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ARCHITECTURAL SYNERGY: A FACILITY FOR LIFELONG LEARNING IN ACADEMIA AND PRACTICE

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ARCHITECTURAL SYNERGY:
A FACILITY FOR LIFELONG LEARNING IN ACADEMIA AND PRACTICE

A Thesis Presented

By

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ABSTRACT

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MAY 2018

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Historically, a disconnect has existed between the education and practice of architecture. Architectural education has long prided itself on the value of creative problem-solving, research, and the fine arts. In contrast, the practice of architecture has evolved to emphasize technical knowledge, specialization, communication, business, and collaboration. This disconnect has led education to miss opportunities to teach students business skills and knowledge required for the workplace, and allowed practice to lose sight of the importance of artistry and research. Architecture educators, students, and practitioners each have a unique set of knowledge and skills to offer the other, and a corresponding set of need and challenges which must be addressed for the profession's continued success.

By analyzing history, current debates in the field, and case studies of current innovative practices and educational models, this thesis addresses these issues with a new model of architectural synergy, embodied through a facility for lifelong learning in architecture.

The primary goal of this building is to inspire integrative and collaborative processes between students, researchers, educators, and practitioners to address the current disconnect between them. Through this facility, each group will have the opportunity to leverage their unique strengths and successes to help the others. This collaborative model will allow each role mutually beneficial opportunities for lifelong learning through the exchange of knowledge, ideas, and processes between different groups.

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CHAPTER I

INTRODUCTION AND JUSTIFICATION

This thesis addresses disconnects between the academy and professional practice. The earliest architects were master builders, and functioned as an integral piece of the construction team. As technological tools and means of communication evolved, they enabled the architect to work remotely at an office, as opposed to directly onsite. Up until the mid-19th century, the practice of architecture was largely unregulated. Aspiring architects would train as an apprentice underneath a master, and learn the skills and knowledge necessary for practice. This model provided a great degree of flexibility for the apprentice. However, there was no means to ensure quality control in training across the discipline as a whole.

In 1919, the National Council of Architectural Registration Boards (NCARB) was founded to implement uniform standards for licensure, which led to the professionalization of architecture. Architectural education, previously optional, became a required component for licensure. Some schools quickly adapted the Beaux-Arts model of teaching, which remains the primary educational model today. The defining feature of this philosophy is the design studio, wherein students confront a theoretical design challenge within a controlled environment. Student are tasked to develop a core concept, produce relevant architectural drawings and models, and present these materials before an audience for review in the form of informal desk critiques, and/or formal reviews. The student's work is assessed based upon how well the project embodies their original

concept. The studio model offers students unlimited creative freedom to experiment, succeed, and fail, within the safe confines of a theoretical, insulated environment. The longstanding accepted objective of architectural education is to develop critical thinking and creative problem solving skills and prepare students to adapt this knowledge to changes in the profession over their lifetime.

In contrast to education, the practice of architecture prioritizes the realities and constraints of time, budget, business, and technical knowledge—all knowledge and skills which one rarely gains as a student. This creates the common belief amongst practitioners that students enter the profession with unrealistic expectations, and unprepared for the realities of practice. Conversely, students begin their careers and feel limited creatively. Once immersed in practice, research and experimentation directly impact the firm's bottom line. Students are disillusioned with the realities of practice, while practitioners often dismiss architectural theory in the name of corporate capitalism.

To address this disconnect, this thesis aims to reunite students, educators, and practitioners through an architectural facility for lifelong learning in academia and practice. Through a direct, integrative approach, we have the power to create an ongoing conversation between professors, practitioners, and emerging professors, imbuing architectural practice with theory and vice versa.

1. Research Methodology

This thesis explored design as a vehicle to test a new, integrated model for lifelong learning in architecture. While the final building is a response to a specific site and program, the goal is that the conceptual framework and methods which form the foundation of this facility can be broadly applied to future projects. My hope is that the core principles of this building will spark a greater discussion between architects and designers during the predesign and schematic design phases, and create lifelong learning centers for other disciplines facing similar challenges.

By designing such facilities around the basis of new ways of thinking, we have the power to create a flexible model of lifelong learning that inspires collaborative methods of thinking, working, and creating. Architecture was used to test and enact this new model of learning, through a new center which brings together students, educators, practitioners, and the local community to facilitate the exchange of knowledge. This research will influence the next evolution of architectural education and practice, as we move towards an integrated and collaborative model designed for the 21st century.

The primary research and literature review trace the history of architectural education and practice from their early origins to the present, and examines current debates and issues in architectural theory and practice. Precedents focus on a combination of vocational schools, and innovative buildings designed to aid in interdisciplinary collaboration and the translation of knowledge. The goal is to use current successful examples of innovative architectural schools and practices as a foundation, and build upon these ideas to inform

the next step as we move towards future integrated models of architectural education and practice.

Together, the literature review and precedent research informed the building's site selection, programming, and overall design. The final building synthesizes the findings of the literature review and precedent studies to enact the proposed framework for learning through architectural design.

CHAPTER II

HISTORY AND CURRENT DEBATES IN EDUCATION AND PRACTICE

Up until the 14th century, architects worked as makers amongst other craftsmen. Early architectural training and education relied on an apprenticeship model, where knowledge was transferred informally from master to student. The apprentice would acquire skills by working with real projects and clients in a professional environment. As their knowledge grew, the apprentice would take on greater responsibility and eventually take on the master's role.

As building construction and the role of the architect evolved, efforts were made to standardize architectural education across the profession. A university-based system was established in the late 19th century by the Architectural Association to formalize education. The resulting Bauhaus model of design education founded the idea of the design studio where work is assessed based on critiques and reviews, which remains the primary educational method used today.[1]

In the article *Communities of Practice in Higher Education: A Challenge from the Discipline of Architecture*, author Janne Morton uses a community of practice perspective as a means to analyzes participation patterns in a senior architecture design studio. Communities of practice (COP) "involve using metaphors of apprenticeship and community to see how learning happens when groups of people with different expertise

[1] Kattein, "Made in Architecture."

work together on a project."[2] The COP framework is intended to mirror architectural practice, where a variety of professionals each bring their unique knowledge, skills, and expertise into a collaborative environment to achieve the best design outcome. While different professional roles are defined, each team member's individual strengths and skills are valued through a mutually respectful environment.

Through her study, Morton concluded that instead of a collaborative environment, the design studio model showed a clear hierarchy of students to instructors. This structure mirrors the traditional apprenticeship style of learning in the profession, wherein the student acquires knowledge from an experience practitioner, and becomes the master. While a series of different relationships developed between students and the professor, interaction was often minimal between students during the studio. During design reviews, students were only given the opportunity to critique each other's work when prompted by the professor. Morton resolves that "the limited sharing of ways of behaving served to mitigate possibilities for co-participation and performance of expertise."[3] In addition, students' opportunities in the design studio to rehearse expert roles were limited. While the majority of work in the profession entails preparing construction documents and specifications, the studio often focuses solely on design and presentation at the conceptual level.

While Morton heavily critiques the traditional studio model, she resolves that the design studio can be leveraged to open the sharing of information, encourage co-participation

[2] Morton, "Communities of Practice in Higher Education."
[3] Kattein, "Made in Architecture."

and performance of expertise, and become a link between education and practice. By putting all participants on an equal playing field, everyone is given the opportunity to contribute their unique strengths to benefit the group. This raises the question of how the traditional studio model can evolve to fit modern needs, and establish a collaborative environment between several different groups. Is the answer a re-imaging of the studio—is this the main location where these interactions should take place?

Another modern attempt to unite education and practice is found at the Bartlett School of Architecture in London. Here, the school is testing a "live project" model, where undergraduate students work with a real client to design and build a series of structures on an actual site in London. Author Jan Arq Kattein remarks that while "architectural education focuses on individual excellence, in practice it relies on teamwork." The live project model stresses collaborative working methods, and "values the architectural process just as much as the final product."[4] The goal is to teach students through early exposure to real world challenges, and foster community cohesion between students, local practitioners, client, and faculty.

One challenge with this model has been grading and assessment. Since assigned projects require complete collaboration, students are graded based on an ongoing research log documenting their process throughout the entire project. This assessment method allows the program to be accredited by the Royal Institute of British Architects (RIBA).

[4] Kattein.

These ideas of redefining modern architectural education are explored further in Will Hunter's article, Alternative Routes for Architecture. Hunter defines his vision for the London School of Architecture as a "21st century form of apprenticeship, which redefines the relationship between master and apprentice…[which] could provide a vital reciprocal relationship that benefits both the teacher and the taught, and ultimately [this] would strengthen the profession as a whole." Architectural education and practice were historically integrated via the apprenticeship model until their separation in the 19th century, when educational training was formalized through the university system. In many ways, Hunter advocates for a return to the apprenticeship model, where the student and master work together in a collaborative environment and learn from one another.

"The main shortcoming of architectural education is not its failure to align with practice, it is its failure to facilitate and reward teamwork, dialogue, and engagement." Hunter envisions the school as an experiment and opportunity to redefine architectural practice as a collaborative process.

In *Architectural Research Methods*, authors Linda Groat and David Wang state that "Architectural research for design seeks to integrate a knowledge of research methods to inform the design process - to bridge the gap between design and research."[5] In *Architectural Research: Three Myths and One Model*, author Jeremy Till addresses the disconnect between architectural research in academia and practice. Till argues that academic research "has led to inward-looking results, produced more for the self-

[5] Wang and Groat, *Architectural Research Methods.*

sustaining benefit of the academic community and less for the wider public and professional good."[6] Till resolves that academia must therefore link up with practice to improve the topics and results of architectural research. All three of these topics question the relationship between academia and professional practice. In addition, they all examine different aspects of the architectural process, which Till describes as one of the three key elements in developing a new model for architectural research.

Through this research, three major topics and questions emerged. Each was explored through the process of diagramming, as shown below in figures 1-3. Ultimately, the third question, "how do we address the disconnect between theory and practice in architecture?" became the main research question and formed the basis for this thesis.

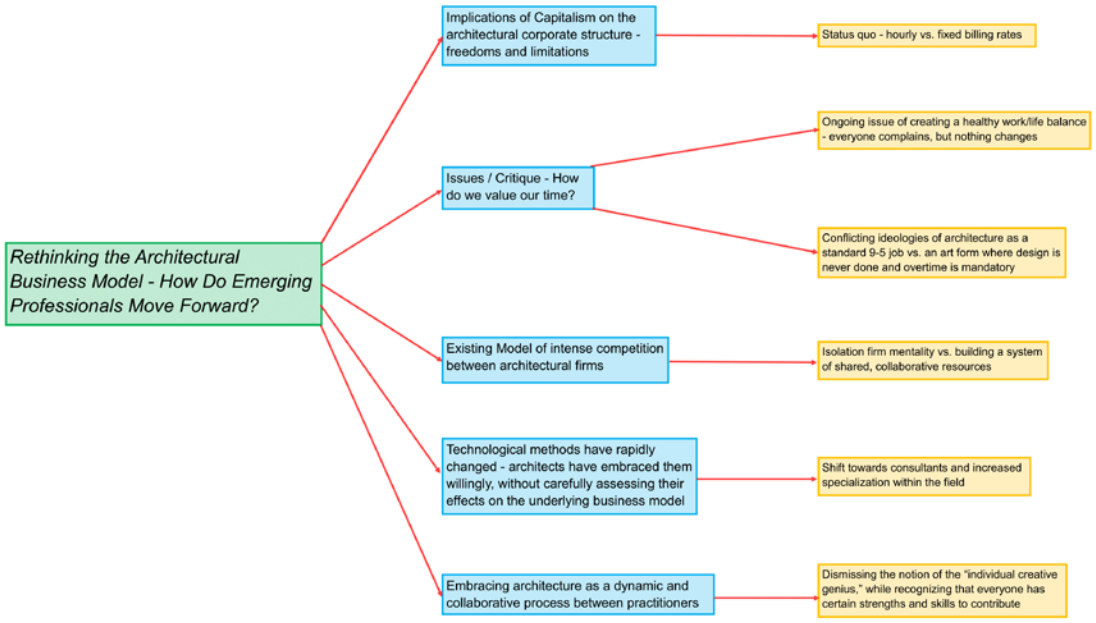


Figure 1 - Problem 1 – Rethinking the Architectural Business Model

[6] "Architectural Research."

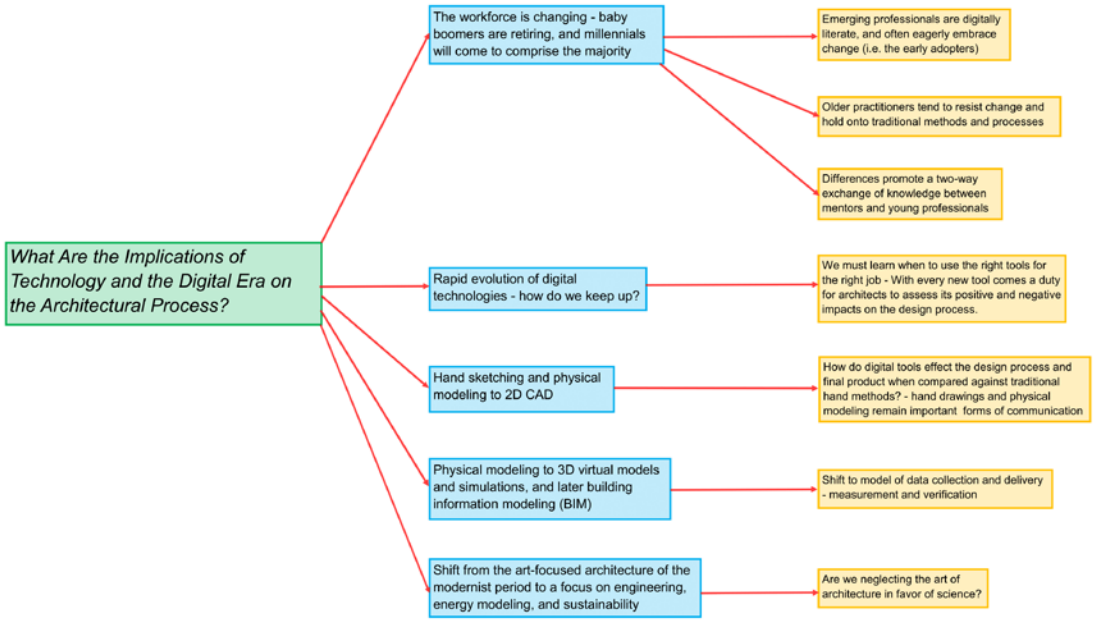


Figure 2 - Problem 2 – What Are the Implications of Technology for the Architectural Process?

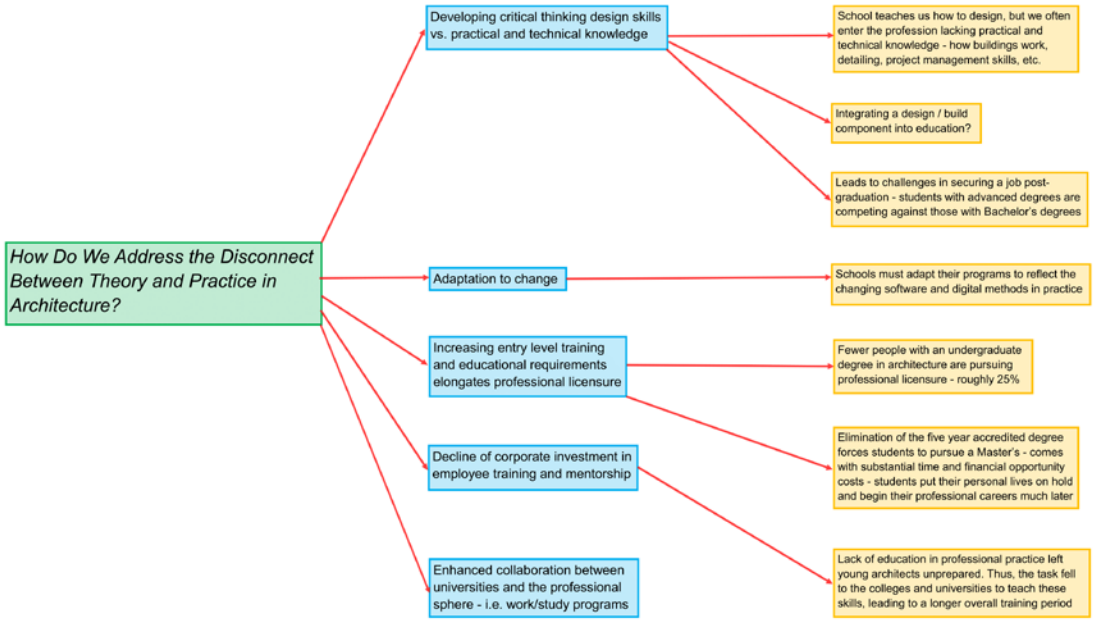


Figure 3 - Problem 3 – How Do We Address the Disconnect Between Theory and Practice in Architecture?

In *Hybridized Pedagogies: Architectural Education in Motion*, author Anthony Titus remarks that modern architectural education is moving towards a "hybrid of science, arts and humanities."[7] He notes the importance of adaptation; to maintain relevancy, both education and practice must shift to meet changing demands. In turn, this adaptation necessitates "eliminating traditional distinctions between academic knowledge, professional practice, architectural production, and architectural research."[8] The Center for Architecture Science and Ecology (CASE) was created as an experimental partnership between the school of architecture at Rensselaer Polytechnic Institute (RPI), and offices of Skidmore Owings & Merrill in New York City to address the separation of education, practice, and the sciences. CASE combines students, educators, practitioners, and scientists through a shared space of inquiry to address the implementation of smart energy use in the built environment. Students are immersed in an academic environment balanced between independent creative exploration, and practical challenges imposed by real world projects. Each new building produced by CASE serves as a live testing ground, and "accelerates the speed between experimentation and realization." [9]

The article *Integrated Practice and Architecture Education: The Evolution of a Pedagogy* acknowledges that integrated project delivery (IPD) is becoming standard in practice and therefore should also be addressed through education. The authors praise the studio as a place to simulate integrative practice and "develop meaning through real life application" through a collaborative studio model, where students participate on project phasing,

[7] Titus, "Hybridized Pedagogies."
[8] Titus.
[9] Titus.

pricing, and presentation as members of an interdisciplinary team.[10] This model was created in direct response to the 1997 findings of Ernest Boyer and Lee Mitgang, who challenged architecture to "engage the university campus, other allied disciplines, and create a climate of integration that benefits both architecture education and the profession."[11]

To address the disconnect between academia and practice, the Royal Institute of British Architects (RIBA) held an open panel discussion at the Mackintosh School of Architecture in 2014, comprised of students, practitioners, and educators. The group defined architecture as a "restless and curious profession, which has the unique ability to reinvent itself quickly," and a "servant of capitalism," due to the marketization of local and globalized practice.[12] In turn, professional practice must evolve in response to changing demands and market forces.

In examining architectural education, the panel agreed that its purpose is not to train students to enter the workforce, as not all students will ultimately become licensed architects. Rather, education should develop students as versatile designers and problem solvers to prepare them for a wide range of experiences thereafter. Education should train students to survive and adapt based on practice size, location, and given problems. While critics praised school's approach to learning by doing, they also acknowledged that a large gap currently exists between education and practice.[13]

[10] Gregory et al., "Integrated Practice and Architecture Education."
[11] Boyer and Mitgang, *Building Community*.
[12] GSA Friday Lectures, *The Big Debate - The Future of Architectural Education*.
[13] GSA Friday Lectures.

Discussing challenges, the board cited staff costs and physical space as the two most expensive components of an architectural education. The group dismissed "sacrificial architectural education," where curriculums are stripped down in response to the corporate business sphere.[14] An architecture degree offers broad exposure to a variety of different fields and related disciplines. While education is rooted in academic theory, the practice of architecture is largely technical in nature. This creates a disconnect between what schools teach students to design, and what is built in reality.[15] There is a growing consensus that the current educational model is "failing to prepare students for practice."[16]

The panel critiqued a lack of risk being taken by schools across the board, noting architectural education needs to be "nimble, flexible, and readily adaptable."[17] The core discipline remains the same, but schools must change their curricula in response to external influencers. The RIBA resolved that in order to maintain their relevance, "schools need to stage their own, internal coups." All of this evidence suggests that the solution is not merely to reshape education in the face of practice, or vice versa. Rather, each should be able to respond to the demands of the other to create a series of mutually beneficial, cyclic exchanges between education and practice.

[14] GSA Friday Lectures.
[15] GSA Friday Lectures.
[16] GSA Friday Lectures.
[17] GSA Friday Lectures.

The RIBA also assessed several existing models of integrative education and practice. In one scenario, part-time students embed into local practices. Efforts are made to link practice to the learning of the students, but implementation can prove challenging due to market fluctuations. Students obtain academic credit through a combination of traditional academic courses, and their experiences in professional practice.[18] This model provide students with a flexible, "guerilla mode of education," where they work and study part-time, and simultaneously gain credit towards professional licensure.[19]

Schools in the Netherlands have enacted a similar model. Here, students work three days a week as architectural assistants, and study during evenings and weekends. Practices take an active role in tutoring students, allowing students to finance their education in real-time, and improving job prospects upon graduation through their experiences in professional practice.[20]

While these approaches require more time and commitment compared to a traditional architectural education, both address the gap between education and practice by graduating students with five years of combined practice and educational studies.[21] There is great value in examining both the duration of education, and different ways of learning. The RIBA proposed that there should be multiple possible routes to professional licensure where research, practice, and school are each considered as an acceptable means of entry into the profession. Required knowledge could be condensed into a

[18] GSA Friday Lectures.
[19] GSA Friday Lectures.
[20] GSA Friday Lectures.
[21] GSA Friday Lectures.

standardized test, allowing aspiring architects the choice to either study at the university, or learn through workforce training.[22]

The RIBA concluded their panel discussion by calling for a "robust synergy of practice and architectural education."[23] Students were deemed the critical link to inspire integrative processes, as they are responsible for carrying their teachings into the workplace, and using their creative design skills to improve architecture through practice. The integration of education and practice provides opportunities for students to carry academic theory directly into professional practice, and reinvent professional practice in the face of education.[24]

"Synergy, in a creative way, between education and practice is needed. However, the distinction must be clear what one offers the other."[25] For a new, integrative model to prove successful, it must provide the framework for a mutually beneficial exchange of ideas and processes between its participants.

In an interview on Education, Research, and Practice in Architecture, architecture practitioner and educator Stephen Bates noted that a key issue in architecture is "finding the time to share developments in academic research and professional practice."[26] The exchange of research methods and findings between education and practice enables

[22] GSA Friday Lectures.
[23] GSA Friday Lectures.
[24] GSA Friday Lectures.
[25] GSA Friday Lectures.
[26] Jan Schevers, *Stephen Bates on Education, Research and Practice in Architecture*.

innovation. Conversely, architectural practice leaves limited time for theory-based learning. Bates resolves that teaching provides a structure for learning, while research functions as a means of learning, and notes that "learning does not end with the university."[27]

According to the *NCARB by the Numbers* annual report released in June 2015, the number of aspiring architects who pursue licensure continues to grow. Emerging professionals are also completing licensure requirements slightly earlier, and at a younger age.[28] However, the problems emerge when examining the statistics for individual jurisdictions. In Massachusetts, we see only a 12% annual completion rate for the Architectural Experience Program (AXP), and a 71% success rate for passing the Architectural Registration Examination (ARE).[29] These compare closely with the 13% AXP completion and 65% ARE national pass rates.[30] Thus, while the number of aspiring architects is at a historic high, the data for how many people actually complete licensure paints a very different picture.

While approximately seventy percent of aspiring architects hold degrees from programs accredited by the National Architectural Accrediting Board (NAAB), student enrollment and degrees awarded have declined.[31] In comparing NAAB-accredited ARE success rates, we see only an 11% increase over those with non-accredited degrees. ARE

[27] Jan Schevers.
[28] "NCARB by the Numbers | National Council of Architectural Registration Boards."
[29] "NCARB by the Numbers | National Council of Architectural Registration Boards."
[30] "NCARB by the Numbers | National Council of Architectural Registration Boards."
[31] "NCARB by the Numbers | National Council of Architectural Registration Boards."

completion rates also hold nearly constant between those with NAAB-accredited and non-accredited degrees, at 2.4 years and 2.8 years respectively.[32]

[32] "NCARB by the Numbers | National Council of Architectural Registration Boards."

CHAPTER III

CASE STUDIES AND PRECEDENTS

A series of case studies and precedents focused on current architectural schools and practices with innovative, collaborative ideologies were examined and used as drivers to influence the design process.

1. School Work Environment

The first precedent that was analyzed is the graduate thesis *School Work Environment: Transition from Education to Practice* by Shane Ross from the University of South Florida. In the introduction of his dissertation, Ross argues that school's focus on "learning how to learn, as opposed to obtaining the experience to practice in any field of professionalism, creates a great disconnect between education and careers."[33] He states that children and adults learn from a combination of what they are taught in the educational sphere, and their personal experiences through work. Ross advocates for a return to the traditional apprenticeship model, wherein a master craftsman would employ a young, inexperienced laborer. In return for his services, the young apprentice gained a livable wage, and personal experience and training in the craft. Ross notes that while some educational programs require an internship or similar practice as mandatory to the degree, many do not have the curriculum, and/or building resources to successfully transition students into a professional work environment. This leads him to ask, "can architecture help to bridge the gap between school and work?"[34] Ross chooses to focus

[33] Ross, "School Work Environment."
[34] Ross.

on firefighters for his research. He proceeds to conduct a series of surveys and interviews with students, educators, and professionals in the field, and analyzes the successes and failures of several existing firefighter training and education facilities. Ultimately, Ross uses his findings to develop a firefighter training facility which aims to integrate work and education through the built environment.[35]

While Ross seems hesitant to come forward and outright say it, it is clear he believes that we must examine the integration of theory and practice as a means to address the disconnect which currently exists between them. Rather than adhering to the traditional model of separation between work and school, why not look towards a new educational model which forcibly integrates work with education?

Similar to firefighters Ross describes, professional licensure as an architect requires both extensive classroom experience and on the job training. The current disconnect between architectural theory and practice creates several fundamental problems for firms and young professionals. Due to intense competition between emerging professionals in the field, many students, particularly those in undergraduate programs, are unable to secure paid internship positions in architectural firms while in school. On the corporate side, most architectural firms want to hire employees who have experience, yet few are willing to make the initial investment in training a worker from the ground up. Companies inherit graduates and are left to fill in the critical practical and technical skills left behind by education. Thus, offices have little incentive to take on undergraduate students,

[35] Ross.

particularly when more experienced students in Master's degree architecture programs are competing for the same positions. As a result, students graduate with little to no professional experience and have difficulty securing a steady job in the field with a Bachelor's degree alone.

Due to lack of professional training during school, students enter the field with unrealistic expectations, and seldom experience the realities of the profession until they begin working full-time. A student spends four years in college and graduates with a Bachelor's degree. However, he enters the profession with little knowledge of what architecture actually entails on a day-to-day basis. What happens if he starts working, only to discover that he does not like it? Oh well, too late. This large risk and uncertainty underlies the current model of higher education. Integrating theory and practice would provide a means through which students could "test out" their career choice in concurrence with their academic studies, providing the freedom and flexibility to pursue a different field of study if they so choose.

Thus, academic programs must seek to establish mutually beneficial relationships with employers wherein education teaches critical thinking and creative problem solving skills, while paid internships develop technical knowledge simultaneously. In this proposed model, students would graduate with both knowledge of academic theory, and practical experience through professional practice. Students would take classes, work part-time, get paid for their work, and learn the skills of the trade (as in a traditional apprenticeship setting). This would also allow students to finance their education in real

time, versus continually accruing student debt. While such a model is prevalent across graduate schools, it is rarely applied at the undergraduate level.

Furthermore, embracing this model would condense the required educational period and licensure process, allow students to earn hours towards the Architectural Experience Program (AXP) early, improve entry-level job prospects, and encourage more aspiring practitioners to pursue professional licensure. The traditional model elongates the educational training period, increases student debt, and delays development in our personal and professional lives. We are spending a longer time in school fulfilling training requirements, rather than evolving our educational models to expedite the processes of learning and professional licensure. The profession continues to evolve at a rapid pace, embracing the ongoing technological innovations of the digital era. By and large, educational models across all fields have remained relatively stagnant in response. In order to be successful, the educational system must be ready and willing to embrace change. In an age where a wealth of information is freely available and universally accessible to all, how do we change the academic model to provide relevance and value for students? As educators and practitioners, this is a critical question that we should ask moving forward.

2. The Detroit Collaborative Design Center

The Detroit Collaborative Design Center (DCDC) was examined as a second precedent. The practice is a “multi-disciplinary, nonprofit architecture and urban design firm at the University of Detroit Mercy School of Architecture, dedicated to creating sustainable

spaces and communities through quality design and the collaborative process."[36] The initial vision for this unique architectural practice was conceived in 1993 by Stephen Vogel, who aspired to "enhance the abilities of local leaders to produce quality design through broad-based community participation."[37] The firm is comprised of seven professionals, and anywhere between one and three student interns. Students are actively involved in design and construction of projects, which range from small-scale residential, to large recreational community developments.

The Design Center's Neighborhood Engagement Workshop (NEW) process takes an active, community-based approach to design, bringing together local residents, business owners, and city representatives to provide input and drive the creative process through public workshops and surveys.[38] Each member of the group brings their own unique goals and perspective to the table. Through a collaborative conversation, these ideas are all fed into the project. Typically, 20 to 30 people will be directly involved in these sessions. However, all are encouraged to share the developments with the wider community, and expand the conversation.

Figure 4 - While the architect typically dictates the design, the DCDC integrates community collaboration directly into the design process.[39]

[36] "Detroit Collaborative Design Center."
[37] "Detroit Collaborative Design Center."
[38] "Detroit Collaborative Design Center."
[39] "DCDC | Collaboration."

The final built work becomes a true response to the community's concerns and aspirations, through their direct involvement in its planning, development, and design.[40] Overall, the practice aims to connect different members and disciplines within the community through a participatory design approach and help to revive the city of Detroit. While the DCDC provides standard architectural design services, the NEW philosophy "empowers residents to facilitate their own processes of urban regeneration."[41] While the DCDC is nonprofit, partnerships with over 80 local organizations help to subsidize overhead fees and fund the projects.[42]

Figure 5 (Left) – A series of local representatives all act as creative designers.[43] Figure 6 (Right) - The final project embodies the local community and encourages public interaction.[44]

[40] "Detroit Collaborative Design Center."
[41] "Dan Pitera."
[42] "Detroit Collaborative Design Center."
[43] "DCDC | Community Design."
[44] "The Alley Project (TAP)."

There are several benefits to a community-driven design process. While municipal planning boards typically hold a series of public forums, they often suffer from poor attendance due to both lack of publicity, and public involvement in the project itself. In contrast, actively embedding the local community into the process as creative designers makes them more invested, as their input now has a direct impact on the architecture. This collaborative process also results in a better final product. Who better understands the local site and context, then the actual people who live and work there? In typical practice, architects must conduct research and familiarize themselves with a foreign site, culture, and history when confronting a project—often in a very short period of time. In contrast, the NEW design philosophy lets the public do the heavy lifting. The result is a win-win. The local community is given the opportunity to act as designers and voice their concerns, while the architect embeds themselves in the community on a much deeper and more personal level.

Figure 7 - Graphical surveys and input devices encourage public feedback in the design process.[45]

[45] "DCDC | Community."

The major challenge with implementing this business model on a larger scale comes in practical operational and budgetary constraints. DCDC has largely succeeded due to a massive network of local partnerships, which provide a stable means of funding. Would these organizations be willing to sponsor a typical, for-profit architectural firm? Unlikely. From a practical standpoint, this inclusive NEW design process is a no-brainer, and clearly benefits the architecture produced. As a non-profit model, supported by strong partnerships, it works. However, in its application to the business of architecture, one must consider the increased time and money required to support this process as opposed to conventional practices.

Business aside, the NEW design methodology tells us something else. In an age of globalization, outsourcing, and digital innovation, many people feel that architecture has become increasingly disconnected with site and context. Gone are the traditional notions of a deeply personal dwelling, replaced by the efficient, yet forgettable modular home. DCDC's unique approach to design reminds us that in the end, the most important part of architecture is its connection with the landscape, history, culture, and people. Such firms which operate on a collaborative public model at a small, localized community scale are able to achieve this successfully. The problems arise when scaling this operation. How does one grow an architectural business to accept foreign commissions, while preserving this intimate connection to local community?

In the book *Inquiry By Design*, author John Zeisel makes the case that together, place, personalization, territory, and wayfinding all play a key role in the evolution of the human brain.[46] By studying each of these aspects through the lens of neuroscience, we can apply the findings to architectural practice and design successful built environments tailored to meet the specific needs of a clientele, whether it be through a small Alzheimer's care facility, or large healthcare center.

Through these two case studies, Zeisel also raises questions regarding the notion of specialization in architectural practice. As our technology evolves and we learn more about human behavior through psychology and neuroscience, should architectural practice respond through specialization in different design types?

At the same time, part of what makes architecture unique is the interdisciplinary nature at its core. Effective architects are those able to understand not only design, but historical and cultural context, climate, psychology, etc. It is a common belief that architects know a little about everything, and everything about nothing. Given the current trends towards "think tank" architecture, paired with increasing collaboration between architects, engineers, and consultants, we will continue to see architects specialize in a singular area as individuals. Yet, the interdisciplinary nature of the profession will remain, as different experts from related fields come together and collaborate to share their knowledge and experience. The notion of the individual genius is gradually shifting towards a more open and inclusive model of architectural practice, wherein every member is given the

[46] Zeisel, *Inquiry by Design*.

opportunity to leverage his or her individual strengths within the context of a collaborative group atmosphere.

3. Tech Campus, Cornell University

Cornell University's new tech campus, designed by Skidmore, Owings, and Merrill, is a system of buildings including the Bloomberg Center, The Bridge (a co-location building), a high-rise residential tower, and conference center. The structures are oriented inward along a central pedestrian spline, coined the Techwalk. Currently under construction, the entire complex will be built on Roosevelt Island in New York City. Together, the campus is designed to foster interaction and creativity by promoting "spontaneous and serendipitous meetings of people from various disciplines and departments as they walk around the campus."[47]

Figure 8 - Aerial Perspective Rendering from Manhattan[48]

[47] "Cornell Wants People to 'Collide' on Its New NYC Tech Campus."
[48] "Cornell Wants People to 'Collide' on Its New NYC Tech Campus."

This new applied science university will remove academic departments to create an open and collaborative community, bringing together designers, engineers, entrepreneurs, and scientists to dissolve boundaries between the academic and commercial business spheres. The complex is built upon ideas of collaboration and cooperation, placing communication and teamwork skills on the same level as the technical knowledge taught by graduate schools.

Figure 9 - The development plan seamlessly interweaves interior and exterior spaces to emphasize openness. Circulation patterns are organized around a central pedestrian spine.[49]

The end goal is to encourage creativity and transform ideas into live businesses through a series of research hubs--"to become the ideal place to create an idea."[50] To accomplish this mission, the designers created a series of intentional "collision points;" moments where individuals from a variety of different backgrounds are brought together through spontaneous interactions.[51]

[49] "Campus."
[50] SOM, "Campus as Catalyst."
[51] "Cornell Wants People to 'Collide' on Its New NYC Tech Campus."


Figure 10 (Left) - The Bridge Building's interior combines research hubs with interstitial common areas to promote interdisciplinary interaction.[52] Figure 11 (Right) - Collaborative group spaces replace traditional private offices in the Bloomberg Center. An open concept plan design with glass partition walls creates visual connectivity and promotes knowledge exchange between different groups.[53]

The Bridge Building provides space for collaborative work and research and serves as one such collision point between students and industry professionals. Architecture is used as a vehicle to bring people into close proximity; to create connection and collaboration between different groups and disciplines which otherwise might never interact. Similarly, the Bloomberg Center fosters an interactive and collaborative co-location environment through a combination of open laboratories and workspaces. As a whole, the tech campus will dissolve traditional boundaries between disciplines and industry to break the idea of each discipline as its own individualized sector in favor of a new holistic, integrated model of education fit for the 21st century.[54]

4. Conway School of Landscape Design

The Conway School of Landscape Design, located in Easthampton, Massachusetts, is an innovative. The mission of the school is to "explore, develop, practice, and teach design

[52] "Gallery of WEISS/MANFREDI's 'The Bridge' Topped Off at Cornell Tech Campus - 7."
[53] "Cornell Wants People to 'Collide' on Its New NYC Tech Campus."
[54] SOM, "Campus as Catalyst."

of the land that is ecologically and socially sustainable," and empower students with the skills to become lifelong learners.[55] The Conway School offers a ten-month Master's program, specializing in sustainable landscape planning and design.

The school was established as a critique of traditional design education, which the founder described as "too compartmentalized, inflexible, and theoretical."[56] Conway's resulting progressive education theory emphasizes a hands-on, collaborative approach to design through an applied curriculum where students take traditional lecture-based classes, and gain direct experience through real projects.

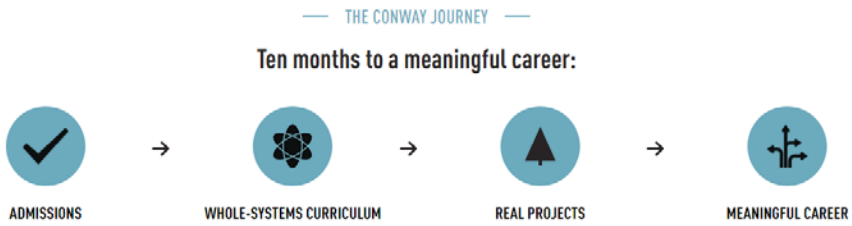


Figure 12 - The Conway School methodology combines live studio projects with an interdisciplinary curriculum to prepare students for lifelong learning in their careers[57]

Throughout the program, students develop real-world design and communication skills by working on real projects and fieldwork with clients in the local community. This live design studio model brings together students, educators, practitioners, and clients to promote a collaborative exchange of knowledge. Students address global challenges through three design projects at different scales: residential, conservation, and new development.

[55] "Home | The Conway School | Graduate Program in Landscape Design."
[56] "Home | The Conway School | Graduate Program in Landscape Design."
[57] "Home | The Conway School | Graduate Program in Landscape Design."

All team members are driven by a shared common vision that unites them. Each group and its members bring their own unique skills and perspectives to the project, which informs the design process and mirrors the environment found in professional practice. Students are divided into small teams to tackle projects, and actively receive input from other groups. This strategy promotes collaboration between teams, as opposed to the individual competition found in traditional design studios.[58] Due to the team-based nature of the work, learning is assessed based on the process and how well students perform certain tasks, rather than the design outcome. Projects are structured to promote a collaborative, team-based design approach, while respecting the importance of individualized learning.

The curriculum combines classes, discussions, and studio work to create an integrated and multidisciplinary program. The school employs a mix of full and part-time faculty and staff who work in the field. In addition, outside leading experts are brought in weekly to lecture and offer students feedback on their studio projects.[59] These direct ties to professional practice allow faculty to continually bring new, relevant topics into their teachings. Thus, the graduate program becomes a dynamic process in itself, rather than a fixed checklist of courses and requirements.

[58] "Home | The Conway School | Graduate Program in Landscape Design."
[59] "Home | The Conway School | Graduate Program in Landscape Design."

Figures 13 (Right) and 14 (Left) - Students work on real projects in collaboration with faculty, practitioners, clients, and local members of the community[60]

[60] "Home | The Conway School | Graduate Program in Landscape Design."

CHAPTER IV

A NEW MODEL FOR SYNERGY

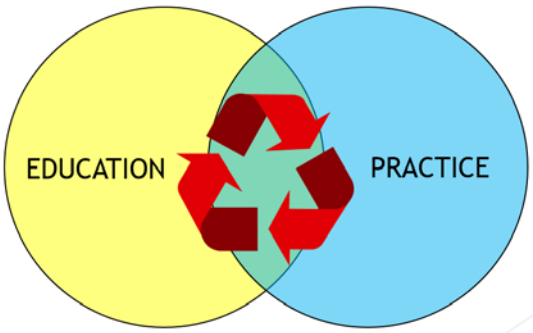


Figure 15 - Challenge – Develop a new, integrative model of architectural education and practice

At its heart, architecture combines the freedoms of creative problem solving with the realities and constraints of science. In embracing a new model for lifelong learning in education and practice, we will create the ideal architect, balanced in creative problem solving skills acquired through a theory-based education, and the technical knowledge and skills required for professional licensure.

Integrating an educational and practice component through this facility will promote an active interaction and exchange of knowledge between education and practice. This will enable education to evolve pedagogies in direct response to external changes in practice, and vice-versa.

As shown below, the proposed model for lifelong learning in architecture engages aspects of education, research, practice, and the surrounding local community through a process of collaborative interactions and exchange (Figure 16). Each individual group contributes

their own unique set of knowledge and skills to the others. In return, each group's corresponding needs and challenges are met by drawing upon the skills, knowledge, and experience offered by their counterparts (Figure 17). This process creates a cyclic exchange of knowledge and skills between traditionally separate groups in architecture. Thus, learning is no longer strictly a linear process where one transitions from school to practice. Rather, through the integration of these four facets and their collaboration with one another, this model stresses that learning is lifelong.

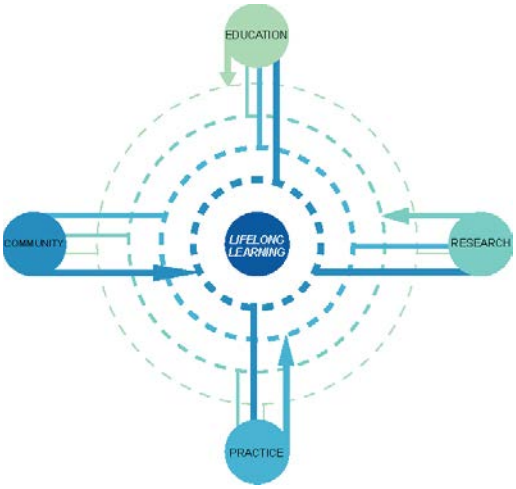


Figure 16 – Lifelong Learning Diagram

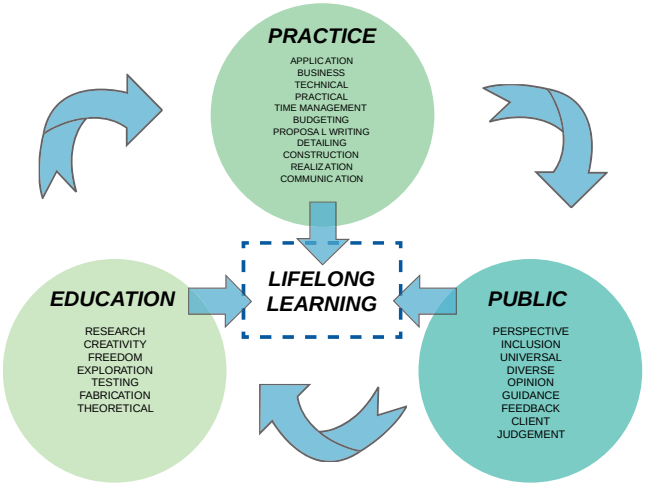


Figure 17 – Knowledge Exchange Diagram

CHAPTER V

BUILDING TYPOLOGY AND PROGRAMMING

Through the findings of the literature and precedent review, two building typologies emerged as possible solutions to the problem.

1. Building Type 01 –The Hub

The “hub” model, based in a major city, reaches out to existing local architecture firms, schools, and the greater public community for support to create an incubator space for collaborative, lifelong learning. Students, educators, researchers, and practitioners come together for part of the day to confront a combination of theoretical and live design challenges. Participants routinely rotate in and out of the facility, bringing people together from a variety of different backgrounds and experience levels.

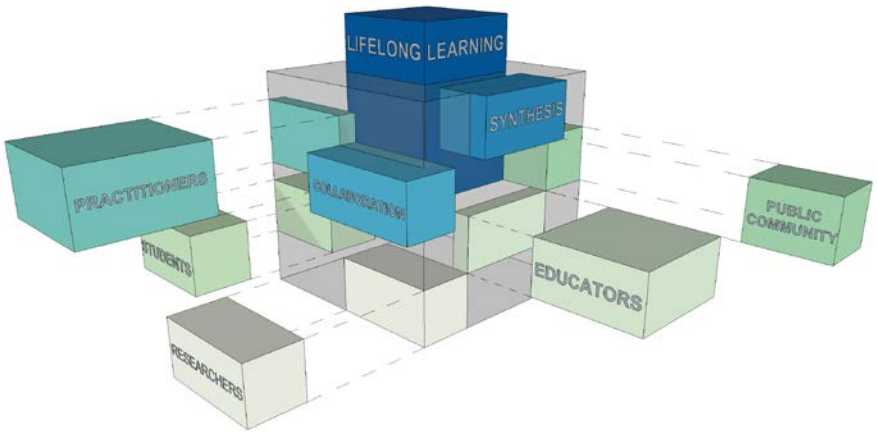


Figure 18 - The hub model draws fr[illegible] for support.

Through a series of private individual, and public group support spaces, this model supports the translation of knowledge between all participants, and promotes collaborative innovation and discovery by providing shared community research, testing,

and fabrication resources. Final results are shared with the public community, providing opportunities for public engagement via review and critique. All programming is concentrated within a small spatial volume, which can slot into an existing office building.

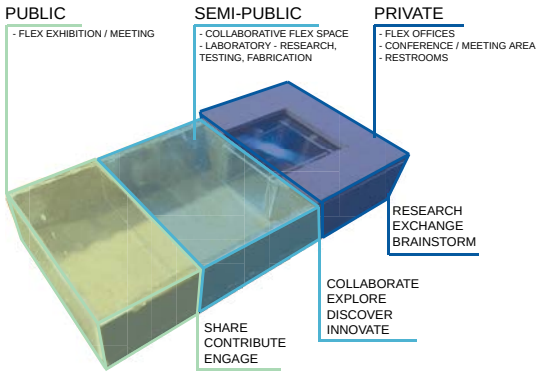


Figure 19 - All program spaces are combined into a condensed, modular unit.

2. Building Type 02 – Integrated Facility

The integrated facility serves as a regularly occupied, standalone building that combines students, educators, researchers, practitioners, and the general public. Similar to the hub model, common resources are shared between all occupants to facilitate interactions and the translation of knowledge between participants.

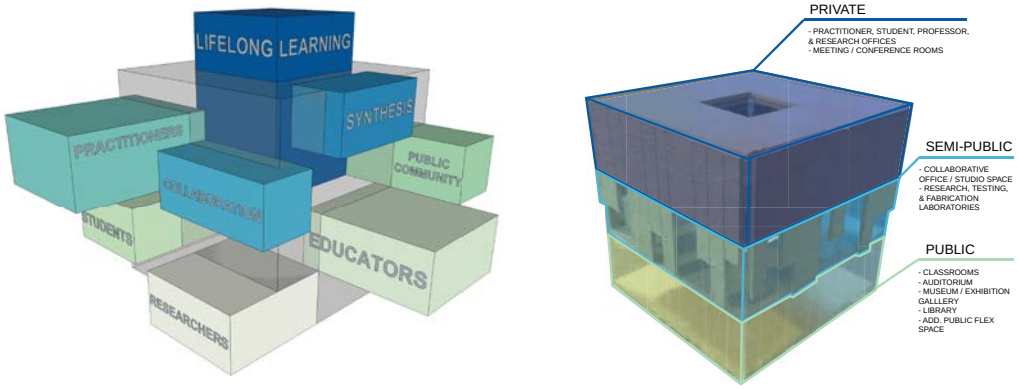


Figure 20 - The integrated facility combines all desired functions in a standalone building.

The integrated building offers the key advantage of housing all facilities in one large facility. In contrast, the hub model provides a designated space as part of an existing building, and relies on external support and resources. For these reasons, the integrated model was chosen to test the proposed framework of group collaboration.

3. Programming

The proposed building program divides spaces into three distinct subcategories: private, semi-public, and public. Fulltime occupants are given a mix of small, private individual spaces, contrasted with large, public group areas. All program elements are interconnected through the facility to promote the exchange of ideas and research between students, educators, and practitioners. This program strategy facilitates collaborative group work, and provides sufficient space for individual work and study. The end goal is to create a cyclic exchange of knowledge between education and practice, embodied for a facility through lifelong learning.

Private functions include several unassigned flex offices, available to students, researchers, educators, and practitioners for temporary use. Conference rooms provide space for small group research and brainstorming sessions. As the project evolved, the number of flex offices was reduced in favor of greater collaborative workspace. This move encourages participants to work primarily in an open plan environment, while the remaining flex offices allow for individual work and isolation when necessary.

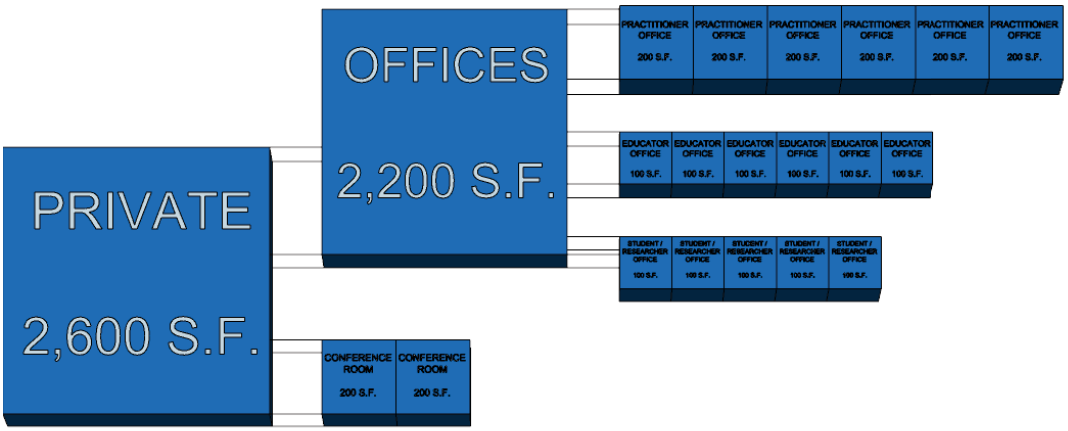


Figure 21 - Private Building Program

The building's semi-public areas provide a combination of interior and exterior collaborative maker space for group exploration, discovery, and innovation. These spaces function as live learning laboratories, where occupants come together to work on live projects. Common shared facilities include laser cutters, routers, and woodworking tools. Overall, the goal of the semi-public space is to facilitate a series of collaborative exchanges between the full-time occupants of this facility.

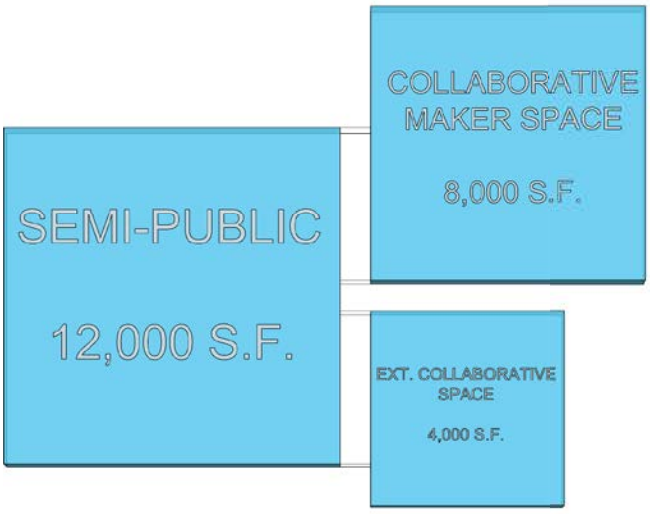


Figure 22 - Semi-public Building Program

Public functions provide space for public access and community engagement. The building's public program is envisioned as a series of spaces for students, educators, and practitioners to share their work, solicit public feedback, and directly engage with the local community. These components include an auditorium, classrooms, lobby/café, gallery/exhibition area, and exterior park.

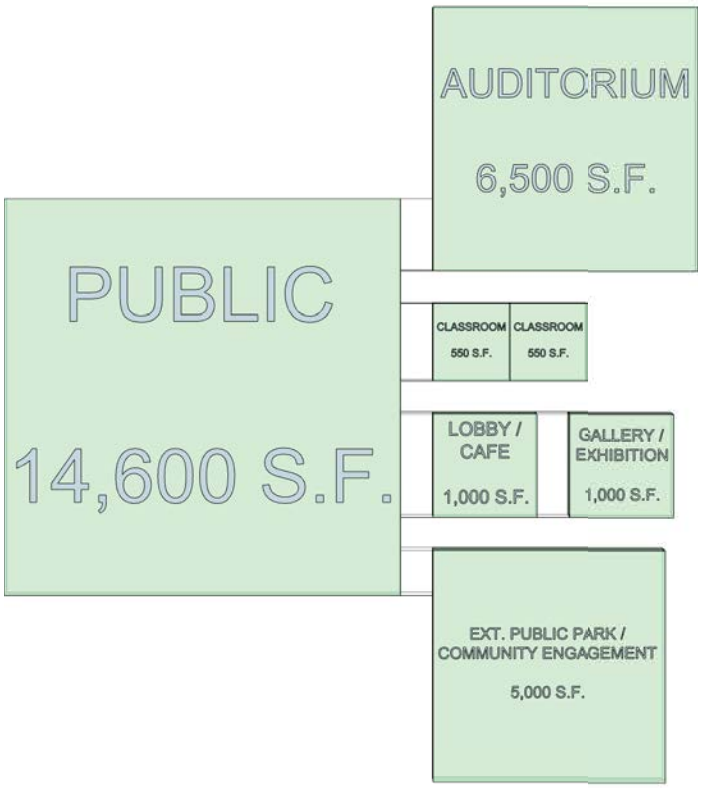


Figure 23 - Public Building Program

After site selection, the aforementioned program was adjusted to accommodate a larger scale of development. The final building contains the same program elements in a five-story, 85,000 square foot facility.

4. Funding and Operation

The creation of this building will be funded via a combination of state and private sources and function as a non-profit organization, using the Architectural Research Institute (ARI)[61] and Detroit Collaborative Design Center (DCDC) discussed previously as precedents for its founding and daily operation.

Similar to the ARI, the operation of this facility will be publicly funded by the city of Worcester. In return, its occupants will work together in diversified teams to deliver work which directly supports Worcester's strategic goals, including the revitalization of the city's downtown district, and development of affordable housing.

Students, researchers, and practitioners will spend normal working hours inside of the building. The facility will also provide exhibition, auditorium, classroom, and lounge spaces open to the public. Local officials and residents have the opportunity to participate in project meetings and solicit feedback.

[61] "Architectural Research Institute (ARI) | College of Agriculture, Sustainability & Environmental Sciences."

CHAPTER VI

SITE SELECTION AND ANALYSIS

The site for the project was chosen to be in the city of Worcester, Massachusetts. Originally envisioned as the major city of the Commonwealth, Worcester's central location acts as a halfway point between the major cities of Boston and Springfield.

In addition, Worcester offers a rich technical school base of students and educators to draw from. Clark University, the College of the Holy Cross, and Worcester Polytechnic Institute (WPI) are all located in the city and have existing drafting and/or architecture programs, with Fitchburg State University just a short distance away.

Selecting a site to base this project also prompted a reframing of the central idea and mission of this facility. Through exploring the city's history, opportunities, and challenges, it became clear that this center must exist both to enact a proposed framework for lifelong learning in architecture, *and* address key issues in the context of Worcester's local community.

According to a 2010 survey of Worcester by the U.S. Census Bureau, 20.1% of individuals and 16% of families fall below poverty level. Beginning in 2011, the city had more retirees than workers. While the second largest city in New England, Worcester has

the second lowest population density when compared against other major cities in the surrounding region.[62] Roughly 2,500 (10%) of the city's students identify as homeless.[63]

Residents and city officials continually list revitalization of Worcester's downtown district, development of affordable housing in the surrounding neighborhood, and infrastructure upgrades as major needs in the city.[64] [65] Similar challenges regarding lack of affordable and middle-income multifamily housing exist at the state level.[66] Thus, the proposed building will bring together students, educators, researchers, and practitioners to enact a new framework for lifelong learning in architecture, and use this knowledge and talent to address issues of downtown revitalization and affordable housing at the local level.

The goal is that these efforts will eventually spawn a series of similar facilities, each pooling architectural resources to confront specific local design challenges. The building's success is made possible by balancing priorities of site and program. Such facilities for lifelong learning must have a clear local purpose and be based in areas where the work they produce will directly benefit the surrounding community. In turn, the facility's programming establishes a prototype model for architectural education and practice, which can be broadly applied across a range of different scenarios.

[62] STAFF, "Officials, Residents Ponder Worcester's Problems, Potential."
[63] Quinn, "In School and Homeless."
[64] admin, "9 Challenges Facing Worcester's New City Manager."
[65] STAFF, "Officials, Residents Ponder Worcester's Problems, Potential."
[66] "Candidates for Governor Speak on What They Consider the Biggest Challenge Facing Massachusetts - The Boston Globe."

The proposed site, 59 Madison Street, is centrally located to downtown Worcester, the Union Station, and surrounding colleges as shown below. The site is easily accessible via a variety of different modes of transportation, including bike, car, bus, train, and walking.

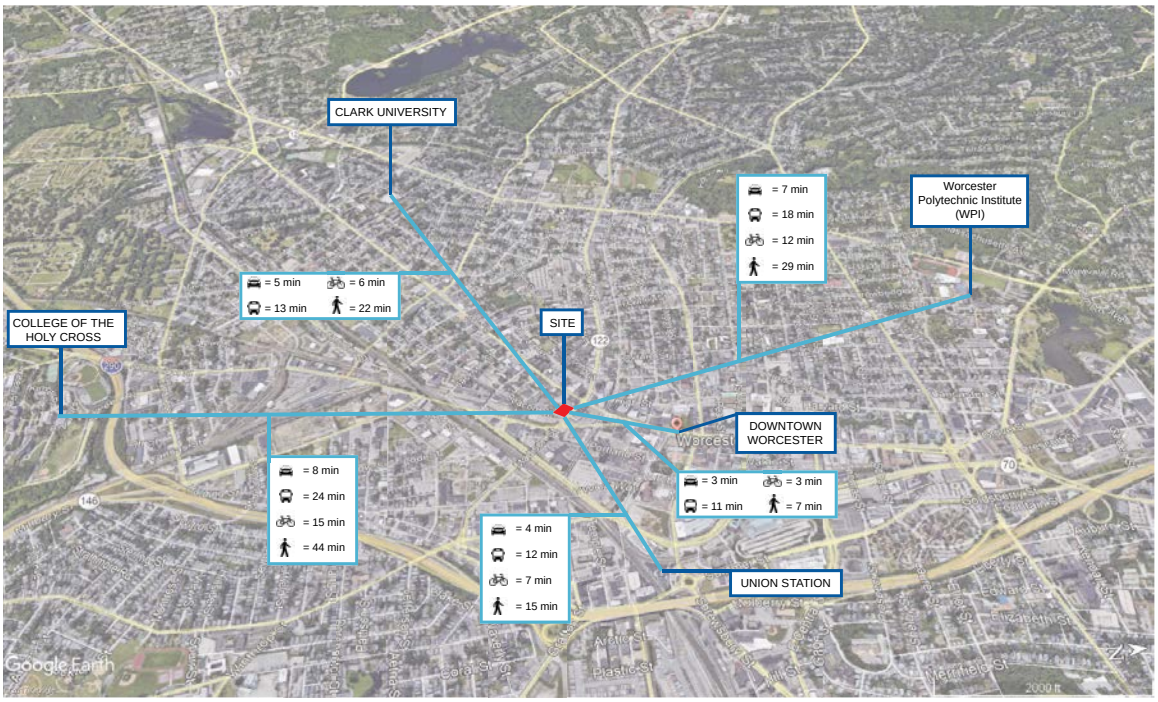


Figure 24 - Transportation Site Diagram

Located off Main Street at the southern edge of Worcester's core downtown district, the site also acts as a physical juncture in the transition from commercial to residential scale development. This gray area creates opportunities to engage both the local business and residential communities through this facility.

The site is flanked by a five-story old brick industrial building to the northwest, and a similar, four-story structure to the south. While the proposed building is treated as a new, standalone facility, these old structures allow for future expansion via adaptive reuse if

desired. Views to the northeast, southeast, and south are mostly unobstructed. The height of the existing factory building to the south creates challenges for natural daylighting. These issues can be alleviated through the proposed building's height and massing.

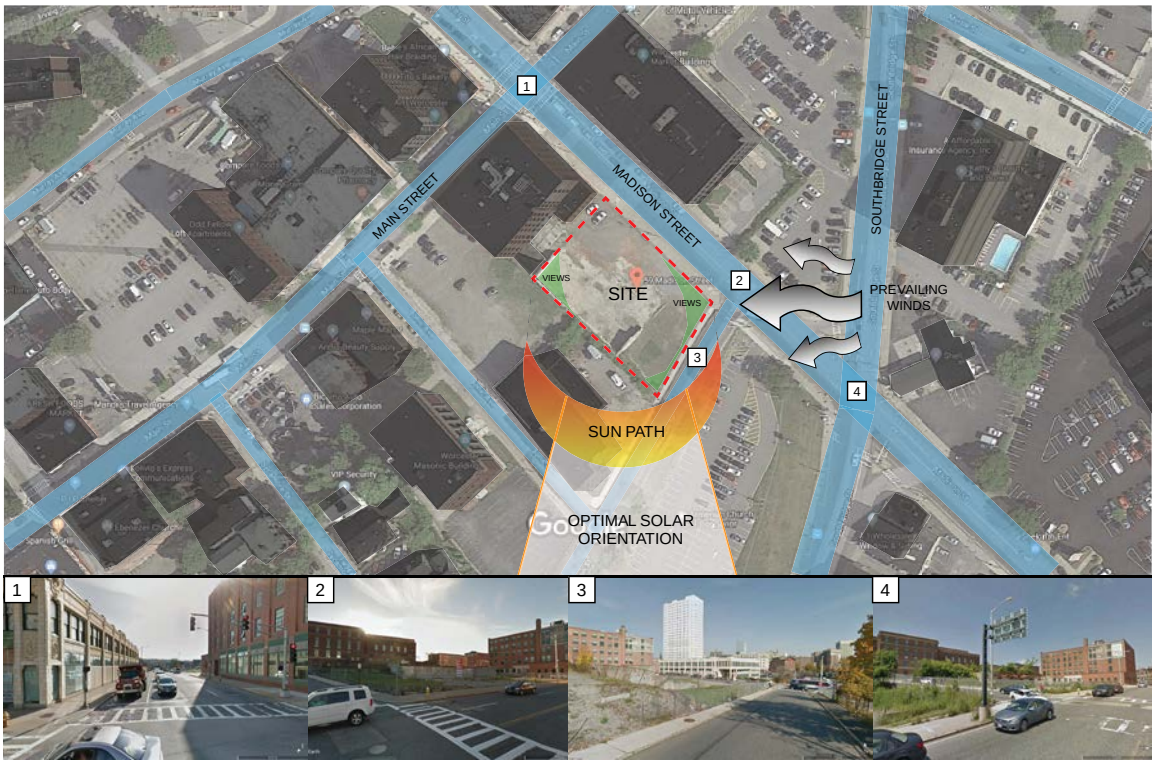


Figure 25 - Site Analysis Diagram

The parcel is zoned for BG-3.0 (business, general) to accommodate commercial and/or mixed use development. In terms of dimensional regulations, the city requires 40 feet of lot frontage and a ten foot minimum rear setback. Side setbacks are not applicable. Proposed development must also maintain a three to one floor to area ratio, and adhere to maximum allowable building height of 100 feet as shown.

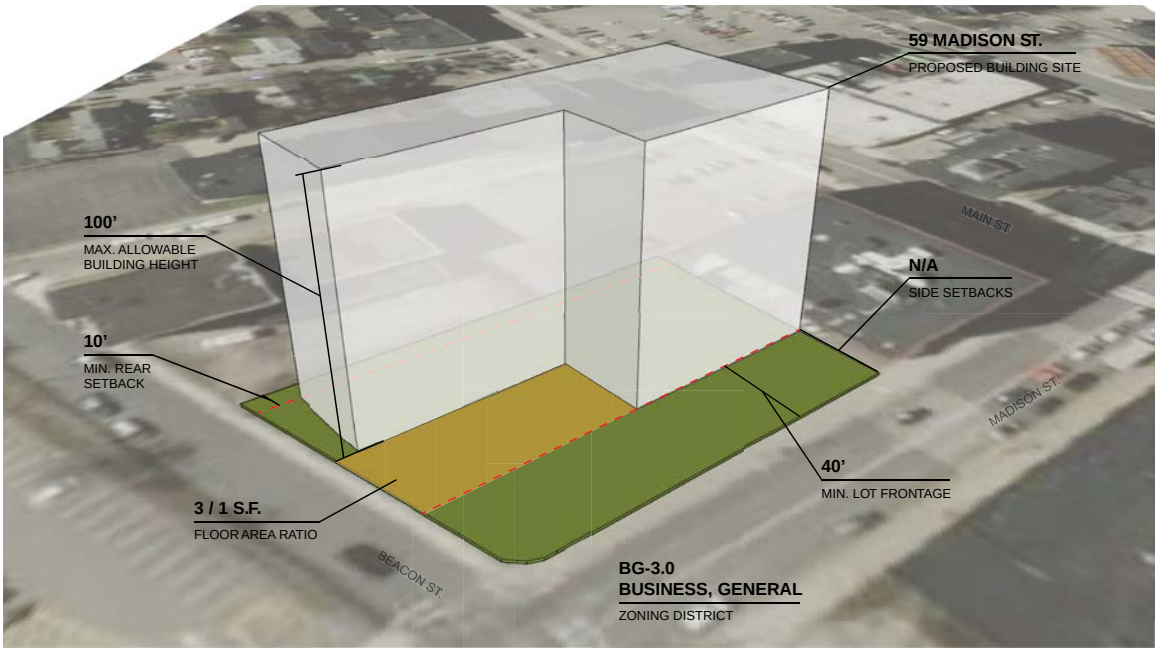


Figure 26 - Zoning Diagram

Given the square footage of the site and zoning regulations, I have proposed that parking be excluded from the program, with the exception of handicap accessible spaces as required by code. Several existing surface parking lots surround the site, and provide ample space to accommodate the building’s fulltime staff and visitors.

CHAPTER VII

DESIGN OVERVIEW

1. Concept Development

Preliminary massing and conceptual design were explored through sketch and a series of iterative physical and digital models. The earliest physical models were completed prior to the project's site selection, and emphasized ideas of spatial layering and visual transparency through the juxtaposition of solid and void spaces. Major themes were interconnectivity and unity, embodied through four, distinct solid forms which coalesce at a central core as shown below.

Figure 27 – Preliminary Concept Models

Once the site was located, later explorations kept these same initial guiding principles, while adjusting the massing to respond to natural and manmade site forces, including

natural daylight, transportation, community connectivity, and scale of existing development.

Figure 28 – Concept Models

In keeping with the surrounding development, the massing engages the street edge on both sides. The central core was removed to create a large transparent void, where all activities would coalesce. Additional iterations tweaked the building massing to rise and fall in response to the surrounding buildings. The final massing begins as a three-story structure at the rear, and embeds its first floor into a 16’ existing retaining wall. Gradually, the form rises to a five-story structure at the intersection of Beacon and Madison street, creating a series of sloped interior and exterior spaces on the southwest façade.

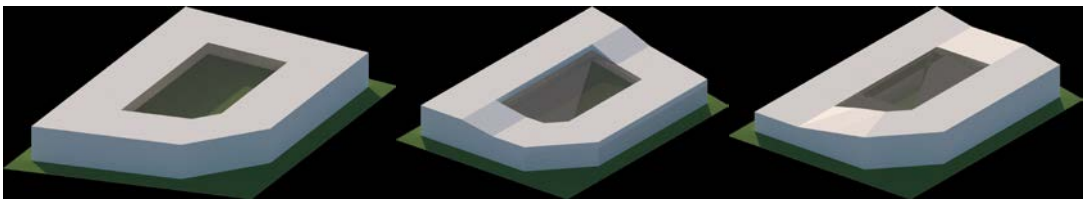


Figure 29 – Massing Studies

Figure 30 - Diagram, showing site integration of building massing and programming

2. Building Overview

Figure 31 - South Exterior Perspective

The five-story, 85,000 square foot Facility for Lifelong Learning brings together students, educators, researchers, practitioners, and local members of the community, who work

together as a diverse, integrated team to address pressing needs of downtown revitalization and affordable housing for the city of Worcester, Massachusetts.

The proposed site lies at a unique crossroads between commercial and residential-scale development. In effort to aid this transition, promote alternative transportation, and engage the local community, I have proposed the existing parcel to the east of the site (currently a surface parking lot), as a future public park. On the northeast side of the building, a landscaped ramp connects to the proposed park, and allows for an additional service entrance at the second floor.

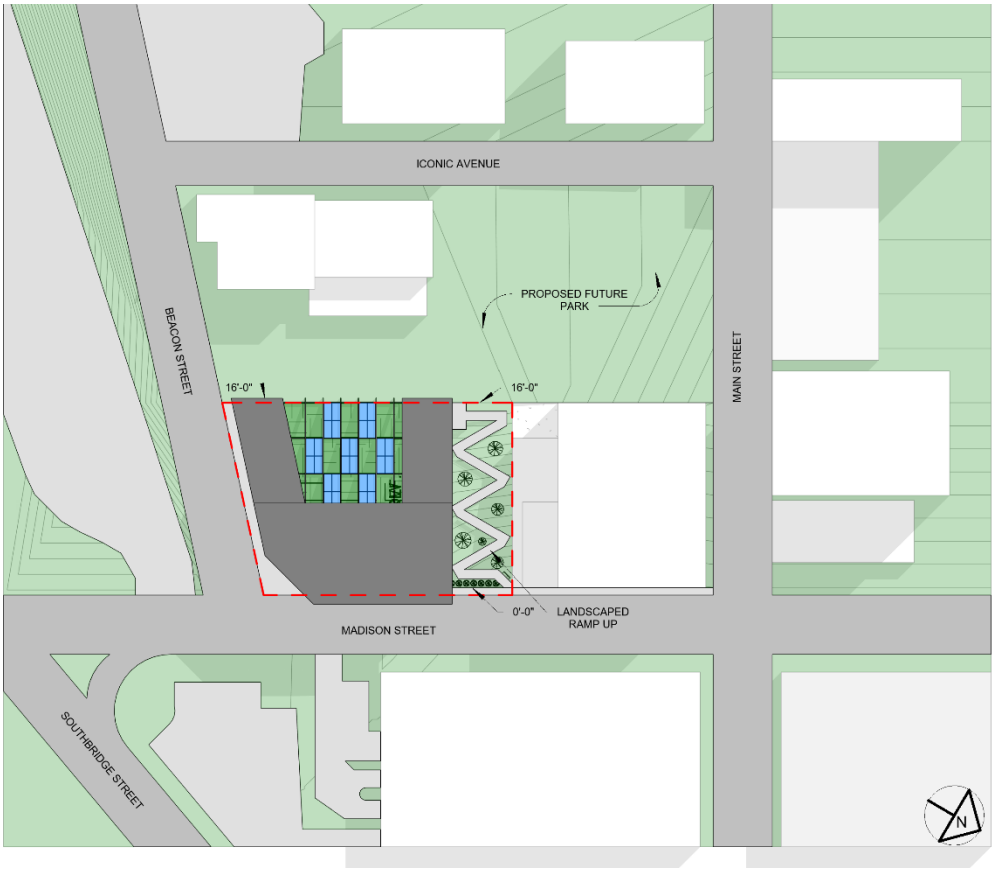


Figure 32 - Site Plan

All major public programming is consolidated at the ground floor for increased visibility and accessibility from the street, including classrooms, a library, seminar room, café, gallery/exhibition area, and large auditorium. The building provides three entrances and stairwells (two of which are enclosed for egress purposes). Located at the intersection of Beacon and Madison Street, the building's design emphasizes transparency and visual connectivity between the interior and exterior, inviting members of the local community to enter and actively engage with these spaces. These common facilities serve the building's fulltime occupants, and can also be leased by the surrounding schools and town of Worcester for workshops, lectures, and other events. This operational model ensures that all available space is effectively utilized throughout the day.

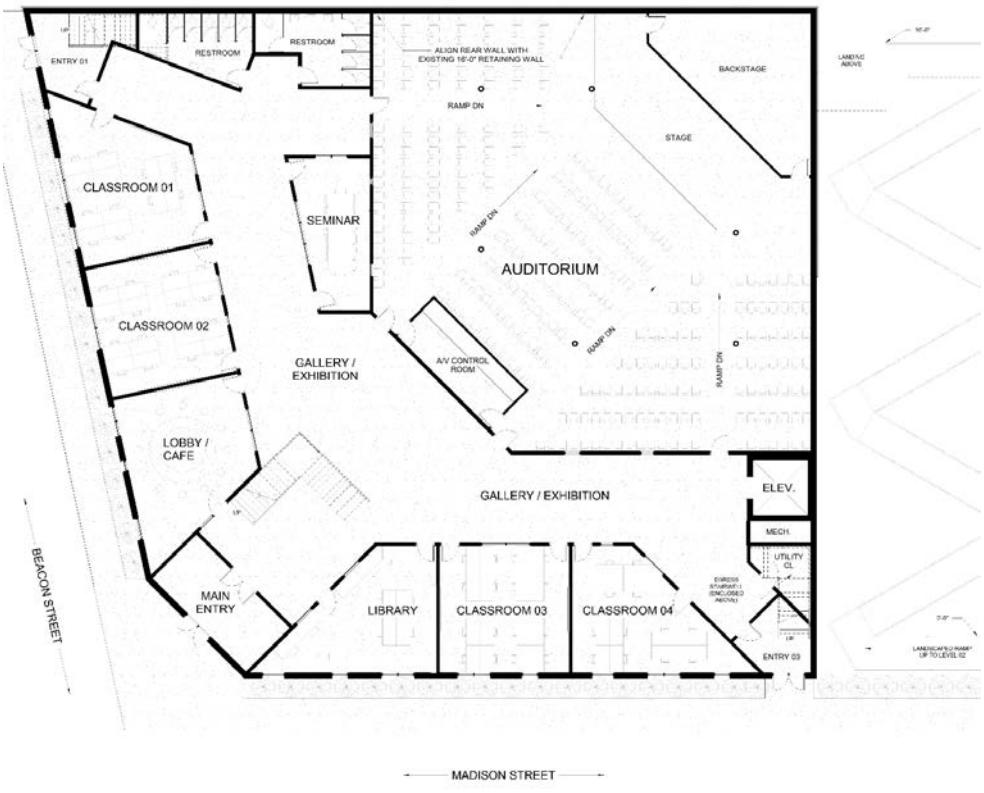


Figure 33 - First Floor Plan

The second through fifth stories of the building contain a mix of open plan, collaborative project space with interstitial conference rooms on the perimeter. In this space, students, researchers, educators, practitioners, and members of the community come together as a team to work on architectural projects for the city of Worcester. The open plan environment encourages collaboration and knowledge exchange both at the individual team level, and across teams working on different projects.

Figure 34 - Second Floor Plan

Project teams are brought together through a shared testing and fabrication laboratory, located at the heart of the facility. These spaces include common resources for physical exploration, iteration, and production, including CNC routers, laser cutters, plotters, woodworking tools, and dedicated workstations for project assembly. Unassigned flex

offices surround the lab and offer a temporary, private place for individual work when desired. Other utilities including staff pantries and restroom facilities are concentrated at the core of the building to free up the perimeter for collaborative project space on all four sides.

Completed and progress work is shared directly with the local community through the first floor public gallery/exhibition space, encouraging spontaneous collisions and interactions between the building's fulltime occupants and public visitors. Local officials and residents are invited to solicit feedback and participate in projects through a variety of formal (i.e. collaborative workspace, conference rooms) and informal (gallery/exhibition, classroom, café) settings, and thus actively shape the development of their own city.

Through opportunities to engage via traditional classroom-based lectures and concurrent involvement on live architectural projects, students are taught traditional academic theory, and practical, technical knowledge and skills required for the workforce.

3. Facade

The building's aluminum panel façade references the surrounding industrial age of the surrounding buildings, while establishing the facility as a unique icon and symbol of revitalization for the city of Worcester.

The façade system is comprised (interior to exterior) of 1/2” gypsum wall board, 2X6 steel studs spaced 24” on center with mineral wool insulation installed in the entire cavity, ½” exterior gypsum wall board, a vapor barrier, 3” of polyisocyanurate rigid foam board insulation, a 2” air gap, and an exterior aluminum panelized cladding system. Cladding is affixed to the studs via a steel track system.

Figure 35 - West Exterior Perspective, showing panelized façade system with conference room projections

Perimeter conference rooms on the upper floors cantilever out beyond the primary building envelope, as shown above. Inspiration for these spaces was drawn from the Comisaria Fuencarral by Voliar Arquitectos, located in Madrid, Spain.[67] These projections add visual character to the façade, while their transparency creates a seamless transition between interior and exterior, and provide plentiful ambient light to interior

[67] “Voluar Arquitectura.”

spaces. Narrow, vertical bands of operable windows allow for additional natural daylighting, while preserving a low window to wall ratio for high building performance.

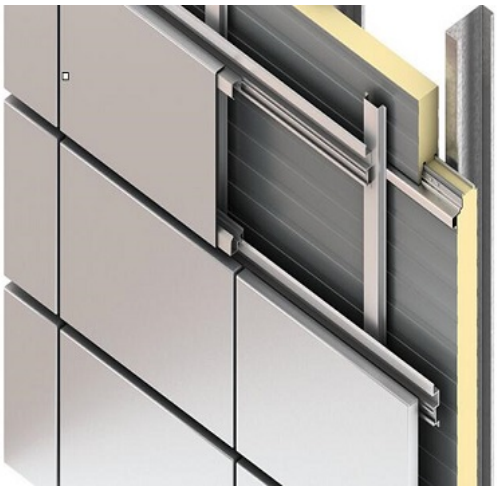


Figure 36 (Left) - Aluminum cladding system.[68] Figure 37 (Right) - Comisaria Fuencarral, by Voluar Arquitectos.[69]

In section, the floor plates stagger forward towards Madison Street as the building rises. This strategy helps the building to actively engage the street edge, shades for the floors below, and creates a series of alternating exterior walkouts and angled lounge spaces on the southwest façade, as shown below. Exterior fins define each structural bay, and provide shading for the angled lounge spaces (see collaborative project space rendering).

[68] "Pros & Cons of Using Aluminum Composite Panels."
[69] "Voluar Arquitectura."

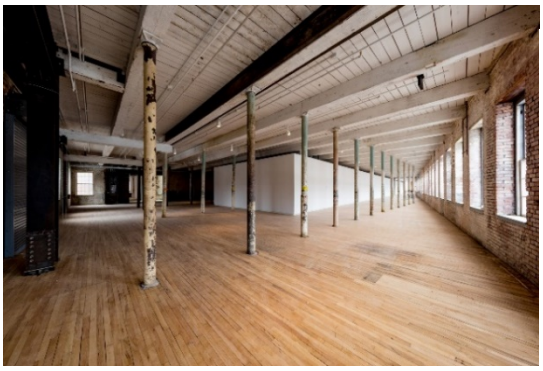
Figure 38 - Northwest Sectional Perspective, showing cantilevered northeast façade and angled southwest façade with exterior walkouts

4. Structural Systems

While the building's exterior materials provides something modern and different, the interior is designed to subtly reference and pay homage to the surrounding industrial buildings, and honor Worcester's legacy of manufacturing.

I drew inspiration from the Massachusetts Museum of Contemporary Art (MASS MoCA) in North Adams, depicted below.[70] The museum, once a series of old factory buildings, underwent a complex transformation and restoration. While most come to view the art, the building itself a great teacher in how places of ruin and abandonment can be revitalized to serve modern needs, whilst preserving their original heritage.

[70] "Bruner/Cott Further Expands MASS MoCA Art Museum in the Berkshires."



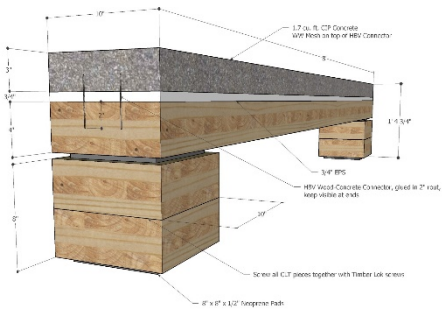


Figure 39 (Left) - Mass MoCA Interior Perspective, showing structural systems.[71] Figure 40 (Right) - Cross Laminated Timber (CLT) floor system.[72]

As seen above, the main structural system employed in these buildings is a series of uniformly spaces steel columns, supporting massive wooden beams, which in turn hold exposed decking and the floor system above.

The new facility pays tribute to the aesthetic character of these old factory buildings, while modernizing the construction techniques. The foundation is a typical poured concrete slab system, with R-10 rigid foam board insulation below. Steel columns support exposed, 12x12” glue laminated timber beams above. Columns are organized on a 12x12’ structural grid, which shifts in some areas due to the building’s angular massing. The timber beams support a composite, cross-laminated timber (CLT) floor system above, comprised of a base layer of CLT decking exposed on the underside, foam insulation for acoustical separation between floors, and a top layer of poured concrete.

[71] “Bruner/Cott Further Expands MASS MoCA Art Museum in the Berkshires.”
[72] “Building a Wood-Concrete Composite Bench with CLTs - by [as].”

Figure 41 - Collaborative Project Space, showing exposed structural systems

5. Interior Design

The facility's interior design stresses concepts of spatial layering and visual transparency to emphasize visual connectivity between spaces and promote enhanced collaboration between its occupants. Various sections of the building's wall and floor systems surrounding the central core are intentionally removed and/or enclosed with glass. This establishes sightlines internally through the building horizontally across spaces, between interior and exterior, and vertically between its floors. The result is a heightened sense of spatial awareness and unity, which prompts one to explore the building beyond their individual workspace.

Gund Hall designed by Australian architect John Andrews for the Harvard Graduate School of Design, was used as a precedent study to help structure the building's interior circulation patterns. Similar to this project, Gund Hall features a stepped rear façade

encasing a multi-level open studio workspace, nicknamed “The Trays.”[73] The Center for Lifelong Learning employs a similar strategy, utilizing its sloped interior spaces for exterior terraces, lounge space, and stairways.

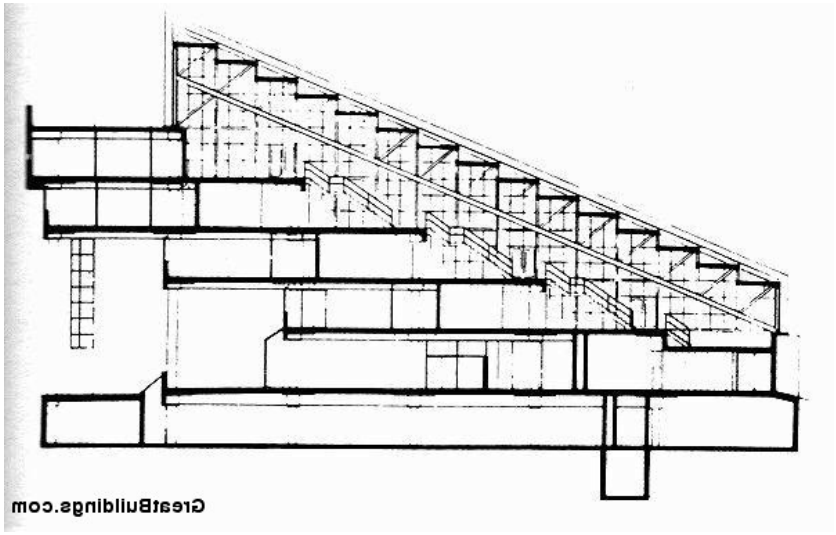


Figure 42 - Gund Hall Building section, showing stepped façade system and circulation patterns.[74]

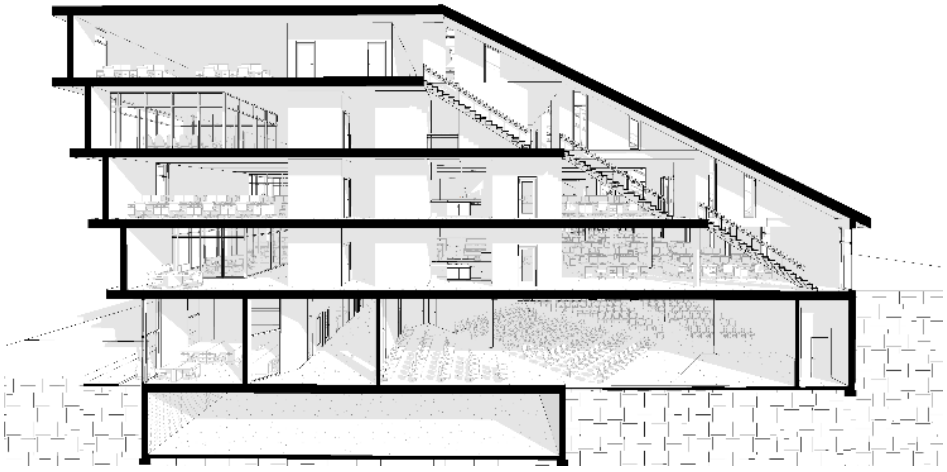


Figure 43 - Facility for Lifelong Learning, Southeast Sectional Perspective.

[73] “‘Trays’ in Gund Hall Serve up Design Delights.”
[74] “Great Buildings Drawing - Gund Hall.”

The end goal is a prototype for lifelong learning which can be widely replicated across a variety of different sites and scales, and even applied to different disciplines outside of architecture. Understanding that the needs of a place evolve, the building is both prescriptive and flexible. The open plan layout and structural grid are designed to allow for repurposing in the future to accommodate alternative disciplines and programming as the city's issues and needs change over time.

Figure 44 - Shared Testing & Fabrication Lab, showing visual connection to collaborative project space, exterior, and between floors

CHAPTER VIII

BUILDING IMPACTS AND BENEFITS

Bringing together students, educators, practitioners, and the public community through this prototype offers several impacts and benefits. Knowledge which is typically isolated and exclusive is now shared, leading to a better final product. This cyclic exchange allows education to adapt methods and pedagogy in response to the workforce and vice versa.

The integration of theory-based architectural education in conjunction with exposure to projects in their local communities helps students to gain creative problem solving and practical, technical skills in real-time, and apply them to real world challenges. This in turn, offers opportunities to further integrate and condense the path to professional architecture licensure. Working in tandem with schooling enables students to finance their education and jumpstart their professional careers. Students who opt to participate in this facility will function at the intersection of education and practice, and enter the workforce empowered with a strong balance of creative and technical skills.

Enhanced collaboration between the academic and professional spheres will inspire new research and innovation, enacting the values of research and academic theory through the practice of architecture.

Lastly, the active involvement of public representatives in projects will allow those most familiar with the area to contribute to the outcome of projects, and help shape the future development of the city as a whole.

CHAPTER IX

CONCLUSION

The disconnect between architectural education and practice has led education to miss opportunities to teach students business skills and knowledge required for the workplace, and allowed practice to lose sight of the importance of artistry and research. To maintain their relevance, education and practice must be flexible and adaptable. This thesis used design to address these issues by introducing a new model of architectural synergy, embodied through a facility for lifelong learning. The proposed building brings together students, educators, practitioners, researchers, and the local community to facilitate an active exchange of knowledge, skills, and processes through an open, collaborative environment. The integration of these traditionally separate groups within a single building inspires innovative discovery, and streamlines the transition from architecture school into the professional workforce.

While this model was explored at the public scale, application in the private sphere would introduce new risks and challenges. In the future, it would be interesting to study how this framework for learning can be broadly applied at a variety of different scales, across a range of disciplines that face similar challenges.

APPENDIX

ORAL DEFENSE PRESENTATION BOARDS

ARCHITECTURAL SYNERGY

RYAN RENDANO

A FACILITY FOR LIFELONG LEARNING

THE PROBLEM

Historically, the **education and practice of architecture have existed as two separate entities**. Architectural education has long prided itself on the value of creative problem-solving, research, and the fine arts. In contrast, the practice of architecture has evolved to emphasize technical knowledge, specialization, communication, business, and collaboration. This **disconnect has led education to miss opportunities to teach students business skills and knowledge required for the workplace, and allowed practice to lose sight of the importance of artistry and research**. Architecture educators, students, and practitioners each have a unique set of knowledge and skills to offer the other, and a corresponding set of need and challenges which must be addressed for the profession's continued success.

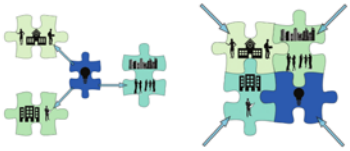
PROPOSAL & OBJECTIVES

Address these issues with a new model of architectural synergy, embodied through a facility for lifelong learning in architecture. The **primary goal** of this building is to **inspire integrative and collaborative processes between students, researchers, educators, and practitioners to address the current disconnect between them.** Through this facility, each group will have the opportunity to leverage their unique strengths and successes to help the others. This collaborative model will **allow each role mutually beneficial opportunities for lifelong learning through the exchange of knowledge, ideas, and processes between different groups.**

METHODOLOGY

Use design as a vehicle to test a new, integrated model for lifelong learning in architecture. While the final building is a response to a specific site and program, the goal is that the **conceptual framework and methods** which form the foundation of this facility **can be broadly applied to future projects**, and create lifelong centers for other disciplines facing similar challenges.

The **primary research and literature review trace the history of architectural education and practice from their early origins to the present, and examines current debates and issues in architectural theory and practice**.



PRECEDENTS

Precedents focus on a combination of **vocational schools, and innovative buildings designed to aid in interdisciplinary collaboration and the translation of knowledge.** Use current successful examples of innovative architectural schools and practices as a foundation, and build upon these ideas to inform the next step as we move towards future integrated models of architectural education and practice. The final **building synthesizes the findings of the literature review and precedent studies to enact the proposed framework for learning through architectural design.**

DETROIT COLLABORATIVE DESIGN CENTER

TECH CAMPUS, CORNELL UNIVERSITY

CONWAY SCHOOL OF DESIGN

ARCHITECTURAL SYNERGY

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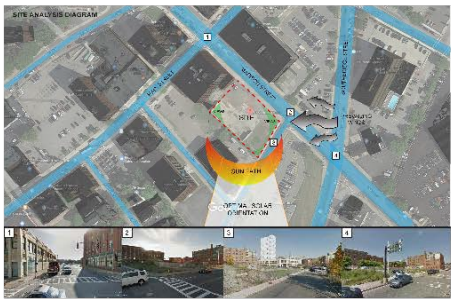
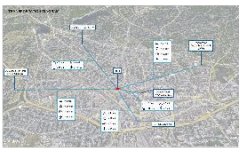
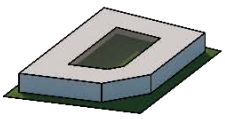
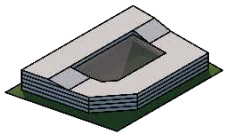
SITE ANALYSIS

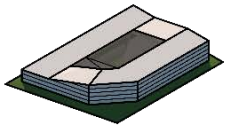


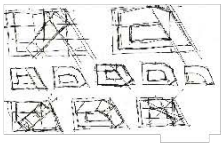


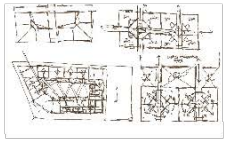
MASSING

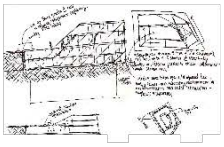




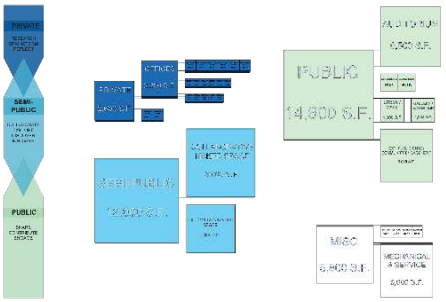


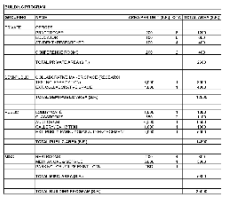


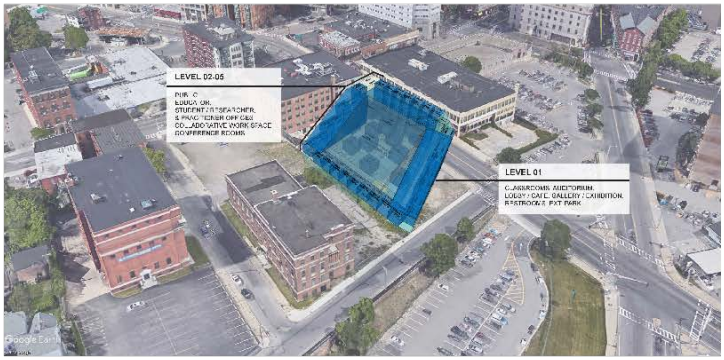




PROGRAMMING





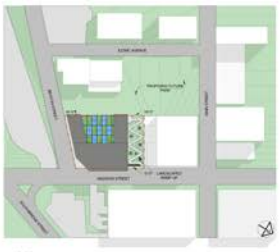


ARCHITECTURAL SYNERGY

RYAN RENDANO

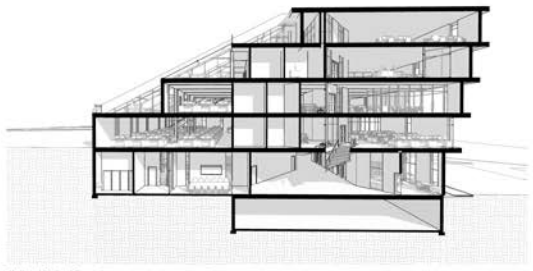
A FACILITY FOR LIFELONG LEARNING

SOUTH EXTERIOR PERSPECTIVE

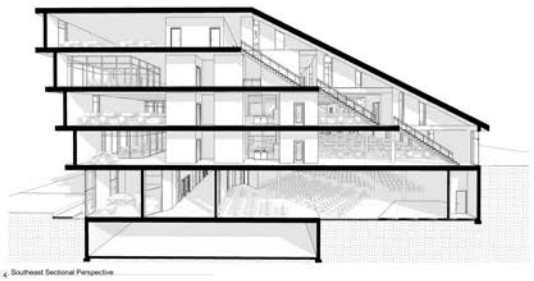


1 Site Plan
1" = 80'-0"

WEST EXTERIOR PERSPECTIVE



3 Northwest Sectional Perspective



4 Southeast Sectional Perspective

ARCHITECTURAL SYNERGY

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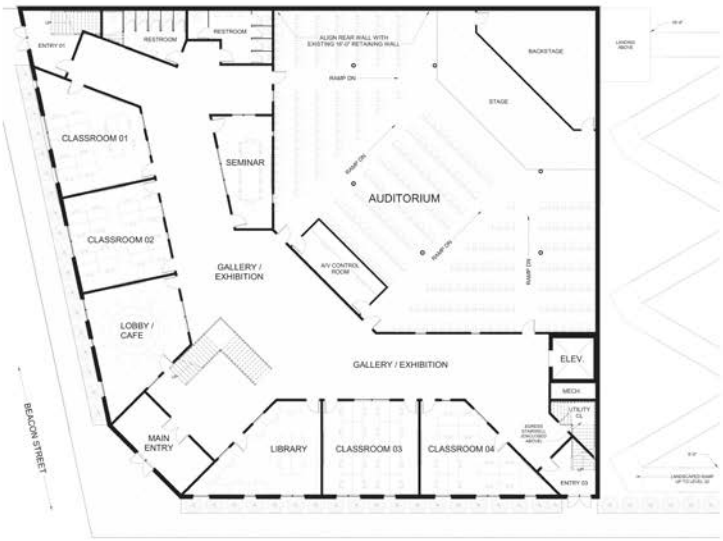
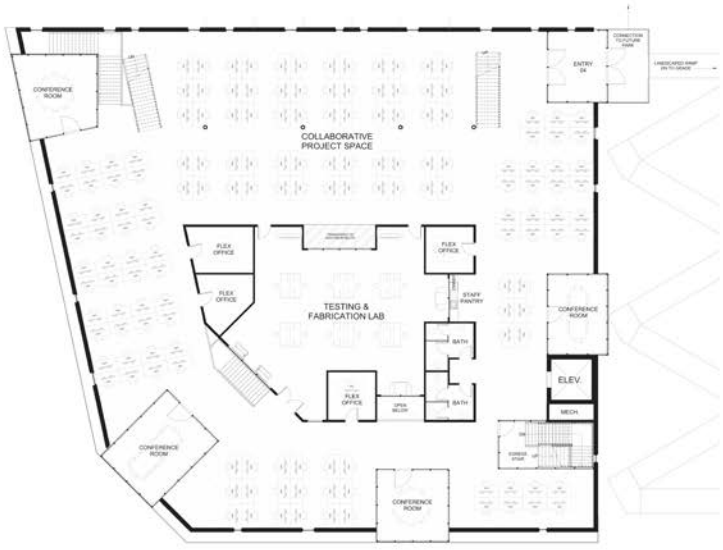


1 Level 01
1/8" = 1'-0"



2 Level 02
1/8" = 1'-0"

1 Level 03
1/8" = 1'-0"

2 Level 04
1/8" = 1'-0"

ARCHITECTURAL SYNERGY

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A FACILITY FOR LIFELONG LEARNING

COLLABORATIVE PROJECT SPACE

2 Level 05
1/8" = 1'-0"

TESTING & FABRICATION LAB

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