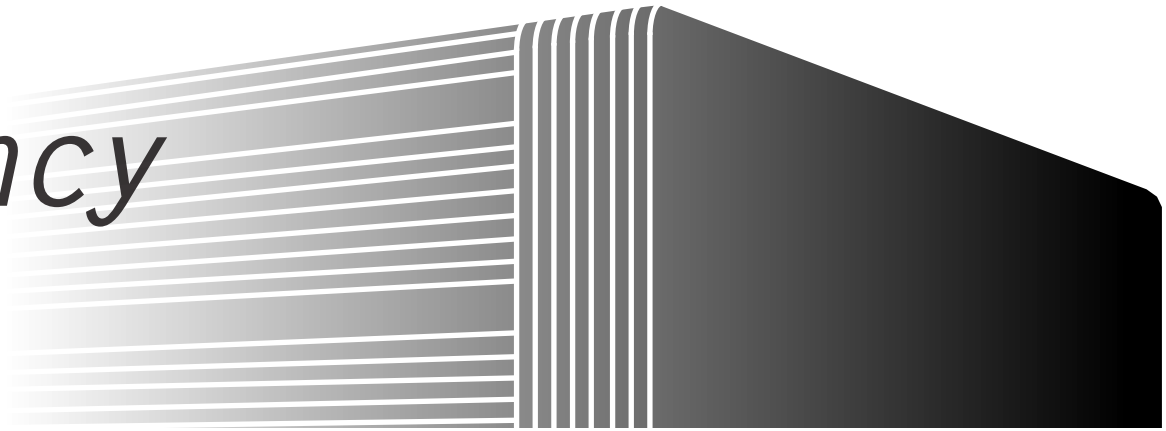
industrial transparency

Bridging environments through
recognition of industrial process

Kristine Wentworth



industrial transparency

A design thesis submitted to the Department of Architecture and Landscape Architecture of North Dakota State University

by

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in partial fulfillment of the requirement for the degree of Master of Architecture

Primary Thesis Advisor

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abstract

Industrial buildings are all too often forgotten in the world of design and urban planning. Pockets of industry buildings break up well design urban neighborhoods with their large, monolithic walls, usually set back from street faces behind huge parking lots. The buildings themselves serve only their industrial, manufacturing, or warehousing functions with the biggest priority being budget, rather than serving the people who work inside of them. This thesis explores solutions to these problems. Through research and design prototypes for an industrial site in St. Paul, Minnesota, new ideas are generated to promote a more sustainable solution to industrial buildings and their integration into an urban setting.

The project design will have a focus on the idea of "transparency." This is more than just the inclusion of glazing systems within the building. The existing industrial buildings create a large separation between what goes on within and the world outside, and there is a divide between industrial workers and the workers who inhabit the beautiful modern and contemporary glass towers only a few miles away. Industrial workers are undervalued within our communities, and isolated from the perks their downtown counterparts have. Creating a "transparent" industrial building will help celebrate industry and help to bridge the gap between these groups.

The research behind this thesis project is conducted through a hybrid of three research methods: descriptive research, evaluative research, and design research. The descriptive and evaluative research are primarily done in the predesign phase, through beginning with research into what is meant by sustainable urban design, and ways it can be implemented within existing neighborhoods. This is followed by information on industrial buildings and on public transit within the chosen site. The design research portion helps explore different ways the structure, spaces, materials, and circulation can aid in the success of providing a "transparent" industrial building.

narrative

Ever since the industrial revolution, manufacturing has played a pivotal role in the developmental progress of almost every facet of life in the modern world. The products that result from the manufacturing of raw goods provide us with everything from the roofs over our heads to the toothbrushes we hold every morning. However, these buildings traditionally are one story, spread out on massive, several-thousand square foot plots. Their construction is typically made from concrete or metal, mass-produced and put together by contractors. While this is relatively inexpensive initially, they are inefficient to heat, generally do not stand up to aging, and take up valuable land within established cities. Most importantly, these buildings create poor working environments for the industrial workers, while the businessmen and women just a few miles away work in beautiful office buildings with wonderful views.

typology

This project is twofold. The first part is a vertical manufacturing and warehouse facility. It will incorporate sustainable materials that enhance, rather than decimate, the aesthetics of the neighborhood, replacing the standard single story buildings.

The second portion of this project involves the urban design and planning of the entire block and block face around the site of this updated industrial buildings. This will be largely driven by sustainable urban design principles, which will be covered in the next section of this report.

project emphasis

The industrial building and site will not only serve the workers within, but will help to increase a sense of transparency between the work being done inside and the world outside. The architecture will serve as a tool for understanding and celebrating the processes of industry or manufacturing. This will translate into both the use of glazing (a physical transparency) and in the way the architecture translates the inner workings into the building structure or skin.

goals

The first goal of the project is to create a design that could be used for a multitude of different types of industry or manufacturing. This field has changed radically in the last century, and will continue to do so. Thus, the building must be strong and flexible to withstand change.

The second goal is to "green up" the neighborhood. Industrial areas of cities all over the country lack green space, and as a result, a welcoming sense of place. By rearranging the program of these buildings into a vertical form, the site opens to allow for these green spaces and positive interactions within the surrounding community.

The final and more elusive goal of the project is to capture and celebrate the spirit of the working class. Industry workers provide services that are often under-appreciated in today's society. This spirit is described as having a "can-do," "everyone-pitching-in-to-help" attitude, more apparent in people who work on a physical task with one another. Especially in the manufacturing field, many hands are utilized to reach the final product. It is more about the collective whole rather than the individual. This

mentality makes industry workers unique, and should be celebrated within their place of work.

audience and users

The audience for this project is most importantly the industrial workers themselves. They are the primary beneficiaries of this newly designed building and site, as they are the ones that will be using it the most. However, since the emphasis of the design is transparency, the secondary audience is everyone in the surrounding neighborhood. The building and site should serve as a bridge between functionality and fun.

As a result of the project, other industrial developers and owners may discover the value in a well-designed, and wish to implement them into their future projects. This project can serve as an example of what could be.

project justification

Industrial workers, and people of the working class in general, are all too often disregarded when it comes to good design. Their wants and needs for their workplaces come second to a budget. However, the work that they do affects us in more ways that we realize. This project will serve as a way to celebrate these individuals and the work they do. The new design will also provide a place for industry to morph into its next generation.

This project will act as a effective display of the skills and knowledge I have acquired over the years in school and in working in the field of architecture. It pairs an elevated display of predesign (research and analysis) with a design that includes attention to materiality, code, structure, and circulation.

research methodology

The method in which this project is researched is actually a hybrid of three research methodologies listed in Landscape Architecture Research: descriptive research, evaluative research, and design research. The first two will each bring something different out of the research I have gathered. The last will help me explore form, structure, and the arrangement of spaces within and their relationship with the typology and project emphasis. These are all explained in more detail within the Plan section of this book.

documentation

The project process will be documented within weekly submittal for my thesis advisor meetings and group discussions. Each week, I will set a goal for myself to stay on schedule and in order to get the most from the feedback from my advisor and peers.

project schedule spring 2017

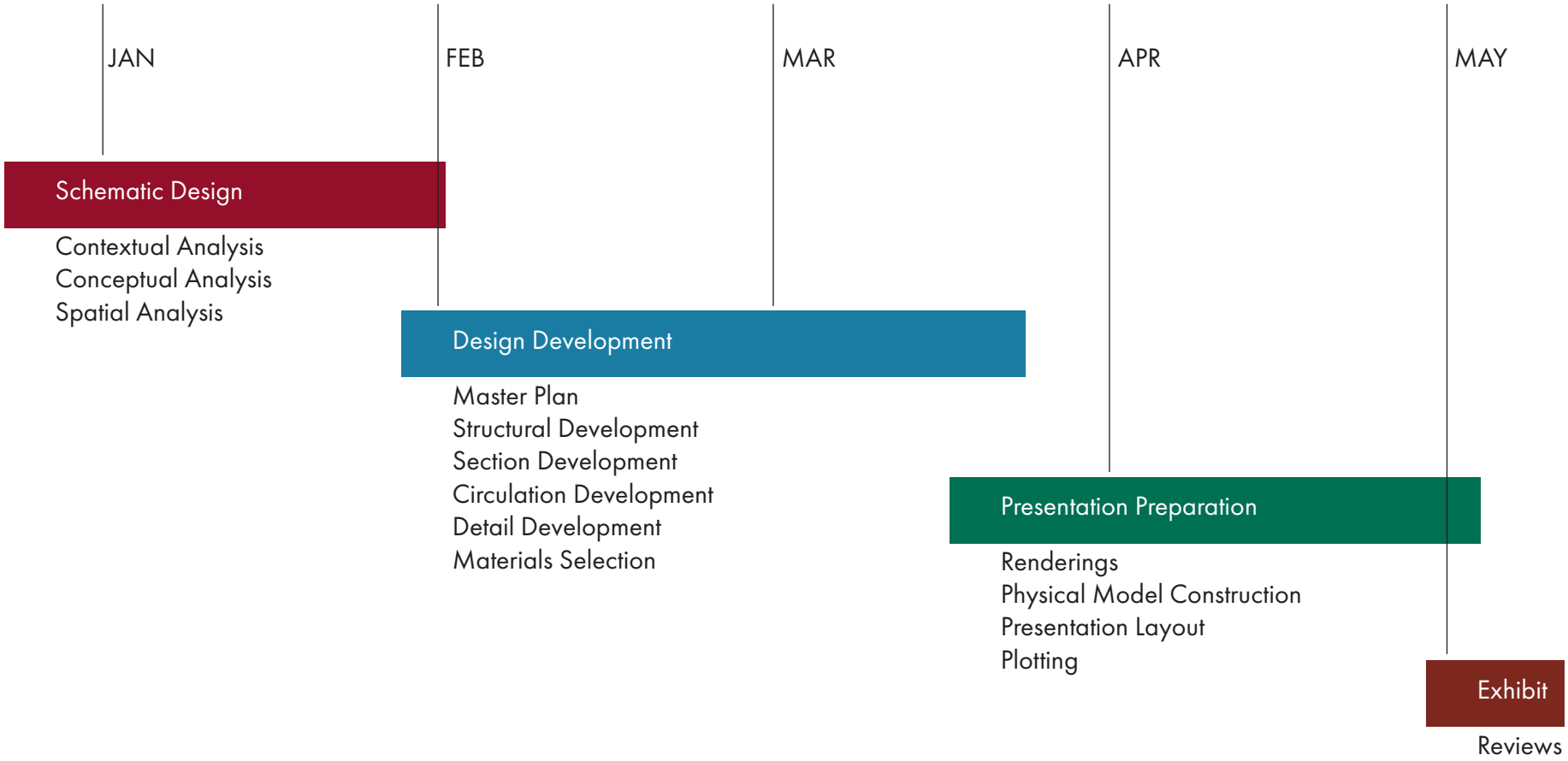


Figure 1

research

Downtown regions of cities within the United States are generally great at maintaining density while providing areas for shopping, eating, working, and for recreation. However, this compact, high-rise style of development begins to diminish outside of the immediate downtown areas. The buildings are set back from streets with large parking lots in the front, and they take up larger footprints while remaining relatively low-rise. A good portion of these are industrial buildings, manufacturing buildings, and warehouses, usually made of concrete and metal panel siding construction. The combination of poor urban planning and this building typology creates dead zones within cities, often cutting off neighborhoods from one another and diminishing any sense of community around them.

Given that successful and sustainable urban planning incorporates mixed-use neighborhoods and access to transportation, reimagining the integration of manufacturing and other industrial processes into an urban environment will lead to positive diversification and stimulation within their neighborhoods. Because of the modernization of these processes and the trend toward sustainability in all fields, redesigning industrial buildings and redeveloping their immediate neighborhoods can be mutually beneficial for the residents, workers, and commuters in the area.

sustainable urban design

Sustainability is more than just a buzzword in the fields of architecture and urban design. According to EnvironmentalScience.org, sustainability "attempts to bridge social science with civic engineering and environmental science with the technology of the future," (Mason, n.d.). It has been a necessity since the United States became aware of environmental problems in the 1960's, as Thomas L. Daniels writes in *A Trail Across Time: American Environmental Planning From City Beautiful to Sustainability*. Sustainable urban planning involves: "... ecological planning, low-impact site design, Leadership in Energy and Environmental Design (LEED)– certified buildings and neighborhoods, public health and settlement patterns, hazard mitigation and disaster planning, conserving water supplies and protecting water quality, alternative energy systems, biodiversity, access to green space, promoting green jobs, environmental justice, multimodal transportation, and, of course, climate change."
(Daniels, 2009).

It is the hybrid of all of these facets that creates a successful urban space. The practice of only a few of these topics does not address the needs of others. Many disciplines must work together in order to retrofit our existing planning system. While many urban designers and analysts have provided a plethora of suggestions and strategies for to achieve sustainable urban design, Patrick M. Condon breaks down these strategies in his book, *Seven Rules for Sustainable Communities*. They are as follows:

1. Restore the streetcar city.
2. Design an interconnected street system.
3. Locate commercial services, frequent transit, and schools within a five-minute walk.
4. Locate good jobs close to affordable homes.
5. Provide a diversity of housing types.
6. Create a linked system of natural areas and parks.
7. Invest in lighter, greener, cheaper, and smarter infrastructure.

(Condon, 2010)

While a few of these are more applicable on a large, citywide planning scale, these strategies can be exercised on smaller dead zones within them. The first of these is the idea of the "streetcar city." Condon describes these as "characterized by easy access to transit, a wide variety of house types, and services and job sites very close at hand," (Condon, 2010). The project site already has the foundation for exciting development with its access to the Green Line light rail and nearby bus stops. Strategy 3 in Condon's list is also appropriate on this site. Small-scale commercial buildings can be found existing around the site, however, due to the large block of industry and manufacturing across the street, they become very untraversed. Redeveloping the streetscape around these areas will help link these shops to the pedestrians using the transit system. Lastly, the sixth item on this list will be very important to the redevelopment of the area. The most striking aspect of heavier industrial areas is their lack of greenery. Sometimes, the only plants on site are the blades of grass poking through the cracks in the parking lot. To make these industrial areas more user friendly, parks and other green space must be introduced. This, coupled with the surrounding mixed-use typologies, will also help attract more pedestrians to enjoy the site at different times (Jacobs, 1992).

In his book *EcoCities: Rebuilding Cities in Balance with Nature*, Richard Register imagines the future of such areas. He writes, "Tall buildings around public spaces will be spectacular expressions of confidence in the future and a new faith in human creativity guided by responsibility. ... A dynamic and healthy balance with nature and between past and future opens the door to infinite explorations in art, design, and science as well as to more authentic human relationships," (Register, 2006). Sustainability presents opportunities for creative solutions to better serve our cities and the people who live, work, and play within.

industry buildings of the past and future

Ever since the industrial revolution, the imagery associated with heavy industry is hardly positive. The industrial revolution, while a symbol of the rapid development during twentieth century in the United States, also serves as a symbol of environmental tragedy, with poor waste management and toxic fumes billowing toward the sky (Grant, 2000). However, a lot has changed over the last one hundred years. We are more conscious than ever about the harmful effects of pollution, and the public is caring more and more about where their products

"... ecological planning, low-impact site design, Leadership in Energy and Environmental Design (LEED)– certified buildings and neighborhoods, public health and settlement patterns, hazard mitigation and disaster planning, conserving water supplies and protecting water quality, alternative energy systems, biodiversity, access to green space, promoting green jobs, environmental justice, multimodal transportation, and, of course, climate change."

(Daniels, 2009)

come from. Sustainable manufacturing is on the rise, and with advancements in technology, the manufacturing and industrial processes are becoming more efficient and less wasteful. This, and a willingness for better design provides an opportunity for changing the associations of over one hundred years ago.

On the outskirts of any developed downtown area, pockets of industry and manufacturing create eyesores along the street face. This is because industrial buildings of the last half century have been nearly windowless, and made out of concrete block, precast double T's, or metal panels. They are relatively fast to assemble and are cheaper to build. While that may be true, dedication to good design is one of the most important aspects of sustainability. When improvements are made to the aesthetics of an area, it improves the quality of life for the users of that space. For these industrial buildings, a newer, more interesting and beautiful design could do this, all while still being available to be retrofitted with the technologies of the buildings' future needs. A focus on good design will aid in the lifespan of these buildings.

One major design challenge within industrial and manufacturing buildings is the need for warehouse space. Many manufacturing companies require a lot of extra square footage for the storage of raw materials and finished goods to be shipped. When considering the design of a new space for a sustainable manufacturing plant, we must think "up" rather than "out." In traditional industrial parks, there are large, single level warehouses with shelves of goods stacked up high. Forklifts must reach way up in the air to remove and store items. In an urban space, these warehouses would take on a vertical approach, being multiple levels with large lifts to bring goods around the plant. Many mills and other processing plants have taken an approach similar to this in the past, but the logic can be applied to many different kinds of industry.

These taller industrial buildings will require more attention to be integrated at the street level. In his book *City Comforts*, author David Sucher provides tips on doing just this with existing older buildings. The cohesion of a new building into an existing neighborhood is achieved by picking up on similar details, materials, forms, and scale. It is imperative to use the existing aesthetic as a guideline for new design, however, there is a time and place to break those guidelines as well (Sucher, 2003). Failing to find the balance can create an awkward, cold, and sometimes just awful space.

business and pleasure for st. paul

Before the Green Line's construction began in 2010, many were worried about the development around it ("Metropolitan Council - Project Facts," n.d.). Heather Beal of Architecture Minnesota wrote, "Preserving authenticity and diversity will be a major challenge as transit-oriented development and urban revitalization plans proceed," (Beal, 2007). Historically, St. Paul has struggled with urban development, due to a strict adherence to old city plans. Adam Regn Arvidson, also of Architecture Minnesota, explains that "Minneapolis is willing on a project by project basis to modify, update, or ignore its plans; St. Paul is not," (Arvidson, 2007). Since the Green Line completion in 2014, new apartment complexes and other buildings have popped up along University Avenue. However, many of the areas on either side still lack density and aesthetic value. The next step for these neighborhoods, including the project site, is to reap the benefits of the new transit system, increase and maintain density, and create a sense of place.

A sense of place is very important for the success of neighborhoods, and is a huge part of why current industrial blocks are unsuccessful. This can be described as the comforting feeling a space conveys, and the reason some areas are more enjoyable to be in and walk through. However, without the attention to the pedestrian experience, scale, and greenery, as many industrial areas lack, people simply will not gather and enjoy a space. Revisiting these basic site components will drastically improve the sense of place, and as a result, the neighborhood in which the industrial, commercial, and residential areas collide.

While many people have preferences as to city versus suburban living, urban living definitely has its perks. For the workers who may relocate to this denser area for work, they would see an increase in access to many walkable small businesses. Their proximity to public transportation, restaurants, and shopping creates a much more pleasurable environment and convenience. Now, even industry workers can enjoy the after-work happy hours or pick up some groceries without hopping in their cars and driving a few miles this way or that, just like the office workers in downtown areas.

The manufacturing businesses themselves can reap the benefits of closer proximity to all forms of transportation. For the chosen site, this includes light rail, freight train, the airport, the

Mississippi River, and two interstate highways. This aids in reducing the cost of transport, especially when the products directly serve the urban population. According to sustainable development expert Herbert Girardet, aspects of sustainable business practice include access to a variety of transport and close access to their markets (Girardet, 2004). With a site so close to the downtown areas of Minneapolis and St. Paul, it is very feasible that many products coming out of the manufacturing areas will be consumed locally.

If sustainable industrial and manufacturing processes become a city's priority, city planners can take steps within the redevelopment of these already developed industrial zones. Depending on the type of processes happening within them, businesses can share one another's resources, byproducts, or wastes in order to create more symbiotic relationships between them. In a sense, the blocks would act as industrial "ecosystems," relying less on the goods and services of those far away and more on each other (Grant, 2000). This reduces transportation costs for the companies, and less transportation means less harm to the environment.

looking forward

Sustainable urban design and development will become increasingly important in the years to come. The principles and strategies that encompass it can be applied from the initial planning of an area to a specific site. This being said, it is time for us to draw more attention to the often forgotten and overlooked industrial areas. The design project will not only demonstrate how industry and manufacturing can be a focal point of a redeveloping urban space, but how increasing its aesthetic value can serve as a catalyst for further growth within the neighborhood. As designers, we can celebrate industry and its role in the development of the United States, and encourage the progression of sustainable practices within its many facets.

annotated bibliography

Arvidson, A. R. (2007). A river runs through them [Twin Cities, Minn.]. Architecture Minnesota, 33(4), 34.

The Twin Cities of Minnesota are not much like twins at all. But why are they so different? Author Adam Regn Arvidson discusses the historical, physical, and policy driven aspects that make these cities very unique from one another. Minneapolis is much more of a river-focused city. Its development since its genesis was all surrounded around the river. In contrast, St. Paul was built on the bluff, overlooking the river. This difference alone led to a divide. Minneapolis's master plan has been updated, and often ignored, throughout the city's development, whereas St. Paul's was not. Thus, St. Paul is full of shorter, more traditional-looking buildings and lush parks.

Beal, H. (2007). Building blocks [St. Paul, Minn.]. Architecture Minnesota, 33(4), 48.

Heather Beal of Architecture Minnesota discusses the development of the new transit system in the Twin Cities and its possible effects on the surrounding areas. The businesses around the metro line will be vastly impacted by the new addition. She goes onto discuss elements found in livable communities. These must be implemented within the neighborhoods affected by the transit line. For residential areas that are near the new line, increasing density must be a priority while providing a smooth transition between the new and existing.

Condon, P. M. (2010). Seven rules for sustainable communities: design strategies for the post-carbon world. Washington [D.C.]: Island Press.

Climate change has made a major impact in the field of design. There has been a major response from the bad urban design habits that emerged from the twentieth century. Professor and urban design expert Patrick M. Condon breaks down the basic principles of urban redesign for the future into seven rules to be applied universally. Many of these are focused around small, walkable blocks, access to transit, and mixed-use development.

Daniels, T. L. (2009). A trail across time: American environmental planning from City Beautiful to sustainability. Journal of the American Planning Association, 75(2), 178–192.

This academic journal takes a historical approach to the development of urban design principles. Since the nineteenth century, urban planners have tried to figure out the best way to organize and run their cities. Thomas L. Daniels shares that the environment had played a role in this since the days of the industrial revolution.

Girardet, H. (2004). Cities People Planet: Liveable Cities for a Sustainable World. Chichester, West Sussex, England ; Hoboken, NJ: Wiley-Academy.

Author Herbert Girardet begins his book with an in depth historical analysis of the growth of cities around the world. He then moves into how the development of industry led to a decline in the environment, such with the discussion of suburban sprawl. The last portion of his book is dedicated to suggestions that urban planners should take in order to combat the issues of waste, sprawl, automobiles, water and food shortages, and energy in a sustainable manner.

Grant, J. (2000). Industrial ecology: planning a new type of industrial park. Journal of Architectural & Planning Research, 17(1), 64–81.

Irresponsible industry has left the environment in a state of crisis. Government regulations only increase the costs to make goods, it does not have an effect of how waste is disposed. As a response to this, industrial ecology has emerged. It proposes that businesses can run similarly to ecosystems, where resources and wastes can be recycled and reused by other nearby businesses. Author Jill Grant also sees potential within the manufacturing and industrial processes themselves. These methods can be applied to the planning of an eco-industrial park, where symbiosis can be achieved between those businesses.

Jacobs, J. (1992). The death and life of great American cities (Vintage Books ed. .). New York: Vintage Books.

annotated bibliography (cont.)

Jane Jacobs is commonly referred to as one of the first urban design experts. She begins her book, originally published in 1916, with illustrating the problems that are and may arise with the widespread use of the automobile. The rest of the book explains strategies for successful urban design, such as the importance of parks and green spaces, utilizing mixed-use neighborhoods, and walkable city blocks. Jacobs uses precedents to illustrate what is and has not worked as fast as urban redevelopment within the United States.

Maps. (2015, October 19). Retrieved October 7, 2016, from https://www.stpaul.gov/departments/planning-economic-development/maps-and-data/maps

This is the zoning map for St. Paul. It demonstrates that industry has been zoned away from the downtown areas, and act as large pockets separating residential and existing mixed used zones from one another. The light rail along University Avenue in St. Paul, Minnesota cuts through one of these large industrial patches. There are also areas along the light rail zoned for Traditional Neighborhoods, where guidelines are set to help ensure the streetscape remains pedestrian oriented.

Mason, M. (n.d.). What Is Sustainability and Why Is It Important? | EnvironmentalScience.org. Retrieved from http://www.environmentalscience.org/sustainability

This website is a jumping off point for those interested in seeking education about and careers within environmental design. Author Matthew Mason defines what sustainability is, where it started, and why it is vital to our futures. The three pillars of sustainability, economic development, social development, and environmental protection, serve as the general guidelines for sustainable practice. The focus is to balance our needs for economic progression with those of our health, safety, and environment. The knowledge and application of sustainability permeates many fields, including politics, science, design, agriculture, and health. The data used is extracted from federal and state agencies.

Metropolitan Council - Project Facts. (n.d.). Retrieved October 7, 2016, from https://metrocouncil.org/Transportation/Projects/Current-Projects/Central-Corridor/Project-Facts.aspx

The Metropolitan Council is an organization dedicated to protecting and enriching the lives of the citizens of Minneapolis and St. Paul's metropolitan areas. This portion of their website explains the process the Twin Cities took to build and complete the Green Line, connecting the downtown areas of Minneapolis and St. Paul. It also describes the measures that the organization took to protect the businesses affected by the rail's construction.

Register, R. (2006). EcoCities: rebuilding cities in balance with nature (Rev. ed. .). Gabriola, BC: New Society Publishers.

With most of the world's population now living in cities, urban designers must stop building these cities centered around cars. Author Richard Register introduces urban design from an ecology perspective, where eat part functions to better serve the whole. This means creating better access to sustainable transportation. Register then outlines a plan in which existing urban spaces can be feasibly transitioned into an EcoCity.

Sucher, D. (2003). City Comforts: How to Build an Urban Village (2nd ed., ed..). Seattle [Wash.]: City Comforts.

Author Sucher illustrated in his book the idea of an urban village. He argues that the devil is in the details, and it does not take much for a public urban space to be successful or for that space to fail. People gravitate toward smaller, intimate spaces. Spaces that speak to them, and where the human experience is put before the needs of cars.

precedents

Ever since the beginning of the industrial revolution, designers have worked to perfect the industrial processes themselves. For some, this included forgoing the human aspect of the design, which created poor working conditions for all. However, since then, many changes have been made to not only improve working conditions, but also to improve the overall design as well. These owners chose to invest in the wellbeing of their companies and their employees with these buildings.

On the following pages, examples of good industrial building design are examined to see what design decisions were made and their effects on the overall aesthetic, function, or public attitude about the building. By analyzing these precedents, I can observe and learn about the structure, circulation, plan, and materiality of modern and contemporary industrial facilities and incorporate or draw inspiration from them.

die gläserne manufaktur

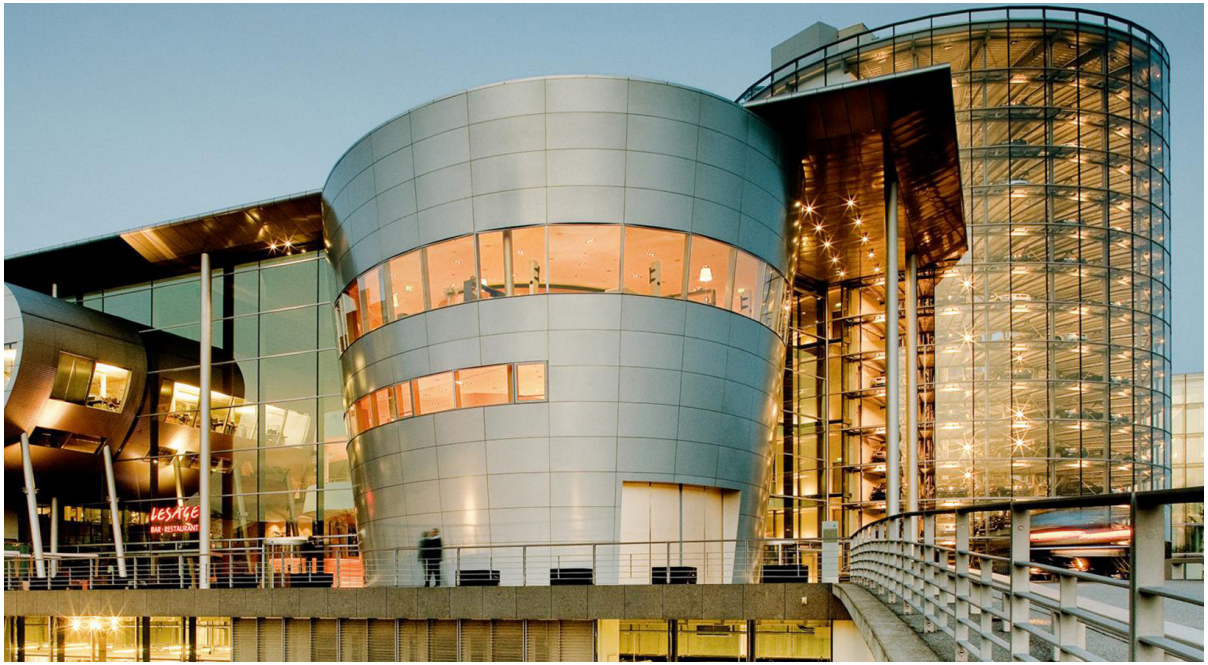
The Gläserne Manufaktur translates directly to "Transparent Factory," and describes the overall theme of the Volts Wagon complex. The philosophy behind the design is form follows flow, where the factory building becomes a mechanism of the processes within, rather than just a wrapping for them.

The heavily glazed facades show off the interior steel structure and put the assembly process on display. The structure and prefabricated panels throughout are tribute to the fabrication of the automobiles.

The factory transparency encourages car buyers and visitors alike to view the process and craftsmanship of the workers. It also provides plenty of public amenities such as a restaurant, bar, lounge, and multiple public performance spaces.

conclusions

This building celebrates rather than hides the fabrication processes and provides a link between those who produce and those who consume. By putting it on display, this building inspires civic pride for the community.



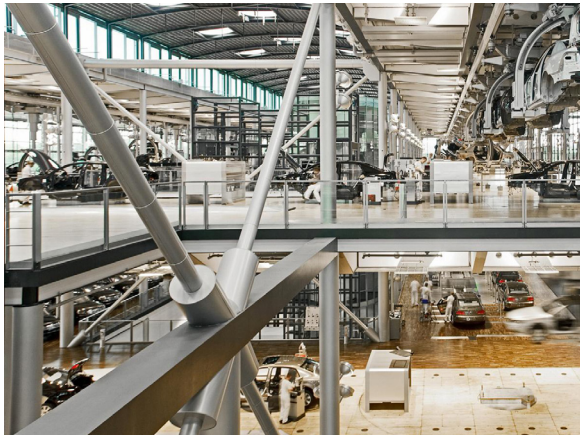


Figure 2 above, Figure 3 left

Project Facts:

Architect: Henn Architekten
Location: Dresden, Germany
Completed: 1999-2001

inotera

Inotera is a manufacturer of high-tech memory chips used to operate all computers, and is the largest producer of DRAM (dynamic random access memory). The complex in Taipei is divided into two large main masses, one dedicated to office use and research, the other for the company's production needs.

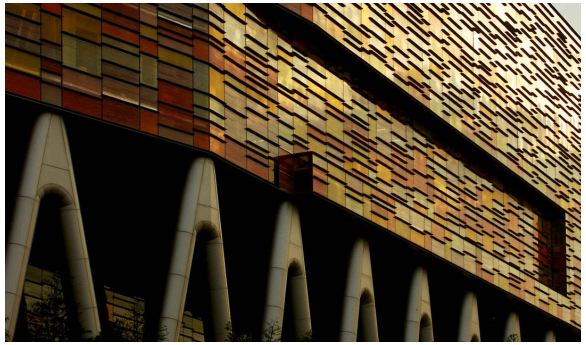
It features a dramatic aluminum wrapped zig-zag structure along the front facade, which helps with the earthquake requirements of the region. The coloring of the facades indicate different uses within the building. Green and red glass panels designate different office spaces, while the blue glass on the other portion indicates the production and fabrication areas. To help bring light into the large mass, three cones penetrate down into the building.

conclusions

The Inotera building demonstrates how both the structure and the interior programming can influence the design of an industry building. Visual cues help add transparency to the processes within.

Project Facts:

Architect: tecARCHITECTURE + Fei & Cheng
Location: Taipei, Taiwan
Completed: 2004



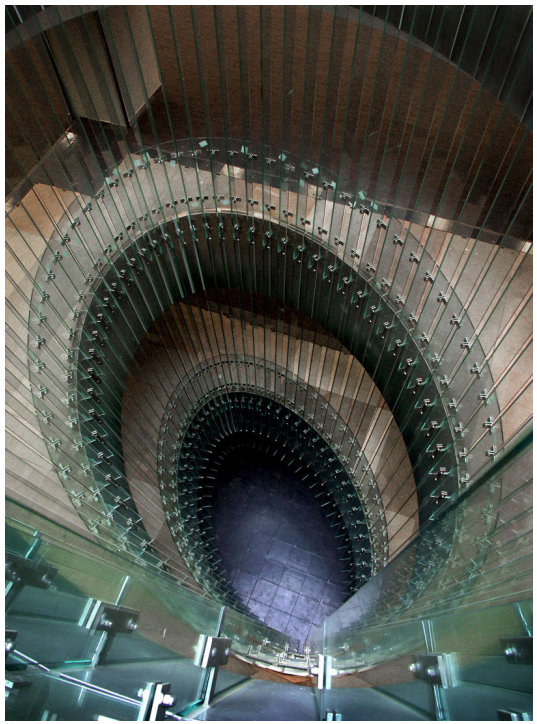


Figure 4 above left, Figure 5 below left, Figure 6 above

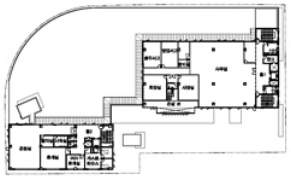
Figure 7 top, Figure 8 bottom, Figure 9 right

Project Facts:

Architect: Ongodong Architects
Location: Bucheon, South Korea
Completed: 2011

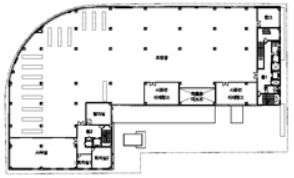
5th Floor

4th Floor

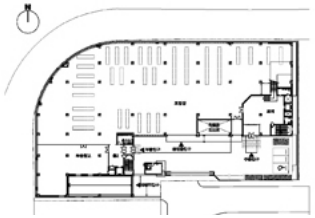


3rd Floor

2nd Floor



1st Floor



hoong-a corporation

Since 1970, the Hoong-A Corporation has produced computer-controlled machinery that fabricates cellular packaging machines for pharmaceutical, food, and health care products.

The focus of this project was oriented around the need for a variety of building uses and circulation that compliments those in an organized way. The underground level is devoted to warehousing the raw materials and for parking. The ground and second levels are for fabrication and assembly. A large lift allows the finished machines to be transported from floor to floor.

The remaining floors (3-5) are dedicated to offices, design spaces, meeting spaces, and recreation. Hoong-A provides its employees with many amenities that include a fitness center, locker rooms, cafeteria, and volleyball courts on site.

conclusions

The building layout provides a large emphasis on the employees, while streamlining the circulation and assembly processes.

programming

The general program for this typology is fairly straightforward. The main areas of an industrial or manufacturing building include warehousing space, manufacturing or assembly space, offices and administration, employee amenities, and most importantly, circulation.

Circulation plays the biggest role in the programming because of the industrial and manufacturing processes themselves. Raw materials or goods need to have a clear path from entering the site to the warehousing and manufacturing spaces, and the finished products need a clear path to the warehousing and off the site. The other aspect of circulation involves the people who use the building. This means centralized and flexible floor plans that can adapt to the needs of the users.

Since the design will be very worker-oriented, the spaces within need to be flexible and responsive to their needs. This means providing recreation spaces for them throughout the site, and perhaps with a green roof. This arrangement also allows for maximum views of the surrounding neighborhoods and skylines of both Minneapolis and St. Paul's downtown areas.

The manufacturing or assembly spaces and the warehouse spaces will be located on the lower floors of the building. This is to improve access and streamline the circulation of goods. Another thing to consider is the structural needs of these spaces. A lot of equipment needed for these tasks creates a large load, especially when it is not all at ground level. The building will need to support the weight of these tasks. Putting the administration and amenity spaces on top will allow for a lightening of the structure.

program diagram

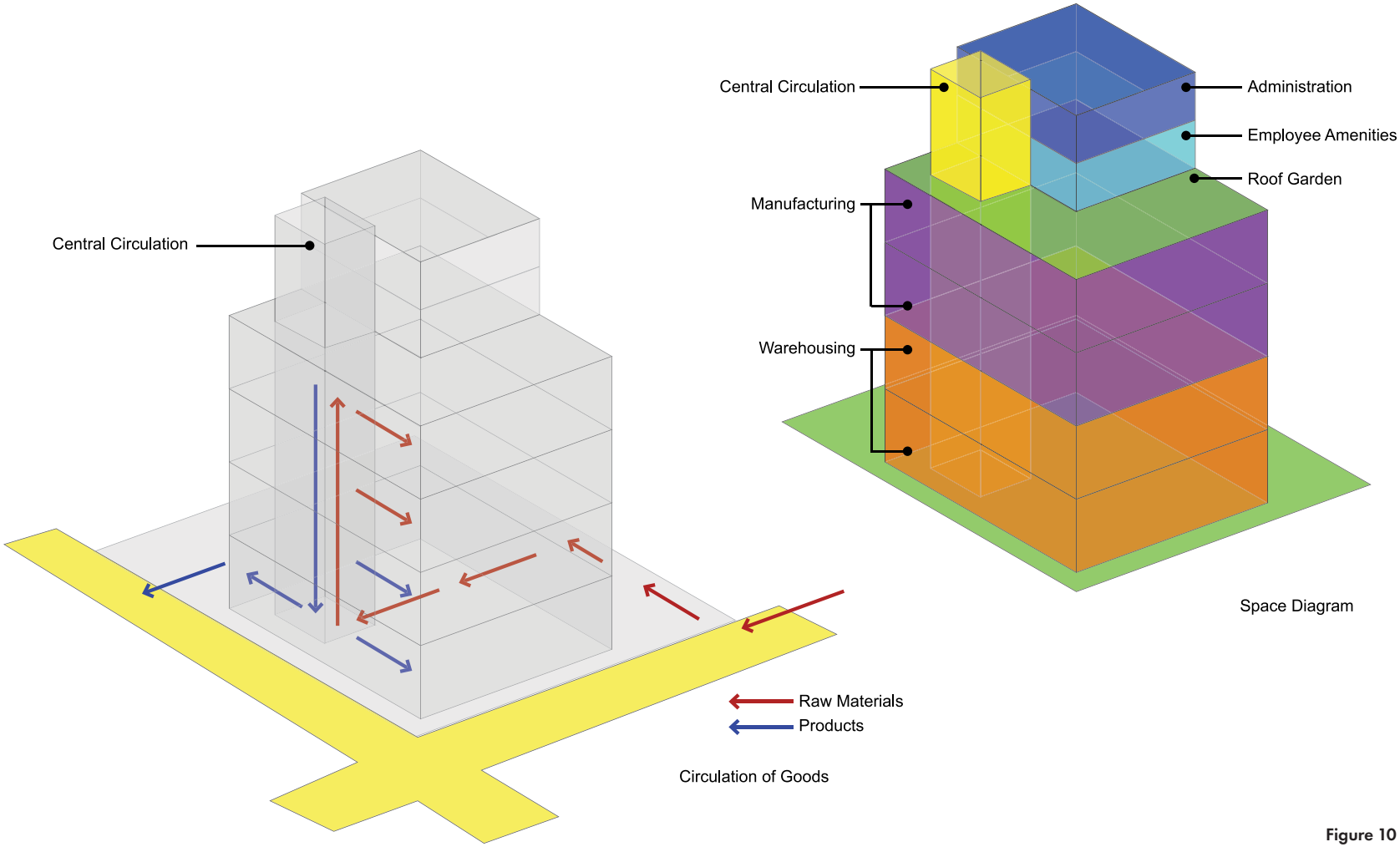


Figure 10

space list

Fuction	People	Capacity	No. of Units	Area per Unit	Net Area	Net Area Subtotal
Entry						
Reception/Display	1		1	1,000	1,000	
Waiting area		10	1	200	200	
Bathroom			2	60	120	
Subtotal						**1,320**
Sales Offices						
Offices	6		6	150	900	
Conference Room		10	1	400	400	
Seating area		5	1	200	200	
Storage			1	30	30	
Subtotal						**1,530**
Production Offices						
Offices	6		4	200	800	
Conference Room		5	2	250	500	
Printing Room		5	1	250	250	
Bathroom			2	60	120	
Storage			1	40	40	
Subtotal						**1,710**
Executive Suite						
Office	1		1	300	300	
Conference Room		20	1	500	500	
Storage			1	25	25	
Waiting area		10	1	200	200	
Bathroom			2	60	120	
Subtotal						**1,145**

Figure 11 left
Figure 12 opposite

Production						
Production Space			1	20,000	20,000	
Management desk	4		4	50	200	
Bathroom			2	300	600	
Subtotal						**20,800**
Warehouse						
Warehouse Space			1	50,000	50,000	
Management desk	2		2	50	100	
Subtotal						**50,100**
Research & Development						
Lab		10	1	1,000	1,000	
Offices	3	1	3	150	450	
Bathroom			2	60	120	
Subtotal						**1,570**
Break Area						
Kitchenette		4	1	200	200	
Lounge		20	2	2,000	4,000	
Bathroom			2	300	600	
Subtotal						**4,800**
Administration						
Office	6		4	150	600	
Conference Room		5	2	250	500	
Storage			1	30	30	
Data Room		2	1	100	100	
Bathroom			2	60	120	
Subtotal						**1,350**
Total						**84,325**

building area summary

Space Name	People	Capacity	Net Area	Net:Gross	Gross Building Area
Manufacturing Building					
Entry	1	10	1,320	0.50	2,640
Sales Offices	6	15	1,530	0.50	3,060
Production Offices	6	17	1,710	0.50	3,420
Executive Suite	1	11	1,145	0.50	2,290
Production	30	400	20,800	0.50	41,600
Warehouse		165	50,100	0.50	100,200
Research and Development	3	15	1,570	0.50	3,140
Break Area		25	4,800	0.50	9,600
Administration	6	13	1,350	0.50	2,700
Subtotal	**53**	**671**			**168,650**

Figure 13 left
Figure 14 opposite

land use requirements

	People	Gross Building Area	Floors	Building Footprint	GAC	Land Area
Manufacturing Building						
Building	53	168,650	6	28,108	25%	112,433
Site Facilities						
Parking						
Employee	50	19,000	1	19,000	70%	27,143
Visitor	10	3,800	1	3,800	70%	5,429
Service	5	1,900	1	1,900	70%	2,714
Subtotal	**65**	**193,350**		**52,808**		**147,719**
Public Space						
Green Space		2,000	1	2,000	50%	4,000
Court		1,800	1	1,800	50%	3,600
Subtotal		**3,800**		**3,800**		**7,600**

the master plan

form

Since the emphasis on the project is transparency of industrial processes, **the master plan must incorporate opportunities for the public and private areas to merge and coexist.**

Since the project will be incorporating sustainable urban design principles, **the master plan should allow for new green spaces and public areas around the building.**

Since the heaviest building loads will come from the manufacturing and warehouse spaces, **the master plan must account for a large, robust structural system.**

time

Since the industrial processes are likely to change throughout the future, **the master plan must allow for updates and even programmatic changes based on the area's future needs.**

function

Since successful urban design incorporates a focus on the pedestrian experience, **the master plan must incorporate wide paths, outdoor seating and activities, and human-scale components.**

Since circulation is a key component to a successful industrial or manufacturing building, **the master plan must provide a cohesive and clear path into, around, and out of the building for products and for people.**

economy

Since this industrial site will serve both the workers and the surrounding community, **the design must be safe, welcoming, and accessible.**

the site

The site chosen for this project is located between the downtown areas of Minneapolis and St. Paul, Minnesota, within the block surrounded by Cleveland and Prior Avenue, south of University Avenue. It is located along the Metro Transit's Green Line, near Interstate 94, and within two miles of the Mississippi River. There are single family residential neighborhoods directly to the east, and some low and mid-density commercial to the north and northeast. It is currently zoned as Light Industrial, with Traditional Neighborhoods, General Industrial, and Multiple-Family on its block borders ("Maps," 2015).

This site serves as a great place to begin to apply transit oriented urban design to a heavily industrial area. Currently, the city has zoned for development along University Avenue (the Traditional Neighborhoods). However, this zone abruptly ends west of Prior Avenue, where small scale commercial and residential gives way to large parking lots and large set-back buildings. The street corner, instead of anchoring the block, gets lost in the pavement.

The existing buildings on the site include a packaging plant, a soft drink wholesaler, a small hotel, and other industry buildings. These are good examples of the large-scale, concrete and metal buildings that many industry buildings are currently comprised of.

This site will provide plenty of access to existing transportation and provides the opportunity for the implementation of more walkable and green space between the residential neighborhoods to the south and east. Utilizing the existing transitways and improving on-site circulation will be a priority for the success of the site.

Due to its location, this site is primed for becoming a link between industry, commercial, and residential areas and uniting those within.

site inventory: climate

Minnesota sees a wide swing of temperature throughout the calendar year. In the warmest month, July, the temperature highs average 85 degrees Fahrenheit. In contrast, the coldest month, January, the temperature lows average 7 degrees Fahrenheit.

Along with the seasons, the sun's angle changes as well. St. Paul sits at about 45 degrees N latitudinally. This change is illustrated in the graphic on page 19. During the summer solstice, St. Paul sees about 15 hours and 36 minutes of daylight. During the winter solstice, the city only sees about 8 hours and 46 minutes of daylight.

Winters in the northern midwest of the United States are less than comfortable. Snow and cold, northwest winds are not uncommon. These factors, along with sub-freezing temperatures dramatically affect how pedestrians interact with outdoor spaces. They are less likely to walk as far to get from place to place.

The challenge the climate poses requires special attention to the areas furthest from the transit to encourage year round use of the spaces.

Map Key:

Summer Solstice Sun

Winter Solstice Sun

Figure 15

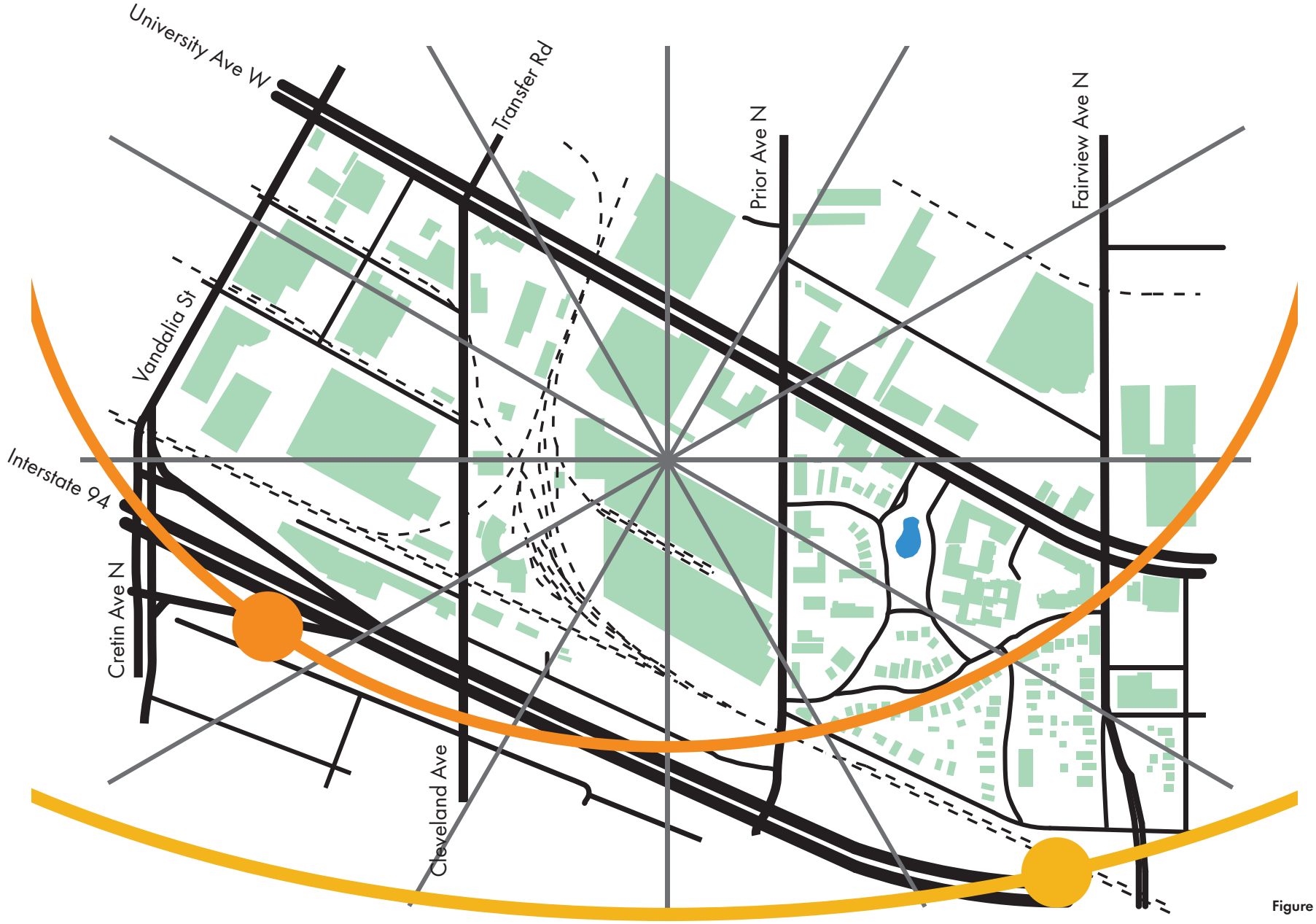

University Ave W
Transfer Rd
Prior Ave N
Fairview Ave N
Vandalia St
Interstate 94
Cretin Ave N
Cleveland Ave

Figure 16

site inventory: automobile traffic

The site is located between two very high-trafficked roads: University Avenue to the north and Interstate 94 to the south. These both bridge the gap between Minneapolis and St. Paul. Other main arterial roads surrounding the site include Vandalia Street, Cleveland Avenue, Prior Avenue, and Fairview Avenue, all generally running north-south.

The intersections of these main roads are all stoplights. Not only is this because they are extremely traversed, they must help direct traffic around the light rail that runs through University.

University Avenue sees a lot of commuter traffic in the mornings and evenings. Drivers tend to find as many ways as possible to avoid Interstate 94 during the rush hours, which turns a twenty-minute commute from Minneapolis to St. Paul into an hour long crawl. During these times, the arterial roads also see an increase in traffic, as the surrounding neighborhoods to the north, east, and west are primarily residential.

Having an interstate running so close to the site poses many challenges. There are fewer connections to the neighborhood to the south of the freeway, because everything is bridged over it. This disconnection discourages pedestrians to travel to and through the site. When the focus of an area is put solely on automobiles, it becomes much more dangerous for the other users (pedestrians and cyclists). It also provides a noise issue for the site. The goal will be to better integrate safe pathways for all users.

site inventory: railway

Even after over one hundred years of existence, trains and rail cars are vital to many manufacturing, warehousing, and other industrial buildings. The rails running through this site belong to Minnesota Commercial Railway. It operates primarily out of St. Paul, and connects with Canadian National Railway, BNSF Railway, Canadian Pacific Railway, Union Pacific Railway, Iowa, Chicago and Eastern Railway, and Twin Cities and Western Railroad.

This site is located just south of the Minnesota Commercial Railway's main yard. This site serves as a junction point for rails running west, north, and east. They follow along the main and arterial roads, serving the industry buildings in the area.

Map Key:

- Heavy Traffic
- Medium - Heavy Traffic
- Medium Traffic
- Light Traffic
- Railway


University Ave W
Transfer Rd
Prior Ave N
Fairview Ave N
Vandalia St
Interstate 94
Cretin Ave N
Cleveland Ave

Figure 17

site inventory: public transportation

As discussed in the background information, access to a variety of public transportation options is an important aspect of sustainable urban design. This site has close proximity to multiple bus routes and stops, including Routes 16, 63, 67, 87, and 137. These run in all directions, and are both local and limited stop bus routes.

Also serviced near the site is a bike rack for the Nice Ride public bike share program. The docking station has a maximum capacity of fifteen bikes. Although University is not currently very bike friendly with its two lane divided highway dominated by automobiles, there are many side streets that lead to and away from that docking station.

Most importantly, this site is located near the Metro Transit Green Line, running from downtown Minneapolis to the west all the way to downtown St. Paul. The closest stop is at University Ave and Fairview Avenue.

The infrastructure already exists to serve the surrounding neighborhood. Utilizing it fully is imperative for the redevelopment of the site.

Figure 18 above
Figure 19 below

Map Key:

- Bus Route
- Metro Transit Green Line
- Bike Route


Interstate 94
Cretin Ave N
Vandalia St
University Ave W
Cleveland Ave
Transfer Rd
Prior Ave N
Fairview Ave N

Figure 20

site inventory: zoning

This site is located on the edge of a largely residential zoned area. The industrial zones stretch from Interstate 94 all the way north to the border of St. Paul.

Along the light rail, the city has rezoned for Traditional Neighborhoods. These are classified as higher-density pedestrian- and transit-oriented mixed-use development. However, this zone does not run far enough west along University Avenue to include the project site.

Redevelopment of this block must better transition from the Traditional Neighborhoods and Multiple Family residential to the Industrial areas to the west and north. Currently, it is very apparent where the zones change from one to another, which is largely due to the lack of sustainably designed and integrated industrial buildings. The small businesses on the east side of Prior Avenue are alienated from high pedestrian traffic, because the face large parking lots and industrial buildings. The goal would be to pull features of the redevelopment of the Traditional Neighborhoods along University Avenue down Prior Avenue, better linking this neighborhood to those to the south.

Figure 21

Map Key:

- General Industrial
- Light Industrial
- Transitional Industrial
- RM2 Multiple Family
- RT1 Two-Family
- R3 One-Family
- T3 Traditional Neighborhood
- T4 Traditional Neighborhood

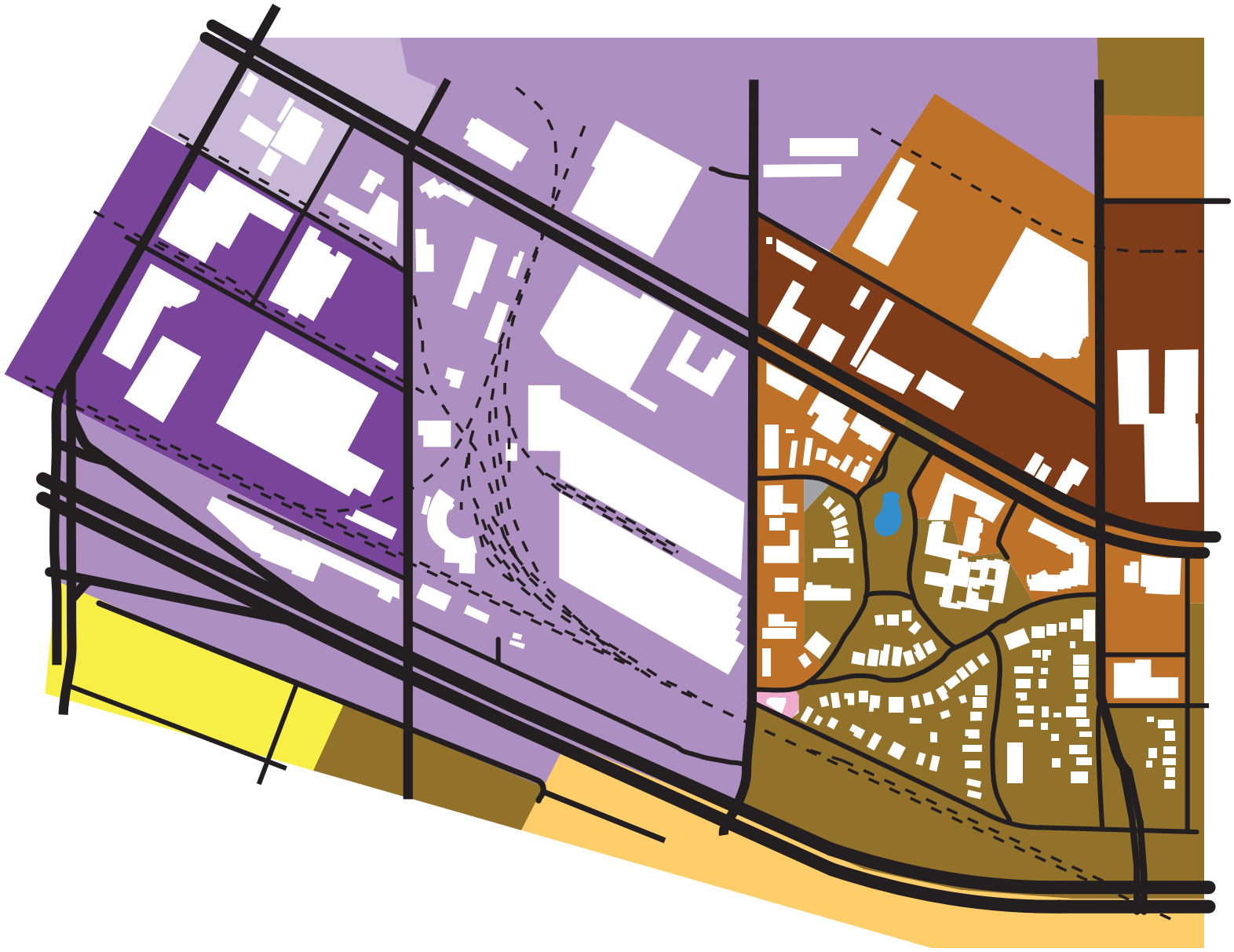


Figure 22

code analysis

When beginning to integrate the International Building Code into a design, the first step is to determine which occupancy category the building will fall into. Due to the nature of an industrial typology, this building must be divided into two, as far as the code is concerned. The first of these is Factory Industrial Moderate-Hazard, or F-1. These are classified as including manufacturing and industrial processes with moderate fire hazard, such as those involving aircraft, appliances, automobiles, machinery, electronics, plastics, printing, woodworking, and others. For this project, these spaces make up the warehousing space and the manufacturing spaces within the building, illustrated in the diagram on the opposite page.

The second occupancy classification in this building is business or B. These include office, professional, and service activites, and storage of related records and accounts. Thus, it will contain all offices and amenity spaces for the building.

The next step is to determine which construction method will serve the building the best. Structural materiality and fireproofing are important pieces of this decision. Sprinkling the building gives maximum square footage allowance to any structural material, however, for the sizes needed for this typology, steel will be the best choice.

From this, one can begin to determine area and height limits. Of course, these numbers will not be accurate until the building floor plans are complete, but it gives the designer a jumping off point and a preview for what code challenges he or she may face moving forward.

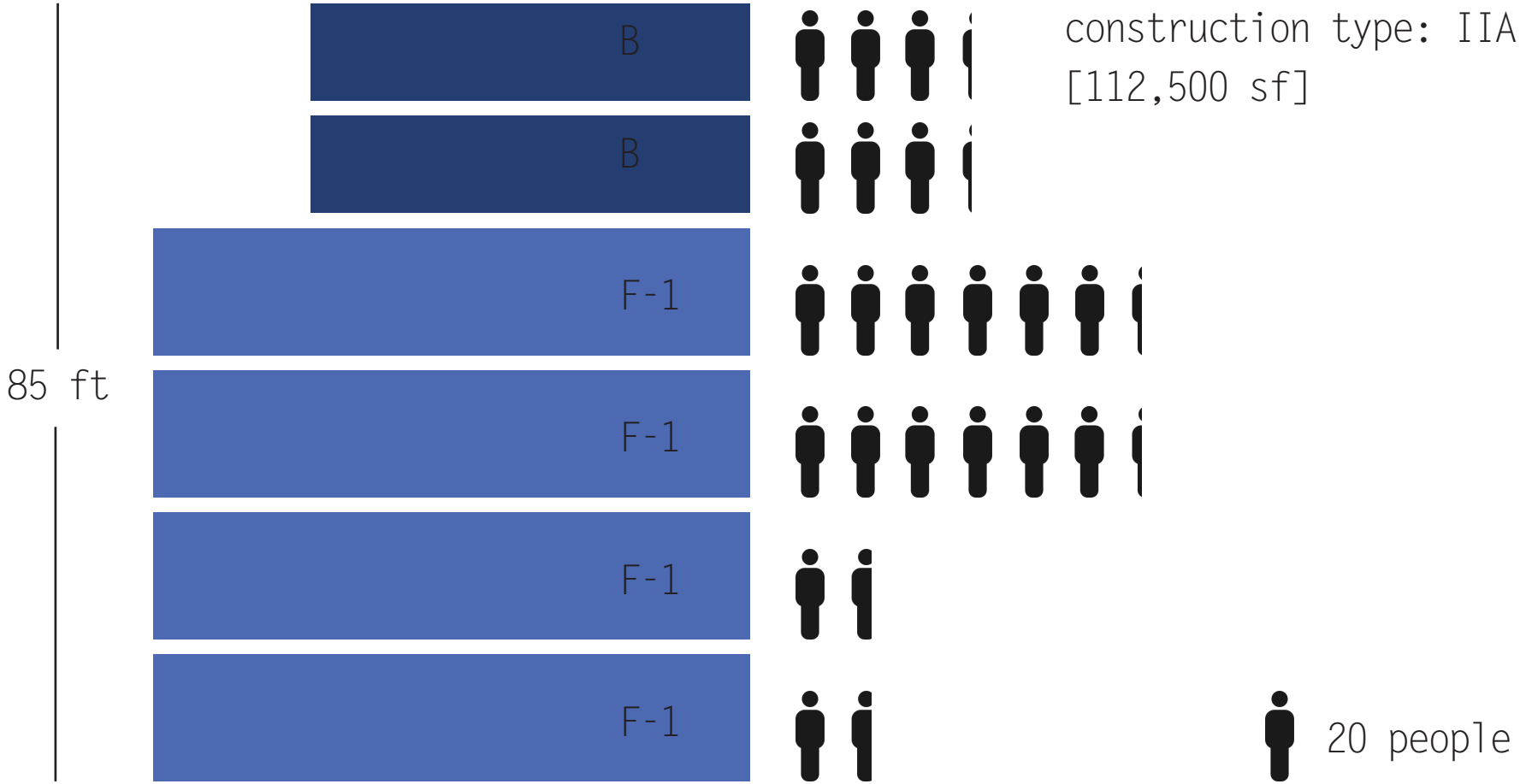


Figure 23

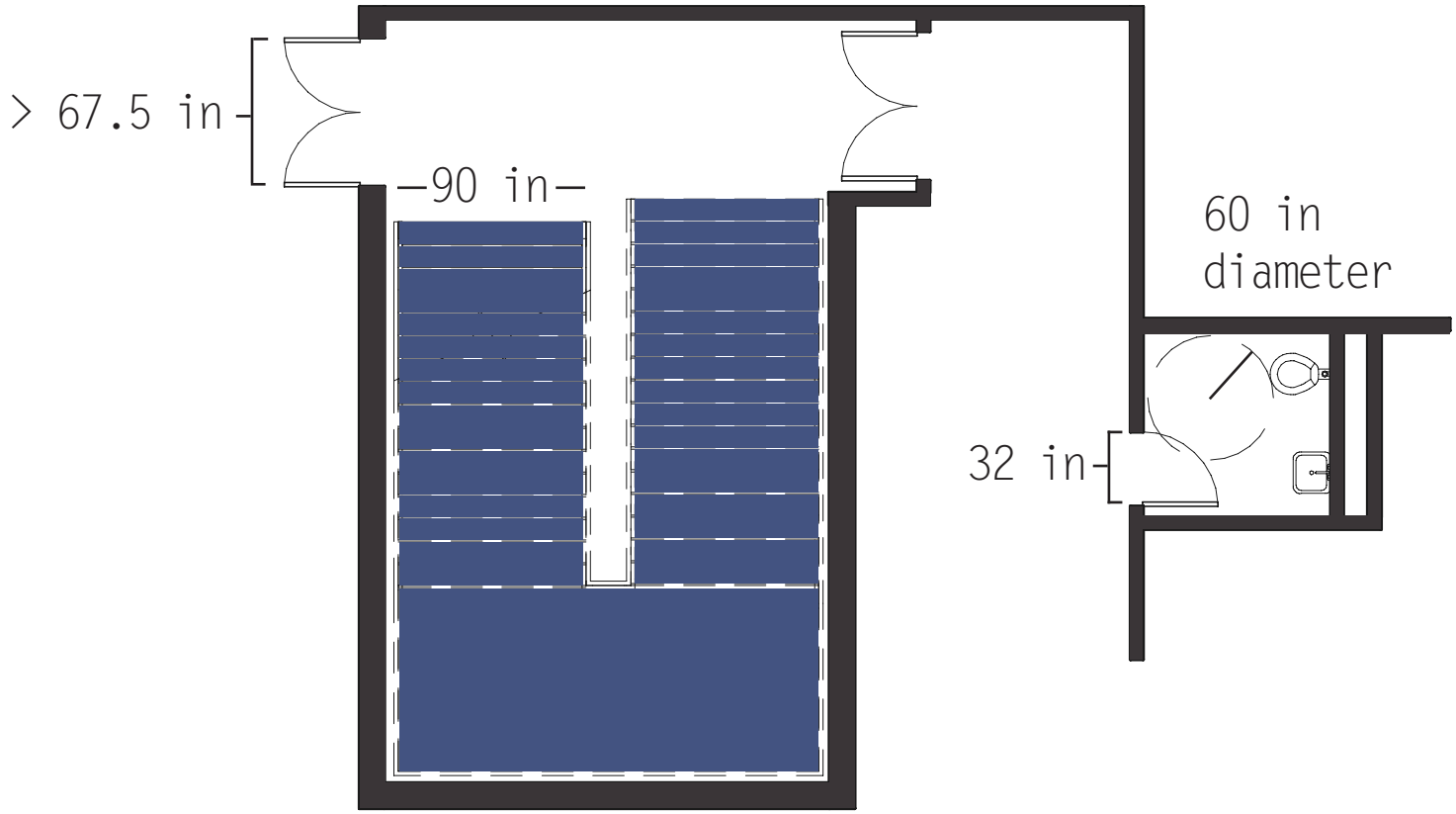


Figure 24

egress

One of the most important purposes of the International Building Code is to help size and design egress for a building. Egress is important in the event of fire or other disaster where people must be evacuated quickly. These are defined by the construction material, method, occupancy, and size of a building.

The diagram on the opposite page reflects some of the other code requirements in the International Building Code and the American Disability Act. The numbers were calculated after an initial code analysis based on the information on the previous page. All stairways, elevator lobbies, corridors, doors, and bathrooms must be ADA compliant. Outswinging doors must be pocketed as to not swing into a path of egress. Single bathrooms must be large enough for a wheelchair to turn around in. The width of stairs is proportional to the occupant load on the above floors, and must contain an area of refuge for wheelchairs.

Other things to pay attention to while designing the floor plan will be to avoid dead end corridors for egress purposes. This will also aid in keeping the circulation a major design feature.

plan

defining the direction

Reflecting on the research paper and the site, precedent, and code analyses, much was uncovered about the site and the typology. However, before diving into the design process, more research should be conducted in the following areas:

Historical Precedents
What worked? What didn't? What has been tried? What more can I draw from what has already been done in the industrial field?

Workplace Environments
How exactly are people and their performance affected when working in different types of spaces?

Once that information is better understood, I can begin the design process. Through this design process itself, I can research more of the following:

Transparency
What does it mean to be transparent? How can I achieve this in architecture? How can this concept translate into a theme that influences all aspects of the design?

Site Development
How will the new design of industrial building affect the surrounding site in a positive way? What can I implement to encourage interaction between the surrounding neighborhood and the building?

The methodologies behind how I will achieve this research are explained on the next page.

methodology

As stated in the narrative portion, the research methodology for this project is not just any one method, rather a hybrid of three. This allows for maximum adaptation to the topics of industrial design and urban design. The methodologies used for the thesis research include descriptive research, evaluative research, and design research. Combined, these will help discover the possibilities of a "transparent" industrial building and its effects on the users of the spaces.

descriptive research

The descriptive research is primarily done in the predesign phase. According to *Landscape Architecture Research*, descriptive research is defined as producing "new knowledge by systematically observing, collecting, and/or recording new information." Already, I have explored what is meant by sustainable urban design and ways it can be implemented within existing neighborhoods. This was followed by information on industrial buildings and on public transit within the chosen site of St. Paul. Moving forward, I will use this method to examine more historical precedents and workplace environments for helpful information that will carry into the design phase.

evaluative research

The evaluative research method is slightly different. Instead of reiterating information, this research method compares architectural practices to accepted norms, rubrics, or new standards. For this project, I will be using this to compare the current site design to the sustainable urban design principles I have researched to determine if they are currently in use, and what can be done to implement them within a new site design.

design research

The design research portion helps explore different ways the structure, spaces, materials, and circulation can aid in the creation of a "transparent" industrial building. Multiple iterations of these will push the design in innovative ways that will be both practical and beautiful.

documentation of process

Throughout the research and design processes, keeping track of progress will be vital in order to me on schedule. I could spend much longer on the design phase than just a semester, however, I will need to pace myself in order to complete it by May.

My design process usually begins on paper. Schematic design, especially with spacial relationships, includes bubble diagrams in which I analyze adjacencies and the project program. In the case of the thesis project, the major components of the program have been determined.

After that, I usually begin working digitally. This helps me better visualize the areas of spaces and how that may affect their relationships with one another. It also helps me recognize design problems or opportunities within the 3-D model as they arise. This project is unique in which I will also rely on developmental physical models as a further exploration of form, structure, and the idea of transparency.

Within the thesis design studio, I will participate in group discussions with peers and my advisor about our projects, in order to get the most feedback possible. This will give me time to voice concerns and ask questions about the different aspects of my project and have the time to make changes and updates.

In order to keep track of the progress, I will need to keep all digital files organized and create different folders for every weekly submittal. I believe this will also be the best way to track how long a particular aspect of design is taking me, and if I will need to make adjustments to the overall schedule.

The biggest challenge of a project of this caliber is staying on schedule and managing the time allotted. Through the documentation process, and the experience I have gained in past studios, I can be realistic about what I have achieved and if it is to the highest potential.

project schedule

An in-depth version of the thesis project schedule is included on the next pages.

The research in this book is a large portion of the Predesign Phase. The additional research portion is for clarifying the items listed in the Defining the Direction section on page.

The Schematic Design Phase is for the initial spacial and site planning. This phase is vital to kick off the project.

Next, the Design Development Phase takes over. This is where the bulk of the work will be done to develop the design of the industrial building, including but not limited to: the structure, circulation, floor plan, details, and materials. This will go up until midterm reviews.

After spring break, I will implement the advise given at the critique. The final phase is the Presentation Preparation. This includes all renderings, videography, model building, and exhibit design. The semester concludes with the final presentation and graduation.

Task Name	Duration	Start
Thesis Project	**185 days**	**Mon 8/29/16**
Predesign Phase	**92 days**	**Mon 8/29/16**
Thesis Prep Book	77 days	Mon 8/29/16
Additional Research	3 wks	Wed 12/14/16
Schematic Design Phase	**12.5 days**	**Wed 1/4/17**
Contextual Analysis	0.5 wks	Wed 1/4/17
Conceptual Analysis	1 wk	Fri 1/6/17
Spacial Analysis	1 wk	Fri 1/13/17
Design Development Phase	**30.5 days**	**Fri 1/20/17**
Master Plan	1 wk	Fri 1/20/17
Structural Development	1.5 wks	Fri 1/27/17
Circulation Development	1 wk	Wed 2/8/17
Section Development	4 days	Wed 2/15/17
Detail Development	4 days	Tue 2/21/17
Materials Selection	5 days	Mon 2/27/17
Mid-semester Reviews	5 days	Mon 3/6/17
Spring Break	1 wk	Mon 3/13/17
Presentation Preparation	**25.5 days**	**Mon 3/20/17**
Renderings	2 wks	Mon 3/20/17
Lumion Movie Development	1.5 wks	Mon 4/3/17
Physical Model Construction	1 wk	Wed 4/12/17
Presentation Layout	1.5 days	Wed 4/19/17
Plotting	1.5 days	Fri 4/21/17
Set Up Exhibit	0 days	Mon 4/24/17
Thesis Exhibit	**9 days**	**Mon 5/1/17**
Final Reviews	4 days	Mon 5/1/17
Digital Copy Due to Instructors	0 days	Mon 5/8/17
Final Thesis Document Due	0 days	Fri 5/12/17
Commencement	0 days	Sat 5/13/17

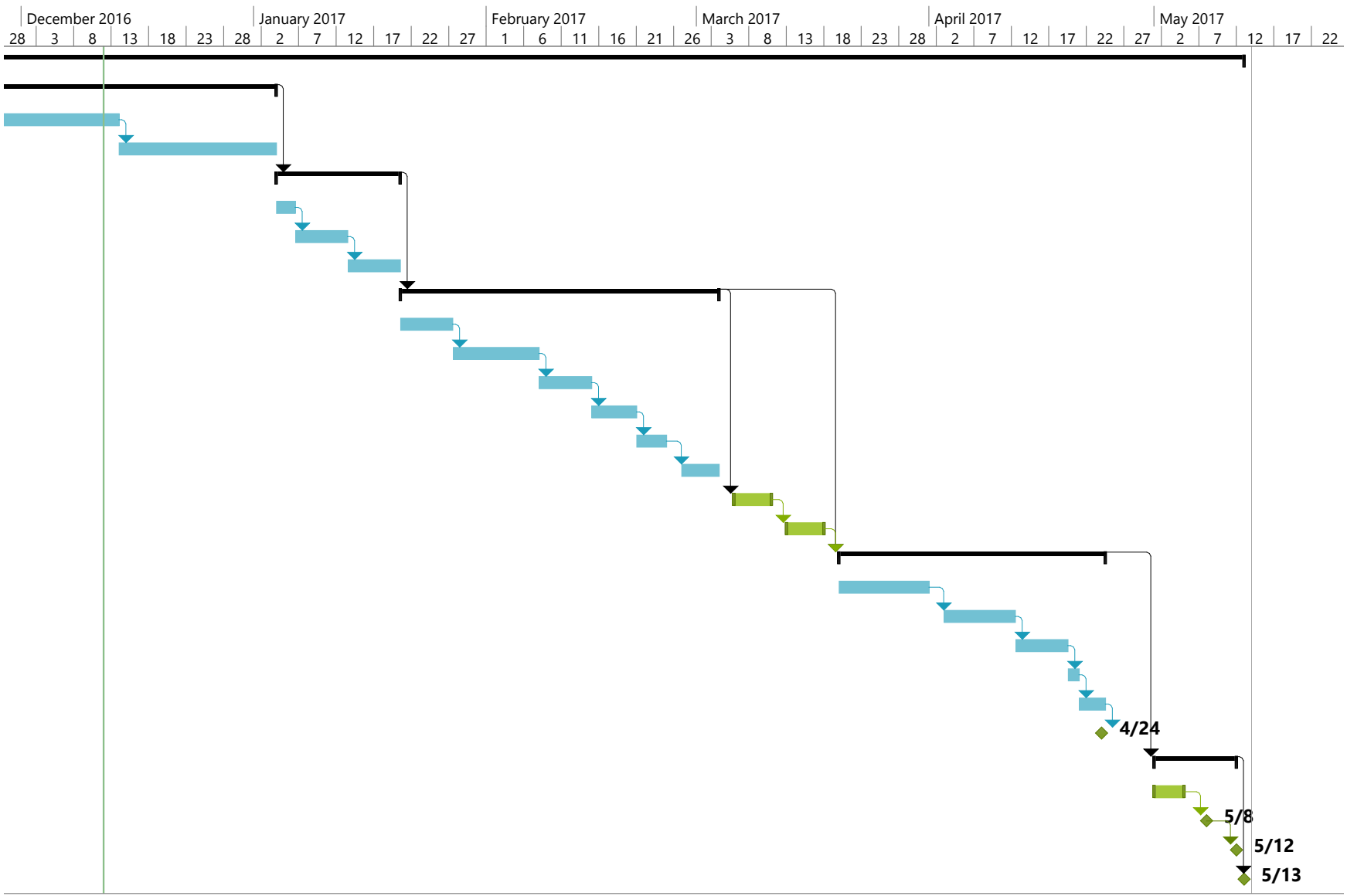

December 2016
January 2017
February 2017
March 2017
April 2017
May 2017
28 3 8 13 18 23 28 2 7 12 17 22 27 1 6 11 16 21 26 3 8 13 18 23 28 2 7 12 17 22 27 2 7 12 17 22
4/24
5/8
5/12
5/13

Figure 25

design

process

Through the design phase, it became important to find methods that could be used to achieve the project goals. They are broken down into the following four categories:

1. Provide multi-user friendly spaces

2. Maximize both utility and design

3. Create a human scaled environment

4. Increase transparency

These four methods allowed for a clearer path as the design phase commenced.

determining the direction

The first step was to determine what kind of spaces would comprise the mixed use and industrial areas, and how much I could get them to overlap with one another. I began conducting interviews with facility managers in the area to determine strengths and weaknesses within their current buildings, and to discover what building elements that they would change about if they could.

I found that the amount of space allocated for different uses (production, warehousing, offices, and support spaces) varied greatly between different types of manufacturing. To account for all of the change, I decided to take the project in a more conceptual direction, rather than designing for a specific client.

Other information I gathered from the interviews were problems owners had with circulation in and around the facilities, and having a lack of green space or outdoor space. These elements because vital to the overall concept.

schematic design

Keeping mixed use along Prior Avenue was important to the urban design principles from the earlier research. I created masses to represent different areas and how they would all fit within one another, creating a large mixed-use complex. I also began to visualize truck circulation around the building for deliveries and pick-ups.

For the industrial space to have maximum access, I pulled part of the space through the retail and commercial areas. This way it too would have street access, while still being in scale with its urban neighbors.

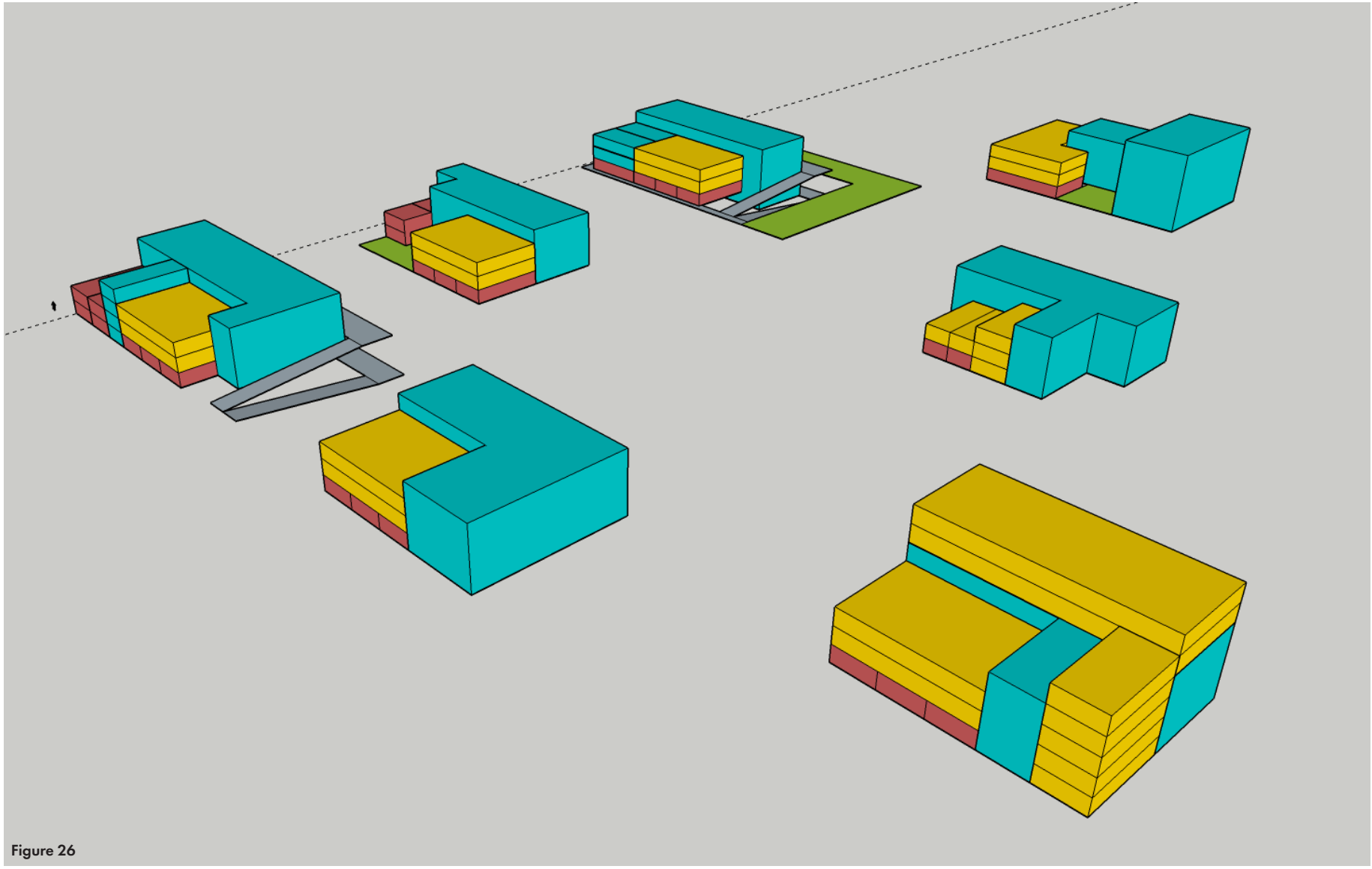
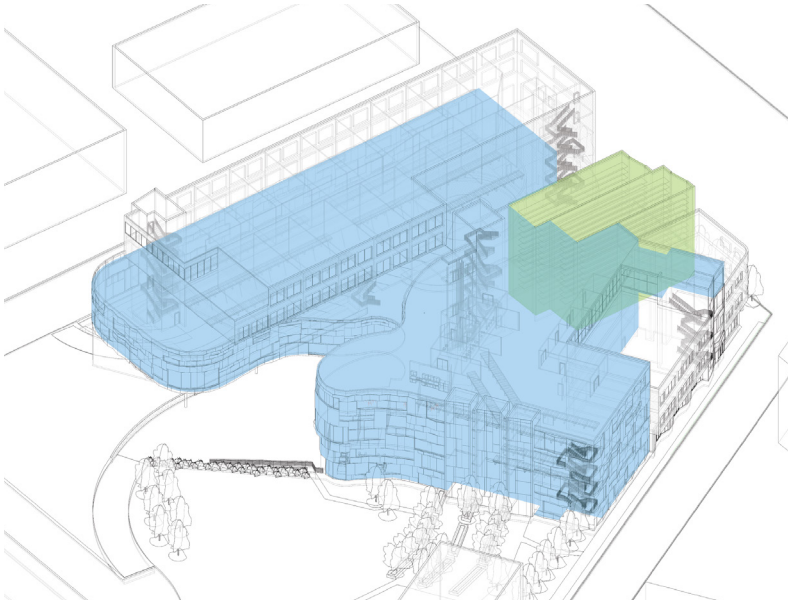


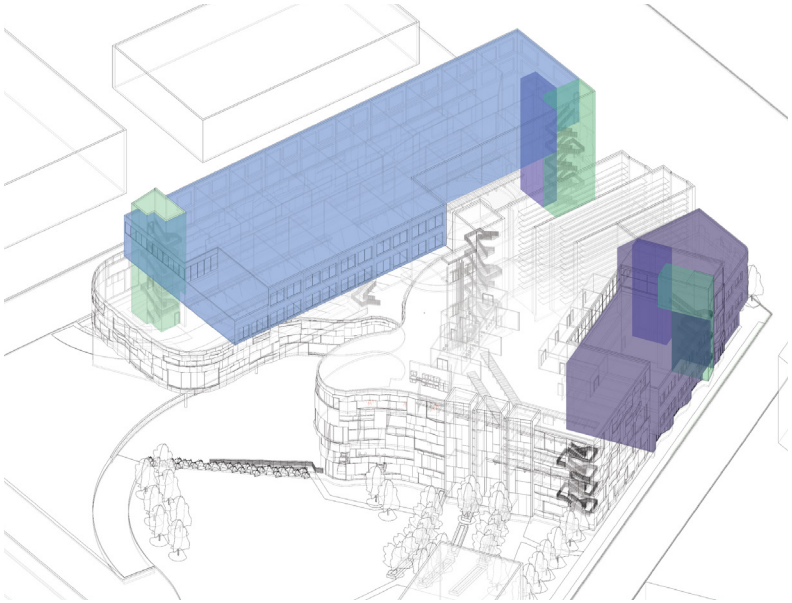
Figure 26

results



MANUFACTURING + WAREHOUSING ISOLATED

Manufacturing Vertical Warehouse



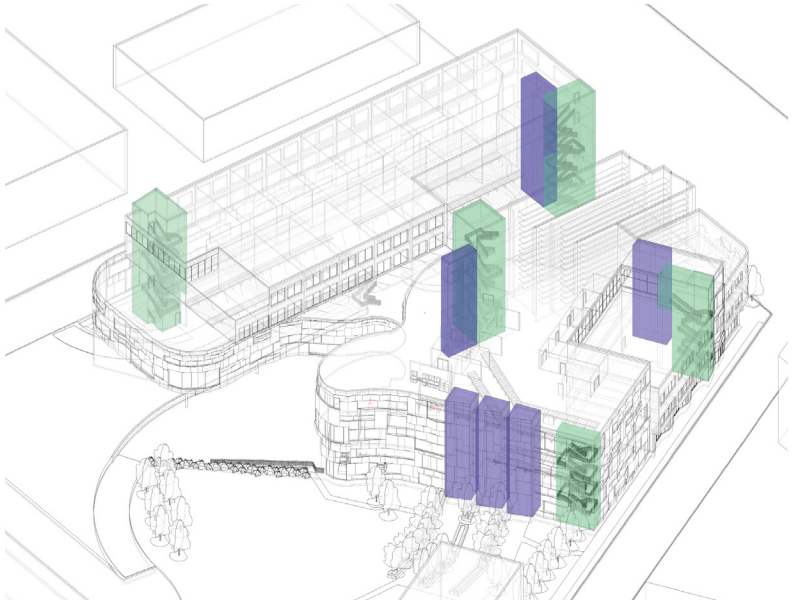
RESIDENTIAL + COMMERCIAL ISOLATED

Residential Commercial

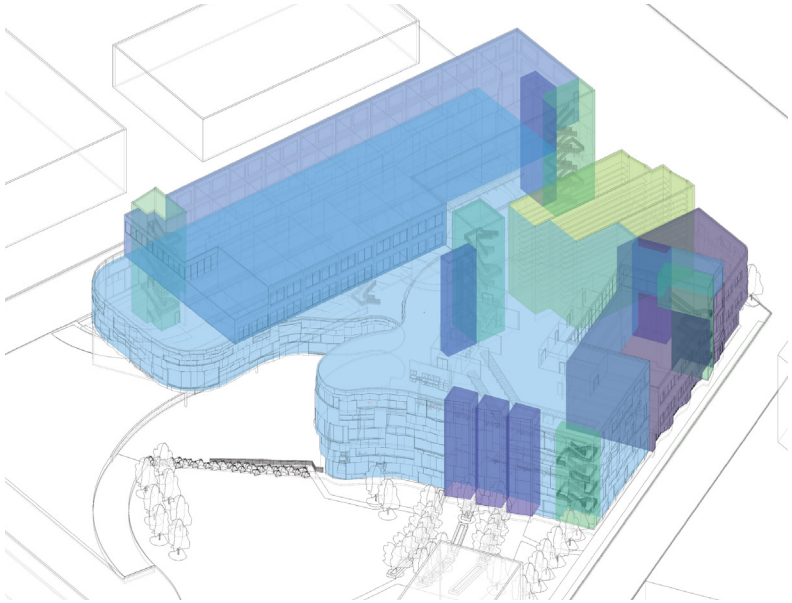
multi-user friendly spaces

The diagrams below illustrate how the spaces are broken down within the complex. In the main industrial space, there are two, double height floors of manufacturing. The third floor over this space is dedicated to office, conference, and a break area that has a view of downtown Minneapolis to the west. The vertical warehousing system is explained in more detail later. Above the manufacturing space on the west side of the building, there are two floors of residential units, with direct access to University Avenue on the north side. The north east corner of the complex is where the retail (on the ground level) and commercial (floors above) reside.

The second unit in serves as the main circulation access way for the second and third floors of the commercial spaces on either side and for the visitor's entrance to the industrial space on the third floor. A section cut on the following pages illustrates this concept.



CIRCULATION ELEMENTS ISOLATED
Elevator Stair



ALL ZONES

Figure 27

sharing spaces

The mixed use platform allows for the most interaction between industrial workers and the neighborhood. The diagram to the left illustrates different zones of the building and site that would be used by either the public or an industrial worker, and where those spaces overlap. A restaurant on the street corner provides a meeting place for anyone during the daytime and evening. The outdoor space on the south facade is primed for foot traffic from above, as well as from the neighborhood east of Prior Avenue. The storefronts along the street encourage a mix of people coming and going at different times during the day.

1. Residential Lobby
2. Restaurant
3. Central Circulation
4. Commercial
5. Employee Entrance
6. Outdoor courtyard

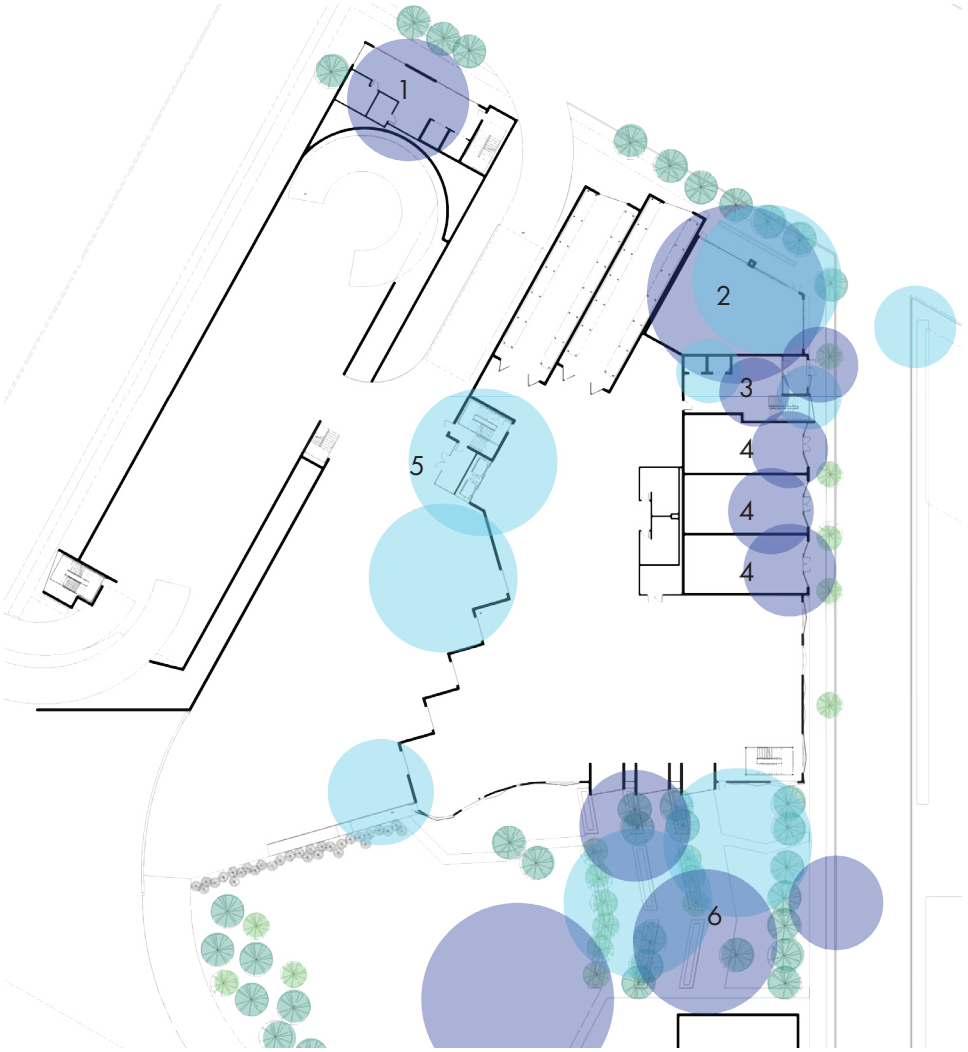


Figure 26

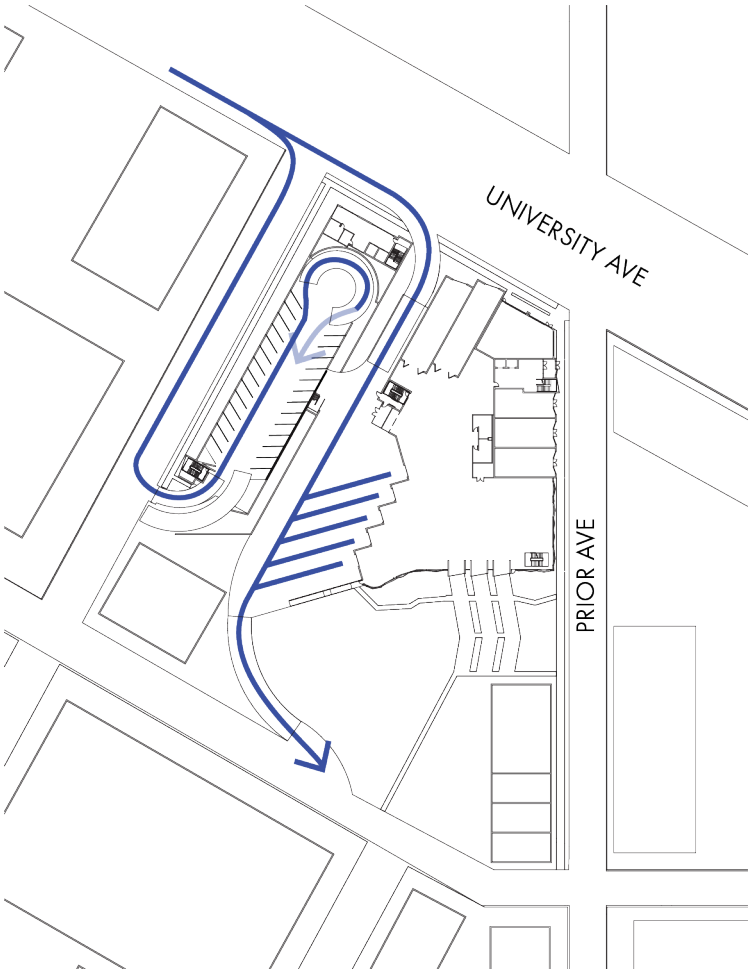


Figure 29

site circulation

Circulation plays a big role in the programming because of the industrial and manufacturing processes themselves. Raw materials or goods need to have a clear path from entering the site to the warehousing and manufacturing spaces, and the finished products need a clear path to the warehousing and off the site.

Providing parking for employees is important too. This one way ramp keeps the traffic moving while pulling the cars off of University, where they are more likely to be coming from.

maximizing utility + design

The diagrams on the next pages graphically represent design research into solving some of the most common issues within industrial buildings. These elements were incorporated into the overall design.

In most industrial parks, the layout of the buildings have one story, spread out on large plots. While inexpensive to build, it creates inefficient interior circulation where forklifts move everything from area to area. By stacking the manufacturing spaces, we can create custom paths of interior circulation and move goods and people more efficiently along a vertical axis.

The traditional method of truck and other delivery vehicle circulation requires vast paving around the building's exterior to allow for turn-around clearance. By creating a one way flow of traffic around the building, one can reduce the amount of paving around it and provide an easier back in for truck drivers.

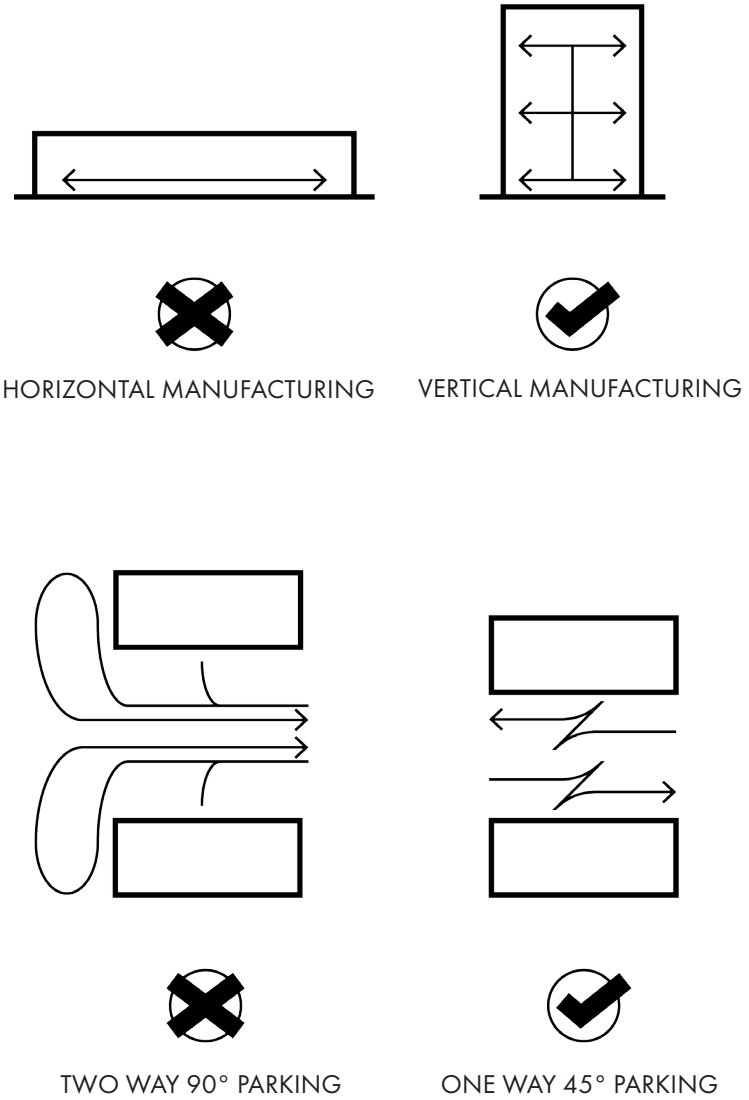
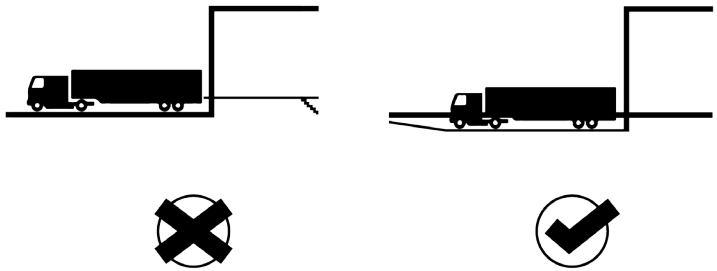


Figure 30



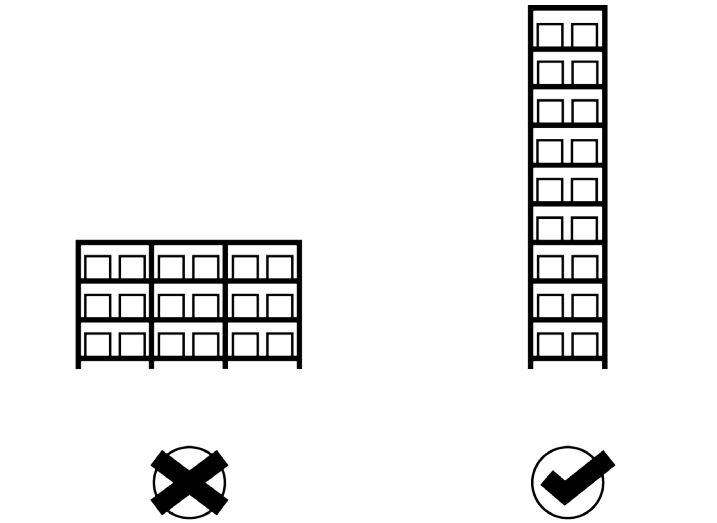
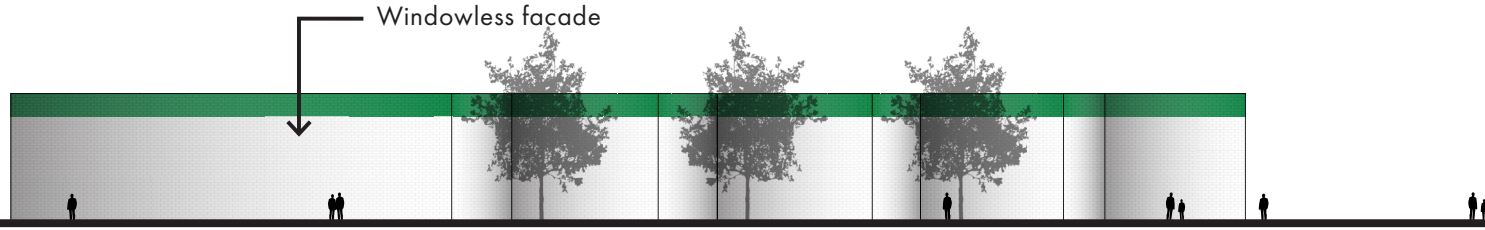


Figure 30

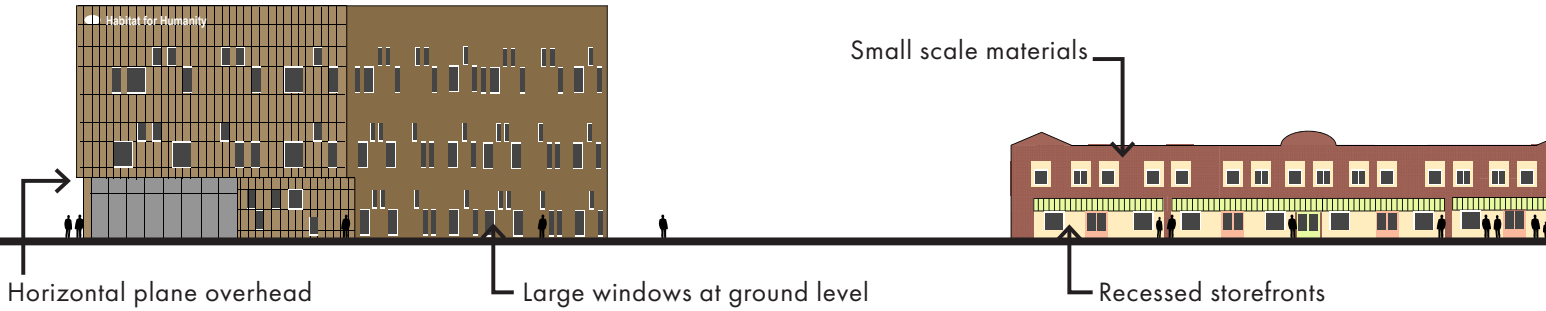
Due to the height of semi truck beds, the floor on the interior of many industrial buildings is raised off of the ground to account for the difference. In order to preserve the ground level, the semi truck path can be redirected below grade. This also improves walkability around the site.

When using traditional shelving for warehousing purposes in a one story facility, one is limited by the maximum height that forklifts can reach and the weight of the items being stored. It also takes up a large percentage of the building footprint. With a built-in vertical robotic warehousing system, the area necessary for warehousing can be reduced by over two-thirds.

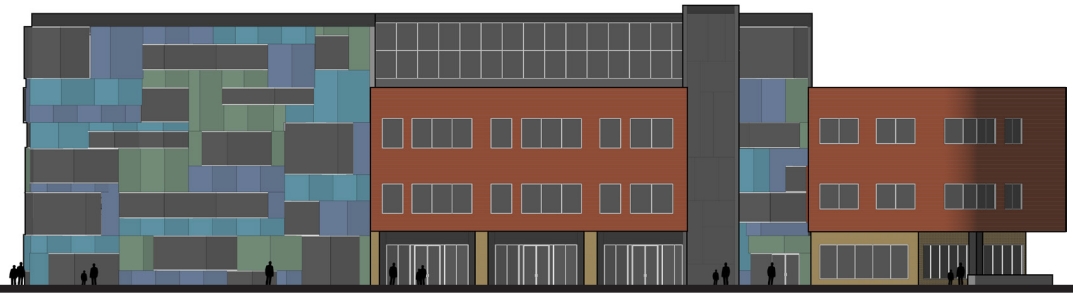
EXISTING CONDITION
1″ = 35′

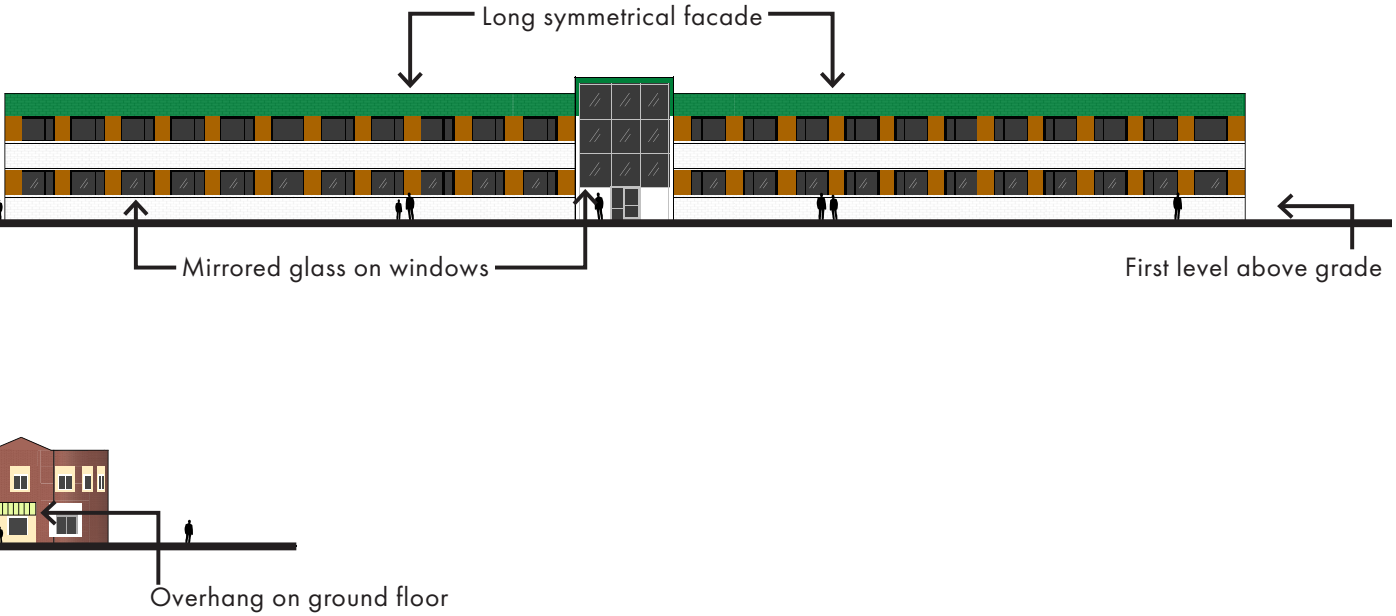


LOCAL PRECEDENTS
1″ = 35′



PROPOSED RESPONSE
1″= 35′





human scaled environment

Human scale is a vital piece of any new urban development. The existing industrial buildings do not serve the pedestrian. They have larger scaled materials (concrete masonry units) that span almost 300 feet. In contrast, the buildings across the street break up their long faces by recessing pockets around windows and doors, creating a smaller storefront feel. The materials are also better scaled for people, with their brick and textured plaster.

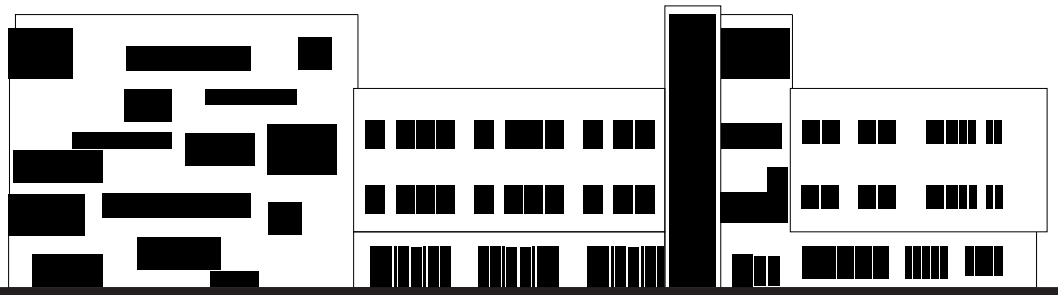
For the new Prior Avenue facade, the taller building provides a break between the ground floor and the stories above with a change of material. A slight overhand on the mixed use portions provide a sense of shelter when walking along the building.

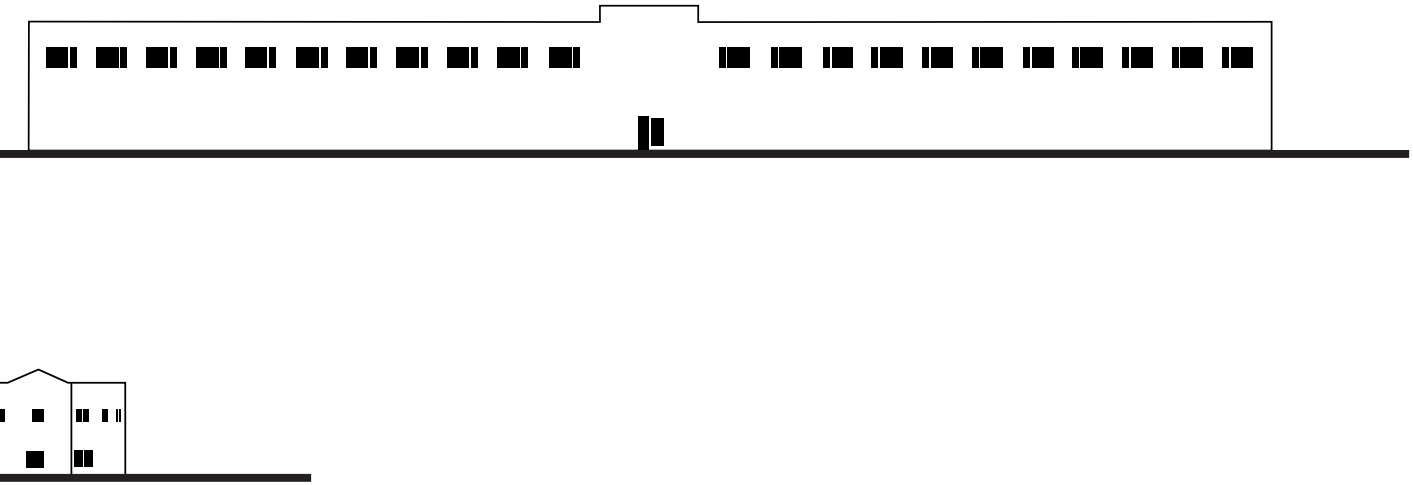
Figure 31

EXISTING CONDITION
1″ = 35′

LOCAL PRECEDENTS
1″= 35′

PROPOSED RESPONSE
1″ = 35′





increasing transparency

The first floor of the existing industrial building is elevated off the ground, putting the first floor windows above eye level. Not that it would matter anyway, as they have mirrored glass on the first level and on the atrium. Without a visual of what is inside, the buildings become monolithic, as illustrated in the diagrams. The neighboring buildings have a better sense of engaging the pedestrian, with their many ground floor windows.

In the new industrial building, increasing transparency is made a priority through a facade that integrates large glass panels, allowing a pedestrian a look into the building's function and structure. The mixed use buildings have glass storefronts for maximum engagement.

Figure 32

master planning

Redevelopment of this block must better transition from the Traditional Neighborhoods and Multiple Family residential to the Industrial areas to the west and north. Currently, it is very apparent where the zones change from one to another, which is largely due to the lack of sustainably designed and integrated industrial buildings. The small businesses on the east side of Prior Avenue are alienated from high pedestrian traffic, because the face large parking lots and industrial buildings. The goal would be to pull features of the redevelopment of the Traditional Neighborhoods along University Avenue down Prior Avenue, better linking this neighborhood to those to the south.

PROPOSED MASTER PLAN
1" = 400'

Figure 33

rendered views

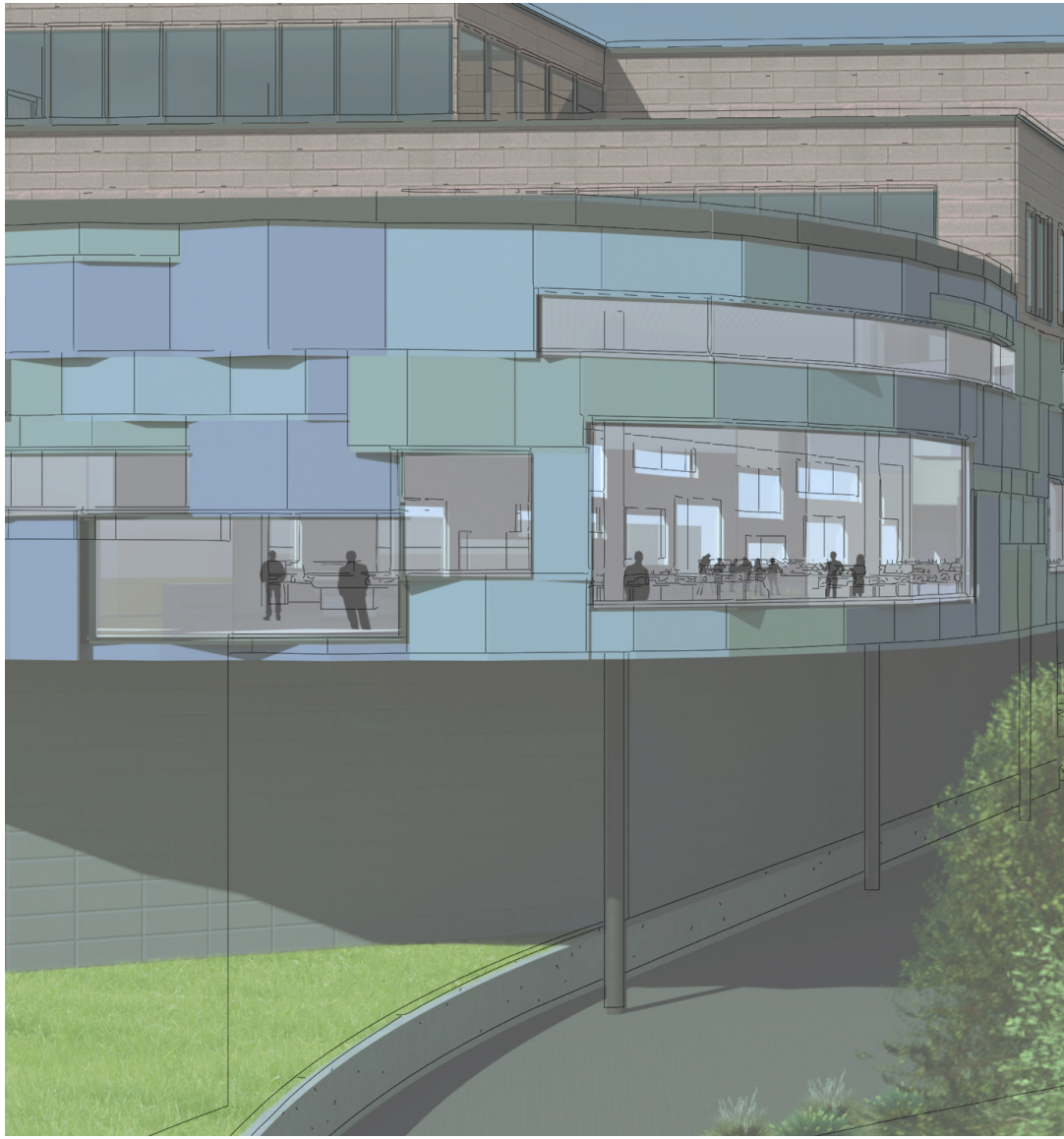


Figure 34

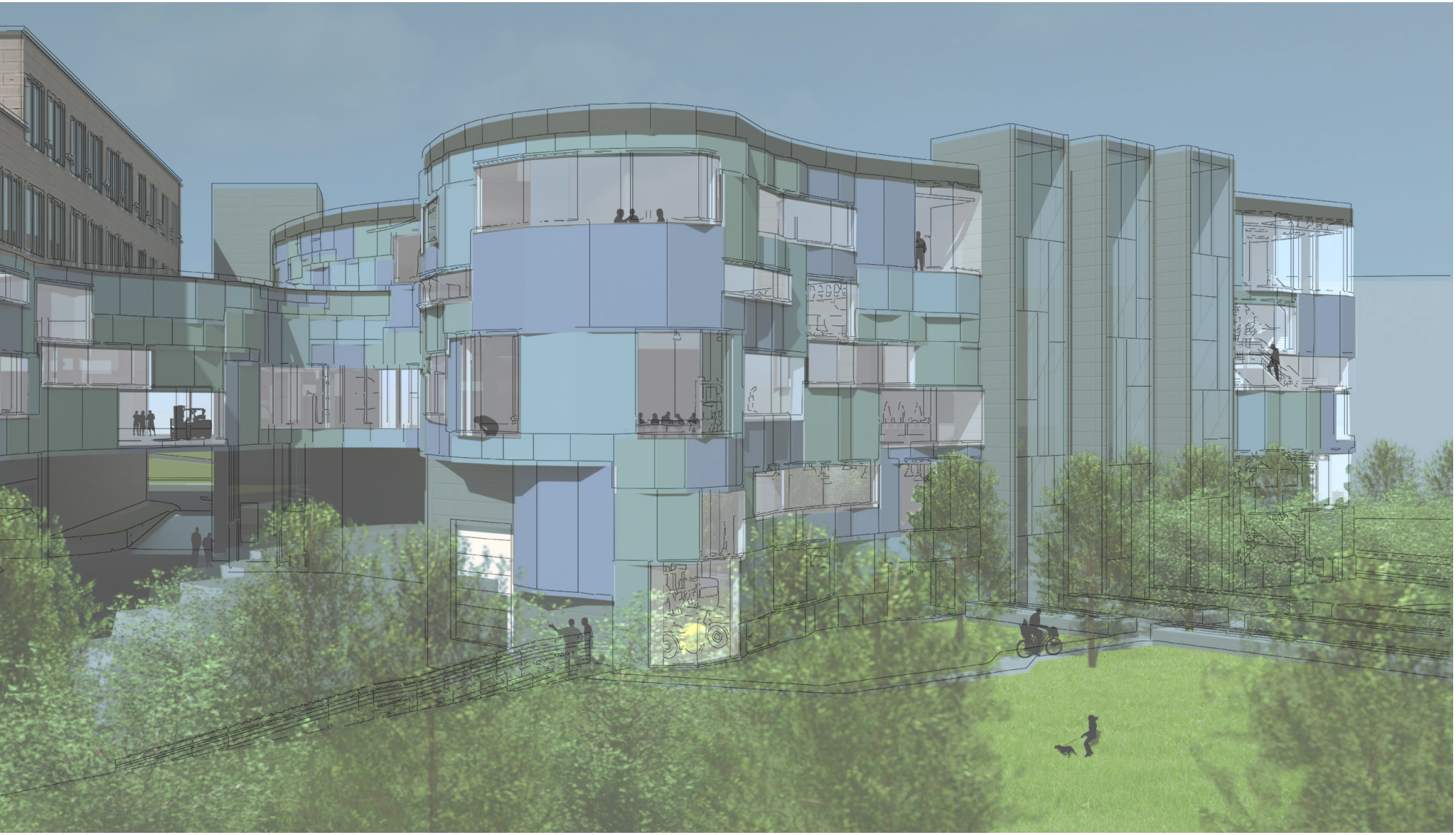


Figure 37

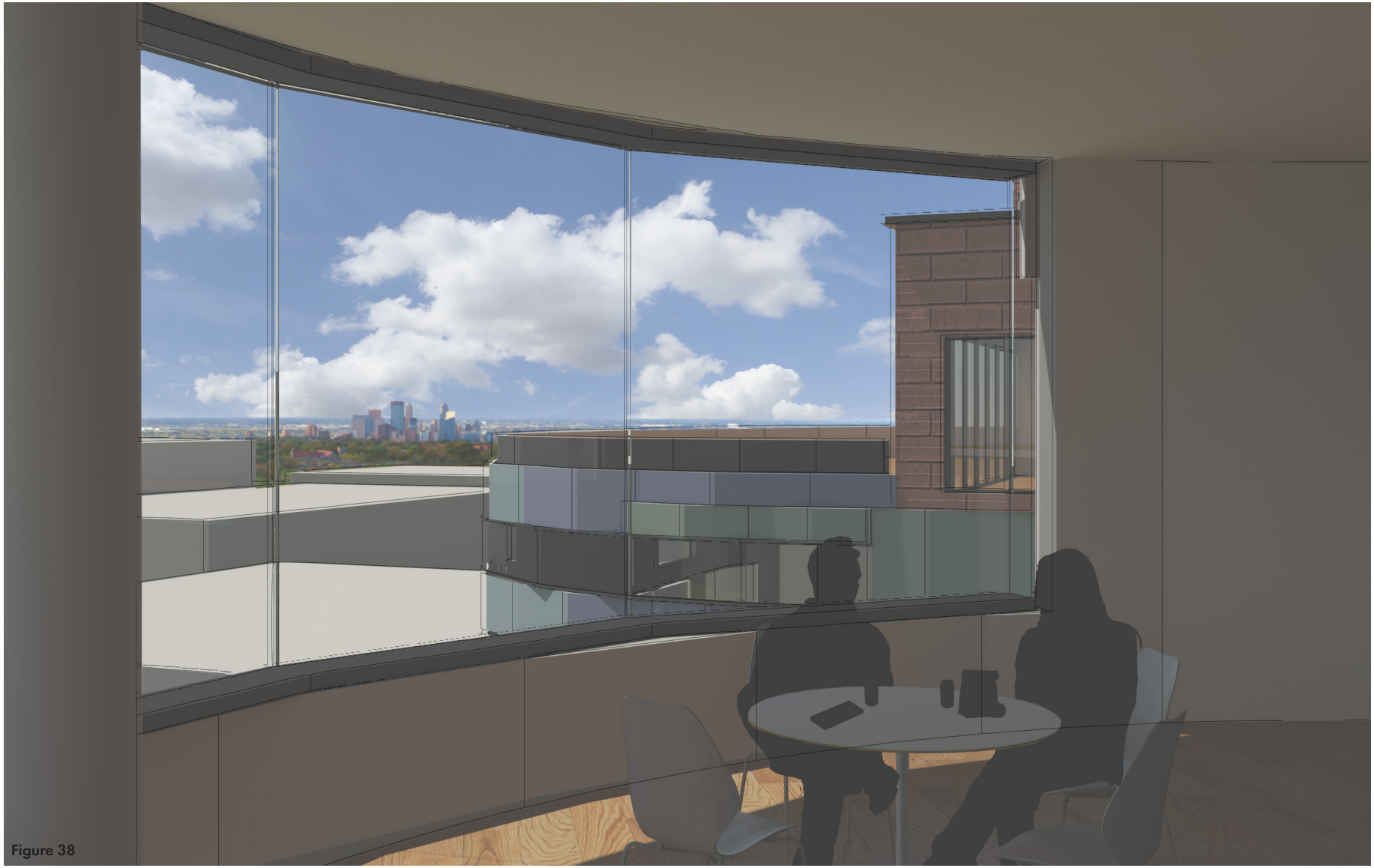


Figure 38

extras

appendix a: personal identification

Kristine K. Wentworth

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952.412.7406

Hometown: Lakeville, Minnesota

Figure 39

appendix b: studio experience

Fall 2013
Prof. Joan Vorderbruggen
A Place for Tea: Tea House (Fargo, ND)
Objective: To create a tea ceremony that is celebrated through the site and the design of the tea house that embodies a connection of the human experience and nature.
Result: Translated the feeling of standing next to a tall oak tree into a concrete, geometric space that took the guest into the earth, to feel humbled by the natural world.

Spring 2014
Prof. Cindy Urness
Ballet Dance Studio (Moorhead, MN)
Objective: To design a dance studio that captures the movement, passion, and expression of ballet and its dancers for the local community.
Result: Curved studio spaces stretch around a central atrium space that is flooded with soothing natural light, signifying the graceful movement of the dancers.

Pritzker Architect Birdhouse
Objective: Build a birdhouse thats is deeply inspired by an architectural master (Richard Meier), while being sensitive to the specific bird residents and their needs.
Result: Using poplar, created a birdhouse that emulates the simplified forms and massing Richard Meier embodies in his works.

Unconventional Dwelling (Marfa, TX)
Objective: As a group, create a community plan for a group of people moving to Marfa, Texas who which to live an alternate lifestyle. Design dwellings for the members that is less than 500 square feet that fits all basic needs.
Result: Planning flexible spaces within the dwellings was essential for fitting in all the requirements, and coordinating materials and form resulted in a cohesive overall design within our group.

Fall 2014
Prof. Paul Gleye
Fargo Visitor Center (Fargo, ND)
Objective: Design a new visitor's center for the Fargo community that is better suited for educating the public on the city. The construction must be out of wood.
Result: Using a large, accessible ramp, the visitor is taken through a gallery of Fargo's history, where finally the space opens up for events and a cafe.

Student Center (Fargo, ND)
Objective: In the downtown campus neighborhood, create a student union center that services the students and provides them with a space they can use throughout the day. The construction must be out of masonry.
Result: Designed a three story building that provided plenty of indoor and outdoor study space and natural light exposure for daytime use, and a cafe where students can relax.

Spring 2015
Prof. Bakr Aly Ahmed
NDSU Library (Fargo, ND)
Objective: Design a new library for North Dakota State University that better serves the modern student. The structure must be steel.
Result: Inspired by a nautilus, the spaces winded around a central core that created an indoor escape for the students.

S.C. Johnson Research Laboratory (Racine, WI)
Objective: As an extension of Frank Lloyd Wright's campus, design a new research and development lab for S.C. Johnson. The structure must be concrete.
Result: Using the very rigid program, created a

lab with offices that received southern exposure, laboratories with indirect northern light, and an atrium that exposed a tartan grid layout of the concrete structural members.

Fall 2015
Prof. Don Faulkner
Capstone: High Rise (San Francisco, CA)
Objective: Design a comprehensive high rise building in downtown San Francisco, where at least 50 percent of the program must be dedicated to residential units.
Result: With an organic, winding exoskeleton, the tower reaches to the sky like a tree in the middle of the urban context, leaving the floor plan flexible to mixed use spaces.

Spring 2016
Prof. Paul Gleye
Urban Design Studio (Brussels, Belgium)
Objective: In the Saint Gilles neighborhood, work in teams to develop an unsuccessful park into a thriving urban center.
Result: Created a complex of buildings that added residential, community learning space, a gallery, and other mixed uses that celebrated elements of the existing neighborhood with a contemporary twist.

Fall 2016
Prof. Mark Barnhouse
Wetlands Research Facility (Ulen, MN)
Objective: Design a wetlands research facility near undisturbed prairie land that responds to the environment and educates the public.
Result: Using Lumion, created a video walk through that explored both the spaces and the detailing of the building, such as the foundation, curtain wall systems and connections, roofing systems, and skylights.

Spring 2017
Prof. Mike Christenson
Design Thesis: Industrial Transparency (St. Paul, MN)
Objective: Demonstrate architectural research ability through exploration of a hypothesis.
Result: Practiced a variety of researching methods that led to exploring both urban design principles, the industrial typology and how they can come together as one.

appendix c: special thanks

To my architecture professors for their lessons that will propel me into my professional career.

To Austin Foss, Kara Iliff, and Nick Lunde for the study groups that helped me through the brunt of the formal research.

To my parents for providing me with endless opportunities to grow and become my best self.