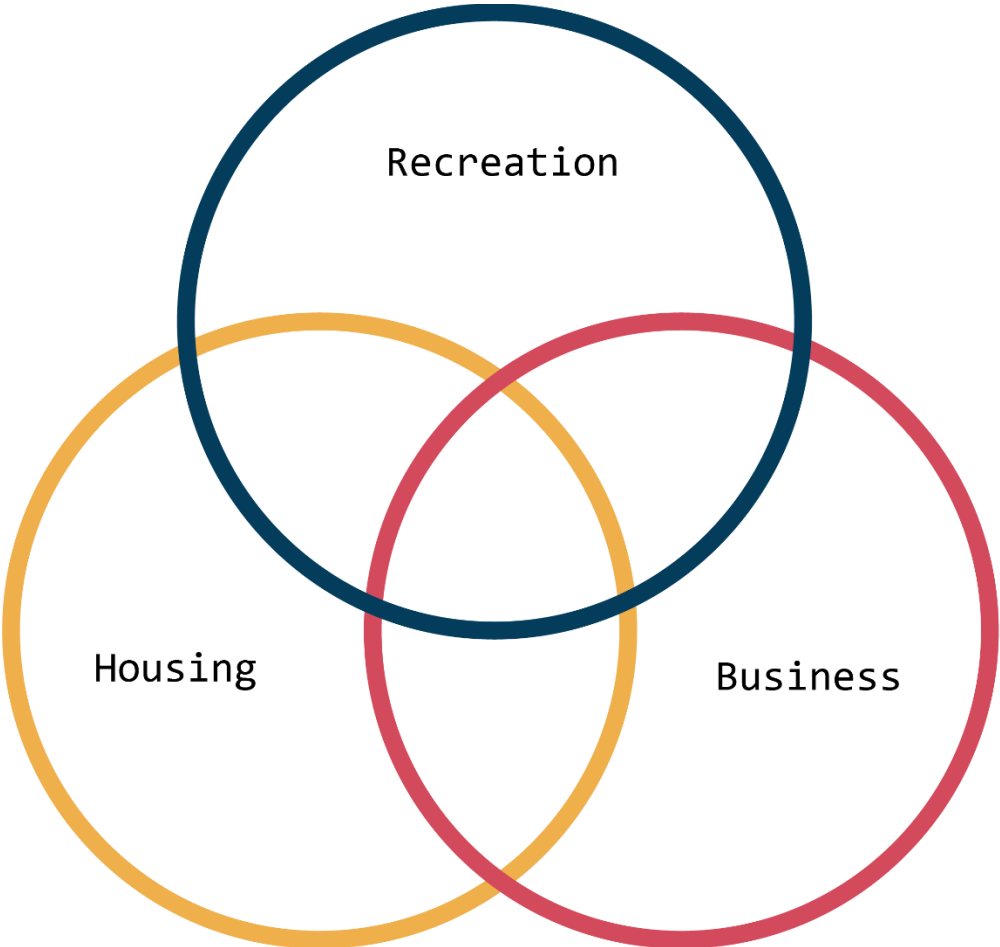

Figure 57. Venn diagram of adjacent zones

4.1. Combining Libraries and Museums

With information gained from works, studies, and applications studied from the case studies, the four arrangement types and their alternatives were created with the goal to overlap the displays of libraries and museums in a new way. To create a combination of each archive specialization instead of dedicated and separate spacing servicing each type. The four examples of arrangements are shown below in a series of renders dedicated to each.
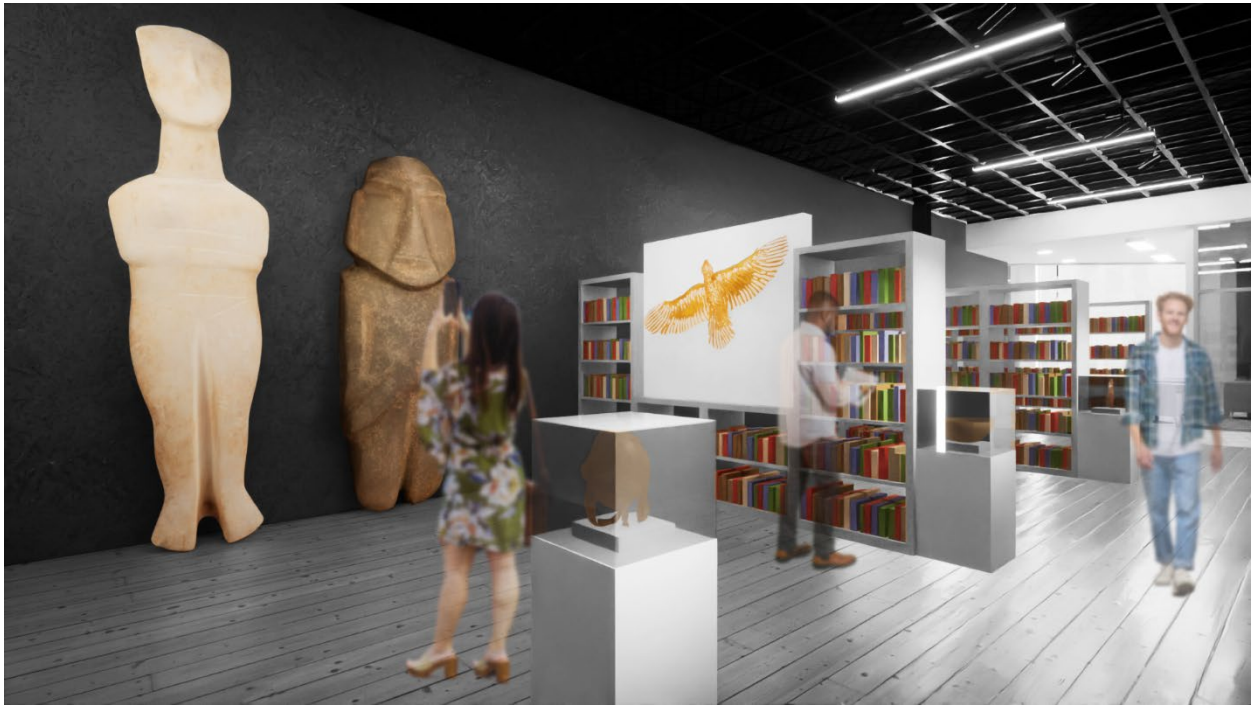

Figure 58. Render of arrangement type one, integrated

The area of focus in figure 58 is the library shelf module near the center of the image, with an exhibit of the bird replacing the top center rows that would have otherwise been a continuation of space dedicated to books. The surround arrangement is also visible within this example as the artistic figures to the left of the image, and the interruption arrangement is visible where the smaller cases are placed on the ends of the shelving module. The application of materials in the space for collections include a wood floor, chosen for being traditional located within many examples of museum spaces and the extend the use of wood into the smaller spaces

of the facility in a different way since the structure in these spaces is steel instead of wood. Wall finishes are typically gypsum in either a grey or white color, but some instances visible in the following figures include sections where glass curtain walls are used.

The most common ceiling in the collections space is an open metal grate, allowing for individuals to observe the structure above, and mechanical equipment while still framing the boundary of its space with a physical plane instead of an implied one that is commonly used in commercial spaces with today's construction. The metal grate connects with the strategies implemented to allow the archive to reorganize its space quickly and easily according to its needs. Allowing light fixtures to change locations and mount to this plane without damaging or leaving scars on the ceiling structure.

Figure 59. Render of arrangement type two, across

Other ceiling materials visible in figure 59, show the sloped wood ceiling in the back of the render that is mounted above the main circulation corridors, and a gypsum ceiling over the smaller hallways mounted at a lower height. The lighting fixtures are less likely to change along

these hallways but in areas like the example above, track lights are provided where displays are located along the edge of a circulation space. These displays may change at a frequency of a few months or years, so it is a logical decision to include lighting fixtures that can be repositioned without their mounting location changing.

In a continuation of the strategy used in the lobby, the hallways also are composed of a travertine tile floor. The collections continue to use a wood floor with an exception in the archive containing carpet tile. Figure 59 is an example of the across arrangement type. Instead of a shelving module, this instance is replaced with the archive existing across of a large artifact on display. The void of space from this arrangement is the hallway where people observe work being conducted in the archive. Also visible in this image is a steel column lining the edge of the hallway both in the foreground and background.
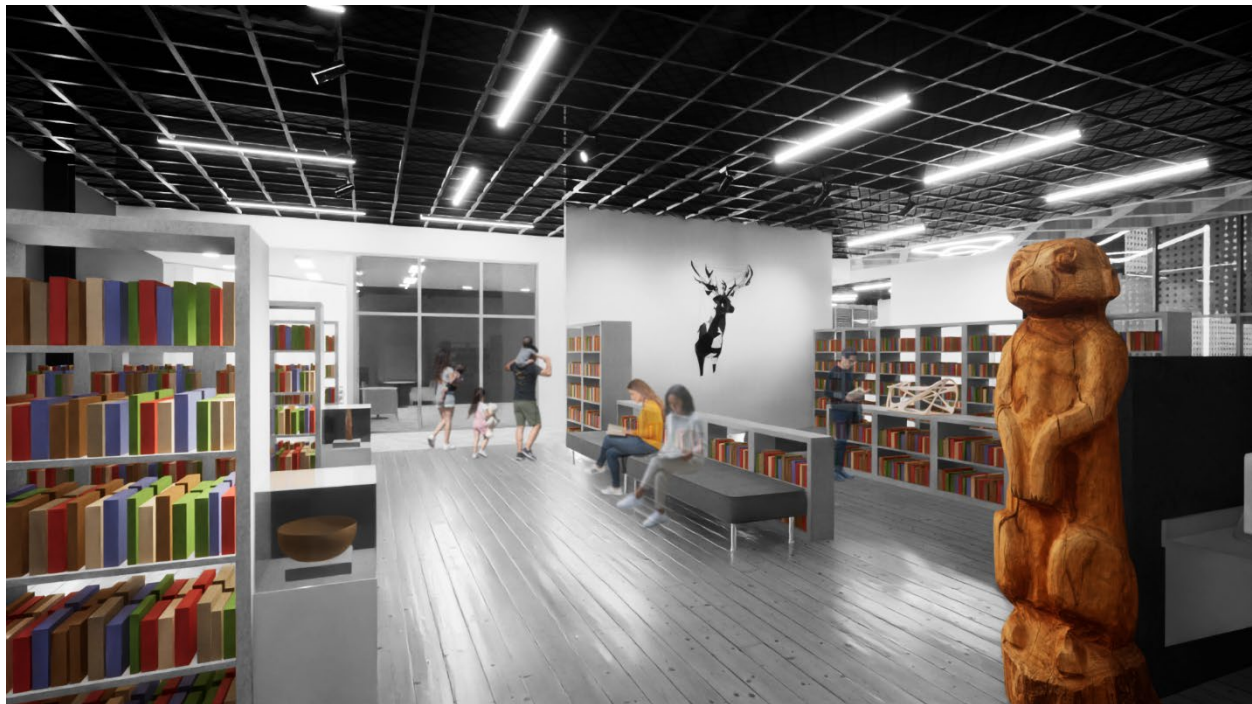

Figure 60. Render of arrangement type three, surround

Highlighting the third arrangement type surround, the space in this render is the same as figure 53 but faces a different direction to focus on a different exhibit. This application of

surround shows a large exhibit mounted to a wall with two rows of shelves on each side

extending to the same plane that the exhibit occupies. The images outlining this arrangement

type noted that different configurations could frame this space with one format along a minimum

of two sides, which is executed in this example, and a maximum of four sides which would

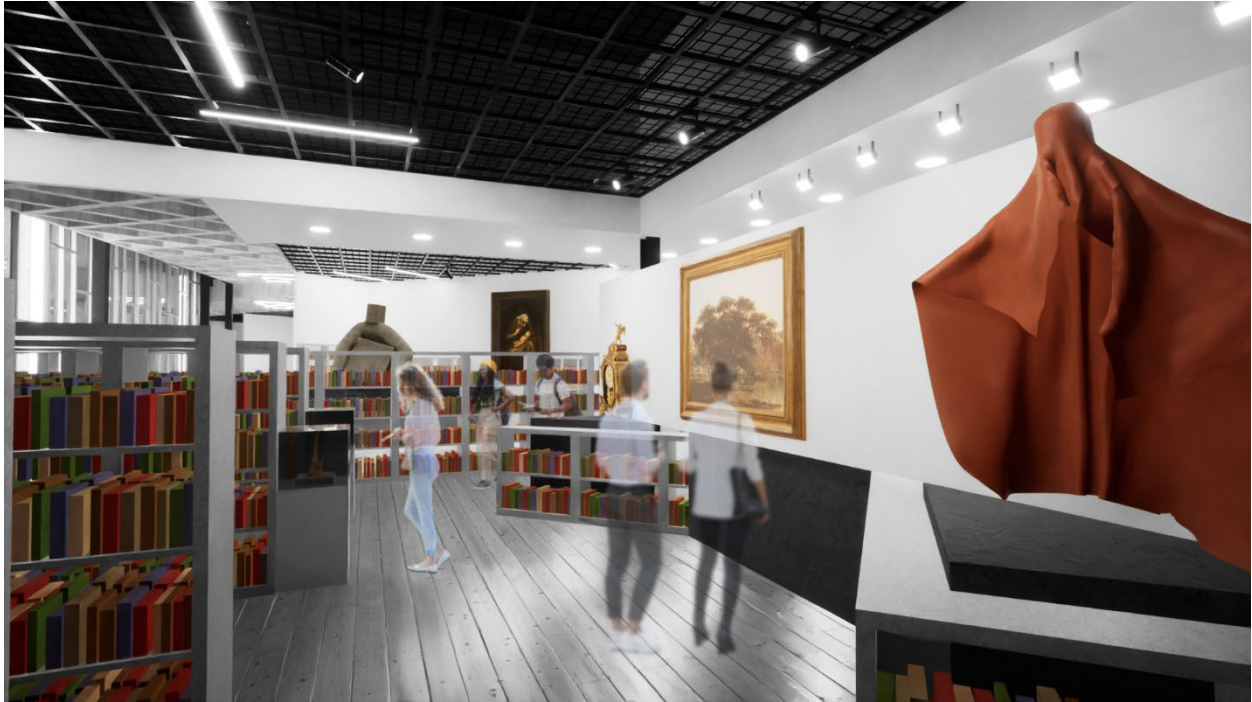require the exhibit to be located centrally instead of mounted on a wall at one end.

Figure 61. Render of arrangement type four, interruption

As the final arrangement type, interruption is the example in the figure above along the

right side of the render. Instead of utilizing a row of library shelves, the configuration of shelving

modules extends in a zig-zag pattern, allowing pedestals in a triangle shape to be placed behind

the shelves. The break in this arrangement type shows a transition to a traditionally framed wall

as a plane that cuts through the pattern established by the shelving system. This application best

shows the execution of the fourth arrangement type along as creating a visually interesting

display for both books and artifacts.

4.2. Documentation

To achieve these goals, three spaces are highlighted on the floor plans in diagrams. The circulation, the area of collections, and the locations of various seating options. Being noticeably larger than the Williston Community Library, it is necessary that the hallways can accommodate people moving through this space comfortably even if events are hosted, and large numbers of visitors are simultaneously using the same space.
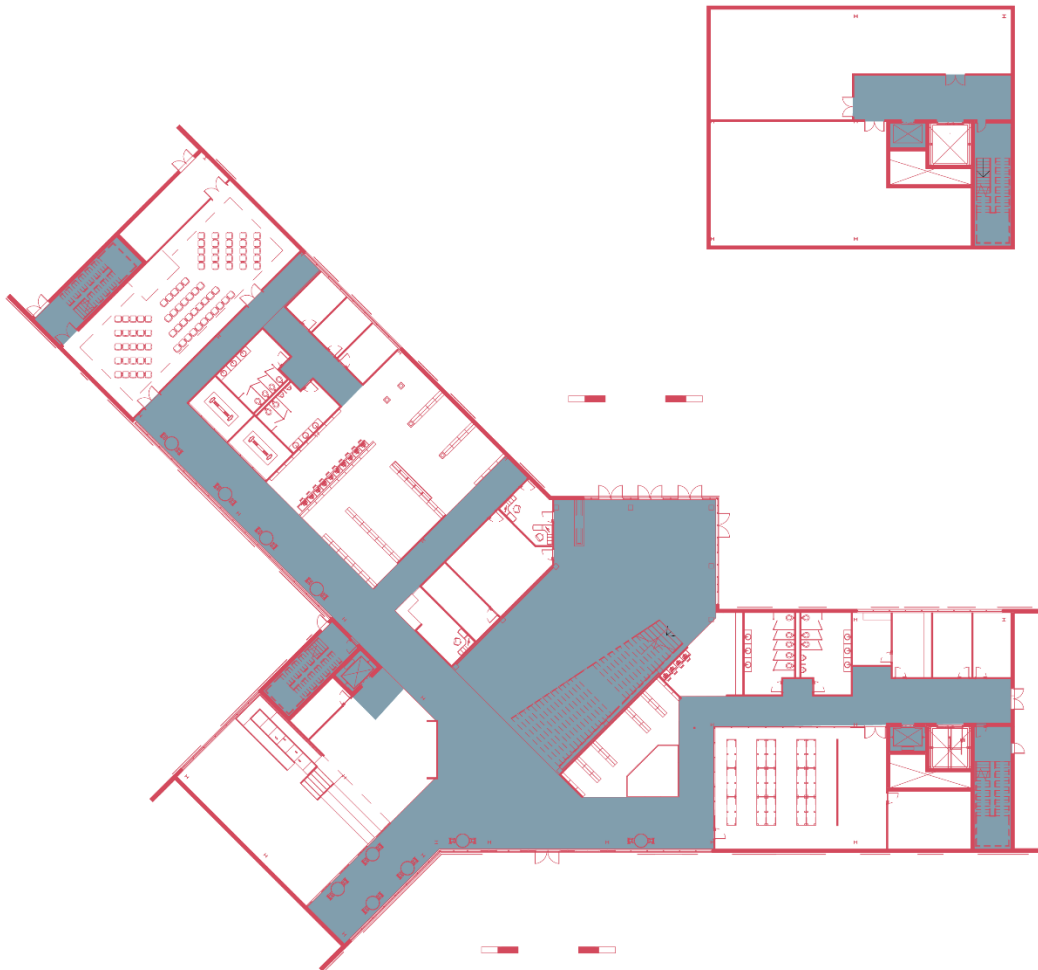

Figure 62. Circulation diagram first floor and basement

Figure 63. Circulation diagram second floor

Shown in these diagrams are the primary corridors, secondary hallways, lobby, and staircases. Among the staircases, the main staircase in the lobby is counted and one staircase within each wing bringing the total of staircases to four. Even though the lobby is counted separately in the program, it is still a space of primary circulation, so it is included in the diagram. Only the east and southwest wings have elevators available for use by both staff and visitors. A service elevator is provided next to the stairs in the east wing, here the corridor extends to the exterior wall where an employee access door connects to the parking lot outside.

This enables the staff to quickly move their collection to the archive on the first floor, or storage in the basement.
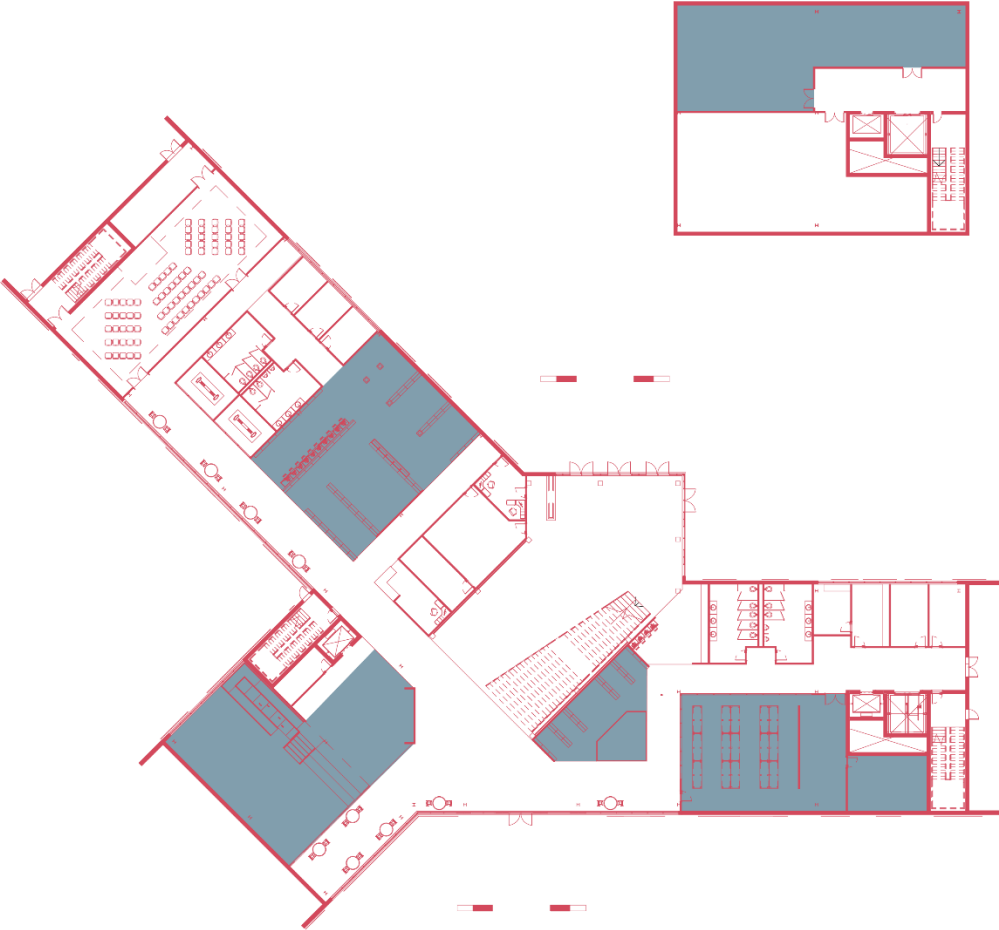

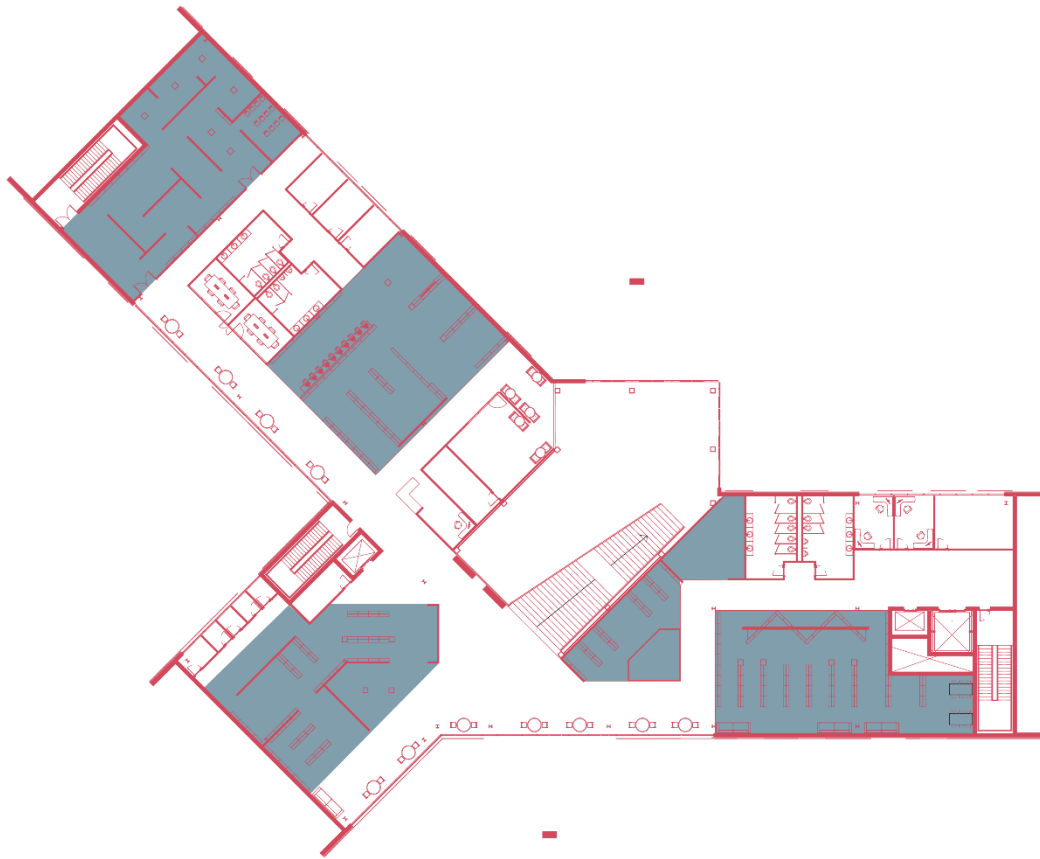Figure 64. Collections diagram first floor and basement

Figure 65. Collections diagram second floor

Counted among the spaces highlighted in the collections, are all the rows of shelves for books, every exhibit and display for artifacts, and the archive with its primary space and storage located in the basement. As the largest space in the program, with almost thirty two percent of the total space, the collections are the location where most of the material studied for thesis have been applied. Applications for each of the four combinations can be found within each highlighted area in the collections.
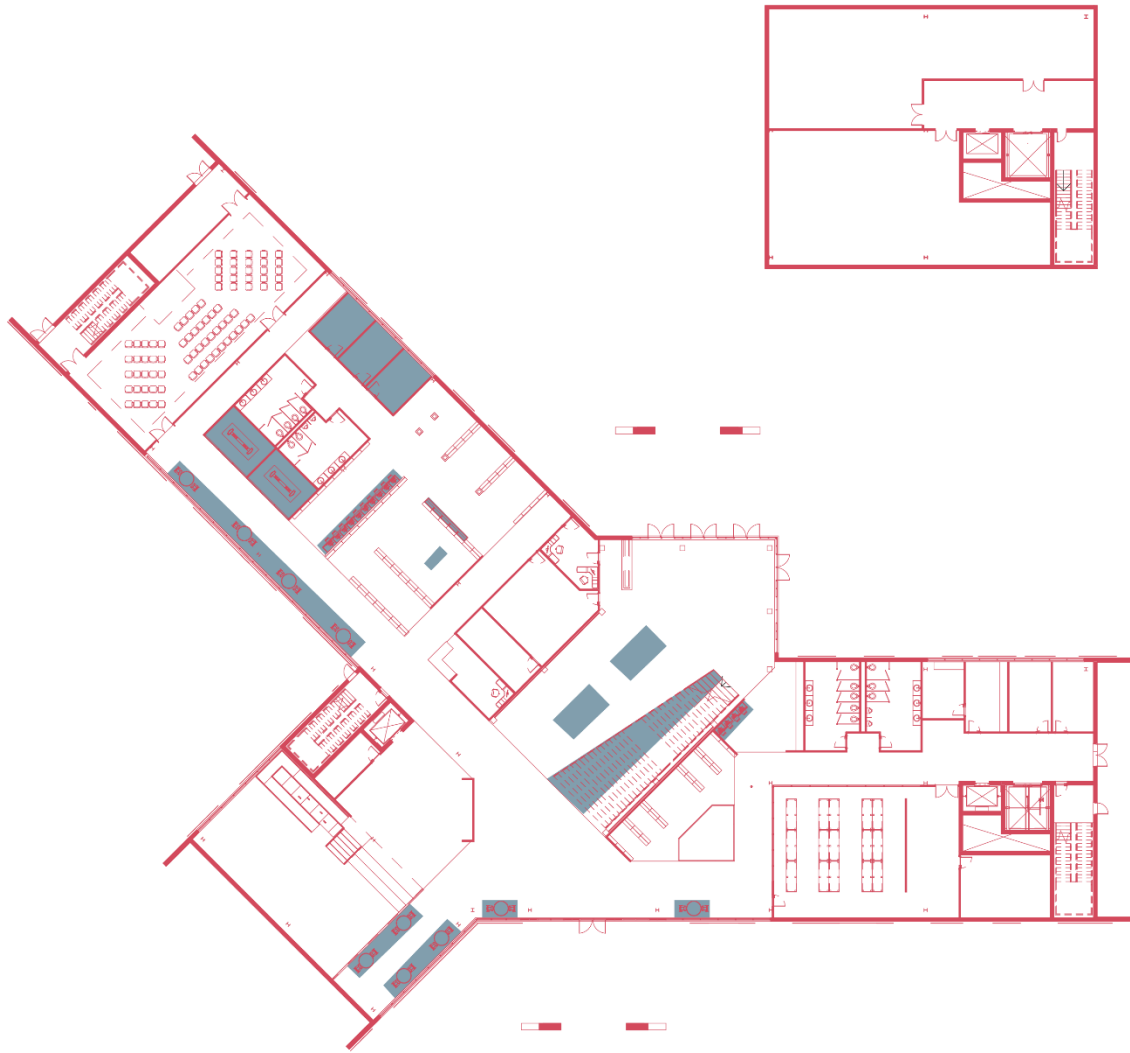
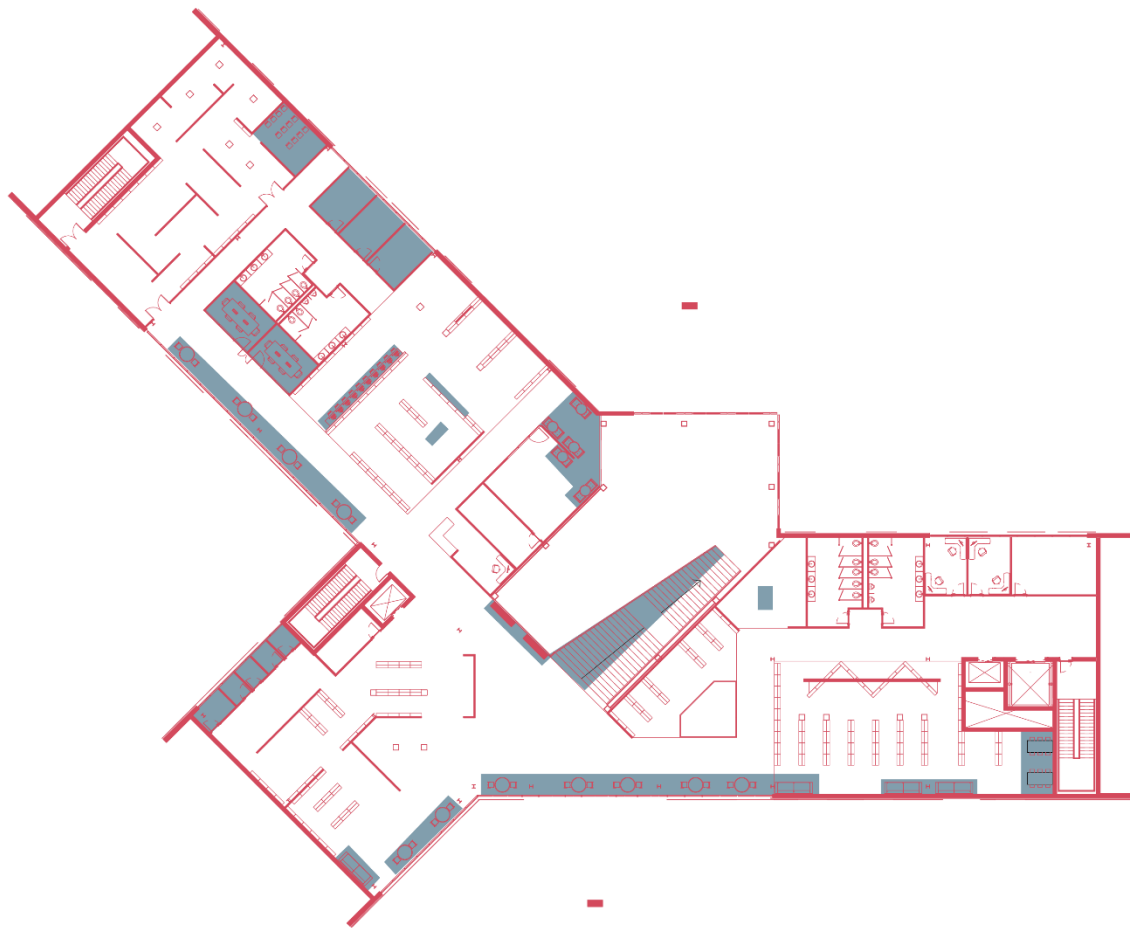Figure 66. Seating diagram first floor and basement

Figure 67. Seating diagram second floor

Highlighting the least amount of area within Bakken Cultural Archive, the seating

diagram identifies each location where every option to sit is located. This includes all benches,

tables and chairs, computer desks, sofas, couches, private study rooms, and conference rooms.

To serve the needs of every individual on the socialization spectrum, this diversity in options was

necessary. There are uncounted seats in the auditorium on the first floor, but this space was not

included in the diagram as the facility would host large gatherings or events and likely not open

for the public to use without coordinating these events with the archive. In the floorplan views, the shape of the main staircase in the lobby is most visibly highlighted. Showing that the stairs are wider at the top and narrower at the bottom. The portion allocated to the stairs maintains a consistent width, but the terraced benches grow wider as the stairs climb, providing more seating options within the largest room in the design.

Figure 68. View of lobby

Within the lobby, the extension of inviting and intriguing spaces extends from the cantilevered roof outside to the center of the wings inside. The terraced bench on the stairs is framed between a dichromatic display on opposite walls. Depending on the angle viewing the wall display, it will either glow red or blue, an artistic display reflecting the colors that represented the library and museum within the arrangement types. Also visible in figure 68 is the structural framing in the lobby. Different from the rest of the structure, here is the interior use of glulam columns and beams, paired with a travertine tile floor. The materials in the lobby were

chosen for their complimentary composition, the inviting warmth that wood provides, and the sound dampening qualities offered by a porous stone.

4.2.1. Structure, Sections, and Elevations

As previously noted in section 3.4 Materials and Scale, the majority of Bakken Cultural Archive is designed with a steel system. Only the lobby and large X shaped roof supports have a glulam system. With the choice to leave structural members exposed, the walls are required to be tied back to the columns which visible in all interior renders, are not furred with wall finishes. The steel columns would then be required to be covered in a fire-resistant coating such as intumescent paint.
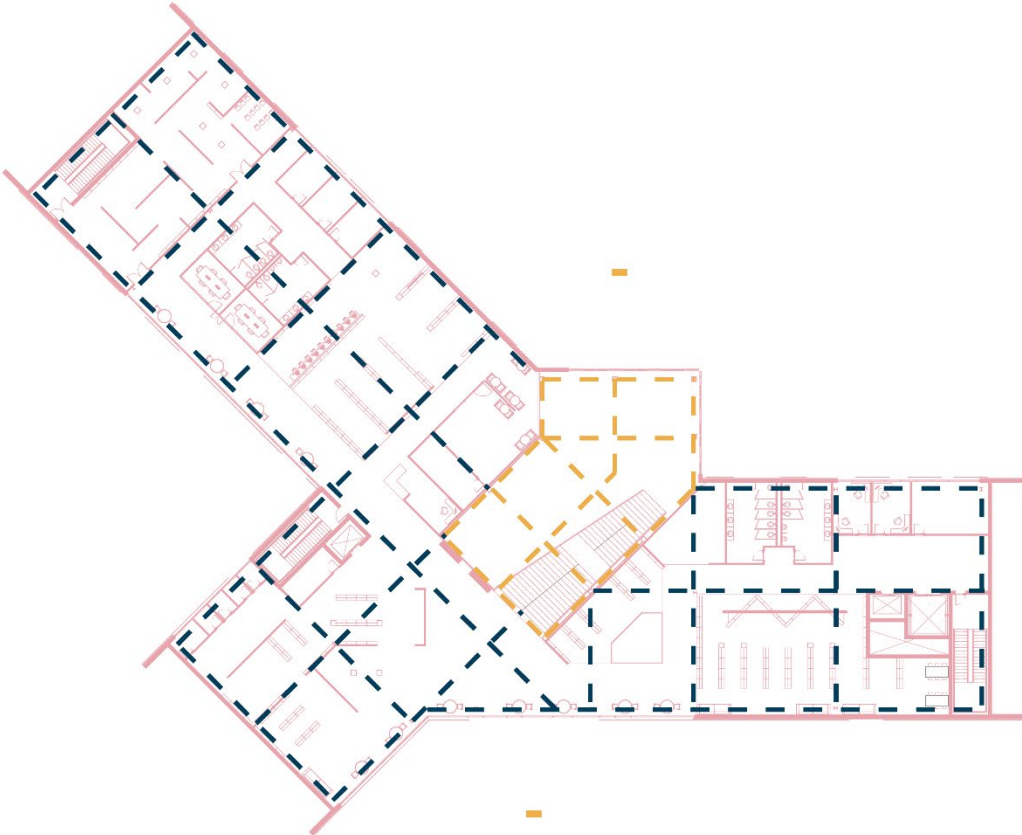

Figure 69. Structural framing plan

Visible in figure 69, are the paths of structural beams with columns located at nearly every line intersection. The blue dashed line represents steel framing, while the yellow dashed lines represent glulam framing. Each wing is framed with three columns along its width, spaced forty-five feet apart. Two rows of columns line the exterior walls with a single row in exactly the center of each wing. The lobby follows this same framing strategy, but the grid is somewhat different than the one used for the three wings of the rest of the structure.
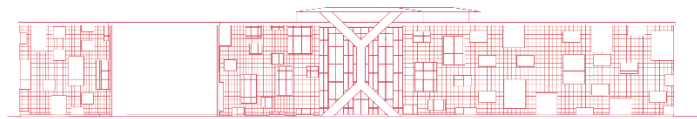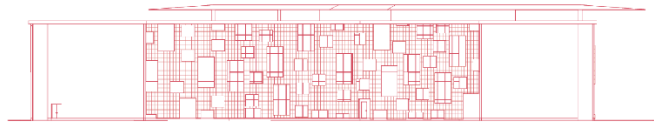

Figure 70. North Elevation

Figure 71. West Elevation

The elevations show two views of the archive. With the complex shape and multiple angles at forty-five degrees, most of the visual data is difficult to interpret, so only two elevations were selected. What is visible within these views, is the full shape of the raised roof section that extends beyond much of the structure. The tapered edge can be seen in both elevation figures, along with the full three-foot thickness that it gradually slopes to.
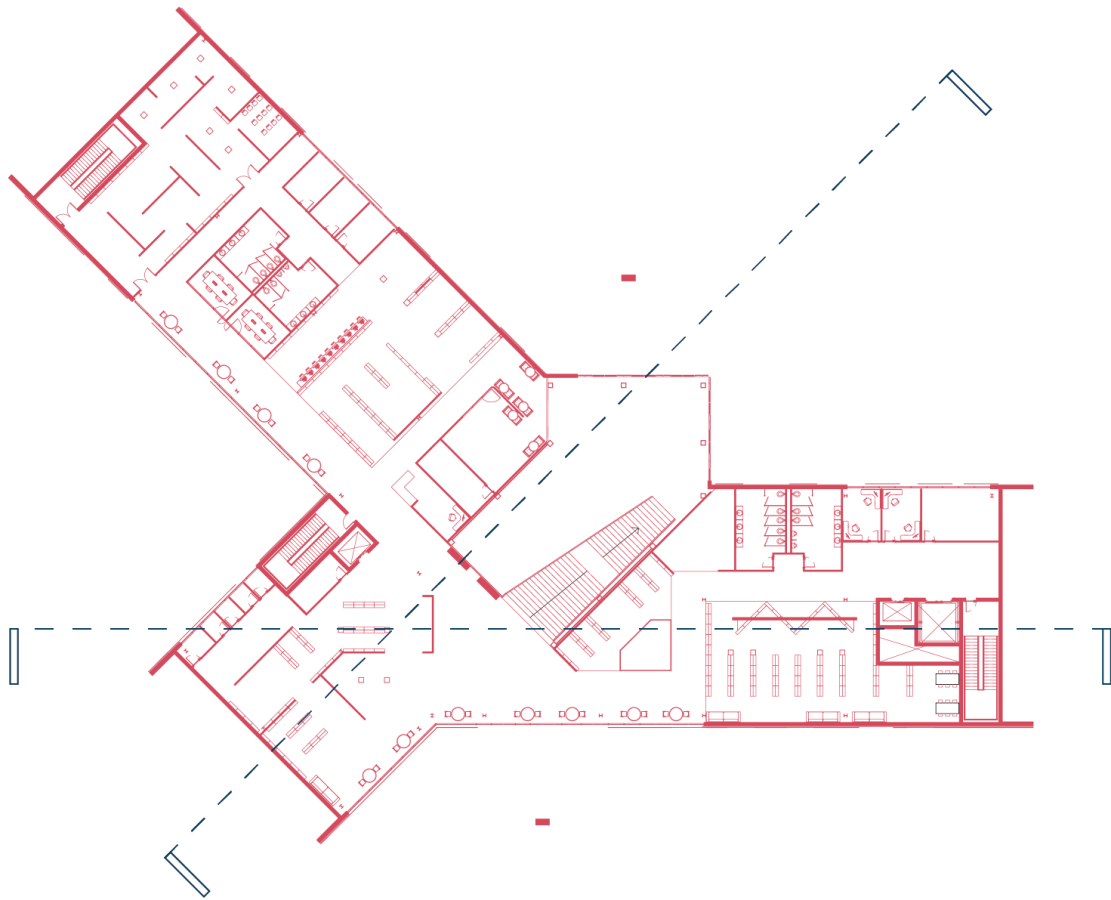
Figure 72. Second floor plan showing section cut lines

Both the full ceiling height is visible in the section views below, and the children's section being depressed three feet lower than the rest of the first-floor height in figure 72. The finished floor to finished floor height between the first and second levels is a generous twenty feet. The ceiling heights vary considerably between two standard heights over the collections and secondary hallways, and the sloped wooden ceiling over the primary corridors. The lowest ceiling height is a comfortable eleven feet and nine inches while the highest ceiling height in the lobby is a drastically different forty-six feet tall. The total height for Bakken Cultural Archive is fifty feet, placing it at one of the tallest structures within Williston Square, the tallest being the proposed hotel attached to the event center on the opposite side of the civic area.
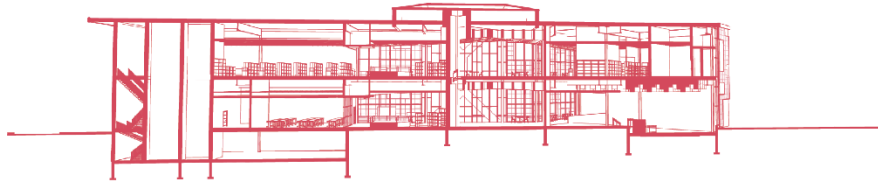
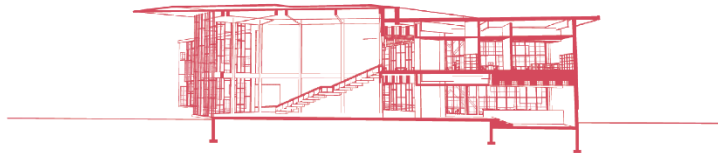Figure 73. North Section

Figure 74. Northwest Section

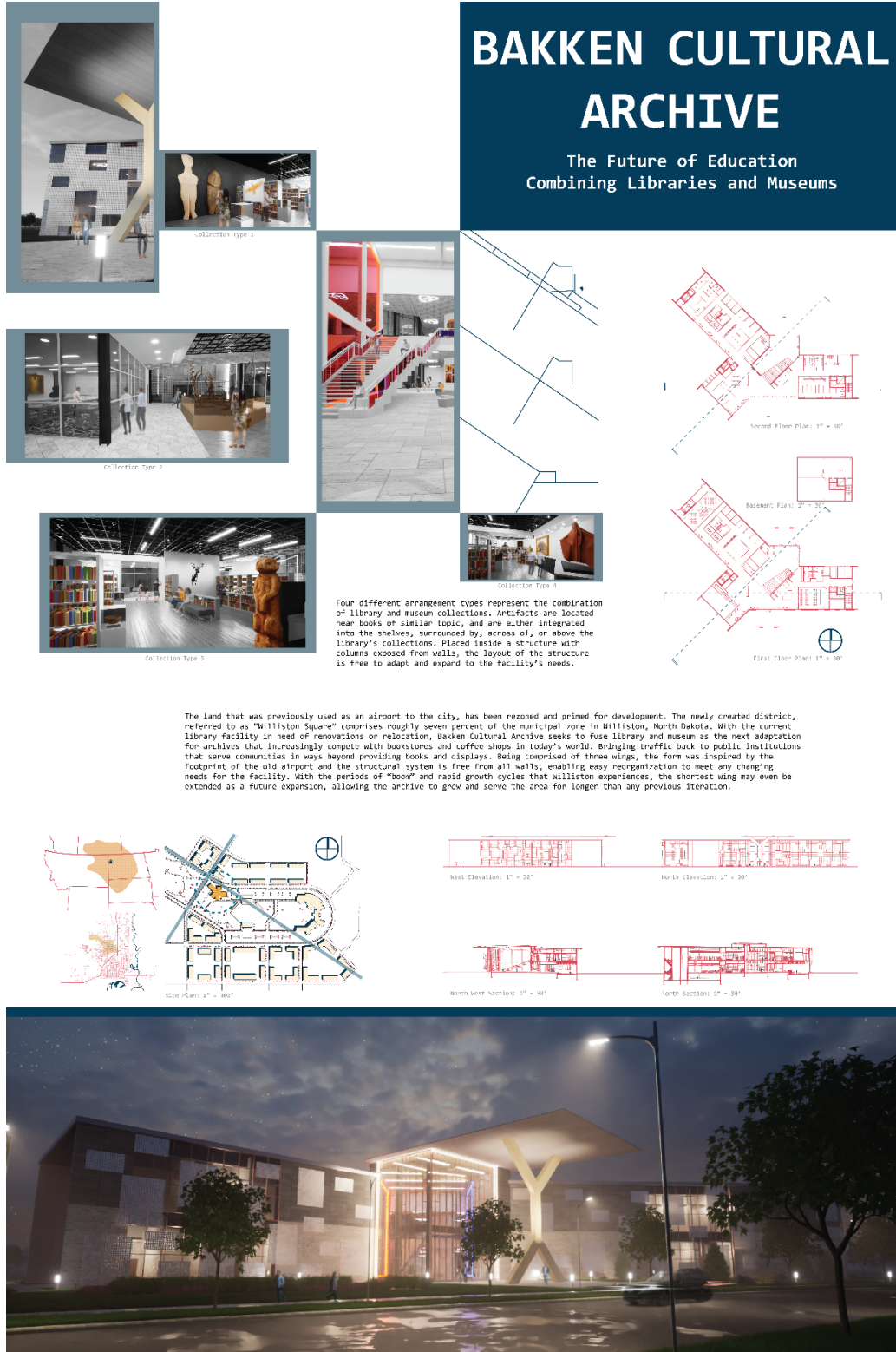## 4.2.2. Physical Models and Boards

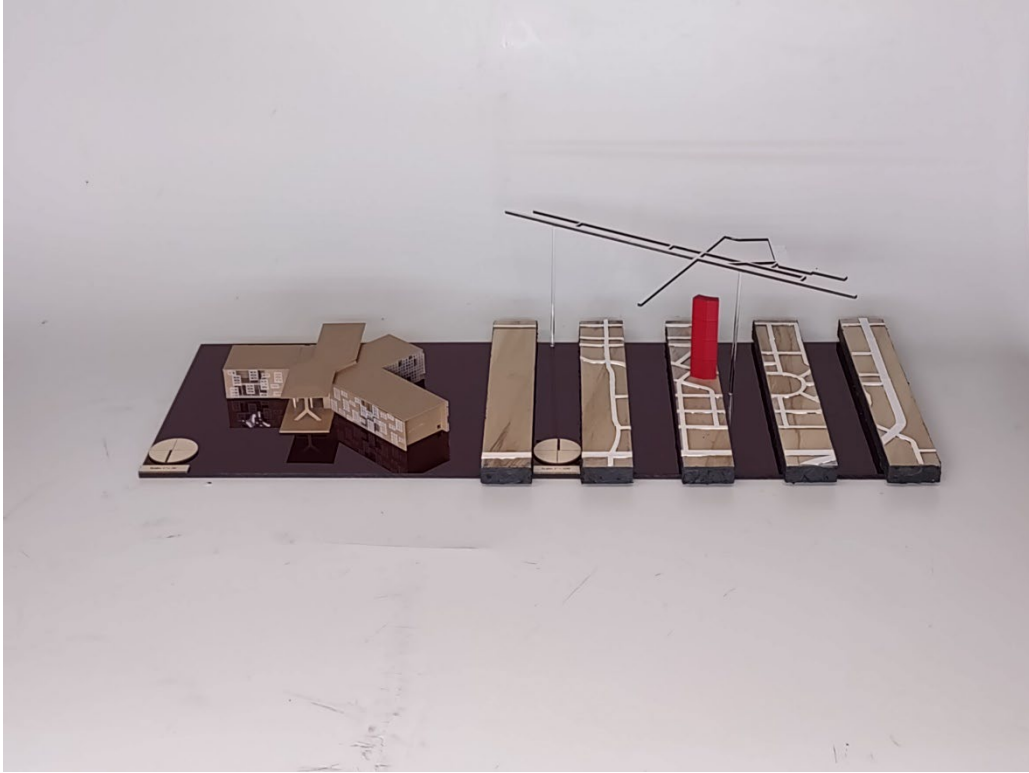
Figure 75. Bakken Cultural Archive complete boards

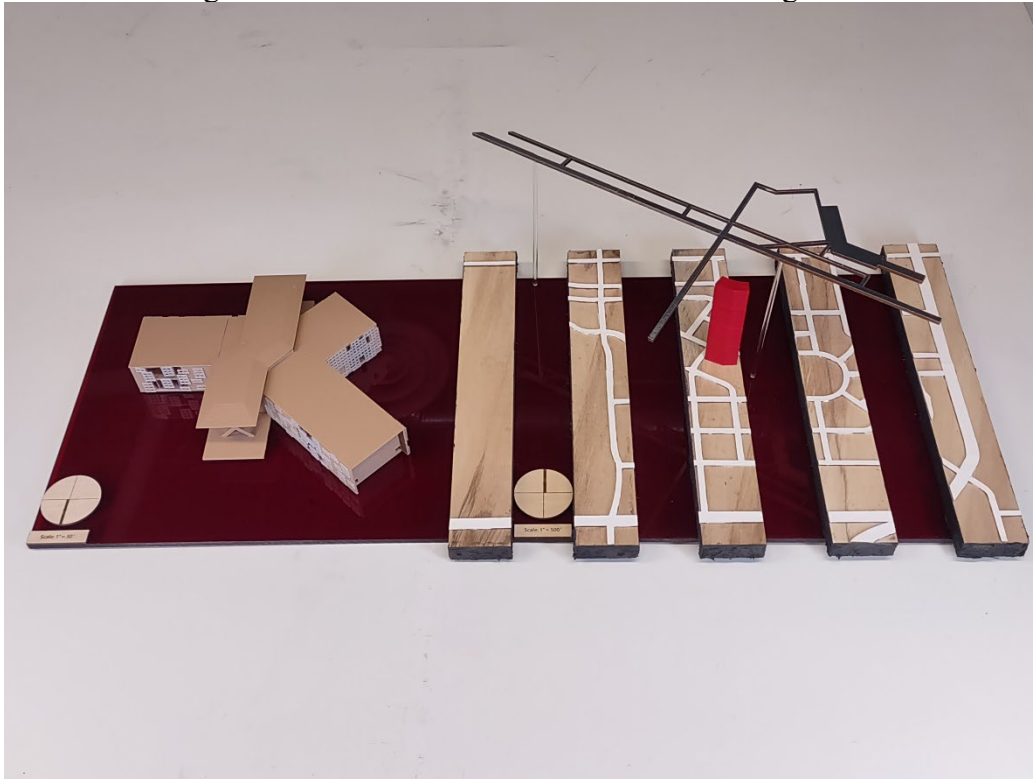Figure 76. Bakken Cultural Archive model image one

Figure 77. Bakken Cultural Archive model image two

The creation of the physical model was achieved through two phases. The initial exploration phase began in January alongside conceptual sketches to explore the site and to identify the area for the archive. Wood blocks were sourced from the left-over bin at the wood shop in the basement of Renaissance Hall. A scale of one-inch equals five hundred feet was chosen for the site model, and the pathways for the roads then laser cut and glued to their wood bases.

Only half of the visual data for the site model is represented. Since at the time of design for this thesis Williston Square was under construction, the decision to include half of the site in staggered elements was made to reflect its in progress and unfinished state. The wood bases, measuring two inches thick, are staggered with the roads painted white on top. The site boundary is noted with the towering red boundaries underneath the outline of the airport covered in a metallic sticker. The airport is supported by acrylic legs which rise from the main red plastic base.

The building model was completed later, throughout march and April. Constructed primarily of a 3-D printed wood-based filament that is brown in color at a scale of one-inch equals thirty feet, the same scale used in the boards. The remainder of material for the building model consists of hand-cut plastics and wood. Both models feature laser cut north arrows and scales.

4.3. Conclusions and Future Work

The design for Bakken Cultural Archive achieves its goals for combining libraries and museums through its use of arrangement types in all its collection's spaces. It can meet the needs of any individual no matter how social, or isolated their visit, through its wide variety of seating options. The archive is effectively a free to access third space that is both accessible to

83

Williston's current population, and future population following prevailing growth patterns in the city.

The proposed scale is appropriate for the current size of Williston considering that the facility is not a strictly dedicated library or museum. With considerations applied in the structural systems, ceiling finishes, and site locations at the edge of a park, Bakken Cultural Archive can grow alongside its community with preparations for expansion already planned for with its current design. Instead of modifying an existing structure through reconstruction or the addition of wings that do not fully match the character of an original design, the archive is prepared to serve the community of Williston and visitors for a period considerably longer than either of the previous library facilities where capable of.

While the archive does not take full advantage of its exterior space, a more successful iteration would have compensated for the extremes in weather patterns that are common to the Midwest. Even though the winters can be cold for durations long enough to dissuade outdoor recreation in these months, there are strategies to offset these conditions. Extending interaction with the design beyond the desirable months of summer, where outdoor events are commonplace and likely to occur in this season at the nearby amphitheater.

Future work should strive to investigate archives and communities with sizeable nocturnal populations. Post covid businesses have seen hours reduced, and few twenty-four service amenities can cater to the needs of individuals whose schedules operate outside a traditional timeframe. Additionally, research might include investigating the feasibility of a combined library and museum with collections both indoor and outdoor, resilient enough to operate through extreme weather or temperature conditions.

REFERENCES

Arne. (2011, June 2). North Dakota's Oil Bust in the 1980s. *A Brief History of North Dakota Oil Production*. https://northdakotaoil.wordpress.com/2011/06/02/north-dakota%e2%80%99s-oil-bust-in-the-1980s/

Babcock, G. (n.d.). *Discovery Center of Springfield* [Photo]. Retrieved April 29, 2024, from https://www.springfieldmo.org/listing/discovery-center-of-springfield/1053/

Bailey, C. (n.d.). *Laurentian Library* [Working drawings]. Retrieved May 9, 2024, from https://www.chrisbaileyarchitecture.com/laurentian-library

Bell, G. (n.d.). *Mark Dion: Theatre of the Natural World, Whitechapel Gallery, London, UK, 13 February 2018 | GBPhotos* [Photo]. Retrieved May 9, 2024, from https://www.gbphotos.com/image/I000018haULcKKW8

Brown, C. R. (2002). *Interior design for libraries: Drawing on function & appeal*. American Library Association.

Camocini, B. (2022). *Engaging Spaces How to increase social awareness and human wellbeing through experience design*. FrancoAngeli.

City of Williston. (n.d.). *Civic Center Conceptual Site Plan* [Masterplan].

Definition of ARCHIVE. (2024, April 18). https://www.merriam-webster.com/dictionary/archive

Diamond Jubilee and Fair. (1962). *Since 1887: The Story of Williston and Area*.

Die Museen Von Florenz. (n.d.). *Bibliothek Laurenziana—Florenz* [Photos]. Images 3 and 10.

Retrieved May 9, 2024, from

http://www.florentinermuseen.com/musei/bibliothek_laurenziana.html

Future libraries: Dreams, madness, & reality - North Dakota State University. (n.d.). Retrieved

August 29, 2023, from

https://ndsu.primo.exlibrisgroup.com/discovery/fulldisplay/alma9943237450001321/01ODIN_N

DSU:ndsu

Gifford, T. (n.d.). *Meditative spaces—North Dakota State University*. Retrieved October 13, 2023,

from

https://ndsu.primo.exlibrisgroup.com/discovery/fulldisplay/cdi_proquest_journals_206047063/0

1ODIN_NDSU:ndsu

Glückler, J. (2017). *Knowledge and Networks* (1st ed. 2017.). Springer Nature.

https://doi.org/10.1007/978-3-319-45023-0

Google Satellite Imagery. (2024a). *Community Library Satellite Image adapted from Google Maps*

[Satellite image]. https://www.google.com/maps/@48.1569682,-

103.6393472,759m/data=!3m1!1e3!5m1!1e4?entry=ttu

Google Satellite Imagery. (2024b). *Williston Square adapted from Google Maps* [Satellite image].

https://www.google.com/maps/@48.1782147,-

103.6472775,3863m/data=!3m1!1e3!5m1!1e4?entry=ttu

Hamar Public Library. (2014). *Hamar Public Library, Norway*.

https://wearelibrarypeople.com/news/hamar-public-library-norway/

Harvard University. (n.d.). *Find a Space | Harvard Library* [Photo]. Retrieved May 9, 2024, from

    https://library.harvard.edu/spaces

Haveford College Libraries. (n.d.). *Study Spaces* [Photo]. Retrieved May 9, 2024, from

    https://www.haverford.edu/libraries/places/study-spaces

Henningsen, E. (2020). *Libraries, Archives and Museums as Democratic Spaces in a Digital Age*. De

    Gruyter. https://doi.org/10.1515/9783110636628

Holzherr, F. (n.d.). *James Turrell: Roden Crater, East Portal* [Photo]. Retrieved May 9, 2024, from

    https://www.florian-holzherr.com

Kahn, L. (n.d.). *Gallery of AD Classics: Kimbell Art Museum / Louis Kahn - 13* [Sections]. Image 20.

    Retrieved May 9, 2024, from https://www.archdaily.com/123761/ad-classics-kimbell-art-

    museum-louis-kahn/503808a328ba0d599b000a3f-ad-classics-kimbell-art-museum-louis-kahn-

    photo

KC Parent Magazine. (n.d.). *Discovery Center of Springfield* [Photos]. Retrieved May 9, 2024, from

    https://kcparent.com/locations/discovery-center-of-springfield/

Kemp, R. L., & Trotta, M. (2008). *Museums, libraries and urban vitality: A handbook*. McFarland &

    Co.

LAMA Library Buildings Preconference. (1992). *Libraries for the future: Planning buildings that*

    work : papers from the LAMA Library Buildings Preconference, June 27-28, 1991.

Laprelle, R. (2013). *Where the Art Is* [Photo]. https://www.sanantoniomag.com/where-the-art-is/

M HKA Ensembles. (1994). *Skyspace—M HKA Ensembles* [Photo].

    http://ensembles.mhka.be/items/3833

Mandelli, C. (n.d.). *Mark Dion's "Theatre of the Natural World" in London* [Photo]. Retrieved May

    9, 2024, from https://www.domusweb.it/en/art/2018/03/08/mark-dions-theatre-of-the-natural-

    world-in-london.html

Muncie, K. (2015). *Kimbell Art Center* [Photo]. https://www.architectmagazine.com/project-

    gallery/kimbell-art-center

Myller, R. (1966). *The design of the small public library*. R.R. Bowker Co.

Oldenburg, R. (1991). *The great good place: Cafés, coffee shops, community centers, beauty parlors,*

    general stores, bars, hangouts, and how they get you through the day (1st pbk. ed.). Paragon

    House.

Renna, M. (2017). *Michelangelo's Laurentian Library* [Photo]. https://isiflorence.org/michelangelos-

    laurentian-library/

Richters, C., Ruault, P., & Baan, I. (n.d.). *Seattle Central Library, Seattle* [Photo]. Retrieved May 9,

    2024, from https://arquitecturaviva.com/works/biblioteca-central-de-seattle-0

Shaer, D. (2023). *The Kimbell Art Museum Celebrates 50 Years of Shining Natural Light on*

    International Art [Photos]. https://texashighways.com/culture/art-music/the-kimbell-art-

    museum-celebrates-50-years-of-shining-natural-light-on-international-art/

St. Louis Science Center. (2018). *Top Children's Science Museums Across the US for Families*

    [Photo]. https://mommypoppins.com/new-york-city-kids/family-travel/top-childrens-science-

    museums-across-the-us-for-families

Swimmer, L. (2013). *Revisiting Rem Koolhaas's Central Library and Peter Bohlin's City Hall in*

    Seattle [Photo]. https://www.architectmagazine.com/Design/revisiting-rem-koolhaass-central-

    library-and-peter-bohlins-city-hall-in-seattle_o

Tanya Bonakdar Gallery. (n.d.). *Mark Dion* [Photo]. Retrieved May 9, 2024, from

    https://www.tanyabonakdargallery.com/artists/34-mark-dion/biography/viewing-room/

Tanya Bonakdar Gallery. (2018). *MARK DION: THEATRE OF THE NATURAL WORLD* [Photo].

    https://www.tanyabonakdargallery.com/exhibitions/304-mark-dion-theatre-of-the-natural-world-

    whitechapel-gallery-london/

The Ohio State University Pressbooks. (n.d.). *Seattle Public Library* [Photos]. Images 5 and 8,

    Drawings 1 and 3. Retrieved May 9, 2024, from

    https://ohiostate.pressbooks.pub/exploringarchitectureandlandscape/chapter/seattle-public-

    library/

The participatory museum—North Dakota State University. (n.d.). Retrieved August 29, 2023, from

    https://ndsu.primo.exlibrisgroup.com/discovery/fulldisplay/alma9947386607401321/01ODIN_N

    DSU:ndsu

The University of Texas at Dallas. (n.d.). *Residential Camps and Conference Services—Residential*

    Camps & Conference Services | The University of Texas at Dallas [Photo]. Retrieved May 9,

    2024, from https://conference.utdallas.edu/

Truschel, J., & Reedy, D. L. (n.d.). *National Survey – What is a Learning Center in the 21st Century?*

University of Scranton Weinberg MemorialLibrary. (2010). *After!* [Photo].

    https://www.flickr.com/photos/universityofscrantonlibrary/4910465522/

Waxman, L. (2006). The Coffee Shop: Social and Physical factors Influencing Place Attachment.

    Journal of Interior Design, *31*(3), 35–53. https://doi.org/10.1111/j.1939-1668.2006.tb00530.x

Williston Economic Development. (2022). *2022 Was A Good Year For Williston* [Land use map].

    https://keyzradio.com/2022-was-a-good-year-for-williston/

Williston Herald. (2022). *By The Numbers: Williston Community Library 2021 Year in Review*

    [Photo]. https://www.willistonherald.com/news/regional/by-the-numbers-williston-community-

    library-2021-year-in-review/article_7eacf8a8-89e3-11ec-bae0-b7f329f040b4.html

Woo, J.-H. (2003). *Case study of tacit knowledge sharing in a distributed design studio*. CRS Center,

    Texas A & M University.