

The New Modern Library

A Design Thesis Submitted to the
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of North Dakota

By

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This thesis focuses on the relationship between a building and its contents, how this affects the layout and appearance of the building, and the changing needs of a typology. The typology used in examining this relationship is a library. The site for the project is in Duluth, Minnesota. The theoretical premise of the thesis is that “with changing technologies and social norms, how can we increase the importance of the Public Library and the books they contain without letting either fade into disuse?” The Project Justification is “Buildings have the ability to focus the attention of the public. Even when things such as books and the internet have different values in today’s society, a well designed library has the ability to sustain a balance and give equal importance to all of its contents.”

With changing **technologies** and **social norms**, how can we **increase** the **importance** of the Public **Library** and the books they contain without letting either fade into **disuse**?

STATEMENT OF INTENT

Project Typology

The typology for this thesis is a library.

Claim

The change from books to digital media in society has affected the use of the library and its importance in the public eye. The building must adapt to the new forms of media taking precedence.

Theoretical Premise/Unifying Idea

The design of a model for future libraries which focuses on creating a sense of balance between old and new media will create a sense of harmony in the architecture and the user, and restore the library as a cornerstone of society.

Premises

Actor: Architects have a responsibility to not only the sustainability of the environment, but to the sustainability of culture and materials through what they create. Literature has to not only be housed in libraries, but sustained and celebrated by them.

Action: A UK study has found that more and more children aren't reading because they're "too embarrassed to read in front of their friends" (CBS Washington). Technology is beginning to make books look outdated and less desirable.

Object: A good library will encourage reading by emphasizing the importance of books and merging technology with written literature in the library.

Project Justification

The popularity of the library is decreasing, the influence of architecture can subconsciously give significance to the books inside the building. Architecture has the power to shape the direction of society through the issues it advocates. Even when things such as books and the internet have different values in society, a well designed library has the ability to sustain a balance and give equal importance to all of its contents. Instead of allowing print to become outdated, architecture can sustain its importance.

THE PROPOSAL

For millennia, books have had an integral place in society, used to keep historical record, educate the public, and even for entertainment. For thousands of years the book has remained the same, and only in the last few decades have increasing advances in technology begun to overshadow tangible literature. For this reason it is important to embrace advances in technology and find ways in which technology and books may support each other. As it would be nonsensical to fight technology, it would also be tragic to lose tangible books.

There will always be a desire for new technology, bigger, better, more things fit into a smaller package. An example of this flux can be seen in music; from the record to the eight-track, the cassette to the CD to the mp3. Through all those stages it would seem the record would become extinct, and though they disappeared from the shelves, people saved their records for decades, and they have finally made a resurgence in stores because people have realized the unique sound quality from a record is just not the same as modern mp3s. It is the same with books. You can read a digital book or look at the internet or watch a movie, but books will always have a tangible quality that people will not want to lose.

For this reason my intention is to remind people of the inherent quality of books by bringing them back into focus in a well designed library. “Well designed” meaning a library in which the interior has a direct influence on the actions and intentions of the patrons. And a “library” becoming a source of information in both paper and digital form, while at the same time becoming a place for multiple functions, drawing people in and becoming a center for the public.

In Duluth, Minnesota, roughly half of the population owns a library card. That is much too large of a number of people not taking advantage of their local library system. This is also another reason for designing a new library which will encourage public use.

“Do you know why books such as this are so important? Because they have quality. And what does quality mean? To me it means texture. This book has pores....The more pores, the more truthfully recorded details of life per square inch you can get on a sheet of paper, the more ‘literary’ you are.”
(Bradbury, 1953)

Users

The Library will mainly be under the patronage of the citizens of Duluth, but will also be open to visitors from other locations. As of 2011, the population of Duluth was 86,277.

The current Duluth Public Library has 47,965 card carrying members; just over half of the current population. I intend for my library to increase that number by one third to 63,953 patrons.

People of all ages, races, and economic statuses will have access to and be using the library.

Employees

As the library is a public building funded by the city, library staff will be employed by the city and also consist of volunteer staff.

Restaurants and retail will be funded by the commercial ventures occupying the space. Including these functions also allows for commercial funding of the entire library building, alleviating the need to rely solely on city funds.

Peak Usage

Peak usage of the library will most likely be between 12-2, and from 5-close on weekdays, and during the afternoon on weekends.

Use of the retail and restaurant areas will range over the course of the day and extend into the evening.

Site Restrictions

There are physical restrictions associated with the site, which is the site of the current Duluth Public Library. The site is an urban infill of a long and narrow area, surrounded by streets on all four sides, one of which is a main street for traffic through the city.

Book displays

Displays and shelving units for books will be a crucial part of the library, as the displays must be well organized, easy to use, and encourage book use.

Digital Media

Digital media will be integrated throughout the library with the material literature, as well as having specialized locations where patrons can peruse DVDs and CDS.

Computer Access

Clusters will be provided for computer and internet use, as well as for classes in digital learning. Access will also be provided in multiple areas for personal computers.

Children's Area

The children's area will be a safe, fun and friendly space for children to experience books and stories, as well as experience digital media.

Study Areas

Quiet areas will be provided for study and research.

Specialized Interest Areas

The library will include areas with more focused interests, such as current and historical magazines and newspapers and microfilm.

Cafe

The library will house a cafe which allows patrons to enjoy their book, or simply socialize with refreshments.

Retail

The library will also support alternative uses such as retail to encourage patronization.

SITE INFORMATION

Region

The site is located in the upper Midwest of the United States in Duluth, Minnesota.

Duluth is located on Lake Superior. Multiple elevations give the area a hilly terrain. The region is home to multiple national forests and campgrounds. The climate of the area is heavily influenced by the winds blowing off of Lake Superior, with winters being slightly warmer by the lake, and cooler inland.

City

Duluth is a city founded on the shipping and mining industry with an economy now mainly funded by tourism. Tourist season is especially high in the fall when people come to the city and campgrounds when the leaves are changing color. The population is 86,277 as of 2011.



Figure 1. Site Location by Country. (Google Maps, 2012)

Site

The site for the thesis is located on the site of the city's current public library. It is located on Superior Street, which is the main road running directly through the entire city. The site is in the downtown area, in the middle of public transportation, and directly off of the freeway entering in to the city. It is also in close proximity to the city's popular "Canal Park" area.



Figure 1.3 Site Location by City. (Google Maps, 2012)

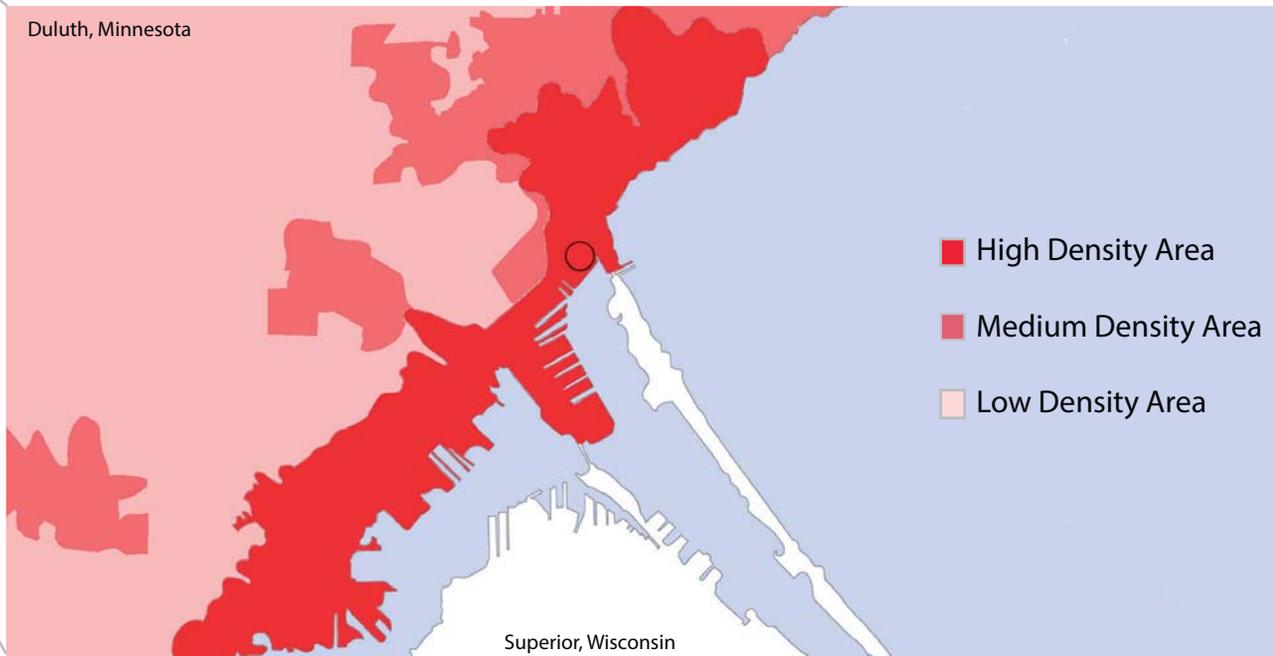


Figure 1.2 Site Location by Region. (Google Maps, 2012)

Major project emphasis will center around the use of books and how to design the library to encourage the use of books by the public.

Secondary project emphasis will include the use of digital media in today's world and how to blend digital media and tangible literature.

Tertiary project emphasis will involve the inclusion of alternate uses to bring in patrons.

Research Direction

Throughout the research and design process the theoretical premise, typology, the historical context of the area and typology site analysis and programmatic requirements will be investigated for this thesis.

Design Methodology

The research process will continue throughout the entire thesis process, including a mixed approach using both qualitative and quantitative data collected simultaneously and will be guided by the theoretical premise.

Qualitative data will consist of following a concurrent transformative strategy involving archival research, interviews, graphic and digital analysis, and visits to various buildings of the same typology.

Quantitative data will involve statistical research and scientific data collected through archival research.

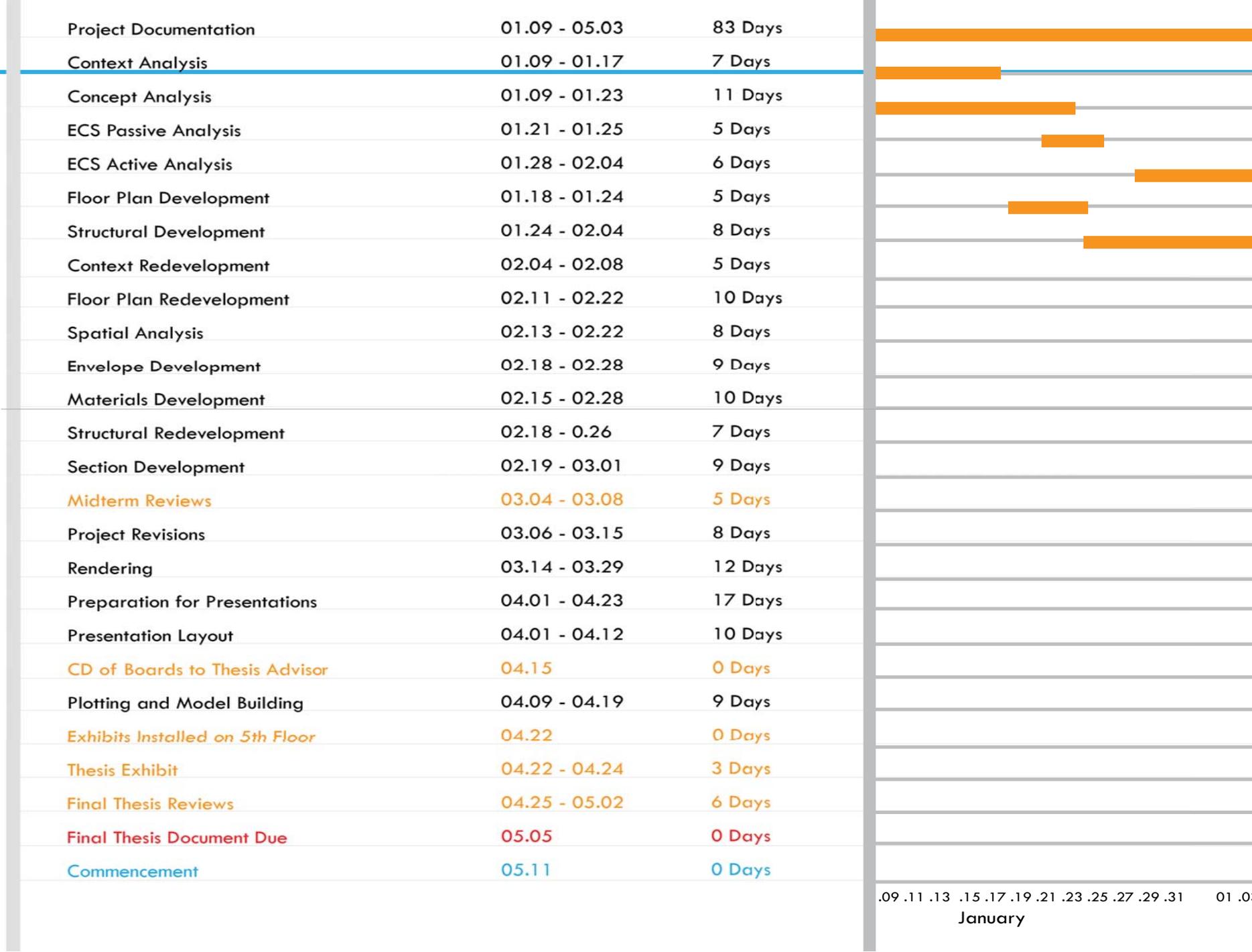
Plan for Documenting

The thesis will be contained in drawing, word, Illustrator, and Photoshop documents throughout the entire process, compiled in InDesign and backed up on an external hard drive.

The final Thesis Project will be plotted on boards for display and displayed in model form.

The final Thesis book will be contained in a digital copy both contained in the NDSU Library Repository and an external hard drive. The book will also be in a printed hard copy version.

Spring Schedule 2013



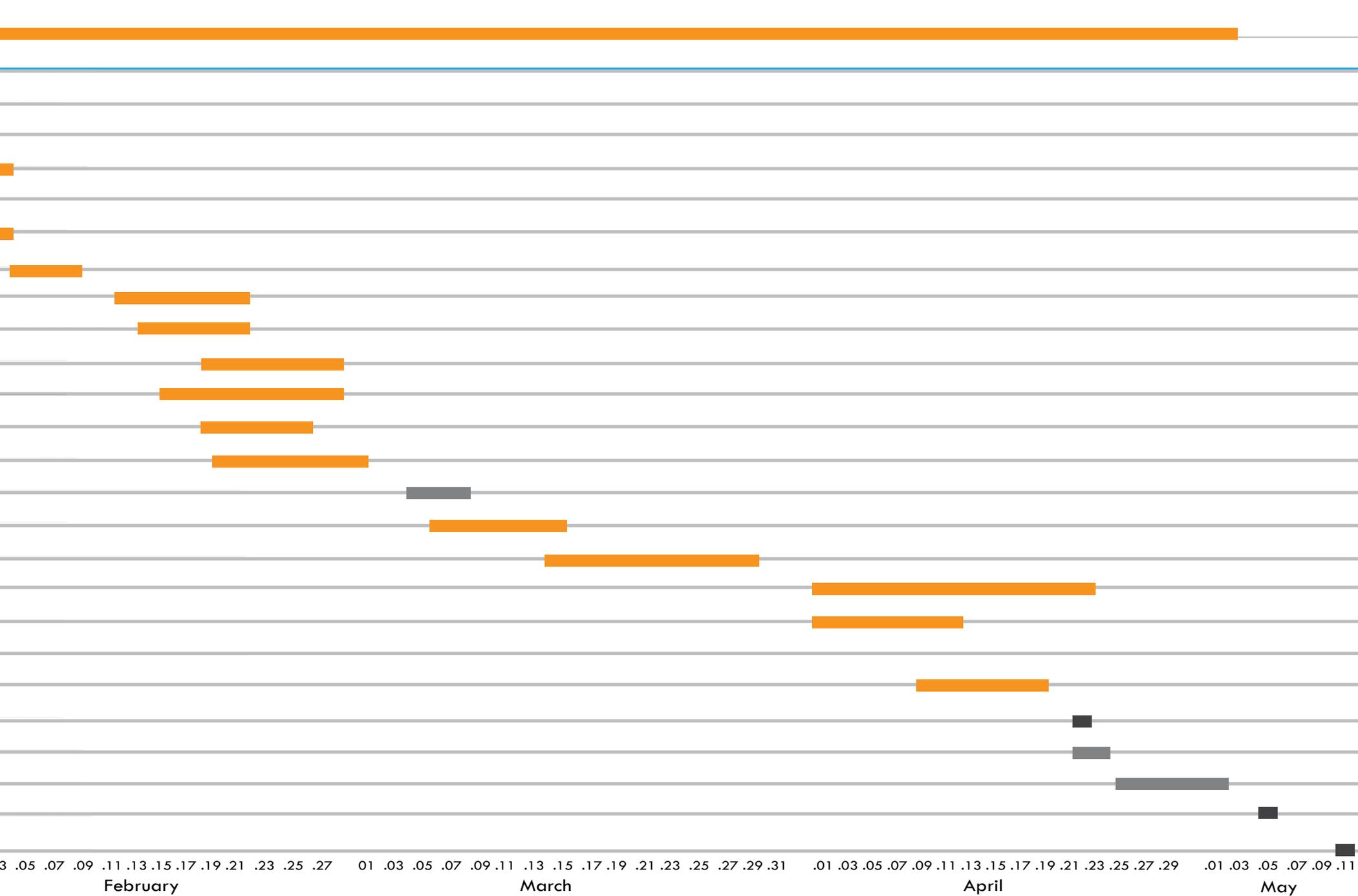


Figure 2.0

Previous Studio Experience

Second Year Studio

Fall 2009

Heather Fischer

Tea House, Fargo ND
Boat House, Minneapolis MN

Spring 2010

Darryl Booker

Montessori School, Fargo ND
Small Dwelling, Boulder CO

Third Year Studio

Fall 2010

Milton Yergens

Guitar Museum
Snow Symposium
Freemasons Lodge

Spring 2011

Regan Schwaen

Indoor Beach, Fargo ND
Concrete Charrette, Fargo ND

Fourth Year Studio

Fall 2011

David Crutchfield

High Rise, San Francisco CA
KKE Trash to Treasure Competition

Spring 2012

Paul Gleye

Urban Infill Design, Lille France

Fifth Year Studio

Fall 2012

Ron Ramsay

Chapel Addition, Agincourt IA
Synagogue, Buenos Aires Argentina

THEORETICAL PREMISE RESEARCH

As technology in the world progresses and digital media begins to take a primary role in the way we receive and disperse information, libraries are now faced with having to re-evaluate their place in society and how they serve the public. The Council of Library Resources has pointed out that even though many believe that the library is an unchangeable establishment, destined to fade into disuse as more people rely on technology, that in reality, “the information structure of the future has not yet taken shape” (Hannah; Harris, 1996). The Council of Library Resources also calls upon architects who are concerned with the future of the library to work with the structure of the library before one is “imposed by default” (Hannah; Harris, 1996). It is imperative that this call is answered before the library and the books and information services the library contains is seen as an archaic establishment. In order to comprehend the best way to establish what could become the modern library structure, and outline the library’s role in information services, one must first understand the historical significance of the library, its place in current society, the role of the books they contain, and the role of digital media today. Only after understanding all of these things will it be possible to design the most advantageous model for the modern library.

The library has been a central establishment throughout history. In the past they were seen as the keepers of cultural history and knowledge. As it became the goals of conquering societies to gather as many books as possible, libraries became symbols of power. The library at Alexandria and the Library of Congress were historically enormous storage facilities, prized for the

Despite many claims and assertions, the information structure of the future has not yet taken shape, but the pace of change is such that it is imperative that ‘architects’ of great skill, who are concerned with the well being...of libraries go to work with some sense of coordination before a structure is imposed by default.

Council of Library Resources

rare, the valuable, and the vast quantities of books in their collection and made available to the public.

Over time the library became more than a symbol of power and knowledge amassed by one person in a private or national collection. The first public library was established in the United States in 1833, bringing men together as manifest equals, giving everyone access to the same amount of knowledge and encouraging the public to better themselves through learning.

The library is still largely seen as a repository for books, giving people the opportunity to research in the building or take the books home for a period of time. However, the library also serves another purpose, Trevor Boddy, architecture critic for the Vancouver Sun, describes the library as a “populist building type” which serves “all classes, all ages, and all education levels” (Boddy, 2006). Here Boddy highlights the library as the continued great equalizer of the masses; anyone can own a library card and come together in the same building to take advantage of the services provided by the library. However, as an institution for the masses, use of the library by the public is declining. Other sources of information are becoming readily available at the touch of one’s fingertips. It has been cited that a “rapidly growing percentage of the use of electronic library resources occurs outside of the library”, which in some cases has exceeded seventy-five percent of library sources accessed from an institution’s collection (Troll, 2001).

The library has also occupied a civic role in modern society, providing ways for people to meet and discuss through book clubs, giving lectures and classes open to

the public, and as one way to adopt emerging technology libraries also offer classes in how to use computers and facets of the internet. Libraries have begun adopting other civic functions to continue to be a part of the public service; some occupying the same building as a small municipal court and the department of motor vehicles. Other libraries have assumed a social role, housing coffee shops, some including stores and restaurants on the ground level, turning the library from a single into a multi-use facility. This has been done in order to encourage use and pedestrian traffic, displaying that as a model, the single library building is becoming outmoded and a visit to the library can be a part of other experiences.

In order to improve the trajectory of the library and ensure and even increase its use, it is paramount that as designers we understand these issues which are affecting the library, what is causing the functions of the library to change, and furthermore, what is keeping them from evolving quickly enough to keep pace with society's demands. Some pointed issues easily identified are the constraints on a library's budget, and the inability to keep pace with "developing information technologies and the internet" (Troll, 2001). The restricted budgets dealt with by most libraries and the growth of information services illuminate the need to anticipate future changes before they arrive, lest the results of a research project become inapplicable by the time the research could be analyzed and implemented because of the sheer rate of technological change. Library budgets have a hard time covering the increasing costs of new technologies which become out-dated almost as quickly as they are produced. For this reason it is easy to see how many

Libraries are not just repositories of books. They are communities, sources of expertise, and homes to lovingly compiled collections that amount to far more than the sum of their individual printed parts.

The Bookless Library. David A. Bell (2012)

libraries hesitate to purchase any new form of technology that has not proven that it will stand the test of time and be an invaluable service. When considering design forms for a new library and especially when taking into account how to merge relevant technologies with the library functions, it will be important to invest in technologies which can adapt with the library, that will not be quickly outmoded, and the can encompass multiple needs and perform multiple functions.

The significance of books lies in the recording of historical events and interpretations. The recording of narrative whether fact or fiction is a window into the culture of the time it was written. The literature contained in books allows us to experience a full spectrum of emotions, teach us about other people, broaden our spectrum of language, and help us “come to a greater understanding of our world and ourselves.” (Cairney, 2011, p114)

For many, the appeal of books resides in their “aesthetic qualities: the feel of the paper,...the heft of the volume in the hand”, (Bell, 2012, p32) the history that is behind every piece of literature ever written can in essence be felt and experienced in each volume printed, much as it might have looked the first time it was ever printed. There is a quality to the physical act of turning a page that cannot be found in the scroll of the computer mouse. Though the digital world provides quick access to a multitude of information, one must sift through the millions of sources to find the credible ones. A book provides a guaranteed credible source and often can point to other sources. Furthermore, many scholars prefer stacks of books and articles they can physically quantify and highlight, sift through and visibly see the progress they have made

as opposed to clicking through numerous files on a computer.

In the mix of literature and digital media today, it is imperative that we avoid “the folly of extreme deconstructive postmodernism” which is “to argue that all texts are equal” (Cairney, 2011, p114); to say that a facebook post, a poem, a newspaper article, a blog, a bumper sticker, and a journal article are all equal in value. On the other hand, it seems that a facet of this idea must be used when designing a new library. In order to make the building and institution relevant, it will be crucial to give importance to all forms of information, whether they are paper books, digital journals, e-books, or documentaries. These sources of information have all become highly relevant in society, and each person has a preference towards which type they enjoy to use the most. In order for the library to flourish and in order for paper copies of books to survive, the books must relinquish the full spotlight as the main draw of the library and develop a symbiotic relationship with their digital counterparts, as opposed to fighting for dominance. For if this remains the case, in what has been coined “the digital age”, it is possible that books would eventually lose the fight.

Digital media has begun to take more and more prevalence in current society. Current technology is able to provide a world of information at one’s fingertips with the press of a few keys on a computer, or even a phone. Digital media has the ability to open the world to someone without even having to leave their home. One is able to access reliable scholarly literature for a research paper, search news and current events, communicate with family and friends, and even shop, all through one little device. Unfortunately,

many people, “mostly older” still do not know how to use these resources effectively; “The Bookless Library” claims that “these obstacles will largely disappear within twenty or thirty years” (Bell, 2012, p32). On the other hand, instead of waiting for general understanding to come around, other scholars site the librarian; not only a cataloguer and navigator of books, but as a resource to “provide access to and engender facility with Information Age concepts, techniques, and methods.” (Boddy, 2006) This highlights the developing role of the library and the librarian. No longer singularly experts on books and cataloguing and navigating resource materials, there is growing demand for librarians to have expertise in digital information databases and other forms of information technology. Much as the librarian must adapt to be a source of knowledge for information in both paper and digital formats, the library must also adapt to become an easily navigable locale in which to find both of these items.

Digital media allows for a mass distribution of information, however it has limitations. Computers crash, batteries need to be re-charged, and electronic, or “e-books” still need to be purchased like a paper book, the only difference there being the elimination of the need to drive to the bookstore. There are a number of e-books made available for free, such as many of the classic works of literature, unfortunately the other e-books still cost almost as much or sometimes more than the paper copy.

Although e-books are not the same as the paper copies that libraries have stored on their shelves for centuries, they still embody the narrative and information characteristic of literature which makes them so important. Libraries

have begun to adopt these new forms of literature by making e-readers available to be checked out and used by the public, as well as making electronic copies available through the library website to be downloaded for a limited number of weeks by people who already own an e-reader. Theoretically this means that the library would no longer need to devote the resources required to purchase and store books. However along with the limitations that still exist with e-books, Harper-Collins announced it “would only allow any individual e-book to ‘circulate’ twenty-six times” (Bell, 2012, p33) before the library would need to buy another copy. Conversely, when a library purchases a paper book, it is theirs permanently. The need to “re-purchase” something already purchased once emphasizes some of the issues which still need to be worked through regarding e-books and digital media; even though a book or journal has been published, they still retain links to the source which sold them, and seem to be “licensed” rather than “purchased”. An issue such as this arose when a woman purchased a used e-reader onto which she purchased and downloaded books, only to find one day that Amazon had wiped her account, making the books she had “purchased” unavailable to her.

Scholars have argued passionately on the issue of the direction in which they think the library should take. Some advocating the virtues of the book and the need to continue its existence in a fast-paced, consumer-driven digital world, others reproaching the book as useless “nostalgia” held on to by those too stubborn or afraid to embrace new, more effective technology (Bell, 2012, p32).

In the end, neither has to be the case. As opposed to elimi-

nating books and depending on technology, which is in need of continued development before it can be as reliable or navigable as its physical counterparts, and instead of clinging to the dusty pages of old books and ignoring the world of information made available at our fingertips, a balance between the two can and should be reached. Instead of arguing one or the other, books and digital media have the ability to support and enhance each other, keeping the “aesthetic qualities” (Bell, 2012, p32) of the book while taking advantage of the “utilities” (Boddy, 2006) of digital information. Current students are already relying on information available on the internet when writing research papers, preferring the twenty four hour a day access, and immediate search results. However, the problem with student reliance on web-based research is the concern “that many undergraduate students may be searching only 0.03% of the Web to complete their assignments”, using general search engines which only access roughly 16% of the available Web content and ignoring “books, journals, databases, full-text digital resources and other scholarly materials provided by the library” (Troll, 2001). Therefore, even as libraries make more information available on the internet, students and other members of the general public are still not aware of how to access and use these resources effectively. Different methods can and should be employed to inform users on how to access the types of sources which will be most beneficial for their use, but for this to be effective the user must first have the desire to take the time to learn a new (albeit more effective) method of research.

The growing concern is that many undergraduate students may be searching only 0.03% of the Web to complete their assignments, ignoring entirely the books, journals, databases, full-text digital resources and other scholarly materials provided by the library.

How and Why Libraries are Changing. (Troll, 2001)

When examining the concerns surrounding how to increase the relevance of the modern library, and how to design a model for future libraries, it is clear after sifting through a sea of information that a balance between paper literature and technology is not only necessary, but also achievable.

The theoretical premise research focused on understanding the fundamental issues surrounding library use and media components to gain a better understanding of how the library might better serve its public. Two main problems were identified in hindering increases in library use. One being use the stigma that is still associated with libraries as being devoted as a storage space for books, and therefore consisting of cramped, dimly lit, musty spaces where one must navigate endless stacks of shelves to find what they are looking for. Strategies in design to be used will require a flexible floor plan and ample day lighting, among other things, to avoid the dark, cramped library that is so often dreaded. The other encumbrance to library use is the restricted budget which the libraries must operate under, generally only having access to six percent of their institution's educational and general operating expenditures budget, making it difficult for the library to continually purchase the newest and most relevant technologies (Troll, 2001).

This has led to the library foregoing the loss of money on a technology that may quickly become outdated, and instead spending money on resources they know are reliable. This is an issue that needs to be overcome, as the

library must also adapt to serve the user, and provide the information sources which are becoming relevant today in a building which encourages one to enter and spend time.

Another contributing factor to the decline in public library use is that people have a difficult time seeing the benefit of doing something at the library that they could do without having to leave the comfort of their own home. Here the research shows that in order to support its continuance, the library would derive benefits from becoming a mixed use space. Furthermore, although people believe that they can access and find all of the information they need from their living room, what they seem to be unaware of is that a majority of the time they are missing truly valuable sources of information by using “surface web” search engines. By encouraging people to have more interaction with the library, even if what they are searching for are digital sources, they may become informed enough to take full advantage of the full-text scholarly sources provided online. All of this speaks to the necessity of designing a library that is not only a place to find information, but also as an appealing place to spend time, either in solitude or as a social meeting space.

Finally, in order to preserve the integrity of the library as a knowledge source, it is clear that a blending between the old and new, the paper and the digital must be achieved. Both books and digital information have their own distinct forms of sensory experiences, and a sense of balance can be achieved in the library building and between these elements by identifying and combining these

CASE STUDIES

AGAVE LIBRARY, PHOENIX ARIZONA



Figure 3.0

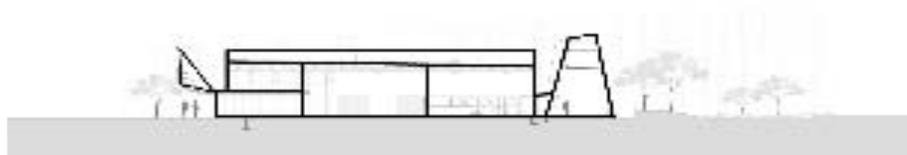
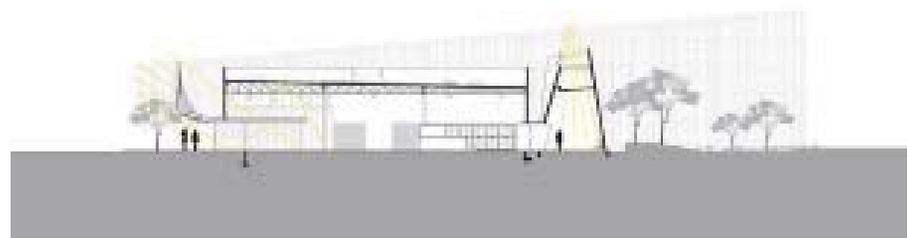
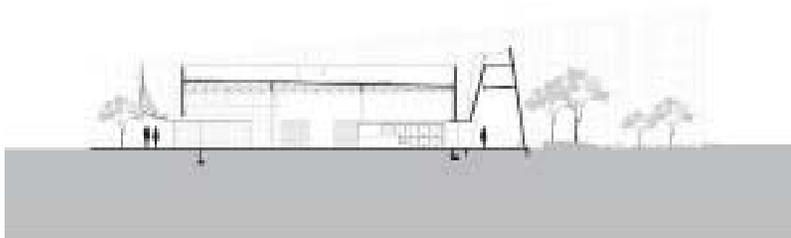
Public Library

25,410 Square Feet
\$6.65 Million

2009

Will Bruder+Partners

BREEAM Rated: Excellent



From left to right: Figure 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8



Figure 3.9

The Agave Public Library is characterized by the almost billboard-like façade which dominates the front of the building, concealing the inexpensive masonry construction of the actual library itself.

The façade is made of vertical strips of galvanized steel hat channels, which are attached to steel I-columns and tube beams. This structure is a false front for the library, with the entrance around the other side. Behind the false front is the library itself which is constructed of an inexpensive masonry box.

The entrance itself is made up of sandblasted concrete with sections of glazing along the bottom eight feet of the building. The blocks of concrete are angled slightly to create a texture on the façade. On the interior south side, the sections of concrete and glazing are above the lower eight foot section of the wall

The interior of the library relies on different forms of material to denote different sections of the library: steel partitions, strips of translucent plastic hanging from the ceiling indicate the computer area, colored carpet tiles on the concrete floor form area rugs for different spaces. In areas a lowered ceiling and skylights are used to create a different atmosphere.

The Agave Public Library does not have a significant effect on the theoretical premise, as it does not directly address the connections between printed and digital media. However, it does provide an interesting example of how to cope with a limited budget, a problem many libraries are currently facing. The library demonstrated effective and aesthetically pleasing ways of using materials to denote spaces. It also effectively was built off of the surrounding context, using the façade to elegantly reflect the areas shopping district. The library also successfully became a part of the community area and brought in patrons.

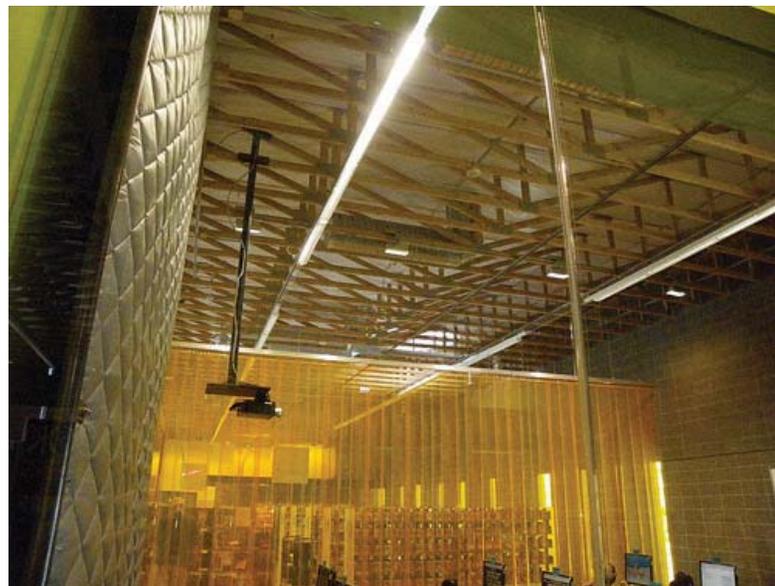


Figure 3.10

SEATTLE CENTRAL LIBRARY, SEATTLE, WASHINGTON



Figure 4.0

Public Library

362,987 Square Feet

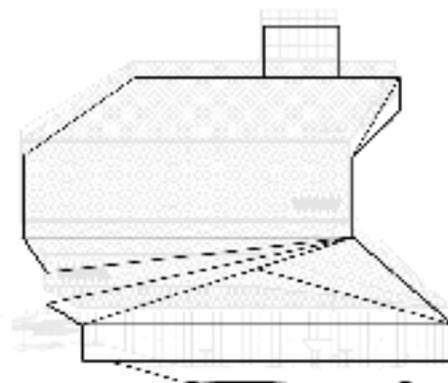
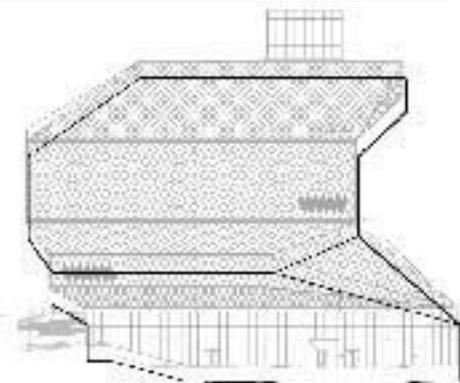
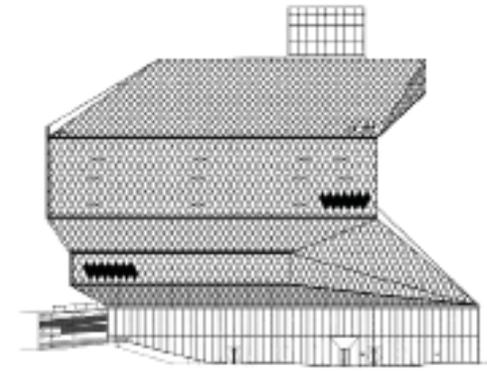
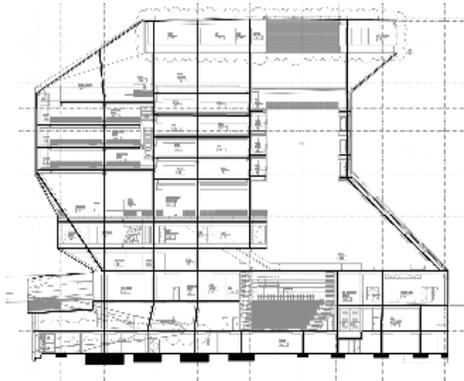
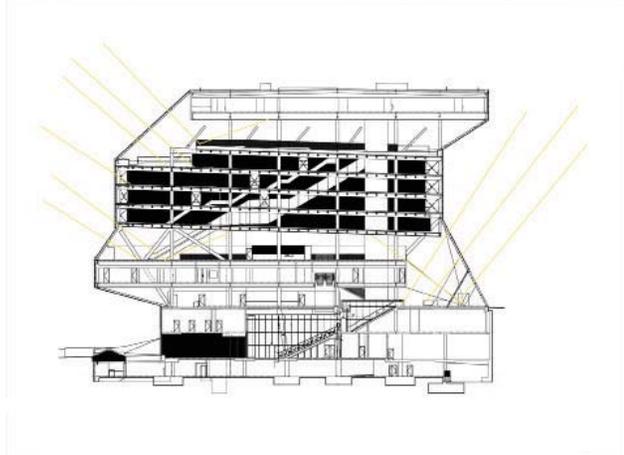
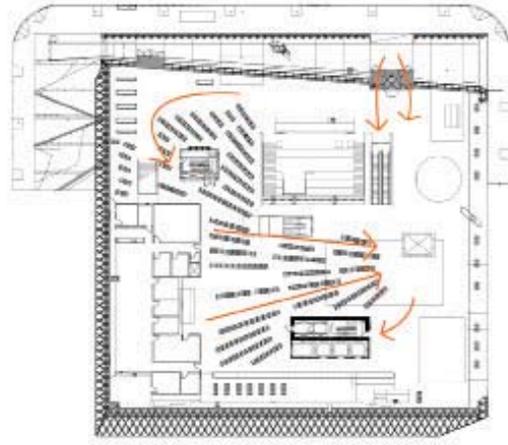
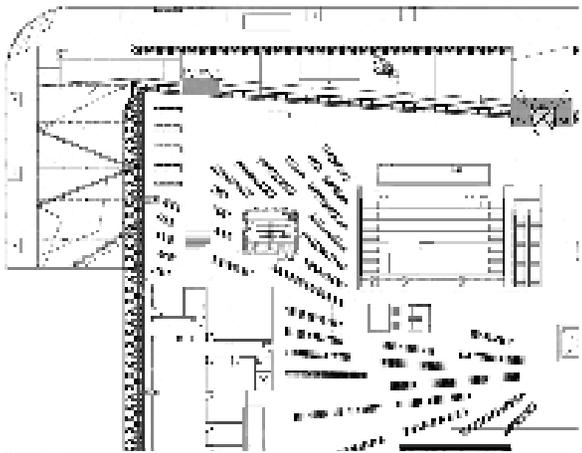
2004

\$169.2 Million

OMA and LMN

LEED Silver

55



From left to right: Figures 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 4.8



Figure 4.9

The unique shape of the Seattle Central Library is derived from the floor plan; in this case, form truly follows function. Traditionally, libraries follow a large open floor plan in which the space is defined by the bookshelves. As the collection expands, these bookshelves encroach upon the public space. OMA took this problem and addressed it by focusing on the need for a flexible floor plan. The Seattle Central Library has taken great steps in redefining the layout of a library, focusing on the building as a mixture of reading, computer, and social meeting place; an area where all types of people and information come together.

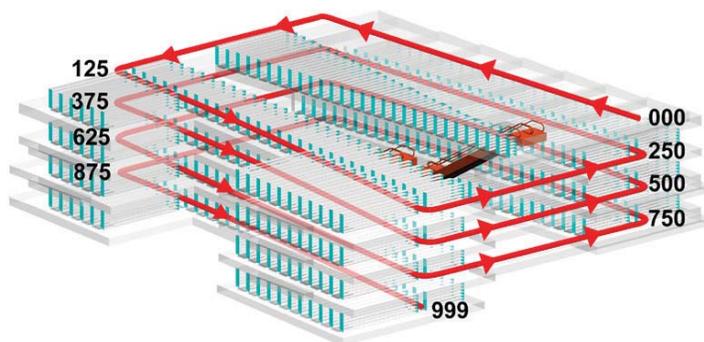


Figure 4.10

The Library has made innovations to the layout of the library with what is known as “the spiral”, in which the non-fiction section of the library is contained in one continuous spiral which spans four floors. This prevents the need of the patron to search multiple floors for a book when instead all they need to do is follow the continuous sections to find their book.

The Seattle Central Library effectively addresses the problem of how to merge books with digital technology in its use of floor plan layout and building

structure, and provides an example of how to integrate different forms of media and make the library a more user friendly and navigable building. This case study contributes to a greater understanding of the theoretical premise by demonstrating that a book and technology-friendly building can be achieved with the right design and understanding. Also expressing that a viable strategy to take into consideration when designing is the adage, “form follows function”.

On the other hand, the Seattle Central Library is a clear example that although “form follows function” may be highly beneficial on the inside of the building, one cannot ignore the site and context within which the building will be located, and shows that not giving consideration to linking the outer appearance of the building to its context can create something rather visually jarring.



Figure 4.11

CARDIFF CENTRAL LIBRARY, CARDIFF, WALES



Figure 5.0

Public Library

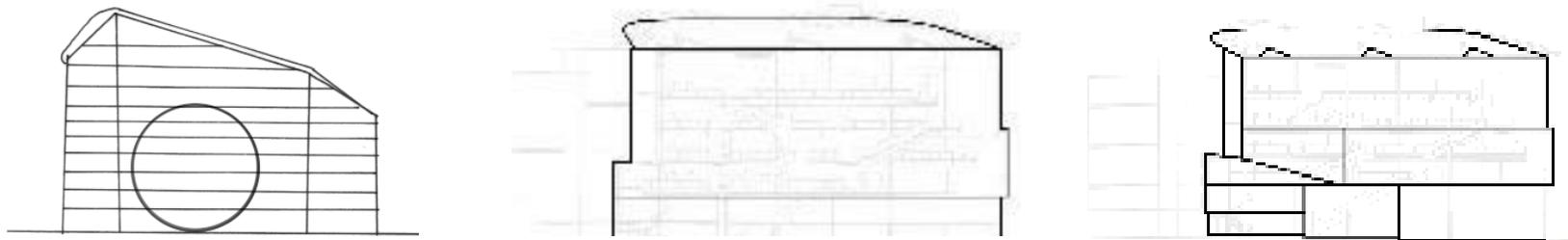
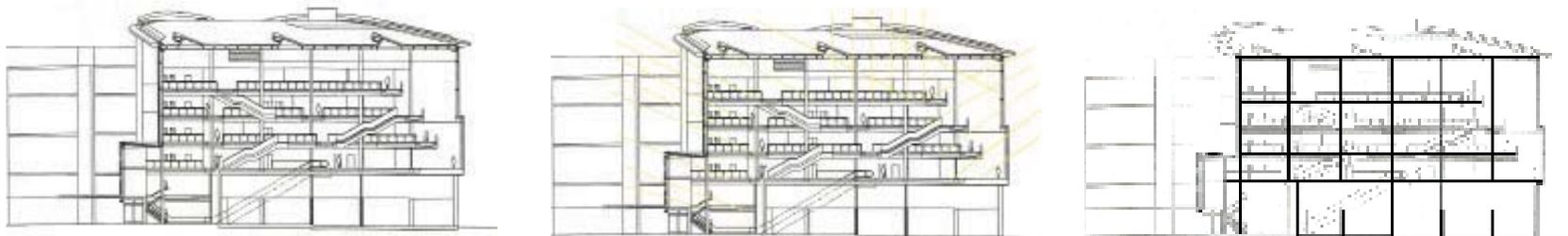
55,000 Square Feet

Completed January 30, 2009

£13.5 Million

BDP Architects

BREEAM rated excellent



From left to right: Figures 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8

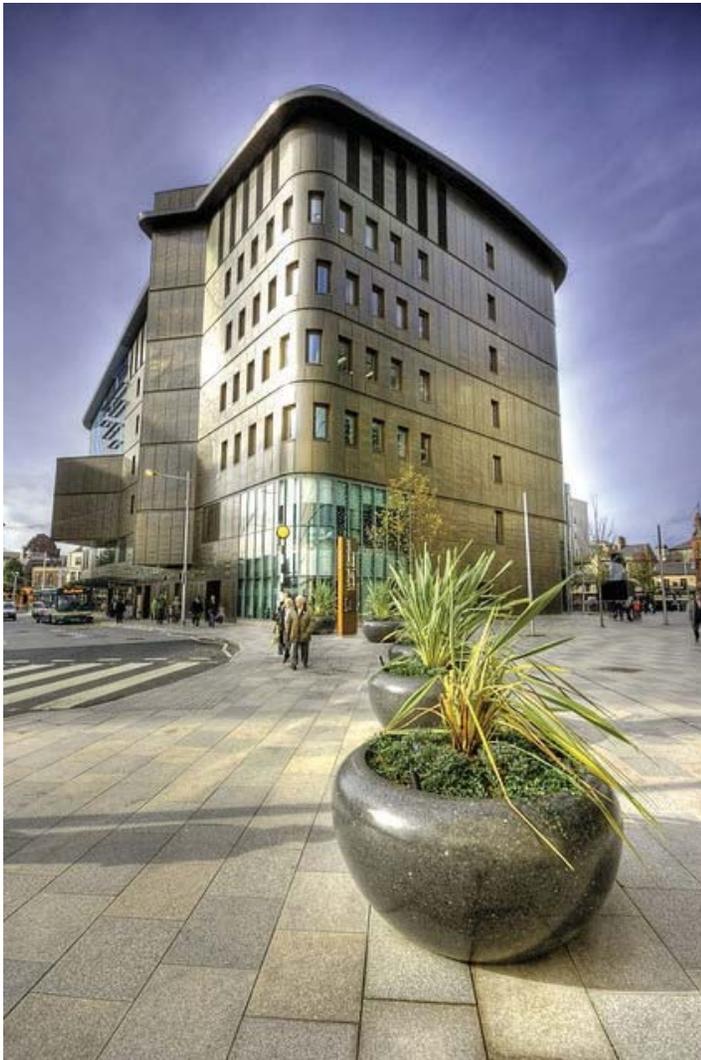


Figure 5.9

The Cardiff Central Library is a design-build project located in the capital city of Cardiff, Wales. The library features a collection of 90,000 books, 10,000 CDs and DVDs. The library also features a special collection of 10,000 books written in the Welsh language.

Cardiff is the capital of Wales, and as the main library of the Welsh capital, it is important that the library maintains prominence in its location and the city as a whole, and serves as a social and intellectual beacon for the city. The building is distinguished by its façade, which is clad in glazed narrow units three different shades of blue with louvers for shading on the public sides of the building. The less publicly visible sides of the building are largely clad in brass finished panels, which help protect against heat gain on the southern side of the building. The narrow sections of blue glazing stand as a metaphor for the books which are contained inside the building. The differences between blue and brass cladding also represent the canal and industrial buildings which used to exist in that area.

The design-build aspect presented challenges to the building design and completion. This led to a lack of refinement in areas, including some exposed structure that was ineffectively done. Additionally, the exterior cladding does not always meet the ground. The finish of the interior concrete structure also has some inconsistencies.



Figure 5.10

Some of the sustainable aspects of the building include a grass roof which improves insulation and reduces rainwater runoff. The ceiling contains sound absorbing panels, and the Building Management System also provides climate control to individual floors, which feature natural ventilations, though they can also be mechanically assisted.

The entrance leads off of The Hayes street which leads up to the building. The plan of the building is derived from the street pattern. One street aligns with the lobby, an automated book drop-off, a popular books section and an advice area. The other street leads to the main areas of the building. The overlapping geometries continue through the subsequent floors of the building, each floor having a slightly different function and layout.



Figure 5.11

The Cardiff Central Library is located in Cardiff's restaurant corridor and near the shopping district. Instead of simply being a standalone building solely devoted to books, the library also serves as a social center integrated into the surroundings of the restaurant district. The lower floor is devoted to retail for the public, mainly restaurants. The layout of the library also lends itself to the notion that libraries are themselves a form of retail, seeing as goods exchange hands.

The three libraries studied create an amalgamation of strategies to use when evaluating the theoretical premise of this thesis and when implementing a design. The use of libraries and their place in the eyes of modern society is changing, and the library must find a way to evolve with society's notions and maintain its role as an information resource and community center, before the world becomes consumed with the internet and loses access to valuable print sources and

All three libraries serve a community function, and were built to fulfill a need. The Agave Public Library was designed both to fill the need for a library to serve the community in that particular area of the city, and was also designed to fit the limited budget of the city. The Seattle Central Library was built to accommodate the increasing number of library patrons, and to serve as both a literary and technological haven for the city. The Cardiff Central Library was designed with the intention of using retail in the lower level of the building in a retail neighborhood to draw in library patrons. All three libraries used slightly different strategies to encourage the public to take advantage of the library facilities. This is one of the focuses of the Theoretical Premise; using design strategies to increase public use of the library and establish the library as a cornerstone institution.

Additionally, much like the Agave Public Library, the Cardiff Central Library takes advantage of the use of materials to express its purpose both inside and out. Both use materials to denote interior spaces, the Agave doing this while avoiding full interior partitions, which would otherwise intrude upon

the already minimal library space. Both also use materials to create an exterior façade which communicates the intent of the building. The striking façade of the Agave designed to become a part of the shopping area, and allude to the “cow-boy” past of Arizona by using the façade to cover the actually building much like in a western town. In the same vein, the Cardiff Library uses materials to both communicate the literary nature of the building, but also allude to the industrial past of Cardiff. The effectiveness of these two libraries in communicating site further emphasizes the extent to which the Seattle Central Library overlooked site influence during the design process.

Some of the differences between the case studies lie in their size, and design strategy. As the Agave Public Library was being designed under a budget constraint, at 25,410 square feet it is significantly smaller than the other two case studies. The primary focus of the Agave Public Library was to allocate resources and building materials resourcefully and still create a library which is welcoming and use-friendly. At 362,987 square feet, the massive Seattle Central Library dwarfs the other case studies. Where the Agave Public Library had to concentrate on a tight budget, the Seattle Central Library had to focus their efforts towards accommodating the massive population of the city. The Seattle Library also pursued the design of a library which was no longer solely focused on books, and found a way to create a harmonious environment for multiple types of information. This goal is directly related to the theoretical premise of this thesis, in which the objective is to design a library which will use books and digital technology to support and promote each other. In pursuing these efforts, the Seattle Central Library designed the interior layout of the building based on necessary functions, and from there created the exterior

structure of the building. This demonstrates a possible design strategy to employ when designing the building for this thesis project.

While the Seattle Central Library was designed from the inside out, the floor plan layout for the Cardiff Central Library followed a different concept; using the streets which led to the library, creating a layout of overlapping geometries which became the subsequent floors. The Cardiff Library provides an effective example of designing based on site influences. It also supports the theoretical premise by establishing that modern libraries need to adopt new modes such as combining uses into the library to create a place where people will gather.

All three case studies offered beneficial insights into the process of library design, and supported the theoretical premise by demonstrating the possibilities associated with merging printed documents and digital media within the library building. However, looking at these case studies I have also concluded that it is possible to take what these libraries have done and take it another level further in the pursuit of the solidification in the importance of the library and the need to retain them for both the purpose of digital media and paper books.

HISTORICAL CONTEXT

Duluth, Minnesota

Population: 86,277

Composition of the city is 68 square miles of land, 19.3 square miles of water.

Duluth has long been an established presence in the United States and especially in Minnesota on the western most corner of Lake Superior. It is a city which appears to be frozen in time when one visits it, still a thriving industrial and shipping city, it has also developed a thriving tourism economy. Most of Duluth's waterfront warehouses have been converted into shops and restaurants, emphasizing the city's relationship with the Great Lake it was built upon. People also flock to Duluth for its beautiful scenery and to experience nature along the North Shore all the way up to Canada. However, Duluth has not always been a tourist hub. It took years of growth and development before it was decided to partially freeze the city in time to preserve its great heritage.

In its earliest days, between the time of the pilgrims and the pioneers, the territory of Duluth was originally occupied by the Sioux and Ojibway Native American tribes, who had a history of violent disagreements. By the 1600s the area was discovered by French explorers, the area developed through fur trading, and was named after fur trader Daniel Greysolon, Sieur du Lhut.

Duluth's landscape was rich in fur, lumber, wheat and ore,

and its prime location on both the harbor and the fact that Duluth was the only U.S. port which could access both the Atlantic and Pacific Oceans. At 2,342 miles from the Atlantic Ocean, Duluth is to this day, the largest inland harbor in the world. This led to great expansion and prosperity for the city, and by the latter half of the 19th century Duluth was being coined as a “zenith city”. The city has had its share of obstacles to growth and success, including an economic downturn in 1857, a scarlet fever epidemic in 1859, and a stock market crash in 1873. However the accessibility the city provides to valuable resources have caused rapid growth time and time again, and by the 1900s, Duluth had “more millionaires per capita than any state in the nation, some say the world” (Greater Downtown Council). The city also played a pivotal role in World War II, providing eighty percent of the steel contributed by the United States from the area’s Mesabi Iron Range. This, coincidentally, depleted much of the areas store of iron and could have spelled economic disaster until the discovery of effective techniques for handling the leaner ore deposits of the area.

One of Duluth’s signature landmarks is the Aerial Lift Bridge, which was constructed in 1905. One of Duluth’s signature features is the Aerial Lift Bridge constructed in 1905. It was originally constructed as a ferry bridge, with a heavy-duty gondola which brought people from the Duluth side of the canal to the city of Superior, Wisconsin on the other shore. A 386 foot long suspension was added in 1930 to allow cars passage across and created the Lift Bridge as we know it, which raises 138 feet in 55 seconds to allow ships to enter the harbor. The Lift Bridge is a landmark for Duluth, standing as a representation of its industry, ingenuity and influence as a harbor city.

By the 1970s foreign competition had a devastating effect on Duluth's industry and economy, forcing the closures of the Duluth Steel Works plant and other industrial areas. In efforts to save the city and its economy, focus was shifted towards tourism, centered around the history of the area. Duluth boasts four historical districts; one being the Commercial Historic District numbering 107 buildings built between 1872 and 1929 along First Street and the city's "main street", Superior. The other three are the Civic Center, the Old Main School, and Glensheen Mansion. These historic districts and the conversion of waterfront warehouses to shops, bars and restaurants support the life of the city as a destination. Besides tourism and industry, Duluth is home to the University of Minnesota, Duluth, which was established in 1947 and is home to roughly 10,000 students. The city is also home to Duluth Business University, Lake Superior College and The College of St. Scholastica.

Despite the strain on Duluth's industry however, the city is still the main transportation center of coal, taconite ore, steel, limestone, cement and agricultural products in the region, shipping roughly 46 million tons of cargo each shipping year. The shipping year is eight months long, due to four months of freezing on the lake.

The Duluth Public Library

Number of library card holders: 2011: 47,965

The current Duluth Public Library was designed by Gunnar Birkerts and was opened in 1980. It still resides at its cur-

rent location at 520 W. Superior Street, on one of the main roads connecting the entire city. The library is located at the end of the freeway entering into Duluth and has the possibility of acting as a gateway into the city. The library is also located at the end of both the city's business district and the popular Canal Park area. Along with the current main library, two smaller branches exist within the city. One is contained within the Mount Royale Shopping Circle, the other is in West Duluth.

In 2008 the library underwent minor renovations which involved an expanded computer lab, new carpet and new furniture. Due to the city's budget, cuts were made to library funding not long after which resulted in a reduction of library hours and staff layoffs.

In 2009 assistance came in the form of a grant from the Bill & Melinda Gates Foundation which was delegated towards purchasing new computers, though it came with the stipulation that the library and the community raise matching funds, which was in fact accomplished.

By 2011 funds were restored to the library which brought back staff members and once again increased hours.

The library features the same material available to the public as the standard library; aside from books, audio books, CDs, DVDs, maps, government documents and microfilm, among others, the library features a special collection. This special collection includes a "Duluth Collection", composed of books by or about Duluth's residents, history, politics, architecture, business and education. There is also a "Minnesota Collection", with books written by Minnesota authors and relating to the state.

Historical Context

The Duluth Public Library also puts on various programs and events including children's programs, a used books sale, story time, film series, and "Book Club in a Bag", which assists patrons in starting their own book clubs.

Unfortunately, the materials and programs currently provided by the library are not enough. Almost everything about the Duluth Public Library is on the decline. Funding for the library is insufficient which means that the library has been unable to gain new materials or even keep all of its current ones. In the past year, the total number of materials in the library's possession has decreased by 156,683, and the number of books owned by the library has been reduced by 421. Most notably, library visits have decreased by almost 4,165 in the past year. These numbers emphasize the library's need for increased patronage and circulation. The current library is cramped, and outdated. The bookshelves resemble cheap metal storage shelves, and line the entire perimeter of the long rectangular library. Most views are blocked from the center of the building, and aside from one seating area in the center of the second floor, seating and desks are situated near the edge of the perimeter between the outer wall and the ends of the bookshelves. In some areas a patron might walk to the end of one shelf, and find they have to retrace their steps because the entrance to the next shelf from the other side is blocked by a pillar.

The Duluth Library is in desperate need of revitalization. It needs greater interest from patrons, and from the city itself. Seattle, Washington accomplished this with the new Central Library designed by the Office of Metropolitan Architecture, creating a library which merged the public, literature, and technology to increase library usage by 158 percent. By creating a new library for Duluth, one which merges the city's history with literature, current progressions and uses of technology in society, and the library as a social meeting place, the Duluth Public Library can become a center for the citizens of Duluth.



Lisa Ostlund, 2012



Lisa Ostlund, 2012

The Library

There are six general types of libraries; national libraries serve as a repository for the nation's information, and also often hold a copy of each publication in the country. Academic libraries are mainly attached to colleges or universities and provide research, workshops and seminars for students. Research libraries are usually national or academic libraries, hold primary and secondary sources, and are geared towards scholarly research. Reference libraries have books available for use and research, but do not lend them out. Special libraries are mostly private and in conjunction with a museum, hospital, law firm etc., for the use of employees for specialized research. Finally, the type of library this thesis will focus on, which is the most widely used type of library as it is open to and lends books to the community; the public library.

The concept of the library has been in existence for over 5,000 years. Originally called a repository, its purpose was to store information. This information was kept on scrolls, some of which have been found in ancient Mesopotamia and the ancient cities of Amarna, Thebes and Nineveh dating from 1300 B.C. to 681 B.C. The Greeks helped the escalation of the book as a part of their pursuit of knowledge. The first significant collection of books was assembled in the Great Library of Alexandria, which at its peak held 750,000 scrolls. The library was originally exclusively a place for scholars; the public could do their reading from the collections added to the bathhouses until the third century. However, a public library was created in Rome in the second century B.C., with books along the walls and a reading area in the middle of the room, as opposed to the Greek

model which separated reading and storage areas. The early years of the library saw challenges such as invasion, funding, and lack of interest that would have meant its end if not for the literary pursuits of the monks in the fourth century. The monasteries were also the first to create an “inter-library loan”.

By the 1400s, libraries were supported privately by the wealthy, and by the 1600s libraries were establishing popularity as universities developed. Libraries became a status symbol, and cities and countries began funding their own statewide collections as symbols of their knowledge and power.

The first public library in the United States was established in 1833, before which one had to pay a subscription to a library in order to then borrow books freely. After the Civil War, libraries were supported by women’s clubs, who began establishing more libraries by combining their own private collections and holding fund raising campaigns. Philanthropist Andrew Carnegie funded 1,700 libraries between 1881 and 1919.

Public libraries may have a certain number of books for users to find in the building while having another amount of books kept in an archived collection, due to either delicate or valuable condition, lack of use, or lack of space. These books can then be requested by a library patron and retrieved by a librarian.

Traditionally the library used a card catalogue system to keep track of and organize books, in which the books information was written on an index card contained in a file cabinet. Depending upon the size of the library these filing

systems could take up the space of anything from a wall to an entire room. As libraries strove to improve their information system and technological depends increased, they switched to an online database of storing information, generally referred to as “webcats”, which allows library members to search the library’s collection from any computer in any location. There is a debate that exists between traditionalists who wish to remain with the previous card catalogue system, and those who believe in the electronic database. Parallels are often drawn between this debate, and the debate over the merits between paper books and electronic books.

The use of modern libraries is declining and the importance of the institution is fading from the public eye. In *The Encyclopedia Americana*, librarian Edwin Wiley addresses four possible causes related to libraries not sufficiently meeting the demands of the public. For instance, making “an effort to erect a monumental building”, as the people who commission buildings such as these often have different priorities for the building than the librarians who work in them every day (Wiley, 1920). Problems can also occur when one attempts to shape the library “to a type of architecture unsuited to library purposes” (Wiley, 1920). Problems such as this have been common when trying to place a library into an existing building without making the proper alterations to the building. The final two factors contributing to library struggles are similar, one being the use of an architect who is unfamiliar with the needs of a library, and the other not consulting with a librarian or library expert. These observations speak to the fact that the modern library is much more than a repository for books, and must be treated with great consideration as a space for use by the public.

Issues with the way patrons see and use the buildings today stem from a lack of understanding of the library's organizational system, and a building layout which does not communicate its organization clearly. Patrons often feel uncomfortable in approaching library staff, and instead spend frustrating and unnecessary time trying to make sense of a clumsy search system. However, the greatest challenge to the modern library is without a doubt, the influence of digital technology in today's society. Students are becoming accustomed to finding information online, which is bolstered by the availability of reliable "e-resources" such as journals and periodicals through online databases such as EBSCO or JSTOR. Between 2002 and 2004 the average American library saw a decrease in overall transactions by 2.2%.

The library is an institution which can trace existence back to the beginning of civilization. It has seen both times of great popularity and faced almost certain disappearance. As time goes on, it has evolved with the function of the times, from scrolls to wooden tablets, and through many forms of book to reach the library we know today. The question which remains is, how will the library evolve during this digital age, will it still be a purveyor of the books we have always known, and will it evolve quickly enough to keep from being replaced by digital technology altogether.

PROJECT GOALS

Academic Goals

The thesis is a representation of the culmination of my last five years of schooling. All of the long hours, late nights, and all-nighters, the hundreds of scrap models, sketch book pages and trash paper drawings have led up to this one final project. This thesis will be the culmination of all of that hard work. My intention for this thesis is to display years of hard work and learning in this one project.

I want to be able to show how far I have come and the potential that lies within the years after school is over to not only myself, but also my classmates, teachers, family, friends and future employers. Ultimately, I intend to graduate with a Master's Degree in Architecture at the end of this year. I have conducted all of my years in academia with the desire to learn and demonstrate my knowledge. I intend for this thesis to be comprehensive, and exhibit a new way of addressing an old problem. It is strange to think that although I did not settle on the profession I wanted to pursue until my last year of college; that the last eighteen years of my schooling and my life have all been building up to the end of this year when I am conferred the Master's Degree I have pursued so diligently. After which I will be unleashed upon the world into a form of living which I have yet to know, the forty hour, nine to five work week. Whether or not it exists in actuality is yet to be seen.

Professional Goals

My professional goals are still in the development phase,

and I believe they stay that way until I actually start getting professional hands-on experience. As is stands, my goals are: to acquire a Master's Degree in Architecture, to complete my internship hours, pass my licensing exams, and become a licensed architect working in a design firm. There are things I am passionate about, such as art, literature, drawing and creating things, and my desire is to work in a place where I may weave these things together into a physical form. I would like to be a part of a firm in which I could take part in designing libraries and museums, and intend for this thesis to display the abilities I have in that area to future employers. On another level, I want to bring a sense of beauty and wonder to the world, and create places which move people emotionally and allow them to experience something in a new way. That is one of the wonders of architectural design; the ability to shape how a person moves through, views, or interacts with a space. It may sound idealistic, and may not always happen as such, but I wish to do something that makes an impact on this world for the better.

I want to learn as much as I can about the world around me. Speaking in ideals again, I would like to work for a firm that does business internationally which would allow me to travel to help complete projects or meet with clients. I have adequate Spanish language skills and would enjoy nothing more than further developing those skills in order to work with a firm in a Spanish-speaking country.

Personal Goals

Personally, my ultimate goal in academics, career and

life in general is to be happy. It may seem like common sense, but my focus is not money, recognition or success. It is to garner a sense of overall well being with my life. My goal is to know that I have done something that is worthwhile, and made a difference. I intend to live a life in which I have not denied myself any opportunity to learn more or experience something new. I intend to live a life above the ordinary in any respect I can. Spring semester of fourth year I participated in the study abroad program to France, and it opened my eyes to experiences and cultures I had previously only ever dreamt of. Architectural design opens up a plethora of opportunities to become a part of the world around us, and to affect and interact with other cultures through design.

SITE ANALYSIS



Lisa Ostlund, 2012



Lisa Ostlund, 2012

The drive from Fargo to Duluth was flush with forests of trees in the midst of changing their colors from a deep green to vibrant orange, a precursor to the forests of colorful fall trees which encompass the city and bring visitors every fall. Upon approaching the city the freeway offered a sweeping view of Lake Superior as we took in the view of Duluth's iconic lift bridge and the city below. The freeway exit emptied out onto Superior Street, leading right up to the Duluth Public Library. At first glance, the sight of the library in front of the historic Depot painted the picture of a city which has overlaid semi-modern structures with a treasured and historic past. Everywhere I looked I felt the tradition and history that saturated every aspect of the built and natural environment around me. The forested hillsides combined with the expansive lake below embody the rustic character of the city. Upon approaching the site, the library appears to be an interesting offset of the surrounding area, complementing the depot behind it. Once on the site, the current building in existence, though only two stories from the sidewalk level, loomed over me in what felt like a large oppressive mass. The rounded second story of the building supported from below by columns made a large plaza space. However this plaza was uninviting and unused. I approached what I believed to be the entrance to the building; and I say "believed" because the entrance was tucked away and appeared to be a side door more than anything, and the approach to the door felt unwelcoming and uncomfortable. Needless to say, the existing building on the site is in need of immense improvements to bring in the members of the community. The area surrounding the site is incredibly picturesque, and the location lends itself to wonderful views of the harbor, the lift bridge and the historic depot on one side, the downtown district on another, and views of the tree-covered hillside on the others.

Existing textures in plan

The site to be used for this thesis is the site of the current Duluth Public Library. As it is currently developed, the textures of the site are man-made. The materials in and around the site are brick, asphalt, concrete, steel, glass, and metal. The site is an island of the smooth, curved library exterior, surrounded by the rough, gritty asphalt road, the concrete sidewalk, and the cobblestoned sections of road. The only vegetation comes in the form of a few trees planted around the building. The area surrounding the site is gridded into rectangular city blocks using roads, and mainly surrounded by rectangular buildings. Though to the northeast of the site is the cylindrical, fifteen story Radisson Hotel, and across the street on the eastern side of the site. The current library on the site is rectangular and is rounded at the north end of the rectangle.

In plan the site experiences little to no shading



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Section

The topography of Duluth is made up primarily of hills, and is known as the San Francisco of the Midwest. The change in elevation from the Sky Harbor Airport, which is at the level of the lake, to the Duluth International Airport on top of the hill is 820 feet. As the city of Duluth is located on the face of a hill, beginning at the lake, the entire city experiences sunlight on a consistent basis. The lake is on the eastern and southern sides of the city, which allows for unobstructed sunlight from those directions. The shadows which exist are cast by the buildings

and shade the streets. Duluth's main road, Superior Street, for example, is shaded at the pedestrian level from the buildings which line the street running from southwest to northeast. On the site itself, the eastern part of the site is partially shaded by the Depot which is directly adjacent. Shading is not greatly affected on other sides of the site.

Number and kinds of built features and their locations

The site is located on the edge of the downtown area of Duluth. Four low and mid-rise buildings are located to the immediate west of the site, however the majority of buildings are mid and high-rises located to the northeast of the site. One block east of the site, Interstate 35 runs along the shoreline of Duluth, and turns into the scenic North Shore drive. Interstate 35 also separates the site from popular tourist attractions along the shoreline such as the Great Lakes Aquarium, Entertainment and Convention center, and the Canal Park area. Interstate 35 is easily crossed by both car and on foot.



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Light quality

When the site was observed, it was a crisp, sunny fall day with only a few wispy clouds to break up the bright blue sky. The site was bathed in bright sunlight, with the existing building in shadow on the north side. It is easy to imagine the air becoming thinner and cooler and the light becoming brighter as winter sets in and the sunlight reflects off of the snow that falls every year. One could see the sunlight reflected off of the deep blue waters of Lake Superior off in the distance. The light that falls



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on the site is strongest on the east and south sides of the site, with a softer light on the western side and shaded, diffused light on the northern side.

Water

The entire city of Duluth is heavily influenced by the presence of Lake Superior. Duluth was founded on the Great Lake and from it sustains a large part of its economy. Therefore within this, the site is heavily influenced by the presence of Lake Superior. The lake is ingrained into the history of the city and the people living in it. The lake itself is the largest body of fresh water in the world, with a surface area of 31,700 square miles and making up ten percent of the world's available fresh surface water. The visibility depth of Lake Superior is 27 feet, making it the cleanest and clearest of all the Great Lakes.

To this end, views from the library to the lake will be fundamentally important. The current site has views of the lake looking to the northeast, east, southeast and south from the site. When standing upon the site, the lake is easily seen, as is a part of Duluth's iconic lift bridge. However, a part of the eastern and southeastern views of the lake are obstructed by the Depot, a building with strong ties to Duluth's history and culture, and is a different type of important view.

Wind

Do landforms or built features affect the flow of the wind?
The site experiences winds coming off of Lake Superior, as it

is a mere half mile from the lake. While standing on the site in sixty degree temperature it is possible to feel warm while being bathed in the sun one minute and instantly chilled as the wind picks up the next. The wind does not remain constant, but rises and falls much like the lake it originates from. The site is minimally sheltered from the wind by the Depot, which stands between the site and the lake.

Human Characteristics

Both the area around the site and the site itself have been heavily influenced and developed by people. As it is in the middle of a city, much of the area is developed. However, the location of this site is on the edge of the downtown area, and therefore acts as a transition between the rocky outcroppings and forested areas of the natural wilderness which is integrated into the city. The site is the location of the current public library; therefore it has already been influenced and developed. The library is used by the public as an information source, and source for computers and other resources. Nevertheless, the library is under-used by the community and has an ineffective and cramped layout.

Distress

When looking at the site, one can see how the years of weathering and a harsh climate have aged the library currently there. The concrete pillars are dirty and stained from years of wind, rain, snow and sediment. The sidewalks and plaza are cracked, and the metal panels have retained water stains. The condition of the library structure itself has stood the test of the



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Soil

On the site the soil composition is 1028A – Urban land – Udorthents – Aquents complex. This soil has 0 to 8 percent slopes. In the area, 35 percent of the soils are Udorthents, 35 percent are Urban land, and 30 percent are Aquents.

For Urban land, Udorthents, and Aquents, the parent material of these soils is loamy alluvium, sandy beach materials, and dredge materials.

Urban land soil is generally located in land spits and on shores. The land forms Udorthents are comprised of rises on spits, rises on shores, flats on spits, and flats on shores. Aquents make up depressions on spits and shores, and flats on spits and shores. From 0 to 3 inches, Aquents are comprised of loam, and from 3 to 80 inches is made up of stratified loamy coarse sand, to silty loam.

The other set of soil composition on the site is classified as F163D – Urban land – Mesaba – Rock outcrop complex. This soil has 1 to 18 percent slopes. In this composition, the soils have a ratio of Urban land is 60 percent, the Mesaba soils are 20 percent, Rock outcrops make up 10 percent, and other minor components make up the last 10 percent.

The parent material in this classification is fill materials from surrounding uplands, gravel pits and bedrock. For Mesaba soils, the parent material is loamy material over bedrock. The parent materials of the rock outcrop is bedrock, and the parent materials for the minor components.

All of these elements of the soil make up the moraines landform. The slope of rock outcrop is 3 to 20 percent.

Water Table

Duluth’s drinking water is supplied by the surface water of Lake Superior. The quality of the drinking water table is monitored by the City of Duluth and the Minnesota Department of Health. The evaluated levels of Fluoride, Nitrate, Chlorine, Copper, Lead, Sodium, Sulfate, Turbidity, and organic substances were well below the level allowed by the Environmental Protection Agency.

The lake water was found to have a Nitrate level of 0.37 parts per million (ppm), the maximum allowed being 10.4 ppm. Nitrates in the water occur from erosion of natural deposits, fertilizer runoff and leaching from septic tanks and sewage. This indicates that even though the entire city is built on a hillside, runoff into the lake is still below the acceptable maximum levels.

The levels of lead were closer to the acceptable maximum than the other components, with 90% of the samples tested rating at 11.0 parts per billion, the maximum acceptable level being 15.0 parts per billion. Lead deposits occurring in the lake are partially the result of the corrosion of household plumbing systems and erosion of natural deposits.

Utilities

As there is a building currently on the site, the site has direct access to power and phone lines, along with drinking and sewage water.

Duluth Drinking Water Table

The following are the measurements taken from Lake Superior and the maximum level allowed by the EPA.

Fluoride (ppm)	1.18	4.0
Nitrate (ppm)	0.37	10.4
Chlorine (ppm)	0.92	4.0
Copper (ppm)	0.06	1.3
Lead (ppb)	<11.0	15
Sodium (ppm)	8.39	No limit established
Sulfate (ppm)	8.48	No limit established
Turbidity (ppm)	.030	100%
(measure of water clarity)		

Ppm - Parts per million

Ppb - Parts per billion

(Janson, L.. 2010)

Vehicular Traffic

The vehicular traffic is heaviest on Interstate 35, entering into Duluth, and on Superior Street, which is the main road that runs all the way through the city and passes right in front of the site. Moderate traffic exists on Michigan Street and South Lake Avenue leading over the Lift Bridge.

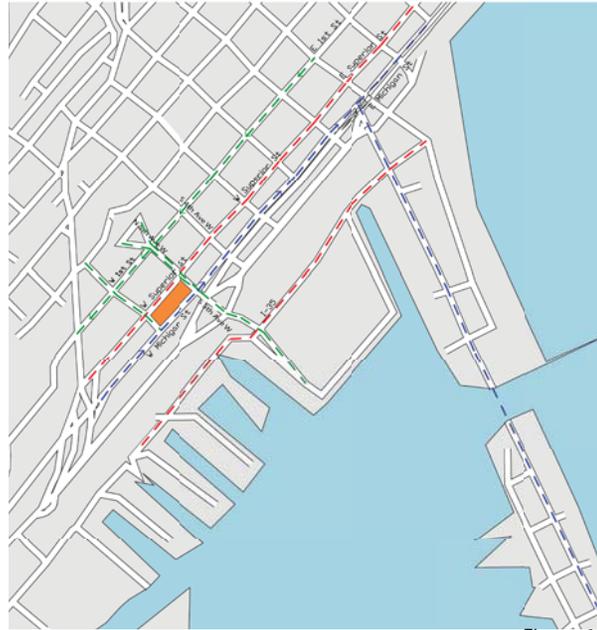


Figure 6.0

Pedestrian Traffic

The heaviest pedestrian traffic exists in the Canal Park area, where there is also the most concentrated area for tourism. This is both along the streets and restaurants and also along the walkway along the lake front. The second most populated pedestrian area downtown is along Superior Street. Topographical Survey:



Figure 6.1



Figure 6.2

- Building
- Road
- Bridge
- Vegetation
- Water
- Zoning District F - 8
- Site

Site Character

The character of the site is developed. The elevation of the site changes from 605 feet to 635 feet, with a basement entrance on the low side, and the main entrance at the high elevation, with a plaza at both the lower and upper level. The site has had cracking and weathering in some of the concrete and brick forms, and dents in the exterior panels of the building. The site itself had not seen significant change in vegetation and the paving stones are picturesque and contradict the large gray building on the site. The site is located in Zoning District F - 8, which permits the building of Main Street buildings, Corridor Buildings, and Iconic Buildings.

Site Reconnaissance





All photographs taken by Lisa Ostlund
2012

Sun Path Diagram

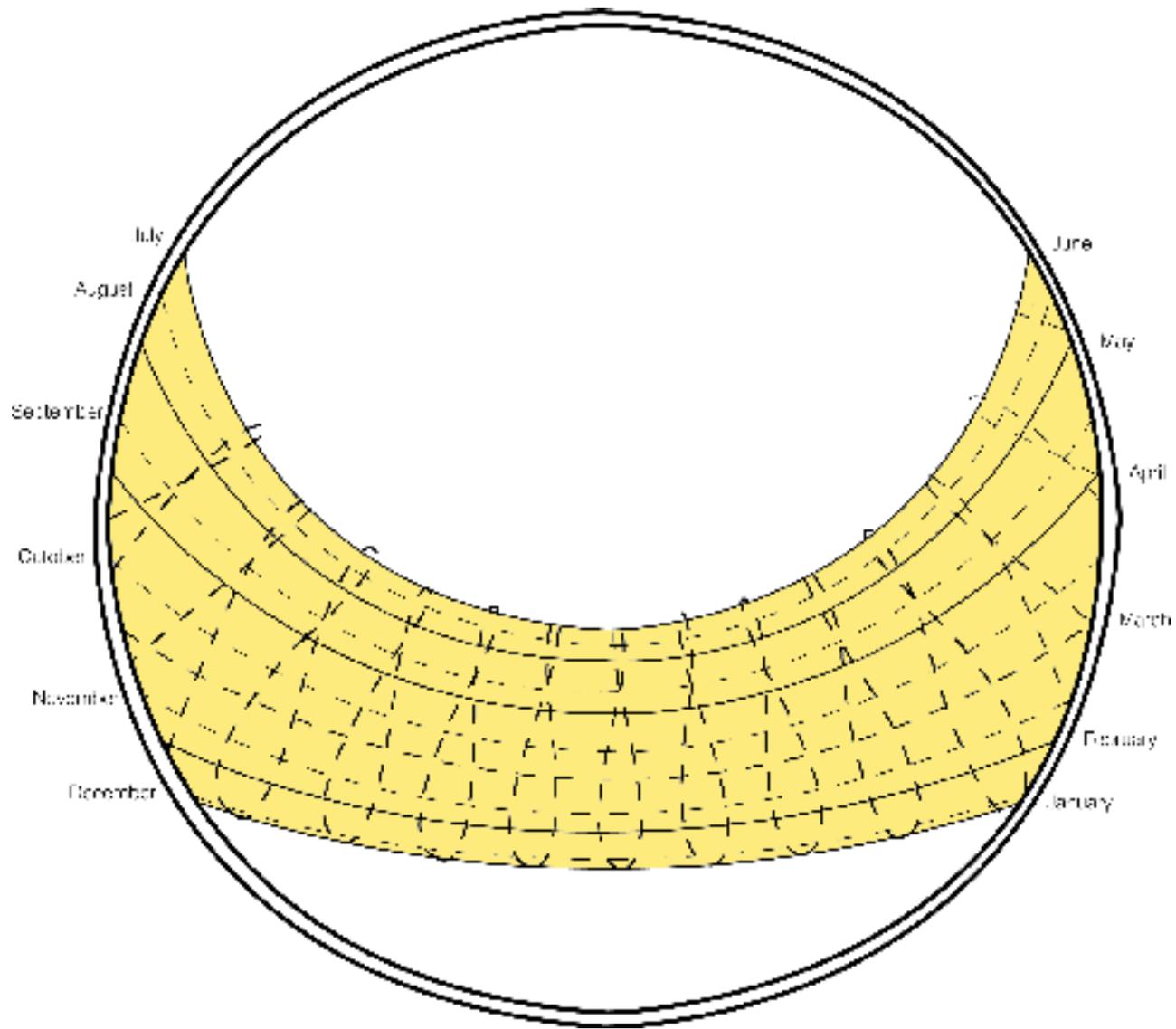


Figure 7.0

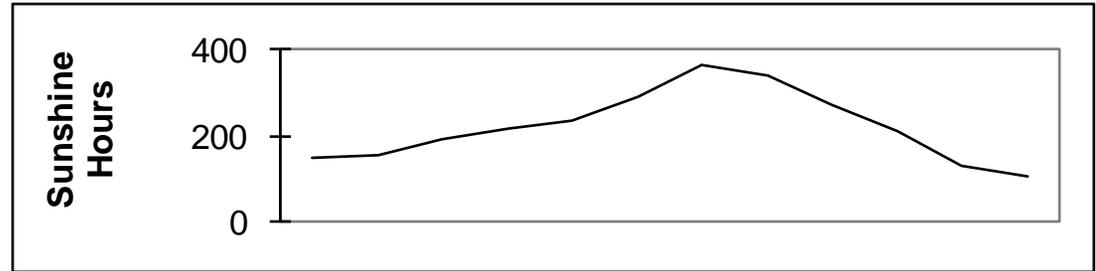


Figure 7.2

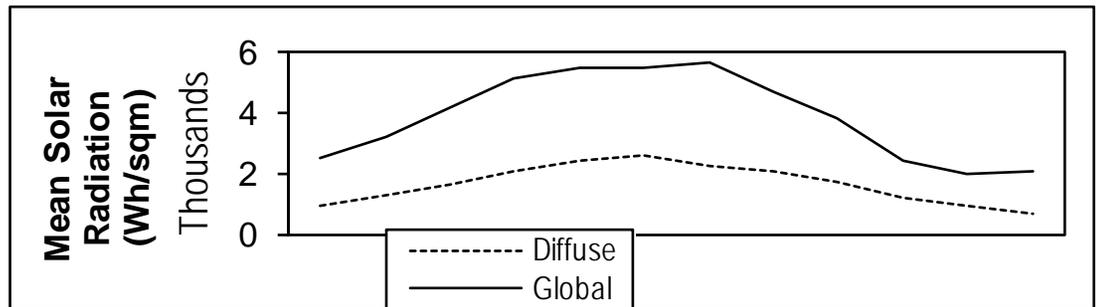


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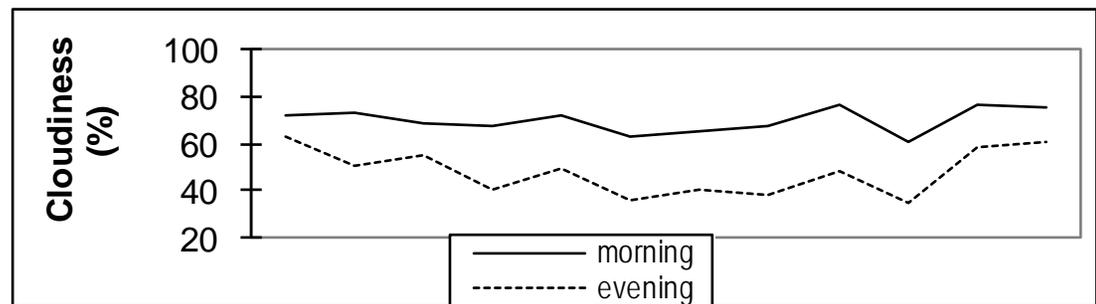


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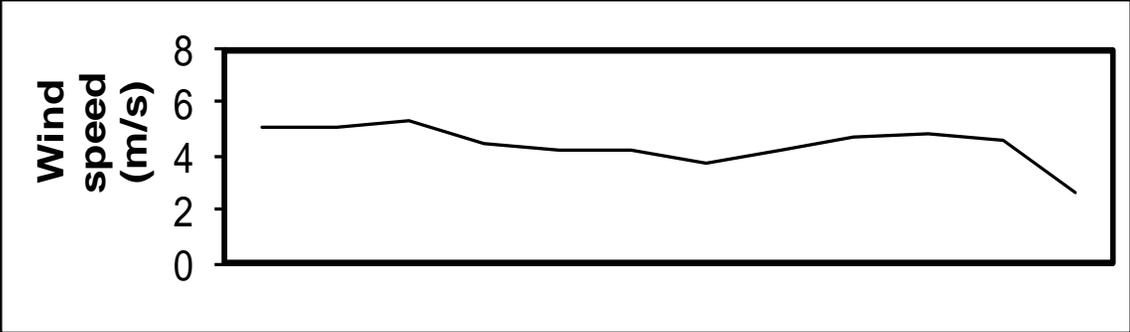


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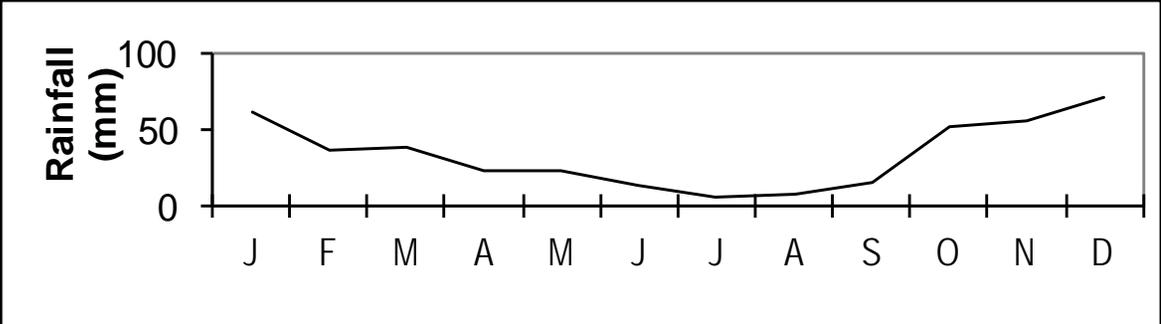


Figure 7.5

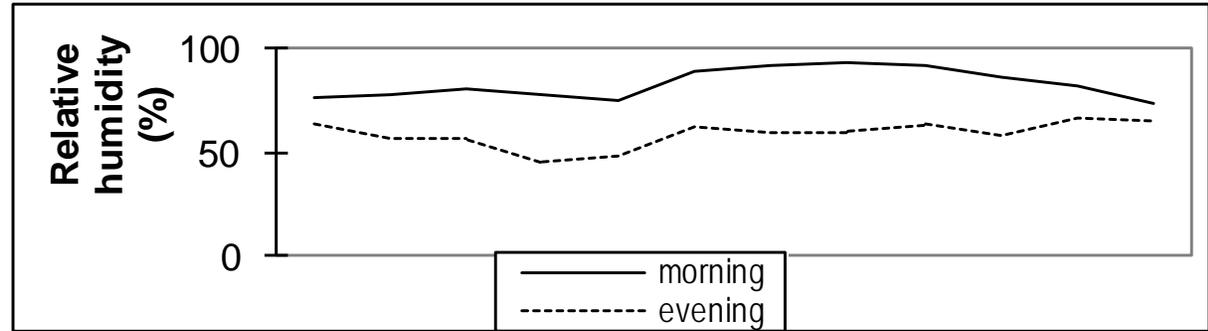


Figure 7.6

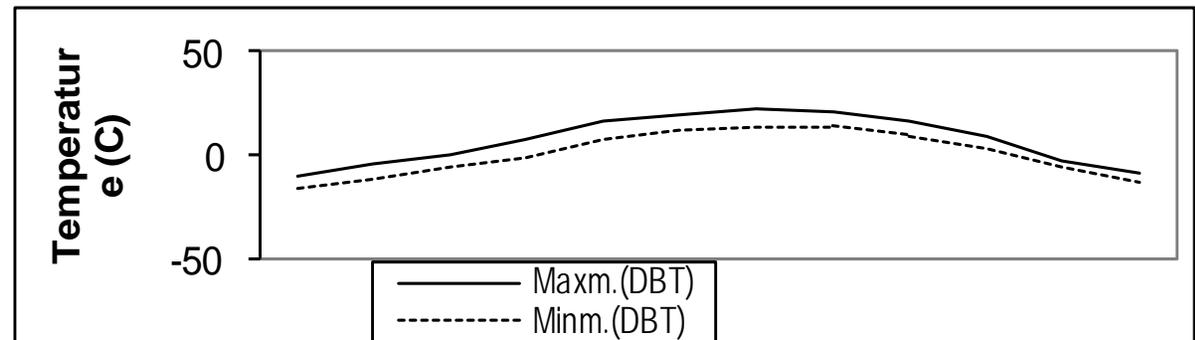


Figure 7.7

Slope Analysis

- Low Grade Slope
- Moderate Slope
- High Slope
- Very High Slope



Figure 7.8

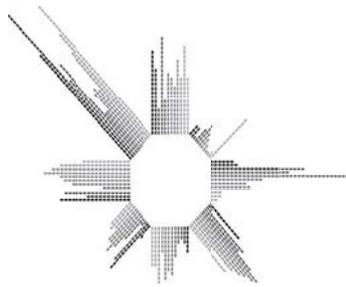


Figure 7.9



Figure 7.10

Noise and Wind Analysis

- Noise
- Wind



Figure 8.0

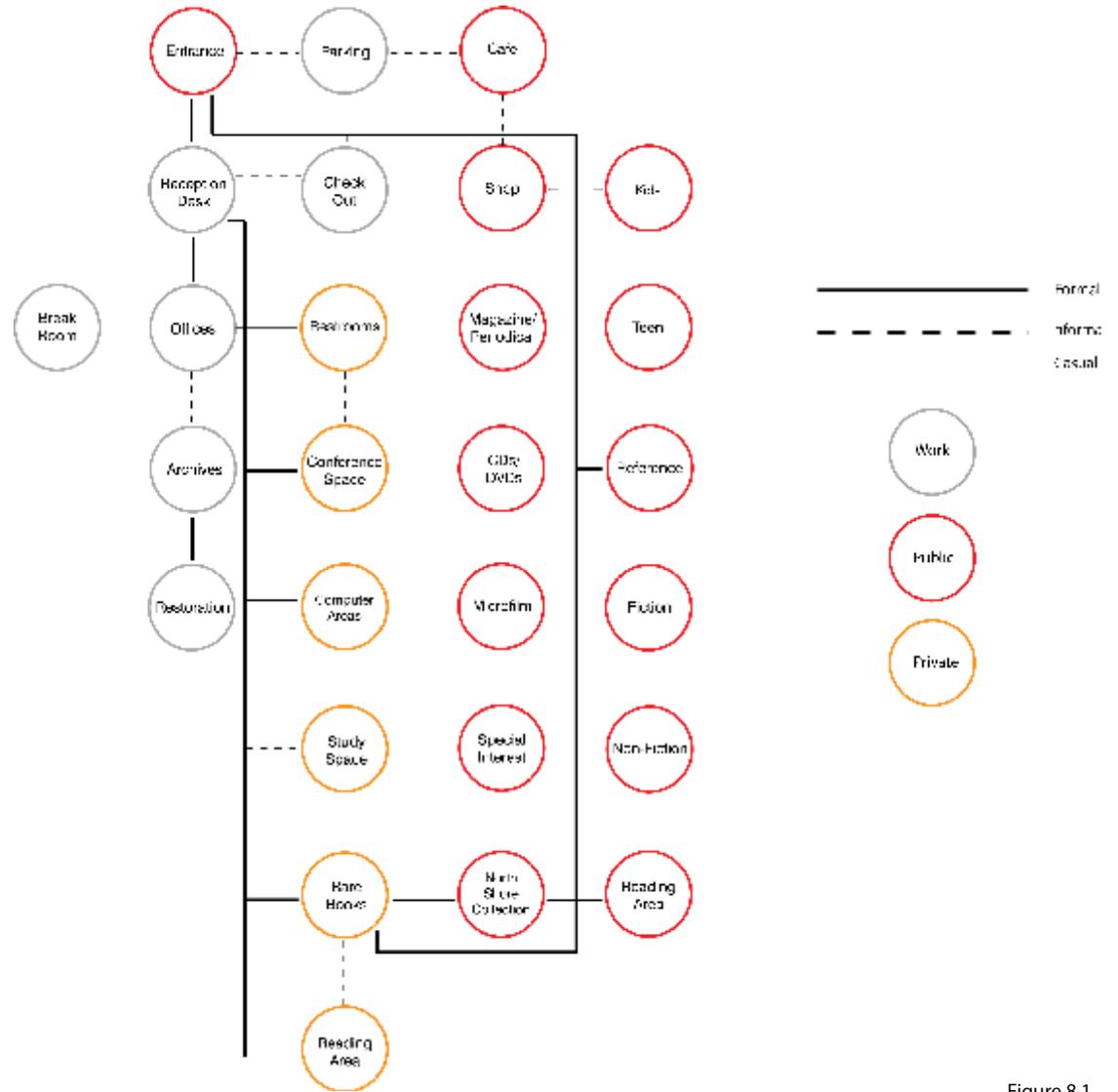


Figure 8.1

Programmatic Space Requirements

Print Media.....15,000 Square feet

This includes all books, fiction, non-fiction, special interest, rare books, North Shore Collection, newspapers, magazines and microfilm.

Digital Area.....10,000 Square feet

This includes computer areas, DVD, CD, and other digital media areas.

Children's Area.....2,500 Square feet

Teen Area.....3,000 Square feet

Offices.....1,000 Square feet

Break Room..... 500 Square feet

Archives..... 1,000 Square feet

Restoration..... 800 Square feet

Rest rooms.....200 Square feet x 6

Reading Areas..... 3,000 Square feet

Study Areas.....2,000 Square feet

Cafe.....700 Square feet

Shop.....500 Square feet

Conference Space.....400 Square feet x 2

Class Space.....1,000 Square feet

Maintenance.....2,000 Square feet

Circulation..... 2,000 Square feet

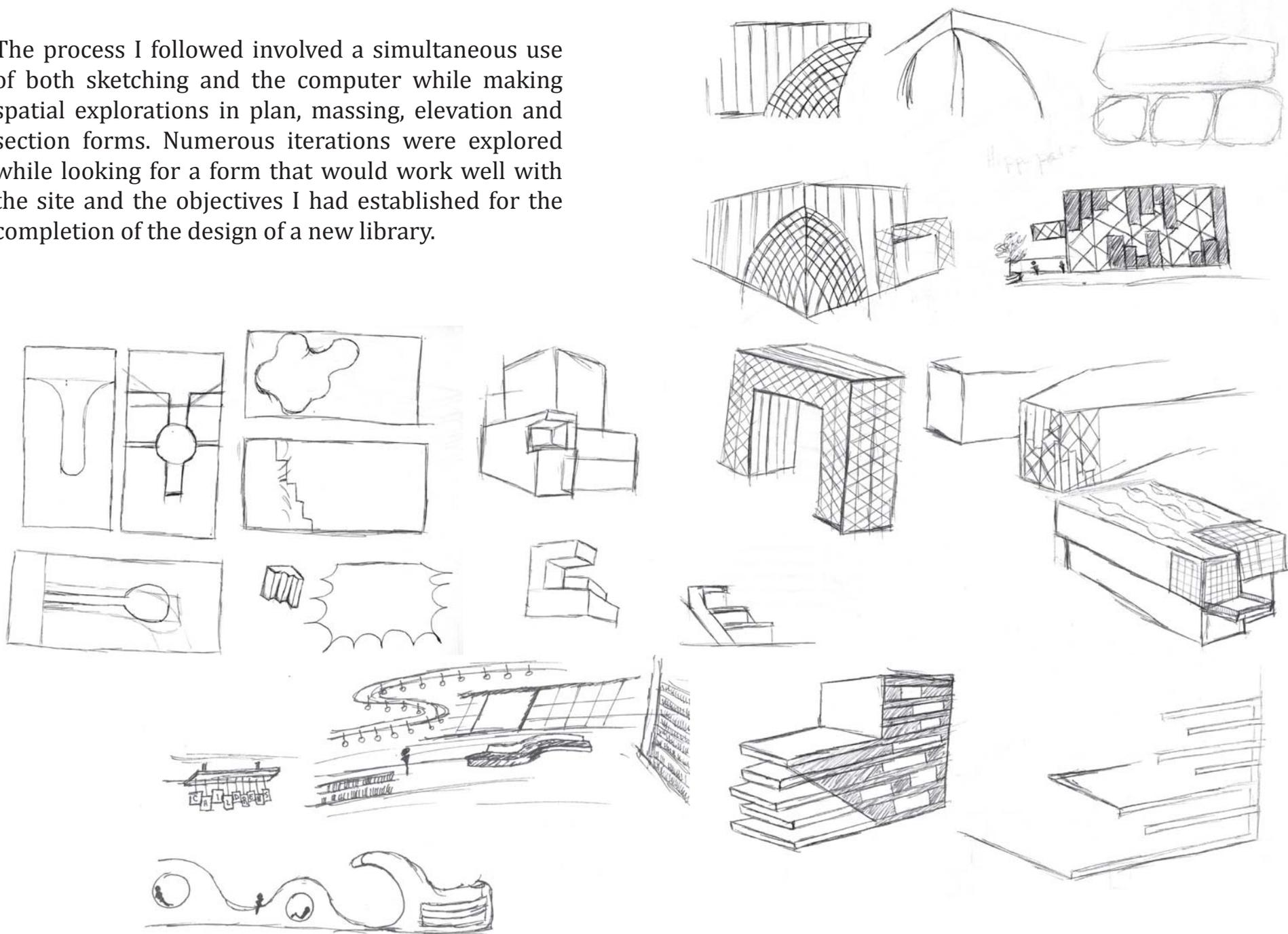
Total Space.....46,600 Square feet

There was a change in space requirements as the design developed and the needs of the project and the allowances of the site unfolded. The space requirements on the left were a starting block for the project. The requirements on the right are the final measurements.

Print Media.....	18,856 Square feet	Outdoor seating.....	4,391 Square feet
Digital Area.....	5,000 Square feet	Reference.....	2,678 Square feet
Children's Area.....	4,803 Square feet	Kitchen.....	1,671 Square feet
Teen Area.....	7,019 Square feet	Circulation.....	2,100 Square feet
Offices.....	736 Square feet		
Break Room.....	313 Square feet		
Archives.....	4,500 Square feet		
Restoration.....	4,800 Square feet		
Rest rooms.....	4,200 Square feet		
Formal Seating Areas.....	4,545 Square feet		
Casual Seating Areas.....	14,963 Square feet		
Study Areas.....	2,000 Square feet		
Restaurant.....	24,175 Square feet		
Retail.....	22,043 Square feet		
Atrium.....	8,590 Square feet		
Conference Space.....	1,522 Square feet		
Class Space.....	1,759 Square feet		
Maintenance/Mechanical.....	5,000 Square feet	Total Space.....	163,873 Square feet

Final Design

The process I followed involved a simultaneous use of both sketching and the computer while making spatial explorations in plan, massing, elevation and section forms. Numerous iterations were explored while looking for a form that would work well with the site and the objectives I had established for the completion of the design of a new library.



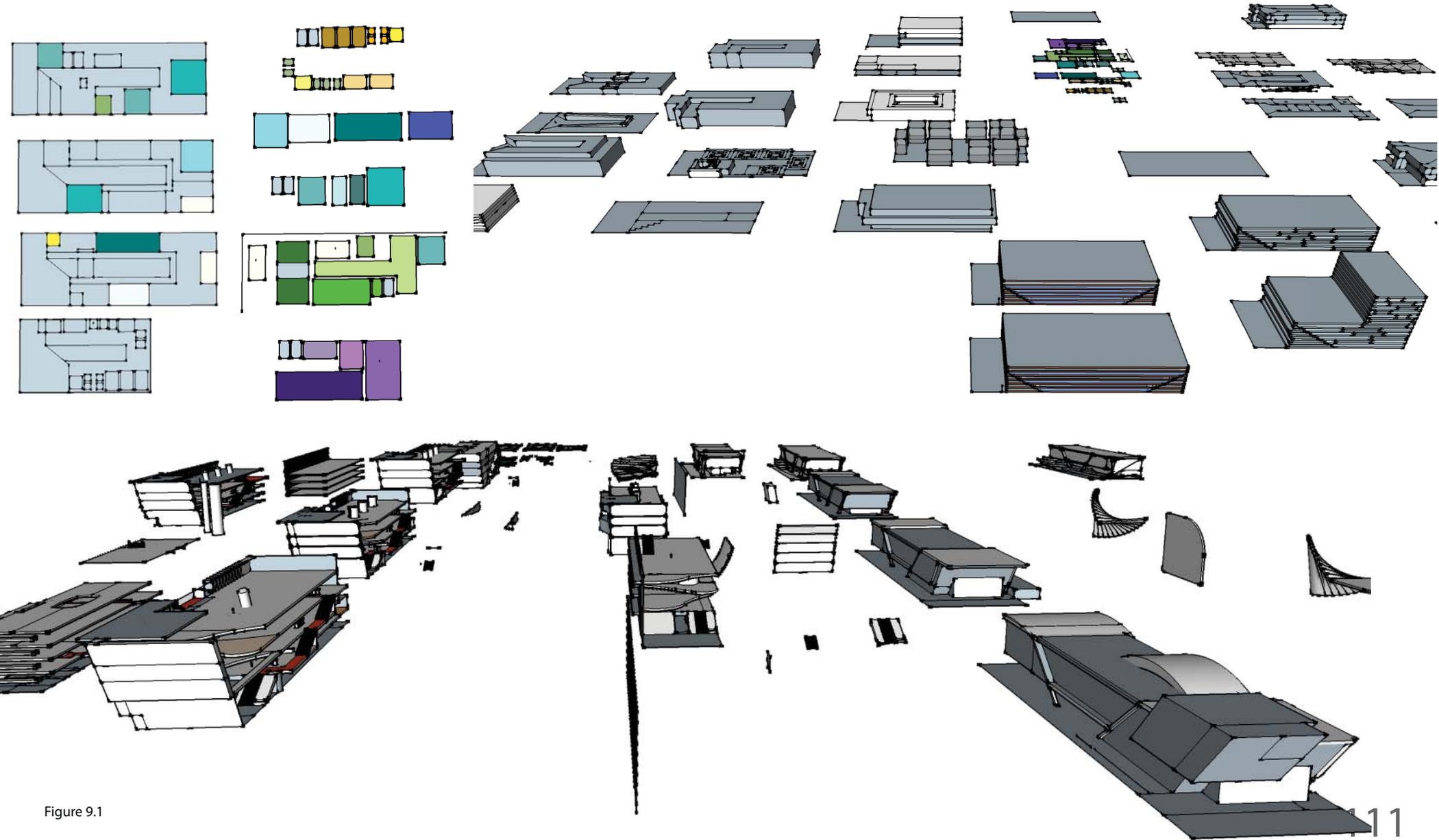
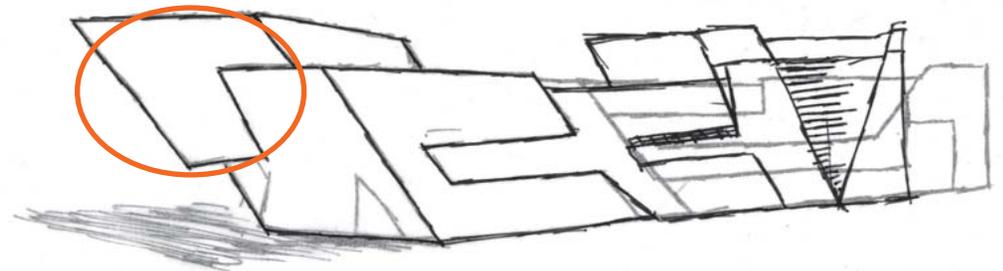
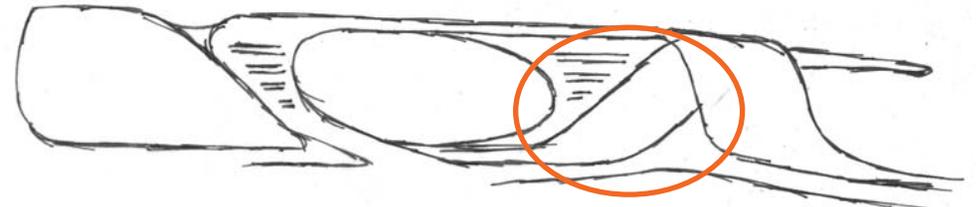
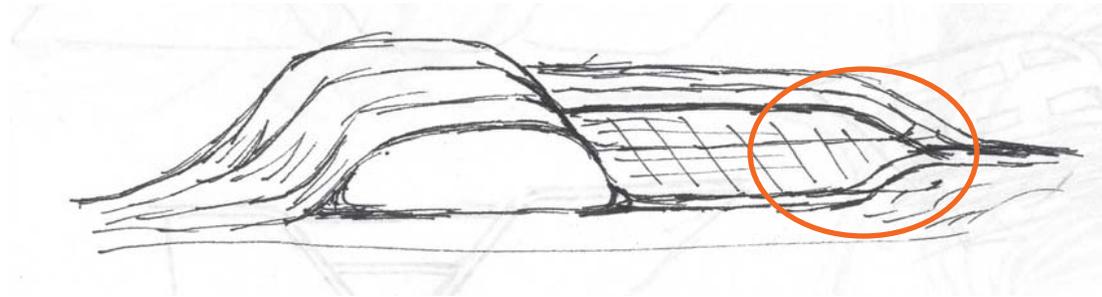
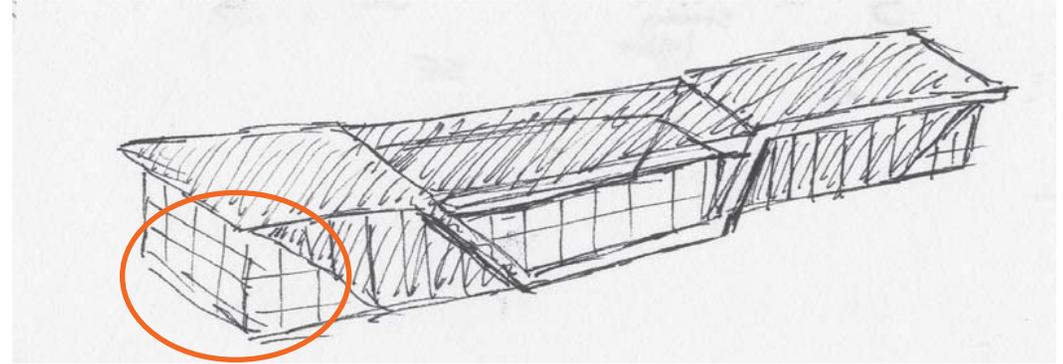
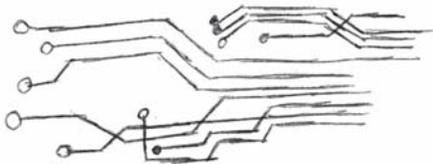


Figure 9.1



These images are the last few final forms before the final building design was reached, each iteration offering a piece of itself in the compilation of the final form. The initial desires were to communicate a connection to the ground, effectively make use of the elevation change on the site, and keep an open flowing space from the atrium through the interior of the building.



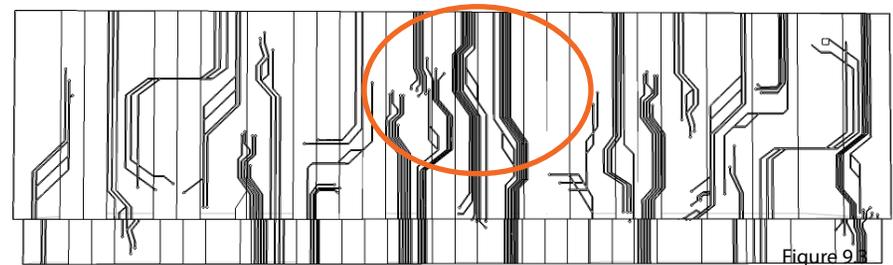
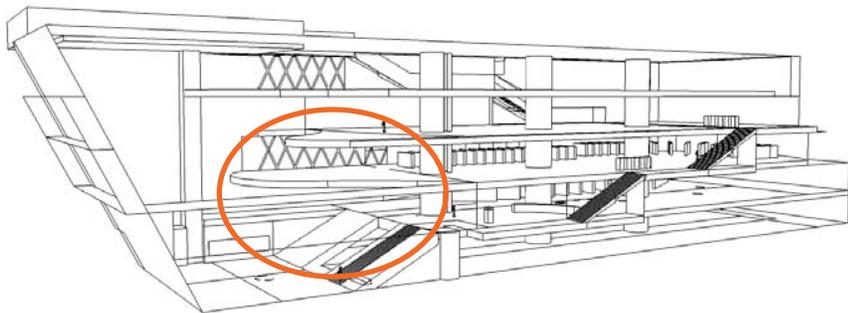
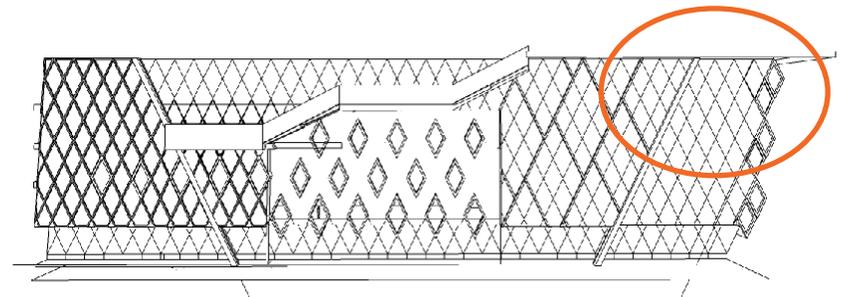
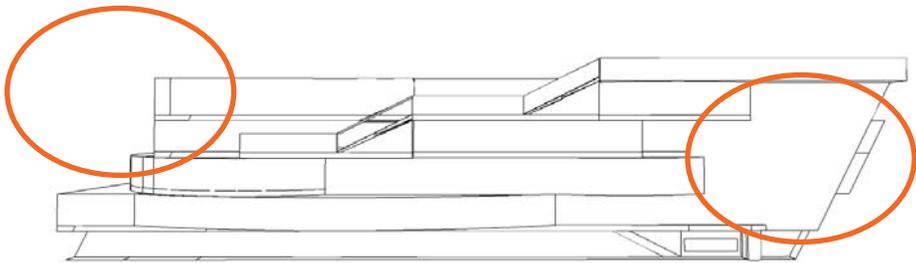
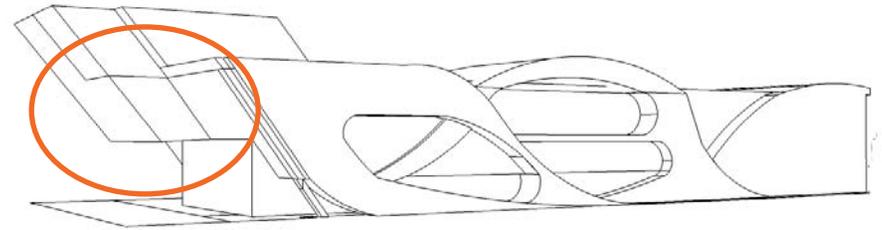
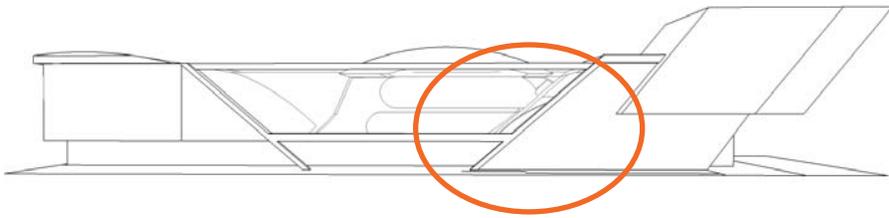
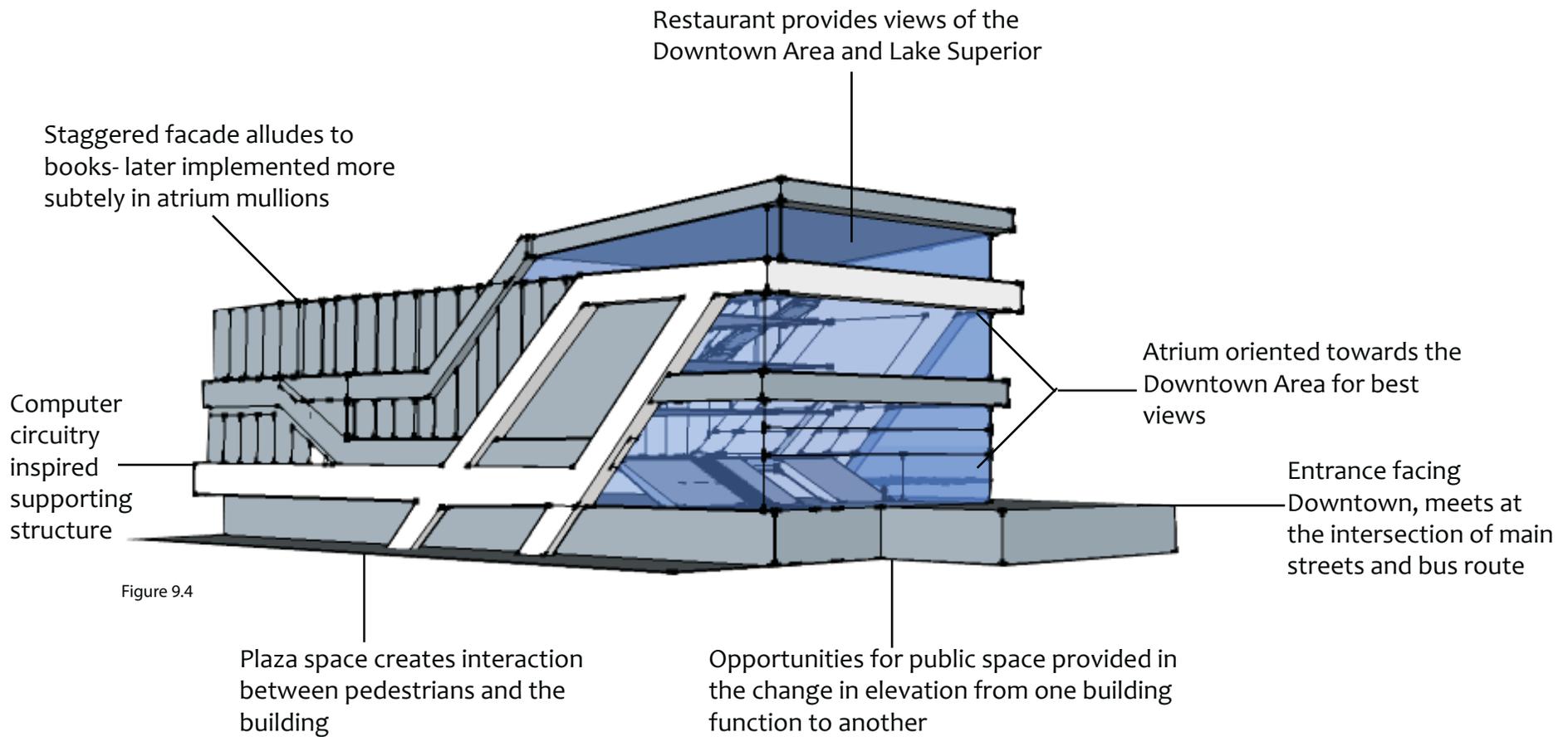


Figure 9



DESIGN DRAWINGS



With changing technologies and media forms, how can we preserve the importance of the Public Library and the books that contain without being either too old-fashioned?

The goal is to preserve the form by digital means to provide immediate access to the books and the information in the physical form. In order to update the information of the books and maintain the importance of the library in reading, the library can be updated and made to be useful and functional. This will be done by increasing the number of books, increasing the number of books, and increasing the number of books.



The site plan is the site of the current public library building in 1988. The site is located on the corner of the city grid. The site is located on the corner of the city grid. The site is located on the corner of the city grid.



The New Modern Library

Figure 10.0



Figure 10.1

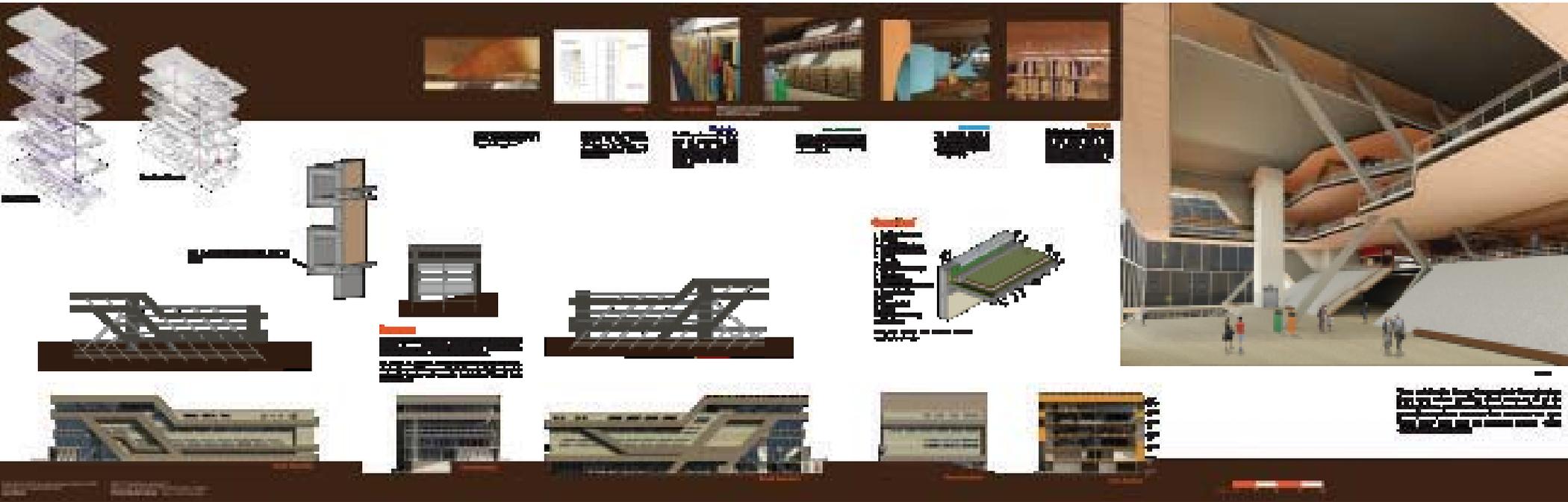


Figure 10.2

Several finalized images did not make it either onto the final boards or the digital presentation, due to space, or a separate image communicating the idea more effectively.



Site Plan with Final Design

Figure 10.3



Entry Approach from Bus Stop

Figure 10.4



Approach from the South West

Figure 10.5

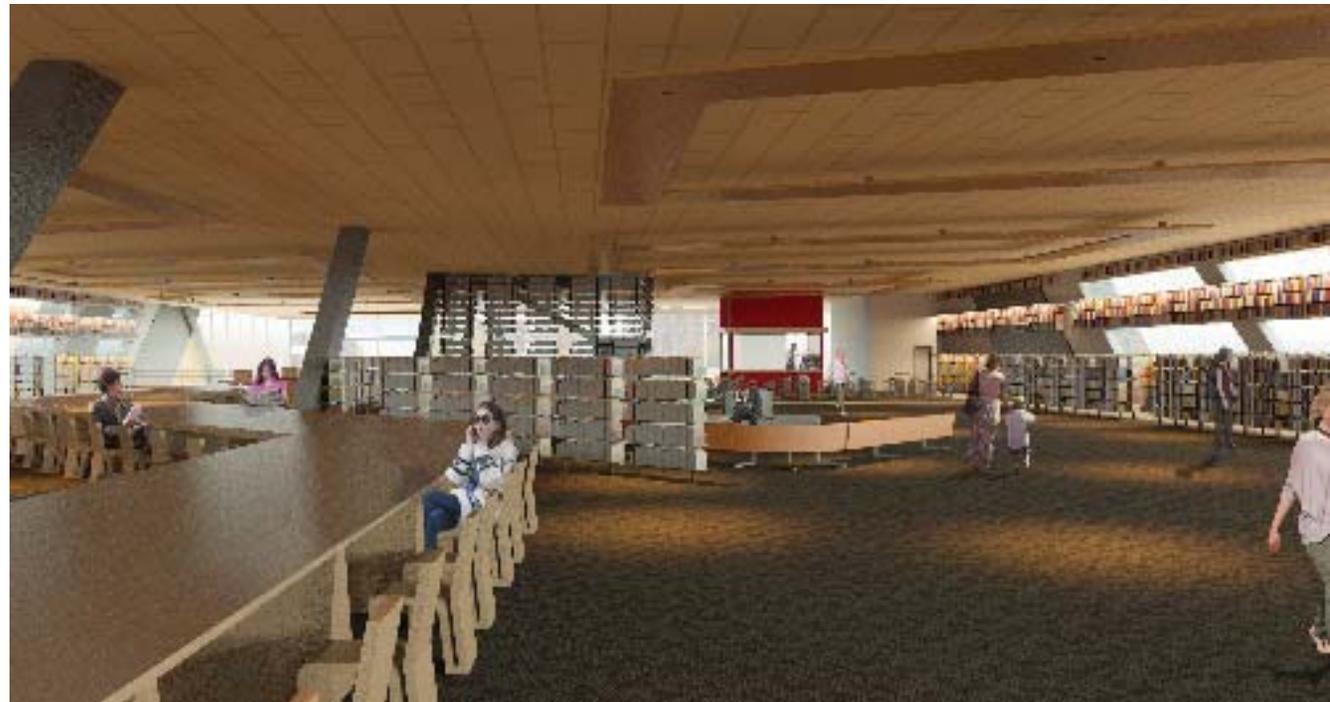
Additional Project Images

The top image was used in the Digital Presentation, but not the boards due to space. The lower image was not used in either in favor of other images, and shows the seating area/ workspace and extraneous circulation.



Reference Desk and Checkout

Figure 10.6



Formal Seating and Circulation

Figure 10.7

DIGITAL PRESENTATION

The **New** Modern Library

The Problem Theoretical Premise

With changing **technologies** and **social norms**, how can we increase the **importance** of the **Public Library** and the **books** they contain without letting either fade into **disuse**?

The shift in prominence from **books to digital media** in society has **affected** the use of the **library** and its **importance** in the public eye. In order to uphold the importance of literature and maintain the importance of the library in society, the library as a typology **must adapt** to societal and technological demands. This will be done by **entertwining literature, technology, consumerism and community services into the program**.

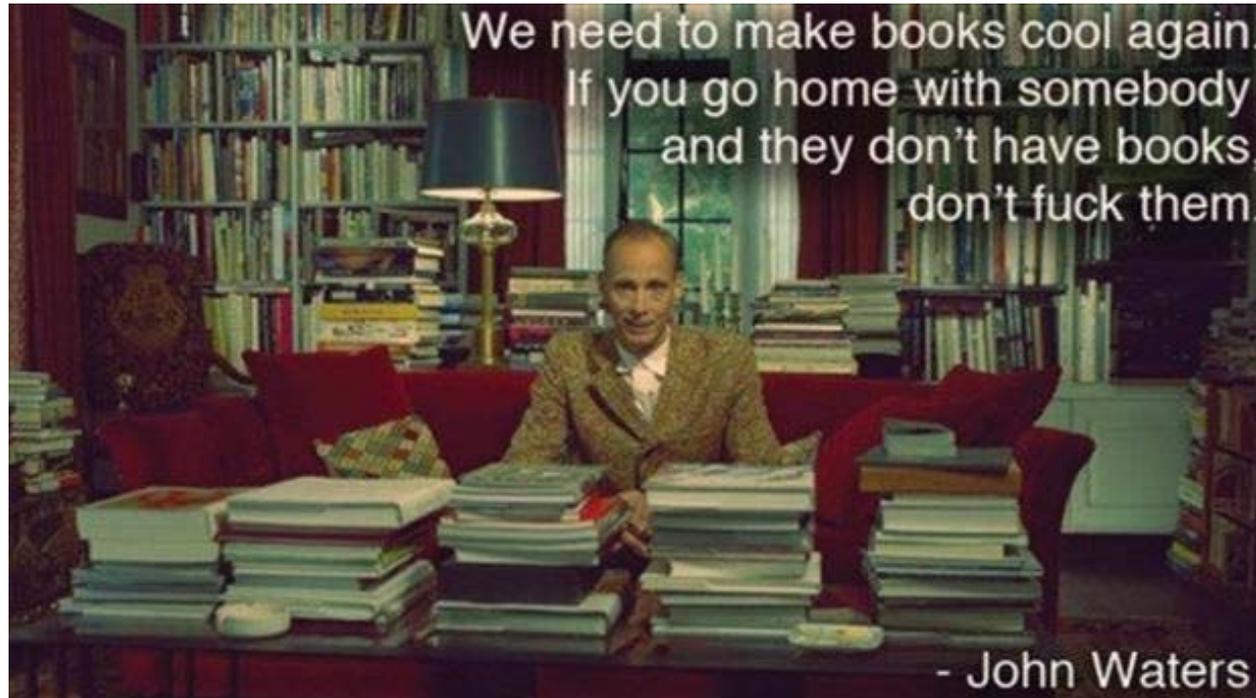


Figure 11.0

Fahrenheit 451
Ray Bradbury

“Libraries are not just repositories of books. They are communities, sources of expertise, and homes to lovingly compiled collections that amount to far more than the sum of their individual printed parts. “

The Bookless Library, David A. Bell

“The growing concern is that many undergraduate students may be searching only 0.03% of the Web to complete their assignments, ignoring entirely the books, journals, databases, full-text digital resources and other scholarly materials provided by the library.”

How and why Libraries are Changing, Troll

“Despite many claims and assertions, the information structure of the future has not yet taken shape, but the pace of change is such that it is imperative that ‘architects’ of great skill, who are concerned with the well being...of libraries go to work with some sense of coordination before a structure is imposed by default.”

Council of Library Resources

Confusing to navigate

Often feel **cramped** in both circulation and bookstack width

Have not adapted to a technology driven society

With instant information available on the internet, the library can no longer be **only a place for books**

Case Studies **Agave Public Library**
Phoenix, Arizona

Use of materials and colors to denote different areas

Open floor plan



Figure 11.1

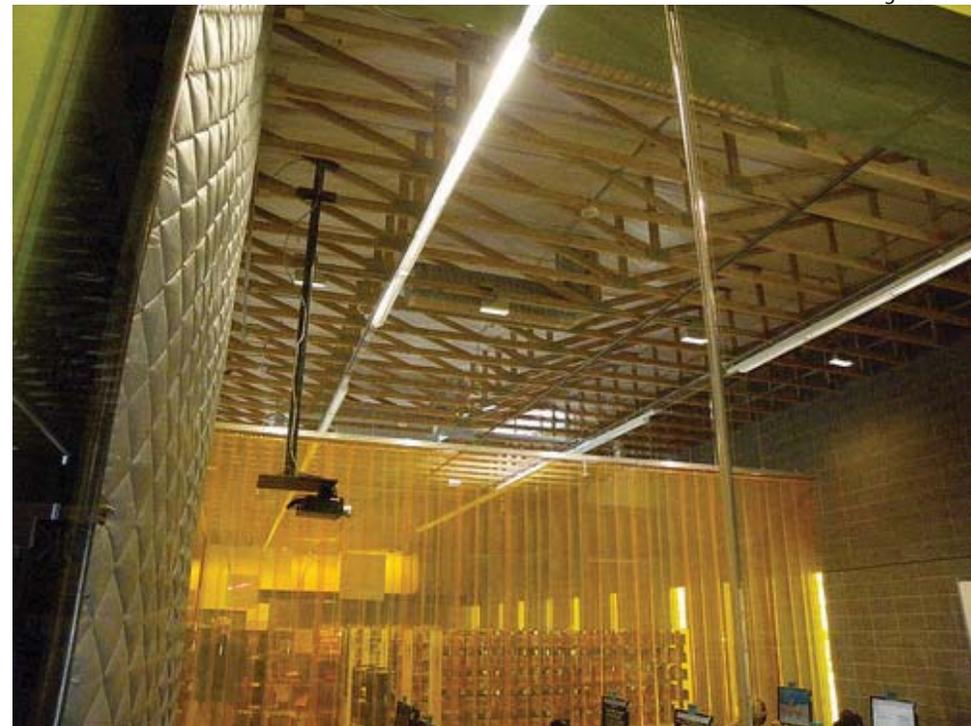


Figure 11.2

“The Spiral”: Ensures unbroken string of books and call numbers

“Mixing chamber”: Large computer oriented area

“The Living Room”: Large open area for reading

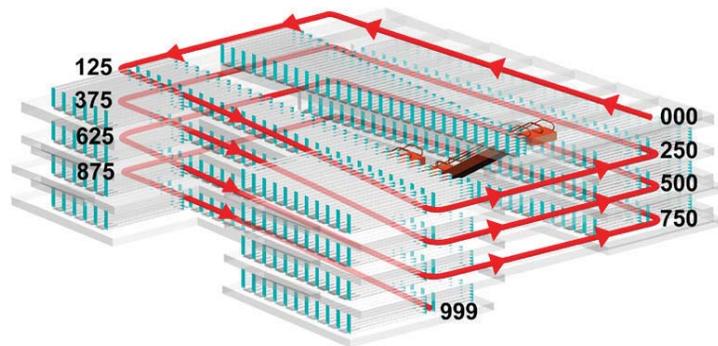


Figure 11.3



Figure 11.4



Figure 11.5

Case Studies **Cardiff Central Library**
Cardiff, Wales

Retail and restaurants on the first level

Materials used to create the exterior of the building mimic the books contained within



Figure 11.6

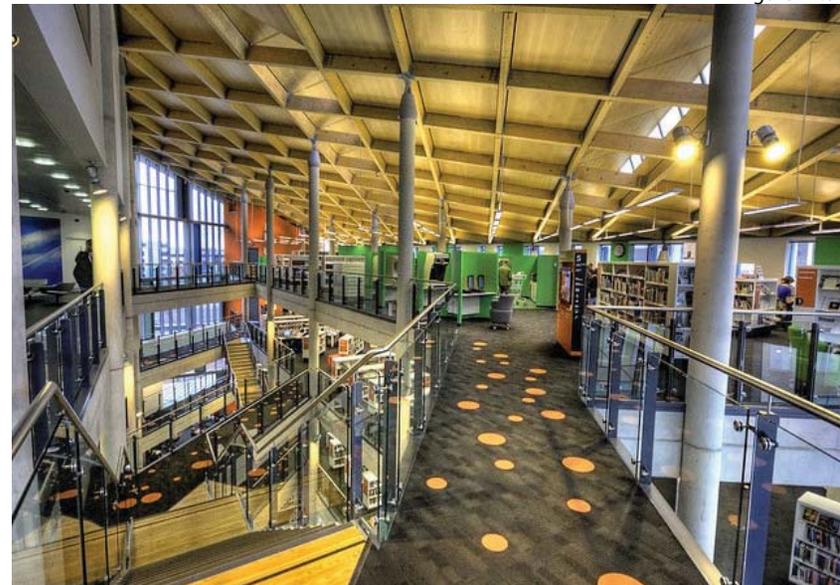


Figure 11.7

Encourage use of books

Use of technology

Cater to a consumer-focused
society

Community Services

Open Spaces

Encourage use of books

Attractive displays and reading areas, easy to find books, suggested readings

Books as part of the walls allows for direct paths

Glass and steel bookshelves used carry less visual weight than traditional shelves

Different materials denote different sections

Reference librarians on each floor

Electronic systems assist in finding books



Use of technology

Computer areas, wireless access, reading and computer areas in same space

Computers for public use on fifth floor

Areas for personal computer use on third, fourth and fifth floors



Figure 11.8, 11.9

Cater to a consumer-focused society

Cafes, restaurants, shopping, merge the renting and purchasing experience

Restaurants and stores on first, second and sixth level.
Lower street level opens to outdoor seating.

Purchasable items integrated in the 3rd and 4th floors.

Archives and restoration on lower level with restaurants,
glass wall allows people to see books being restored



Community Services

Classrooms, meeting spaces, teen and children's programs, lecture spaces

Children's area on the third floor

Teen's area on the fourth floor

Classroom, meeting and lecture spaces on the fifth floor



Figure 11.10, 11.11

Open Spaces

Tall ceiling heights, atrium, natural lighting,
spread out materials

15 ft ceilings

Front atrium is open the height of the building, light
wells used



Figure 11.12

The Site Duluth, Minnesota

Population: 86,319

Metropolotan Area:
279,771

Cardholders: 47,965



Figure 11.13

Population Density

- Low
- Medium
- High

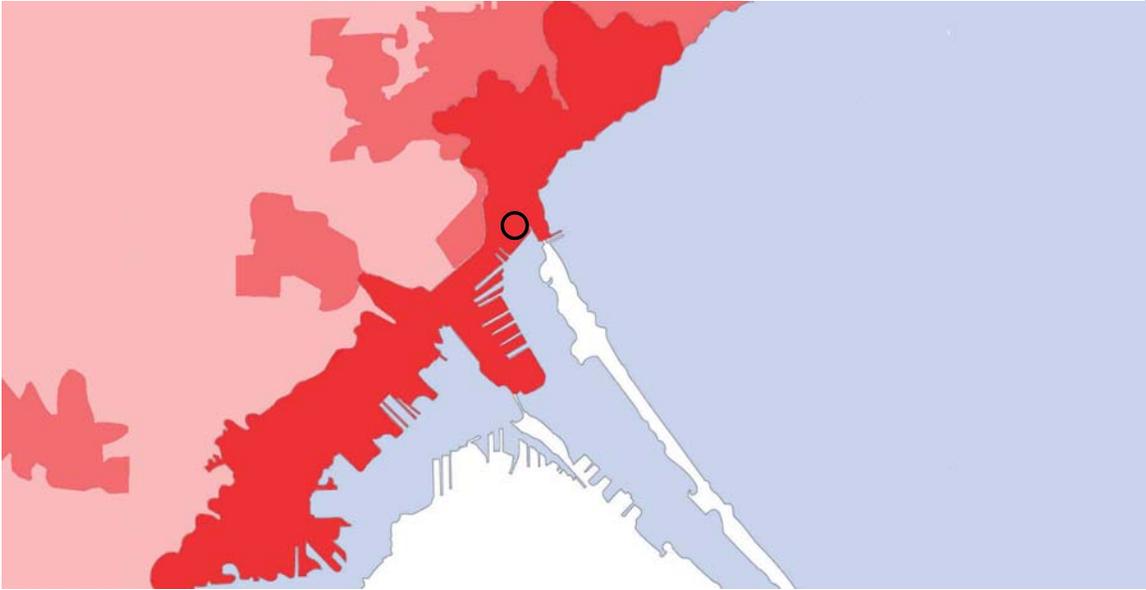


Figure 11.14

The Site Duluth, Minnesota



Figure 11.15

- Existing Bus Route
- Existing Parking

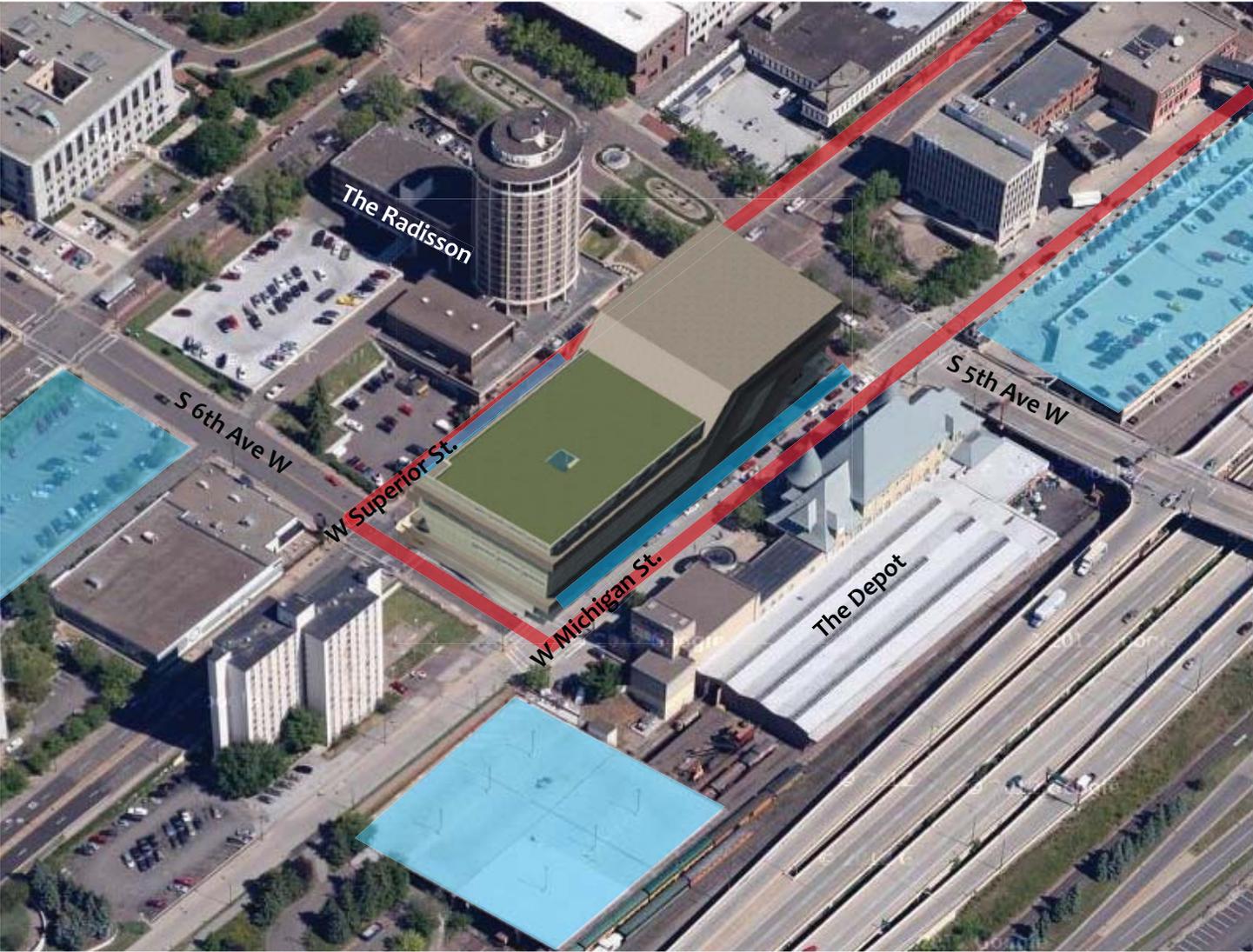


Figure 11.16

The Site Duluth, Minnesota



Figure 11.17



1



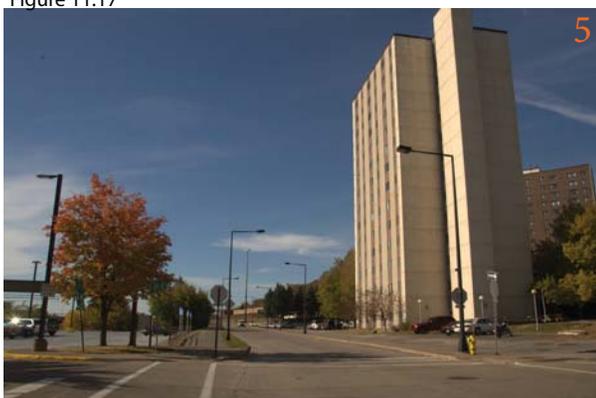
2



3



4



5



6



7

Images taken by Lisa Ostlund

The Site **Current Library**

Between 2010 and 2011: Library Visits: **Decreased** 4,000

Items Checked Out: **Decreased** 27,000

Public Internet Use: **Increased** 4,000



Cramped shelf spaces



Ineffective lighting



Uninviting children's area



Unattractive layout



Difficult to navigate



Unappealing reading areas added to ends

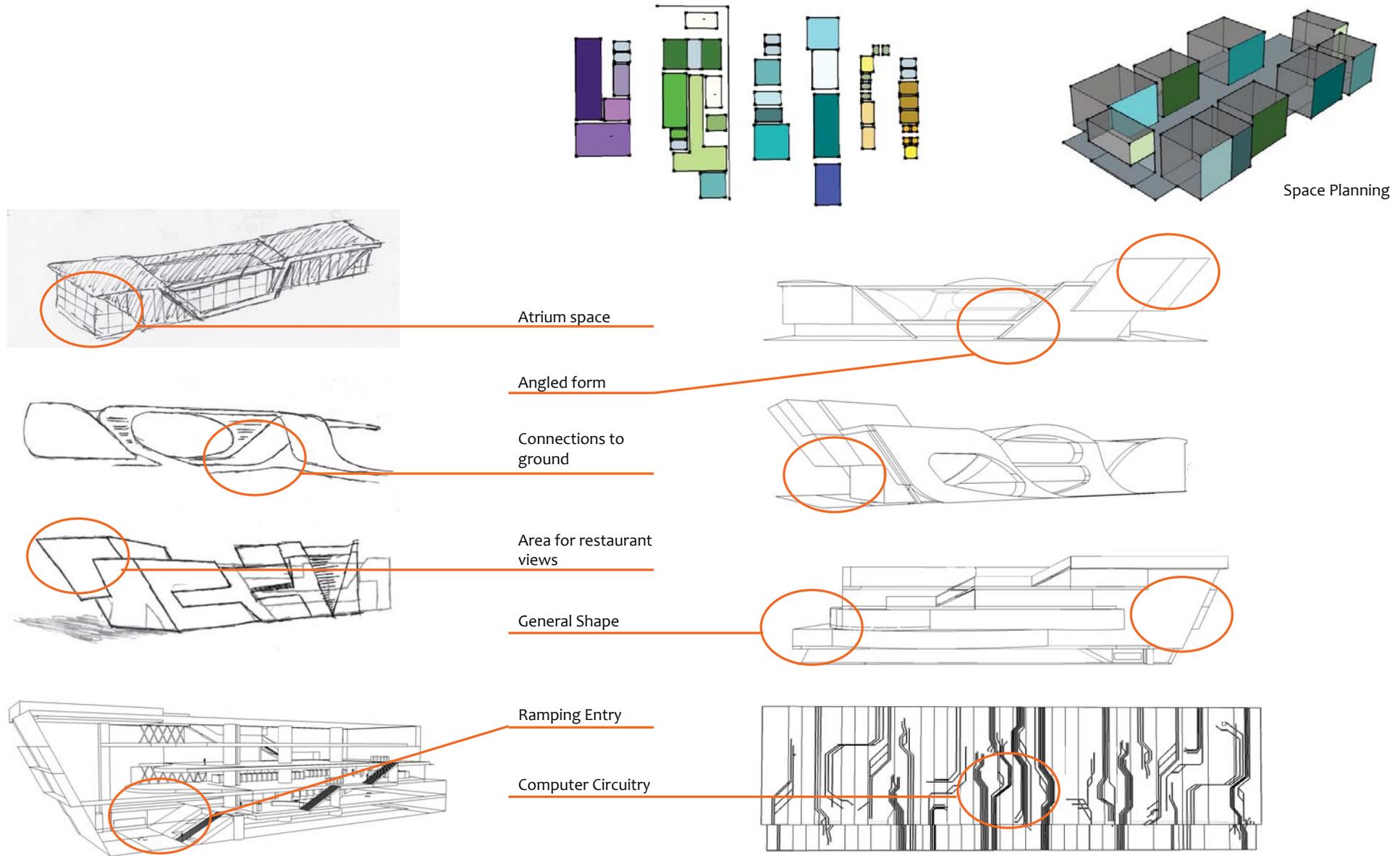


Figure 11.18

Figure 11.19

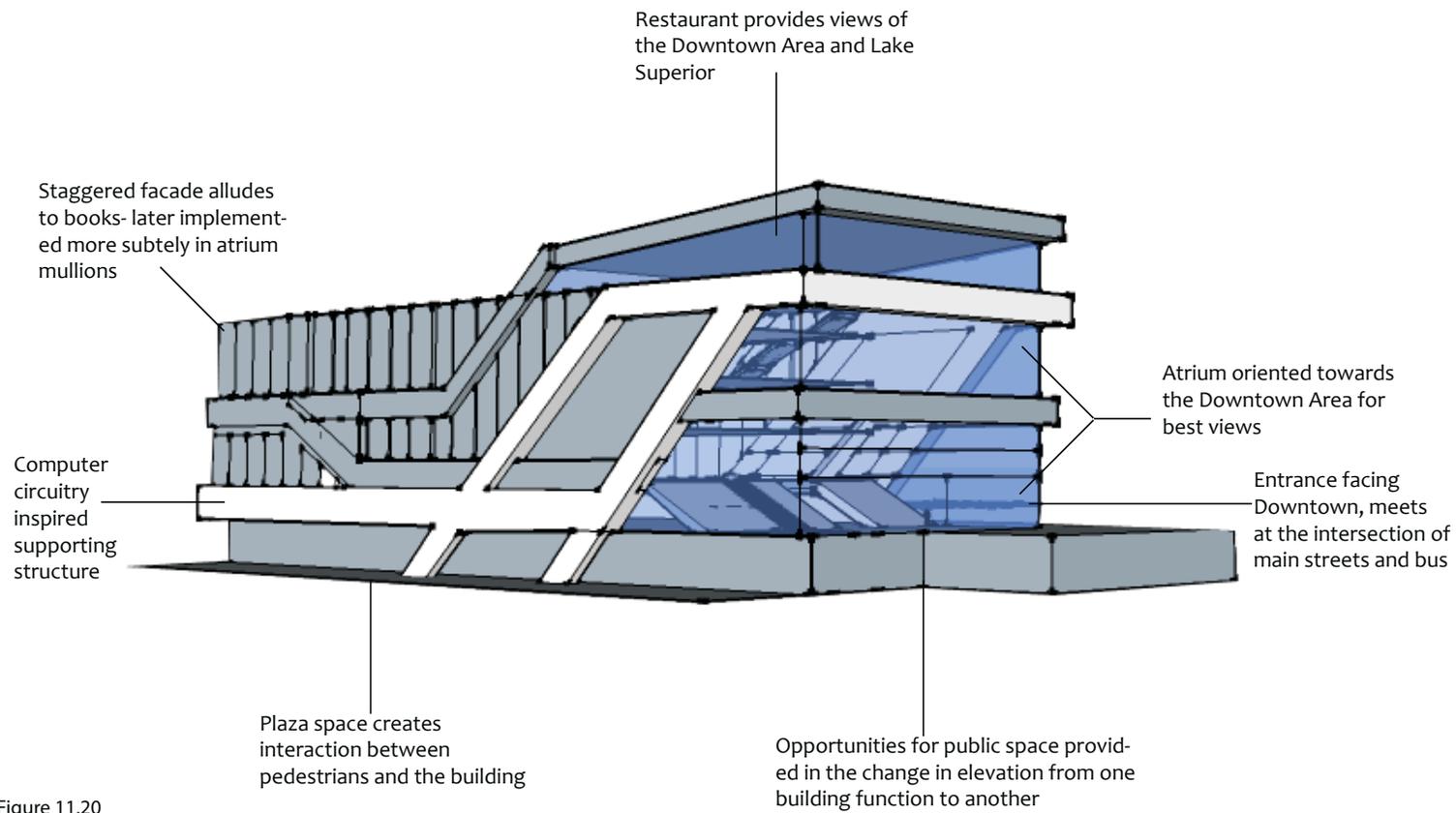
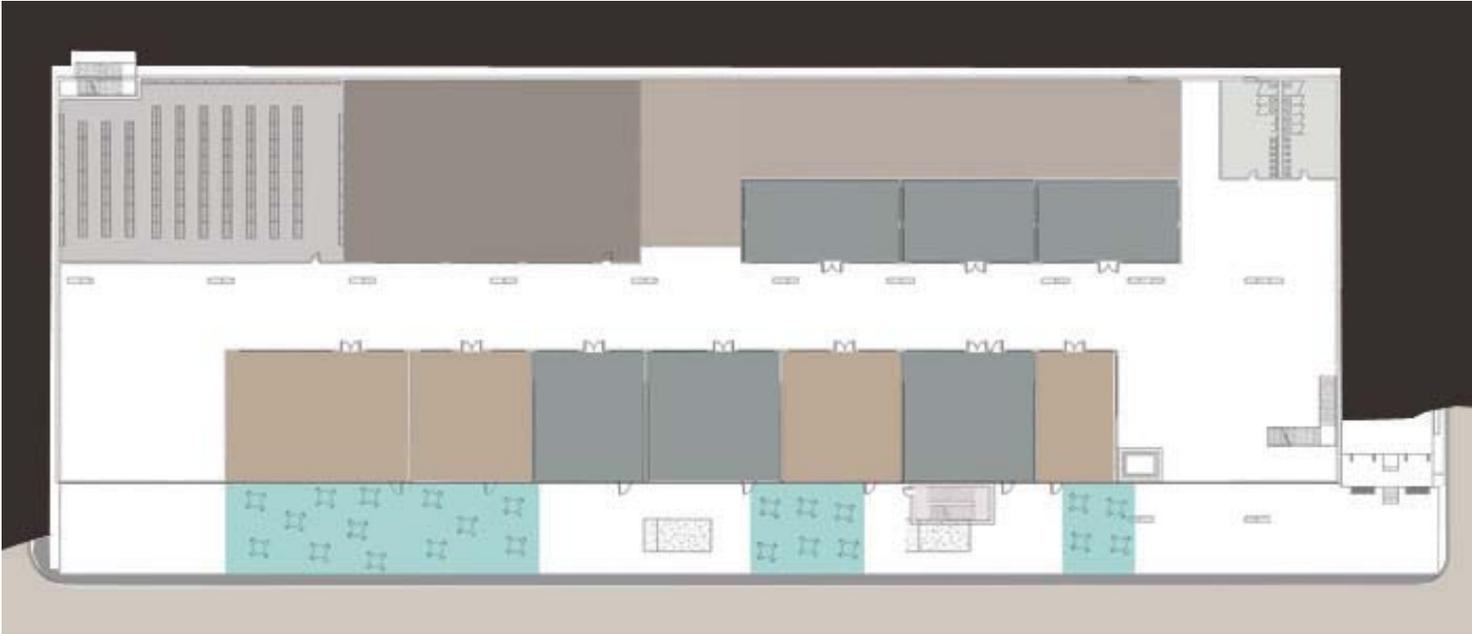


Figure 11.20





Archives	4536 Sqf
Restoration	4877 Sqf
Mechanical Room	5433 Sqf
Retail	7650 Sqf

Cafe	5915 Sqf
Outdoor Seating	4391 Sqf
Restrooms	1035 Sqf
Emergency Stair	

Figure 11.22

Renderings **First Floor**

Steps connect the retail first level and main entrance of the library. Act as community space.



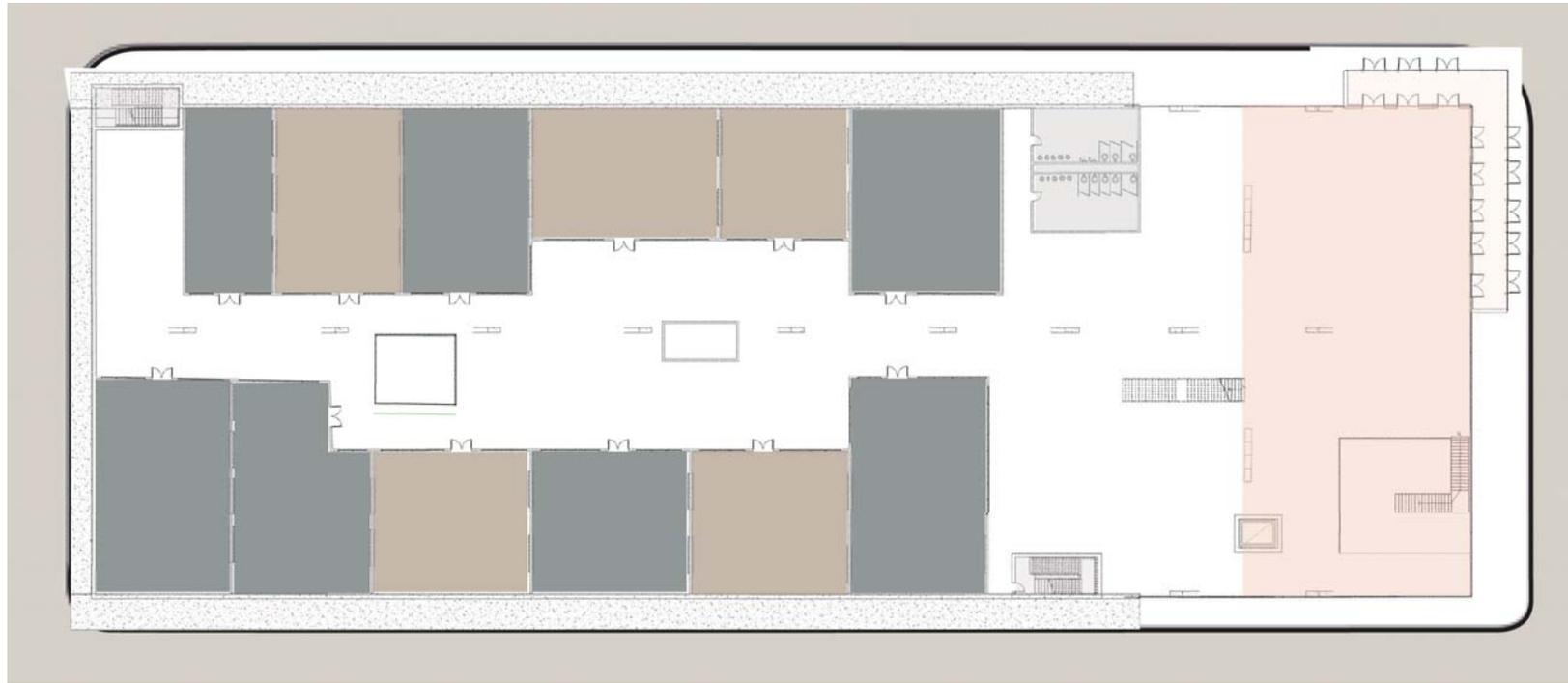
Figure 11.23

Outdoor cafes create a dialogue between the building, pedestrians and the street, as well as simulating a plaza between the library and The Depot.



Figure 11.24

Consumer Society - Open Spaces

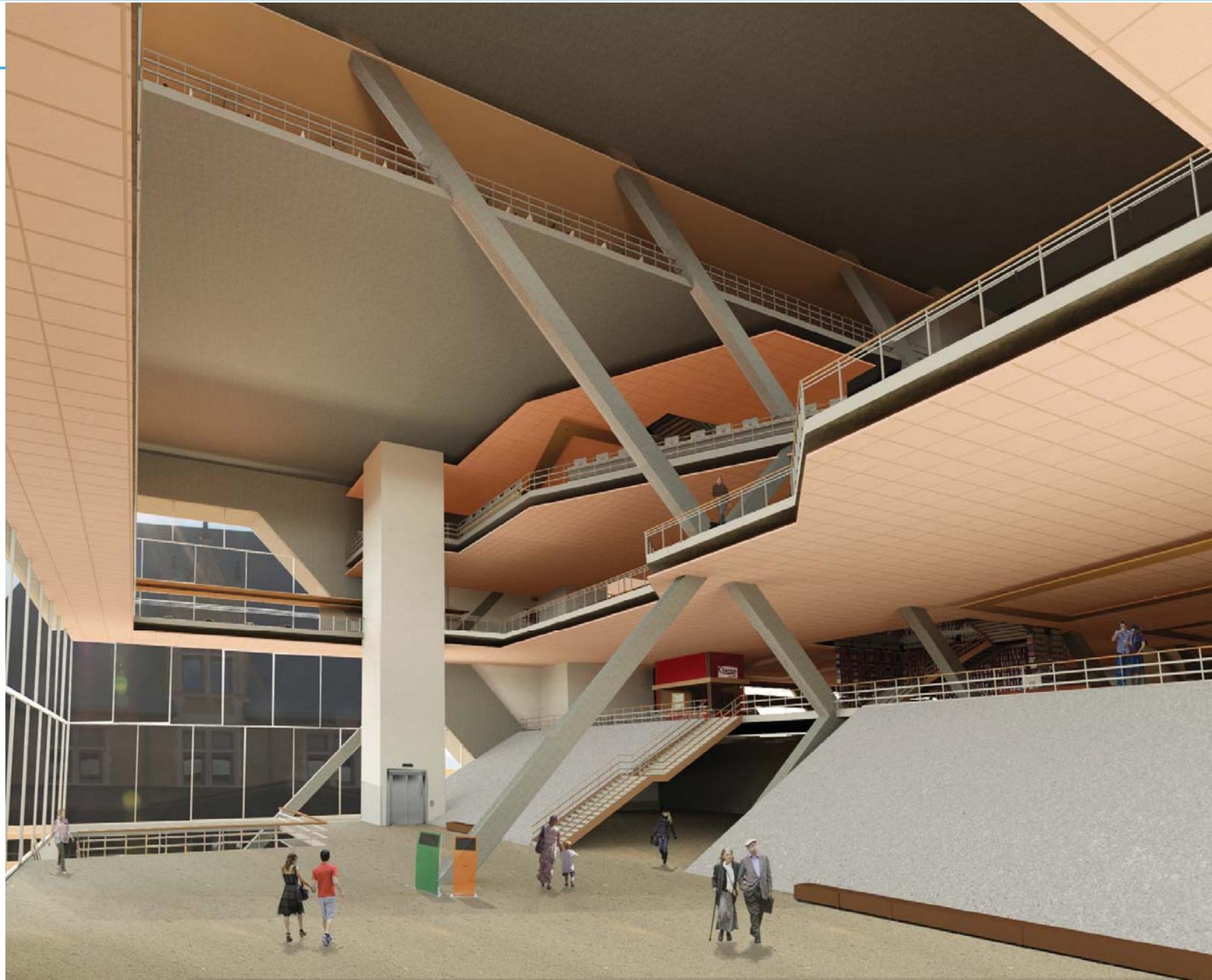


Entrance/ Atrium	8590 Sqf
Retail	13464 Sqf
Cafe	8357 Sqf
Restroom	988 Sqf
Emergency Stair	

Figure 11.25

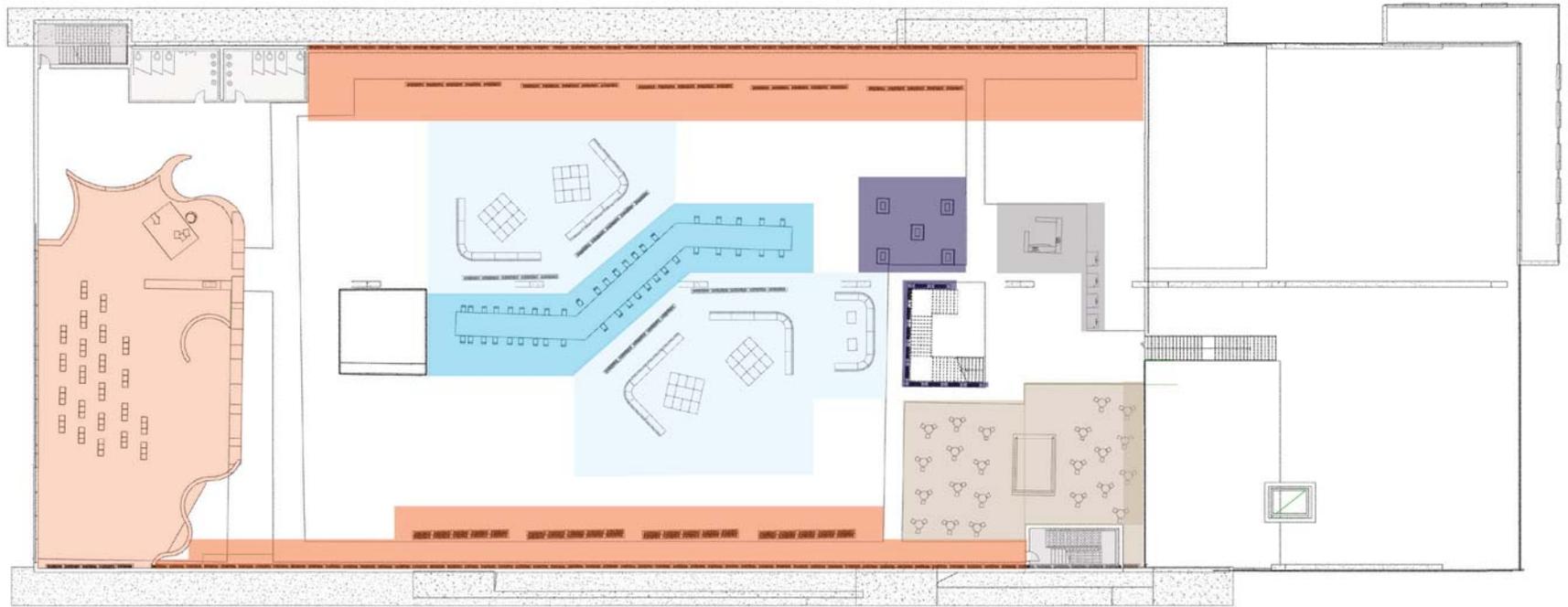
Renderings **Second Floor**

Atrium reaches the height of the building, bringing in light and connecting the floors.



Open Spaces

Figure 11.26



Reference/ Check Out	1715 Sqf	Informal Seating	5076 Sqf	Emergency Stair
Retail Books	929 Sqf	Cafe	2241 Sqf	
Non Fiction	6170 Sqf	Children's Section	4803 Sqf	
Formal Seating	1711 Sqf	Restrooms	582 Sqf	

Figure 11.27

Renderings Third Floor

Reference desks occupy each library floor. Coffee shop offers opportunities for relaxation and the books lining the stairwell are for purchase and mix retail with renting.



Figure 11.28

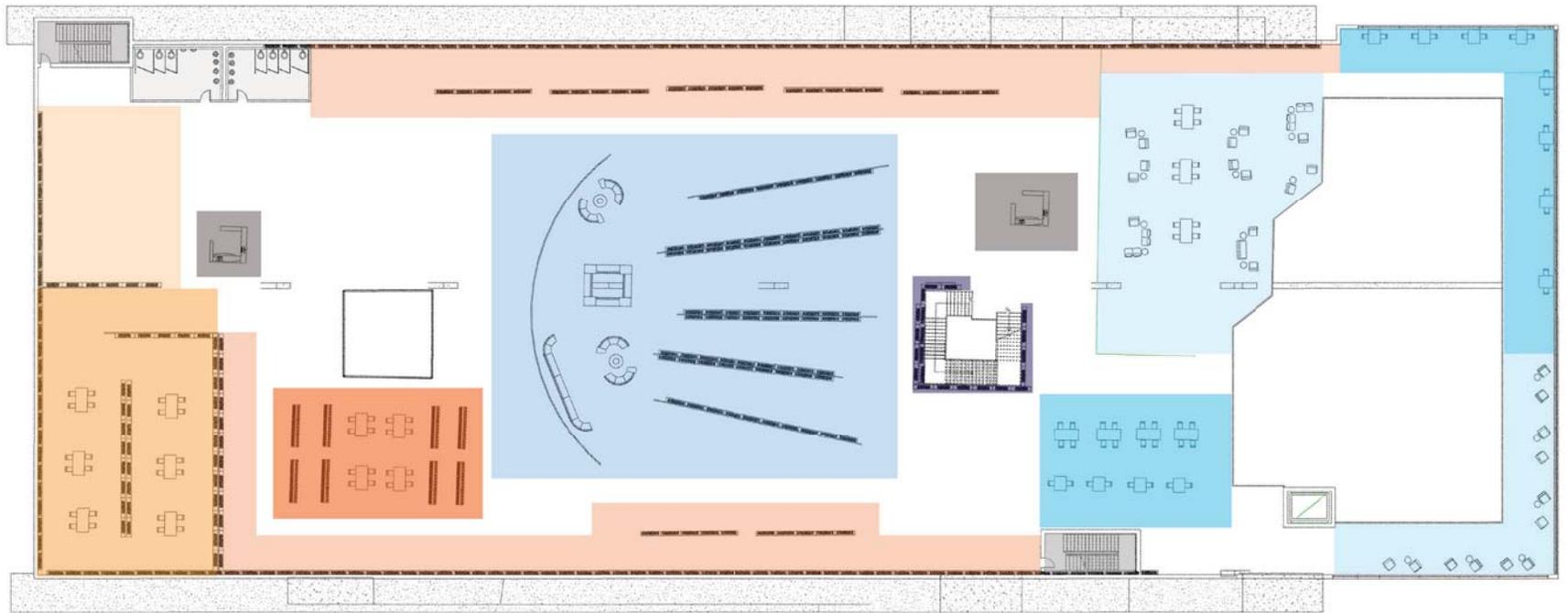
Children's area combines bright colors and a playful area full of reading, climbing and play spaces.



Encourage Use of Books - Consumer Society - Community Services

Figure 11.29

Plans Fourth Floor



Reference	577 Sqf	Informal Seating	5186 Sqf	Rare Collection	425 Sqf
Retail Books		Teen Section	7019 Sqf	Restrooms	631 Sqf
Fiction	6127 Sqf	Magazines	1680 Sqf	Emergency Stair	
Formal Seating	1410 Sqf	North Shore Collection	3273 Sqf		

Figure 11.30

Renderings **Fourth Floor**

Walkway creates reading space and offers views of the area.



Figure 11.31

Teen area uses different materials to give an experience unique to the rest of the library.



Figure 11.32

Encourage Use of Books - Open Spaces - Community Services

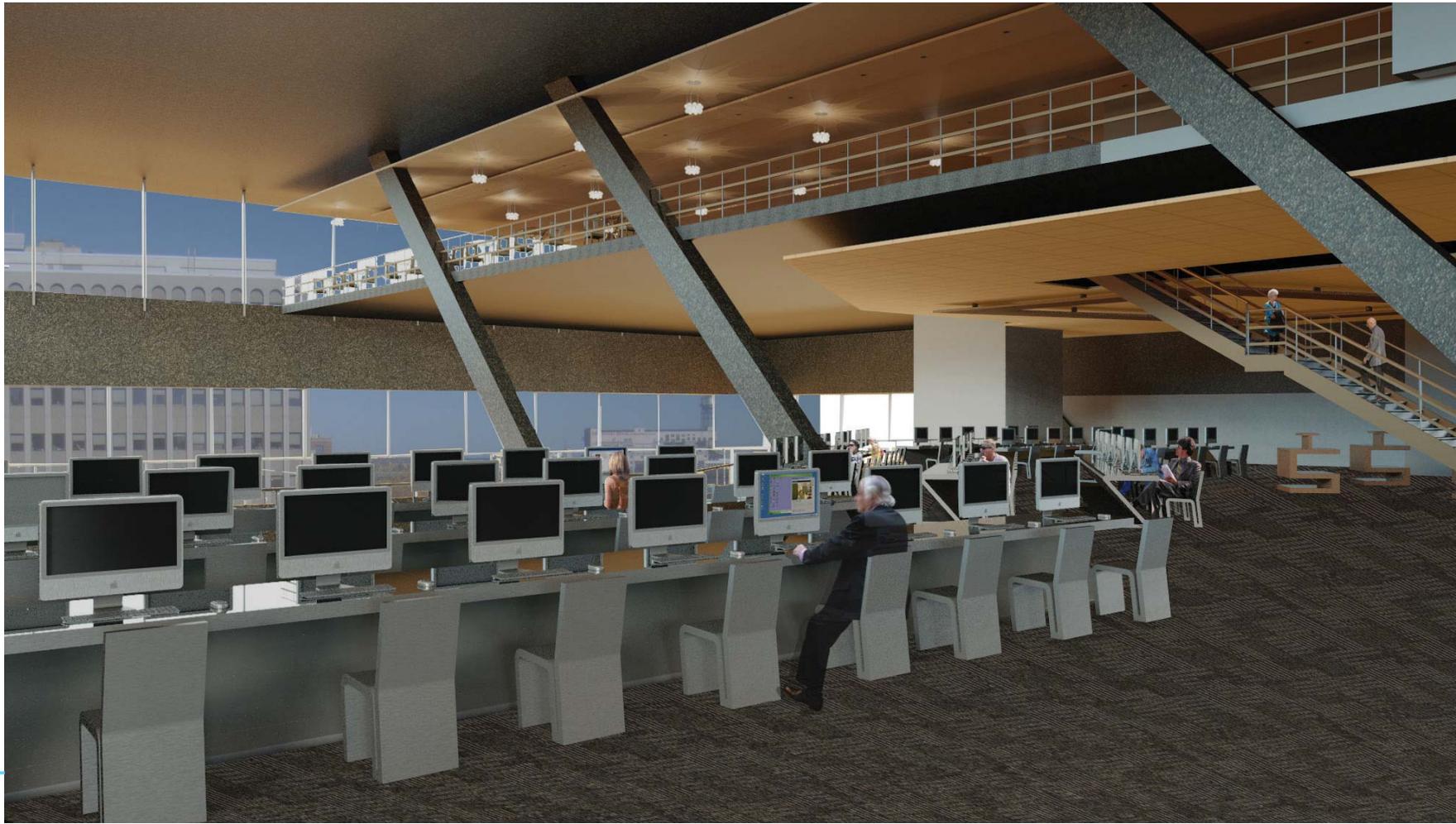


■ Reference	386 Sqf	■ Informal Seating	4701 Sqf	■ Break Room	313 Sqf
■ Computer Area	2968 Sqf	■ Newspapers	387 Sqf	■ Classrooms	1759 Sqf
■ Microfiche	794 Sqf	■ Conference Rooms	1522 Sqf	■ Restrooms	456 Sqf
■ Formal Seating	1424 Sqf	■ Offices	736 Sqf	■ Emergency Stair	

Figure 11.33

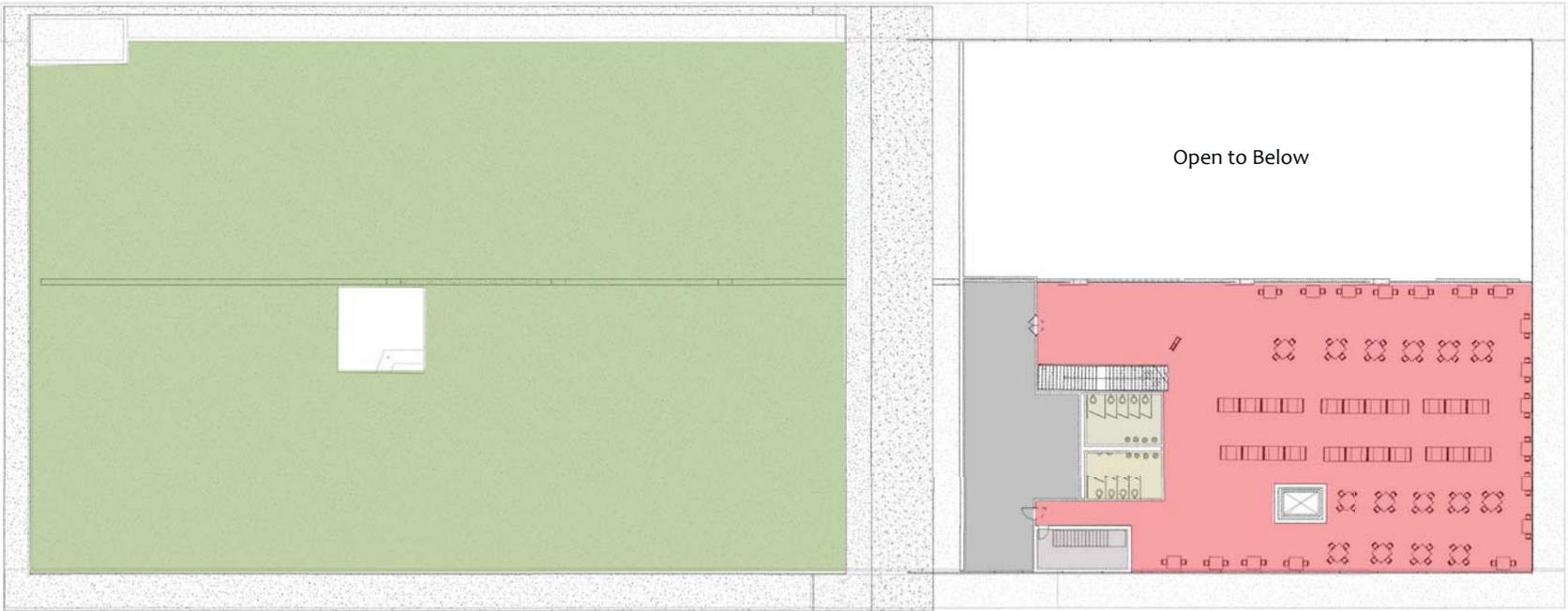
Renderings **Fifth Floor**

Seventy five computers are available for public use, and give views to the outside and the atrium below.



Use of Technology -
Community Services-
Open Spaces

Figure 11.34



- Kitchen 1671 Sqf
- Restaurant 7662 Sqf
- Restroom 386 Sqf
- Emergency Stair

Figure 11.35

Renderings Sixth Floor

The sixth floor restaurant offers views into the atrium below and the Downtown and Lake Superior area.



Consumer Society

Figure 11.36



Non-Fiction Section, Kiosks

Material differentiation assists in navigation.

Non-Fiction section uses green carpet and corresponding kiosks.

Orange metal mesh gives privacy, different shelf materials give teens their own space.



Plywood and concrete shelves, metal mesh dividers



Glass and steel shelves

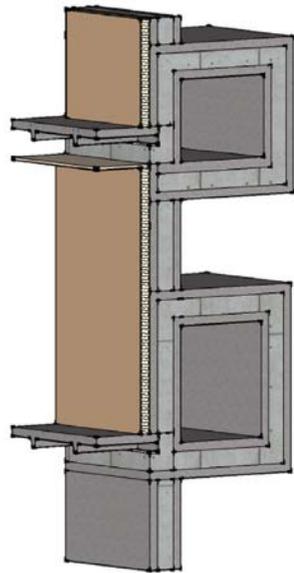
Fiction section uses blue carpet and corresponding kiosks.

Colors and materials encourage a playful atmosphere.



Separating wall

Figure 11.37, 38, 39, 40



Built up reinforced concrete beams form a hollow support structure which grounds the overall frame.

- 1 Reinforced concrete
- 2 Flashing
- 3 Cap Sheet Membrane
- 4 Base Sheet Membrane
- 5 Primer
- 6 Microfab
- 7 Microfab Double Layer
- 8 Filter Fleece
- 9 Drainage Layer
- 10 Waterproofing Membrane
- 11 Growth Medium
- 12 Grass
- 13 Concrete Curb
- 14 Gravel
- 15 Double Tee Flooring
- 16 HVAC Space

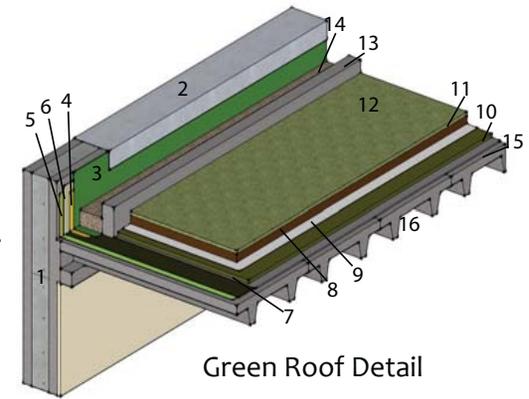


Figure 11.41,42

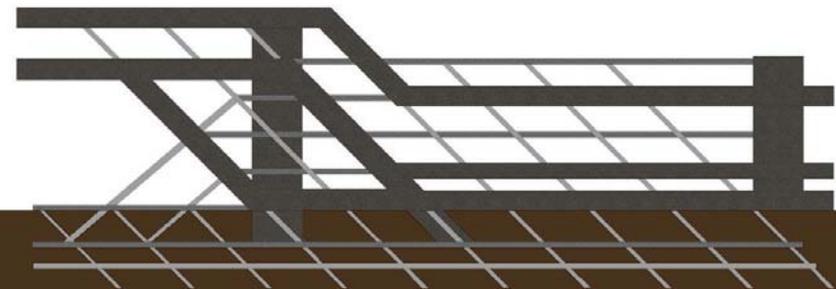


Figure 11.43, 44

What was done **Objectives**

Encourage use of books

Use of technology

Cater to a consumer-focused society

Community Services

Open Spaces

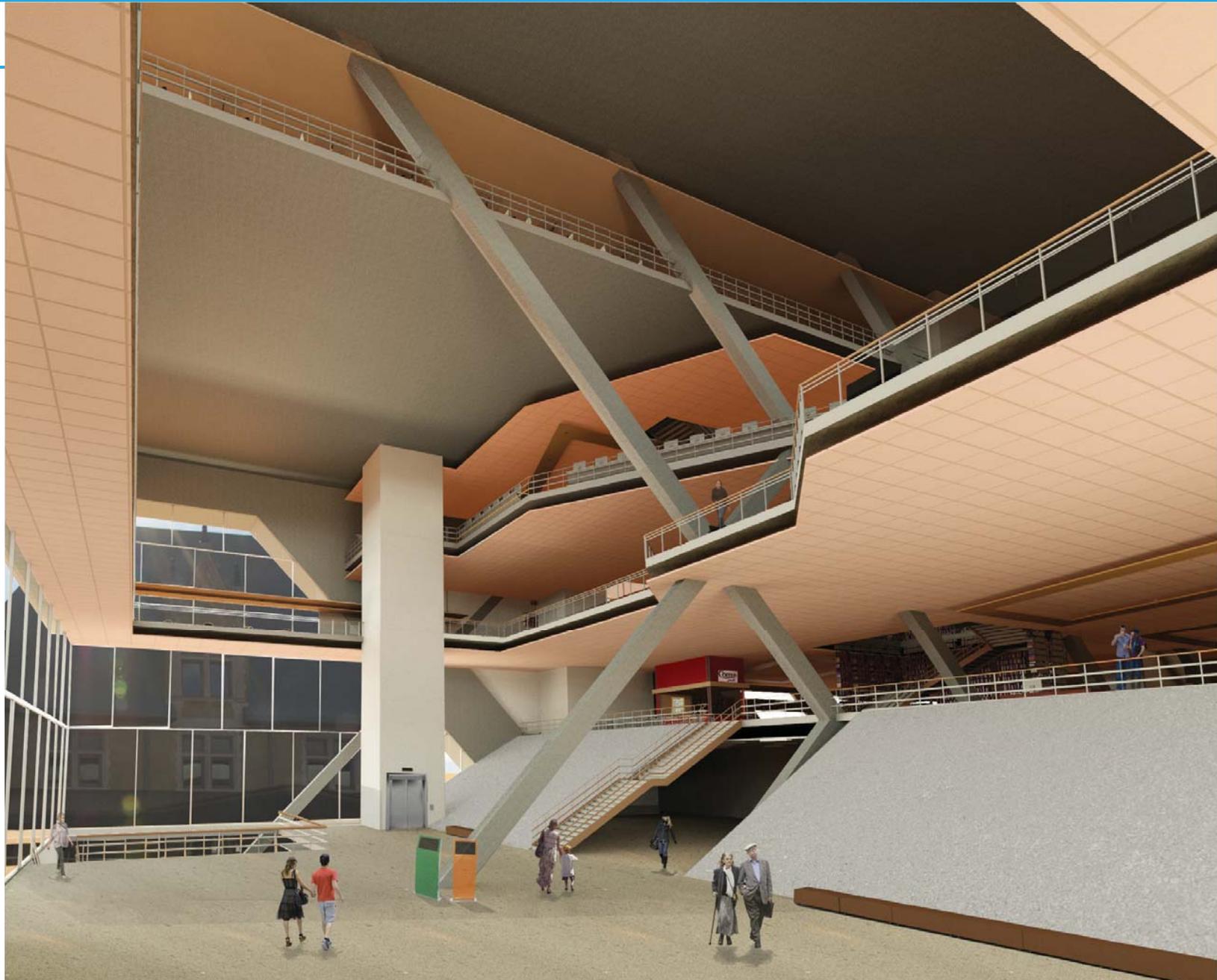
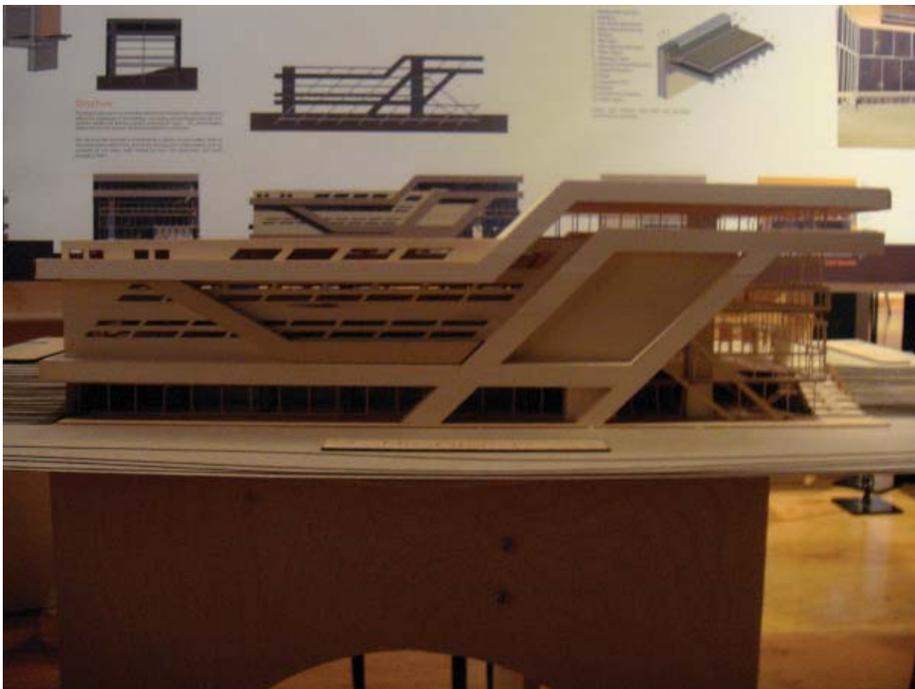


Figure 11.44

PROJECT INSTALLATION





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- Quote on the front cover attributed to Frederick Douglas (1845)

The same infinite detail and awareness could be projected through the radios and televisions, but are not. No, no, it's not books at all you're looking for! Take it where you can find it, in old phonograph records, old motion pictures, and in old friends; look for it in nature and look for it in yourself. Books were only one type of receptacle where we stored a lot of things we were afraid we might forget. There is nothing magical in them at all. The magic is only in what books say, how they stitched the patches of the universe together into one garment for us. Of course you couldn't know this, of course you still can't understand what I mean when I say all this. -Ray Bradbury, *Fahrenheit 451*

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