



TOWARD INTEGRATION: Collaborative Architecture and Design Methods

Thesis proposal for a
Fargo International Market & Food Co-op

Zach Mathern

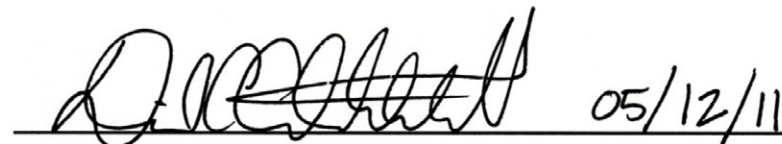
TOWARD INTEGRATION: Collaborative Architecture and Design Methods

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

By

Zach Mathern

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



Primary Thesis Advisor



Thesis Committee Chair

May, 2011
Fargo, North Dakota

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Thesis Abstract

This thesis investigates the current delivery methods architects use to create buildings in relation to the access to and quality of them. It pays special attention to investigating new delivery methods, which enable a wider range of clients to access design services and dwell within quality built environments.

Key Words: Architectural Delivery Models, Integrated Project Delivery, Nonprofit Organizations, Food Co-op, International Market

Problem Statement

What are the implications of architecture delivery models on the access to and propagation of quality architecture?

Statement of Intent

Project Typology

An architecture suitable for the needs of a growing nonprofit organization and its public users.

Theoretical Premise/Unifying Idea

Claim Under Investigation

The current model for architectural delivery falls short of providing high quality buildings which are financially accessible to clients as well as being a profitable venture for architects.

Supporting Premises

The current models for architectural delivery have flaws and are changing constantly.

Providing quality architecture requires effective processes of design and implementation.

Architects are struggling to sustain a viable practice while creating quality architecture.

Economically accessible architecture is needed for many clients.

Conclusion

With a better delivery model, quality architecture will in turn be propagated within sectors of society currently lacking in quality built environments.

Project Justification

Given the under-utilization of architectural services and advances in technology and building practices, it is necessary for architects and the construction industry as a whole to change the way in which design and architecture is delivered to society.

Proposal

Narrative

Fargo, ND is becoming populated and diverse enough to be able to accommodate some socioeconomic institutions which many larger cities already have. Organizations such as a food co-op and international market would improve the lives of the city's inhabitants, provide economic activity, and add to the city's diversity. There are, however, many obstacles which exist in the architecture and building industry which inhibit this type of development of our built environment. First, architecture firms are struggling to provide quality services with constant pressure to lower fees, especially in a struggling economy. Furthermore, current contractual relationships in the building industry are adversarial, increasing costs due to litigation and waste, as well as creating negative situations between the parties involved in building. Lastly, nonprofit organizations in general have less money to put toward architecture. I believe, however, that these obstacles can be overcome. Not only that, I believe it is imperative that we solve these problems in order to sustain local organizations and businesses that support local communities.

User/Client Description

The synthesis of an international market and food co-op is a unique and complex venture requiring cooperation and leadership. A partnership organization between these entities will be the primary client and owner of the proposed building. This organization will have a big-picture focus in order to ensure cohesiveness and coordination in the project.

Conversely the two entities, the international market and food co-op, are specific groups of people with needs of their own. In the design process, close attention will need to be paid to each party's needs while also making the best decisions for the project as a whole.

Users of the building will be the general public and, more specifically those in the community who are interested in a unique experience while shopping, eating, and learning in a rich environment. These people will come from many cultures and have varying economic standing. It is therefore important to create an environment in which it is comfortable for a wide cross section of society to interact.

Major Project Elements

Collective

- Internal and external parking
- Connections to public transportation
- Public gathering/performance space
- Office space
- Cooperative gardens

Food Co-op

- Product floor
- Bakery/prep-kitchen
- Product storage
- Classroom/learning kitchen
- Office space
- Cafe

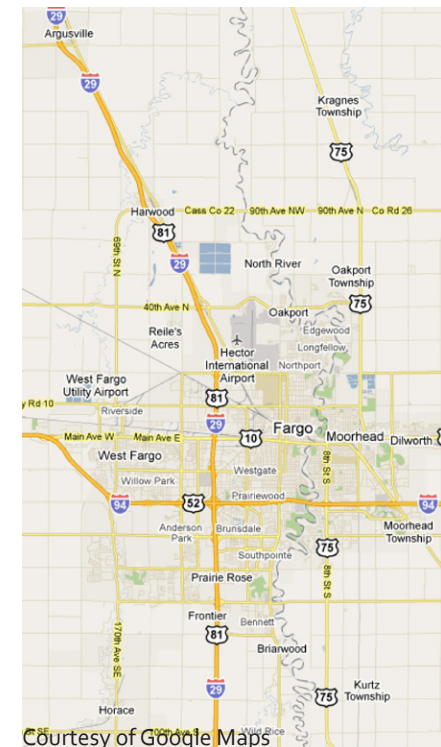
International Market

- Retail stalls
- Food court
- Kitchens
- Office space

Site Information: Macro

North Dakota is a midwestern state with a wide range of climatic fluctuations and a relatively flat landscape. Agriculture and oil extraction are major industries which drive much of the state's economics. The state is experiencing growth and diversification in its major metropolitan cities, as well as a shrinking rural population.

Fargo, the largest city in the state, is a growing community with a population just over 95,000 (Fargo Profile, 2010). Fargo is situated with the Red River on its eastern edge, with the city of Moorhead directly across the river in Minnesota.



Site Information: Micro

Fargo's downtown is a valuable location for this project due to its relatively progressive trends, growing residential population, and need for diverse services and activities. Downtown Fargo has seen rapid growth in recent years, yet there are many existing buildings and open spaces that are still under-utilized. Careful consideration of the flexibility of these sites to accommodate the programmatic requirements of this project will be needed in order to select a strong place to anchor the project. The specific site will need to be accessible by public and private vehicle and pedestrian traffic. If an existing building is to be renovated, it is to be of an institutional/durable quality.

Project Emphasis

The goal of this thesis is to investigate architectural delivery models in order to determine the best strategy to enable a wider variety of clients to access design services as well as construct buildings. Specifically, it will consider nonprofit organizations, architecture firms, and contractors that are of small to medium size in order to determine a system that is best suited for their economic situations.

Plan for Proceeding

In order to create a comprehensive thesis, a mixed-method quantitative/qualitative research approach will be used. Research will be done investigating the theoretical premise/unifying idea, project typology, historical context, site analysis, and programmatic requirements.

I will employ the Concurrent Transformative Strategy in order to gather , interpret, and present qualitative and quantitative information simultaneously. Information will be presented graphically and through text. Interviews will also be conducted with local people involved in each organization.

The research strategy will ultimately be driven by the theoretical premise/unifying idea.

I will document the thesis process throughout the research and design phases with photography, drawing, modelling, and other digital media.

Previous Studio Experience

2007-2008 Second Year Studio

Fall Semester - Professor Darryl Booker

Tea House - Fargo, ND

Boat House- Minneapolis, MN

Mountain Dwelling - Colorado

Spring Semester - Professor Mike Christenson

Casting and Volumetric Studies

Community Live/Work Development - Fargo, ND

2008-2009 Third Year Studio

Fall Semester - Professor Ron Ramsay

Agincourt Arts Block - Agincourt, IA

Public Library - Moorhead, MN

Spring Semester - Professor Steve Martens

Kinisis Science Museum - Fargo, ND

Structural Analysis and Re-Development

2009-2010 Fourth Year Studio

Fall Semester - Professor Bakr Aly Ahmed

Mixed-use High Rise - San Francisco, CA

KKE Competition - Musical Instrument

Spring Semester - Professor Mike Christenson

Professor David Crutchfield

Building Element Analysis - Jaipur, India

Important Notions for Urban Design in Jaipur

Mixed-use Urban Design - Jaipur, India

2010-2011 Fifth Year Studio

Fall Semester - Professor Steve Martens

Christian Science Church

Historic Structure Report - Fargo, ND

Adaptive Re-Use - Fargo, ND

Program

Theoretical Premise Research

Theoretical premise: With a better architectural delivery model, quality architecture will in turn be propagated within sectors of society currently lacking in quality built environments.

To support this premise, one can observe our current situation. What is our current strategy for architectural delivery and what are its results?

The current norm is a dysfunctional architecture/engineering/construction (AEC) industry which seems to have missed the productivity increase in other industries that were made possible by technological and process advances in the late-twentieth century. Often, budgets don't reflect actual costs, schedule deadlines are missed, and change orders result from inadequate design documentation (Bernstein, 2010). As much as 30% of construction costs can be wasted in the construction process due to inefficiency, mistakes, and delays (The Economist, 2000). While these failures and inefficiencies continue, the AEC industry is now expected, and rightly so, to produce environmentally responsible and high-performance building solutions (Bernstein, 2010).

In the current model, traditionally a design/bid/build (D/B/B) process, a linear process of design (programming and schematic design through construction administration) creates a framework based on hierarchical processes of subcontracting and the separation of thinking and making (design and construction) (Bernstein, 2010).

The separation of design and construction is especially evident when considering the contractual relationships in a D/B/B process. As seen in the adjacent diagram (Figure 1.), an architect contracts with an owner to provide design services. Upon completion of the design and construction documents, the owner then contracts with a constructor to build the design. The constructor is expected to determine how to build the design, a constructor responsibility known as means and methods (Bernstein, 2010).

In this typical contractual relationship, the architect is not involved in means and methods, which isn't considered part of the design. Also, the constructor is not involved in the design creation, because he/she doesn't have the professional credentials required (Bernstein, 2010). It only seems logical that experiential insight is missing when construction experience isn't part of designing and design experience isn't a significant part of construction.

Current contracts, which delineate the differences between parties by creating boundaries and removing responsibility of one party for another, are inherently adversarial. This has led to fragmentation and inefficiency in the process of propagating architecture, and therefore reduces the quality of that architecture (Ashcraft, 2010).

While buildings continue to be built with these inefficient processes, performance and environmental targets continue to rise rapidly. Without major change in the AEC industry, the rising targets will continue to be unmet. The use of technologies and increased collaboration will allow us to move toward a better practice of building.

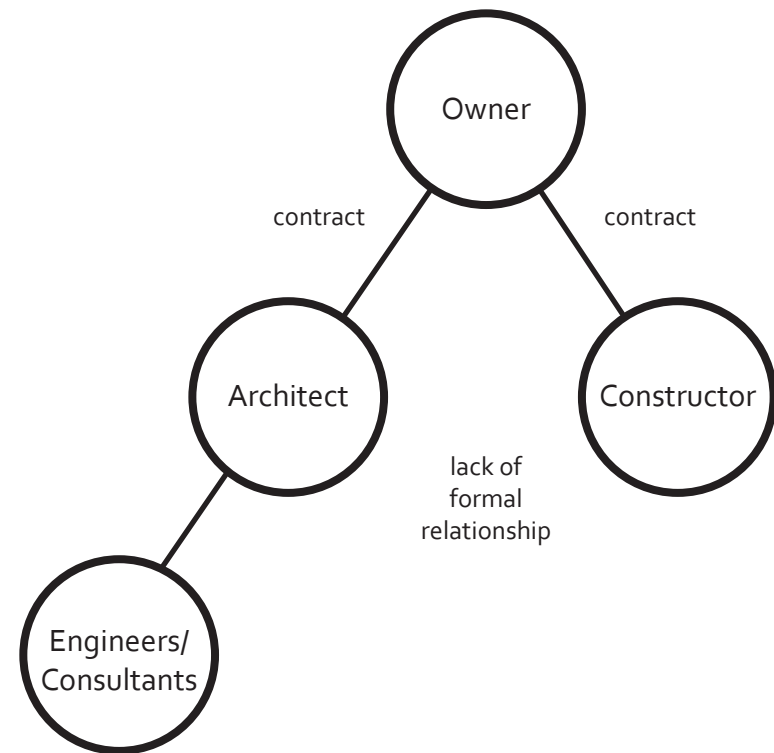


Figure 1.

Technology has a role in reshaping the practice of architectural delivery. What does technology and, specifically, building information modeling (BIM) enable?

Three dimensional modeling allows designers to visualize and create virtual form and space in way that creates a much more comprehensive set of information than 2d drawings can support. BIM goes even further by connecting data and 3d models into a database of qualitative and quantitative information. Through the use of BIM software such as Revit, greater production efficiency and more accurately detailed models are possible. These productive improvements however, are a small part of what is made possible by BIM and collaboration.

Collaboration is the key to bringing out BIM's most powerful outcomes. In a collaborative process, architects, engineers, contractors, vendors and the like can provide data which can be used interactively to optimize the design (Ashcraft, 2010, p. 147). The information within a BIM project can come from multiple parties simultaneously throughout the design process, allowing early decision making and a reduced production time.

The use of BIM and intensified collaboration is being supported by research and AEC industry organizations because it results in higher quality buildings which can also attain greater environmentally sustainable solutions (Ashcraft, 2010, p.147).

The Construction Users Roundtable, after analyzing the sources of construction inefficiency, determined that full collaboration, including the use of BIM, open information sharing, and early involvement of key players will optimize the building process. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers also agree that a collaborative or integrated process, including early involvement of all parties will enable higher building performance and a reduction in total project costs (Ashcraft, 2010).

While BIM is a tool that can increase efficiency and create higher quality, its use and simple collaboration alone, without major changes in the contract and process structure of the current AEC industry, is not enough to create a truly integrated practice of building quality environments. An emerging delivery model, termed Integrated Project Delivery, is a new model of practice for all fields within the AEC industry and has the potential to revolutionize the building process.

Collaboration and the use of BIM technology are catalysts for comprehensive design and quality buildings. How can Integrated Project Delivery enable this success?

Integrated Project Delivery (IPD) is a process in development which is not yet widely practiced in the United States, but is gaining momentum and recognition as a better solution for the propagation of quality architecture. IPD has been developed from sources around the world, especially from the successful Project Alliancing method in the United Kingdom and Australia (Ashcraft, 2010, p. 151).

The AIA's *Integrated Project Delivery: A Guide*, published in 2007, states, "Integrated Project Delivery (IPD) is a project delivery approach that integrates people, systems, business structures and practices into a process that collaboratively harnesses the talents and insights of all participants to optimize project results, increase value to the owner, reduce waste, and maximize efficiency through all phases of design, fabrication, and construction" (AIA, 2007). These may be goals of any project, but the IPD structure can enable this aspiration to become behavior that can be managed and rewarded. The leadership and risk-sharing structure of IPD actively supports collaboration (Ashcraft, 2010).

In order to collaborate effectively and attain the benefits of Integrated Project Delivery, the entire team, including owner, architect, engineers, and other key players must understand and support the principles of IPD (AIA, 2007).

Principles of Integrated Project Delivery

Mutual Respect and Trust

In an integrated project, owner, designer, consultants, constructor, subcontractors and suppliers understand the value of collaboration and are committed to working as a team in the best interests of the project.

Mutual Benefit and Reward

All participants or team members benefit from IPD. Because the integrated process requires early involvement by more parties, IPD compensation structures recognize and reward early involvement. Compensation is based on the value added by an organization and it rewards “what’s best for project” behavior, such as by providing incentives tied to achieving project goals. Integrated projects use innovative business models to support collaboration and efficiency.

Collaborative Innovation and Decision Making

Innovation is stimulated when ideas are freely exchanged among all participants. In an integrated project, ideas are judged on their merits, not on the author’s role or status. Key decisions are evaluated by the project team and, to the greatest practical extent, made unanimously.

Early Involvement of Key Participants

In an integrated project, the key participants are involved from the earliest practical moment. Decision making is improved by the influx of knowledge and expertise of all key participants. Their combined knowledge and expertise is most powerful during the project’s early stages where informed decisions have the greatest effect.

Early Goal Definition

Project goals are developed early, agreed upon and respected by all participants. Insight from each participant is valued in a culture that promotes and drives innovation and outstanding performance, holding project outcomes at the center within a framework of individual participant objectives and values.

Intensified Planning

The IPD approach recognizes that increased effort in planning results in increased efficiency and savings during execution. Thus the thrust of the integrated approach is not to reduce design effort, but rather to greatly improve the design results, streamlining and shortening the much more expensive construction effort.

Open Communication

IPD’s focus on team performance is based on open, direct, and honest communication among all participants. Responsibilities are clearly defined in a no-blame culture leading to identification and resolution of problems, not determination of liability. Disputes are recognized as they occur and promptly resolved.

Appropriate Technology

Integrated projects often rely on cutting edge technologies. Technologies are specified at project initiation to maximize functionality, generality and interoperability. Open and interoperable data exchanges based on disciplined and transparent data structures are essential to support IPD. Because open standards best enable communications among all participants, technology that is compliant with open standards is used whenever available.

Organization and Leadership

The project team is an organization in its own right and all team members are committed to the project team’s goals and values. Leadership is taken by the team member most capable with regard to specific work and services. Often, design professionals and contractors lead in areas of their traditional competence with support from the entire team, however specific roles are necessarily determined on a project-by-project basis. Roles are clearly defined, without creating artificial barriers that chill open communication and risk taking.

Integrated Project Delivery: A Guide, © copyright, AIA | AIA CC 2007

A key component of Integrated Project Delivery is a new form to the contractual relationships between parties involved. The goal is to have one multi-party agreement in which all parties share in the failures and success of the project. This enables an interconnectedness missing in traditional contract documents. Under IPD contracts, the project team works jointly to develop goals and financial targets early in the process, so all members are on the same page from the onset. The project is also managed jointly between the team members (Ashcraft, 2010).

Several options for contracts have been published by AIA and others by ConsensusDOCS. One ongoing issue is that the legal system and insurance industry have not fully developed protocols and services to support the new contracts. The choice of contract, legal, and insurance implications need to be carefully considered on a project-by-project basis at this time. Even though legal issues are of concern, one important benefit of IPD is that courts and insurance companies may be less involved in construction litigation because disputes can better be solved within the IPD team structure and won't rise to the level of a legal claim (Novitski, 2010).

This potential decrease in construction litigation is another important factor in the cost-saving potential of IPD and evidence to support a collaborative process. Legal litigation is a money-draining process, which further separates the parties involved in a project. By solving issues collaboratively, success is rewarded to the whole team, further strengthening the trust between team members.

Who owns the model? Who controls the project? Who is to blame if there is a design problem? There are many questions practitioners have regarding IPD, but often they arise based on old patterns of practice, and may become irrelevant with the implementation of an IPD process. In the IPD process, control is shared and leadership is assigned dynamically based on who in the team is best suited for leadership on a particular issue (Bernstein, 2010).

While this intense collaboration and sharing of responsibility may be challenging, research shows that collaboration and information sharing leads to an overall greater outcome for the team. In fact, an individualistic approach, concentrating on personal gain without true investment for the group's combined success, provides lower reward to the individual in the long run. Over time, rewarding cooperation (and retribution for not collaborating) results in the highest benefit to the whole (Bernstein, 2010).

While new and challenging to implement, Integrated Project Delivery provides a framework to solve complex issues in a collaborative environment. This early involvement of key players, open sharing of information, team decision making, and risk-sharing process ensures a higher quality product. Furthermore, less waste and controlled financial goals can reduce overall project costs for an owner and involved parties.

Summary

In the research of the theoretical premise I have investigated current models of architectural delivery and noted their inefficiencies and adversarial frameworks. From this basis of current practice, an investigation of Building Information Modeling shows the benefits of multidimensional modeling and its connection with qualitative and quantitative data in an architectural design problem. Finally, collaboration has been identified as a key to the usefulness of BIM, and new models of architectural delivery, such as Integrated Project Delivery, will leverage technology and collaboration in order to create higher quality architecture.

The current system of practice, most often a Design/Bid/Build process, is inefficient and does not foster teamwork and success in the process of a project or the project outcome itself. Under traditional contractual relationships, parties are separated in their responsibilities and liability, creating an adversarial relationship which can easily lead to complicated and costly litigation between those involved.

While other methods than D/B/B exist, they too lack full collaboration and mutual benefit. In a design/build situation, owner's are left without an agent relationship to protect their interests. In processes involving construction managers, while often more collaborative, there are still disjointed processes in design and construction.

BIM has the ability to allow various parties to corroboratively work on a design solution, and allows useful information to be imbedded in the model and used by everyone to optimize the design. This technology alone, however, only further complicates the existing issues in non-collaborative delivery models. The full potential of BIM can only be realized by a framework for architectural delivery that fully supports collaboration and information sharing.

Integrated Project Delivery is founded on principles of collaboration, information sharing, and sharing/measuring/defining success and failure with the whole team involved in an architectural project. The collaborative involvement of the owner, architects, engineers, constructors, subcontractors, and suppliers can lead to better outcomes. Research and supportive professional organizations indicate that this collaborative process will reduce waste on the project, including time, money, and materials. Higher levels of sustainability and building quality are also attainable in the IPD process.

The combination of Integrated Project Delivery and BIM can reduce costs and produce higher quality results, therefore it has potential for a greater cross section of society to be involved in built environment creation, and can produce healthier, safer, more efficient environments for the benefit of humans, as individuals, organizations, and the public as a whole.

Typological Research

Case Study I

Whole Foods Co-op, Duluth, MN

Owner: Whole Foods Community Co-op, Inc.

Architects and Engineers: LHB, Inc.

Constructor: Builder's Commonwealth, Inc.

18,000 sq. ft.

This full-service grocery store, specializing in organic and local products, is a member-owned company with about 6000 current member/owners. In 2005, high demand and increasing profit enabled the co-op to design, renovate, and transition into this LEED Certified building. The co-op employs 89 staff with annual sales of \$11 million.

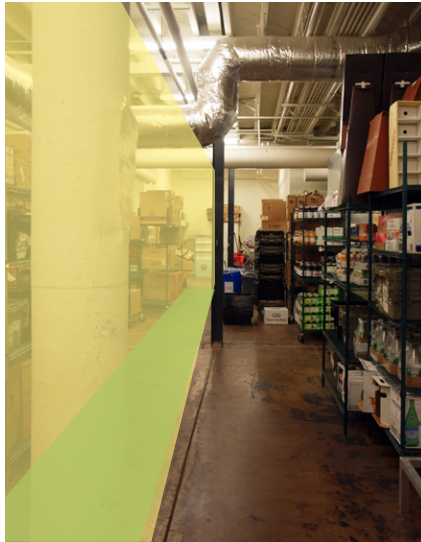
Situated in hilly Duluth, people and product flow is a very important aspect of the design within the existing two-level building. Regarding the design of the co-op, General Manager Sharon Murphy stated, "I think architecture is removing barriers and making things flow", which indicates this issue was at the forefront of considerations for the design team (personal communication, December 3, 2010).

"I think architecture is removing barriers and making things flow."

Another major aspect of the project is the integration of sustainable materials and systems that increase the building's energy efficiency, occupant health, and durability.



Graphic Analysis

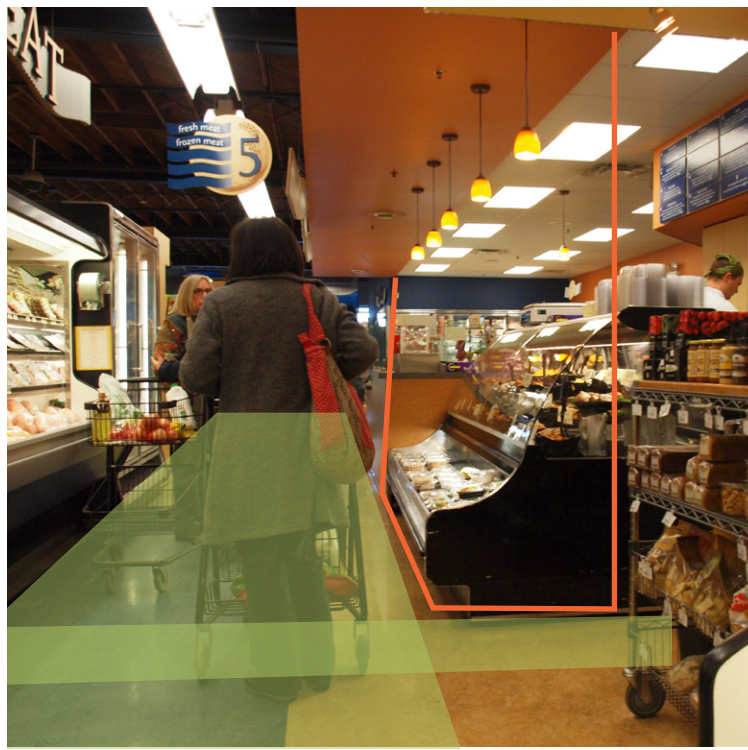


Structure

Major structural elements, namely column lines, have been used as cues for lines of movement. Because this is a renovation project, the structural column grid existed pre-design, and in some locations spaces are interrupted negatively by a column. In most cases, however, using the columns and indicators of path is an effective solution.

Natural Light

Fenestrations are hierarchically placed based on space use. In the produce section, small high windows with exterior shading reduce light harmful to food but still allow a limited scope of view outdoors. In spaces where people linger and interact, large consecutive windows allow light to flood the space.



Circulation to Space

Long open corridors or aisles function as linear paths to easily move large volumes of goods and serve as the fastest routes for people. Both open and enclosed functional spaces flank these paths. These larger paths run parallel with each other, lengthwise with the building, while smaller perpendicular paths form connections between the larger paths and spaces.

Major Programmatic Elements



Demonstration Kitchen



Refrigerated Storage



Staff Workstations



Outdoor Seating



Deli/Prepared Foods



Staff Laundry/Shower Room



Centralized Refrigeration



Loading Dock

Other elements include:

Product Floor, Produce Prep. Room, Deli Kitchen, Checkout Lanes, Indoor Seating, Conference Room, Break Room, Product Storage

Case Study II

Yale Steam Laundry Condominiums, Washington, DC

Owner: IBG Partners/Greenfield Partners

Architect: John Ronan Architects

Associate Architect: BBG-BBGM

Engineers: Holbert Apple Associates (structural)
GHT Limited (M/E/P)

General Contractor: Clark Construction

38,000 sq. ft.



Courtesy of Architectural Record



Courtesy of Architectural Record

Located near the Washington Convention Center, this renovation project exemplifies the ability to renovate and re-use high quality industrial buildings for new purposes while keeping the important historical character intact. Listed on the National Register of Historic Places, this former commercial laundry facility provides an “aesthetic anchor” for this multi-family residential project. According to the architect, the layout of spaces is based on the internal steel structure and configuration of windows. Materials such as hot-rolled steel are used for new elements to contrast with the white-painted exposed interior brick. Connected to the original structure are two new towers of condominiums and apartments (Lentz, 2010).



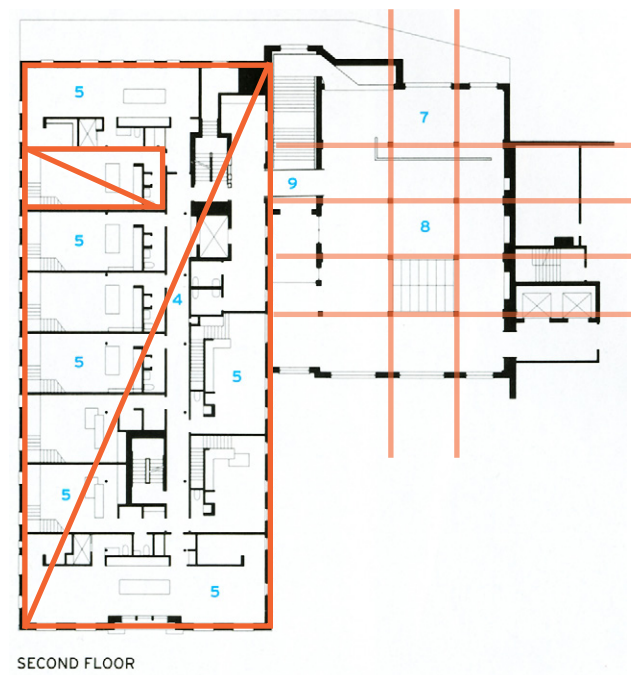
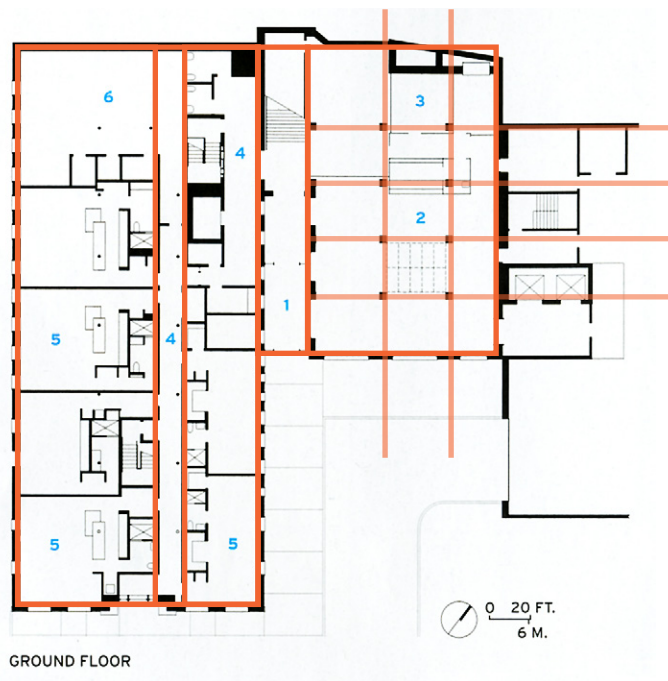
Courtesy of Architectural Record

Steel stairs and bridge contrast with the existing painted brick interior.

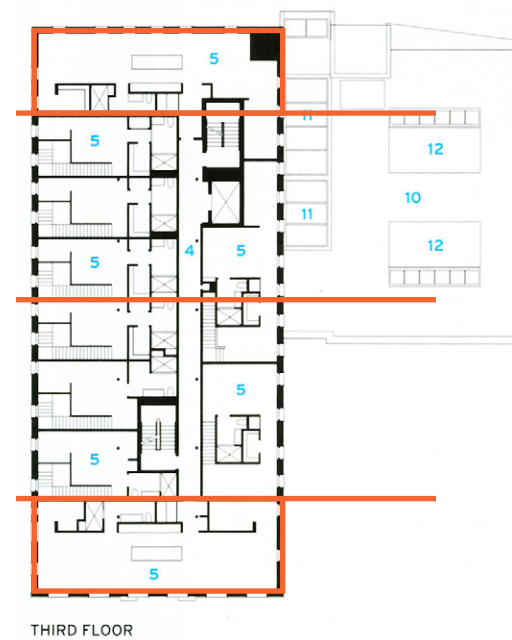


Courtesy of Architectural Record

Existing structural columns were used to help delineate space.



- 1 ENTRANCE
- 2 LOBBY/RECEPTION
- 3 MANAGEMENT OFFICES
- 4 PUBLIC CORRIDORS
- 5 RESIDENCES
- 6 OWNER STORAGE
- 7 RECREATION AREA
- 8 GYM
- 9 BRIDGE
- 10 ANNEX ROOF
- 11 SKYLIGHT
- 12 LIGHT MONITOR



Images Courtesy of Architectural Record

Case Study III

Berkeley Bowl West, Berkeley, CA

Owner: Yasuda Family, Berkeley Bowl Produce, Inc.

Architect: Kava Massih Architects

144,217 sq. ft.



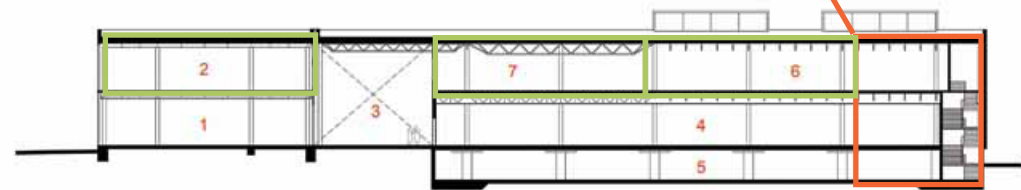
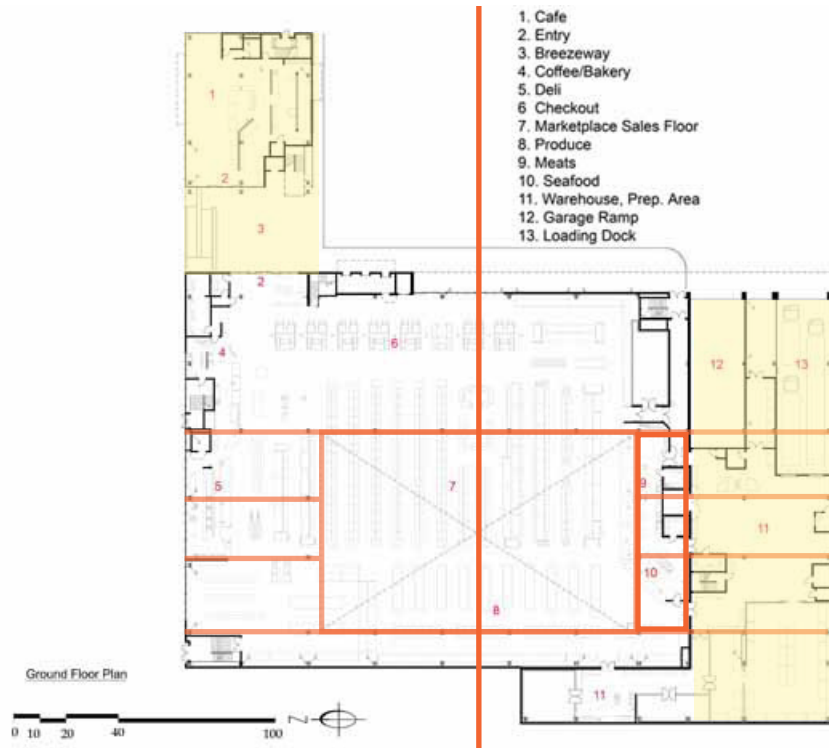
Courtesy of Architectural Record



Courtesy of Architectural Record

Berkeley Bowl West, completed in 2009, is a modern iteration of a retail grocery store. The program of the project also includes a cafe, community room, underground parking, warehouse, and commercial kitchen (Berkely, 2010).

Located in a district with many warehouses and industrial buildings, the owner and designers emphasized the need for customers to feel comfortable at this family grocery store, while still drawing relationships to its industrial context. Outdoor seating protected by a high canopy provides a place for customers and community members to gather, while this breezeway connects the grocery store to housing, the cafe, and the community room (Berkely, 2010).



1. Cafe
2. Community Room
3. Breezeway
4. Marketplace Sales Floor
5. Parking Garage
6. Kitchen
7. Offices

Images Courtesy of Architectural Record



Courtesy of Architectural Record

Warm colored wood is inviting to customers at the entrance, while steel siding pays homage to the industrial surroundings.



Courtesy of Architectural Record

Large skylights and tall ceiling height allows natural light to illuminate the expansive grocery store.

Summary

This case study series examines built works of architecture based on their typologies, programs, and quality of work. These case studies have implications on my choice of site which includes an existing building for adaptive re-use and the project typology of mixed-use/retail, including a food co-op and international market.

In the case study of Whole Foods Co-op, the analysis of program elements will bear on the program of this thesis. The Whole Foods Co-op also exemplifies goals of sustainability, notably its efficient systems, use of renewable materials, and LEED certification. These principles are reciprocally supported by this case study and the theoretical premise research.

The Yale Steam Laundry Condominiums provide insight into adaptive re-use of a similar building, it and the site for this thesis being 1920s commercial laundry facilities. Although the program is different, the existing context in which a new design has been inserted shows a deliberate and careful study of appropriate changes and additions to a historically significant building.

Finally, the Berkely Bowl West is an example of program elements and design solutions for a retail grocery store. While food co-ops and privately-owned grocery stores may have some different goals and practices, they share many common elements. Also, food co-ops often look to the expertise of the grocery store industry for insight into the business of food sales.

While these case studies may not have involved truly collaborative delivery models, such as Integrated Project Delivery, the claim of the theoretical premise still stands and the case studies serve to develop the typology and program of the thesis.

The analysis of the case studies was done by examining photographs and research information about each project. From this “observation” of the projects, qualitative aspects of each can be seen. The qualitative aspects will be evaluated to refine the desired qualitative aspects of the thesis design.

Graphic analysis of each project brings about understanding of relationships between elements, clarifies reasons the design may have been created, and provides insight into the theoretical underpinnings of the projects.

All of these cases address some issues of sustainable design which bear on the theoretical premise. Sustainable design is a key aspect of Integrated Project Delivery as well as the goals of food co-ops in general and those involved in an international market.

Historical Context

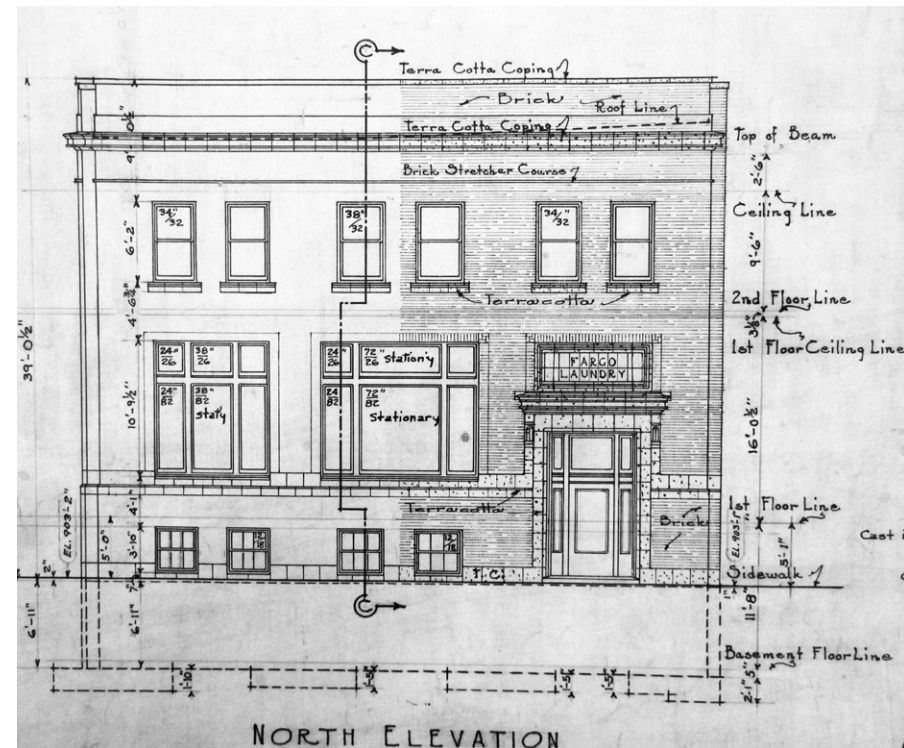
Fargo Laundry building

On the corner of 10th Street and 1st Avenue South in Fargo, North Dakota, is the former Fargo Laundry, Co. building, constructed in 1923. This historic building, subsequent building additions, and the half-block it occupies is the site for this thesis project. The original laundry facility was designed by locally renowned architect William Kurke and the firm of Keith & Kurke Architects and Engineers (Friesz, Horntvedt, Jensen, & Lindmeier, 2010).

The unique Industrial Style of the Fargo Laundry building is exemplary of Kurke's architectural talents. Started in 1913, Keith & Kurke & Associates quickly became a prominent architecture firm in Fargo and the state of North Dakota. Kurke was responsible for the design of several other prominent buildings in the area such as Morrill Hall, Churchill Hall, and the Memorial Union on the campus of North Dakota State University. He also participated in the design of the North Dakota State Capitol. These and the laundry facility are examples of works Kurke was involved in as North Dakota was on a path of growth and prosperity, especially in the early 20th century (Friesz et al., 2010).

During that time, immigration and westward expansion and travel was rapidly increasing. Fargo, which is located on the Red River and the Northern Pacific Railroad line created an ideal situation for settlement and a resting place for travelers. Many hotels, entertainment venues, and industries popped up in Fargo over a short time period. The necessity for commercial laundry facilities was growing rapidly and sprouted many laundry facilities downtown (Friesz et al., 2010).

The original public entry to the Fargo Laundry, Co. building, as seen in the original elevation drawing.



Original elevation drawing produced by Keith & Kurke Architects & Engineers. Courtesy of NDSU Institute of Regional Studies and University Archives.

Though the population of downtown Fargo started to decline in the 1950s and 1960s the Fargo Laundry building stayed open as a laundry facility. Property ownership has changed several times but had stayed a laundry facility until recently. This exemplifies the quality of the building and its adaptability to changes in technology and methods used by commercial laundry facilities.

The original building design is constructed of exterior masonry walls with interior timber framing. This structural frame is a major factor in the building's flexibility. While structural columns are arranged in a grid within the building shell, the open plan allowed for changing configurations of equipment throughout the years as a laundry facility (Friesz et al., 2010).

Another significant aspect of the original design is the large glazed openings, most notably on the east facade. These large windows allowed natural daylight to penetrate into the facility's work spaces to provide light for the laundry workers. Portions of the windows are also operable. This operability allowed for ventilation of hot steam and provided fresh air circulation to mitigate buildup of chemicals used in the laundry process. A final significant aspect of the building's design is its three-section plan, defining public, semi-private, and private space (Friesz et al., 2010).



1920s photograph of employees and owners of Fargo Laundry.
Courtesy of NDSU Institute of Regional Studies and University Archives.



The delineation of private and public space is a key aspect of space planning. There are three distinct zones visible in plan and also in the buildings east facade. The entrance on the north facade indicates the public section of the building, also visible as a slight extension of the building facade, consisting of about 1/7th the buildings total length. This served as a reception area for those doing business at the laundry facility (Friesz et al., 2010).

The middle 5/7th of the building is semi-private space allocated for the working functions of the laundry facility. In this section, on the first floor, the actual laundering occurred. On the second floor of this middle section the laundry was folded and repaired by the laundry employees, as seen in the photograph to the right (Friesz et al., 2010).

Lastly, the remaining 1/7th of the building length is private, serving as the shipping and receiving functions of the business. This area is located adjacent to an alley which allowed trucks to deliver laundry to and from the building (Friesz et al., 2010).

While the original laundry building has stood the test of time, more warehouse space and the increase in retail laundry operations necessitated an addition onto the west side of the building in 1991. Also included in this addition is a drive-up and retail wing of the building, accessible by 1st Ave. S (Friesz et al., 2010).



1920s photograph of Fargo Laundry employees at work.
Courtesy of NDSU Institute of Regional Studies and University Archives.

Despite the longevity of the laundry operations in the building and the overall unchanged structure of the original laundry building, there are many improvements that will need to be made to revitalize the usefulness of the building. Also, major changes need to be made in order to meet code and accessibility standards for the building to be useful. Chemical remediation, mechanical equipment, roof, and window replacement are necessary steps if the building is to be renovated (Friesz et al., 2010).

While these improvements will be major project expenses they are necessary for the building to last at possibly double its current lifespan. These upgrades would help save the building from deterioration and would also serve to make the building more energy efficient, safe, and pleasant to be in.

These issues will be assessed as part of this design thesis, but overall, the integrity of the original structure will be regarded with respect in this adaptive re-use project. The historical significance of the building is a key aspect of this thesis and in the context of reality. The original Fargo Laundry building has potential for nomination and acceptance into the National Register of Historic Places.



1971 photograph of the Fargo Laundry building.
Courtesy of NDSU Institute of Regional Studies and University Archives.

Food Co-op in Fargo, ND

A food co-op is an organization of members who work cooperatively in order to provide a wide range of food products to its members and the community. Historically, food co-ops operate on principles of providing healthy food options, such as organic and local products.

Food co-ops are common in cities across the United States, even those smaller than Fargo. This raises a question. Why doesn't Fargo have a food co-op? The fact is, Fargo did at one time have a food co-op, but for various reasons, including mismanagement, it was not able to stay afloat as a viable business.

The need and desire for the products that a food co-op can provide have not disappeared. In fact, there is currently a group of dedicated volunteers working to start a food co-op in Fargo in the near future. I am personally interested in this becoming a reality, so that I can be a member and purchase food, and also because I think it is an important organization to sustain healthy living in our community.

This is a major reason I have chosen to include a food co-op in my thesis project, along with its applicability to the theoretical premise of this project.

International Market in Fargo, ND

The International Market Plaza is a real project in development in Fargo. This yet-unrealized market program has been developed by the Immigrant Development Center (IDC) in Fargo. The IDC is an organization which strives to provide opportunities for economic development and stability to low-income individuals, immigrants, and refugees.

This project has been developed to act as an incubator for entrepreneurship and self-sufficiency, and to provide services to the community that are in growing demand, such as restaurants, groceries, and retail shops.

Architectural and organizational plans have been developed for the International Market Plaza, however, full funding for the project has not been realized, and the existing building slated for the market's use will most likely be used for another purpose.

Regionally, there are successful cases of similar retail markets for the economic development of minority or low-income communities, such as the Midtown Global Market in Minneapolis, MN. The success of other similar programs regionally and the meaningful goals of the International Market Plaza have personally interested me in this project. I would also enjoy the amenities the market would provide. The international market project also has relevance to the theoretical premise of this thesis.

Goals for the Thesis Project

1. To develop the theoretical premise in conjunction with the architectural design in a process of design development modelled on the principles of Integrated Project Delivery and the theoretical premise research.
2. Completion of a comprehensive thesis book comprised of concise research writing and informative graphics which works to support the final design presentation.
3. Completion of a design presentation which fully incorporates the ideas of my theoretical premise, showcases design and production abilities, and shows the ability to resolve a complex set of issues in a meaningful manner.
4. The development of a working schedule with clear goals and frequent target dates in order to stay active in the thesis process.

5. Frequent collaboration with the thesis advisor and peers in order to share ideas and opinions which will keep the project out of isolation from the influences of collaborative learning.

6. Careful documentation of the design process in order to show the influences of the theoretical premise on the design outcomes.

7. The composition of a comprehensive thesis which will act as evidence of my academic and professional abilities, serving as a cornerstone in the transition from the educational to professional environment in the field of architecture.

8. Enjoyment of the act of architecture, in order to affirm the continued interest in tackling complex social issues through the act of environmental design.

Site Analysis

To initiate this site analysis, I approached the Fargo Laundry building on foot. Approaching from the south I noted the simple but somewhat elegant facade which overlooks thousands of cars as they pass going northward on 10th St. The building doesn't appear to be in any great disrepair, but it is apparent that it is unused and needs significant improvements.

It seemed unfortunate that the only paths to pass the building to get a sight of the west end parking area of the lot was either in an alleyway to the south, or on the sidewalk on the north edge. Both of these paths have little vegetation. Only three reasonably-sized trees exist on the site, and in fact are on the city boulevards. One small tree is adjacent to 10th St. and two larger trees flank the parking lot on the north side. Once I made my way to the back of the site (west side) it was clear that almost the entire site either has built structures or is paved.

The site does feel dynamic, however. The 1991 addition of a warehouse and shipping/receiving dock, as well as a drive-through retail structure protruding to the north, break up the parking lot into something more than a simple rectangle. While the newer structures by no means live up to the detail and general quality of the original buildings design, they add a dynamic feeling to the site.



The views outward from the sight are a mixture of roadways, trees, houses, apartments, and various small businesses. A church, park district building, and the county courthouse are also visible through trees and tucked behind other buildings. This view outward shows the diversity of functions, density, and use of the land surrounding the site. There is a sense that the site is on the periphery of a more bustling downtown.

Although there is very little activity on the site currently, the amount of passing traffic and sizable amount of building and outdoor space begs for the revitalization of the property. The existing buildings on the site are the most prominent, large-structures within two blocks in any direction. This gives the site a sense of hierarchical value as a landmark for passers-by, and potentially a destination point.



Quantitative Analysis

Soils

The soil on the site is classified in the Fargo series. It consists of very deep silty clay. The series is level and is poorly drained due to its slow permeability (USDA, 2005).

Vehicular Traffic

10th St., a major one-way thoroughfare passing the site, which allows north-moving traffic, has more than 12,000 vehicles passing daily (average annual daily traffic figures from 2006). 1st Ave. S. has a fair amount of east/west traffic at about 3000 vehicles per day. Adjacent to the west side of the site, 11th St., which primarily serves the nearby residential community has roughly 500 vehicles passing per day (MetroCog, 2007).

Pedestrian Traffic

There is light pedestrian traffic on the sidewalks on the site's perimeter. Most of the pedestrian traffic is to the west of the site and consists of people coming to and from residences and cars parked along the street. There is limited pedestrian use of the 10th St. sidewalk on the east edge of the site.

Site Character

The original 1923 building and 1991 addition are effectively empty and unused. The owner still has limited use of the building while it is for sale. Other than the under-utilized building and unappealing parking lot, the site is in relatively stable condition, with a few trees and grass on the property perimeter which grow well in summer.

64 Site Analysis

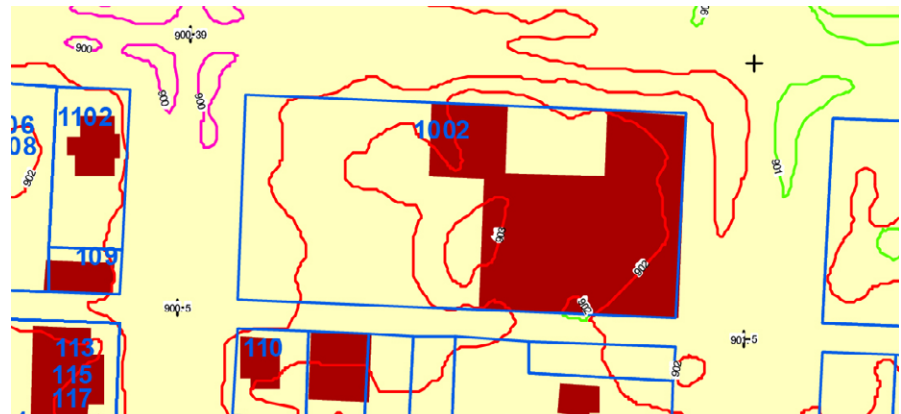
Utilities

Electrical power is fed to the original laundry building on the north edge of the site. Natural gas enters the existing building on its east facade in the southeast corner.



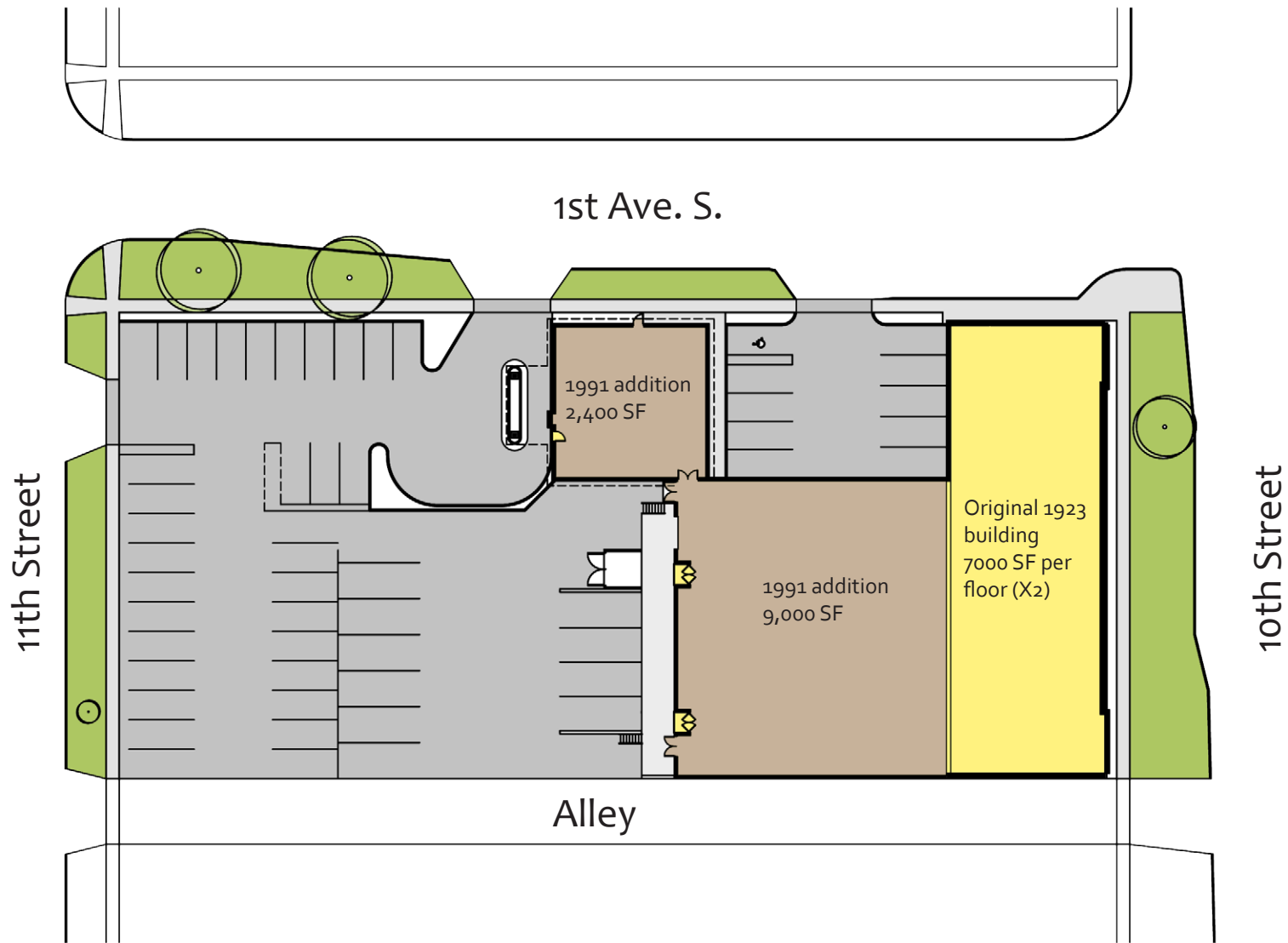
Topography

There is very little slope on the site. Considering the entire site is either building or parking lot, any remaining slope is a function of man-made water shed on pavement surfaces.





Aerial Photograph (City of Fargo, 2008).



Site Plan 1"=50'

Programmatic Requirements

Collective

Internal parking	50+ spaces
Connections to public transportation	
Public gathering/performance space	600 sq. ft.
Office space	400 sq. ft.
Cooperative gardens	1000 sq. ft.

Food Co-op

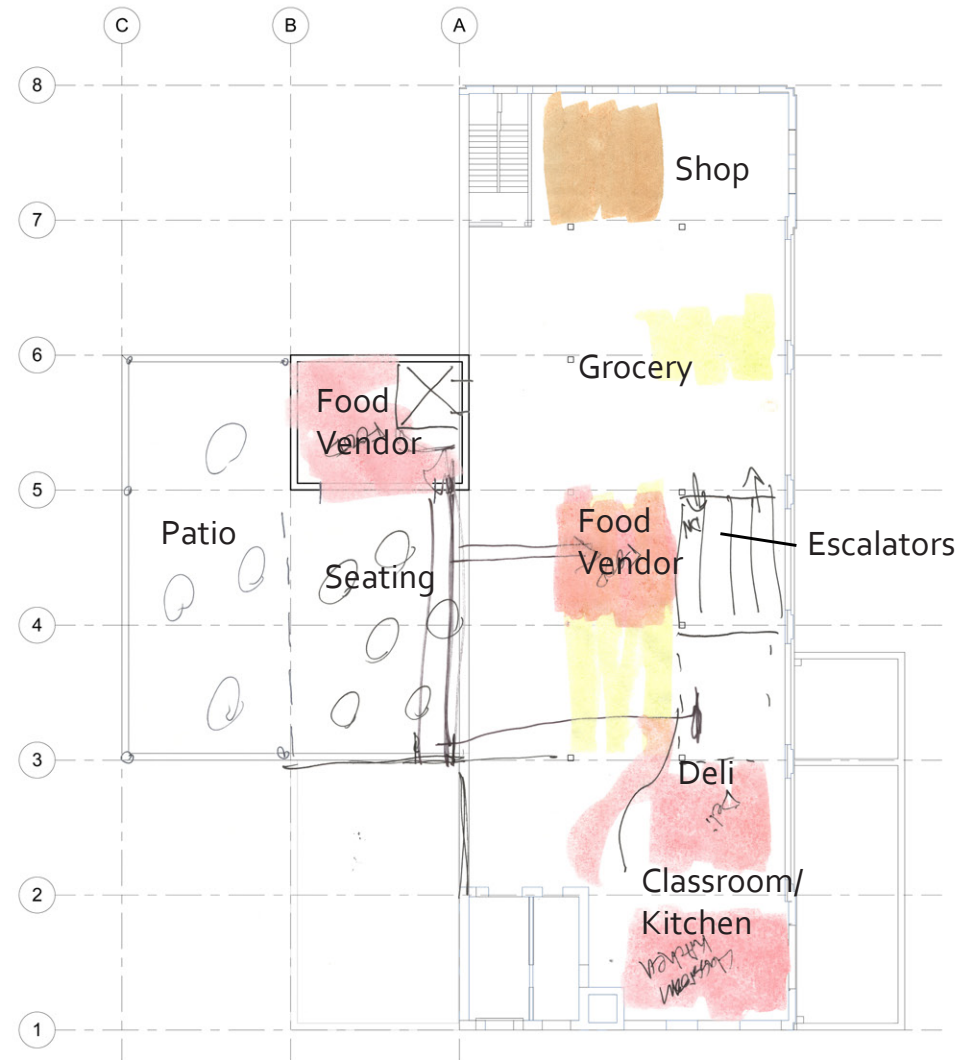
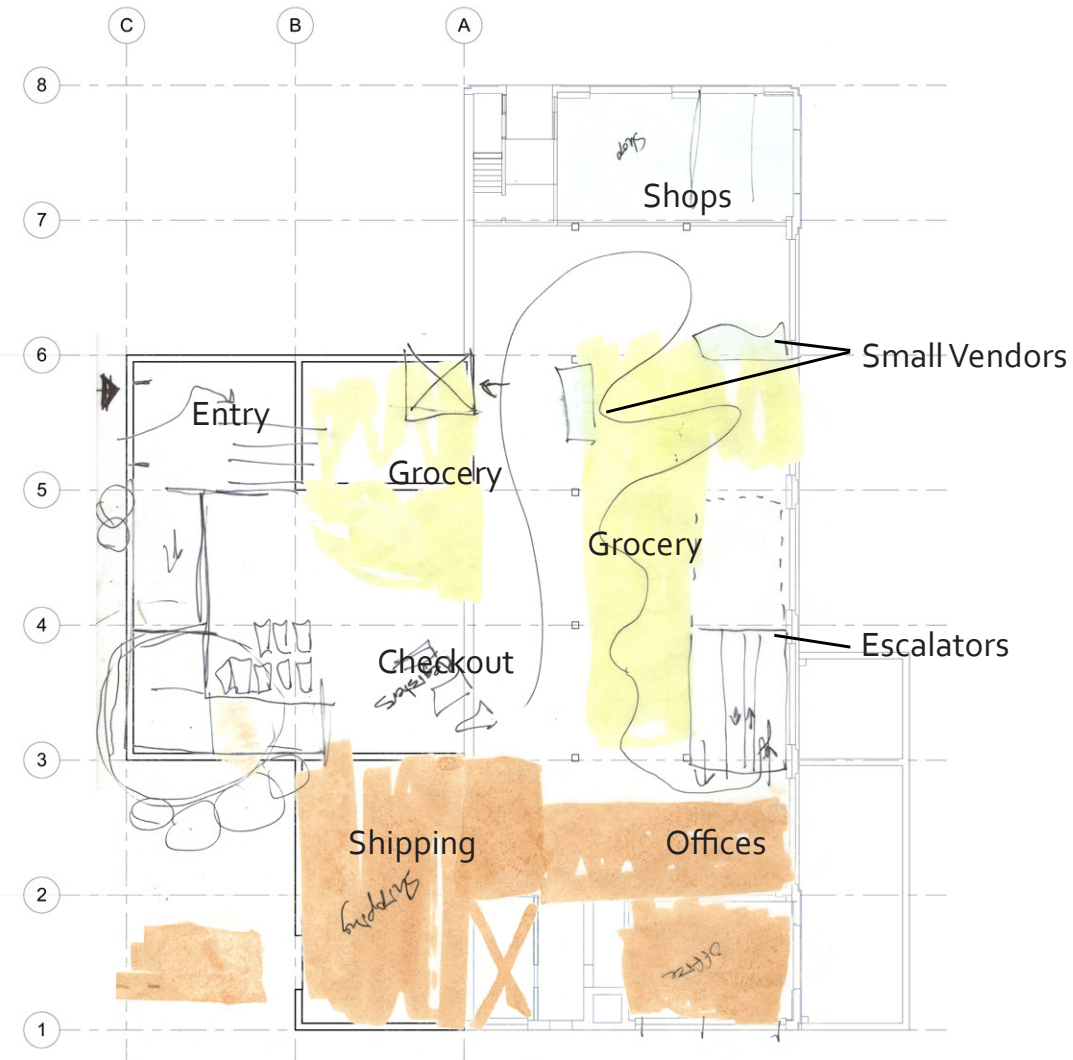
Product floor	4,000 sq. ft.
Bakery/prep-kitchen	500 sq. ft.
Product storage	5,000 sq. ft.
Classroom/learning kitchen	400 sq. ft.
Office space	400 sq. ft.
Cafe	2,000 sq. ft.

International Market

Retail stalls	7,000 sq. ft.
Food court	3,000 sq. ft.
Kitchens	1,000 sq. ft.
Office space	500 sq. ft.

Process Documentation

Initial Planning



Collaboration

(Consisting of a working session with Chris Hawley of Stahl Meland Hawley Architects & Builders, chosen for a balance of architectural design, contracting, and collaborative process experience.)

STRUCTURE

* ISSUES

- columns on same pattern/grid as existing

* IDEAS

separation between or exaggration at connection
different structural pattern
set as its own thing.

- Material

Steel (new) vs. Wood (exist)

Masonry bearing - different than existing (CMU) economical

MECHANICAL

- HVAC to new + exist

Use horizontal beam/soffit for chase
split to each side

SITE

* ISSUES

- Main floor 5' above grade

* IDEAS

Bring people up some first on site, some interior
Shelves of parking (stepped)

Nodes of landscape

CIRCULATION

- Interior ramping

do some outside
some inside

- Systems

Incremental resting points
points of interest/sales

Group elevator

DESIGN + FORM + Other

* ISSUES

- Connection to historic building

* IDEAS

off-set from existing (reveal)

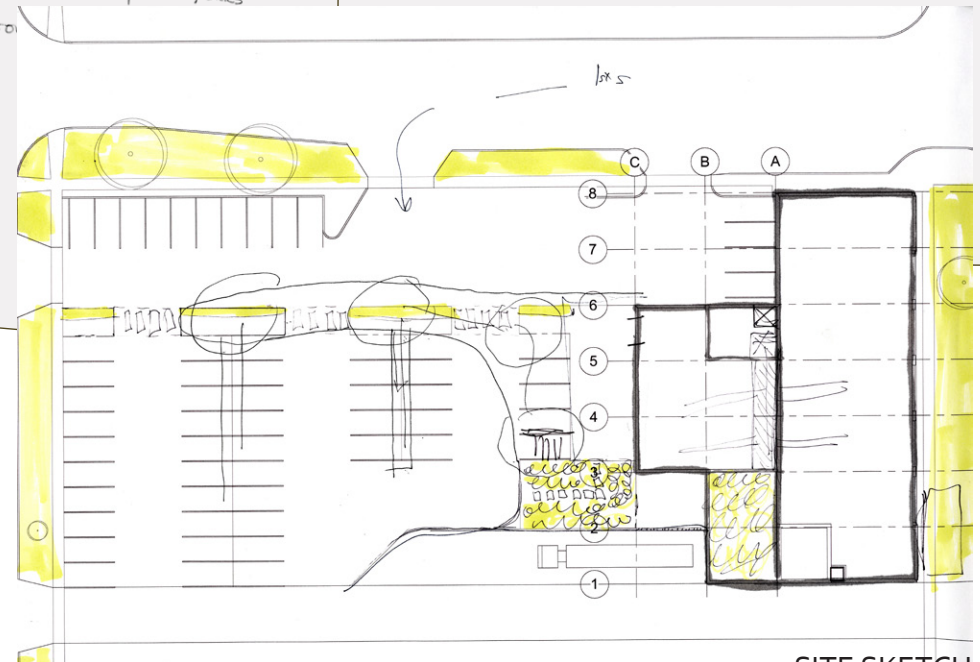
make rules about connection
like "never touch new brick to old brick... etc."

- Core tower may be misleading where entrance is

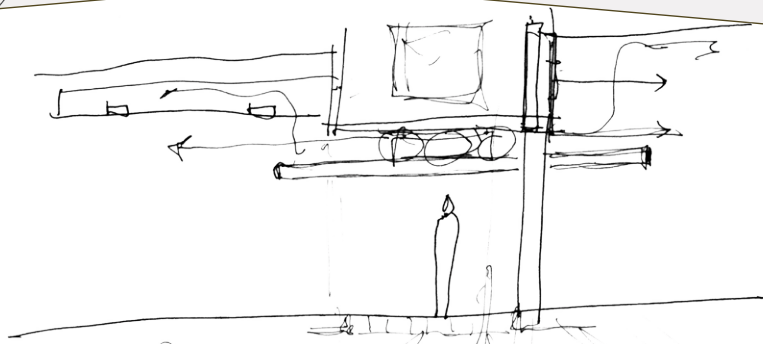
reduce size

accentuate entry

canopy
axis



SITE SKETCH



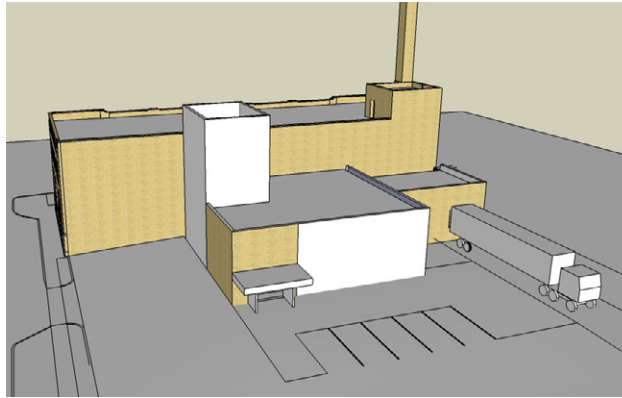
STRUCTURE/MECHANICAL/SPACIAL SKETCH

Development

(Quick visualization of decisions from collaboration)



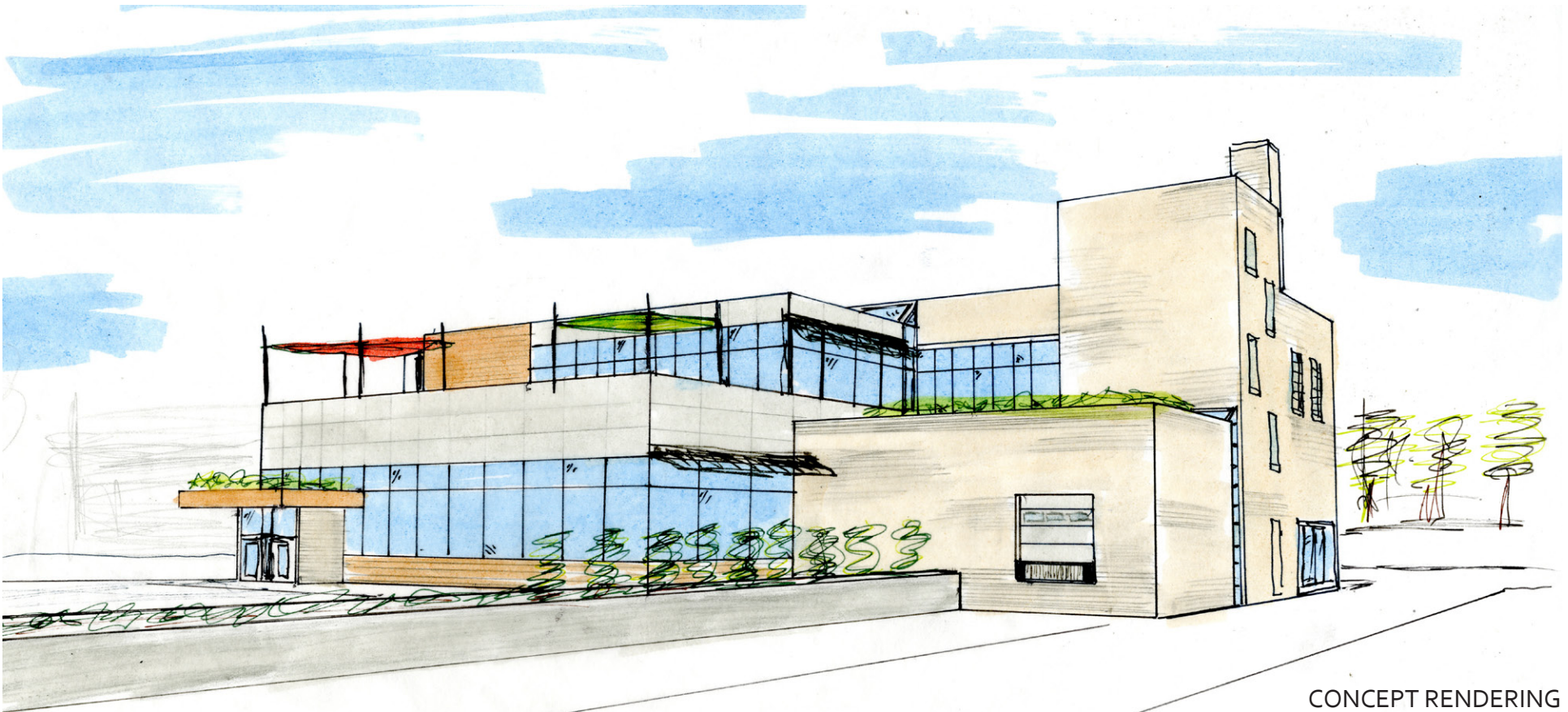
Reveal/offset bridging new and existing



Material contrast and replication



Soffit/mechanical chase between new/existing



CONCEPT RENDERING

Project Solution Documentation

TOWARD INTEGRATION: Collaborative Architecture and Design Methods

Thesis proposal for a

Fargo International Market & Food Co-op

Food Co-op

Grocery
Deli
Education



Whole Foods Co-op
Duluth, MN

+

An integration of
processes, people,
and experiences

International Market

Retail shops
International foods vendors



Midtown Global Market
Minneapolis, MN

Zach Mathern

ARCH 772 Design Thesis

Thesis Advisor: David Crutchfield

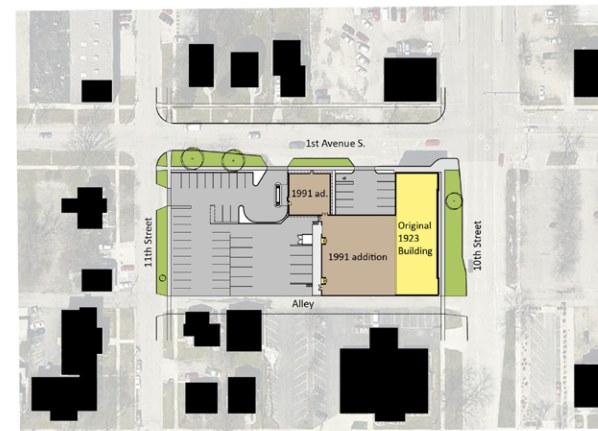
Software:

AutoCAD Architecture 2011,
InDesign CS5, Photoshop CS5, Render[.in],
Revit Architecture 2011, SketchUp 8 Pro



FORMER FARGO LAUNDRY CO. BUILDING, 1002 1ST AVE. S. FARGO, ND

Site/Context

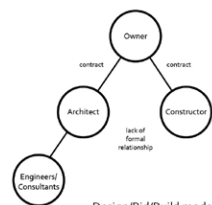


Problem Statement

What are the implications of architecture delivery models on the access to and propagation of quality architecture?

Research

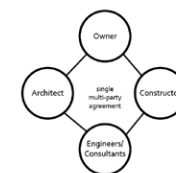
Current architectural delivery models lack in communication, sharing, and accountability (such as design/bid/build).



Design/Bid/Build model

Integrated Project Delivery as a formal collaborative process is successful by Involving key participants early Intensified Planning and goal definition Collaborative and Open communication

Technology and Building Information Modeling (BIM) enable further collaboration of key participants, by allowing participants to develop one model, virtually merging the buildings parts to create a cohesive and resolved model.



Integrated Project Delivery model

Forming Conclusions

Integration of people and process produces further developed and integrated architecture, and therefore higher quality results.

meaning...
less waste
better coordination of complex issues and details
shared success and failure
and
collaborative innovation



DELI / CAFETERIA BEYOND



CAFETERIA / INTERNATIONAL FOODS VENDORS



NORTH ENTRANCE / BUS STOP

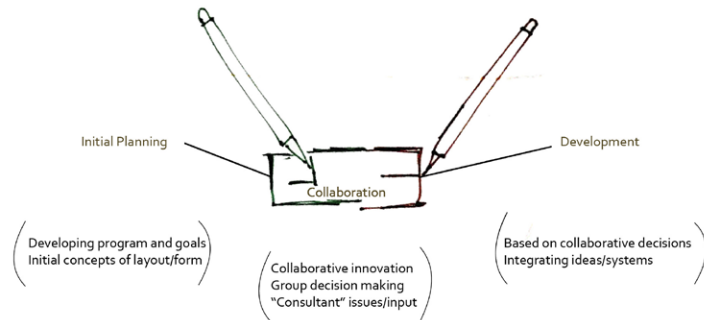


ENTRY / RETAIL SHOPS / RAMP / LEARNING KITCHEN

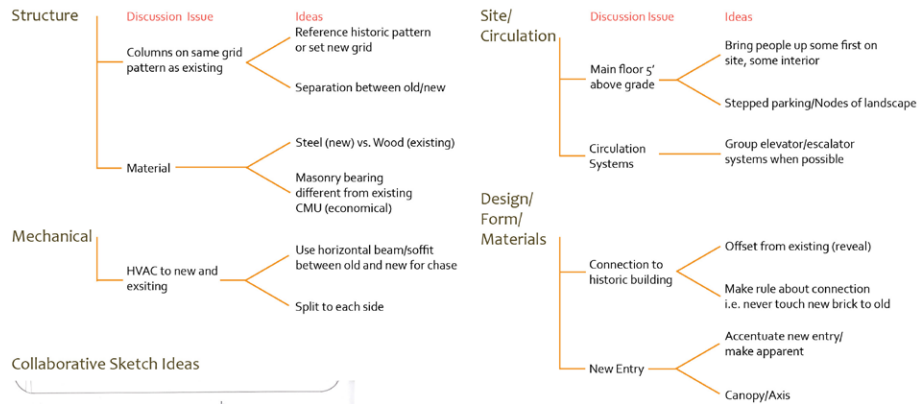


OPEN CORRIDOR / PRODUCE

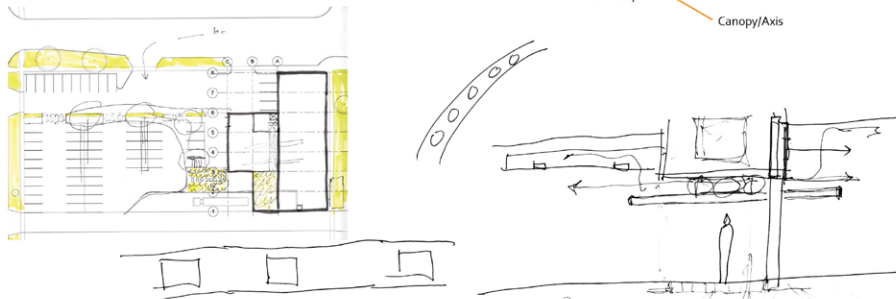
Process



Collaboration (Consisting of a working session with Chris Hawley of Stahl Meland Hawley Architects & Builders, chosen for a balance of architectural design, contracting, and collaborative process experience.)



Collaborative Sketch Ideas



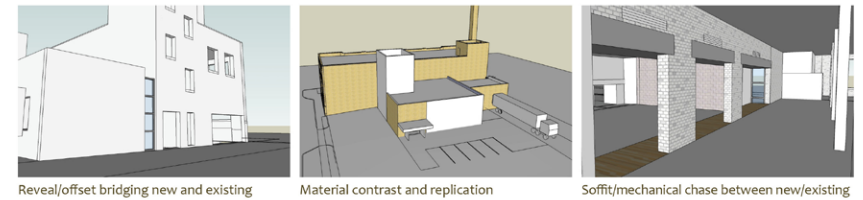
SITE SKETCH

STRUCTURE/MECHANICAL/SPACIAL SKETCH

Initial Planning



Development (Quick visualization of decisions from collaboration)



Reveal/offset bridging new and existing

Material contrast and replication

Soffit/mechanical chase between new/existing



CONCEPT RENDERING

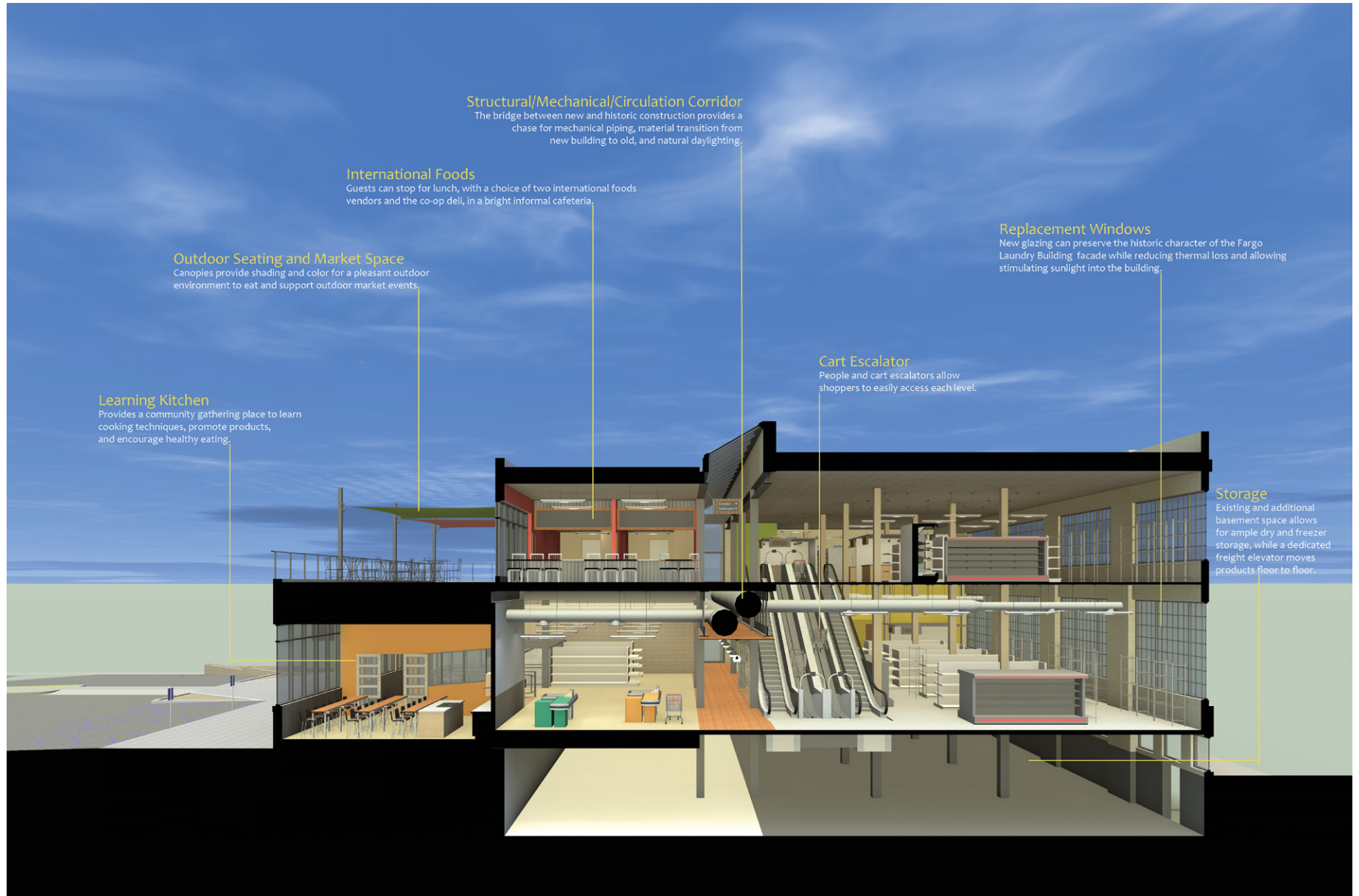


MAIN LEVEL FLOOR PLAN
Scale: 1/16" = 1'-0"



SECOND LEVEL FLOOR PLAN
Scale: 1/16" = 1'-0"







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