

Red River Civic Plaza

An Urban Park Destination for Fargo-Moorhead Community



Designed by: Joseph R. Starbuck

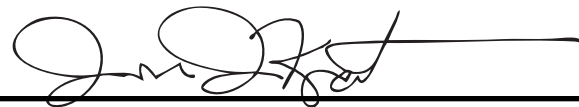
Red River Civic Plaza:
An Urban Park Destination for Fargo, North Dakota

A Design Thesis Submitted to the
Department of Architecture and Landscape Architecture
of North Dakota State University

By

Joseph R. Starbuck

In Partial Fulfillment of the Requirements
for the Degree of
Bachelor of Landscape Architecture



Primary Thesis Advisor

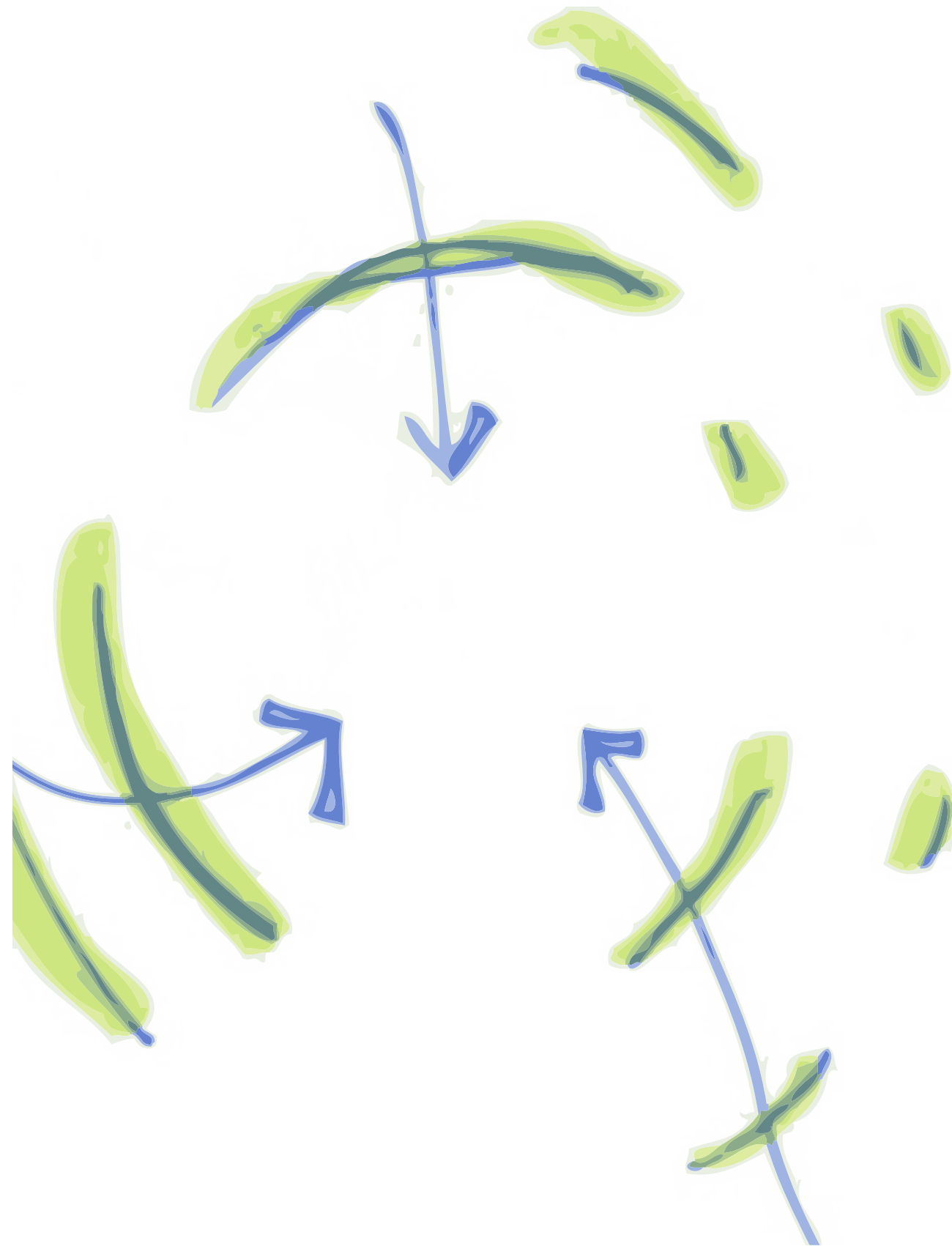


Secondary Thesis Advisor

May 2015
Fargo, North Dakota

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Disclaimer

This thesis booklet is comprised of work produced over the 2014-2015 academic-year at North Dakota State University in the following courses: Thesis Preparation (LA 563) and Thesis Design Studio (LA 572). During these two semesters, extensive design development may have caused the design focus to slightly change. Design is a continuous full-circle process, therefore the initial hypothesis and research presented in the beginning of this booklet may not directly correlate to the final design solution at the end of this booklet. This thesis booklet is intended to show the actual design process from August 2014 - May 2015 as it indeed transpired.

Abstract

The City of Fargo, North Dakota, is funding the construction of a new City Hall to replace their current 1960s structure (Burgess, 2013). This proposed development provides the largest city in North Dakota with a tremendous opportunity to design an iconic open space between their Civic Center, Public Library, and their proposed City Hall. This research focuses on the integration of low impact development into the Red River Civic Plaza to manage stormwater by utilizing bioretention, green roofs, porous pavements, and rainwater harvesting to reduce the demand for the current engineered water conveyance systems consisting of gutters, storm sewers, culverts, and detention basins (Vogel, 2006; Throwe, 2013). The Red River Civic Plaza provides the Fargo-Moorhead community with three sets of benefits: economic, environmental and sociological. This research quantifies the volume of stormwater run-off before prior to development, and identifies the cost effectiveness of low impact development over time compared to our current engineered water conveyance systems, as well as its environmental and sociological benefits in the landscape. The paper concludes with opportune locations for integrating low impact development within the Red River Civic Plaza to maintain zero discharge of stormwater from the site and provide the Fargo-Moorhead community with a socially interactive, sustainable public destination.

Inspiration

Over the duration of my studies at North Dakota State University, I have developed two distinct passions, volunteering and design. Using this thesis, I intend to bridge my two passions through an altruistic design of a sustainable civic park to improve the quality of life in Fargo-Moorhead. I aspire to design a socially engaging park which also serves as a model for sustainable development by successfully managing stormwater through low impact development. The Red River Civic Plaza will enhance social interaction through comprehensive programming, altogether strengthening our Fargo-Moorhead community.

Statement of Intent

The City of Fargo, North Dakota, is experiencing a development and population surge as a result of oil mining in the Bakken formation on the western side of the state (Welbes, 2013). As a result, aging architectural infrastructure and a rise in population has contributed to the need for the development of a larger and improved Fargo City Hall. The new city hall will be located a few hundred feet east across Third Street North from its present location in downtown Fargo. The demolition of the current City Hall is providing the City of Fargo with an exceptional opportunity to redesign a space that connects the Civic Center, the Public Library, and the Red River to the proposed City Hall. This timely development provides a tremendous opportunity to design an iconic multi-use civic destination that becomes the Red River Civic Plaza. This thesis identifies how the Fargo-Moorhead community will benefit from the Red River Civic Plaza through the examination of the following sustainable, civic open space precedents:

- Director Park in Portland, Oregon
- Shoemaker Green at the University of Pennsylvania in Philadelphia, Pennsylvania
- Civic Space Park in Phoenix, Arizona

These precedents may yield important sociological design and stormwater management strategies which I will apply to the design of the Red River Civic Plaza. My research will focus on the integration of low impact development into the Red River Civic Plaza by utilizing bioswales, bioinfiltration, rain gardens, and permeable paving to reduce the demand for the current engineered water conveyance systems consisting of gutters, storm sewers, culverts, and detention basins (Vogel, 2006; Throwe, 2013). My research will quantify the volume of stormwater runoff before and after development, and identify the cost effectiveness of low impact development over time, as well as its environmental and sociological benefits in the landscape. My thesis will conclude with opportune locations for integrating low impact development within the Red River Civic Plaza to maintain zero discharge of stormwater from the site and provide the Fargo-Moorhead community with a socially interactive, sustainable public destination.

Critical Evaluation of Cited Papers

The Red River Civic Plaza in Fargo, North Dakota is to function as a public park which promotes community engagement, while successfully managing stormwater runoff. This research will analyze low impact development (LID), and its ability to manage stormwater, as well as the economic, environmental and social benefits LID provides. These main points will be reinforced through a case study discussion of Simon and Helen Director Park, in Portland Oregon, ultimately supporting the implementation of LID into our cities.

Stormwater management has become of increasing importance in the United States over the past three decades because municipalities, state, and federal agencies have all recognized that we need to take action to restore our surface hydrology. Development in the United States has had a negative impact on our water resources. Our development historically consists of altering the native landscape into cities covered more and more by impervious surfaces. These impervious surfaces prevent stormwater from infiltrating and recharging our ground water; thus, the stormwater runoff transports debris, chemicals, pathogens, and sediment into our lakes, streams, rivers, wetlands and coastal waters. The water which enters the storm sewers is discharged untreated into our water sources which we utilize for drinking water and recreational activities (U.S. EPA, 2003). Historically our cities have been designed with combined sewer systems (CSS) which transport stormwater and sewage in the same system. These once popular systems continue to become overloaded during high intensity storm events which result in a mixture of stormwater and sewage released directly into our local waters; these are known as combined sewer overflows (CSO). "CSOs dump millions of gallons of raw waste and other dangerous pollutants into rivers, creeks and lakes - waters we may fish, swim or boat in, or which may be sources of drinking water" (American Rivers, 2012). There are efforts to convert all CSS into separate stormwater and sewer systems; according to a 2008 report by the EPA, it is estimated that our U.S. cities still require \$63.6 billion for combined sewer overflow correction and \$42.3 billion for stormwater management (U.S. EPA, 2008).

In 2007, congress approved the Energy Independence and Security Act, of which section 438 addresses stormwater runoff requirements for federal projects greater than 5,000 square feet. Two years later the United States Environmental Protection Agency (EPA) published a document titled Technical Guidance on Implementing the Stormwater Runoff Requirements for Federal Projects Under Section 438 of the Energy Independence and Security Act (Landphair, 2014). This document is commonly utilized today by designers and those involved in federal development projects by providing case studies and a broad overview of LID strategies. We can utilize these

strategies to improve our conventional water conveyance systems through LID, which is gaining considerable attention due to its economic, environmental, and sociological benefits.

LID is a framework for sustainable stormwater design with the goals of minimizing developmental impacts and maintaining or reducing pre-development runoff rates and volumes. There are various strategies used to minimize developmental impact including, bioretention, green roofs, porous pavements, and rainwater harvesting (Vogel, 2006). Collectively these developmental strategies assist in reducing the demand for the current engineered water conveyance systems consisting of gutters, storm sewers, culverts, and detention basins (Throwe, 2013).

The economic, environmental, and social benefits associated with LID typically outweigh the benefits of conventional stormwater management conveyance systems. According to a 2007 U.S. EPA study, eleven out of twelve LID projects were less costly than utilizing conventional stormwater systems. The American Society of Landscape Architects (ASLA) conducted a "more comprehensive survey of 479 case studies in 43 different states." It ultimately revealed that LID overall costs were reduced 44.1 percent, remained the same 31.4 percent, while overall costs were more in 24.5 percent of cases. (Law, 2014). LID strategies provide a diversion for stormwater from the CSS, and also provide increased water quality through filtration by utilizing vegetation and permeable soils. These strategies have proved evident in cases such as the LID approaches implemented in Chicago, Illinois in 2009 which diverted 70 million gallons of stormwater from the CSO system. The City of Portland, Oregon, implemented curb extensions that include vegetated swales, downspout disconnections and parking lot infiltration to reduce their CSO and Willamette River water quality issues. This LID implementation ultimately saved Portland \$0.89 to \$4.08 per gallon removed from their conventional conveyance systems. In a movement, similar to Portland's, the City of New York has implemented a plan utilizing both conventional and LID strategies to save an estimated \$1.5 billion dollars in the next 20 years (American Rivers, 2012).

These conventional stormwater conveyance systems require infrequent maintenance, but the structural integrity degrades over time demanding expensive capital costs for repairs and replacements. Conversely, LID requires more frequent maintenance, but the natural infrastructure becomes more resilient over time yielding higher performance as the vegetation matures, exponentially becoming the smarter investment for your money. After implementing LID strategies the City of Portland will save \$65 million to \$145 million over time in operating and maintenance costs.

The implementation of LID also provides energy cost savings. A 2004 report by Texas A&M University summarized more than 25 articles about buildings utilizing cool roofs and identified energy savings ranging from 2 to over 40 percent, with average savings of about 20 percent (U.S. EPA, 2014). Green roofs have a higher albedo than conventional roofing systems;

therefore, they absorb lower amounts of solar radiation, resulting in reduced annual heating and cooling costs. This is evident in the following two green roof precedents:

1) “A Toronto study found two green roofs with minimal vegetation to both reduce peak summertime roof membrane temperatures by 35°F and summertime heat flow through roofs by 75 percent and 90 percent compared with a conventional roof, substantially reducing energy needs for cooling”, and

2) Similarly in Minnesota, the “Target Center Arena in Minneapolis encompasses 113,000 square feet and captures nearly 1 million gallons of stormwater annually. The green roof has cut annual energy costs by \$300,000” (American Rivers, 2012). While LID can be utilized to save energy costs with buildings, it also reduces the energy demands to heat, treat, and transport water. “Water and wastewater systems across the United States are some of the highest energy consumers, responsible for an estimated 3 percent of U.S. energy consumption annually” (American Rivers, 2012).

LID strategies such as infiltration help to recharge our groundwaters while rainwater harvesting contains water on site, both of which reduce the costs of heating, treating and transporting the stormwater. Additionally, rainwater harvesting decreases the need for potable water by capturing stormwater runoff which may be utilized for irrigation, flushing toilets, and other industrial uses.

Ultimately, the initial costs for LID can be greater than that of conventional stormwater infrastructure, but due to the reduction of overall stormwater management needs after the implementation of LID, the project costs may be significantly reduced. LID is more economically effective in the long-term because it yields a lower overall life cycle cost, contrary to the expensive repair and replacement needs of conventional stormwater infrastructure.

When current stormwater conveyance systems work in conjunction with CSO systems, the product is unhealthy water sources, resulting in highly contaminated landscapes yielding unsatisfactory ecological conditions. The runoff that pollutes the same waterbodies in which we swim, boat, and fish, and from which derive our drinking water, contain “toxic chemicals such as insecticides and polychlorinated biphenyls (PCBs), as well as heavy metals like copper and lead” (American Rivers, 2012). The contaminated runoff negatively affects the surrounding ecology; a few water related sicknesses include botulism, gastrointestinal illness, and methemoglobinemia. Botulism is a bacteria growth which develops due to increased water temperatures. This bacteria affects the nervous system, and is known to be significantly detrimental to birds and fish (Groenblauw, 2014). Gastrointestinal illness is an infection which people derive from swimming or eating seafood from contaminated water sources. Lastly, methemoglobinemia pollutes

drinking water supplies and is caused by excess nitrogen, which inhibits the blood’s ability to deliver oxygen to the body. “In the EPA’s 2006 report to congress, the Agency found that CSOs and SSOs caused at least 5,576 illnesses every year from exposure at recognized recreation beaches across the country”. Years earlier, in a 1998 study, “34.5 percent of gastroenteritis infections and 65.8 percent of ear infections that were reported were linked to swimming in ocean waters that were contaminated by sewage”. The implementation of LID principles in the landscape can reduce pollutant loadings in our water bodies. LID can also “improve air quality which assists to reduce asthma rates, mitigates the urban heat island effect to lower heat stress related fatalities, and improves and increases green space for recreation” (American Rivers, 2012).

Ultimately implementing LID in our cities can help prevent community health issues, degrading ecology, and reduced tourism revenues. There are many cities implementing strategic LID plans to mitigate their water quality issues, including the City of Washington D.C., and the City of Philadelphia. Firstly, “A 2007 study of Washington DC found that the use of urban trees and green roofs for stormwater management would keep 1.2 billion gallons of runoff out of the water infrastructure system. This equals a 10 percent reduction in untreated discharge entering local rivers and would reduce the frequency of combined sewer overflows by almost 7 percent. At the minimum, this would keep an estimated 120 pounds of copper, 180 pounds of lead, and 340 pounds of phosphorous, and 530,000 pounds of total solids among other pollutants out of local waterways every year” (American Rivers, 2012). Secondly, based on a 2009 assessment of Traditional and Green Infrastructure Options for Controlling CSO Events in Philadelphia’s Watersheds, 1 to 2.4 premature fatalities and over 700 cases of respiratory illness days were avoided each year due to the implementation of LID, which is estimated to save \$130 million over forty years in health costs. These precedents prove that LID not only provides economic benefits for overall water quality but, environmental benefits as well.

The sociological benefits associated with LID include community involvement, safety, and social support. Based on conducted surveys in the City of Portland, it is evident that due to the resident’s knowledge of the associated benefits of the bioswales and rain gardens they are willing to engage with their local community members to maintain the bioswales, and rain gardens within their neighborhood. This provides evidence that LID may be able to encourage community engagement in the future of our cities. The safety benefits truly depend on the implementation of LID in the landscape, but during winter months pervious paving will generate “less ice and snow buildup than on the previous surface, and it requires less plowing and salting. During freeze-thaw cycles, melt water infiltrates rather than freezing as an ice layer” (American Rivers, 2012). This is a great benefit for northern cities that experience large winter events, because it will help maintain public health and encourage winter activities by keeping the streets and sidewalks more clear of snow and ice. Finally, “studies show that people with

more vegetation in their living environments feel less lonely and are less likely to experience a perceived lack of social support” (Groenblauw, 2014). The implementation of LID can ultimately improve community involvement, and promote public safety as well as an increased social support system.

The economic, environmental and sociological benefits, as well as the importance of LID should be clear based on the information on the previous pages. Using the case study of Simon and Helen Director Park in Portland, Oregon to demonstrate the successful implementation of LID, we can begin incorporating these strategies into projects within our home cities.

Director Park, which is a half acre urban park in downtown Portland, Oregon, constructed in 2009 is considered to be one of the world’s most successful public destinations. The park is proclaimed to be a successful destination due to its ease of accessibility, variety of seating options, and distinctly yet subtly defined spaces (Loomands, 2014). One of the Portland Department of Parks and Recreation’s important goals for the project was to ensure 100 percent of the stormwater is filtered on site before discharging into the city’s conventional stormwater system. The park was successfully designed to meet this goal by the landscape architecture firm, Olin Studio. Director park annually prevents over 990,000 gallons of stormwater from entering Portland’s CSO system, through utilizing bioinfiltration planters, tree wells and a green roof (Thoren, Louw, 2013). These stormwater management practices save \$200.00 annually, and also help avoid a projected \$3.9 million in future capital costs to upgrade the stormwater infrastructure. Director Park also utilizes rainwater harvesting technologies and repurposes the stormwater for irrigation of drought tolerant plants, saving approximately \$300.00 annually. Most importantly, Director Park meets their goal of filtering 100 percent of the stormwater before any runoff is discharged towards the Willamette River. These LID strategies help reduce the pollutant loads in the river, ultimately improving the economic, environmental health and well-being for the City of Portland (Portland Parks and Recreation, 2014).

Jan Gehl, (a well-known Danish Architect and Urban Designer), conducted a study on Director Park and identified that the park’s visitors engaged in three types of activities: necessary, optional, and social. Necessary activities include such visitors as, a mail carrier delivering packages, or a businessman heading to work. Optional activities includes visitors which choose to engage in various acts, such as eating lunch or reading a book. Social activities are those in which individuals are interacting with one another through necessary or optional activities. Gehl concludes that Director Park is a highly successful public destination due to the high number of optional and social activities (Thoren, Louw, 2013).

As a result of Director Park’s design to incorporate unique site elements and frequent event programming for a diverse group of visitors, the space is quickly becoming a well known destination within the City of Portland. Visitors recognize and begin to appreciate the unique character which the Director Park holds, such as, the Teacher’s Fountain, The Elephants in the

Park Cafe, the majestic glass canopy, the human-sized chess board, the open access layout of the park, and its close proximity to public transit. Director Park experiences a large number of visitors every day, even with its close proximity to the historically popular Pioneer Square, only one block to the North East. It is a similar unique character which the Red River Civic Park needs to make it a successful public destination within the City of Fargo. Through the identification of unique site elements and frequent programming we can design an iconic civic space which encourages our Fargo-Moorhead community to gather together, encouraging enhanced social engagement.

The Red River Civic Plaza will benefit from the implementation of LID in order to reduce the stormwater runoff and pollutant discharge from the site. Even though there are not significant pollution issues associated with the Red River, the City of Fargo will benefit from the economic, environmental, and social benefits that LID provides. The Red River Civic Plaza will be an iconic destination from which the Fargo-Moorhead community will learn new and upcoming strategies for managing stormwater. The Plaza will act as a model for future development in the region, by promoting an economically, environmentally and socially healthier future.

Case Study: Director Park Portland, Oregon

PROJECT NAME: Simon and Helen Director Park

LOCATION: SW Park Avenue between SW Yamhill Street and SW Taylor Street in downtown Portland Oregon.

PROJECT TYPOLOGY: Urban Plaza

DATE DESIGNED: Design began in 2006

CONSTRUCTION COMPLETED: Construction completed in 2009

COST: \$9.45 million of which \$7.2 million was construction cost, and \$2.25 million was design and administration. The land, which was donated to the city, was valued at \$6 million bringing the value to \$15.5 million.

SIZE: 1/2 Acre

LANDSCAPE ARCHITECT: Olin Studio, Mayer/Reed

ROLE OF THE LANDSCAPE ARCHITECT: A landscape architect was initially consulted by the city to recommend improvement to the site and street network in 2001. After the development of an underground parking structure was initiated on site, the client pursued a landscape architect to lead the design of the streetscape and the public space at grade.

ARCHITECT: ZGF Architects, TVA Architects

CLIENT: The City of Portland Department of Parks and Recreation

CONSULTANT(S): KPFF Consulting Engineers Inc., Brant Construction, Benya Lighting Design, CMS Collaborative Inc.

PROJECT MANAGER: Allison Rouse (Allison K Rouse Landscape Architects of Portland, Oregon) and Eric Jacobson (Portland Development Commission)

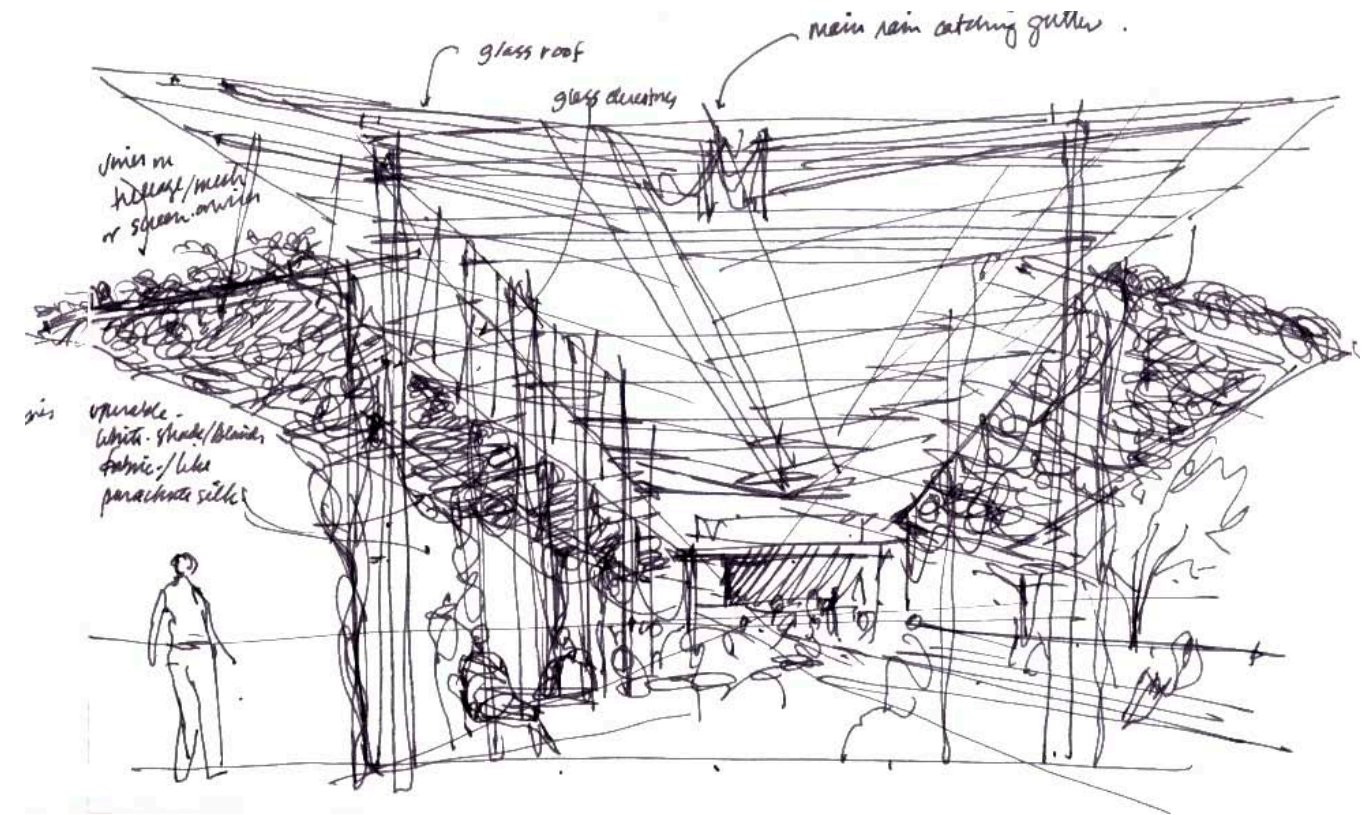
CONTEXT: The adjacent blocks are very walkable and include commercial, residential, and retail uses providing the park with a diverse group of visitors.

SITE ANALYSIS: At the broader scale, the City of Portland had a desire to connect a series of parks along a vibrant promenade known as their “Park Avenue Vision”, and Director Park is the first component of this vision. At site scale, the park has a 9 foot grade change diagonally down from the SW corner of 9th and Taylor towards the NE corner of Park and Yamhill. A site slope of 4.9% required terracing in-order to achieve flat areas throughout the park. The site grading in conjunction with the underground parking provides insufficient room for trees on the northern portion of the park.

GENESIS OF PROJECT: The vision for a park on this site began in the 1840’s when a row of 19 blocks were donated to the City of Portland for park space.

PROJECT BACKGROUND AND HISTORY:

- Prior to its most recent development the site functioned as a typical surface parking lot with an underground parking structure, and provided no alternative functions or benefits to Portland’s community members.
- In the 1840s Daniel Lowndale and William Chapman donated a row of 19 blocks to the city of Portland designated for parkland.



- Jordan Director Schnitzer donated \$1.6 million towards the development of the urban space and named it Director Park after his grandparents Simon and Helen Director who provided great service to the Portland community.

DESIGN INTENT: The intent was to design an open space which acted as a community destination incorporating various amenities, engaging pedestrians through programmed and non-programmed activities.

DECISION MAKING PROCESS: The design was a collaborative effort which included the public, the design team, the City of Portland Department of Parks and Recreation, the Department of Transportation, and the Water Bureau. This process integrated the public through an opinion survey, 4 newsletters, 3 public open houses, 13 citizen advisory committee meetings, and numerous presentations with the city counsel and other stakeholder groups.

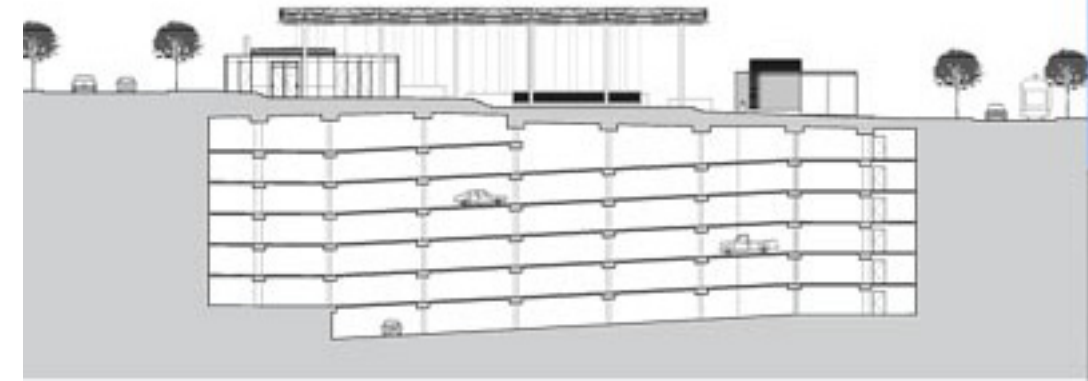
DESIGN PROCESS AND DEVELOPMENT: The design of Director Park was highly influenced by the 6-level subsurface parking garage which was constructed before the design of the park. The parking garage posed a great challenge to the client and landscape architect as the site drops nearly 9 feet from the SW to NE Corner, it provided very little room for trees and site furnishing footings on the northern portion of the site since the parking garage roof is level. Many of the decisions made in the development of Director Park were made as a result of this subsurface parking structure.

MAINTENANCE AND MANAGEMENT: Director Park is managed by the Portland Parks and Recreation department. They have employed two full-time maintenance staff to care for the park. The city also employs security which visits the park once each hour of the day. The security plan is essentially grounded in the overall strategy of providing programs and activities for the space that make it a fun place to be, and that draw people to the park throughout the day. These individuals provide the many necessary “eyes on the park”.

PROGRAM ELEMENTS: Programmed to complement downtown Portland and support its engaging arts and culture. Director Park hosts over 50 events per year including but not limited to ice-cream giveaways, dance classes, music performances, and yoga classes. Director Park is designed without curbs, connecting all adjacent building fronts with unobstructed pedestrian access. This design increases the ease of access to the park and allows for adjacent businesses to utilize more space during special events.

PROJECT SUCCESSES:

- 100% of the stormwater is filtered on site before discharge into the City of Portland’s stormwater system.
- Annually prevents over 990,000 gallons of stormwater from entering Portland’s combined sewer overflow (CSO) utilizing bioinfiltration planters, tree wells and a green roof. These stormwater management practices only save \$200.00 annually, but also help avoid a projected \$3.9 million in future capital costs to upgrade the stormwater infrastructure.
- Utilizes rainwater harvesting technologies and repurposes the stormwater for irrigation of drought tolerant plants, saving approximately \$300.00 annually.
- Created 7 full-time job positions including two on maintenance staff, and five at the park cafe.
- Attracts an average of 1,495 people per day during the summer months (March - October), and 376 people per day in the winter months (November - February).
- The park is within close proximity to the Max Light Rail, and incorporates over 20 bicycle racks making it easy for visitors to access the site.



PROJECT LIMITATIONS: The parking garage posed a great challenge to the client and landscape architect as the site drops nearly 9 feet from the SW to NE Corner, it provided very little room for trees and site furnishing footings on the northern portion of the site since the parking garage roof is level.

PROFITABILITY: Director Park generates an average annual gross revenue of over \$34,000.

SOCIOLOGY: A study which Jan Gehl conducted on Director Park focused on the park's visitors and their engagement in three types of activities: necessary, optional, and social. Necessary activities are those such as, a mail carrier delivering packages, or a businessman heading to work. Optional activities are those such as, eating lunch or reading a book. Social activities are those such as, individuals are interacting with one-another through necessary or optional activities. Gehl concludes that Director Park is a highly successful public destination due to the high number of optional and social activities.

PEER REVIEWS: Director Park is seen as a highly successful public destination. A few elements that make this a successful place include, its ease of accessibility, variety of seating options, and distinctly yet subtly defined spaces. The park manages an eleven foot change in elevation and still provides ADA access from all directions to enter any of the subtly defined spaces which make up Director Park. The edges of the park are designed with an open concept allowing pedestrian traffic to flow in, out and through the park. The park is a multimodal destination; it is adjacent to the public light-rail, the park is constructed on top of an underground parking garage. The park also provides a large number of bicycle racks for ease of accessibility, and to encourage a variety of users to visit the site. Director Park was designed to invite a diverse group of visitors for diverse uses at different times of day. The design was successful accomplishing integrates many different types of seating, including, movable furniture, large group, small group and more intimate seating options. These seating options are placed throughout Director Park adjacent to different amenities such as the Elephant Deli, the giant chess area, and the Teacher's Fountain. This introduces us to some of the subtly defined spaces throughout Director Park. Olin Studio creatively used paving patterns, vegetation, and physical structures to help define spaces throughout the park. These spaces are each highly successful in their own and together make Director Park the popular destination it is known as today.

CRITICISM: Sun glare had a negative effect "rendering some of the ends of the "feathered" steps - where they narrow as they meet the grad - undetectable" (Thoren, Louw, 2013). A number instances where users tripped and fell in this area, the decision was made to install "small wooden toadstools" which assist in the mitigation of accidents. Since the installation of the wooden toadstools, no accidents have been reported. Also due to the lack of early coordination between the client for the subsurface parking structure and the client for Director Park; the underground parking structure was constructed, ultimately constraining the initial design process for the park due to the parking garage's elevation and the site topography.

GENERALIZABLE FEATURES AND LESSONS: Initially wireless internet was not included in the original program for the park. Once they decided that it was a necessary feature, they overlooked that the large glass canopy would impede the signal. Due to this limitation they were required to install more expensive equipment to adequately suffice for users of the site; ultimately resulting in over a \$50,000 expense.

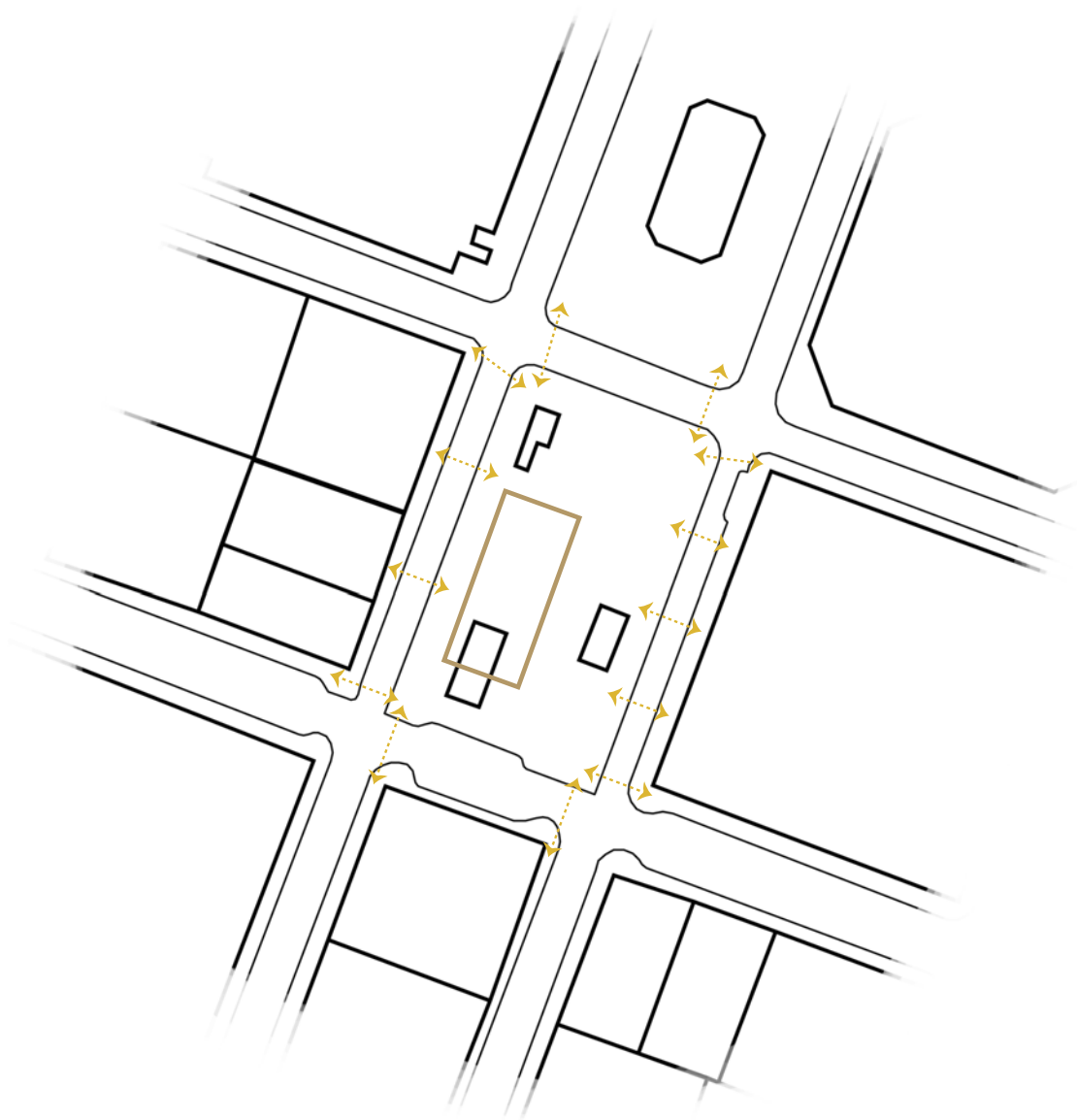
Another limitation was related to the electrical plan. The electrical needs were initially under estimated for various hosted events at Director Park. Thus, an over \$60,000 expense was added onto the overall costs after the project completion.

FUTURE ISSUES AND PLANS: The Park Avenue Vision to develop and connect 19 blocks of parkland within the City of Portland will continue to be developed in the imminent future. This means that the Park Avenue connection from Director Park will continue to strengthen in the upcoming years resulting in an expanded use of the park.

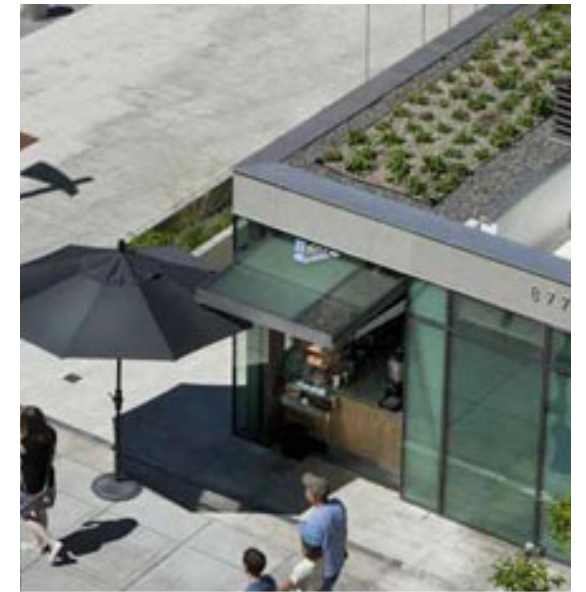
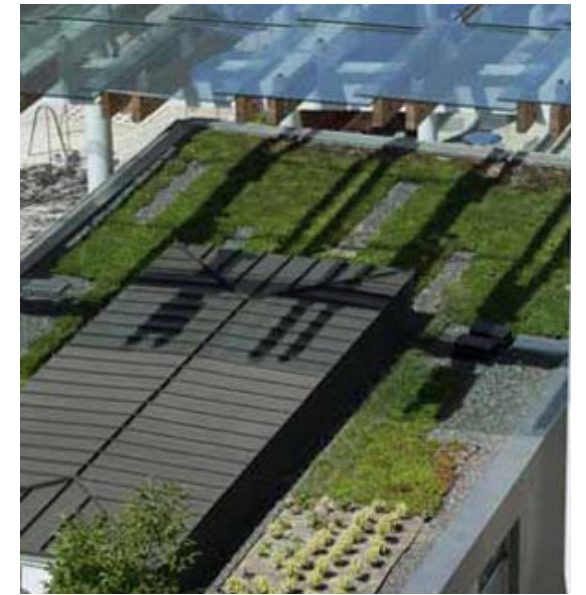
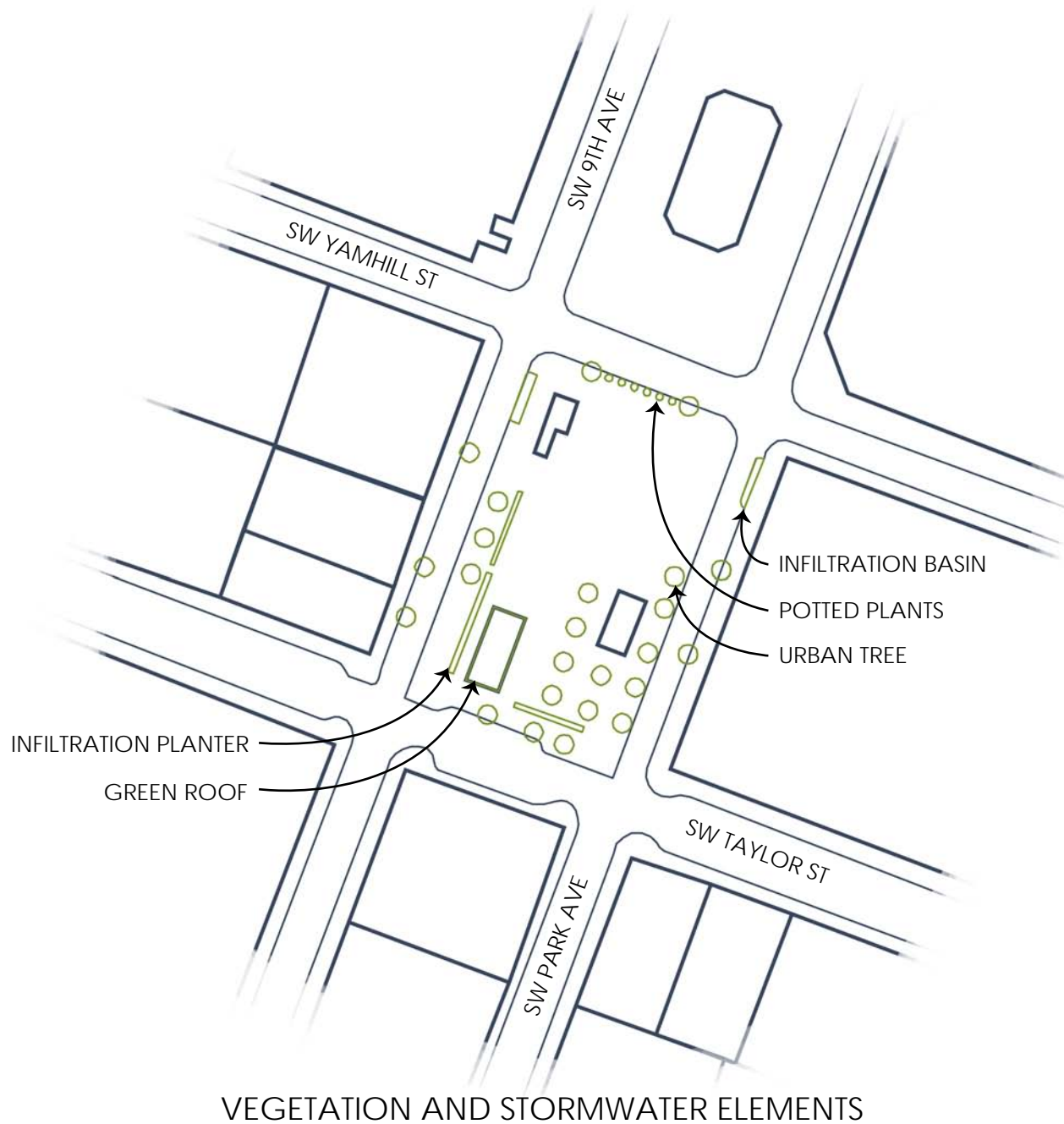


Analysis: Director Park Portland, Oregon

Director Park contains many elements that I wish to include in the Red River Civic Plaza, and the following analysis assisted me in gaining a deeper understanding for how the park functioned and why Olin Studio made the design decisions which make Director Park a popular destination for the Portland, Oregon community.



DIRECTOR PARK PEDESTRIAN ACCESS



Thesis Statement

In response to the design of a new City Hall in Fargo, North Dakota, I intend to create an identity for the Red River Civic Plaza as a downtown multi-use park that serves as a year-round destination.

Project Typology

Project: Red River Civic Plaza

Location: Fargo, North Dakota

Size: 3 Acres

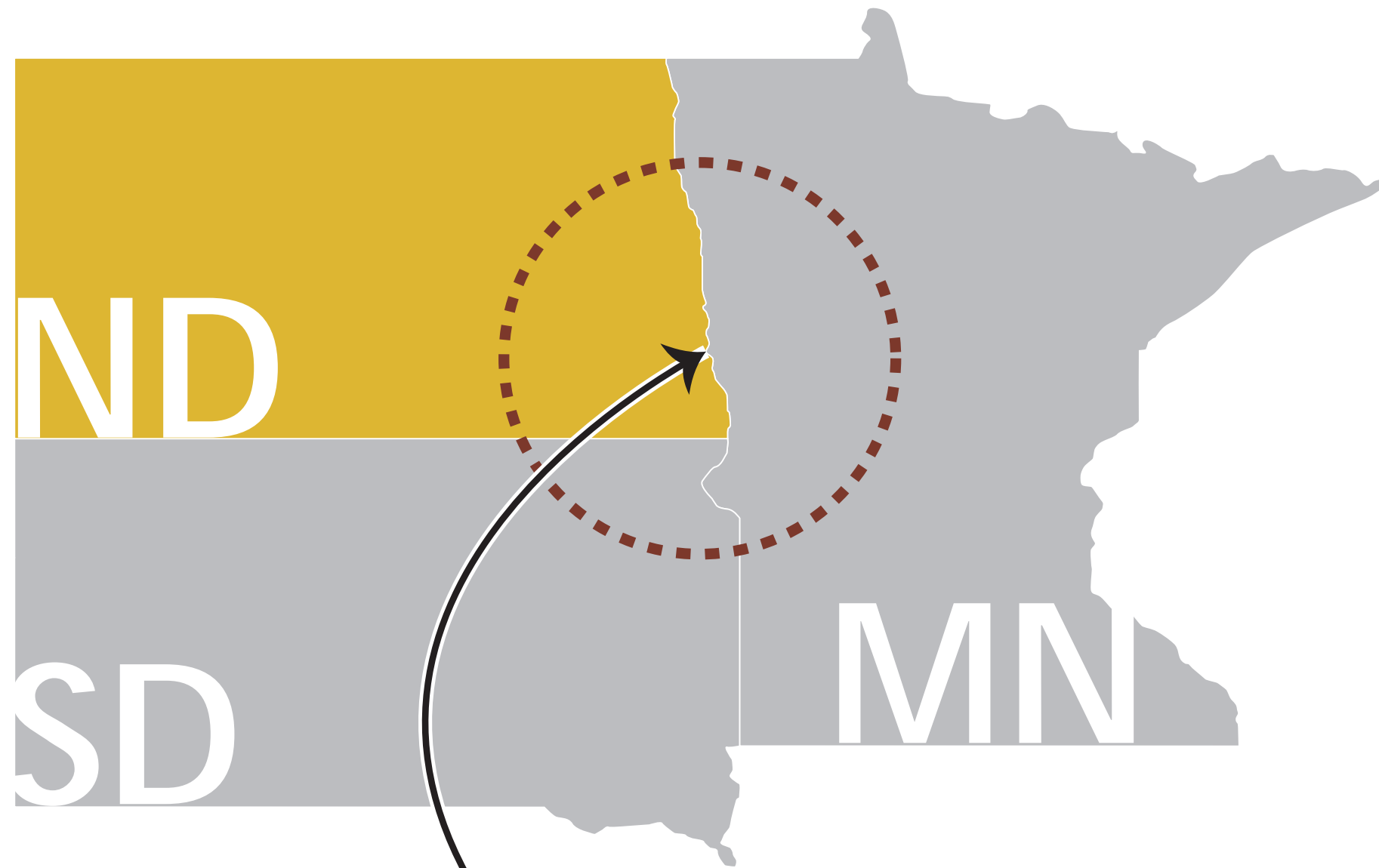
Designer: Joseph Starbuck

Typology:

- Urban Park/Plaza
- Iconic Gateway

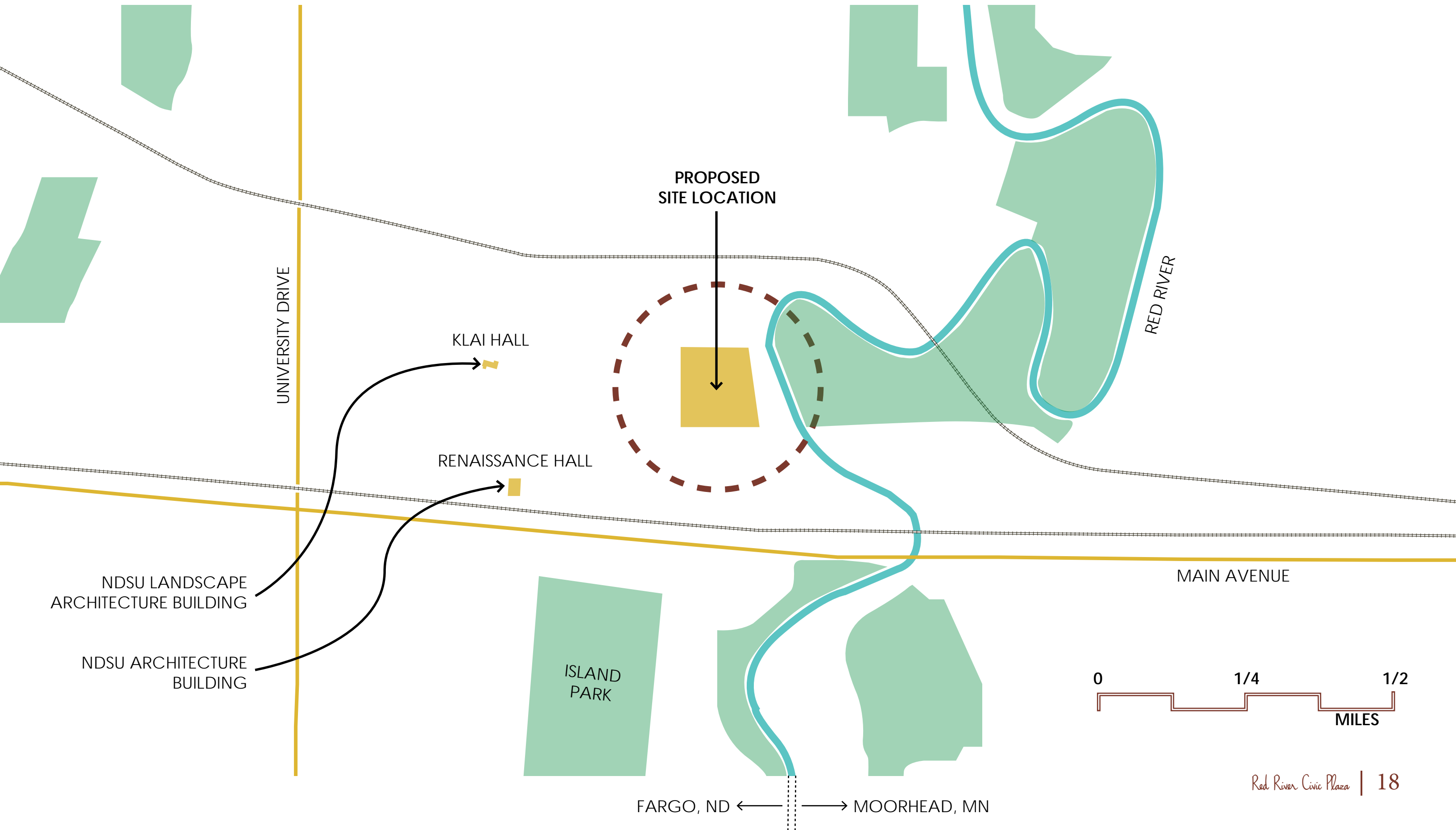
The Red River Civic Plaza is an iconic gateway to downtown Fargo, North Dakota. This park will be a downtown civic destination serving the Fargo-Moorhead community through the implementation of low impact development stormwater management strategies.

Site Location



Fargo, North Dakota

Site Location



Site Location



EXISTING FARGO CIVIC CENTER

EXISTING FARGO PUBLIC LIBRARY

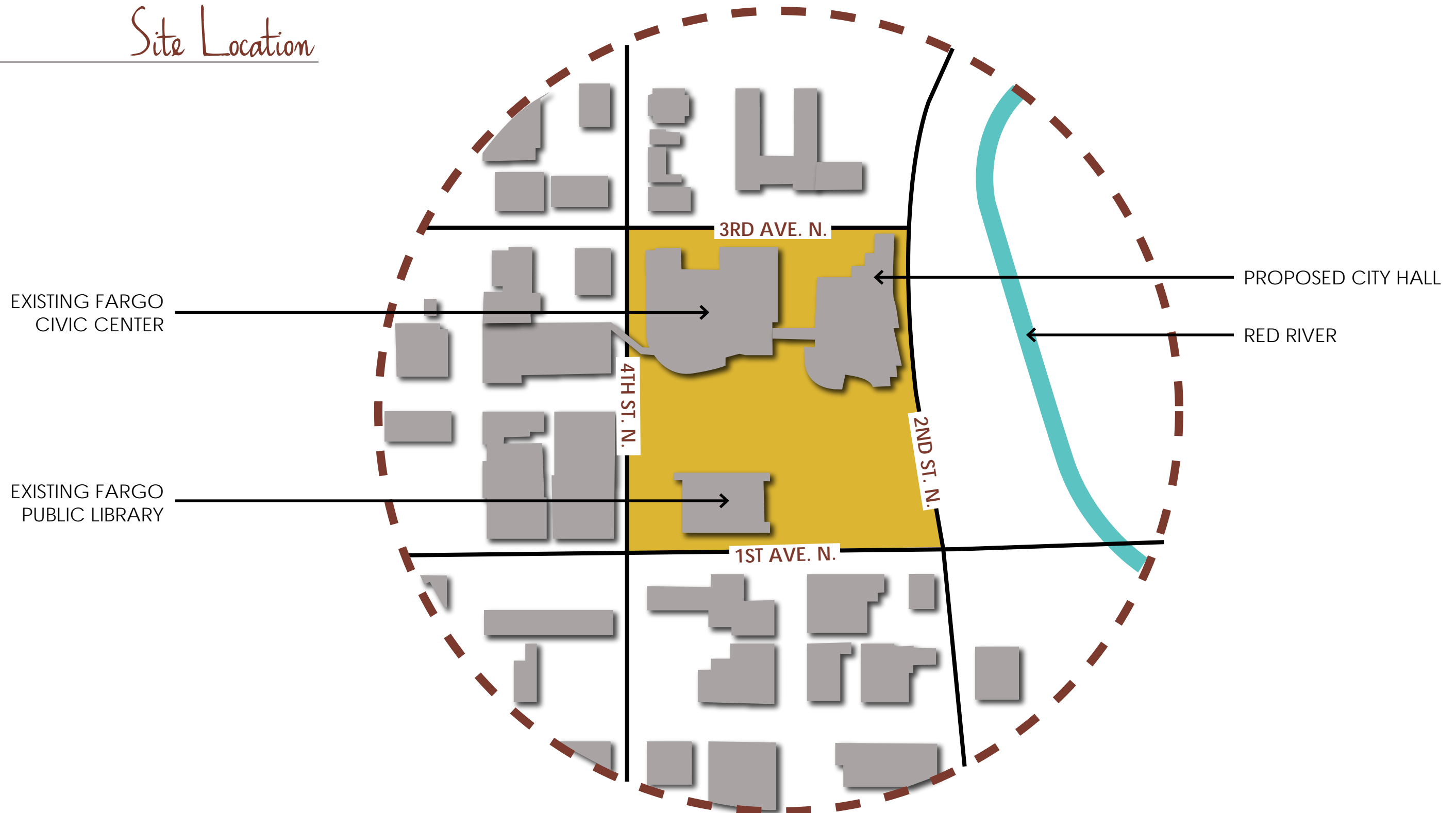
RED RIVER

EXISTING CITY HALL



■ FUTURE SITE OF THE RED RIVER CIVIC PLAZA

Site Location



■ FUTURE SITE OF THE RED RIVER CIVIC PLAZA

Existing Site Conditions



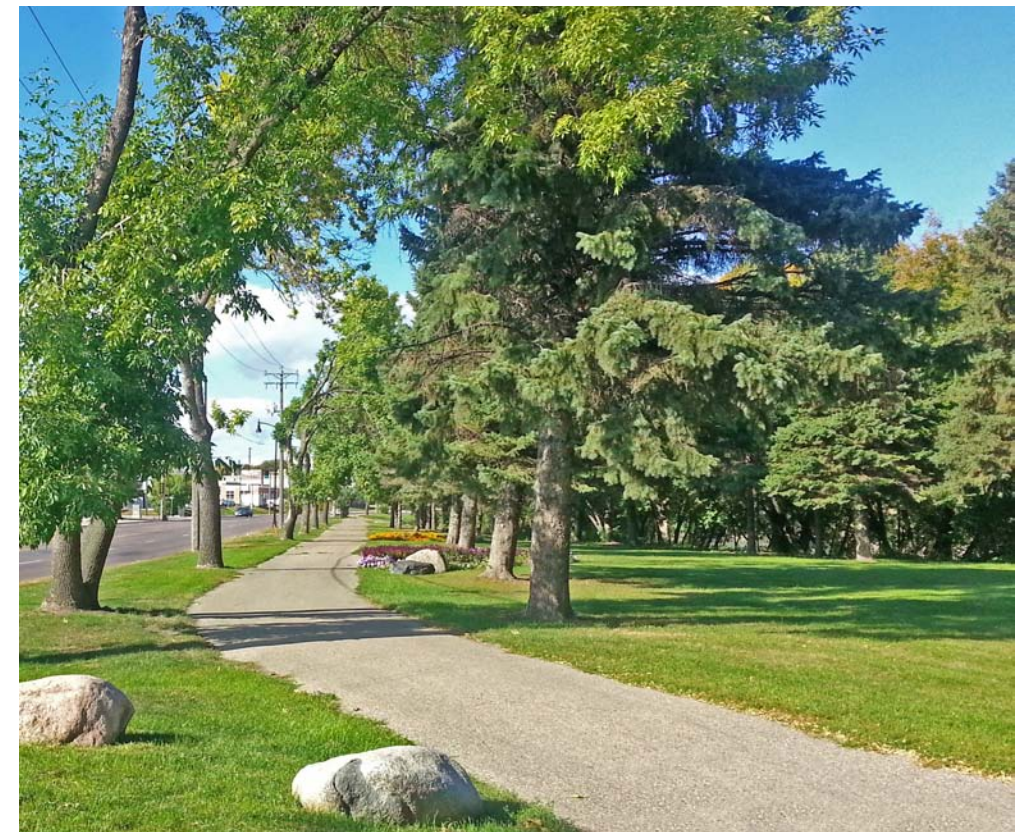
EXISTING OPEN SPACE BETWEEN THE CIVIC CENTER, AND PUBLIC LIBRARY.

Site Strengths

- The front doors of the Public Library, Civic Center and proposed City hall will face the central open space.
- The Red River is within close proximity to the site.
- The site is located two blocks east of popular Broadway Street.
- The civic use buildings will ensure activity on a daily basis.

Site Limitations

- Due to highly used civic buildings, there will be strong public opinion regarding any development on site.
- After business hours the site may experience a decrease in activity.
- There are no nearby businesses or residencies operating after hours in-order to fulfill the “eyes on the street” concept (Jacobs, 1961).



RECREATION SIDEWALK ADJACENT TO THE RED RIVER, AND EAST OF THE SITE.

Existing Site Conditions



EXISTING CITY HALL BUILDING TO BE DEMOLISHED.

The site has immense potential to become an iconic public park for the City of Fargo. Located adjacent to the Red River in the thriving downtown realm of Fargo, the site will serve a large portion of the Fargo-Moorhead community. The centralized location will prove beneficial by drawing downtown workers from Fargo and Moorhead, recreation enthusiasts from along the Red River, and community members from adjacent neighborhoods. As a public space adjacent to the Red River, this site will also prove to be a successful location to educate the community on the benefits of integrating low impact development into our city blocks to manage stormwater runoff.



EXISTING PARKING LOT ON EASTERN PORTION OF SITE

Research Questions

1. What is the predevelopment volume of stormwater runoff for a 100 year storm on the three-acre site.
2. What is the infiltration rate and storage capacity of bioinfiltration, green roofs, permeable paving, and rainwater harvesting in Fargo, North Dakota?
3. What does the Fargo-Moorhead community need, and want to see from the Red River Civic Plaza?
4. From which direction will the majority of pedestrians and cyclists be travelling from to access the Red River Civic Plaza?
5. How many people are drawn to both the Fargo Civic Center, and the Fargo Public Library at various times throughout each day?
6. What outdoor amenities will help encourage and accommodate community members to use the park during the winter season?
7. What types of seating, and seating arrangements yield a socially interactive space?

Research Hypothesis

I expect that the current site contributes over 80% of its stormwater runoff to the existing City of Fargo's stormwater conveyance systems. I expect the three acre Red River Civic Plaza low impact development to be able to manage 100% of the stormwater runoff on site providing zero discharge of stormwater from the park for up to a 100 year storm event. I also expect the park to be able to manage an additional five acres of stormwater runoff from adjacent streets, preventing a total of eight acres of stormwater runoff from contributing to the City of Fargo's stormwater conveyance systems during a 100 year storm event. I expect the Red River Civic Plaza to be able to function as a series of distinct spaces as well as a singular space when necessary according to the event taking place. The space will encourage individuals to visit and spend time in the park by providing a large variety of seating options to accommodate different size groups. The distinct gathering spaces will need to be located in areas which have the highest quantity of sun exposure to maintain a comfortable social environment throughout the year.

Approach to Research

The proposed demolition of the current City Hall is providing the City of Fargo with an exceptional opportunity to reimagine a once disconnected space that will now connect popular North Broadway Drive to the Civic Center and Public Library, to the proposed City Hall, and to the Red River. Aging architectural infrastructure and a rise in population has contributed to the need for the development of a larger and improved Fargo, City Hall. The new City Hall will be located a few hundred feet east across Third Street North from its present location in downtown Fargo. Due to the vast number of stakeholders for the proposed Fargo, City Hall, the resulting open space development is also gaining a vested interest from the community. The large community interest in this project enticed me to use this as a model project, implementing innovative stormwater management strategies in the design of an iconic multi-use civic destination that is the Red River Civic Plaza. The City of Fargo is the client for this open space design, and they will guide the development of the Red River Civic Plaza which is intended for use by the children, students, workers and retired workers of the Fargo-Moorhead community. My approach includes, there are seven important research questions which need to be answered:

1. What is the predevelopment volume of stormwater runoff for a 100 year storm on the three-acre site.
2. What is the infiltration rate and storage capacity of bioinfiltration, green roofs, permeable paving, and rainwater harvesting in Fargo, North Dakota?
3. What does the Fargo-Moorhead community need and want from the Red River Civic Plaza?
4. From which direction will the majority of pedestrians and cyclists be travelling to access the Red River Civic Plaza?
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6. What outdoor amenities will help encourage and accommodate community members to use the park during the winter season?
7. What types of seating, and seating arrangements yield a socially interactive space?

The data measures that will be used to answer each of the questions above, as well their influence on the design will be further explained in the data measure section.

Watershed Analysis

17 MICRO-WATERSHEDS MAKE UP THE EXISTING HYDROLOGY ON THE SITE

TOTAL RUNOFF AREA: 12.25 ACRES
IMPERVIOUS SURFACES: 10.60 ACRES
PERVIOUS SURFACES 1.65 ACRES



Watershed Analysis

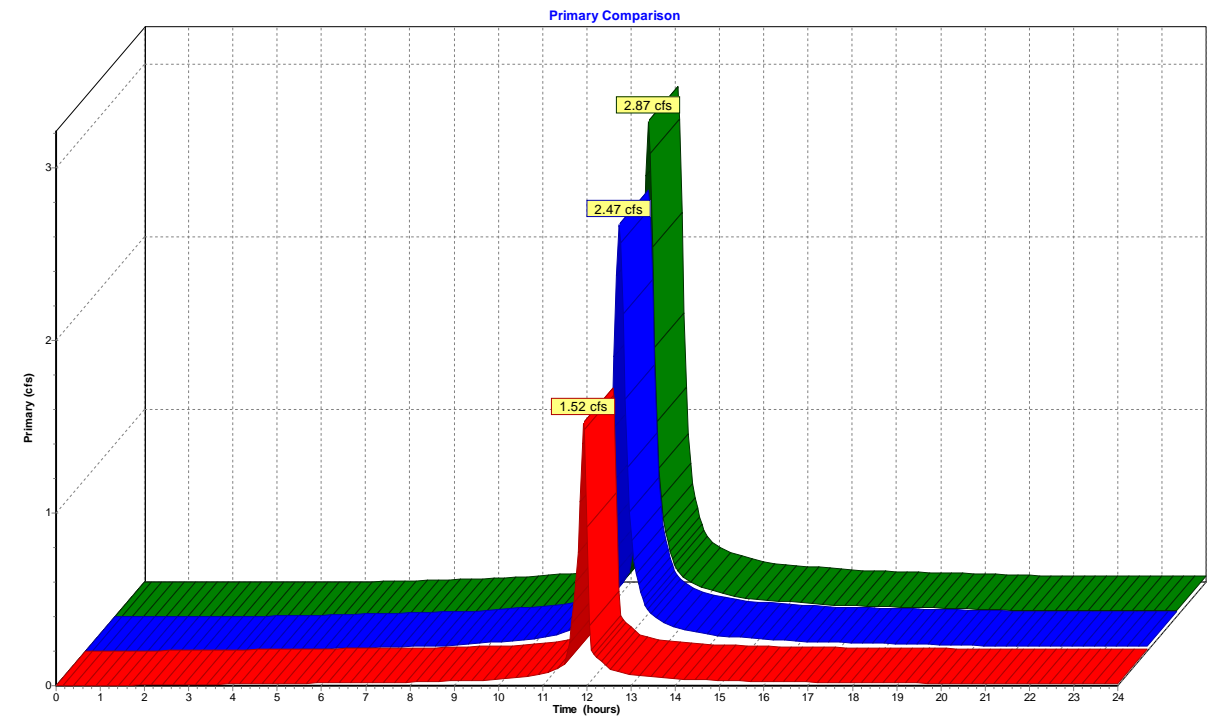
Type II - 24 Hour - 25 Year Rainfall Event

Stormwater Runoff: 6.86 cubic feet
 Impervious Surfaces: 47,709 square feet
 Pervious Surfaces: 22,238 square feet

Utilizing HydroCAD (hydrology analysis and modeling software) the existing 12.25 acre site was broken-down into 17-micro watersheds which were then analyzed to better understand the existing hydrology of the site. This information was ultimately used for the design of the proposed stormwater infrastructure at the Red River Civic Plaza



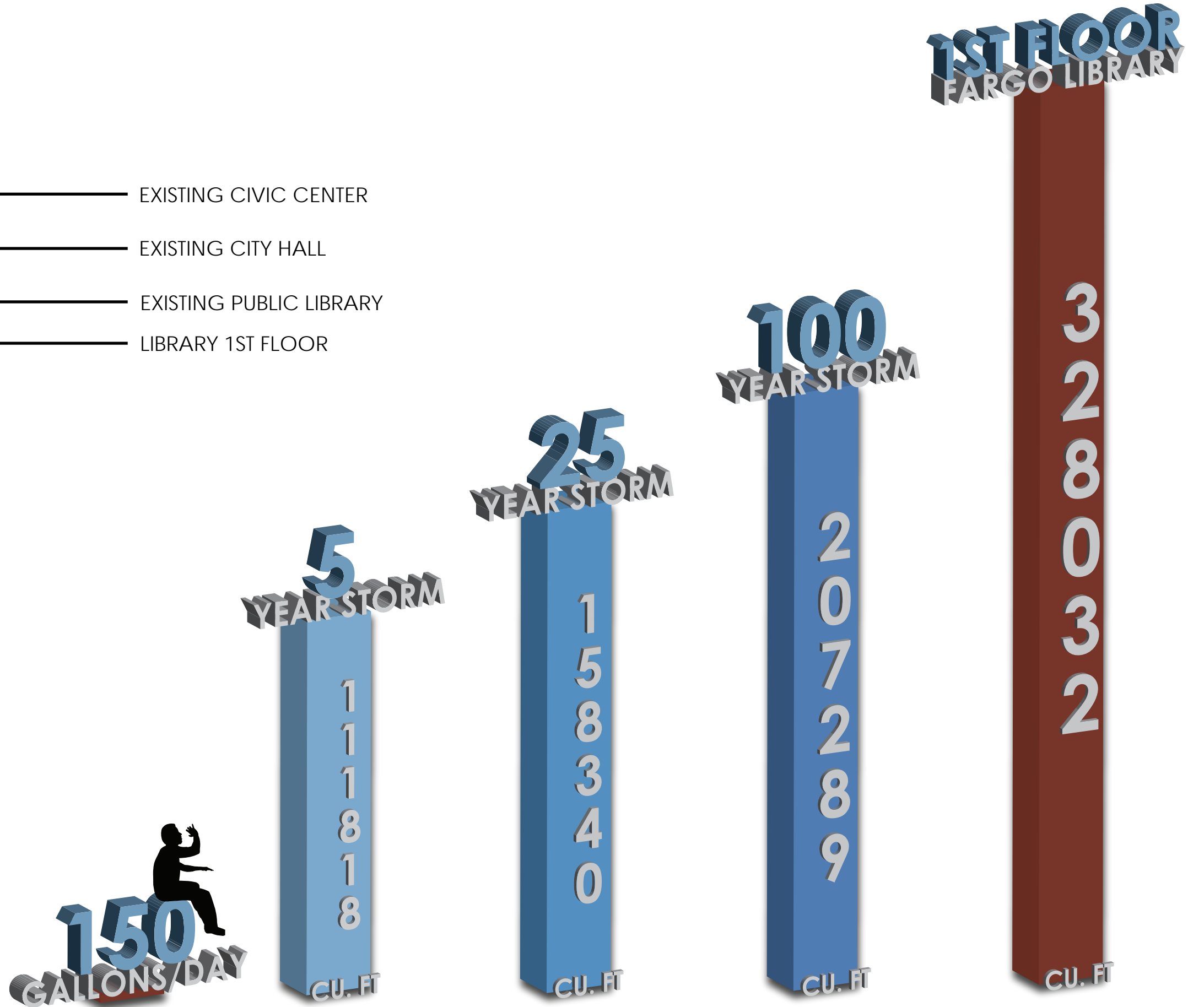
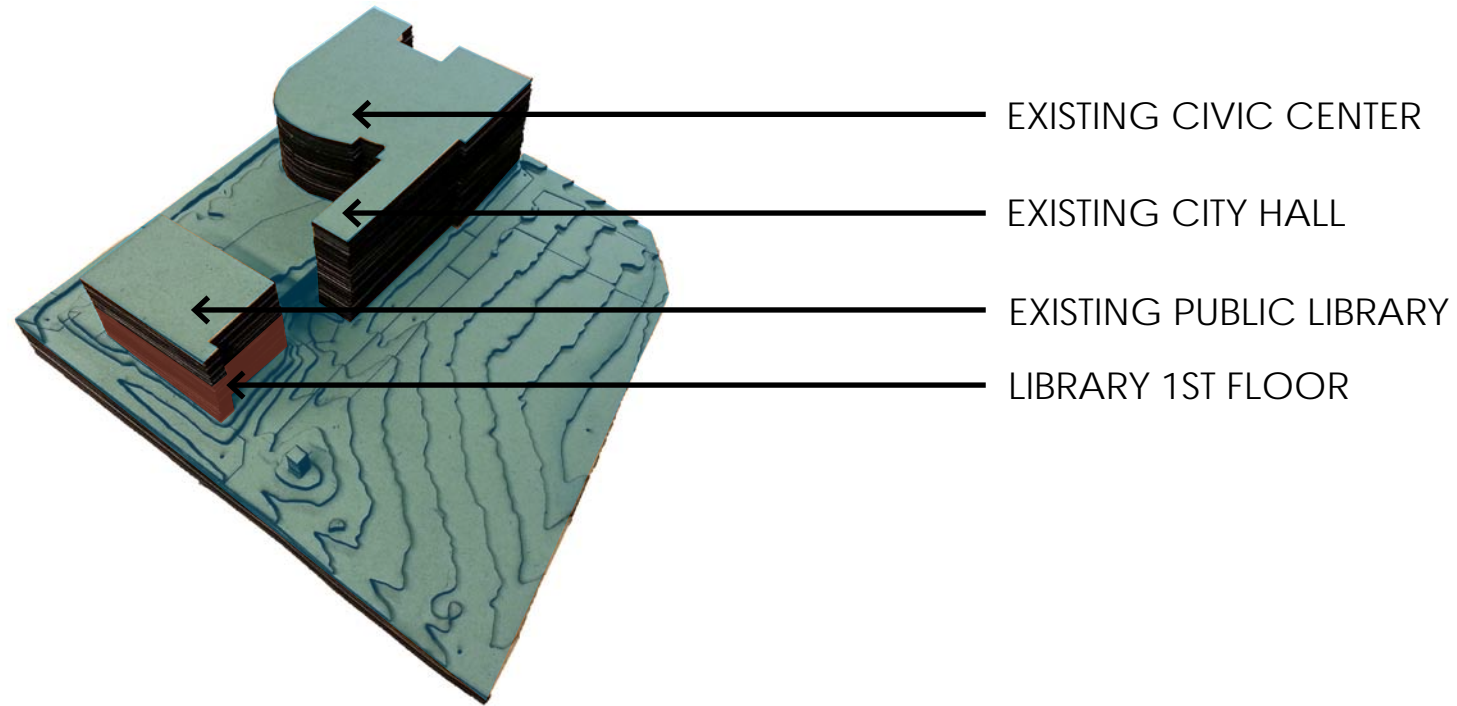
WATERSHED LOCATION MAP



HYDROCAD 4TH STREET NORTH, CATCHMENT BASIN COMPARISON

WATERSHED	AREA (SF)	Concrete/Asphalt	Turf Cover	Shrub Cover	Longest Time of Concentration (TOC)
1	14,684	14,349	0	335	32' C @ 3%; 295' C @ 2.3%
2	10,839	10,839	0	0	227' C @ 1.5%
3	32,713	17,333	13,771	1,609	88' T @ 1.5%; 131' C @ 1%
4	33,487	8,887	24,600	0	222' T @ 1%; 109' C @ 5%
5	4,215	427	3,788	0	77' T @ 4.3%
6	26,395	19,553	4,842	2,000	70' T @ 1%; 228' C @ 1.25%
7	18,228	13,368	1,258	3,602	27' T @ 8%; 313' C @ 1%
8	26,278	21,864	341	4,073	32' S @ 6%; 290' C @ 1.3%
9	17,651	16,562	489	600	14' S @ 4.5%; 319' C @ 1.4%
10	15,723	15,187	100	436	57' C @ 4%; 10' T @ 3.3%; 148' C @ 2.3% 33' T @ 2.2%; 32' C @ 2.2%
11	167,789	160,666	4,891	2,232	394' C @ 2.1%; 22' T @ 2.1%; 40' C @ 3.3%
12	5,735	5,455	0	280	188' C @ 1%
13	20,688	19,630	458	600	284' C @ 1%; 244' C @ 1.8%
14	24,748	23,255	1,343	150	10' T @ 1%; 177' C @ 1.5%; 25' T @ 5%; 22' C @ 3%
15	87,894	87,894			
16	25,809	25,809			
17	348	348			

Watershed Analysis



EXISTING SITE STORMWATER RUNOFF VOLUMES

Outdoor Winter Attractions

RESEARCH RESULTS CONCLUDED:

Popular Winter Outdoor Attractions

- Heat Lamps
- Ice Rinks
- Christmas Tree Lighting
- Submit Your Tree (Christmas Tree Growing Competition)
- Christmas Lights
- Cafe (warm food, and drinks)
- Christmas Market (cultural touch depending on location)

CONCLUSION: Utilizing the proper programming, a frigid climate does not limit parks and plazas across the world from serving as a destination during winter months



Bavaria Germany Christmas Market (Above)



Rockefeller Plaza New York City, NY (Above)



Rice Park, St. Paul, MN (Above)



Main Street Square, Rapid City, SD (Above)

Socially Interactive Seating

BENCH RESEARCH RESULTS:

- Benches should be set back at least 24” from the pedestrian walkway to allow space for people walking by, yet not too far offset to allow space for people walking by.
- Benches should be placed together with other street amenities such as waste receptacles, bus shelters or kiosks
- “Benches shouldn’t face each other, unless their being used for games. People tend to feel uncomfortable when they sit face to face with a stranger, and will twist around or sideways to avoid eye contact. Occasionally, pairs of benches should be placed at a 90 to 120 degree angle, which is both good for conversations and for sitting alone.” (pps.org)
- Benches should be spaced so that wheelchairs can be accommodated on the side or in front of the bench.
- Wood is the most comfortable material for a bench due to the fact that it doesn’t conduct heat or cold.

All things being equal, you can calculate that where pedestrian flows bisect a sittable place, that is where people will most likely sit, and it is not so perverse of them. It is by choice they do so. If there is some congestion, it is an amiable one, and a testimonial to the place. Circulation and sitting, in sum, are not antithetical but complementary.”

- William H. Whyte



Bench Seating (Shoemaker Green, Philadelphia, PA)



Movable Seating (Paley Park, New York City, NY)

Socially Interactive Seating

TERRACED SEATING RESEARCH RESULTS:

- Minimum of 14” tread width if seating is desired (match this with 6” or 6.5” of tread height)
- Step corners are important areas for social seating. It allows for a 90 degree seating ledge to socialize. (In-order to escape a required hand rail check code for how high off the ground the stairs can rise).

SEATWALL RESEARCH RESULTS:

- 17” is the preferred height for a seatwall.
- People will sit on a changing height seatwall from 1’ to 3’
- The minimum depth for a seatwall or ledge that can serve as a bench on both sides is 30”

Columbus Circle in New York City is located at a major intersection and adjacent to Central Park. The New York Parks and Recreation Department allows skateboarding to occur here in this plaza. The fountain and planting buffer between traffic, and a strong inward focus mixed with allowing skateboarding makes Columbus Circle one of the most popular destinations for people watching in the city.



Terraced Seating (Kungstradgarden, Stockholm, Sweden)

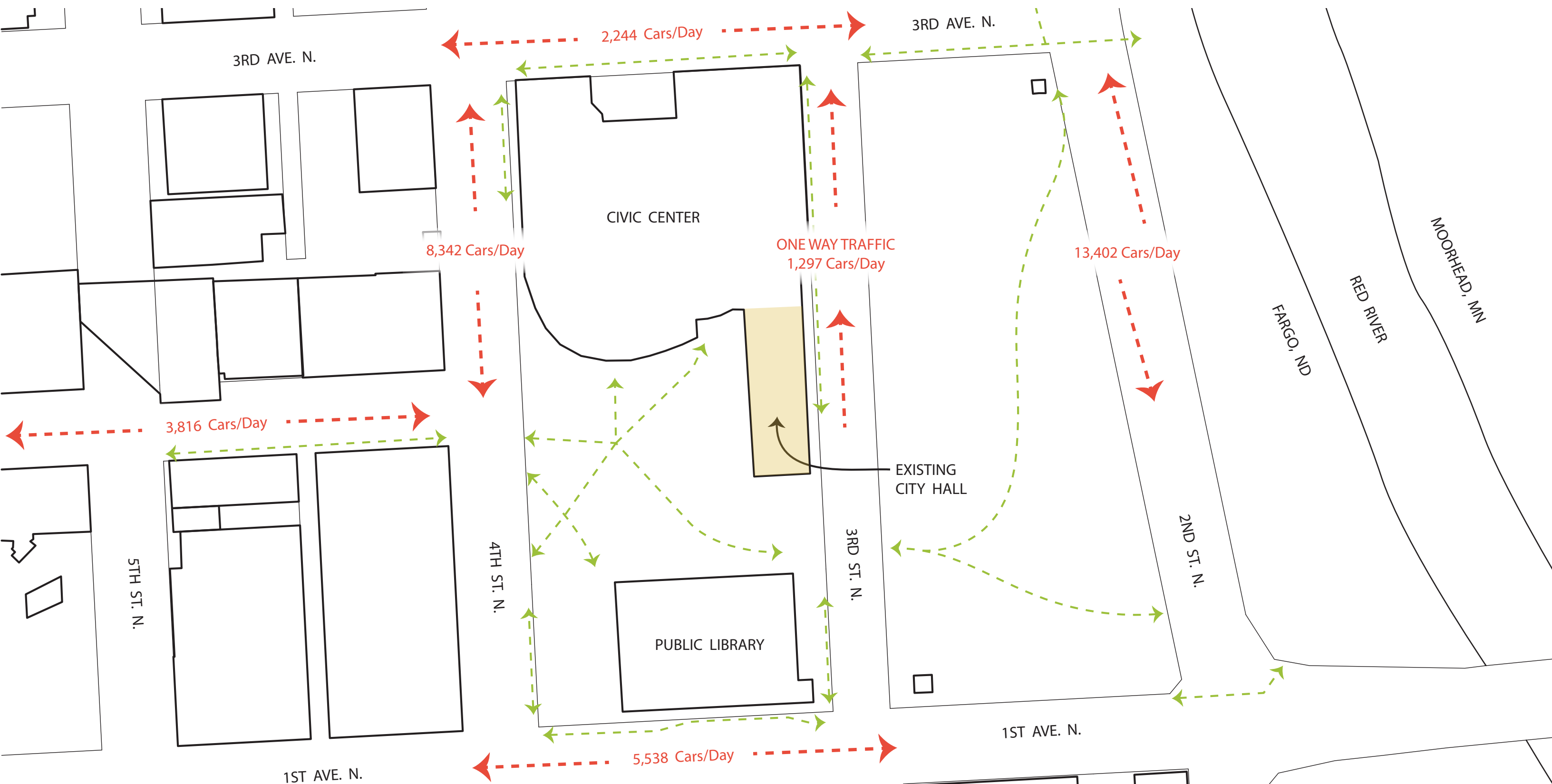





People Watching (Columbus Circle, New York City, NY)

Circulation

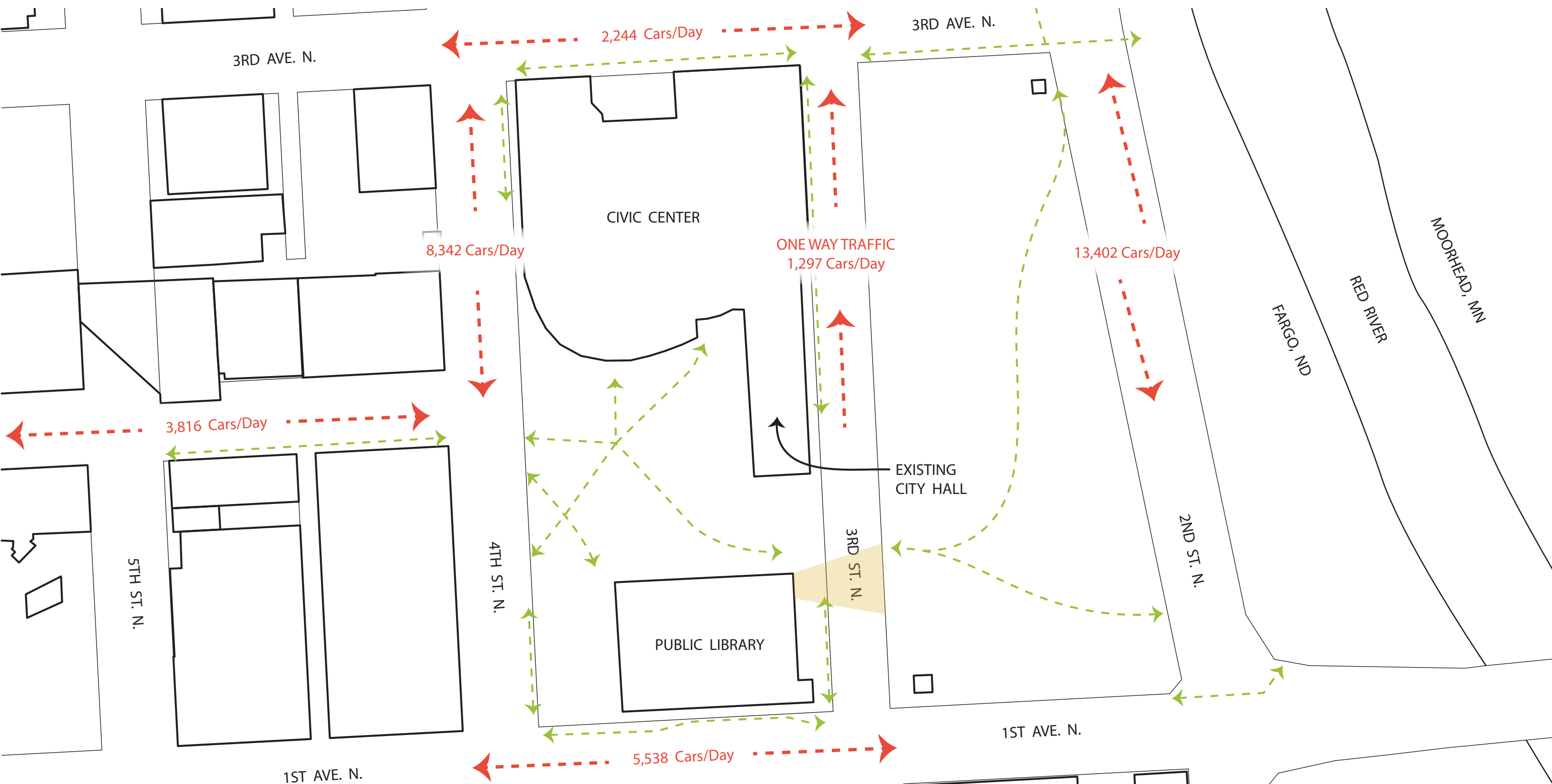


Circulation



 PEDESTRIAN CIRCULATION	 CIRCULATION NOTES: The existing City Hall location limits pedestrian east and west through-traffic towards Broadway Street or the Red River.
 VEHICLE CIRCULATION	

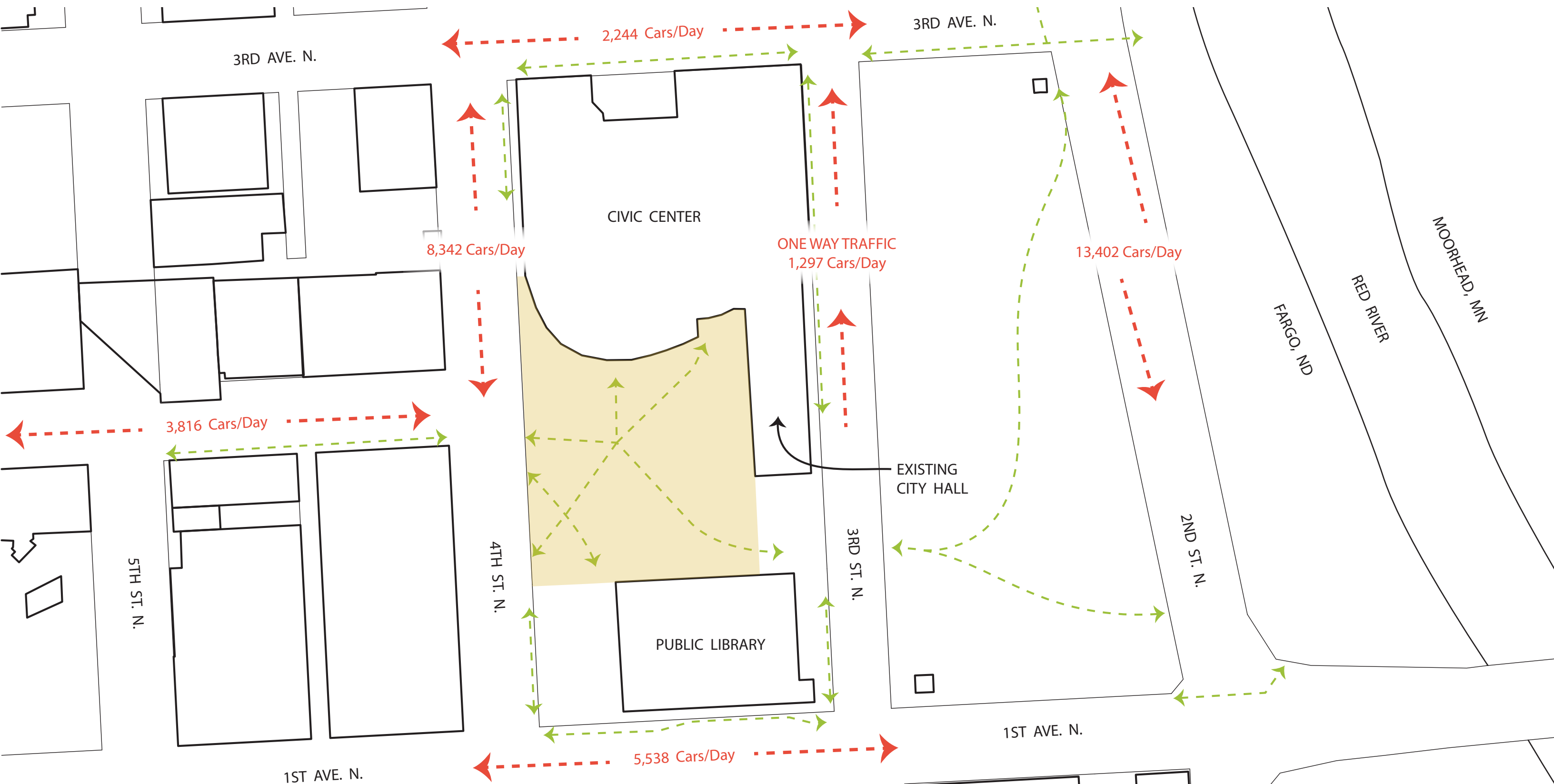
Circulation



- PEDESTRIAN CIRCULATION
- VEHICLE CIRCULATION

CIRCULATION NOTES: The existing north east entrance to the Fargo Public Library has poor access, requiring pedestrians to cross Third Street North, as well as the need to ascend stairs at the entrance.

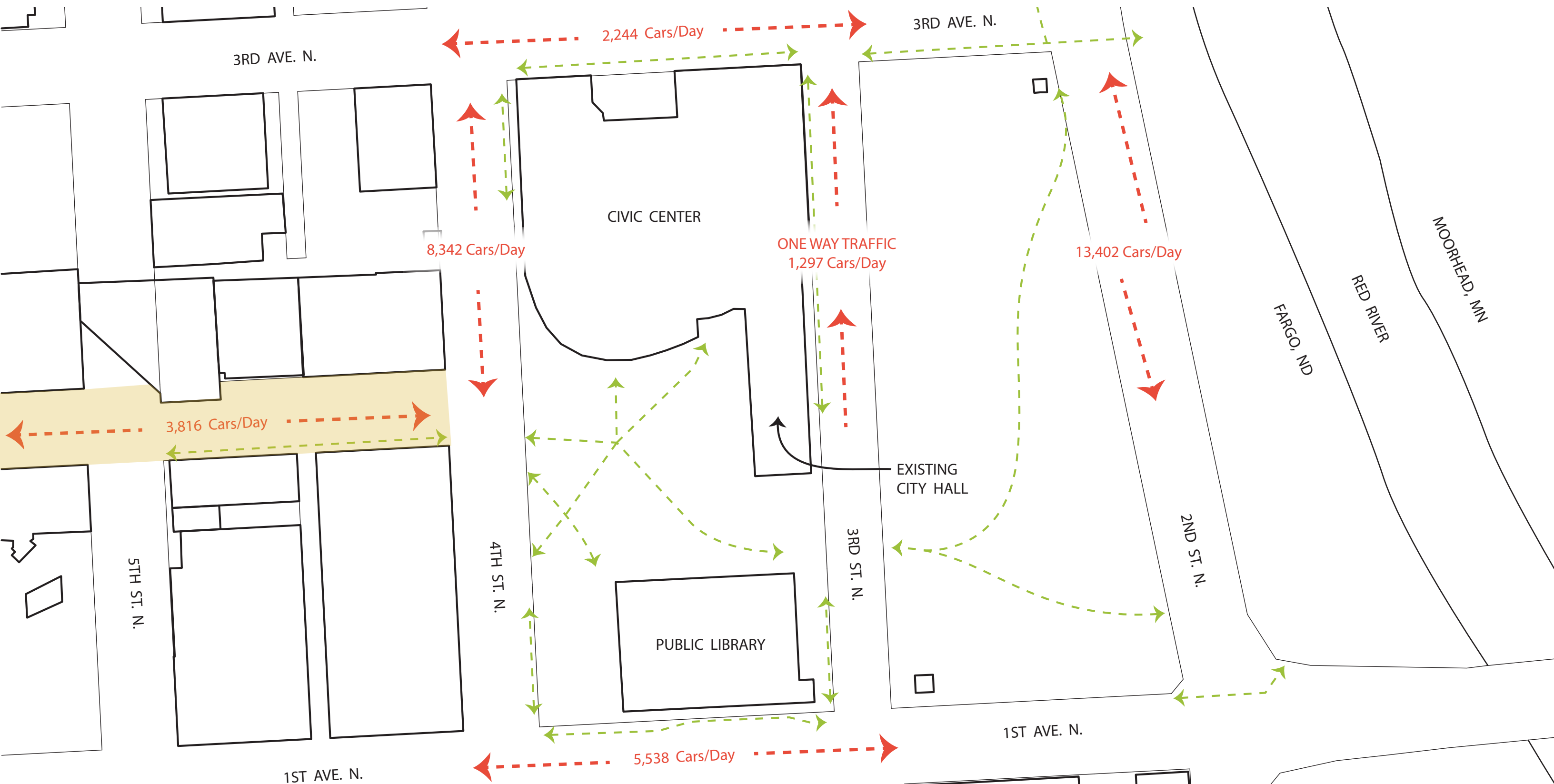
Circulation



- PEDESTRIAN CIRCULATION
- VEHICLE CIRCULATION

CIRCULATION NOTES: The existing green space between the Public Library and the Civic Center, presents inadequate seating options as well as the necessary destination amenities to attract visitors to stay at the park.

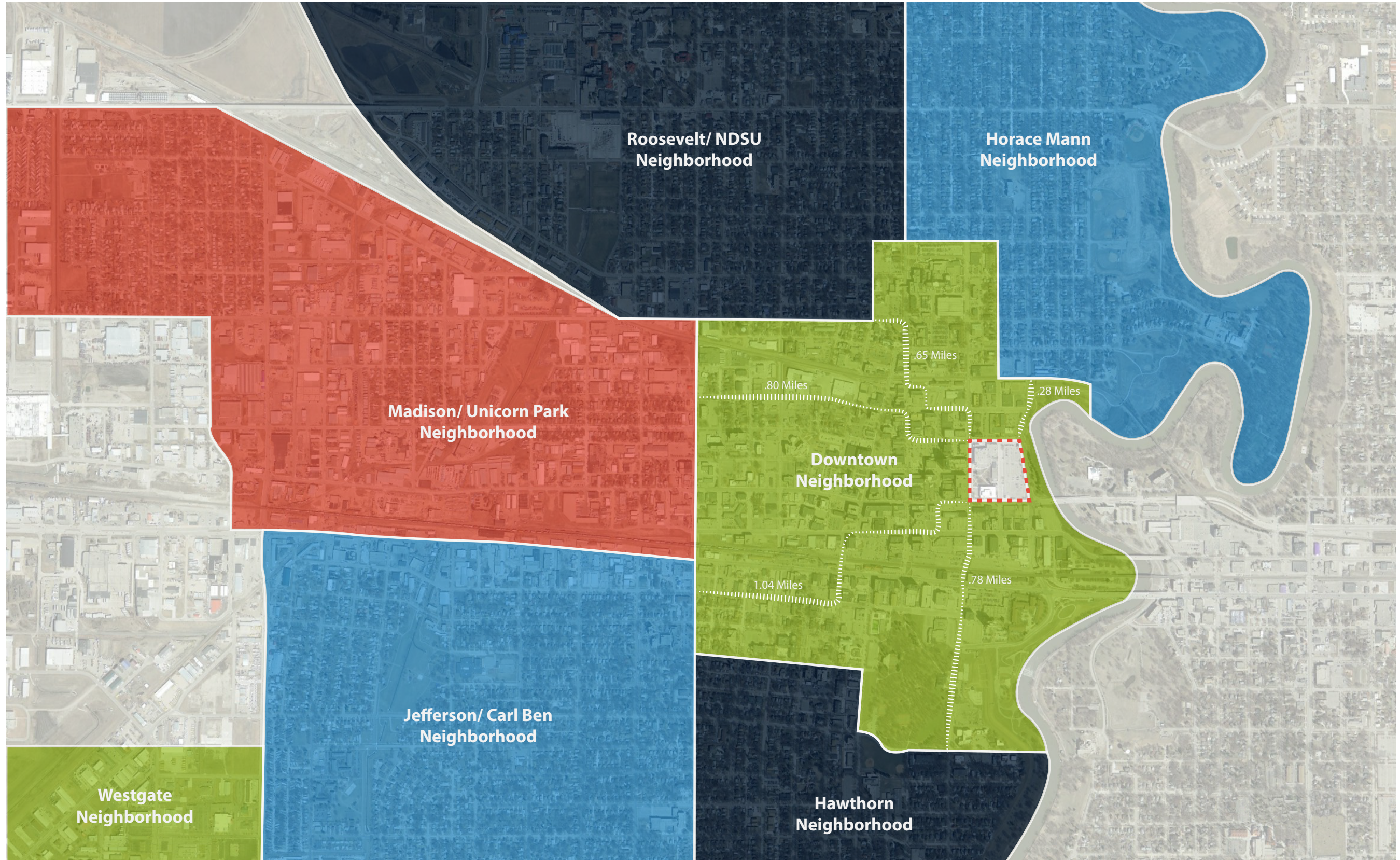
Circulation



- PEDESTRIAN CIRCULATION
- VEHICLE CIRCULATION

CIRCULATION NOTES: Second Avenue North has great potential for a pedestrian entrance from the west, but the existing sidewalks are narrow and make the corridor feel unsafe.

Neighborhood Inventory

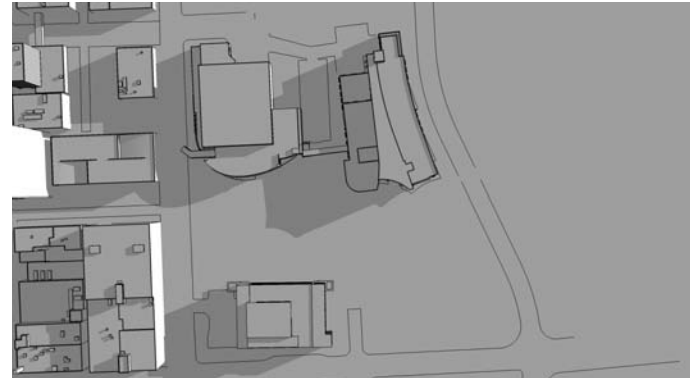


Existing Vegetation

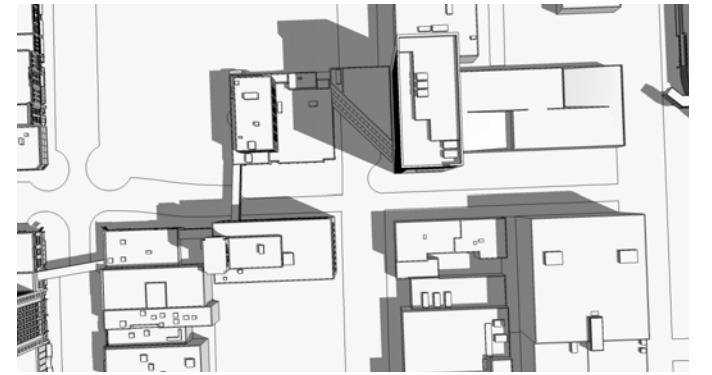
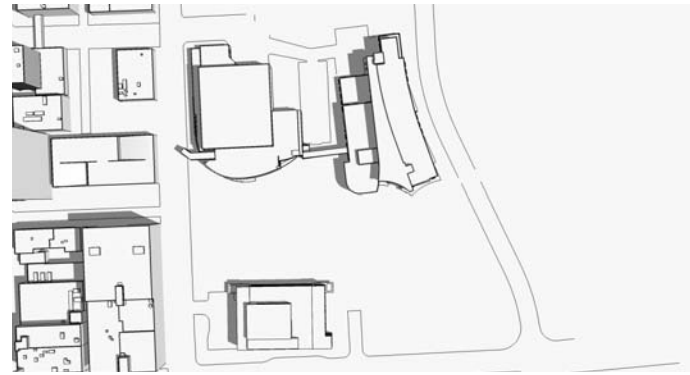
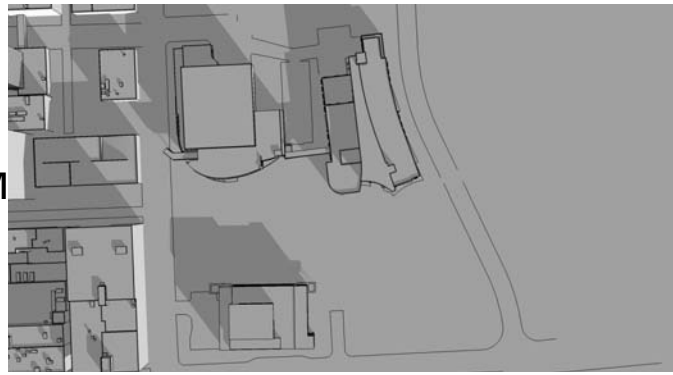


Shade Studies

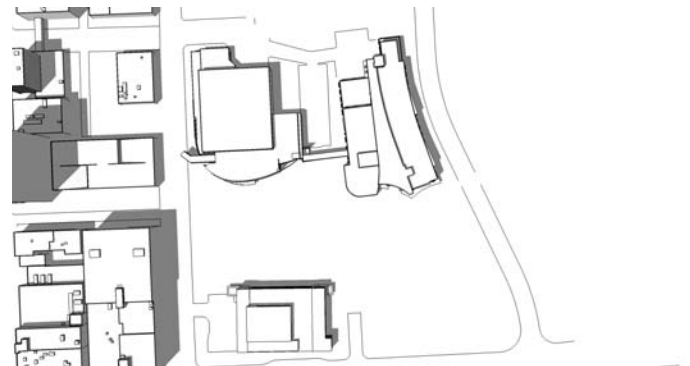
6:00 AM



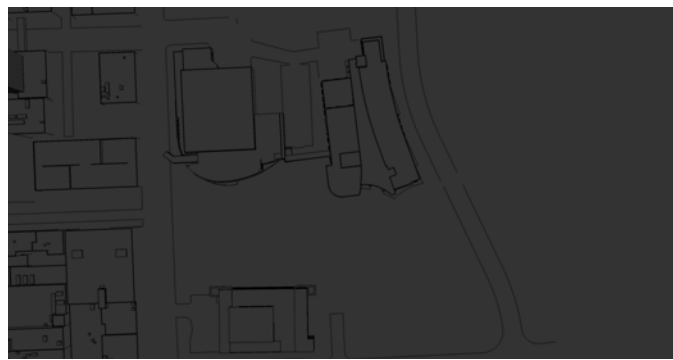
10:00 AM



2:00 PM



6:00 PM



JANUARY (EXISTING PROJECT SITE)

JUNE (EXISTING PROJECT SITE)

JANUARY (2ND AVENUE NORTH)

JUNE (2ND AVENUE NORTH)

Design Development Models



LOW IMPACT DEVELOPMENT STUDY MODEL

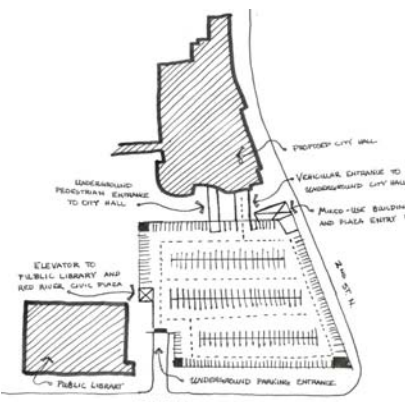
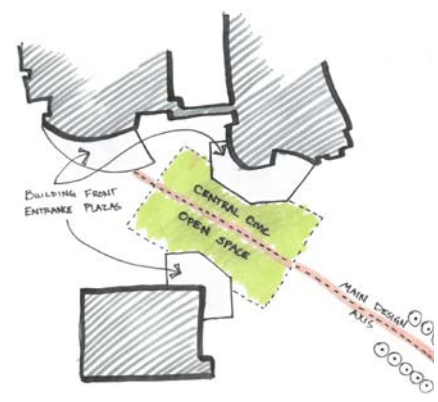
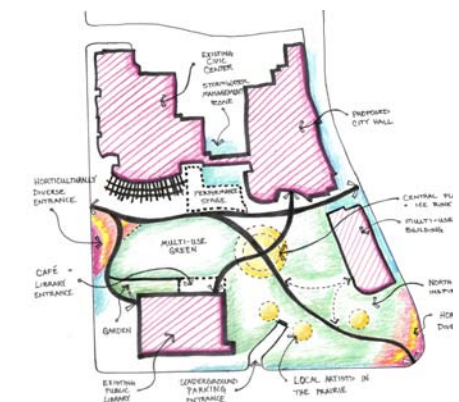
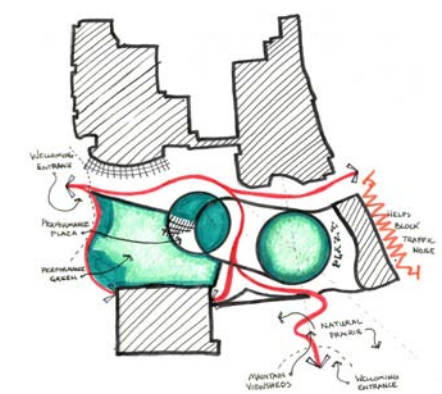
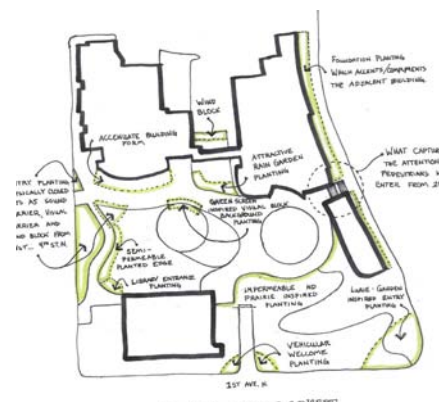
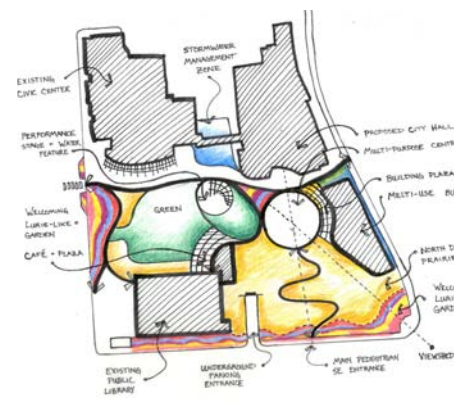
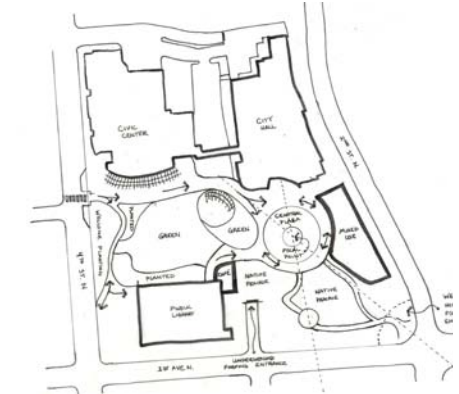
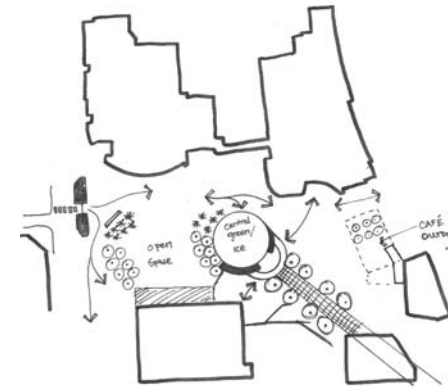
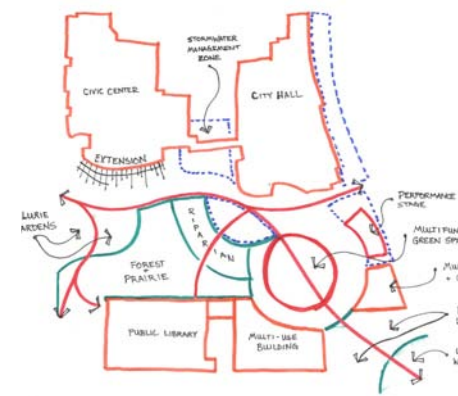
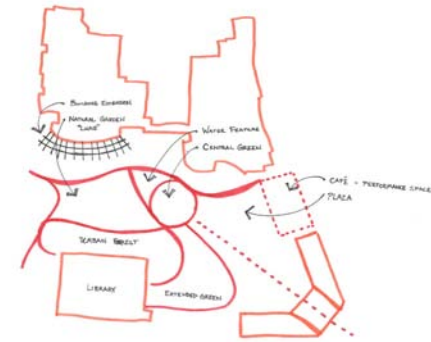
This model which is conceptually designed off of the layers of a green roof; describes six low impact development strategies for improving our stormwater management on site, contrasting our standard grey infrastructure technologies.



EXISTING SITE HYDROLOGY MODEL

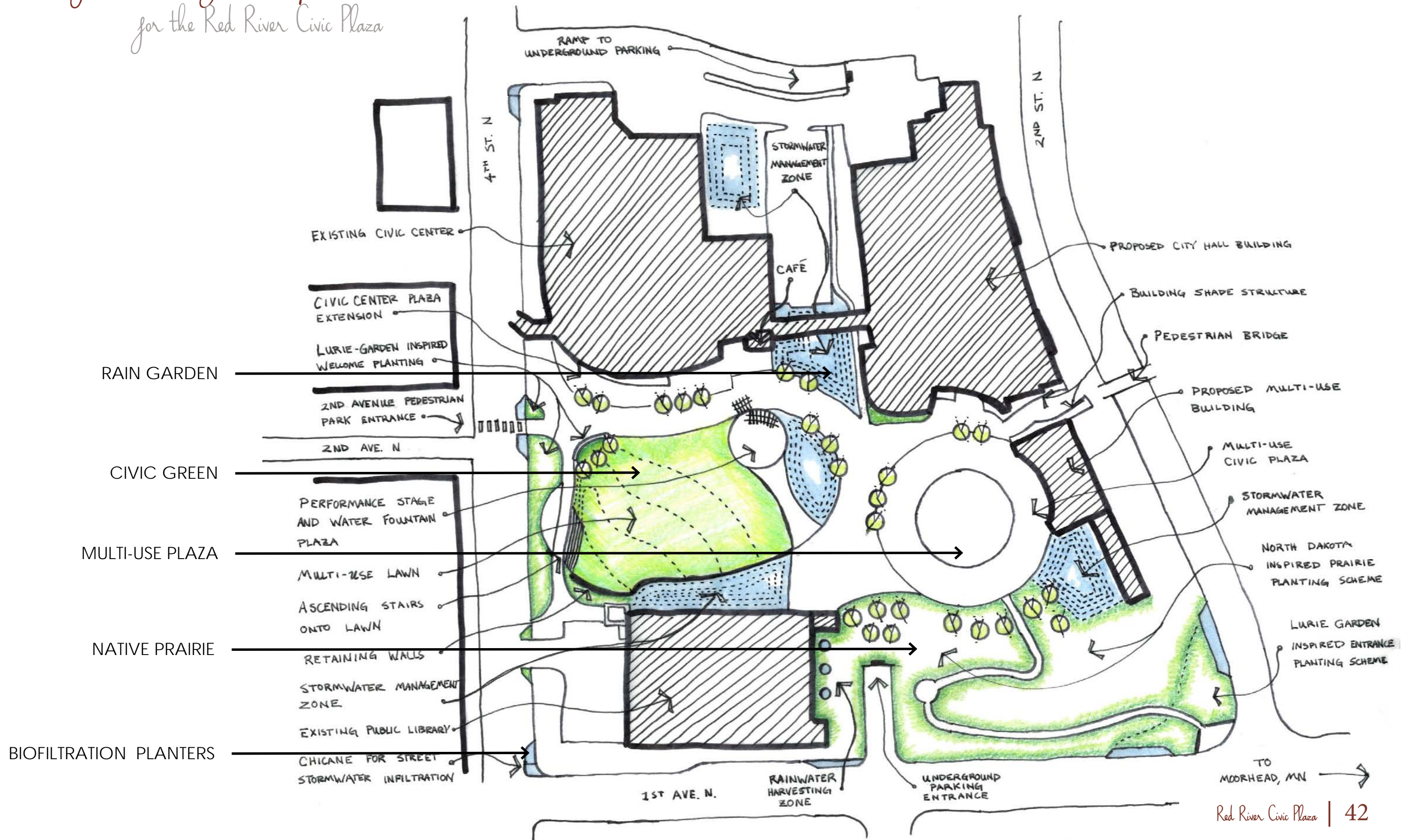
This approximately one square foot topography model helps show the existing hydrology on the site. The model also indicates where each of the catchment basins are located along with boundary lines for their corresponding watersheds.

Design Concepts



Most Influential Design Concept

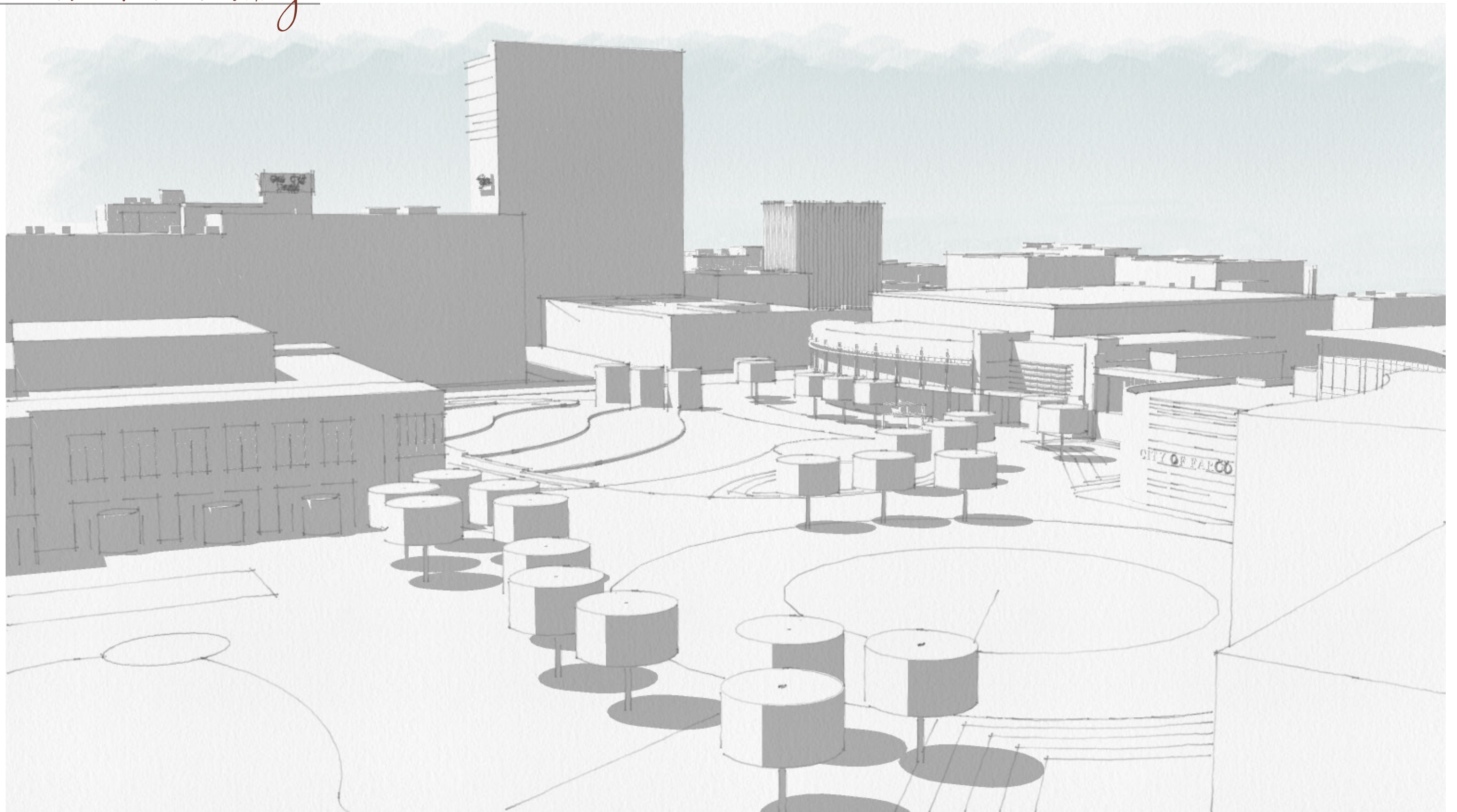
for the Red River Civic Plaza



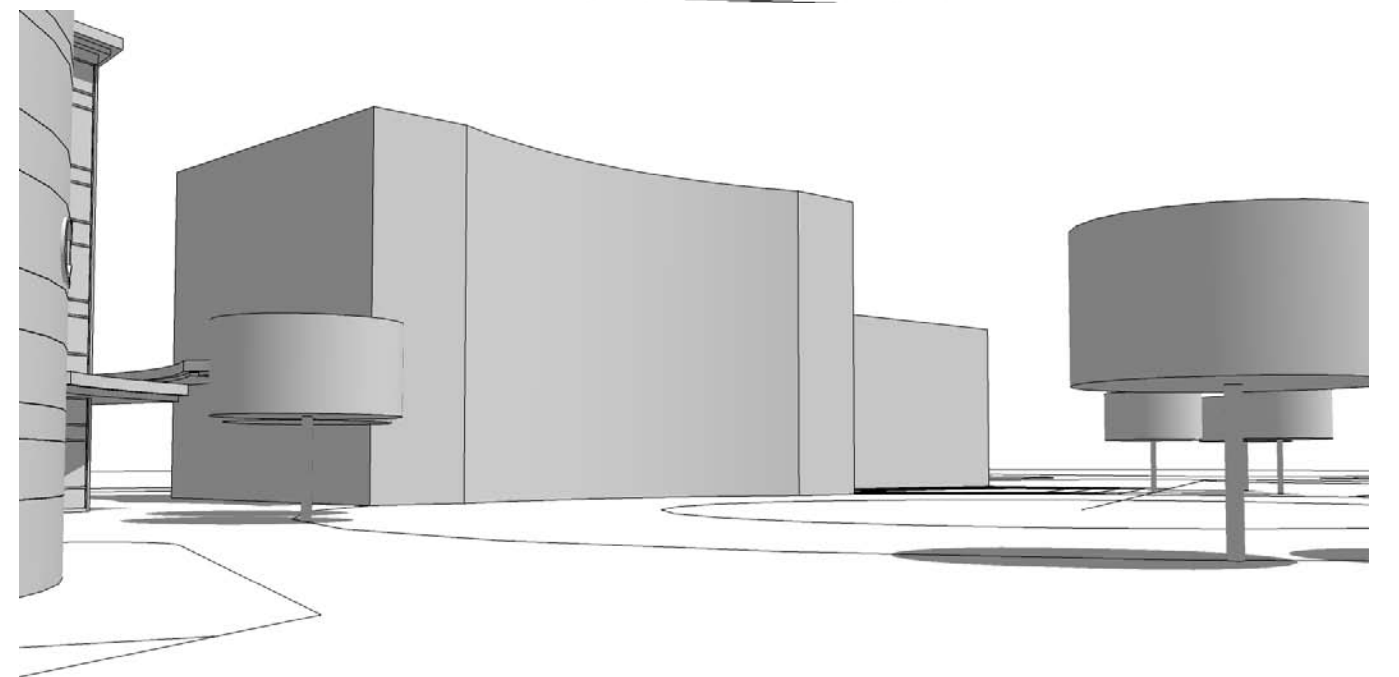
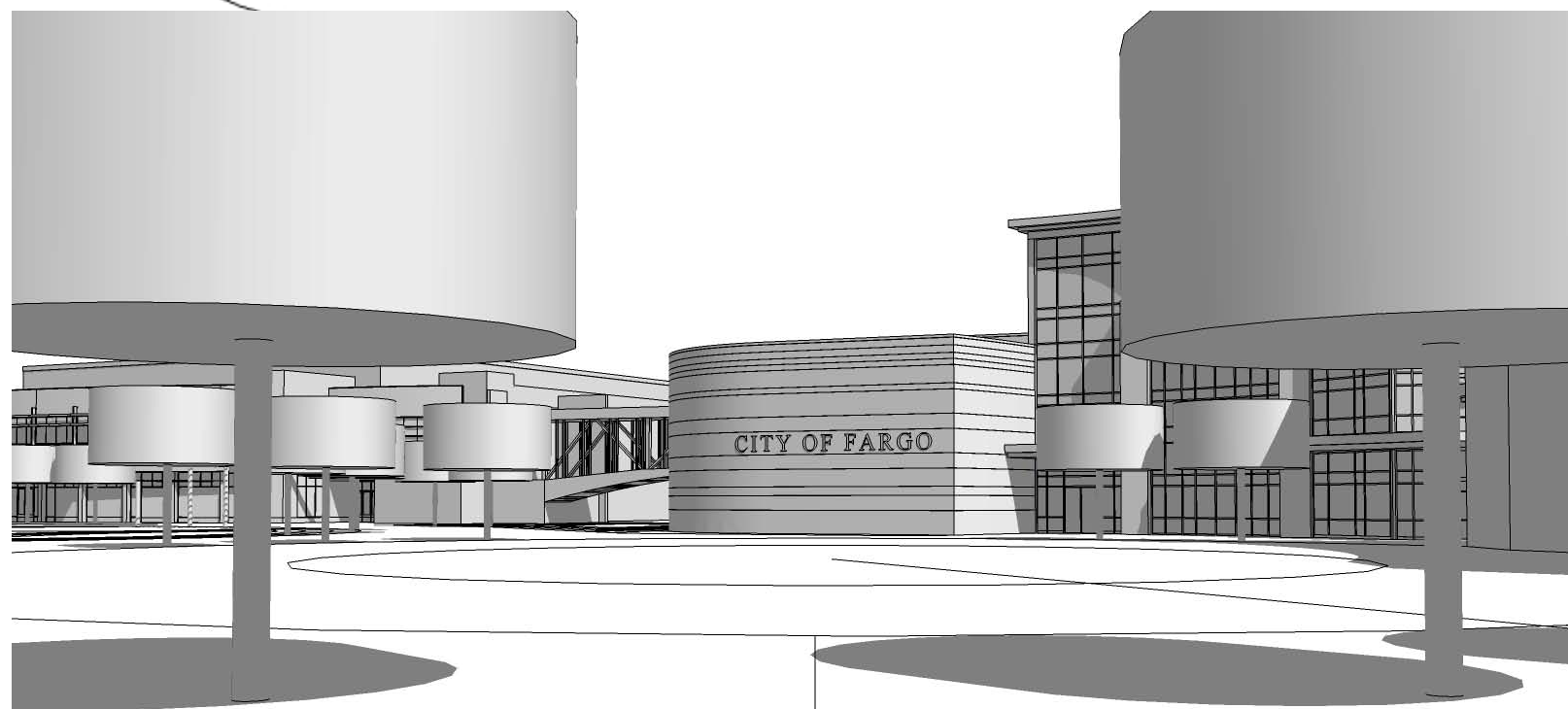
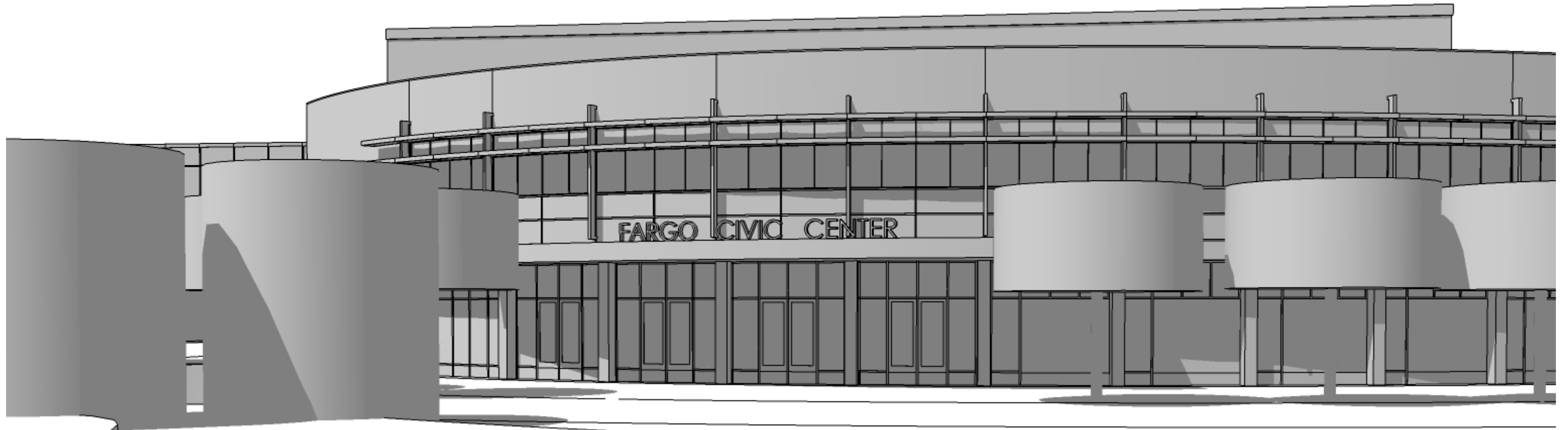
Spatial Programming Concept for the Red River Civic Plaza



Basic Form Modeling

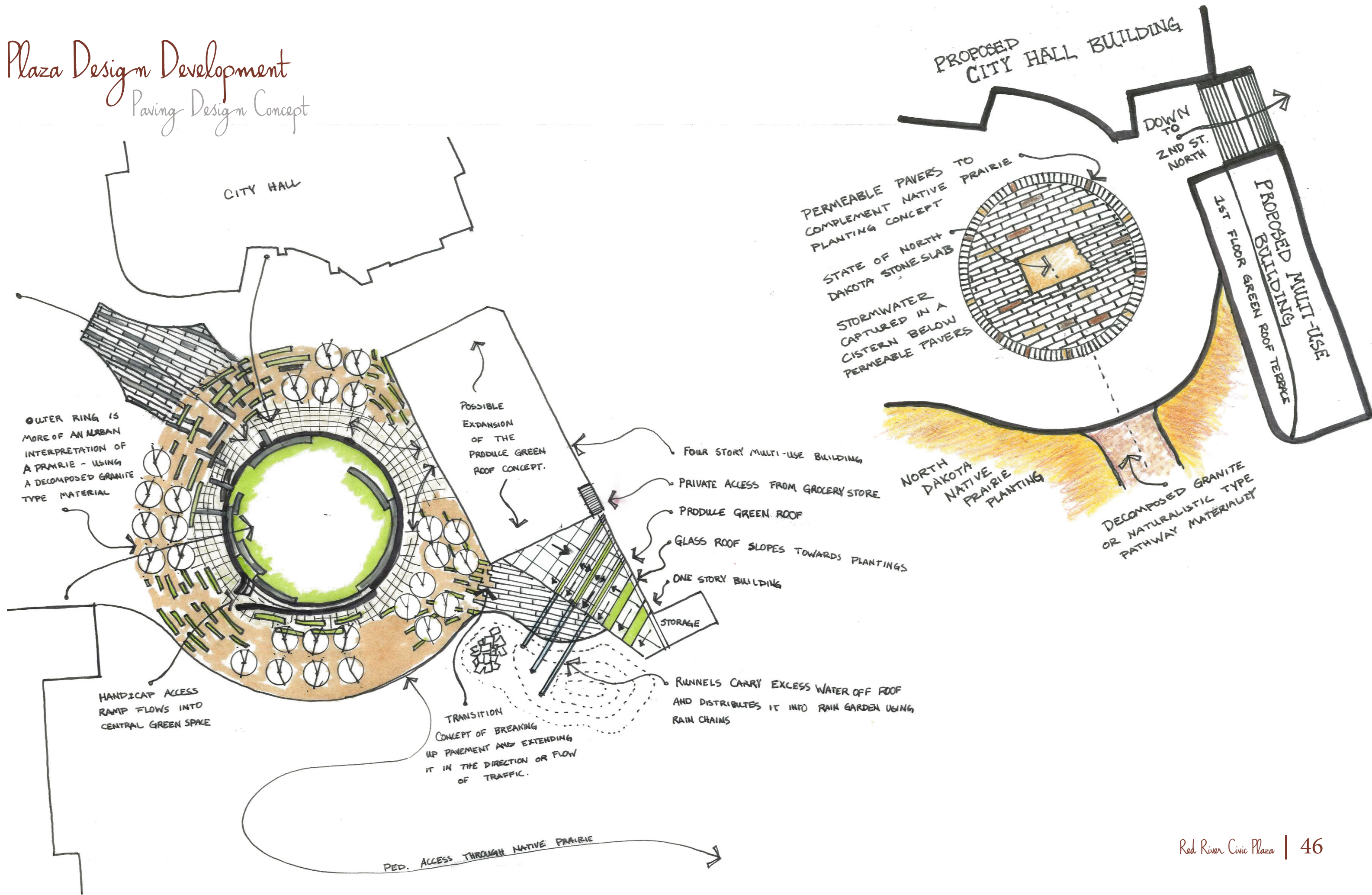


Viewshed Modeling



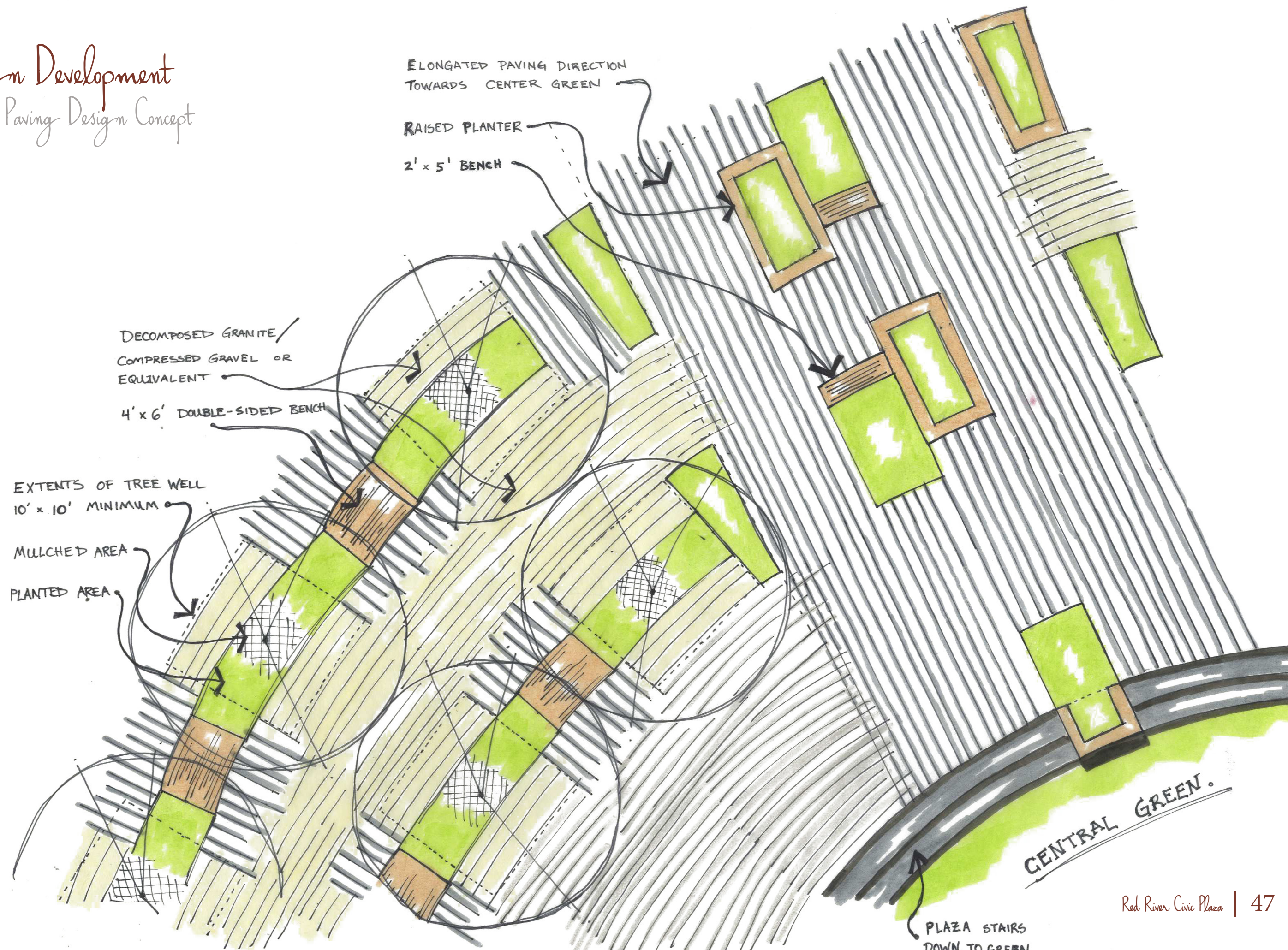
Plaza Design Development

Paving Design Concept

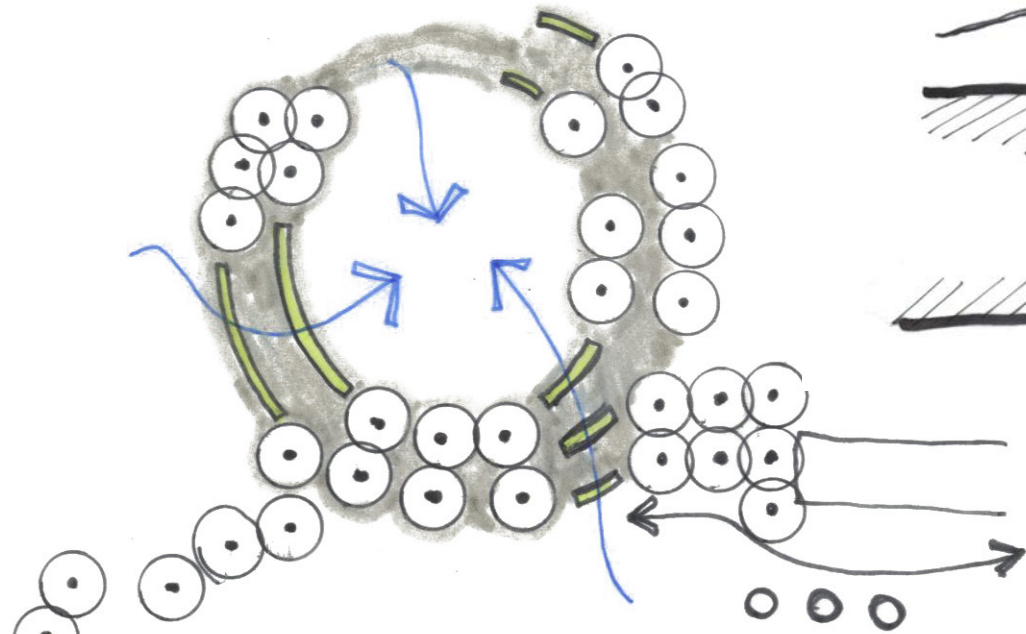


Plaza Design Development

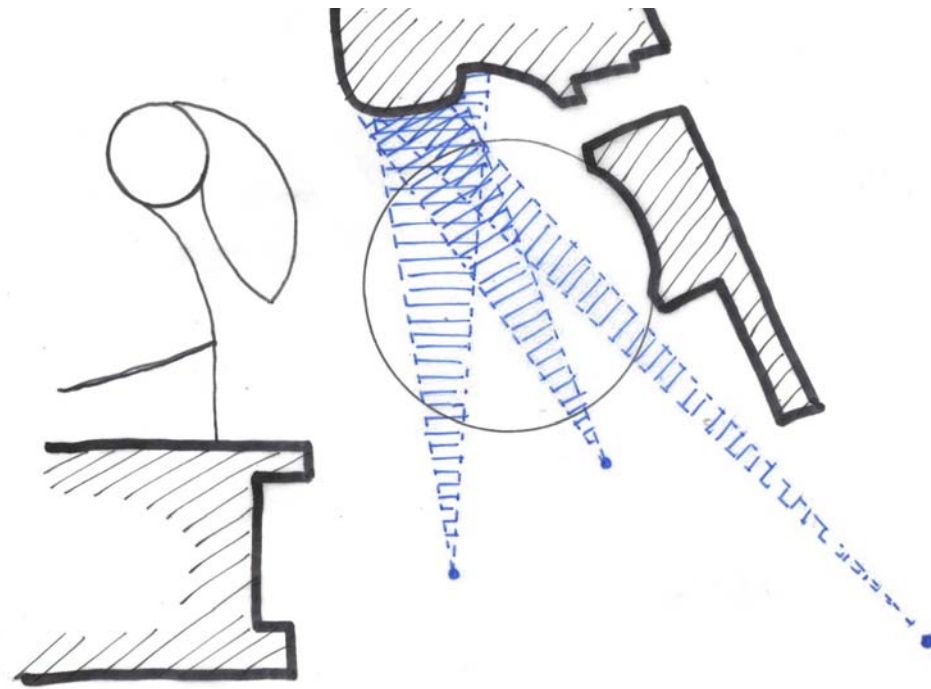
Paving Design Concept



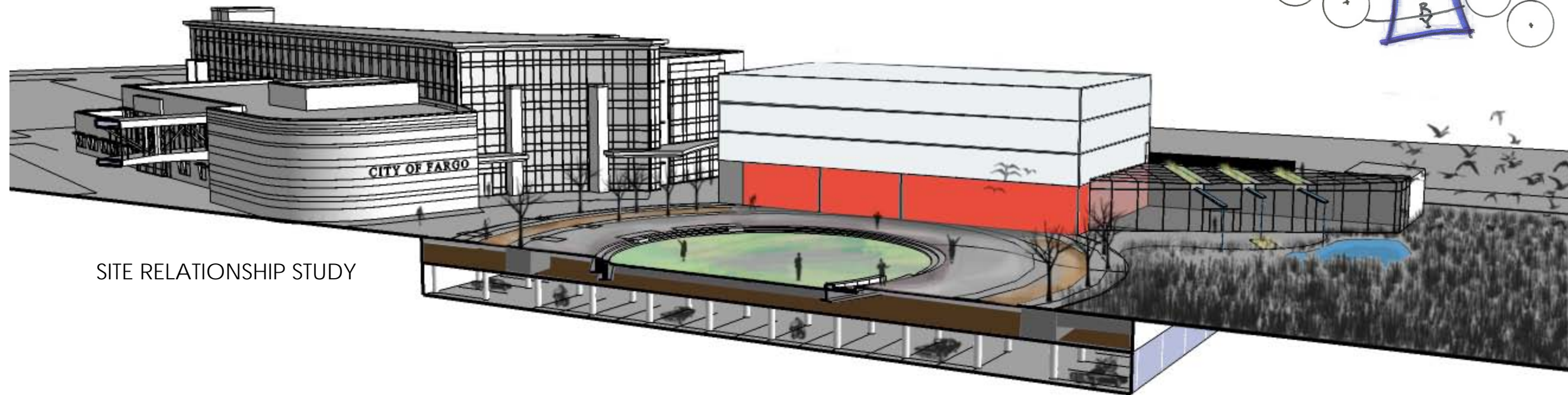
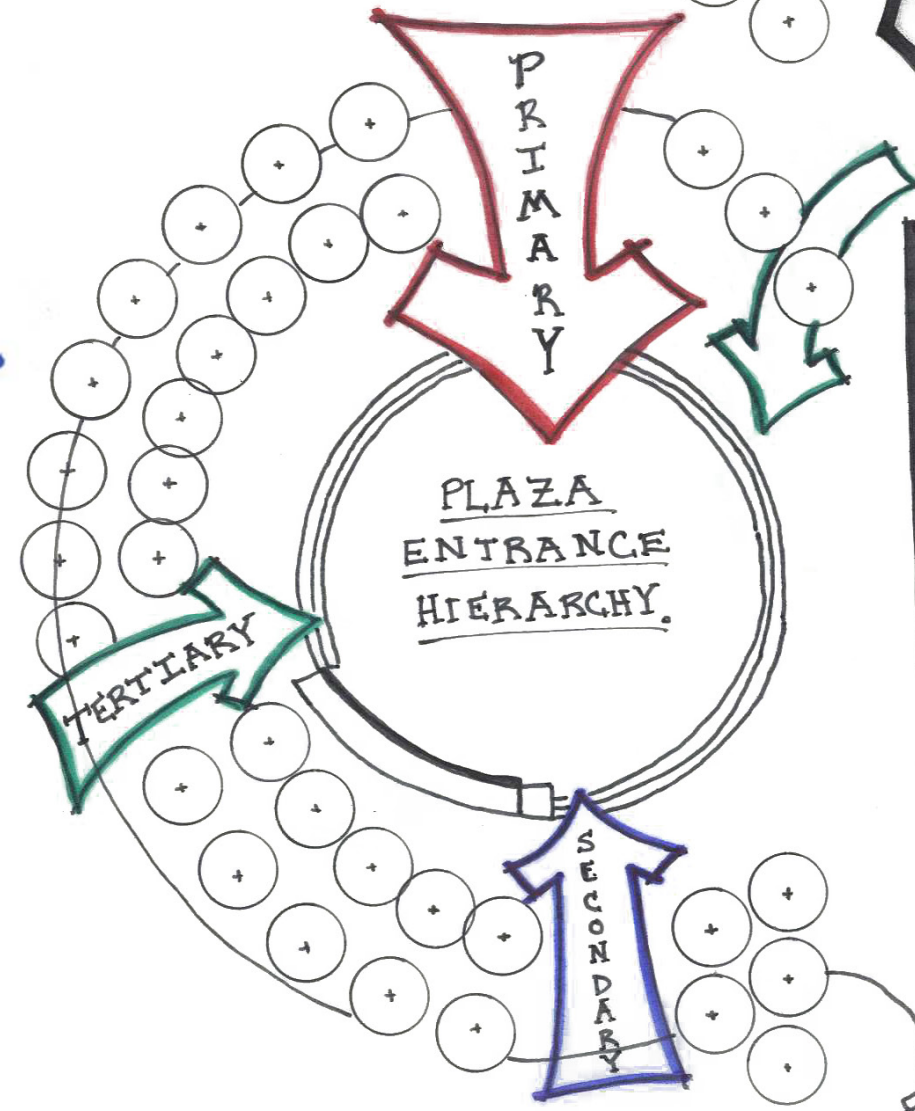
Plaza Design Development



CIRCULATION STUDIES

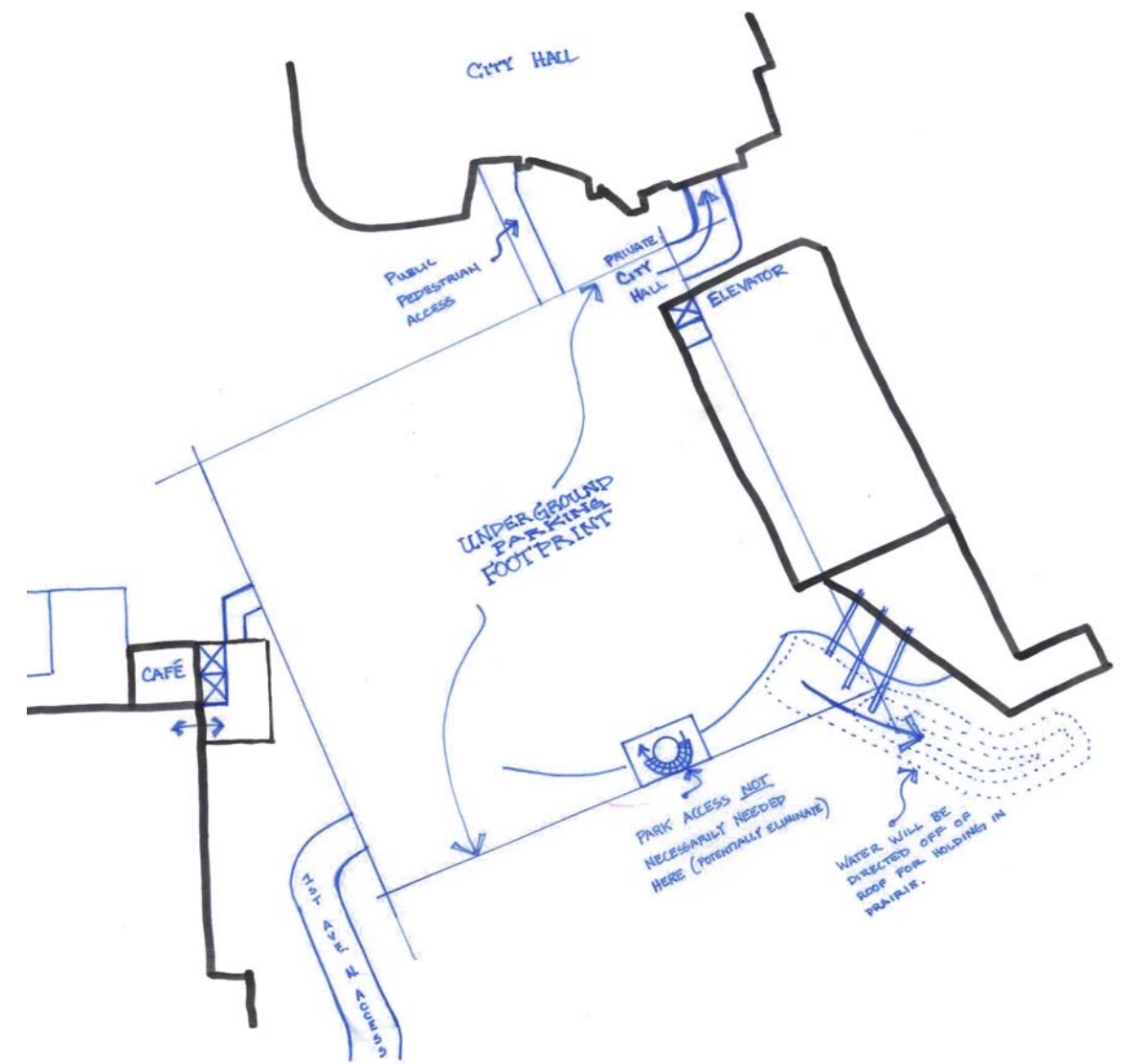
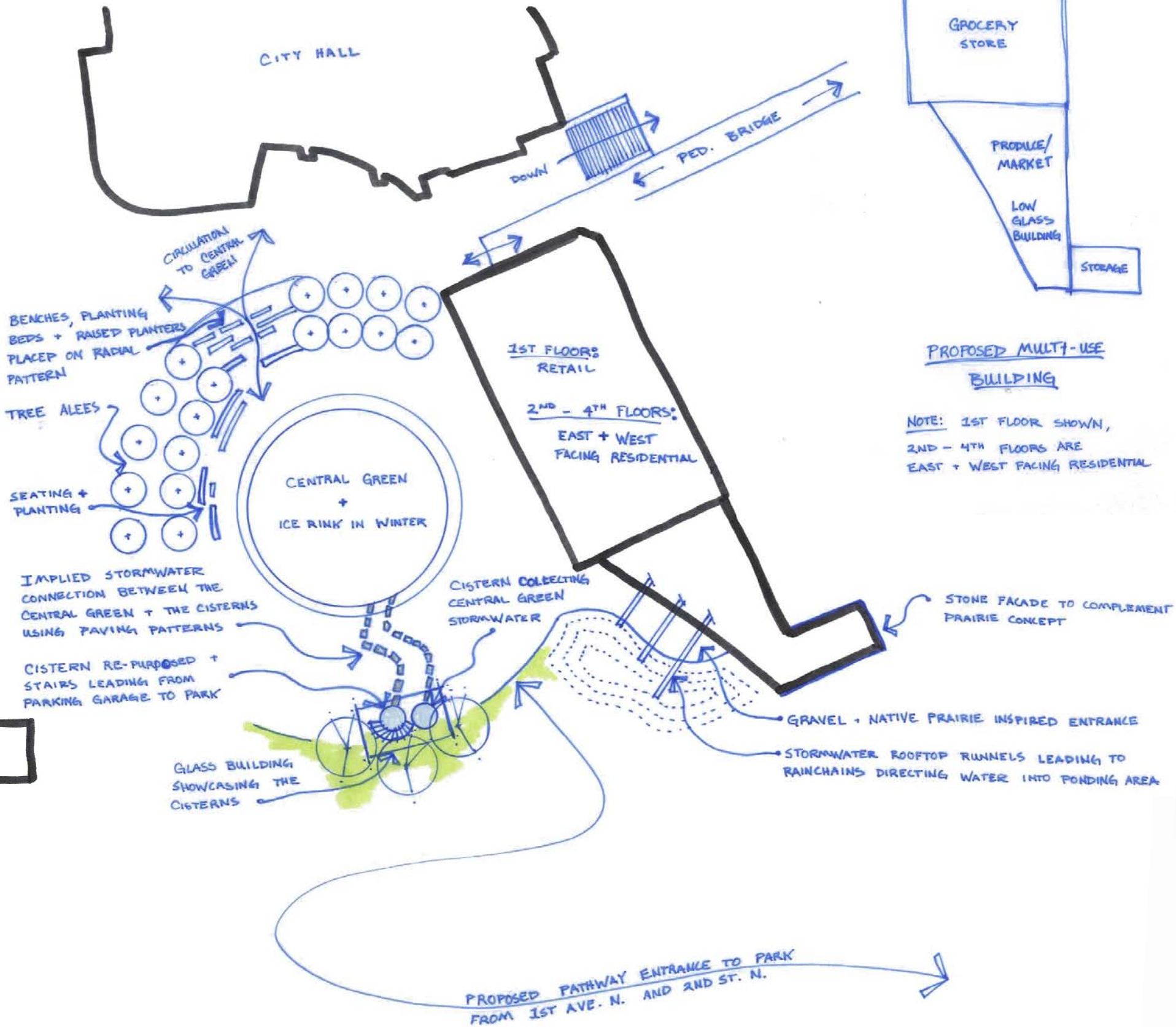


VIEWSHED STUDIES

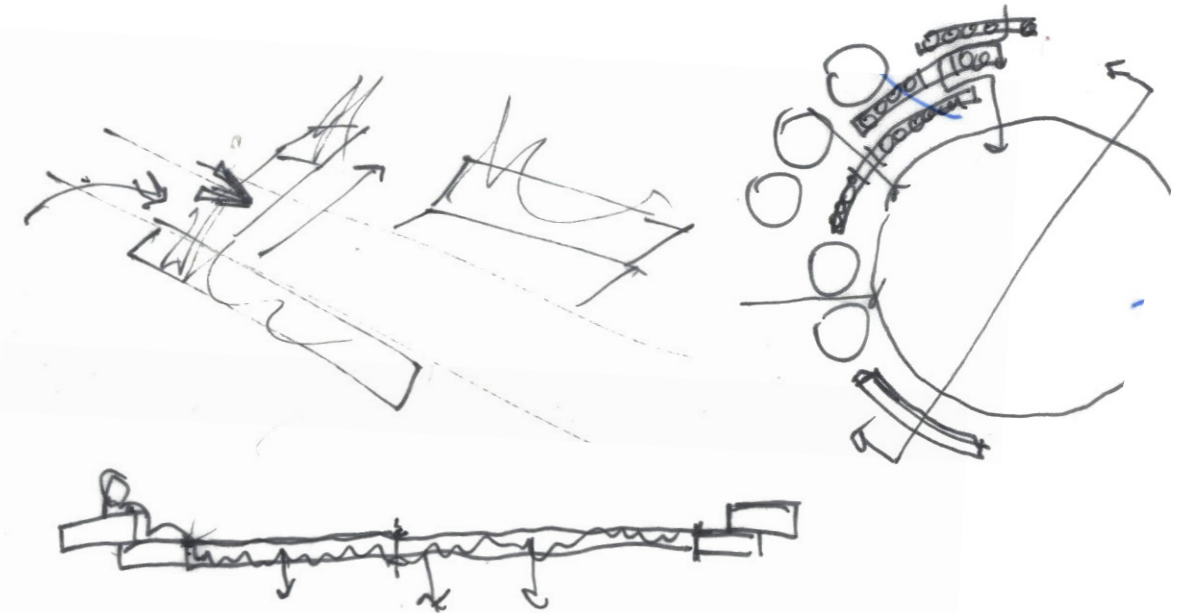


SITE RELATIONSHIP STUDY

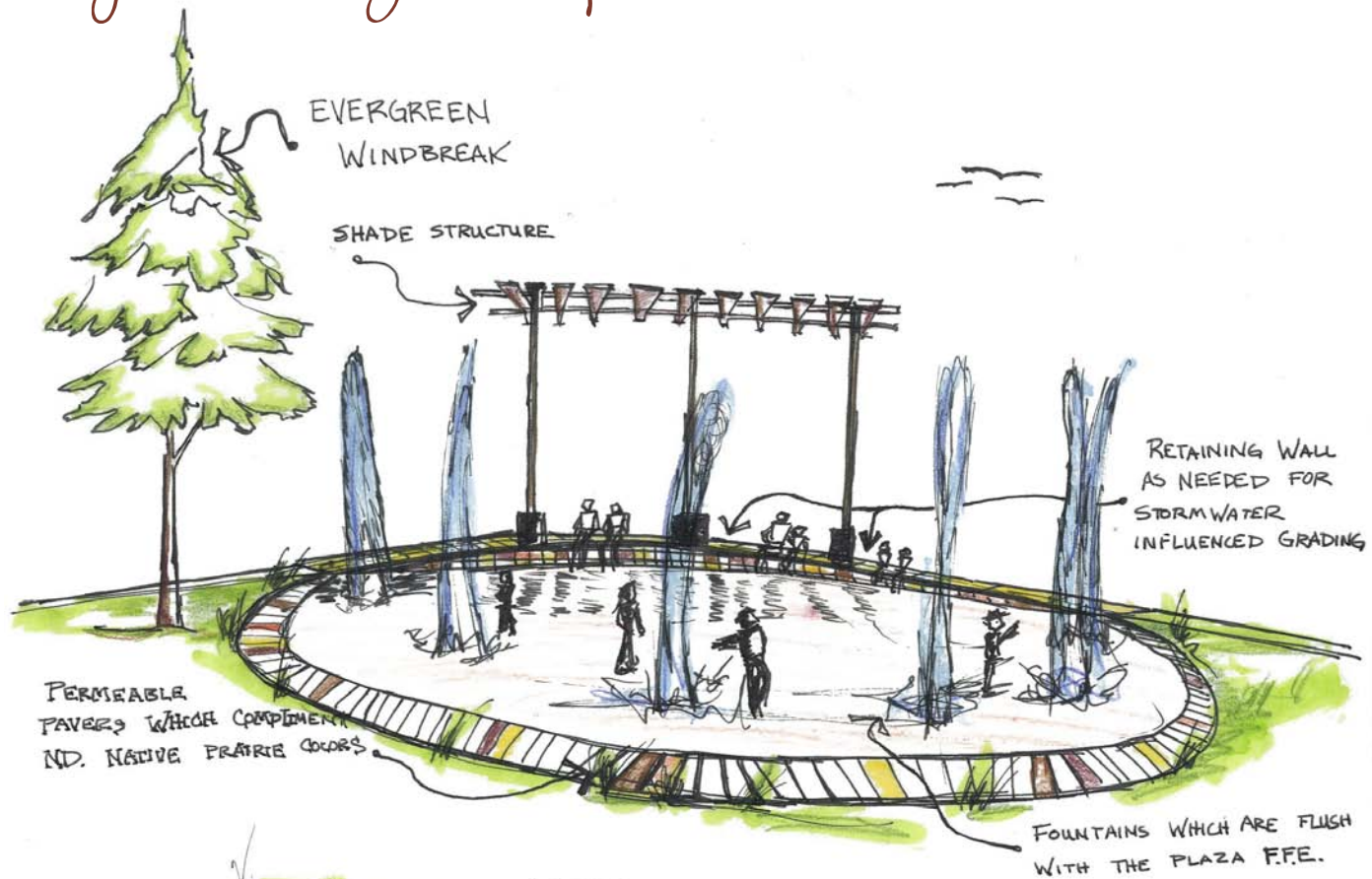
Plaza Design Development



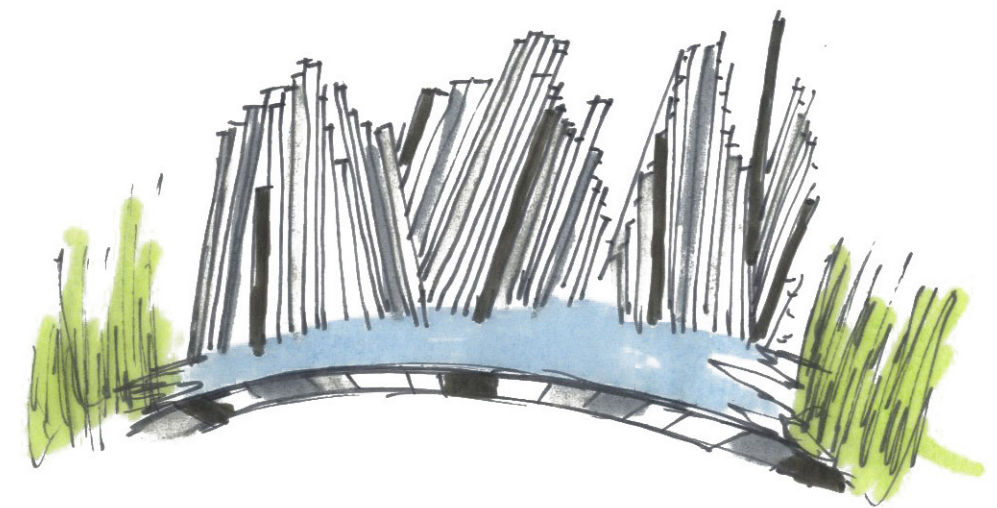
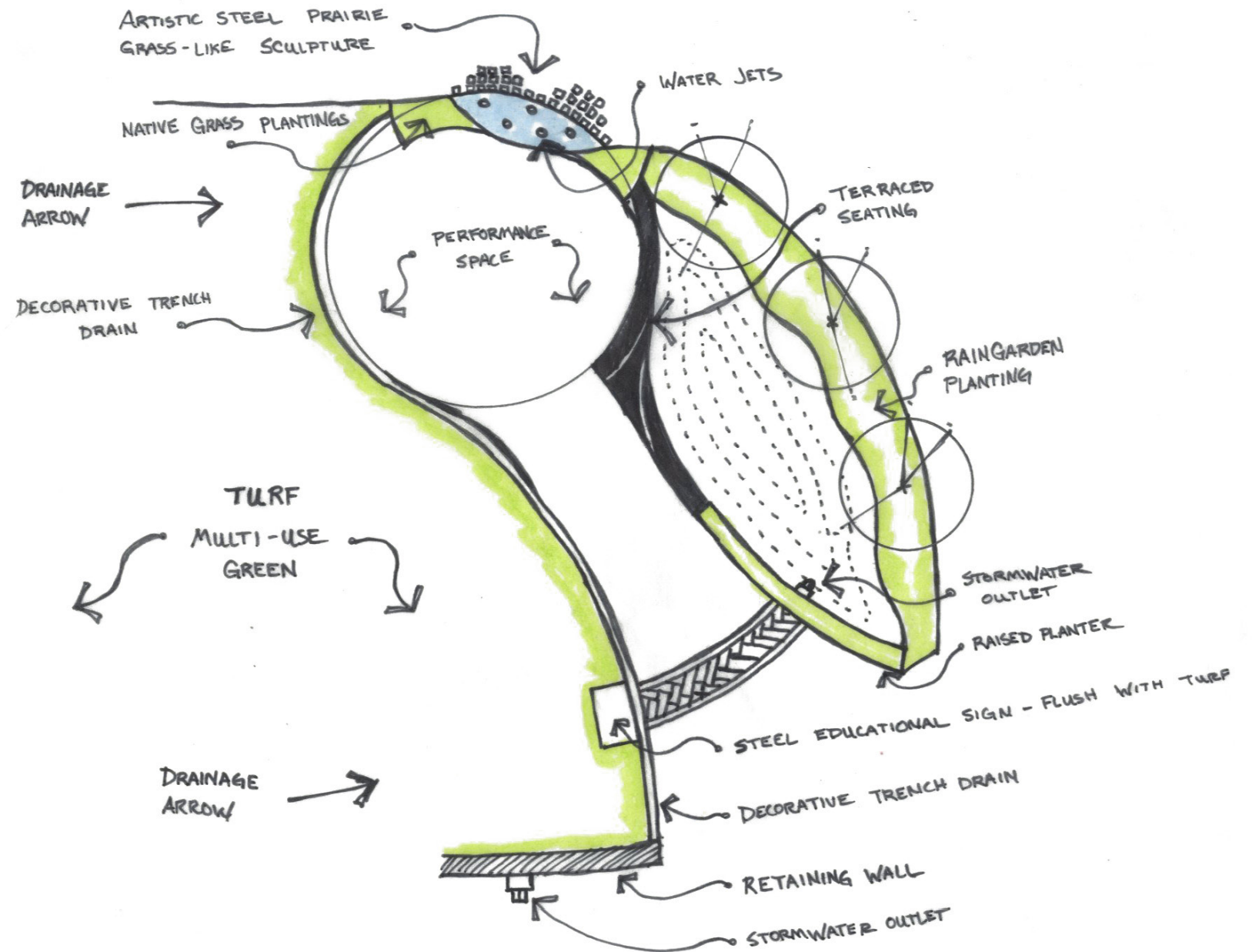
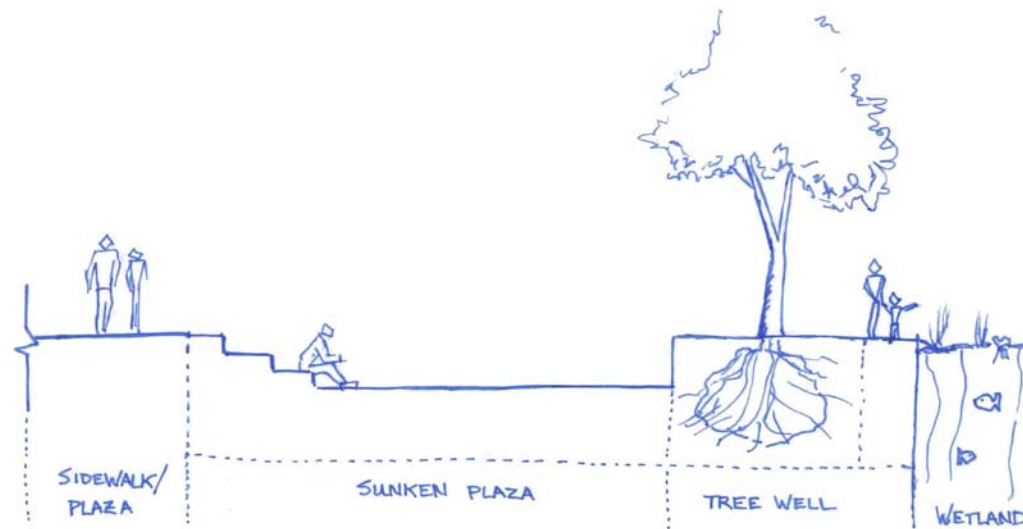
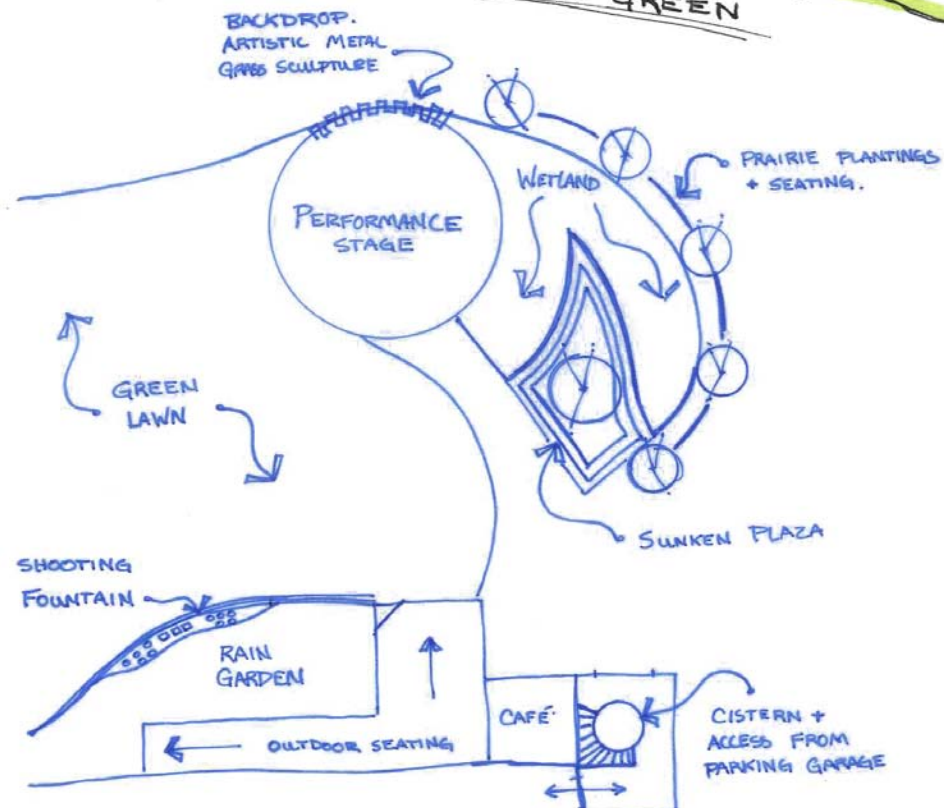
UNDERGROUND PARKING CONCEPT



Performance Stage Development

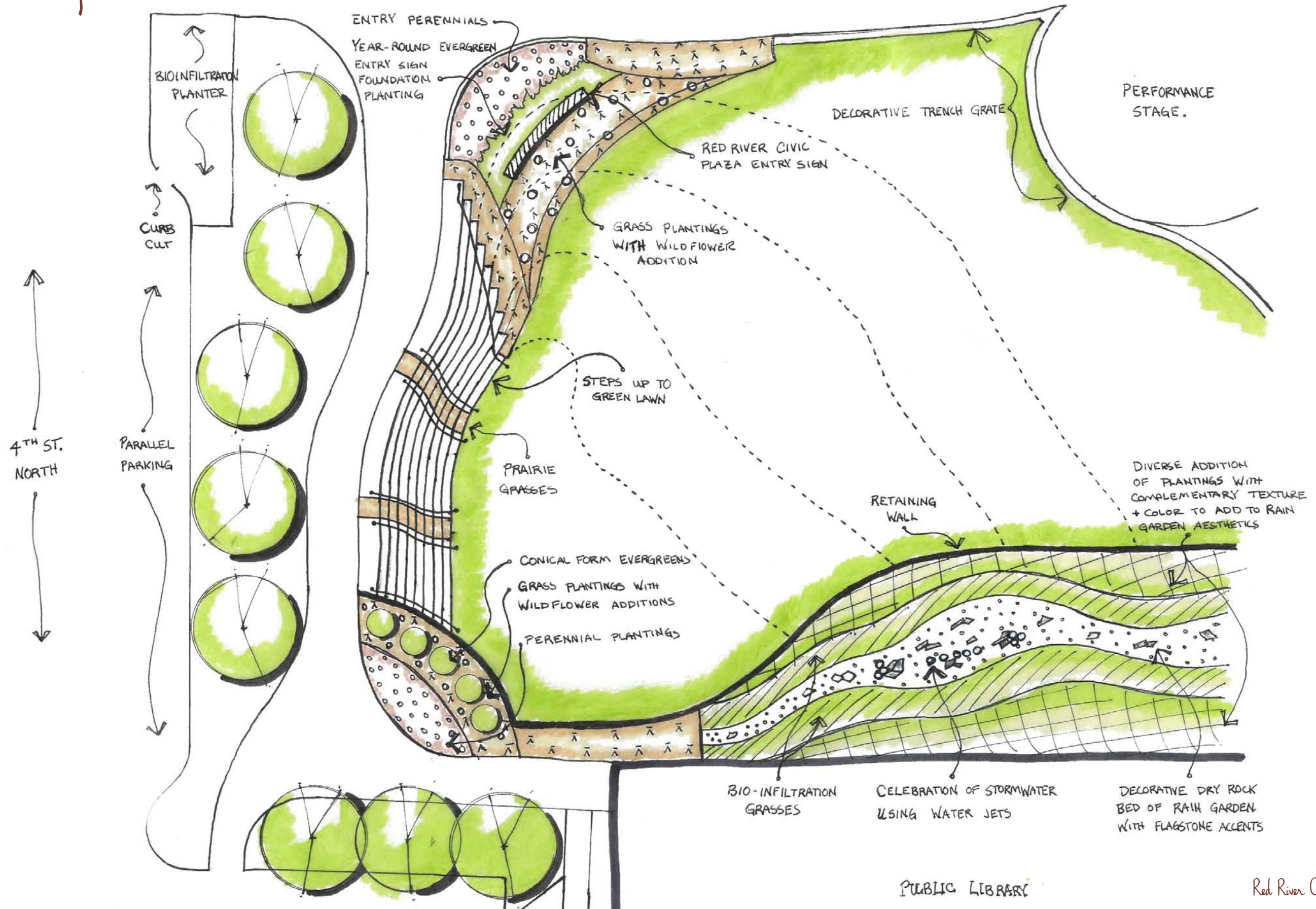


TURF
OPEN GREEN

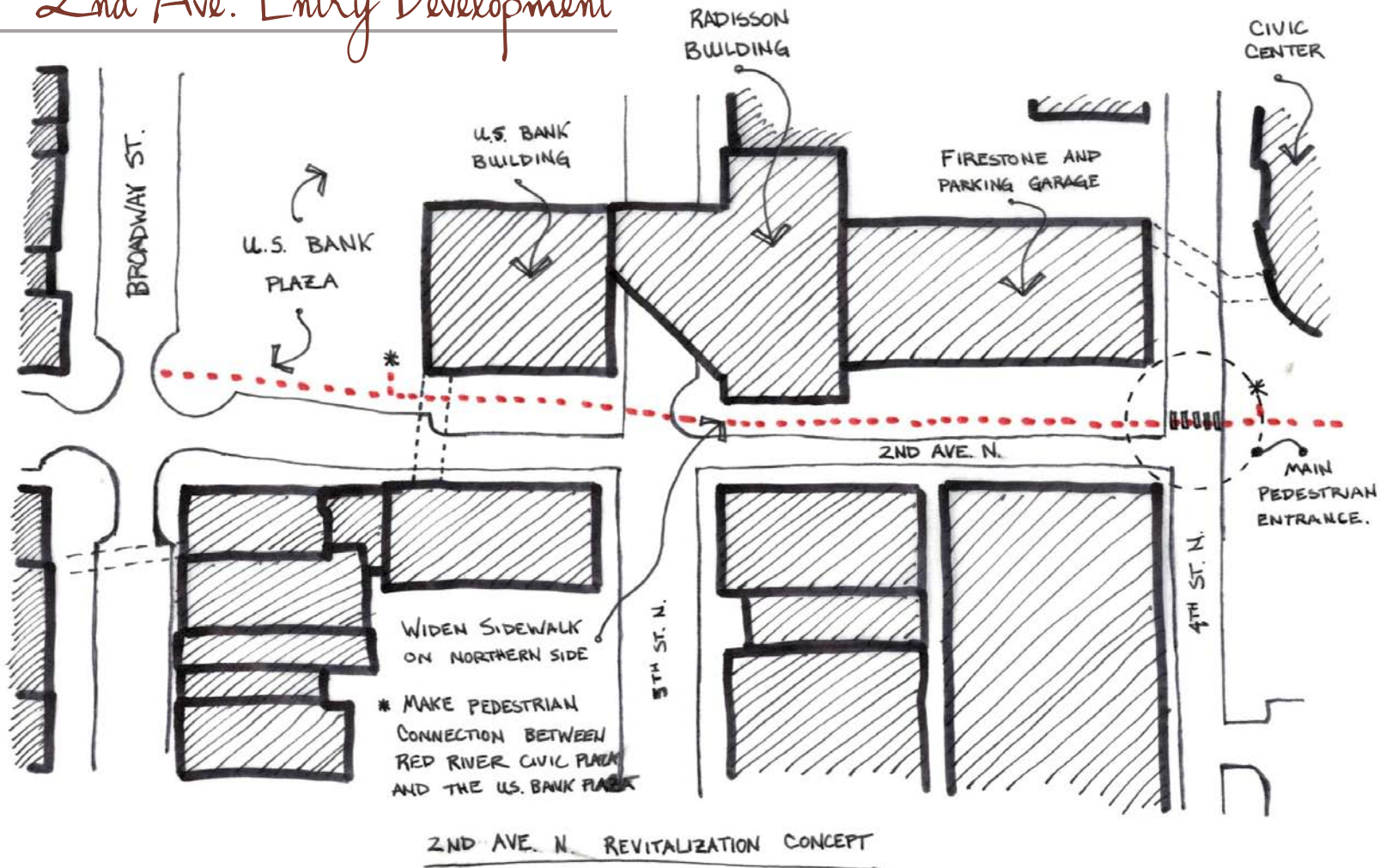


HOW MAY STORMWATER BE CELEBRATED; INTERACTED WITH; AND PROVIDE EDUCATIONAL OPPORTUNITIES THROUGHOUT THE RED RIVER CIVIC PLAZA?

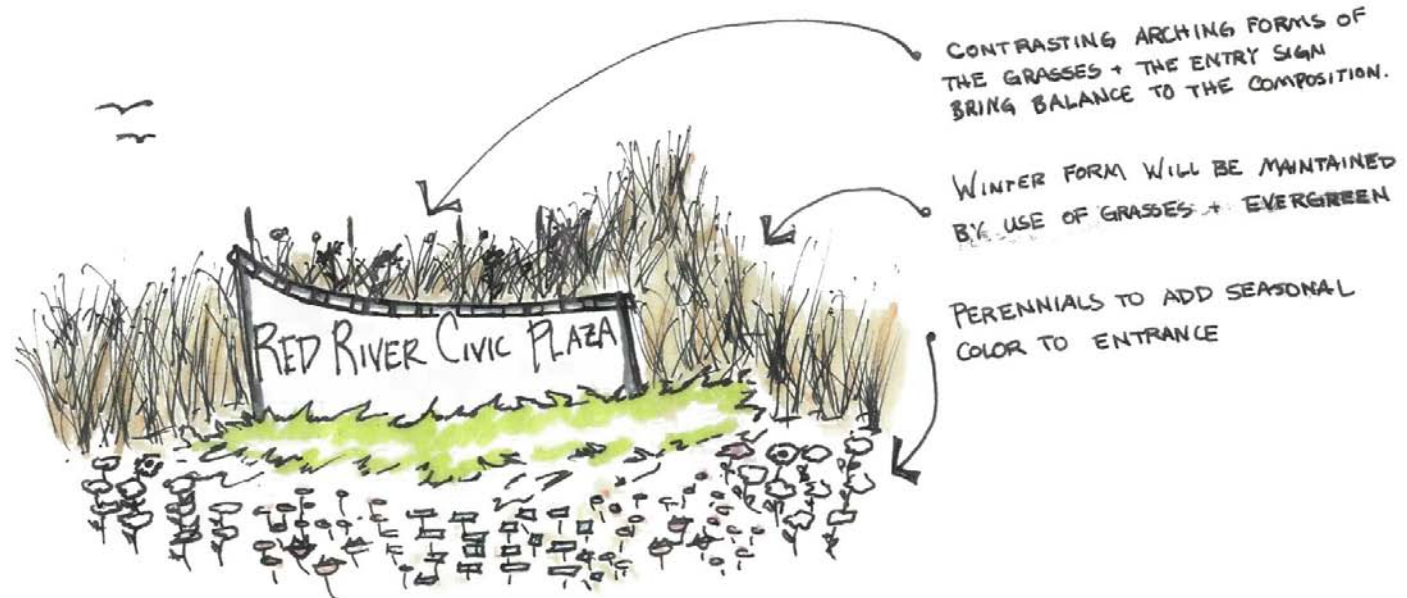
Multi-Purpose Lawn



2nd Ave. Entry Development



WEST ENTRY PATHWAY LIGHTING CONCEPT

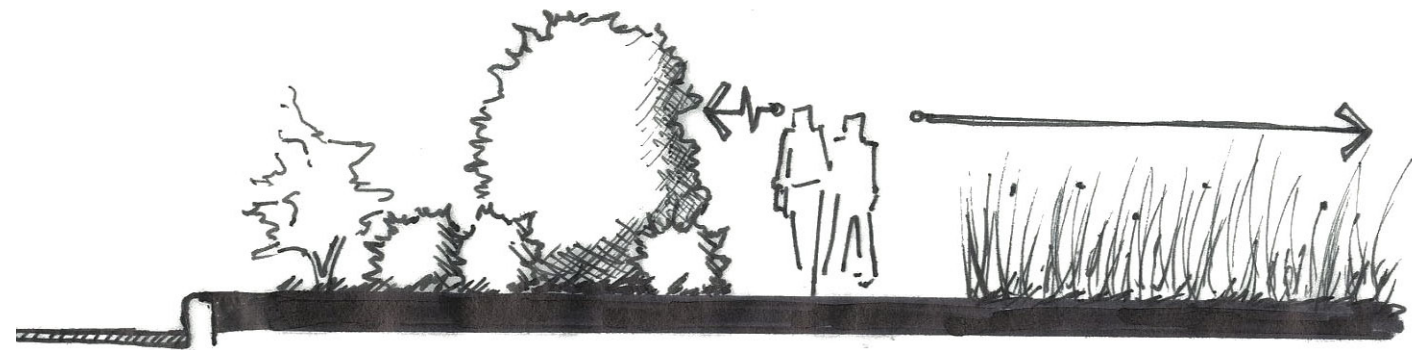


ENTRY SIGN CONCEPT

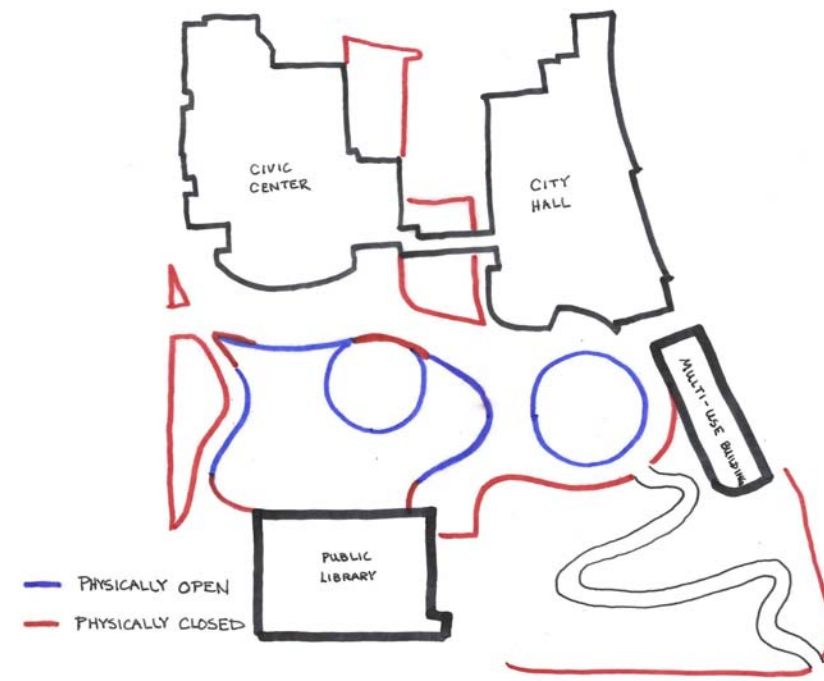


WEST ENTRY CONCEPTUAL MODELING

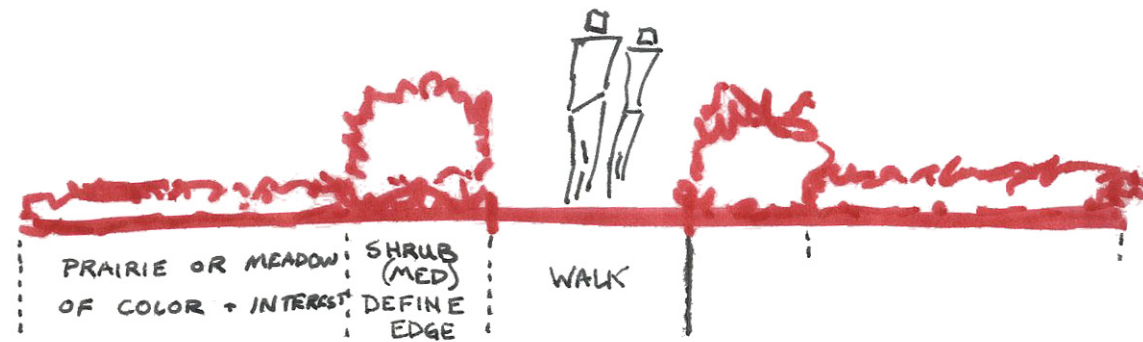
Planting Design Concepts



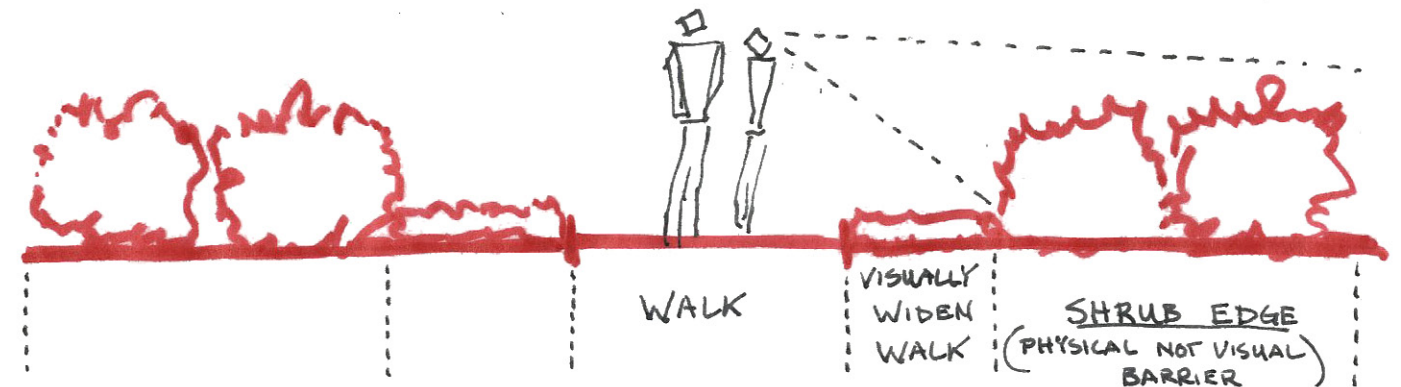
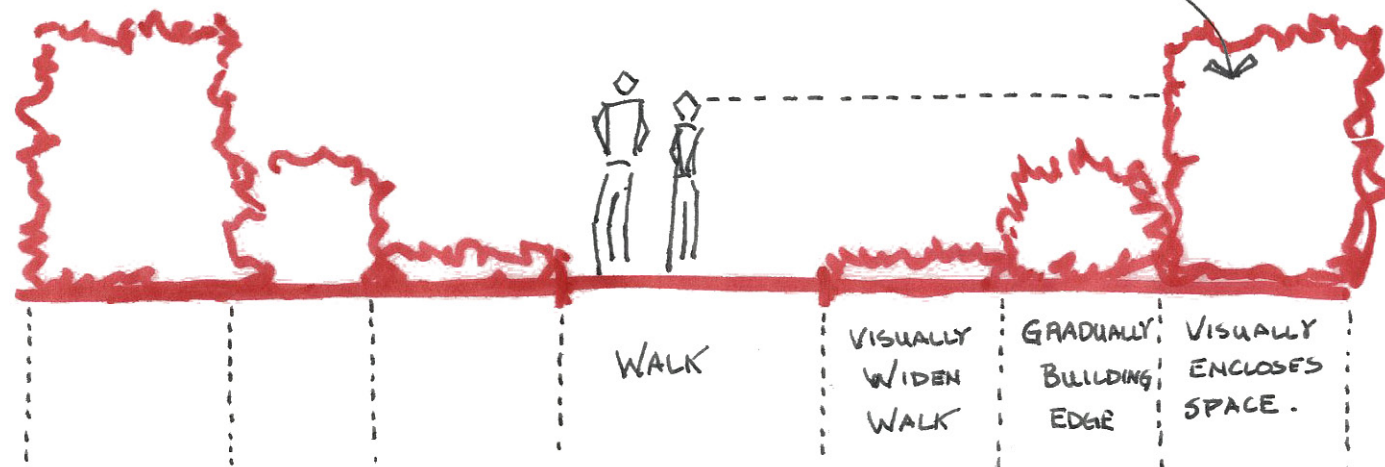
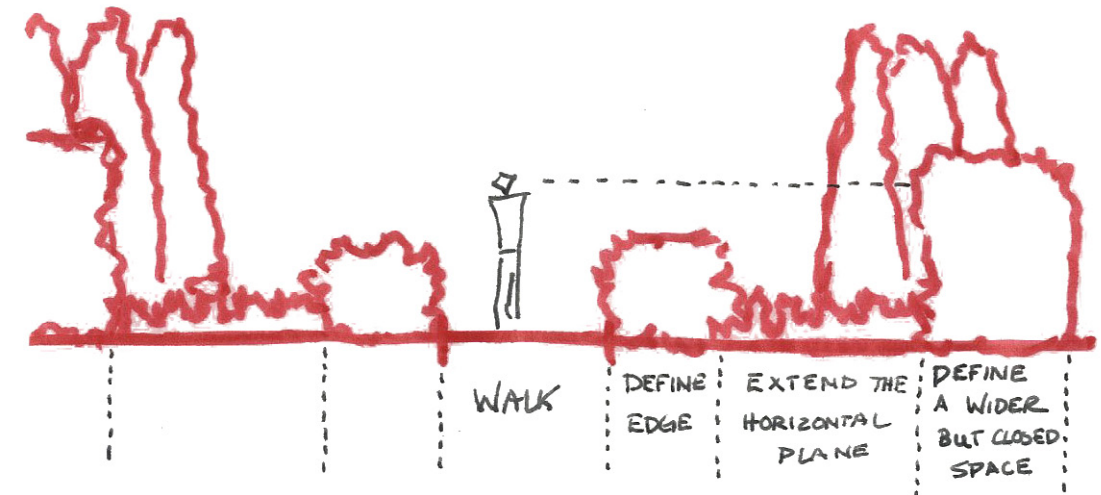
PARTIALLY OPEN SPACE - ORIENTATION TOWARDS PLAZA



PLANTING PLAN CONCEPT - CIRCULATION PERMEABILITY



MAY ENCOURAGE VISUAL FOCUS FORWARDS.



Masterplan



Multi-Seasonal Civic Plaza

NORTH DAKOTA URBAN PRAIRIE
STYLE PLANTING; MIXES GRASSES
WITH WILDFLOWERS WHICH
BRINGS A NATURAL & COLORFUL
AMBIANCE TO THE PLAZA

PERFORMANCE STAGE

PERFORMANCE STAGE
RAIN GARDEN

DESCENDING INTERACTIVE
TERRACED SEATING

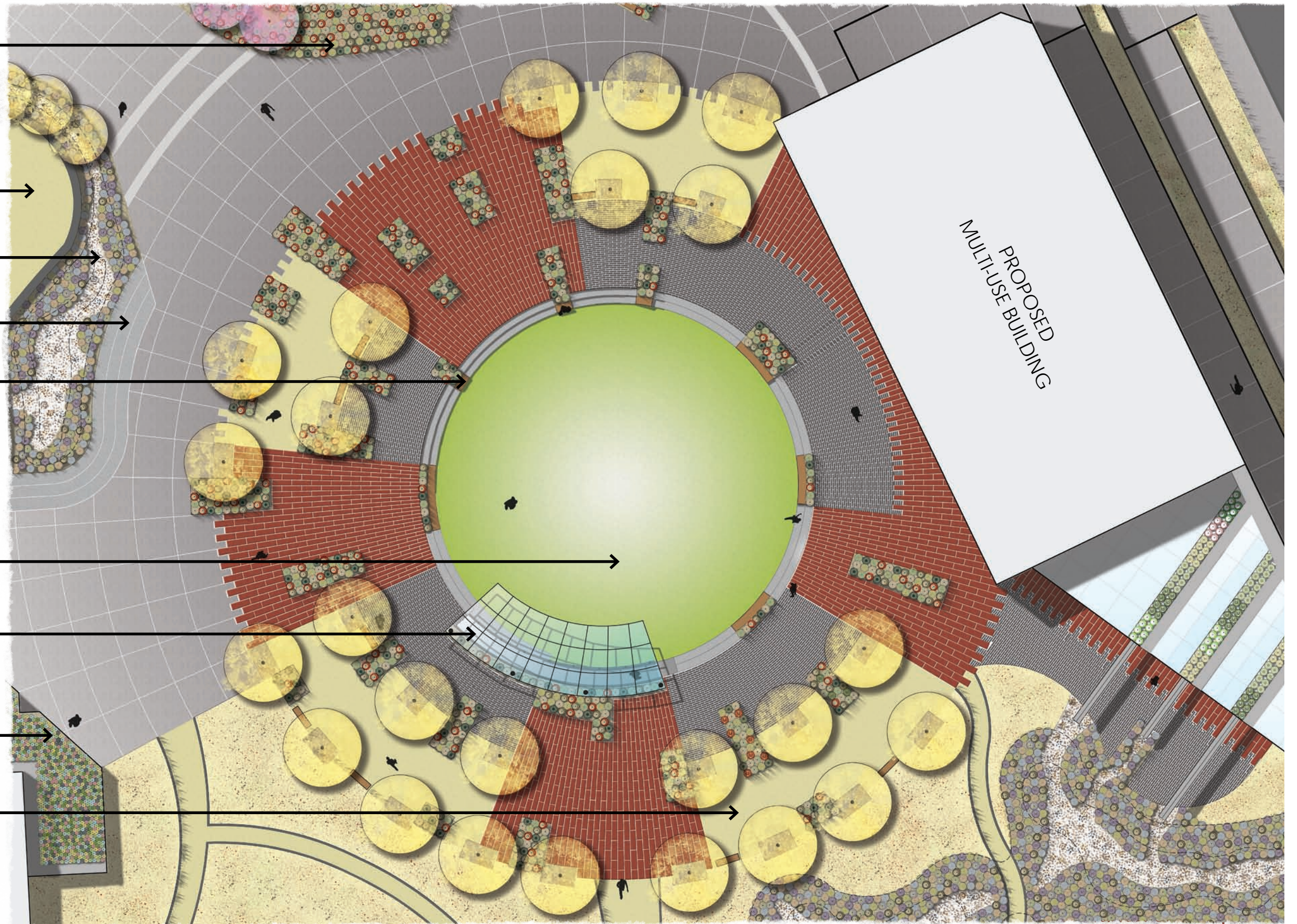
18" (H) WOOD SEATING
INTEGRATED ALONG THE
CENTRAL GREEN EDGES. THE
WOOD BENCH INSERTS ADDS
A WARM AND COMFORTABLE
SEATING OPTION TO THE
CONCRETE STEP PERIMETER.

92' DIAMETER GREEN; CONVERTED
TO ICE RINK IN THE WINTER

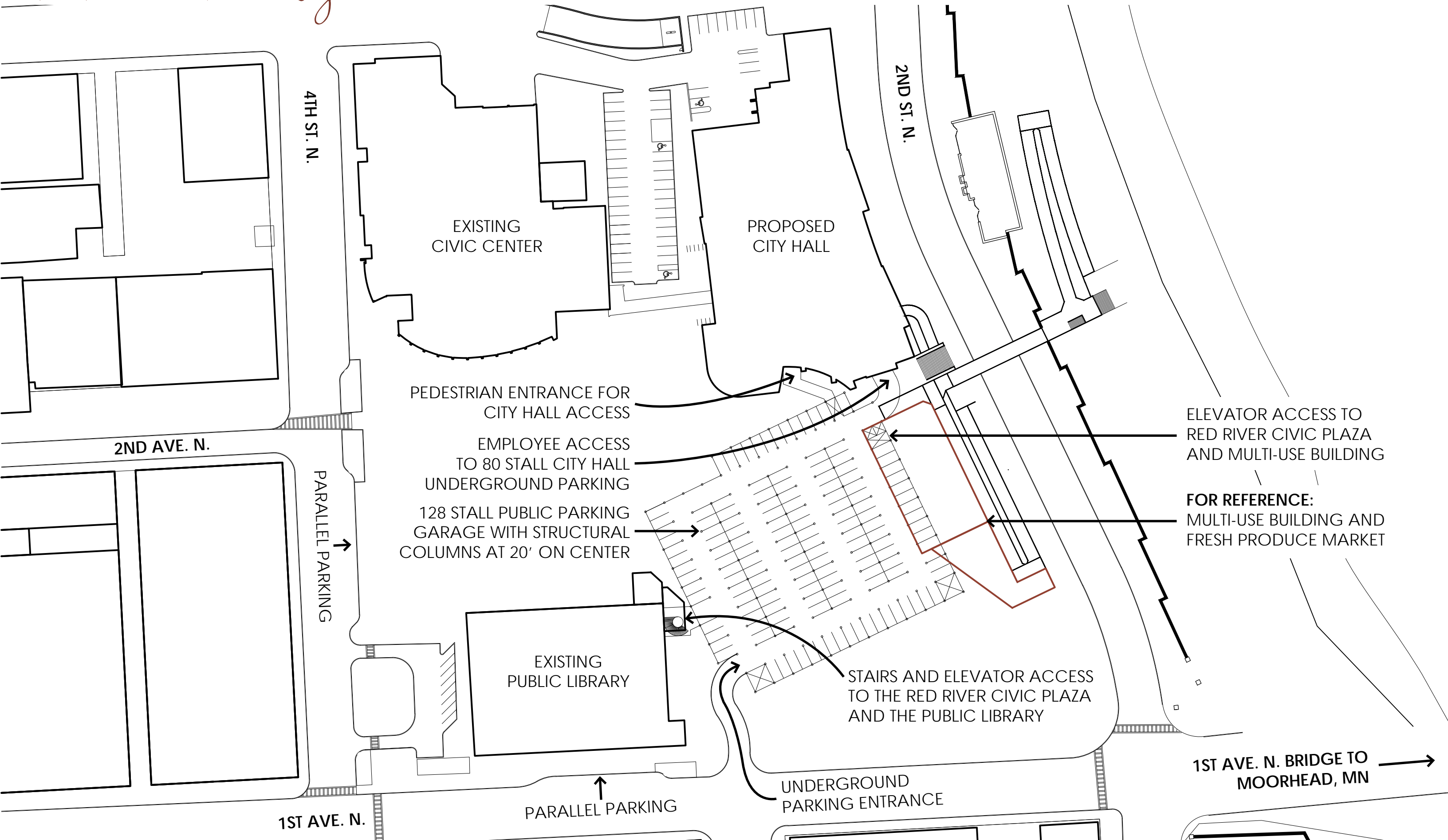
GLASS SHADE STRUCTURE
OVER ADA RAMP

PROPOSED EAST LIBRARY
ENTRANCE & ATTACHED CAFE
WITH GREEN ROOF FEATURE

DECOMPOSED GRANITE PATHWAYS
SERVES AS A TRANSITIONAL FEATURE
CONNECTING THE CONTRASTING
NATIVE PRAIRIE TO THE URBAN PLAZA



Red River Civic Plaza Parking

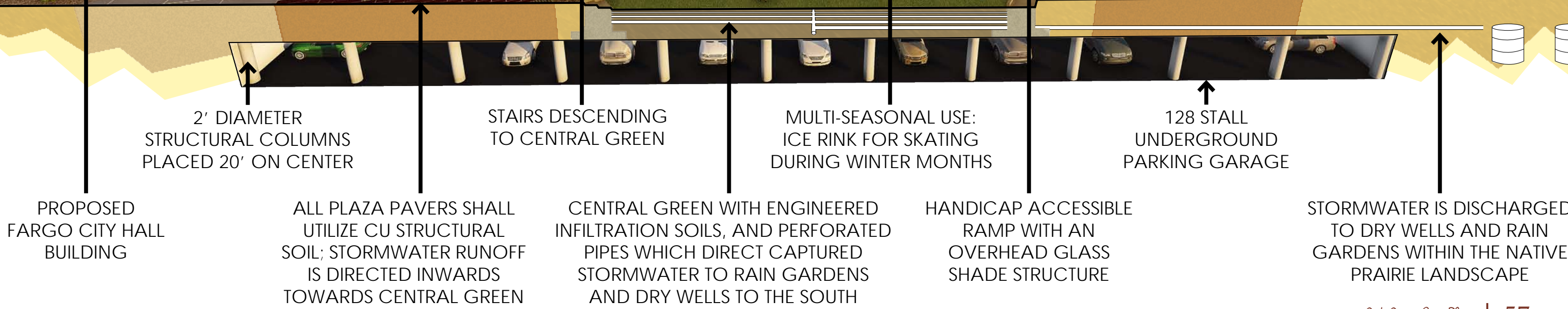


Civic Plaza Site Relationships

1ST FLOOR: ELEVATORS FOR UNDERGROUND PARKING ACCESS, A WARMING HOUSE WITH PUBLIC RESTROOMS, THREE LOCAL BOUTIQUE RETAIL STORES, A GROCERY STORE WHICH HAS A CONNECTED FRESH PRODUCE MARKET.

2ND-4TH FLOORS: RESIDENTIAL UNITS, 4 UNITS ON EACH FLOOR FACE WEST & OVERLOOK THE PLAZA, 6 UNITS ON EACH FLOOR FACE EAST AND OVERLOOK 2ND STREET NORTH; ALL UNITS HAVE UNOBSTRUCTED ACCESS TO THE RED RIVER BY WAY OF A PUBLIC PEDESTRIAN BRIDGE.

RED RIVER PRODUCE MARKET WITH A PRODUCE GREEN ROOF, AND STORMWATER RUNNELS WITH RAIN CHAINS THAT DIRECT STORMWATER TO RAIN GARDENS, CREATING AN INTERACTIVE AND EDUCATIONAL ENTRANCE



Civic Plaza Winter Attractions



Performance Stage Rain Garden Planting Plan



- (5) *Betula papyrifera*, Paper Birch
- (15) *Pycnanthemum virginianum*, Mountain Mint
- (16) *Bromus ciliatus*, Fringed Sedge
- (15) *Asclepias incarnata*, Swamp Milkweed
- (11) *Carex comosa*, Bristly Sedge
- (19) *Helenium autumnale*, Sneezeweed
- (23) *Iris versicolor*, Northern Blue Flag
- (9) *Physostegia virginiana*, Obedient Plant
- (15) *Lobelia siphilitica*, Great Blue Lobelia,
- (10) *Panicum virgatum*, Switch Grass
- (11) *Rudbeckia subtomentosa*, Sweet Black-Eyed Susan
- (31) *Anemone canadensis*, Canada Anemone
- (14) *Heliopsis helianthoides*, Early Sunflower
- (15) *Carex vulpinoidea*, Brown Fox Sedge

BRONZE LETTERING EMBEDDED
FLUSH IN DECOMPOSED
GRANITE PERFORMANCE STAGE

MULTI-PURPOSE LAWN STORMWATER
DISCHARGE INTO RAIN GARDEN

TRENCH GRATE

INTERACTIVE TERRACED SEATING

FLUSH BRONZE STORMWATER
EDUCATIONAL SIGN

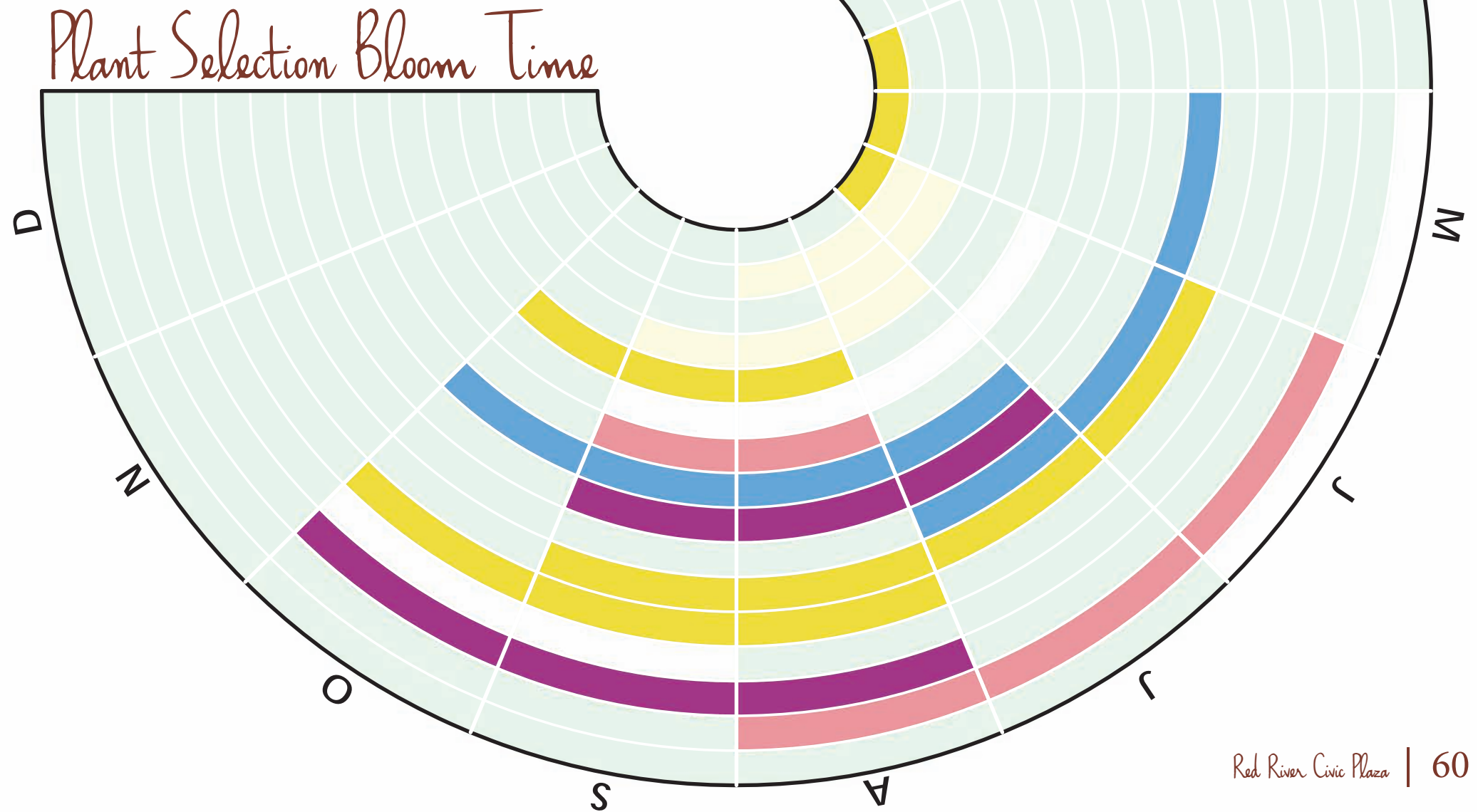
MULTI-PURPOSE LAWN

Rain Garden Bloom Schedule

WILDFLOWERS ARE INTER-PLANTED WITH THE FOLLOWING RAIN GARDEN GRASSES:

FRINGED BROME, BLUE JOINT GRASS, WATER SEDGE, BRISTLY SEDGE, FRINGED SEDGE, PORCUPINE SEDGE, COMMON LAKE SEDGE, LANCE-FRUITED OVAL SEDGE, BROWN FOX SEDGE, VIRGINIA WILD RYE, SWITCH GRASS, DARK GREEN BULRUSH, WOOL GRASS, AND GREAT BULRUSH.

- CANADA ANEMONE
- SWAMP MILKWEED
- NEW ENGLAND ASTER
- PANICLED ASTER
- SNEEZEWEED
- EARLY SUNFLOWER
- NORTHERN BLUE FLAG
- PRAIRIE BLAZING STAR
- GREAT BLUE LOBELIA
- OBEDIENT PLANT
- MOUNTAIN MINT
- SWEET BLACK-EYED SUSAN
- COMMON ARROWHEAD
- PURPLE MEADOW RUE
- CULVER'S ROOT
- GOLDEN ALEXANDERS

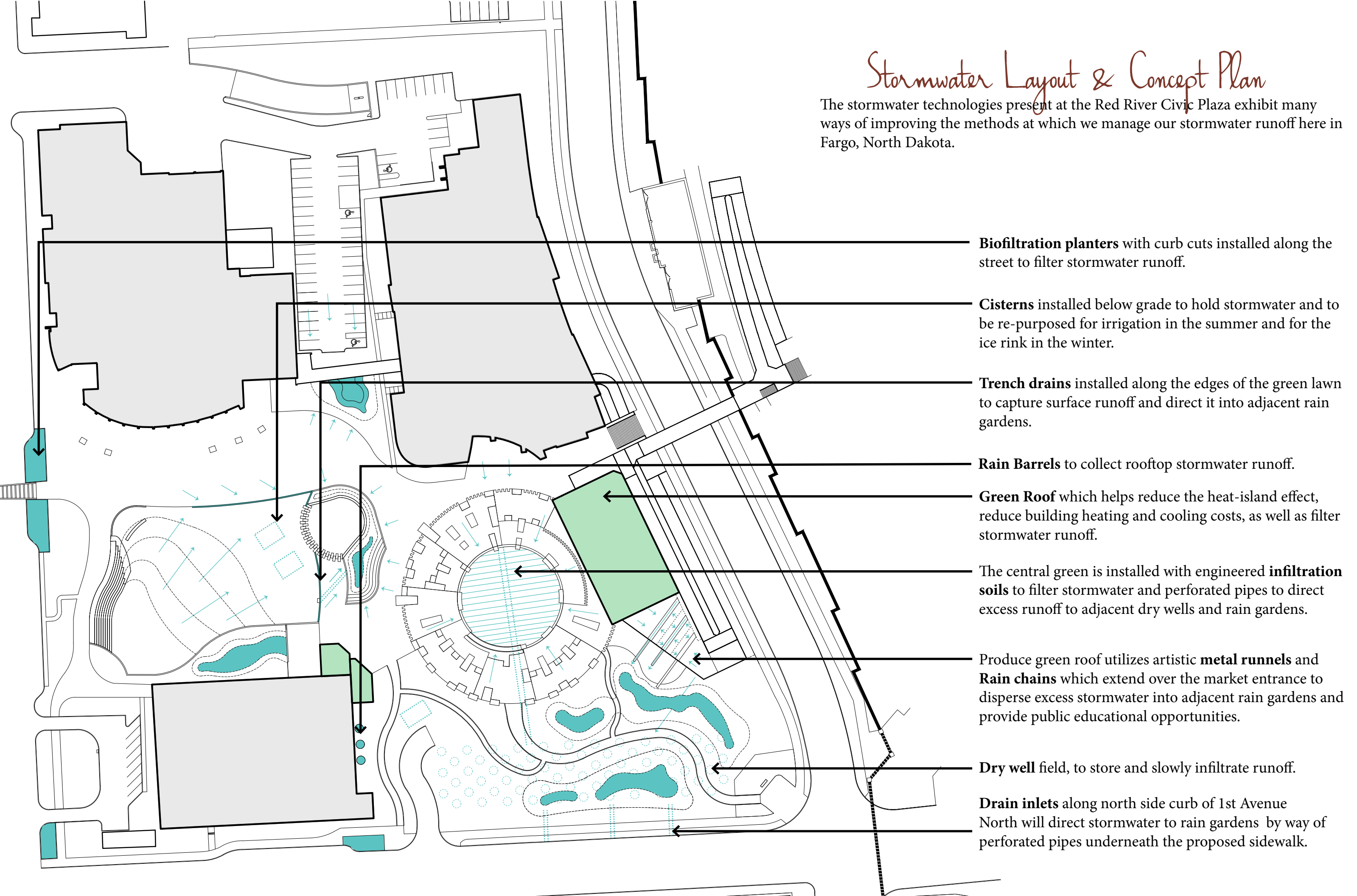


Concert at the Civic Green



Stormwater Layout & Concept Plan

The stormwater technologies present at the Red River Civic Plaza exhibit many ways of improving the methods at which we manage our stormwater runoff here in Fargo, North Dakota.



Biofiltration planters with curb cuts installed along the street to filter stormwater runoff.

Cisterns installed below grade to hold stormwater and to be re-purposed for irrigation in the summer and for the ice rink in the winter.

Trench drains installed along the edges of the green lawn to capture surface runoff and direct it into adjacent rain gardens.

Rain Barrels to collect rooftop stormwater runoff.

Green Roof which helps reduce the heat-island effect, reduce building heating and cooling costs, as well as filter stormwater runoff.

The central green is installed with engineered **infiltration soils** to filter stormwater and perforated pipes to direct excess runoff to adjacent dry wells and rain gardens.

Produce green roof utilizes artistic **metal runnels** and **Rain chains** which extend over the market entrance to disperse excess stormwater into adjacent rain gardens and provide public educational opportunities.

Dry well field, to store and slowly infiltrate runoff.

Drain inlets along north side curb of 1st Avenue North will direct stormwater to rain gardens by way of perforated pipes underneath the proposed sidewalk.

Glass Canopy Directs Stormwater Into Planter



Runnels and Rain Chains
Create an Educational Entrance



Rain Barrels Capture Library Runoff



Welcome to the
Red River Civic Plaza

Red River Civic Plaza Cafe



Late Evening Ambiance



CITY OF FARGO

Fargo, North Dakota
Red River
Civic Plaza

Conclusion

The Red River Civic Plaza can serve as a year-round destination for the entire Fargo-Moorhead community. The benefits which this well-developed community park will have for the people of Fargo-Moorhead, would drastically enhance our image and sense of community. This thesis displays the importance of managing stormwater, and how a successful park can also serve as infrastructure to manage some of our region's heaviest rainfalls. Improved stormwater management can serve as a model for future development in the Red River Valley and when applied on a large scale can assist in mitigating some of the region's flooding issues.

“Think Globally, Act Locally”

The Red River Civic Plaza will help strengthen our Fargo-Moorhead community and give our region an outdoor venue to display that strong culture which makes our community unique from every other on earth. By taking note of similar, successful urban public spaces across the world - we can learn what benefits the Red River Civic Plaza can provide, and how it can make Fargo-Moorhead an even better place to call home.

Personal Information

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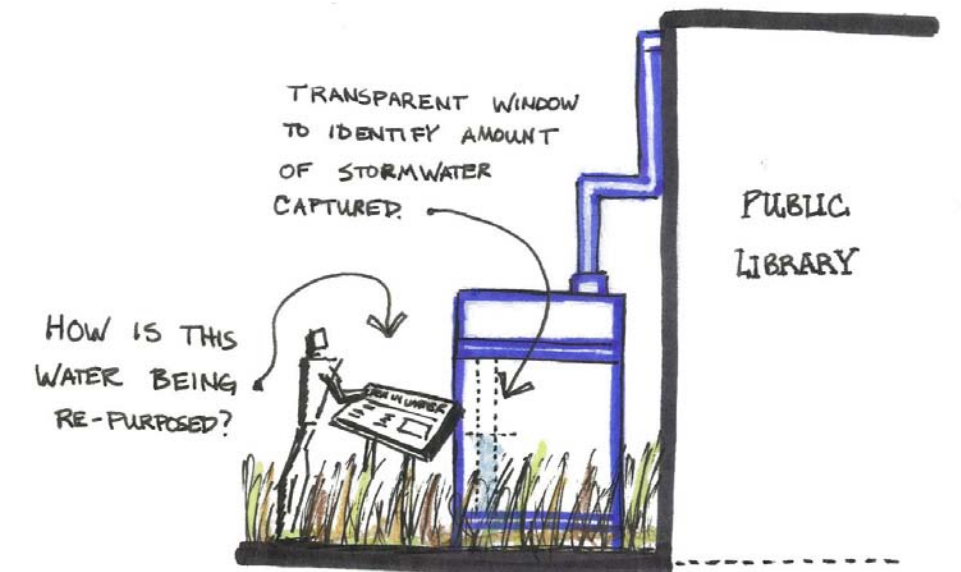
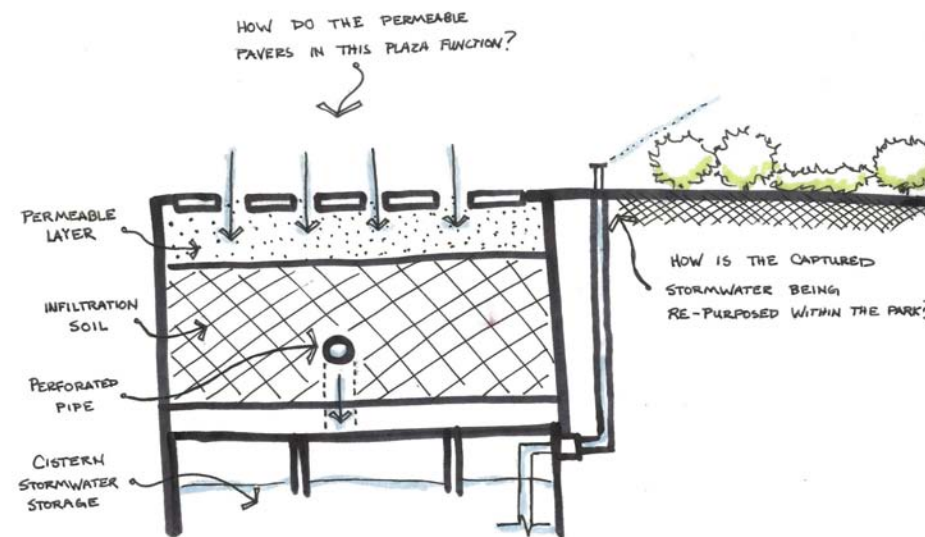
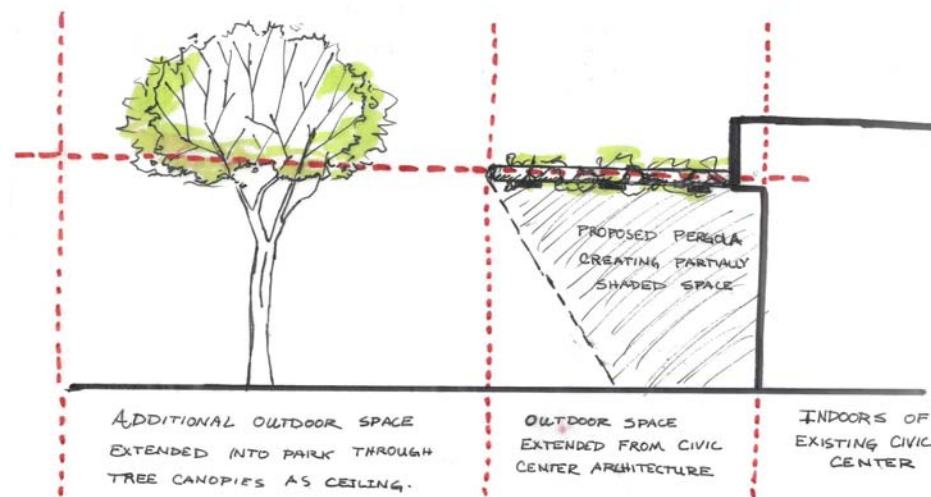
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OTHER INTERESTS: TRAVELING,
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"Everyone can rise above their circumstances and achieve success if they are dedicated to and passionate about what they do."
- Nelson Mandela



Annotative Bibliography

AECOM. *Civic Space Park brings new urban typology to Phoenix*. September 15th, 2014. <http://www.aecom.com/What+We+Do/Design+and+Planning/stories/In+Phoenix>

This webpage provides an overview and analysis of the Civic Space Park that AECOM designed for the City of Phoenix, AZ. This project provides a vast assortment of programmatic elements that serve the civic space, these include: LED animations, water features, public art, and sustainable site design.

American Planning Association. *How Cities Use Parks for Green Infrastructure*. 2003.

Referencing seven different cities as case studies, this short publication identifies how green infrastructure can be implemented as a part of every city park. These parks would begin to shape urban form and help reduce public costs for stormwater management, flood control, transportation and other forms of built infrastructure.

American Rivers, Water Environment Federation, American Society of Landscape Architects, & ECOnorth. *Banking on Green: A Look at How Green Infrastructure Can Save Municipalities Money and Provide Economic Benefits*. 2012.

In this joint report the authors look at how green infrastructure can save municipalities money and provide economic benefits. The publication identifies solutions using green infrastructure to reduce total energy costs. It also touches on how these approaches can reduce flooding damage and costs. Lastly, the report notes approaches to protect public and environmental health.

April Phillips Design Works. *Union Square*. September 4, 2014. <http://www.apdw.com/portfolio/urban/union-square/>.

This website provides very basic design information on Union Square in San Francisco. The webpage includes some basic images, which provides quality inspiration.

Burgess, Erik. *Fargo Officials want New City Hall*. June 19, 2013. <http://www.prairiebizmag.com/event/article/id/15002/>.

This Prairie Business newspaper article discusses the original need for the new Fargo City Hall. This includes statements such as, "city hall, built in the 1960s, has serious infrastructure problems and has lost its usefulness".

This article includes quotes from various high profile individuals working for the City of Fargo.

City of Fargo. *Fargo City Hall Project*. September 4, 2014. <https://www.facebook.com/FargoCityHallProject>.

This is a Facebook page that was created for the Fargo City Hall Project. It is continuously being updated with new photographs/renderings, as well as some brief information. Some community members have also commented on some of these posts, providing their own feedback on the project.

Groenblauw, *Atelier Themes*. August 30, 2014. <http://www.urbangreenbluegrids.com/social/#ref-2>.

This website hosts a large amount of information on green infrastructure technologies, including some good graphics. The site also includes thorough stormwater management case studies from across the world. This site includes "Design Tools" which lay out different methods of managing stormwater. This is an extremely beneficial resource.

Haney, Don. *New Fargo City Hall design plans nearing completion; project on schedule*. June 25, 2014. <http://kfgo.com/news/articles/2014/jun/25/new-fargo-city-hall-design-plans-nearing-completion-project-on-schedule/>.

This article from the summer of 2014 provides a more recent cost estimate for the project. \$18 to \$22 million, and mentions an estimated guess to begin construction in the spring of 2015.

Landphair, Harlow. *Landscape Architecture Construction: Knowledge and Skills for the Entry Level Professional 4th Edition*. Unpublished manuscript accessed October, 2014.

Chapter one in this book is titled, Introduction to Stormwater Management, and it provides a thorough basis for understanding the science behind stormwater management. The chapter includes information regarding why stormwater management is important to cities, low impact development principles and practices, to hydrology and calculations.

Landscape Voice. *Simon and Helen Director Park*. December, 13, 2012. <http://landscapevoice.com/simon-and-helen-director-park/>

This blog entry includes a number of high quality photographs of Director Park during the month of December. It proves that the site is used during the winter months, though the number of visitors is significantly less than the summer months. Essentially this blog entry is a good resource for further project photographs.

Law, Steven. "Green Streets: Function or Frill?" *Portland Tribune*. February 27, 2014. <http://portlandtribune.com/pt/9-news/212312-70086-green-streets-function-or-frill>.

Extremely interesting article on the cost of grey infrastructure + the cost of implementing green infrastructure in the City of Portland, Oregon. There are excerpts in this article from city officials from the City of Portland as well as the city of Philadelphia. This article provides a large amount of quotes and specific numbers for costs and savings.

Loomands, Taz. *21 Reasons Portland's Director Park is One of the Most Successful Public Spaces in the World*. July 1, 2014. <http://sustainablecitiescollective.com/bloomingrock/266006/21-reasons-portland-s-director-park-one-most-successful-public-spacesworld>.

This blog entry entails a highly detailed critique on Director Park, and what makes it a successful urban space.

This article holds credibility due to the fact that it has been analyzed and written by a licensed architect. It analyzes such aspects as: accessibility, seating, walkability, context, defined space and more. This provided a positive peer review for the case study that I am building for Director Park.

Manzini, Andrew O. *Green Infrastructure 7: Best Practices for Landscape*. Red Vector, 2013.

This is a very in depth and thorough assessment of the best management practices for landscape green infrastructure. This report lists the benefits, limitations, integration techniques, design, construction and maintenance responsibilities for each green infrastructure system.

National Public Radio. On The Plains, *The Rush For Oil Has Changed Everything*. January 29, 2014. <http://www.npr.org/2014/01/29/264912750/on-the-plains-an-oil-boom-is-transforming-nearly-everything>.

This National Public Radio article and radio bit discusses the economy boom in the State of North Dakota due to the oil fracking in the western side of the state.

National Research Council. *Urban Stormwater Management in the United States*. Washington D.C.: The National Academies Press. 2008.

A textbook which discusses the challenges regulating stormwater, and integrating them into our urban cities. It includes a large number of facts and citations from important researchers in the field of stormwater management such as the EPA. The book discusses innovative strategies to managing stormwater, and what we need to do moving forward to yield healthier watersheds in the United States.

NDSU Archives. *City Hall*. September 4, 2014. <http://library.ndsu.edu/fargo-history/?q=content/city-hall>.

This webpage from the NDSU Library Archives provides a very brief history of the Fargo City Halls. It includes a few historic photographs of these buildings as well.

National Wildlife Federation. *Red River of the North*. December 1, 2014. <http://www.nwf.org/wildlife/wild-places/red-river-of-the-north.aspx>.

This website gives a brief overview of the Red River, its history, culture, opportunities, threats and solutions.

Portland Parks and Recreation. *Director Park Commonly Asked Questions*. Accessed October 7, 2014. <https://www.portlandoregon.gov/parks/article/340907>

This publication provides particularly detailed responses to questions related to the design and function of Director Park. The source contains specific information regarding the park's stormwater management strategies. The publication proved helpful for developing a case study of Director Park.

Annotative Bibliography

Soil Science Society of America. *Grey Infrastructure*. August 31, 2014. <https://www.soils.org/discover-soils/soils-in-the-city/greeninfrastructure/important-terms/grey-infrastructure>.

This article discusses grey infrastructure, the costs and issues associated with it as well as what the City of Portland is doing to implement green infrastructure.

Thoren, Roxi; Louw, Andrew. *Simon and Helen Director Park Methodology for Landscape Performance Benefits*. September 9th, 2013. <https://lafoundation.org/myos/my-uploads/2013/09/09/director-park-methodology.pdf>

This methodology for landscape performance benefits produced by a research fellow and research assistant at the University of Oregon includes specific details related to Director Park's successes, and limitations.

Throwe, Joanne. *Help for Aging, Neglected Infrastructure*. January 2013. <http://cenews.com/article/9154/help-for-aging-neglectedinfrastructure>.

This article is geared towards civil engineers discussing how we neglect and don't take good care of our grey infrastructure until an emergency occurs and we need to replace it. The article briefly touches on the benefits that green infrastructure can provide when implemented when replacing grey infrastructure.

U.S. Environmental Protection Agency. *Reducing Urban Heat Islands: Compendium of Strategies*. Draft, accessed 10/19/2014. <http://www.epa.gov/heatland/resources/pdf/CoolRoofsCompendium.pdf>.

This publication contains an in depth view at cool roofs. It details the types of cool roofs, their benefits and costs, as well as other factors to consider when proposing cool roofs. Benefits include, reduced energy use, reduced air pollution, and improved human health and comfort.

U.S. Environmental Protection Agency. *Water: After the Storm - Weather*. January 2003. <http://water.epa.gov/action/weatherchannel/stormwater.cfm>

This short publication provides the basic information regarding why stormwater runoff is a problem, as well as the pollution it typically transports into our waterbodies. The publication also provides stormwater pollution solutions which helps inform the public on how they can reduce their impact on our water resources.

U.S. Environmental Protection Agency. *Clean Water Needs Survey 2008 Report to Congress*. U.S Environmental Protection Agency Office of Water Management. January 6, 2012. <http://water.epa.gov/scitech/datait/databases/cwns/2008reportdata.cfm>.

This is the EPA's 15th national survey regarding the water quality and the effects on public health. It includes research and estimates on the cost of improving the water quality in the United States.

Vogel, Mary. *Moving Toward High Performance Infrastructure*. Washington D.C.: Urban Land, 2006.

This Urban Land Report generally discusses the move towards implementing green infrastructure in our cities by following several case studies from Alexandria Virginia, Portland Oregon, and Seattle Washington. The report provides data supporting the implementation of green infrastructure.

Welbes, John. *North Dakota oil boom rippling through Minnesota*. May 7th, 2013. http://www.twincities.com/ci_23192483/minneapolis-fed-sees-wage-growth-rippling-from-north.

This article provides basic information about the North Dakota oil boom, and how the economic benefits are reaching far across the state and into Fargo, ND and the State of Minnesota.

ZGF Architects. *Portland, Oregon's Simon & Helen Director Park*. May 17th, 2011. <http://www.archinnovations.com/featuredprojects/landscape/zgf-architects-portland-oregon-simon-a-helen-director-park/>

This website provides a good overview of the Director Park project from the perspective of ZGF Architects. The source includes details and photographs of the design process, and the constructed product.