The Winnipeg Design Centre:

Rethinking Architecture Education in the 21st Century

By

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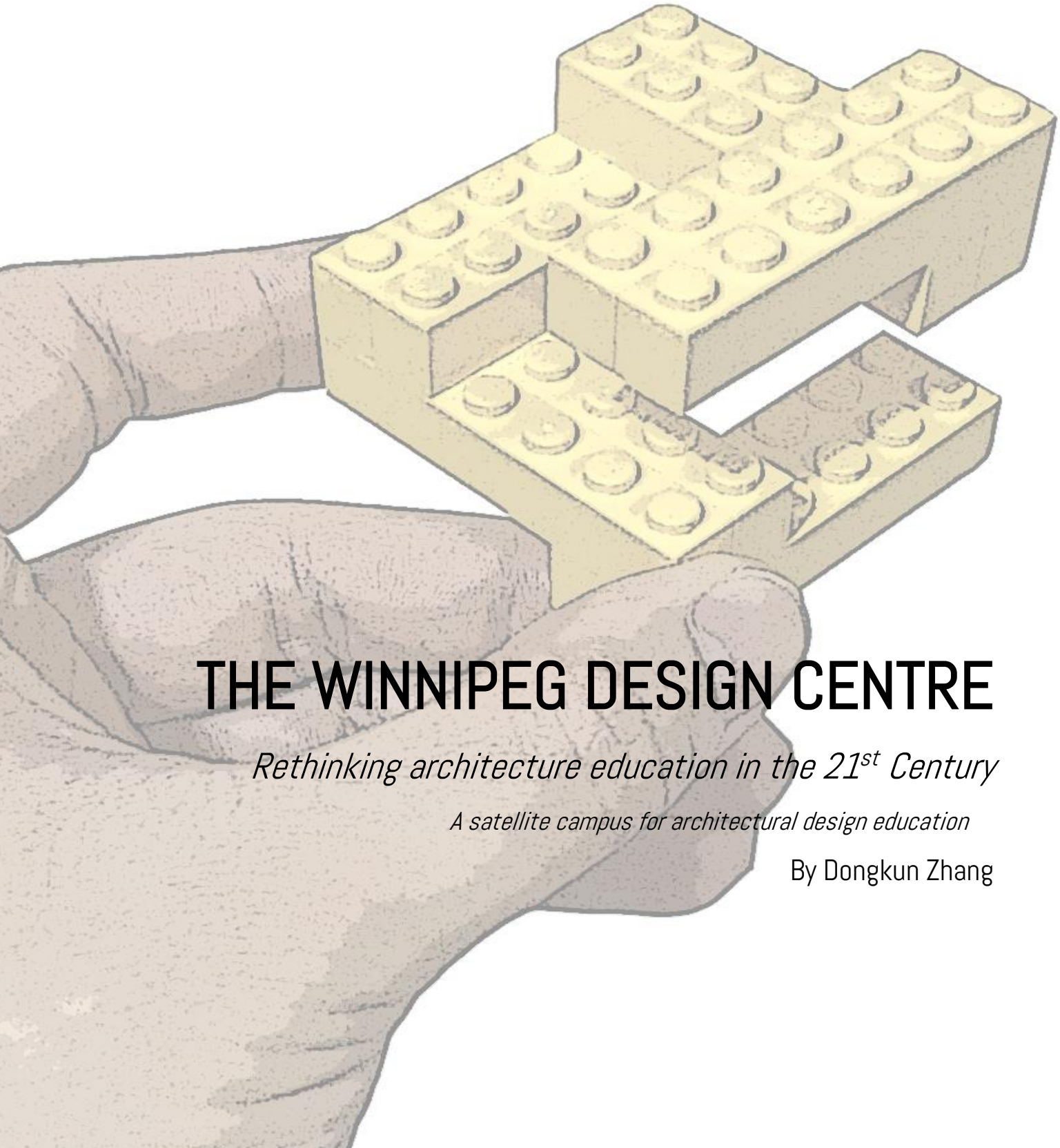

THE WINNIPEG DESIGN CENTRE

Rethinking architecture education in the 21st Century

A satellite campus for architectural design education

By Dongkun Zhang

I. Acknowledgements

I would like to express my appreciation to all the people who have motivated me to complete this practicum study. To my Advisory Committee, Kelley Beaverford, Jason Kasper, and Richard Milgrom, for their advice and expertise. Thank you for guiding me to explore the infinite creative opportunities in interior design. Finally, I must express my profound acknowledgement to my parents, my wife and my daughter for providing me with unfailing support throughout the journey of my study.

Thank you.

II. ABSTRACT

Postmodern architectural education offers a paradigm shift in programs that promote competence and artistic autonomy through design centres. Considering this transformation, architectural educators from all around the world work to educate students toward professional practice. However, the traditional physical settings of architecture schools do not often address this research question that is explored in this study: how can the interior design of learning spaces best support architectural design education in the 21st century?

This practicum explores an interior design strategy for architectural educational institutions to stimulate design awareness, participation, accessibility, and collaboration of the academy, members of the public, and professionals, to accomplish high quality built environments for users. It responds to the central research question through a study of architectural design pedagogy. The study results in a proposal for a satellite campus in the form of a design centre, for the Faculty of Architecture at the University of Manitoba in Winnipeg. The theoretical framework outlines the rationale of learning theories, modes of knowledge-inquiry, as well as defines the meaning of the design centre. Based on the understanding of these concepts, the author addresses an interior design strategy to reinforce the architectural design learning setting as a living textbook for knowledge exchange.

The proposed project will be for a not-for-profit educational facility housing space for - architectural students, academics, enthusiasts, and allied professionals to advocate design excellence in service to urban communities in the city of Winnipeg. The proposed name of this campus is the Winnipeg Design Centre (WDC). The conceptual project will belong to the Faculty of Architecture at the University of Manitoba and have the unique distinction of offering education through exploration of live design projects. The goal will be to facilitate and improve public knowledge about architectural

design, foster collaboration among members of architectural design communities, scholars, policy sectors, engineers, and building users. By bringing all stakeholders together, the WDC will reach the goal of inspiring new ideas to solve architectural related issues and problems as well as being a new community resource for Winnipeg's architectural professions and stakeholders. The physical facility of the WDC will be multi-functional, housing meeting spaces, workshops, design studios, lecture spaces, exhibition spaces, study spaces and leisure spaces.

Keywords: *Architecture, design centre, Constructivist Learning Theory*

IV. KEY TERMS.

Before the author begins to introduce this practicum study, it is critical to define some key terms used throughout the following chapters. There are four key terms used as a guideline for this study: architecture, design centre, constructivist education, and pedagogy.

Architecture: a holistic term that can be described as a concept, an art, a science or a product. In this practicum, the term architecture is used to describe the action and the process of responding to a problem. Architecture is a creative act that responds to human needs and maintains the society; it is the creation of meaningful spaces which are developed through thinking and making by both individuals and by collaboration.[1] This argument clearly shows that architecture involves an extensive scope of design practices. In this interventional study, the author uses the term architecture in the broadest sense to include architecture, city planning, landscape, and interior design. Although focus and scale can define each discipline, the author refers to all the disciplines in the same way as the design problem-solving process in the discussion about architectural education.

Design Centre: a place for establishing a dialogue between architectural institutions and the public; it is also intended to illustrate the changing perspective of the architectural institutions that are moving more towards community engagement than the traditional way of practicing architectural education. In this study, the essential role of a design centre is to combine a practice-based model of learning with community engagement to, create high-quality physical environments that also improve the quality of life for communities. Design centres serve as facilities where professionals, students, educators, clients, and community members discuss architectural

[1] Özmen C. Increasing Social Awareness and Professional Collaboration in Architectural Education-Free Future[J]. 2013, 1(4):84-84.

project concepts and collaborate with each other. This organization can also augment the architectural institute; it would be a place where architecture students could exchange ideas with professionals from other disciplines.

Pedagogy: the method and practice of teaching. Pedagogy is not merely the instructional approach; it is also the technique of delivering information. This practicum explores types of pedagogies that can inform the design of interiors for architectural education.

Constructivist Learning Theory: a theory focused on how people learn. It states that individuals construct their knowledge and understanding about the world through experiencing objects and reflecting on those experiences. When individuals encounter new things, they must unify new objects with their previous experience and cognition, maybe changing what they believe or discarding the new objects as irrelevant.[2] In the learning environment, constructivist education can apply to various learning and teaching practices. Generally, it often encourages students to participate in active activities (real-world problem solving, observation, experiments) to create learners' knowledge and then to reflect what they have learned based on those activities.

[2] Constructivism as a Paradigm for Teaching and Learning. Accessed April 29, 2017. http://www.thirteen.org/edonline/concept2class/constructivism/

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CHAPTER 1.0

PROJECT INTRODUCTION.

This chapter describes the rationale, the functional objectives, as well as the investigation methods of the practicum project. This chapter also accommodates the learning objectives that the author hopes to achieve through the investigation study.

1.1 BACKGROUND.

Thomas Fisher, the dean of the College of Design at the University of Minnesota, in his recent publication "Designing our way to a better world" (2016) predicted that The Third Industrial Revolution would come to us in 2050, and it would re-construct the practice of architecture dramatically.[3] According to Fisher, the Third Industrial Revolution will shift from mass production and consumption to the production of mass customization by advanced digital technologies and machines.[4] These technologies will disrupt and alter the architectural professions and education that have characterized the last two centuries. By 2050, public communication will become a significant part of the customization economy. Therefore, for the architectural profession, it is necessary for the end users to have some guarantee of integrity before they purchase the architectural services.

In light of these changes, it will also require a change in how architecture schools cultivate future practitioners. The future school of architecture should begin to encourage students to take courses in a comprehensive and extensive range of disciplines and shall provide more flexible opportunities that allow students to meet with clients and study with local firms as well as community organizations. By working with individuals from the public and different industries, students can gain first hand knowledge of the future directions of design as well as more advanced information about the professional industry through an active dialogue. When planning for cities or designing buildings, architects or designers should try to do so from the perspective of future occupants and predict the applicable patterns of use in a city or building; while generating forms, volumes, shapes, textures, materials or symbols that correspond to the anticipated user demands. The continually changing communities shape how individuals live, work, and

[3] Fisher, Thomas. "Welcome to the Third Industrial Revolution: The Mass-Customisation of Architecture, Practice and Education." *Architectural Design* 85, no. 4 (2015): 40-45. doi:10.1002/ad.1923.
[4] Ibid.

play in the built environment. The process of creating these places is about expressing and supporting the surrounding culture. Because of this, the author argues that what architectural students must focus on is not what is designed but rather how design contributes and responds to the necessities, shortage, and aspirations of those individuals who will use these places. To this end, we need to rethink how we educate future architectural practitioners.

In this day and age, architectural professionals and educators are looking for the most appropriate strategies to cultivate a new generation of practitioners. There is currently a transformation from the modernist educational form with a focus on searching universal and subjective design principles, to the postmodern educational form with the infusion of interdisciplinary knowledge in the design process, affording different perspectives in the architectural design study. A postmodern educational form is supported by the constructivist educational approach with the concept - knowledge is the learners' creation through his or her own experiences.[5]

In many arguments related to the future pursuit in the education of future architectural students, their physical learning settings are not often satisfied (Fathi, 2014; Cramer, 2012; Von Koenig, 2013; Richard, 2013). For centuries, North American architecture schools have remained mostly unchanged for their educational spaces where these institutions have established an ideal educational condition for master-centred practice which is largely focused on one-way knowledge transmission.[6] This kind of educational system is good at establishing students' foundational skills. However, the significant challenges we face in the 21st century require a much more interdisciplinary and comprehensive educational format; calling on faculty and students to work with different colleagues in different

[5] Schrader, Dawn E. "Constructivism and Learning in the Age of Social Media: Changing Minds and Learning Communities." New Directions for Teaching and Learning 2015, no. 144 (2015): 23-35. doi:10.1002/tl.20160.
[6] Fisher, Thomas. *Designing our way to a better world*. Minneapolis: University of Minnesota Press, 2016.p.15

industries and multi-disciplines related to social, cultural, environmental, and economic dilemmas that continue to influence society.

Additionally, these educational institutions are designed around the concept of architectural icons to attract their students as well as demonstrate a historical architectural design ideal.[7] For instance, the main building of the architecture school at the University of Manitoba, The John A. Russell Building is defined as modernist architecture with the characteristics of open span building plans, mainly using materials of steel, concrete, and glazing. This building illustrates the modernist educational concepts situated in the mass production and consumption economy and social structure that has already changed in our postmodernist production of a collective customization context in the 21st century.

Although the creativity of architecture has become pyramidally significant in the economic world, design problem solving does not get taught explicitly in current architecture schools; Fisher argues that two things are getting lost in current architectural education.[8]

First, ongoing architectural education often loses sight of putting wisdom into action. It doesn't matter how much knowledge the education gives to students; it is important to give students the ability to know how to apply this knowledge to their architectural projects. Fisher states the following:

> *The wisdom that comes from understanding the limits of what we know and what we can and should do has become one of the missing pieces of education that we desperately need to rediscover.*[9]

Many individuals in architectural academia believe that they must produce creative designers and thinkers rather than graduates who are ready for the

[7] Peter Jamieson. "Designing more effective on-campus teaching and learning spaces: a role for academic developers." *International Journal for Academic Development* 8, no. 1-2 (2010): 119-33. doi:10.1080/1360144042000277991.
[8] Fisher, Thomas. *Designing our way to a better world*. Minneapolis: University of Minnesota Press, 2016.p.35
[9] The Psychology of Media and Communication, 2014-2015 ~ E., https://studiegids.leidenuniv.nl/en/courses/show/42961/the-psychology-of-media-a (accessed May 30, 2018).

workforce.[10] The author partly agrees with this thought. However, what does this contribute to the profession? It creates a burden for the professionals to re-educate graduates about actual knowledge and the practice of architecture. Current architects and designers trained through the traditional educational approach develop a heavy dependence on their instructors for help with making decisions.[11] This encourages students to look for design ideas from their instructors and rely on their confirmation before making decisions. This situation has been found in most architecture schools' education systems worldwide and is one of the factors that limits the design abilities of graduates.[12] Thus, new types of pedagogies are needed. More specifically, educators must strive to enhance the students' abilities to make their own design decisions. Architecture school should consider a shift from building-centred learning approaches to more comprehensive learning strategies.

Second, current architectural education often forgets to 'imagine' the world that individuals hope to achieve. Since individuals cannot know the future in the same way they are aware of their present life and history, and because the database and confirmable claims or statements about the world have become the primary judgment of truths. Additionally, current architectural education largely ignores thinking about the future; it is relegated to science fiction.[13] Thus, individuals have a hard time understanding alternative living conditions. According to the Canadian Education Standard (2015), there are typically only 6-hour semester courses related to both humanity and human behaviour in architectural education,[14] which is insufficient for students to be able to generate new design ideas. In the author's experience as an interior design student at the University of Manitoba, while various

[10] Julia Wyatt. "How architecture education is limiting students." Architects Journal. Accessed March 15, 2017. https://www.architectsjournal.co.uk/how-architecture-education-is-limiting-students/8643685.article.
[11] Rezaei, Hassan, Iraj Etessam, and Seyed Mustafa MokhtabadAmre'ei. "The Influence of Paris School of Fine Arts on Architecture Education." *International Journal of Architecture and Urban Development* 3 (August 21, 2013).
[12] Ibid, p.30.
[13] Fisher, Thomas. Designing our way to a better world. Minneapolis: University of Minnesota Press, 2016.p.35
[14] "Conditions and Procedures for the Certification of Educational Qualifications." CANADIAN ARCHITECTURAL CERTIFICATION BOARD. 2010. http://cacb.ca/en/the-canadien-education-standard/.

criteria and standards relating to architecture such as building codes, design principles, and sustainable design approach are explicitly addressed through the education, functional criteria such as user behavior, ideology and psychology often remain underrepresented. As Sven, the architecture educator from Yale University (2013) argues, it is critical for architectural education to reconsider the issue related to the lack of knowledge about how a spatial allocation functions, 'architects create shape, yet hopes for function.'[15]

With these two disadvantages situated in current architectural education, students suffer a lack of confidence needed to face future challenges. In a paper called "Reflections on Architecture Design Education: Understanding the Role of the Design Method", Fathi asserts that architectural education should allow students to learn in an experience and interaction-based learning environment.[16] Equally important, is that architectural education be situated in the social framework which has a significant influence on practitioners' knowledge construction and acquisition as well as the development of critical thinking abilities. With this belief, the public education and constructivist education has become pervasive in many architecture schools worldwide, leading to an emphasis on experiential learning rather than more traditional methods of formal architectural education linked to professional practice. The author believes that good design comes from unexpected connections – architectural designers need interaction with real practice and the public to begin to understand their needs; that suggests that the architecture schools should provide students with not only skills but also the self-confidence to actualize their design interests and passions. To achieve this, the learning and educational

[15] Schneider S, Kuliga S, Hölscher C, et al. Educating Architecture Students to Design Buildings from the Inside Out: Experiences from a Research-based Design Studio[C]// *International Space Syntax Symposium*. 2013.
[16] Bashier, Fathi. "Reflections on Architecture Design Education: Understanding the Role of the Design Method. *"World Journal of Islamic History and Civilization*, 2014, 20-24.

environments for architectural students should be situated in a social and public context.

1.2 CLIENT PROFILE.

This Practicum Project assumes the Faculty of Architecture at the University of Manitoba is the client for the study. The University of Manitoba established in 1877 was the first university in western Canada. Today, the university community is approximately 30,000 students, who study in ninety-degree, diploma, and certificate programs.[17]

Currently, the University of Manitoba exists in various locations in the city of Winnipeg, ranging from the main Fort Garry Campus in southern Winnipeg, to the Bannatyne Campus in the downtown area of the city, as well as seven small-scale satellite campuses around the province such as the Aboriginal Education Centre, the National Centre for Livestock and Environment, the William Norrie Centre, the Glenlea Farm Management Centre, the Delta Marsh Field Station, the Star Lake Field Station, and the Wallace Lake Campus. These satellite campuses represent the additional educational resources for its students.

Since 2010, the province of Manitoba has invested $47 million to support the university's Project Domino. It expects that the University of Manitoba will continue to accommodate its students' academic requirements by adding more educational resources since the Project Domino states that:

> *"Post-secondary education embraces a process of learning and discovery where we learn from the past, and that knowledge becomes the foundation for the inspiration and innovation to move us forward."*[18]

The concept of Project Domino embraces the educational strategy by providing more research environments for students' success; it seems apt to

[17] University of Manitoba - About the University - About the University of Manitoba. Accessed January 02, 2017. http://umanitoba.ca/about/.
[18] University of Manitoba – Project Domino - About the University of Manitoba. Accessed January 02, 2017. https://umanitoba.ca/admin/vp_admin/const/media/project_domino.pdf.

propose a new facility in the form of a satellite campus to provide additional support for the Faculty of Architecture.

The Faculty of Architecture at the University of Manitoba was founded in 1913. It was the second architecture school in Canada. It was also the first architecture school providing accredited professional graduate programs in Architecture, Landscape Architecture, Urban Planning, and Interior Design.[19]Considering the arguments in the previous section evolved the author's interest in developing a place for architectural students, educators, professional experts, and members of the public to meet and work together, the focus of this practicum shall explore a design centre or an educational institute for applied research in architectural design and community development. The proposed design centre shall concentrate on the challenges encountering 21st-century cities.

[19] University of Manitoba - Architecture - Environmental Design Program. Accessed January 02, 2017. http://umanitoba.ca/environmentaldesign/.

1.3 TYPE OF INTERIOR PROJECT.

The proposed design centre will unite a satellite location with the Faculty of Architecture at the University of Manitoba. The purpose is to co-cultivate graduates with the skills required to make meaningful contributions to the design and problem-solving processes through hands-on professional experience. The interior space of this proposed project will be much smaller than the Faculty of Architecture's facilities on the Fort Garry campus. The Winnipeg Design Centre will be used to support and possibly expand the mission of the Faculty of Architecture.

Real clients including firms, organizations, or the public will be encouraged to propose projects to the faculty to consider as academic assignments for students. Professors or mentors will work with the clients to constitute the framework of the architectural project. This proposed educational approach may provide rich experience and establish profound relationships with a variety of professional practitioners as well as the public through this process of learning. Conversely, clients will also benefit from students' creative and innovative design ideas.

The proposed Winnipeg Design Centre (WDC) will function as the site for a co-operative education program or for pop-up studio courses. The goal would be participation from students in all the departments in the Faculty of Architecture including Architecture, Landscape Architecture, Urban Planning, and Interior Design. The new facility could accommodate 40 students. This facility would provide users with a collaborative experience that blurs the boundaries between disciplines, professors, learners, school and public.

The proposed WDC curriculum will stimulate communication and interaction between departments within the faculty as well as engagement with clients, organizations, professional practitioners, and the public in the aspect of architectural design in the 21st century.

The author proposes to locate the project in an urban area in downtown Winnipeg to address the issue that students at the present Fort Garry Campus are isolated from the city proper; which is important, as, in the author's opinion, the urban built environment constitutes the primary resources for students to shape their future character as professional practitioners. The proposed WDC encourages its students to learn how to approach, design problems from a broader context around them. To measure the potential of future architectural education, institutions need to step away from isolated educational experiences towards a more collaborative and inclusive model for learning. In the proposed WDC, students will have opportunities to discuss various topics with professionals and the public relating to architectural design. James P. Cramer, the retired Chairman/CEO of AIA association, argues:

"The fascinating thing is that despite the naysayers, the design profession is pioneering into new satisfying realities that include unexpected upside scenarios in career satisfaction and monetary remuneration."[20]

Rather than maintaining decayed dogmas and principles, why not inject dynamism to line up with today's advanced professional industries and public realities?

The primary goal of this Practicum Project is to design a facility where students from the Faculty of Architecture at the University of Manitoba can engage with everyday activities in urban life. The City of Winnipeg will become a school where students will participate in creative projects by connecting with real clients and professionals to fill the gap between architecture, academy, and practice. This practicum project is conceptual and mainly driven by a series of learning theories. The intention is to investigate concepts about architectural education and apply them to the interior design approaches for the proposed project. The proposal may be

[20] Cramer, James P. "A Proposal to Improve Architectural Education." Design Intelligence. Accessed September 25, 2017. https://www.di.net/articles/a-proposal-tos-improve-architectural-education/.

considered as an alternative method for architectural education environments, from site selection to interior design framework including spatial organization, lighting, equipment, furnishings, and materials.

The proposed program in the Winnipeg Design Centre will combine both the criterion of studio education and some aspects of a co-operative program. According to the Canadian Association for Co-operative Education (CAFCE),

> *"Co-operative education is the bridge between the employer, the student and the academic institution and benefits everyone involved. The employer benefits from the latest theories and fresh ideas from the academic world, the institution gets practical input from the professional community, and the students receive hands-on experience in their chosen field of study."*[21]

The experience acquired in the proposed WDC will lead architectural students to bridge the gap between academic and professional industries through the co-operative program. Meanwhile, this project should be a form of the educational institute to improve the current architectural education. The proposed Winnipeg Design Centre will be a step towards 21st-century design education.

[21] "Benefits of Co-operative Education for Students, Employers, and Institutions." Benefits of Co-operative Education for Students, Employers, a. Accessed October 02, 2017. http://www.cewilcanada.ca/about-us-benefits.html.

1.4 INVESTIGATION METHODS.

Ron Sanchez, the professor of Management, Copenhagen Business School, argues that knowledge management systems can be divided into two types- explicit knowledge and tacit knowledge.[22] Explicit knowledge can be explained merely and stated objectively such as books, articles, and lectures. Tacit knowledge dominates cognitive activities and plays a significant role in knowledge construction. Architectural design is a broad subject which involves materials, economy, social, culture, environment, psychology and many other disciplines. As an innovative activity, architectural design is directly relating to an individual's experience. There is a vast amount of tacit knowledge related to the operation, construction, design, and technical details in the architectural discipline; the acquisition of tacit knowledge relies on an individual's experience, practice, comprehension, and interaction. Experts from the real-world professions usually operate their practice based on tacit knowledge, to deal with complex problems.

Architecture is a subject with art as the body and science as the root; the experience involved in the design field is not explicit. Thus, knowledge related to architectural design could be stated as tacit knowledge. So, in a sense, architecture is associated with the architect and designer who makes decisions and designs without always relying on explicit expertise including previous principles, rules, and knowledge from textbooks that can be articulated. Based on this argument, a question arises: which instruction model can help architecture students to learn tacit knowledge?

Based on the above context, the author will critically explore the relationship between the interior spaces and learning processes to allow architectural students to receive tacit knowledge.

The following research questions will drive the study:

[22] Sanchez, Ron. *"Tacit knowledge" versus "Explicit knowledge": approaches to knowledge management practice*. Kbh.: Institute for Industriøkonomi go Virksomhedsstrategi, Handelshøjskolen i København, 2004.

1. How can the interior design of a design centre achieve the goal of providing a high-quality learning facility for an architecture school?
2. How can interior design best accommodate a design centre?
3. How can the interior design concept promote a dialogue between architectural design schools and the public?

The methodology of this design investigation is diverse including a critical review of concerned theories, precedent studies, observation of existing learning environments, generation of a program, site and building code analysis, and design exploration for the proposed WDC facility. The design application focuses on selected spaces of the project that specific vital values addressed in the theoretical investigation. Sources used in this study are from varied disciplines including education, psychology, architecture and interior design.

Chapter 2.0 is composed of investigation studies of critical definitions and theories which can be divided into five primary categories:

1. The foundations of architectural education.
2. Introducing how individuals learn in different ways.
3. How the Constructivist Learning Theory can affect the design learning process.
4. How different people learn based on Experiential Learning Theory.
5. How to apply the ELT theory to the spatial organization of the proposed WDC.

Chapter 3.0 analyses a series of precedent case studies based on lessons learned from different kinds of design centres as well as architectural design institutions worldwide relating to space organization, use of materials, lighting, and furnishings. In this chapter, the author also focuses on human behavioural factors of the existing studio environments of the Faculty of Architecture at the University of Manitoba. The author conducted the study by observing learning space phenomena and functions including layout, objects, characteristics that give evidence of how the different user groups

(architecture students, environmental design students, landscape/city planning students and interior design students) use their learning environments differently. The author used photographs to keep track of observations as well as analysis of these observations through spatial configuration. This study provided many design connotations for the interior designer to consider such as the spatial organizations for different groups of students, furniture choices, workstation functions, view/acoustical requirements, and storage requirements.

Chapter 4.0 analyses the context and conditions of this Practicum Project including site analysis and existing building analysis.

Chapter 5.0 outlines the design strategy with defined spatial resources for design learning environments, an analysis of the design programming and spatial adjacencies and a summary of the design approaches.

Chapter 6.0 outlines the client profile and design programming.

Chapters 7.0 and 8.0 constitute the conclusion of the design process and outcomes, answer the research questions, and identify any limitations in this practicum project.

This practicum project is focused on exploring learning theories and applying such theories to interior design concepts for the design-learning environments that accommodate the 21st-century design pedagogy. The design proposal in this practicum study does not attempt to achieve final and critical verdicts about how the WDC platform of the Faculty of Architecture at the University of Manitoba should be designed. Rather, this project seeks to expand the interior design knowledge base through the study of an architectural design learning environment.

CHAPTER 2.0
INVESTIGATION+ANALYSIS+DESIGN EXPLORATION.

This chapter contains the theoretical framework that will inform the design concept. The chapter investigates the fundamental concepts of constructivist education, experiential learning theory, and the social climate of the 21st-century architectural education. The goal is to gain an understanding of how the interior environments of a design school can accommodate the learning climate of the 21st century. As a whole, the knowledge gained through this investigation will help the author identify a set of interior design strategies for the proposed WDC.

2.1 FOUNDATION OF ARCHITECTURAL DESIGN EDUCATION.

Although architectural education does not adapt to the conventional form of the post-secondary pedagogics, there are still many educational traditions that remain largely unchanged despite alterations lead by the postmodern context. In the interest of understanding the present state of architectural design education, it is critical to give evidence of its transformation in a historical context. By exploring the history, the author will expound a set of instructional traditions that influence contemporary architecture and design education in the 21st century. To identify the proper physical learning environment to support the architectural design process in the 21st-century context, it is critical to explore the history as well as future learning climates of architectural education.

The Ecole des Beaux-Arts and the Bauhaus play a significant influence on contemporary architectural education in the 21st century.[23] The most predominant element to highlight these pedagogic movements was the design studio format. This form of pedagogy is a mixture of individual-based and collective based learning process guided by an instructor's criticism.[24] The studio functions as the essential site for working, meeting and collaborating with peers. The formation of the architectural studio regarding curriculum and as a physical learning environment is distinct from the more authoritative manner of other post-secondary learning contexts.

The origin of architectural education can be traced back to the Middle Ages. The apprenticeship of the Guilds Workshop formed the instructional pedagogy during this period. This is a training accentuated education system that focuses on the fabrication of craft such as masonry, metallurgy or carpentry, learning architecture through geometry, geography or culture,

[23] Shane, Grahame. "Modern Architecture, Modern Architecture: A Critical History." *Journal of Architectural Education* 35, no. 2 (1982): 33. doi:10.1080/10464883.1982.10758289.
[24] Crinson, Mark, and Jules Lubbock. *Architecture: art or profession? three hundred years of architectural education in Britain*. Manchester: Manchester Univ. Press, 1994.

and recording examples by traveling to gain practical experiences.[25] The Guilds Workshop in the Middle Ages started a learning tradition in architectural design that was based on an active, experiential approach. This education system did not aim to develop architectural students' original concepts or discover new knowledge. Alternatively, students were trained by pre-established design guidelines, acknowledged construction rules and codes.[26]

The Guilds Workshop educational process was a long journey. Qualified masters would lead their students through a seven-year commissioned apprenticeship. During these years, masters would instruct their students with basic knowledge and skills about architecture through detailed hands-on experience.[27] After the seven-year apprenticeship, students would take another three years to travel around Europe and study architectural examples. By finishing this ten-year educational journey, students would present a masterpiece to the Guilds Workshop to demonstrate their ambitions of becoming a qualified specialist. Once the Guilds Workshop accepted the students, they could have permission to design projects.[28]The Guilds Workshop focused on hands-on experience through masters' skills and knowledge rather than theory.

At the beginning of Renaissance, architectural education developed more into art than a handicraft. The synthesis of philosophy and theory in the education of the architecture school was the approach to teach more about design principles rather than a fabrication of objects. In the 19th century, Ecole des Beaux-Arts was established in Paris, turning the page for architectural education after the Guilds Workshop.[29]

[25] Lewis, J. L. (1950). A study of the craft guilds of the European middle ages and their contribution to industrial arts education. *Unt Theses & Dissertations*.
[26] Ibid.
[27] Ibid.
[28] Ibid.
[29] Brune, Emmanuel. "The Architecture of the Beaux-Arts." *Journal of Architectural Education* 29, no. 2 (1975): 16-17. doi:10.1080/10464883.1975.10758022.

The Ecole des Beaux-Arts assigned architecture as a fine art practice that put more attention on the aesthetic rather than practical aspects of architecture.[30] This was a significant change from the tradition of craft aesthetics. The educational approach in the Ecole des Beaux-Arts focused on theory and practice. Students received lectures on design principles, history, building constructions, physics, and mathematics. In addition to the formal lectures, students would also be apprentices working on projects with their masters.[31] Students learned basic design principles and essentials while applying this knowledge to their projects with their masters' guidance. There was a major change in the system of Ecole des Beaux-Arts in that students were asked to work on hypothetical projects rather than real ones. Therefore the learning environment changed into an insular learning context separate from the public space. The physical setting of Ecole des Beaux-Arts campus reflected its instructional concept. The campus was in Musee du Louvre in Paris, and the building was constructed on the site of an old monastery.[32] The floor plan of each building was like its enclosed and symmetric style. The physical setting of the Ecole des Beaux-Arts learning environment reflected its unified and strict cultivation style that influenced follow-up architecture schools. The author as a student in the 21st-century architecture school. The current architectural studio still focuses on an instructor-centered and artistic pedagogy approach. Therefore, the current instruction system is based on a preferred behavior of instructors, like the masters of the Ecole des Beaux-Arts.

In the late 18th century, the British industrial revolution expedited the advancement of construction and production, which also led a revolution of architectural education. After World War I, in 1919, the Bauhaus school was established in Germany. This school introduced an education model that facilitated modern design for the industrial world. The Bauhaus

[30] Brune, Emmanuel. "The Architecture of the Beaux-Arts." *Journal of Architectural Education* 29, no. 2 (1975): 16-17. doi:10.1080/10464883.1975.10758022.
[31] Ibid.
[32] Ibid.

education system spent over thirteen years from 1919 to 1933 to develop itself and established three different academies in Weimar, Dessau, and Berlin. Over this period, the school of Bauhaus evolved the studio system based on the alternative and cognitive concept of technologies and materials. Learners at the Bauhaus engaged in design experiments on their own to develop their inventiveness, awareness, and imagination. The Bauhaus borrowed part of the educational structure of the Guilds Workshop. The founder of the Bauhaus, Walter Gropius, argued that everything the architectural students needed to learn came from the experience of working on practical projects guided by accomplished masters.[33]

Students in the Bauhaus were required to accomplish a series of required courses focused on abstract visual design. According to Bauhaus professor, László Moholy-Nagy, "all art and architecture, no matter what its style consists of lines, planes, masses, and colors composed according to principles including balance, proportion, and rhythm."[34] These are essential for architectural students to know. Since Walter Gropius argued that once students gained fundamental knowledge based on László Moholy-Nagy's vision, it would not lead architectural students into the preconceived design of students in Guilds Workshop and Ecole des Beaux-Arts.

The architectural design of the Bauhaus school in Dessau, designed by Walter Gropius followed functionalism. There was no application of symmetry from the classical structure for space layout. The physical environment of the school was divided into five areas including studio, leisure, workshop, administration, and dormitory. Students and instructors designed most of the furniture in the school and fabricated them in the workshop. The cultivation philosophy of Bauhaus was to allow students to show their creativity through the process of real experience by using authentic materials. Although the Bauhaus was established in 1920's, the

[33] Winkelhake, Claude, and Walter Gropius. "The New Architecture and the Bauhaus." *Journal of Aesthetic Education* 2, no. 3 (1968): 151. doi:10.2307/3331342.
[34] Ibid.

foundation courses related to it's design principles are still operating in many current architecture schools around the world today.

The primary educational traditions from the Middle Ages to the end of 18th century constituted the foundation of experience based pedagogical forms that typify 21st century architectural education. Postmodern architecture education emerged in a knowledge-based context at the beginning of the 20th century. It presented a knowledge era of architecture disciplines with subjective truths, multidisciplinary philosophies, and theories, as well as technologies and ways of knowledge acquisition.[35] The new values of architecture education melted the strict rules of traditional education form based on coordinated and conventional design approaches, concepts, and reality. Alternatively, by applying constructivist teaching and learning theory that focuses on the creation of knowledge through students' personal and social experiences.

[35] Demirel, Buket. "ARCHITECTURE AND PUBLIC DIALOGUE: AN EVALUATION OF THE ROLE OF ARCHITECTURE CENTERS." *January 05, 2005.* Accessed July 26, 2017.

2.2 HYPER-LEARNING IN THE 21ST CENTURY.

Postmodernity introduced the new knowledge context at the beginning of the 20th-century. It presented a learning age where communication goes beyond content, knowledge investigation taking precedence over instruction and study outcomes over the settled rules.[36] For architectural education, the new learning age has melted the strict rules of traditional education form based on coordinated and conventional design approaches, concepts, and realities. Alternatively, architectural education has shifted from the conventional delivery of design theories and principles to an interdisciplinary investigation that indoctrinates architectural design with profound values and enhanced social awareness in design.[37] This type of instruction has grown architectural education beyond the boundaries between academic, professional practice and the needs of the public. The 21st-century architecture education system should be cognitive, effective and accountable to its context. To improve the quality of cultivation, there is a need to balance what we teach students regarding academia and practice.

Hyper-learning becomes a collection of activities that filters through social activities outside of academic environments including work, amusement, and domestic life. Carl Raschke, an American philosopher, states that the process of knowledge transaction not only happens in the typical instructional setting, but also occurs in social places such as café, corridors, and lounges. Hyperlearning is no longer limited to traditional learning spaces but instead occurs in a comprehensive spatial network either physical or virtual. Students explore knowledge and understand more actively through experience. Thus, the Postmodernity architectural education suggests that instead of receiving knowledge passively, students should construct their knowledge based on personal and social experience.

[36] Kasparek, Nick. *Toward a Utopian Peace Education. Peace as a global language: Peace and welfare in the global and local community*. 2016.
[37] Winifred, Newman, Shahin, & Vassigh. (2016). What would vitruvius do? re-thinking architecture education for the 21st century university, 166-174.

According to the previous discussion, Postmodernity learning is no longer limited by one dominant learning space but instead takes place in a networked learning environment. Students learn from an active process through exploration and experience. Therefore, it is significant for architectural education pedagogies to support this form of learning. In the following sections, the author will introduce educational approaches based on Constructivist and Experiential Learning Theory. The intent is to investigate these theories as possible catalysts to inform the physical setting of the proposed Winnipeg Design Centre.

2.3 CONSTRUCTIVIST EDUCATION.

There are various ways of learning. Studies have shown that the concepts of learning have changed meaningfully in the last thirty years, from the view that students are 'blank paper' to the idea that students are knowledge constructors.[38] A group of educators argues that knowledge is not the extended cumulation, but the nesting frameworks.[39] As also stated by Michael P. Joseph, a psychologist that deals with cognitive behavior, learning is a combination of interpersonal and social experiences; the process of doing something with the end of certain knowledge and capability to solve specific problems. Real learning can expand an individual's thinking and activate a sense of excitement to discover. The core mission of education is to help the learner find connections.[40]

David, Kolb is an educational theorist from America who spent thirty-five years researching the experiential learning theory which is known as ELT.[41] ELT is a dynamic development based on the model of constructivist learning theory known as Constructivist Learning Theory (CLT) mainly found by Jean Piaget, Carl Jung, Kurt Lewin, and Lev Vygotsky. Before the author introduces the Kolb's ELT theory, it is critical to provide some background and a brief view of its foundation. The following section provides a summary of the constructivist learning theory (CLT) for readers to become familiar with the learning principle.

[38] Luth, Patience Lamon Opiyo, "The architectural design studio as a learning environment: a qualitative exploration of architecture design student learning experiences in design studios from first- through fourth-yea" (2008). Retrospective Theses and Dissertations. Paper 15788.
[39] Steen, M. Van Der, M. Van Twist, and P. Frissen. "Learning from experience: From case-based teaching to experience-based learning." *Teaching Public Administration*, 2016. doi:10.1177/0144739416670701.
[40] Joseph, P. Michael. "And What Do You Mean by Learning? by Seymour B. Sarason." *Catholic Education: A journal of Inquiry and Practice*, 5th ser., 9, no. 4 (July 2013). p. 2
[41] Ibid. p.3

2.3.1. CONSTRUCTIVIST LEARNING THEORY.

Constructivist Learning Theory (CLT) is an epistemology used to explain how individuals learn. It was introduced into the education in the 1960's in western education academic.[42] According to Julie Rainer Dangel, associate professor of education at Georgia State University, the traditional instruction models focus on a process between stimulus and response.[43] Nevertheless, with the development of neurology, Dr. Dangel found that the formation of knowledge structure in an individual's mind is not merely a passive acceptance process, but rather a process of active knowledge construction. To understand abstract and sophisticated knowledge, the process of information internalization is essential for knowledge formation in a human's mind.[44]

CLT states that knowledge is the learner's creation, it is constructed by individuals' experiences from both personal and social aspects.[45] The earlier instructional philosophies neglected the value of learners' self-exploration as well as activities in the process of learning and attend to existing knowledge transmission. Constructivists disagree with the view of "knowledge as the absolute truth," since Jean Piaget, the founder of constructivist learning theory, argues that knowledge is being constructed rather than discovered.[46]

Per Piaget, learners construct their knowledge based on interactions between their activities and their surrounding environment; these

[42] Dangle, R. Julie. "Activity theory as a framework for designing constructivist learning environments." *Educational Technology Research and Development* 47, no. 1 (1999): 61-79. doi:10.1007/bf02299477.
[43] Joseph, P. Michael. "What Do You Mean by Learning? by Seymour B. Sarason." *Catholic Education: A journal of Inquiry and Practice*, 5th ser., 9, no. 4 (July 2013). p. 2
[44] Mahoney, Michael J. "What Is Constructivism and Why Is It Growing?" *Securities* 49, no. 3 (2004). doi:10.1037/004362.
[45] Schrader, Dawn E. "Constructivism and Learning in the Age of Social Media: Changing Minds and Learning Communities." New Directions for Teaching and Learning 2015, no. 144 (2015): 23-35. doi:10.1002/tl.20160.
[46] Berlyne, Daniel E. "Comments on Relations between Piaget's Theory and S-R Theory." Monographs of the Society for Research in Child Development 27, no. 2 (1962): 127. doi:10.2307/1165534.

interactions can happen both mentally and physically. He also explains that learners learn best by exploring ideas and encountering objects.[47]

Thus, to create the desired learning environment, students should be provided with opportunities to explore new ideas and experience their contexts in a diversity of different ways. Constructivist learning spaces should facilitate learners to find connections with their experiences, understanding, emotions, and lives. Students can only efficiently learn when they encounter new information. Learning in any discipline is not like painting on a blank canvas; it is always related to individuals' original cognitive structures. Students learn and understand new knowledge and information by their experiences including informal learning and concepts from daily life. Thus, constructivism claims that learning can also be a social activity including talking, listening, doing or watching in a social context. The knowledge whether constructed by personal or social experience will eventually assimilate to an authentic representation of truth for each learner as they develop their understandings of specific knowledge.

CLT asserts that knowledge is not merely an objective reflection of reality, instead knowledge is an explanation of the objective world, hypothesis or hypotheses. It is not constant; it will change, sublimate and rewrite after the emergence of individual's new interpretations and assumptions. In this case, the new learning environment of the proposed Winnipeg Design Center should maximize the group working and social communication opportunity in both a formal and informal learning context to assimilate knowledge exploration.

Therefore, knowledge is not an absolute and the generalization of laws in the objective world cannot provide means to solve every problem. In specific problem solving, there is a need for learners to re-create new knowledge-based on the original knowledge structure in learners' minds.

[47] Goodman, Greg S. *Educational psychology reader: the art and science of how people learn*. New York: Peter Lang, 2014.

Students themselves construct accurate understandings through specific experiences and context of the learning process. Otherwise, it is called mechanical and passive learning.[48] It is critical to consider providing reflection opportunity in constructivism based learning environments that can help learners to re-create their knowledge structure for certain types of problems.

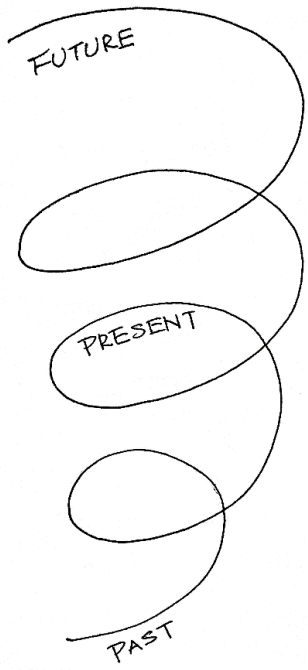


Figure 1. The constructivism based learning process like a spiral.

Based on the above concepts, the author argues that constructivist learning theory is a spiral. When learners continuously reflect on their experiences, learners can develop cumulatively strong capacity to integrate new information. Meanwhile, the CLT does not dismiss the traditional pedagogies; it modifies the roles of professors and students; from knowledge passer and recipient to facilitator and active participant in the learning process. These findings will direct influence on the design outcome of the physical environment of the proposed WDC. In the following sections, the author will review a constructivism based learning system that accommodates the interior design approaches for the WDC to establish an integrated learning experience for the end users.

[48] Berlyne, Daniel E. "Comments on Relations between Piaget's Theory and S-R Theory." Monographs of the Society for Research in Child Development 27, no. 2 (1962): 127. doi:10.2307/1165534.

2.3.2. THE EXPERIENTIAL LEARNING THEORY.

This section explores the learning models that are critical to contemporary architecture design education. Considering postmodernism and constructivism in the education field, architecture evolves its unique pedagogy. Donald Alan Schon, a philosopher and professional of urban planning at the Massachusetts Institute of Technology, argues that architecture is a type of hybrid learning system, "an occupation concerned with the design of usable structures and an art based on the forms of building and the experience of passage through space." This argument reveals the hybrid nature of architectural education with multiple styles of learning and teaching. Per the National Research Council and the American Psychological Association, the recent efforts to improve higher education since 2000 have focused on improving the process of learning by the application of the experiential learning theory (ELT).[49]

According to the founder of the ELT, David A. Kolb, the American educational theorist called the theory "the theory of experience.[50] Kolb identifies four learning models in individuals' learning process, each model representing a distinctive epistemological phase using the metaphors of Concrete Experience, Reflective Observation, Abstract Conceptualization, and Active Experimentation. These metaphors are built based on the nature of the knowledge construction process and the relationship between the learner and what can be learned. The ELT based learning models are significant to the design concept exploration of this Practicum Project because they demonstrate the coexistent pedagogical values and approaches in architectural design education. In the following discussion, the author will explore a theoretical concept that insists the learning processes of

[49] Kolb, A. Y., and D. A. Kolb. "Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education." *Academy of Management Learning & Education* 4, no. 2 (2005): 193-212. doi:10.5465/amle.2005.17268566.
[50] Kolb, A. Y., and D. A. Kolb. "Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education." *Academy of Management Learning & Education* 4, no. 2 (2005): 193-212. doi:10.5465/amle.2005.17268566.

investigation, reflection, analysis, experimentation, and social practice are the most superior in contemporary architectural education.

In 1984, David Kolb, an American educational theorist, published his learning theory inventory, the experiential learning theory (ELT) and its concept has acquired praise and acceptance as conducive to further learning and teaching in higher education. Nevertheless, what reason caused such growth interests of ELT in modern education? Richard Boyatzis, an American professor of Organizational Behavior at Case Western Reserve University, points to the restriction of instructor-centered pedagogy in cultivating an integral education that respects the learners' intellectual and emotional purity and ability to become independent learners.[51] Since the proposed project, the Winnipeg Design Centre is trying to develop the type of architectural learning environment to accommodate an integral model of the learning process and knowledge development. The ELT integrates four distinct learning styles based on a four-stage learning cycle. Dr. Kolb argues that different individuals naturally favor a particular type of learning style which is affected by varieties of factors including personal experiences, the social environment around them, or previous educational structures they have accepted.[52]

The ELT states that "learning as the process whereby knowledge is created through the transformation of experience."[53] According to Kolb, the product of learning results from two lines of the learning process which are known as "The Processing Continuum" and "The Perception Continuum." The Processing Continuum constitutes the learning styles of doing and watching things whereas the Perception Continuum constitutes the learning styles of feeling and thinking thoughts.

[51] Kolb, A. Y., and D. A. Kolb. "Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education." *Academy of Management Learning & Education* 4, no. 2 (2005): 193-212. doi:10.5465/amle.2005.17268566.
[52] McLeod, Saul. "Saul McLeod." Kolb's Learning Styles and Experiential Learning Cycle | Simply Psychology. April 01, 2010. Accessed April 27, 2017. https://www.simplypsychology.org/learning-kolb.html.
[53] Kolb, A. Y., and D. A. Kolb. "Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education." *Academy of Management Learning & Education* 4, no. 2 (2005): 193-212. doi:10.5465/amle.2005.17268566.

Kolb's Experiential Learning Theory not only provides a framework of different learning styles, but also emphasizes the cycle of learning that naturally would happen when learners encounter new experiences and ideas- from experiencing things to providing feelings for learners, then the opportunity for reflections based on the experience, followed by a thinking process into a concept. The concept would be tested in the final stage by using the knowledge that has been generated from previous learning processes. Kolb gave each learning stage in this learning cycle unique name from Concrete Experience (feeling) to Reflective Observation (watching) to Abstract Conceptualization (thinking) and finally to Active Experimentation (doing). Per previous sections, learning is the process of knowledge construction that contains all the above four learning stages that are representing the nature of knowledge, and the correlation between the learner and objects can be learned. These terms are important for the theoretical investigation of this practicum project because they elucidate the scope of co-existing pedagogical principles and importance in design learning process; reflecting both proficient and individual types of knowledge gained from official and facilitative communication and interaction. The following diagram shows the ELT based learning cycle with its four-stage learning process from feeling to watching to thinking and to doing.

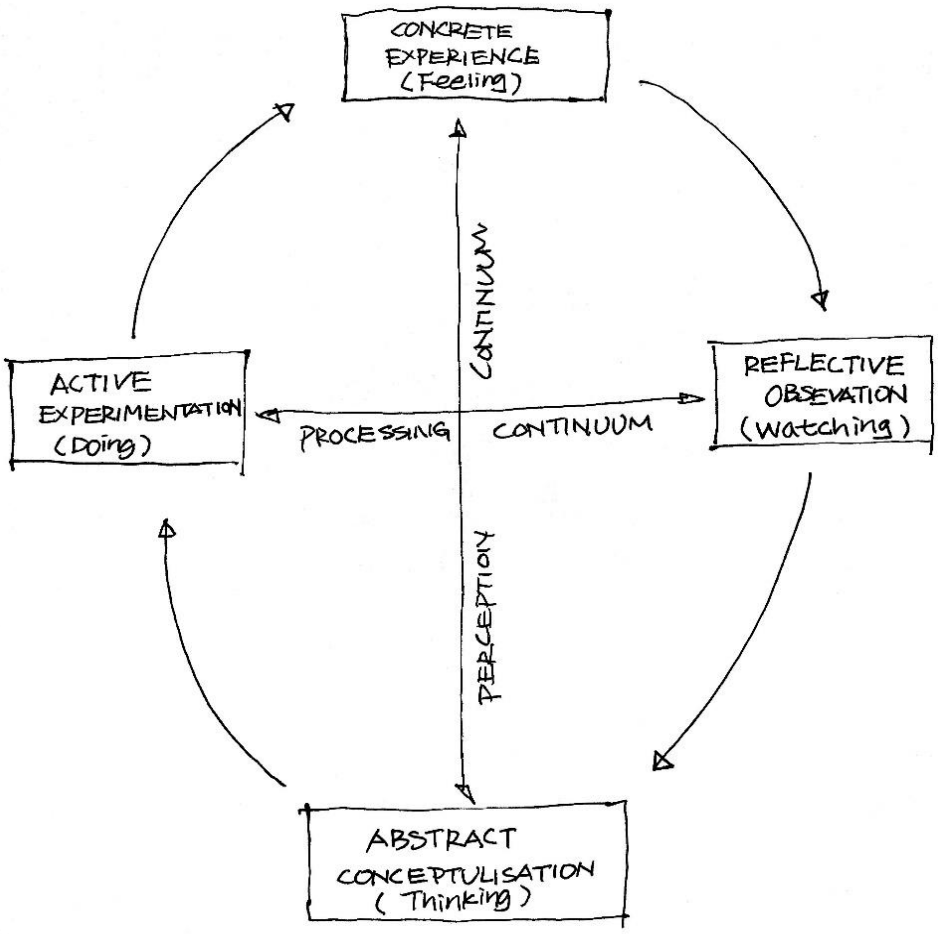


Figure 2. The Experiential Learning Theory based four-stage learning cycle.

To apply the ELT to architecture education, the author argues that the pedagogy should offer the opportunity for students to learn in the way that employs their strengths. In the following sections, the author will introduce these four learning stages based on the Experiential Learning Theory and explain how the author will apply these learning processes to the proposed WDC to improve architectural design education.

2.3.2.1 CONCRETE EXPERIENCE (CE).

David Kolb's models of learning begin with the concept of "concrete experience." Per Kolb, this mode of learning contains both organization and participation in new experiences. This mode is accomplished through the application of reflected knowledge based on learners' past experiences, as well as through the experiences from learners' engagement with others. Therefore, the "concrete experience" is forcing learners into activities related to learning objects. In order to reflect the concept of "concrete experience" in the proposed WDC design concept, the physical environment should force members to talk and participate in activities related to design.

Dewey established two requirements for those positive "experiences" which can contribute to improving learning-*continuity* and *interaction*. Concisely, the concept of continuity suggests that individuals process their new experiences based on previous experiences. The idea of interaction pays attention to the relations between individuals and environments where experiences are taking place.

2.3.2.2 REFLECTIVE OBSERVATION (RO).

Reflective observation is the second phase of learning with the aim of finding the recognition of the relationship between learners' themselves and the everyday world. During this learning process, it requires room to question and re-define learners' worldviews, as well as further, establish their procuration in connection to the social context. Kolb advocates that there are three parts of reflective thinking[54]:

1. Recognizing and confirming the preconditions which shape individual's action and cognition;
2. Analyzing these preconditions about how an individual experience the real world;
3. Reconceptualising the existing conceptions to make them comprehensive and unifying

This learning phase involves representing details of the experience such as learner's observation, feelings, and challenges faced. The consequence of reflective observation is the ascription of individual's understanding and explanation of the experience. Therefore, facilitation of this learning phase emphasizes the learner's description, observation, questioning, and interpretation based on his or her experiences. Learners in this phase are required to generate the ability to explain explicitly based on the meaning of their experiences within their actual explanatory frameworks and knowledge structure.

The author described previously that not all experience is applicable for knowledge development unless learners start thinking and reflecting on them. The reflective observation leads to an inner treating of the experience. Per Kolb, learning by reflection can help to create a sense of awareness that develops a distinction between occasional learning and the intentional

[54] Kolb, A. Y., and D. A. Kolb. "Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education." *Academy of Management Learning & Education* 4, no. 2 (2005): 193-212. doi:10.5465/amle.2005.17268566.

learning that the ELT hope to achieve. The unique contribution of reflective observation is to facilitate learning by directing individual's attention to the historical conditions that attract individual's experiences. For example, the abstract knowledge forms such as theory, textbooks, tests, etc.; can give any disciplinary knowledge to a learner. Reflective observation, however, will force the learner to reflect on the roots of knowledge that may include manifestations, limitations, conceptualization, and explanation of the reality.

Therefore, the reflective observation can lead one to think about the purposes of the proposed WDC; it should provide such spaces to put learners back into the process of learning by re-conceptualizing learner's daily experiences as portions of the content to be taught, critiqued, and thought. Such spaces can include group critique spaces, presentation space, and lecture space.

2.3.2.3 ABSTRACT CONCEPTUALIZATION (AC).

Abstract conceptualization is the process of building connections through abstract thinking across diverse experiences. When an individual is situated in a new experience, he or she may feel curious about the unique experience of further learning; or they may feel frustrated because of the unfamiliarity. Per Kolb, this situation can be described as a feeling of dissonance; for ELT, the dissonance is an opportunity to generate knowledge and meaning.

Abstract conceptualization encourages the learner to move beyond the experience description that is happening in the phase of reflective observation, and toward exploring the connection between learners' reflections and their actual knowledge. Thus, when learners leave the phase of abstract conceptualization, they should have formulated concepts to illustrate both their interpretations and observations of the experiences. This is the stage that learners will use their knowledge to find the connection with other resources to create one learner's unique concept.

To facilitate knowledge construction, learners should take what they know into a more complex context with bodies of knowledge outside their own experiences. The importance of this learning phase is the development of the ability to use abstract concepts differently. For example, learning in the proposed WDC, students have the chance to meet individuals from different professional practices, citizens with different cultural backgrounds, and scholars from different areas of studies which help to develop a suite of capacities that afford learners the ability to negotiate and understand multiplicity and difference.

The experiences that individuals encounter in their lives represent the pretext for constituting relationships between practice and theory, which boost learners' capacities to see and interpret differently, as the author mentioned above. The goal of abstract conceptualization is to build more complex knowledge frameworks that are developed from previous

knowledge and extend with freshly gained information.[55] This argument reveals that knowledge is cumulative, and the ability to connect existing knowledge to new information will help learners move easily between the abstract and the coagulation. Learners should be able to identify the interaction of the varieties of components of learners' reality to create such complex frameworks of knowledge.

Learners usually form conclusions or personal theories based on the phase of observation and reflection. In the phase of abstract conceptualization, it is the stage that learners will spend some time to generate real knowledge. Therefore, it is crucial for the proposed WDC to provide spaces with resources for learners to concrete their thinking, and provides space for quiet study. Space for this learning process stage can include a resource library and quiet study spaces.

[55] Kolb, Alice Y., and David A. Kolb. "Experiential Learning Theory: A Dynamic, Holistic Approach to Management Learning, Education and Development." *Handbook of Management Learning, Education and Development*, 2008.

2.3.2.4 ACTIVE EXPERIMENTATION (AE).

Now, the author will discuss the final stage of the ELT which is known as active experimentation (AE). This phase of AE is sometimes seen as another similar version of the reflection phase where learners figure out some of the discoveries from the earlier phases of learning. The purpose of this phase is to correct earlier held knowledge in abstract conceptualization and reflective observation. The AE always reminds learners to review their assumptions and implement what they have learned constructively. Reviewing assumptions is to reflect on previous assumptions held in the earlier stages of learning and to identify key values for future exploration. By this stage, the learner should have had some concrete experiences already, had some opportunities to reflect on them, then they reach this phase of study. This is the platform where the knowledge revision happens by asking learners themselves questions such as: what have they learned/what they need to know for further exploration/what can they do differently?

By asking themselves questions, learners will be led to know what they don't know. This is a good opportunity for learners to think about the directionality of knowledge development. The goal of this learning stage is to put the knowledge that has been constructed in previous learning stages to the test. The active experimentation reserves spaces for uncertainty and to keep learning as an ongoing activity to solve continuous dissonance; leading to a more concrete experience, which starts the ELT learning cycle all over again. Based on the above case, it is significant for a learning environment to provide us with spaces where learners can find applicable solutions for their design problems as well as the space for learners to reflect on their received information from the past three learning stages. It is also undisputed to provide the site for students to test their ideas and concepts.

2.3.2.5 THE FOUR TYPES OF LEARNERS.

David Kolb's ELT theory sets out four unique learning styles based on the four-stage learning cycle. Kolb argues that everyone naturally prefers a certain type of learning style that is influenced by experience, social environment, or previous cognitive structures. Each ELT based learning style represents a combination of two favored learning stages from the ELT learning cycle that the author introduced in the previous sections. The following diagram demonstrates Kolb's substance for the four types of learning styles; diverging, assimilating, converging, and accommodating.

	Doing Active Experimentation (AE)	Watching Reflective Observation (RO)
Feeling Concrete Experience (CE)	Accommodating (CE/AE)	Diverging (CE/RO)
Thinking Abstract Conceptualization (AC)	Converging (AC/AE)	Assimilating (AC/RO)

Table 1. The learning style matrix based on Kolb's four-stage learning cycle.

To know an individual's learning style or figuring out which type of leaner the individual belongs to, it is critical to know the characteristics for these different types of learners: Diverging Learner, Assimilating Learner, Converging Learner, and Accommodating Learner. The following description is a result of the author's literature review based on the Kolb's 2005 publication: Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education; to demonstrate types of learning that can benefit different types of learners. The following interpretation will also apply to the design concept for this proposed project including space organization, design features, furniture selection, material, color, and lighting design considerations.

2.3.2.6 DIVERGING LEARNER.

The Diverging Learners prefer Concrete Experience (CE) and Reflective Observation(RO) where they can think and see objects from different perspectives. This group of learners prefers watching rather than doing things. They like to gather information in an idea-generation context such as brainstorming session, debate session, meeting session, critique session, or lecture session with broad topics. Individuals with a diverging learning style are emotional and inventive in personality. They are interested in people, so they like to work in teams and would like to receive feedback from an extensive context.

Therefore, it is significant for a learning environment to provide spaces for learners to support an opportunity to talk, gather or receive information from a broad context, and allow learners to work in groups. These spaces should be situated within a social context. Diverging learning spaces shall provide a flexible design approach to facilitate different kinds of group learning activities including group brainstorming, client meetings, group critique spaces, and lecture spaces. These spaces should contain mobile design features such as foldable, stackable, moveable and variable components. Materials, colors, and lighting for this type of learner should force the participant to share ideas, activate learner's creative brain engines, and facilitate thinking.

2.3.2.7 ASSIMILATING LEARNER.

The Assimilating Learners prefer learning in a context with abstract concepts with experiential learning skills of abstract conceptualization (AC) and reflective observation (RO). They prefer clear and straightforward explanations of certain knowledge rather than practical experiences. This group of learners is good at understanding abstract information and systematizing that information into a logical format. Therefore, Assimilating Learners like reading, having lectures, and having time to think by themselves or in a group to explore the applicable knowledge for their projects.

Therefore, it is significant for learning environments to provide spaces for learners to support an opportunity to receive abstract concepts, theories, and information about architecture as well as space for learners to study in a quiet and private context. Design features in this type of learning setting should provide learners with a sense of silence, including private dividers to facilitate quiet study as well as lounge based furniture to create a home-like study environment. Materials, colors, and lighting in this type of learner learning space should encourage concentration.

2.3.2.8 CONVERGING LEARNER.

Converging Learners prefer learning in a technical context with the preferred learning style of Abstract Conceptualization (AC) and Active Experimentation (AE). This group of learners believes that there is always a right answer to a specific question or problem. Therefore they prefer learning through a process of exploring solutions to practical problems. They prefer technical rather than interpersonal aspects. Converging learners are good at applying technical knowledge into theories and concepts to solve complex problems or issues. Individuals with converging learning styles often become specialists in their professional fields. They are logical and rational with problem-solving on their minds.

It is necessary to provide spaces for converging learners where they have opportunities to receive technical information, advanced news or information about architectural fields. Converging learning environments should introduce some creative design features to stimulate architectural students' creative emotion. Furniture selections for this type of learning environment should be comfortable since architectural design students may spend most of their time in this area to generate their designs. The material, color, and lighting design for this type of learning space should include some fun factors to make students enjoy their design process, as well as factors that help students to increase productivity.

2.3.2.9 ACCOMMODATING LEARNER.

The Accommodating Learners prefer learning in a situational context with the learning style of Concrete Experience (CE) and Active Experimentation (AE). They like doing experiments to test their concepts and theories. This group of learners is likely to be involved in 'hands-on' experiences with other individuals; who often rely on those individuals for required information rather than figuring it out by themselves. Therefore, Accommodating Learners naturally benefit from the ability to eliminate outcomes that do not address problems quickly.

It is significant for accommodating learning environments to provide spaces for learners to have the opportunity to do 'hands-on' experiments to test their concept and theories. These spaces may also contain the function to simulate design context for architectural students to feel space, form, structure, materials, etc. Accommodating learning spaces shall provide a design approach to motivate design students' fabrication and creative enthusiasm. Furniture with mobile design features such as foldable, stackable, moveable, to facilitate different design fabrication and examination activities. The material, color, and lighting design for this type of learning space should promote innovative and creative thinking as well as increase students' productivity.

Summary.

It is significant to identify the role in each learning process as affecting elements in the ways of knowledge construction. Dissimilative perspectives in the educational curriculum can help to create a more prolific cultivational experience which allows learners to construct their knowledge and understanding about architectural design.

This Practicum Project considers linking the concept of the four models of learning as well as the four types of learners, based on the idea of the ELT to the proposed WDC interior design concept. Further discussion on the representation of the four learning models in the design concept will be described in the chapter on design implications.

Based on the previous analysis of Kolb's ELT theory, the author created the following chart to summarize these four models of learning with different activities that will support various aspects of learning processes. The following table will be critical in the spatial development of the design by informing space organization, adjacency diagrams, and furniture selection for the proposed Winnipeg Design Centre.

Learner Type	Preferred ELT Learning Style	Personality Characteristics	Preferred Learning Activities
Diverging Learner	Concrete Experience (CE) Reflective Observation (RO)	- Sensitive - Emotional - Imaginative - Like to talk - Broad cultural interests - Open minded	- Group work - Interview - Presentation - Group critque - Discussions
Assimilating Learner	Reflective Observation (RO) Abstract Conceptualization (AC)	- Quiet - Prefer to listen than talk - Mind with an abstract concept - Organized - Logical	- Reading - Lectures - Time for thinking
Converging Learner	Abstract Conceptualization (AC) Active Experimentation (AE)	- Introversion - Mind with the technical concept - Intensive	- One-self exploration - Technical information exploration - Conceptual experiments
Accommodating Learner	Active Experimentation (AE) Concrete Experience (CE)	- Mind with leadership - Social reliable	- Hands-on experiments - Simulation experiments

Table 2. The reflective summary based on the investigation study of David Kolb's 2005 publication: Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education

2.4 THE SOCIAL CLIMATE OF DESIGN EDUCATION.

Students often gain knowledge and practical experience through the social culture of their learning environment as well as the more formal aspects of educational programs. In this section, the author will lead readers to explore the social nature of gaining knowledge based on the concept of constructivist learning theory. As the author described in section 2.3, knowledge is the product of social interaction in the form of collaborative learning. Such a way of learning refers to diversified educational activities encouraging human relationships as the key to solving complex problems.[56] Per the author's own experience, design investigations are more fruitful when supported by collaborative activities including brainstorming, discussions, and concept exchanges with others.

Therefore, in a sense, the productivity of creative design concepts is primarily the product of the interrelation between a social and physical environmental context. [57] In architecture schools, students spend a significant amount of time in their studios with classmates, therefore friendships and opportunities for collaboration form based on the common interests and aspirations. [58] The architectural field involves many interdisciplinary challenges. Thus, the collaboration between peers, designers and specialized industries holds a significant value to complete a design project successfully. The importance of collaborating is not a recent finding. It came from a Bauhaus concept that proposed that the overlap between disciplines can encourage design with comprehensive explorations.[59]

[56] Lata, Hemant, and Leena Sharma. "Effect of Constructivist Approach on Academic Achievement of Seventh Grade Learners in Mathematics." *International Journal of Scientific Research* 2, no. 10 (2012): 43-56. doi:10.15373/22778179/oct2013/36.
[57] Richardson, Virginia. "Constructivist Pedagogy." *Teachers College Record* 105, no. 9 (2003): 1623-640. doi:10.1046/j.1467-9620.2003.00303.
[58] Murphy, Colette. "Psychology for the Classroom: constructivism and social learning - By Alan Pritchard and John Woollard." *British Journal of Special Education* 38, no. 4 (2011): 213-14. doi:10.1111/j.1467-8578.2011.00521
[59] Ascher, Barbara Elisabeth. "The Bauhaus: Case Study Experiments in Education." *Architectural Design* 85, no. 2 (2015): 30-33. doi:10.1002/ad.1873.

Interdisciplinary learning can also be a collaborative activity where instructors provide opportunities for students from different programs to work together towards investigating a substantive issue.[60] Essentially, architectural design is the process of creative interactions between individuals. In order to develop potential design solutions, there is a need for students to investigate projects with multidisciplinary teammates in the architectural studio.[61] Simultaneously, the community's participation is a primary part of a collaborative design studio. Therefore, it is important for design learning environments to provide students with places to meet and interact with their clients and community groups; in addition to a curriculum that encourages the application and synthesis of knowledge outside of architectural disciplines.[62]

When academics, industry professionals, and the public work in tandem, they can become an effective machine for innovation, creativity, and economic growth.[63] The benefits are numerous such as providing opportunities for students and professors to work on ground-breaking projects and research, updating students and professors with cutting-edge knowledge, delivering solutions for both academics and practitioners.

The constructivist education approach is interested in discovering meanings. In this section, the author introduced the concept of situated learning where the guiding informs meaningful knowledge from expert practitioners in a professional context. Investigation on how individuals learn in the practice context demonstrates that situated learning is an approach of constructivist learning with the assistance of cognitive apprenticeship.[64] Studies from

[60] Yurtsever, Bengi, and Gozde Cakir. "An Assessment for Interdisciplinary Education Modal Implementation of Basic Design Education in Architecture."*Procedia - Social and Behavioral Sciences*51 (2012): 157-61. doi: 10.1016/j.sbspro.2012.08.137.
[61] Dong, K., and J. Doerfler. "The interdisciplinary design studio. *"Structures & Architecture*, 2010, 261-62. doi:10.1201/b10428-126.
[62] Dong, K., and J. Doerfler. "The interdisciplinary design studio. *"Structures & Architecture*, 2010, 261-62. doi:10.1201/b10428-126.
[63] Kolb, Alice Y., and David A. Kolb. "Experiential Learning Theory: A Dynamic, Holistic Approach to Management Learning, Education and Development." *Handbook of Management Learning, Education and Development*, 2008.
[64] Kerka S. Constructivism, Workplace Learning, and Vocational Education. ERIC Digest No. 181. [J]. Cognitive Development, 1997:4.

different professions prove that the situated learning method can help learners to deal with unclear, complex or critical situations by having individuals with expertise to guide learners' attempts to solve problems. Kerka (2008) studied how employees learn the ropes; these employees learn and do at the same time, learning by doing can interpret and reconstruct the knowledge they received from previous. Kerka's study demonstrates that the workplace is an informal learning environment, high-efficiency learning resulted from students' engagement and interaction in the actual working activities, facilitated by experts. Although knowledge construction is a unique process for everyone, it can be shaped by the culture of workplace practice. There is a limitation of workplace learning; learners may only pay attention to the direct information they were told by the expert, unlikely to learn what this information means. Thus, to apply the situated learning into architectural education, there is still a necessity to have an advisor on the school side; helping students understand why things must be done in a specific way and giving students the guidance they need to develop skills. Activity is a fundamental factor in the in-knowledge construction process. The situated learning approach forces students to access "higher-order procedural and propositional knowledge" by allowing them to participate in routine work activities.[65] The repeated experience helps to reinforce students' knowledge index and prepares active engagement in problem-solving for students.

[65] Kerka S. Constructivism, Workplace Learning, and Vocational Education. ERIC Digest No. 181. [J]. Cognitive Development, 1997:4.

2.5 DESIGN CONSIDERATIONS.

In order to understand the complex necessity, value, and functions of the 21st century architecture school, it is critical to explore the foundations and learning processes of architectural design. In this chapter, the author will discuss various concepts including the foundations of architectural education, the 21st century learning context, the constructivist education, the experiential learning theory and the social climate of architectural design education. The following chart involves a summary of the central concepts the author discusses in this chapter what he considers to be the main concerns for the proposed Winnipeg Design Centre.

CONCEPT	SUMMARY	DESIGN CONSIDERATION
Foundation of Architectural Design Education	The fundamental configuration of the contemporary architecture school was influenced profoundly by the Guilds Workshop, Ecole des Beaux-Arts, and the Bauhaus. The project-based design studio pedagogics is apparent in the current Faculty of Architecture at the University of Manitoba.	Give priority to the learning spaces for a hands-on and collaborative experience.
Constructivist Education	The constructivist education promotes vital reciprocity of mind and culture, abstract information, and meaning, truth and experience. As an exploration-based learning process encourages diversified perspectives of content exposing that there are multiple solutions for the certain problem.	Provide spaces for learning outcome exchange include presentation, discussion, and experimentation. Provide spaces for investigation including library and study zone.
Experiential Learning Theory	The process of learning in any discipline should follow the procedure of having an experience, reflecting on the experience, learning from the experience, and testing from experience.	Provide spaces to accommodate the experiential learning process, including doing, reviewing, concluding, and planning
Social Climate of Architectural Design Education	Architectural discipline is stepping into the era that requires students to be more engaged in the problems of people's everyday life. The social culture of architecture school plays a vital role in design concept development. Social interactions shape the physical environment that individual live, work, learn, and play.	Incorporate exhibition spaces and a public presentation space that can connect with the public. Spaces should be designed to maximize social communication and collaboration among students, professionals, clients, and the public.

Table 3. The summary of a configuration of architectural education and equal interior design consideration.

By applying these design connotations addressed from the investigation of a historical architectural education context, current learning climate, and future shifts, a satellite campus-based Winnipeg Design Centre will be proposed. A central concept will be applied to the structure and program the design determinations as based on the integration of the Constructivist Education and Davide Kolb' Experiential Learning Theory. The combination of this theory shall provide a framework for the design proposal. Essentially, ELT catalyzes making connections between the process of learning and a space for learning, about architecture and design.

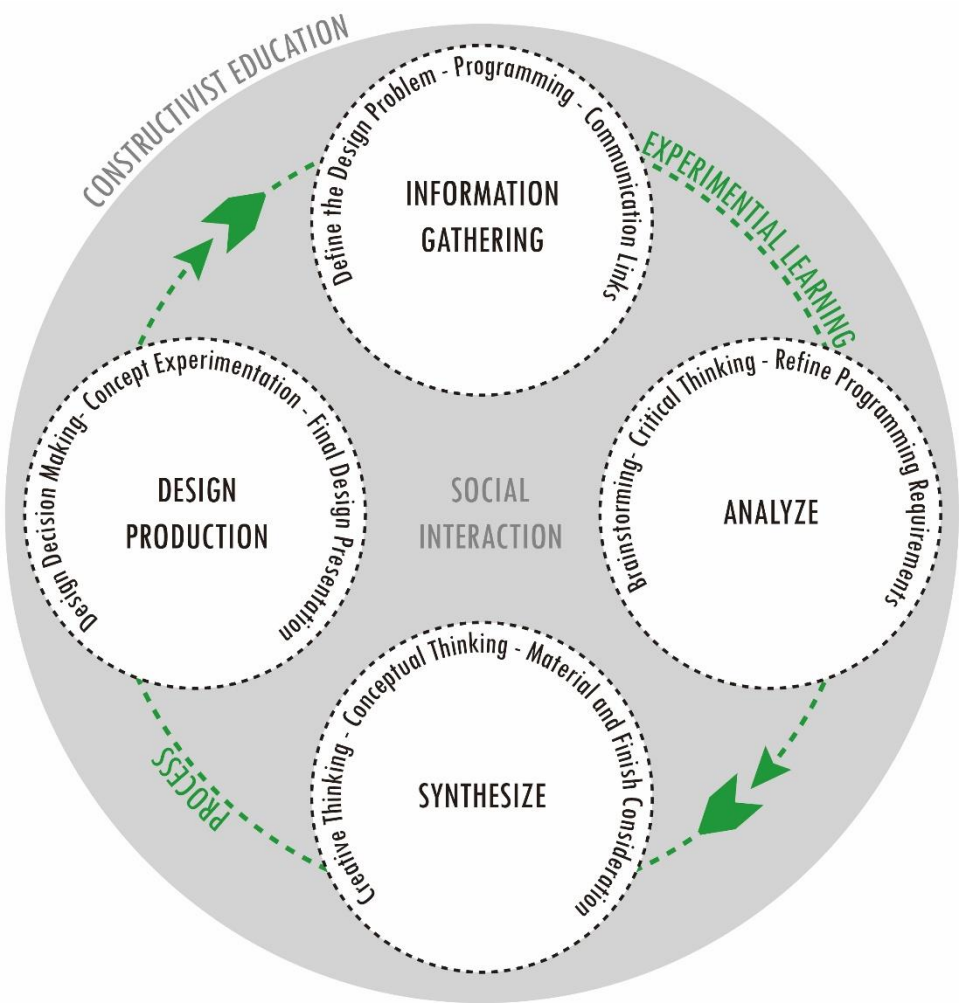


Figure 3. Summary and integration of investigation study conducted in chapter 2.0.

CHAPTER 3.0
DESIGN METHODS

In this chapter, the author will explore the design language and guidelines for the proposed Winnipeg Design Centre. These explorations represent a series of investigations including a precedent study, a trace study, and a human sensory investigation. The precedent study undertakes guidance and inspiration through the reviews of predominant projects that demonstrate attitudes relevant to the theoretical framework that the author discussed in Chapter 2.0. Each precedent review contains a project description, analysis, and design summary to inform the design considerations of the proposed project.

In the trace study, the author intends to gain insight of the existing learning environment of the current Faculty of Architecture at the University of Manitoba. The human sensory investigation explores how the design of physical, educational environments are affected by human's sensation, perception, and evaluation.

3.1 PRECEDENT REVIEWS.

In this section, the author selected three design projects that contain similar intentions and values as the proposed Winnipeg Design Center for a precedent study. These projects feature pivotal notions to be applied in the proposed project including a spatial organization that aligns with the constructivist nature of the design education. This precedent study intends to question traditional learning environments and applications of design features to promote the social climate of design education.

3.1.1 THE STEVEN L. ANDERSON DESIGN CENTER.

Figure 4

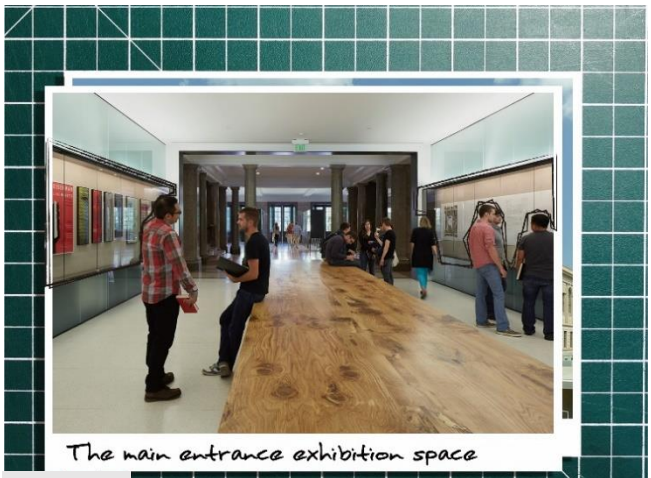


Figure 5

Figure 6

Project Year: 2013

Project Location: Fayetteville, Arkansas

Square Footage: 37,000 sq. ft

Client: University of Arkansas

The Steven L. Anderson Design Centre is a renovation project based on the existing building-Vol Walker Hall for the faculty of architecture at the University of Arkansas. This project added a series of learning spaces to accommodate the programs of architecture, landscape architecture, interior design, and urban planning.

The Steven L. Anderson Design Centre reveals its modern style character by use of concrete, steel, and glass fins for its new façade in Figure 4. The interior space of the building house a variety of spaces including studios, administrative offices, student/staff lounges, exhibition spaces, meeting rooms, and a lecture hall.

The spatial organization of this project corresponds to the constructivist education and experiential learning process that the author discussed in chapter 2.0. Building occupants and visitors enter the building by passing through a series of exhibition spaces

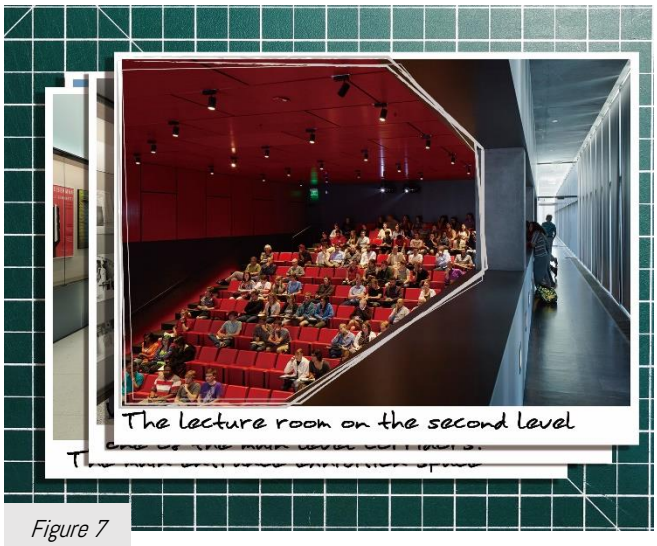


Figure 7

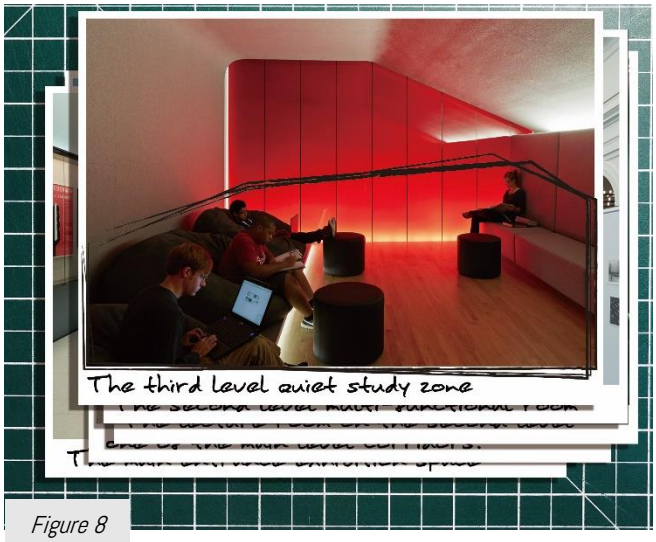


Figure 8

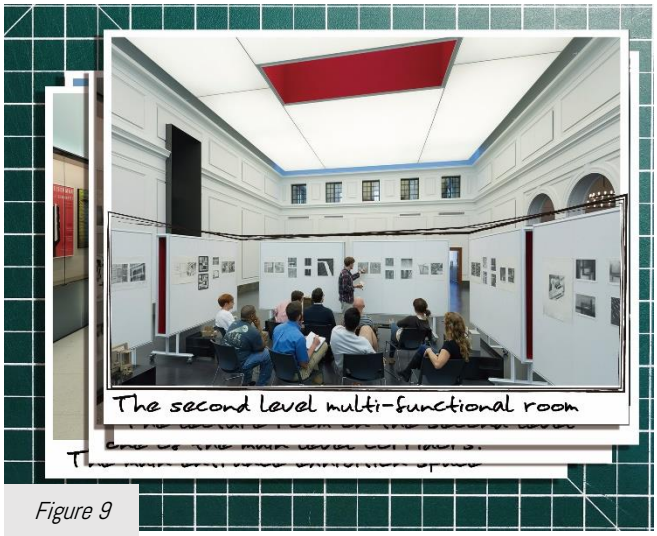


Figure 9

on the main level (Figure 5 and 6). These spaces expose abundant resources to students including design news, trends, technology information, and forum schedules. The disclosed information assimilates students to experience from the beginning. It is known as the concrete experience from the aspect of experiential learning concept.

The vertical circulation leads occupants to the second level that contains a series of educational spaces including a lecture hall (Figure 7), and a multi-functional space (Figure 9) is used for exhibitions, critiques, and group working sessions. The learning spaces on the second level provide opportunities for students to be involved in reflection, analysis and communication activities. This spatial integration corresponds to the second stage of the experiential learning process, which is the thoughtful observation with the goal of developing learners' critical thinking and information analysis abilities.

The third level is the combination of quiet study zones (Figure 8) and studios (Figure 10). These spaces identify the third and fourth stages of the experiential learning process and are the abstract conceptualization and the active experimentation respectively. The abstract conceptualization is aimed at

Figure 10

developing learners' independent problem-solving skills. Then, the active experimentation is to develop learners' practical and hands-on experimental skills.

The overall design concept of this project revealed the constructivist perspective of architectural education. The lighting design approach of this facility can demonstrate the author's argument. For example, according to figure 6, the customized display units that are used to exhibit students' projects, are designed with unidirectional lighting fixtures; in figure 7, the lecture room borrows daylight to make the space more engaging. The architect of the Steven L. Anderson Design Centre, Marlon Backwell, argues that there is not merely one "standard light deployed everywhere," there are various "lighting situations" which are part of a homiletic approach to the architectural design.[66] The lighting design concept reveals the designer's intention to lead students to discover the implicit design concept automatically. It is corresponding to the constructivist education's concept learning as a process of experience and knowledge construction.

[66] "Learning Light: The Steven L. Anderson Design Center." Architectural Lighting. December 19, 2014. Accessed May 22, 2017. http://www.archlighting.com/projects/learning-light-the-steven-l-anderson-design-center_o.

DESIGN CONNOTATIONS

The table demonstrates the relationship between the inspired design features and theoretical frameworks addressed from the chapter 2.0 based on the constructivist education and the experiential learning processes.

DESIGN FEATURE	DESIGN CONSIDERATIONS	THEORETICAL FRAMEWORK
The spatial organization of the Steven L. Anderson Design Centre	→ Provide exhibit opportunities in the main entrance of the proposed facility. → Provide flexible function learning environments to support the learning process of reflective observation → Propose the physical learning environment inside and outside of the building as a learning resource for students.	The Experiential Learning Theory
The operable design critique space adjacent to the public space.	→ Provide operable and mobile design approaches to accommodate multi-functions → Provide mobile and stackable furniture → Provide display opportunities for all related design spaces	The hyper nature of the 21stcentury educational context

Table 4. Precedent study summary of the Steven L. Anderson Design Centre.

3.1.2 THE SHEILA C. JOHNSON DESIGN CENTER.

Project Year: 2009

Project Location: New York

Square Footage: 37,000 sq. ft

Client: Parson School of Design

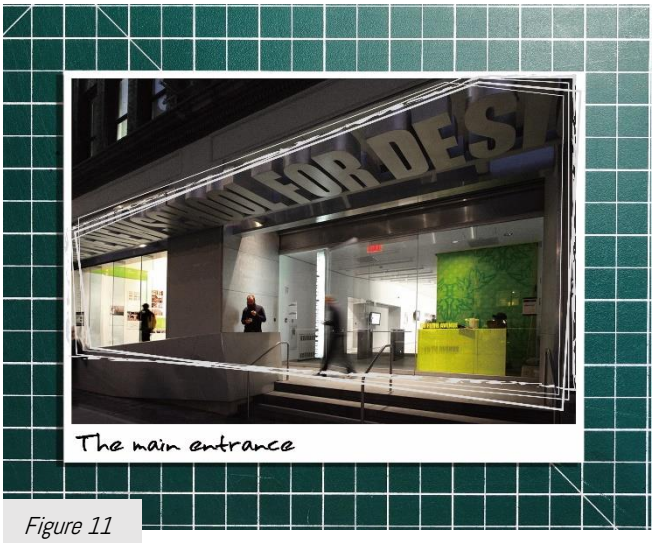


Figure 11

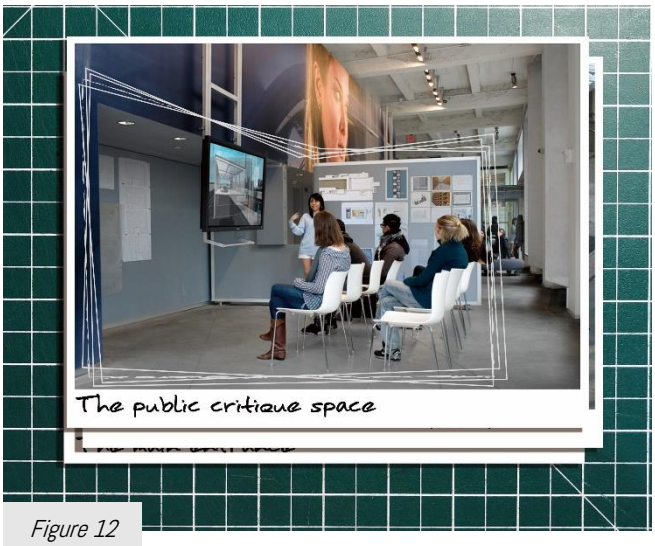


Figure 12

The Sheila C. Johnson Design Center (Figure 11 shows the main entrance of the facility) established at the new campus of the Parsons School of Design founded in 1896. The mission of the design center is focused on interdisciplinary investigation, training, and practice-based collaborative learning to generate the active dialogue between professional design industries and the public for developing design innovations to respond to contemporary design problems.[67]

The main entrance of the center is located at the intersection of the West 13th Street and Fifth Avenue which provides access to more public spaces including the welcoming area, exhibition spaces, public critique zones (Figure 12), seminar spaces, and the auditorium. These spaces are surrounded by the continuous 'window lounges' shown in Figure 13 that encourage faculty members as

[67] About Parsons." About Parsons School of Design | The New School. Accessed May 26, 2017. http://www.newschool.edu/parsons/about/.

Figure 13

Figure 14

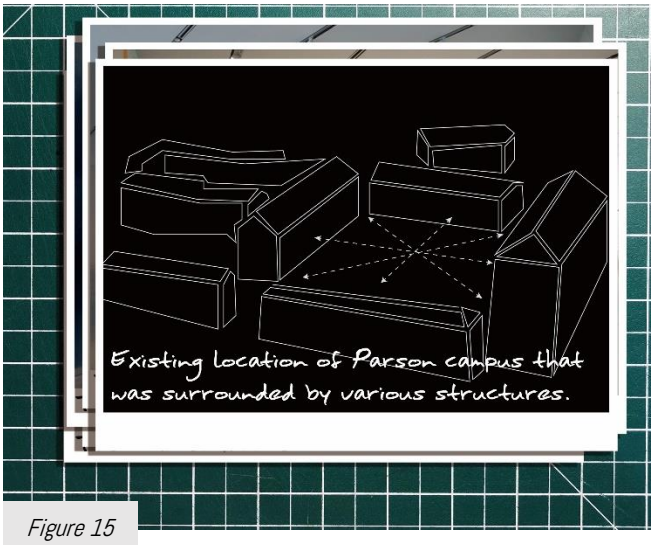


Figure 15

well as the public to occupy the perimeter of the building by providing a series of deep-framed full height glazing systems that can open up views outwardly to the street and inwardly to exhibition and collaboration spaces. The new glass façade system also forms the zone for self-study, socializing, and lounges. This design approach reveals the social climate of the 21st-century design education, learning activities occurring anytime and anywhere.

The physical environment of this design center integrates learning and public communication spaces with exhibition galleries to provide a new concept for the design school. The social nature of design education has interpreted clearly in the design concept of this project by incorporating a collection of social-based learning spaces including a public critique area shown in Figure 12 and multiple galleries with year-round exhibition programs shown in Figure 14. The programs in this design center establish an active dialogue which blurs the boundaries between academia and the public.

The interior design concept of this facility was to bring in an 'urban quad' into the interior space to form the 37,000 square feet design center. Figure 15 shows the existing

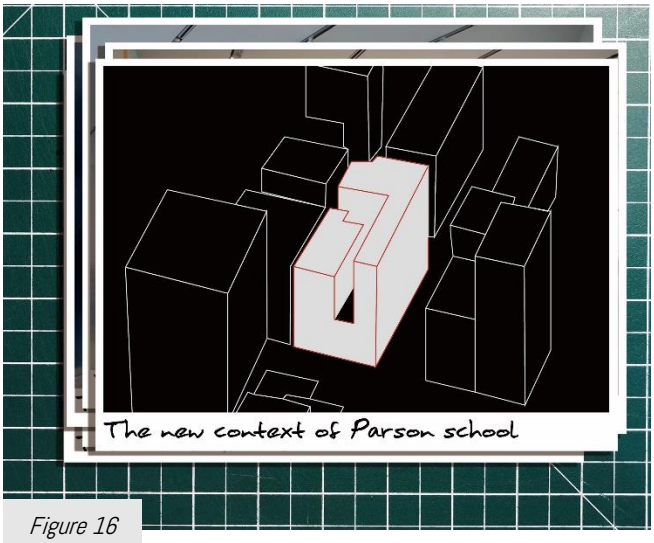


Figure 16

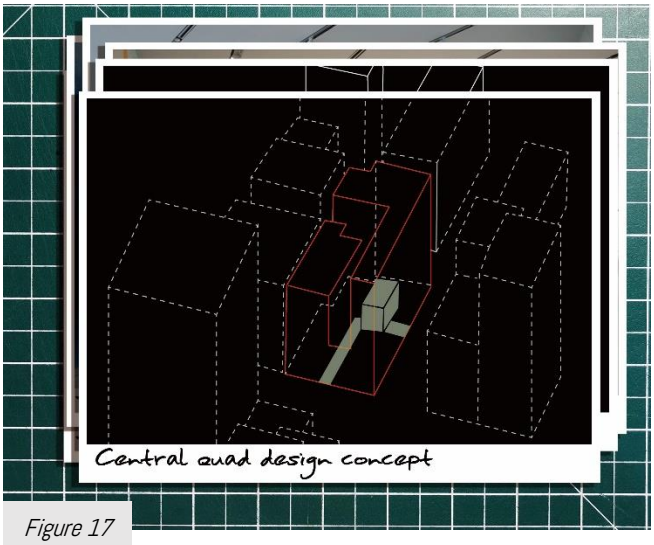


Figure 17

Figure 18

site location of the Parson campus that was surrounded by various structures. The site of the current campus formed a central quad by the ambient compositions. Figure 16 shows the new site of the Parson school in the context of an urban environment. The design team of the project applied the form of the surrounding context into the interiors of the facility, to create a central quad shown in Figure 17. This design feature merges the circulation system inside the building and connects all spaces. A skylight system (Figure 18) has been introduced for this project to cover most of the central quad spaces, with the intention of bringing the urban atmosphere into the design center.

The most creative design solution in this project, the author used the unique spatial arrangement of the critique space adjacent to the context shown in Figure 12. By locating such spaces in a high-density traffic area that helped to expose design students' projects to the public with the goal of establishing the public dialogue between innovative activities and civic participation.

The design critique space illustrates the flexibility and applicability based on occupants' functional requirements. Space provides operable pin-up boards that can be used as acoustic and privacy dividers for

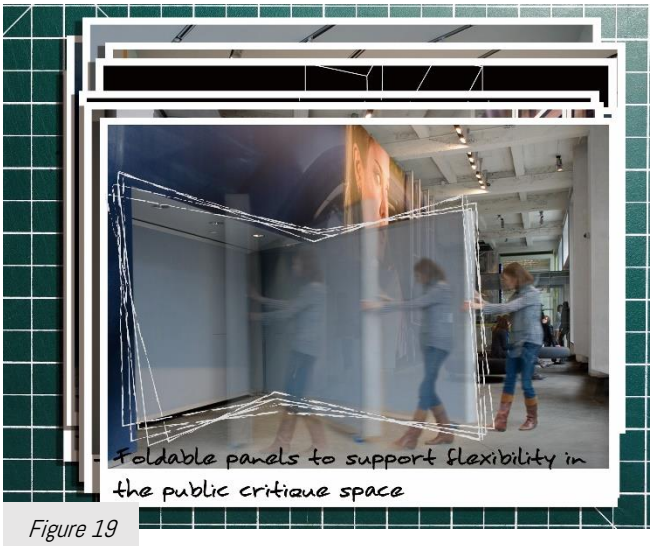


Figure 19

Figure 20

multiple events to be hosted at the same time shown in Figure 19. Several slide-able LED screens have been incorporated into this space that can be used for presentations during critique or group discussion sessions. It also can be used to exhibit student's work displays to the public (Figure 20). The design concepts of the Sheila C. Johnson Design Center demonstrate how interior design can facilitate design students' learning activities through flexibility and adaptability.

DESIGN CONNOTATIONS

The table demonstrates the relationship between the inspired design features and theoretical frameworks addressed from the chapter 2.0 based on the social climate and hyper-learning nature of the architectural design education in the 21st-century context.

DESIGN FEATURE	DESIGN CONSIDERATIONS	THEORETICAL FRAMEWORK
The 'urban quad' design concept to inform the spatial organization that maximize social interaction within the interior spaces.	→ Provide interface area that maximizes interaction opportunity between students, faculty members, and visitors.	The social climate of architectural design education
The spatial adjacency of the design critique and gallery spaces are close to high-density traffic area.	→ Locate exhibition and design critique spaces close to the high-density traffic public area to increase the accessibility for visitors.	
The operable design critique space adjacent to the public space.	→ Provide operable and mobile design approaches to accommodate multi-functions → Provide mobile and stackable furniture → Provide display opportunities for all related design spaces	The hyper nature of the 21stcentury educational context

Table 5. Precedent study summary of the Sheila C. Johnson Design Center.

3.1.2 THE WHY FACTORY.

Figure 21

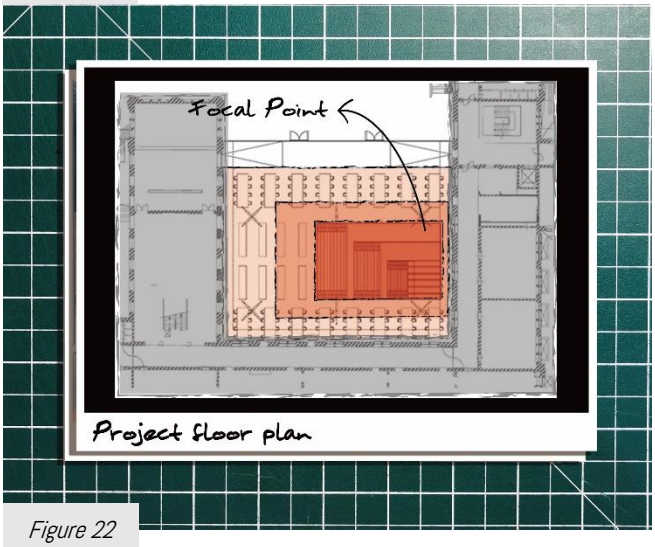


Figure 22

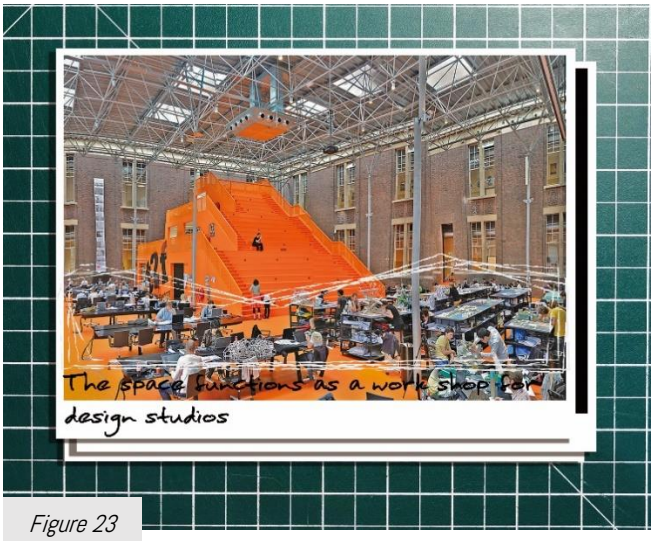


Figure 23

Project Year: 2009

Project Location: Mekelweg, Netherlands

Square Footage: 11,000 sq. ft

Client: Delft University of Technology

The Why Factory is a research and lab-based Institute for the Faculty of Architecture at the Delft University of Technology with the purpose of expanding the voice of architecture in urban life. Various programs host synchronously in this facility including Ph.D., Masters, and undergraduate programs for research, seminars, and workshops. Since a variety of user groups use this facility, there is a necessity for the physical learning environment to be flexible enough to accommodate various functions.

The focal point of this facility is a terrace staircase structure which unites a lecture room and a laboratory in bold orange and contrasting materials that mark a new attempt for the design educational environment.

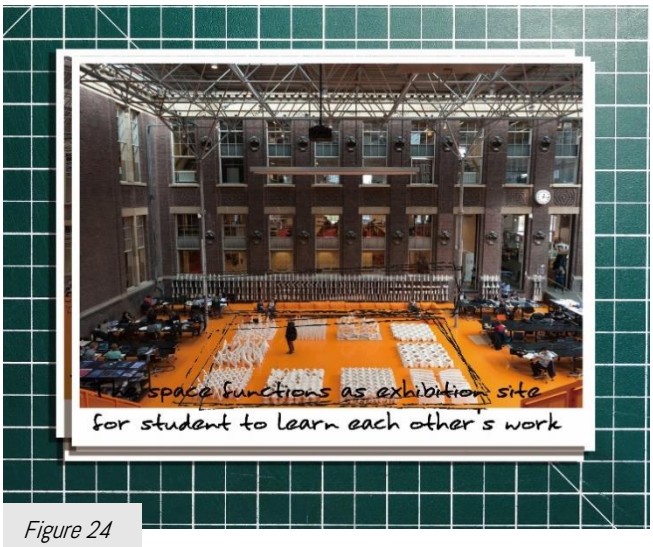


Figure 24

Figure 25

The open spatial organization around the focal point provides a high degree of functionality. The designers of this project proposed mobile furniture for all the learning spaces (i.e., mobile storage and display units as well as stackable chairs) for easy storage and management. At any given time, the open concept allows this facility to be changed into various spatial segmentations including workshops, exhibition galleries, or special event spaces.

The design concept of the Why Factory provides an example of how to accommodate different learning targets through the application of one strong design feature. This precedent not only creates a physical learning resource for its student groups but also represents the changing viewpoints for the architectural design pedagogy through the application of the design features in this educational facility. From the integration of the space design concepts demonstrate a clear interpretation of the constructivist education that learning occurs through a variety of experiences. Therefore, it is significant for the proposed WDC to provide a learning environment where a student can have an integrative educational experience.

DESIGN CONNOTATIONS

The table demonstrates the relationship between the inspired design features and theoretical frameworks addressed from the chapter 2.0 based on the constructivist education, social climate as well as the hyper-learning based architectural design education in the 21st-century context.

DESIGN FEATURE	DESIGN CONSIDERATIONS	THEORETICAL FRAMEWORK
The central staircase structure provides the focal point of the facility.	→ Provide a central focal point with operable functionality and adaptability.	The hyper nature of the 21stcentury educational context
The application of bold color and contrast material to highlight focal point.	→ To apply strong and bold colors and materials to express the identity of the proposed facility.	
The flexible and adaptable spatial integration to accommodate different learning objectives.	→ Provide mobile furniture collections with attributes of foldability, stack-ability, and operability to adapt to various spatial functions.	The Experiential Learning Theory

Table 6. Precedent study summary of the Why Factory.

3.2 TRACE STUDY.

In order to demonstrate the spatial requirement of this proposed project, it is critical to understand the demands of the user groups. In this section, the author conducted an observational study to trace the human behavioral factors of students in an existing learning environment of the Faculty of Architecture at the University of Manitoba. The trace study is organized based on the experiential learning processes that the author discussed in chapter 2.0. The observations were recorded in the format of photography and writing notes. This study is significant to inform the design programming of the proposed WDC by understanding the existing learning conditions of the faculty and users' needs.

3.2.1 THE FORUM.

Figure 26

Figure 27

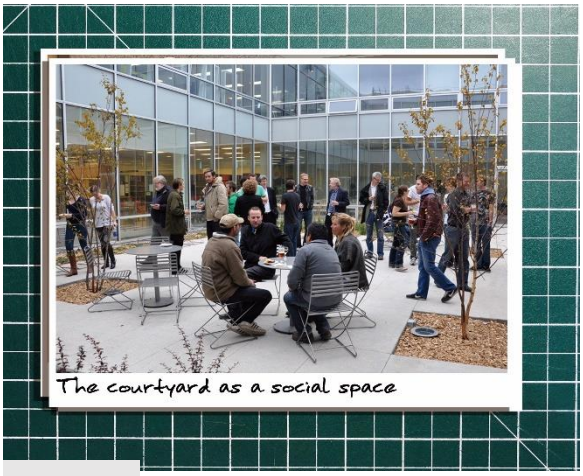


Figure 28

Social interaction is a critical component of learning experiences in architectural design education. As the author discussed in chapter 2.0, constructivist education does not only constrain the learning activities within formal classrooms but also through socialization. A variety of social events are held at the current Faculty of Architecture at the University of Manitoba including forum lectures, faculty exhibitions, informal lounge breaks, and even trip programs by professors and classmates. In this way, the social context stimulates the development of students' communication and social skills. This learning process is known as a concrete experience that is discussed in ELT.

The current faculty building is equipped with a forum hall (Figure 26), lounges (Figure 27) and a courtyard (Figure 28) to satisfy the requirements of holding social activities. Even though the spaces in the faculty are open to the public, individuals are still isolated from the faculty, since the campus is far away from the urban context of the city of Winnipeg. Therefore, many social based events such as public critiques, client and professional discussions are usually not accommodated by the Fort Garry Campus.

3.2.2 PRESENTATIONS

According to the concept of the ELT, the presentation is an ideal educational approach to facilitate the second stage of the experiential learning process, Reflective Observation. This stage intends to develop students' abilities of analysis and critical thinking. In general, architectural design students present their work in two typical ways, verbally and visually. Various mediums can be used by students to present their design solutions including design models, presentation boards, portfolio booklets, and design drawings. These mediums are also exhibited physically in various ways including free-standing models (Figure 29), pin-ups (Figure 30), and by suspending form (Figure 31). The following photographs show the diverse presentation approaches in the current Faculty of Architecture at the University of Manitoba.

Figure 29

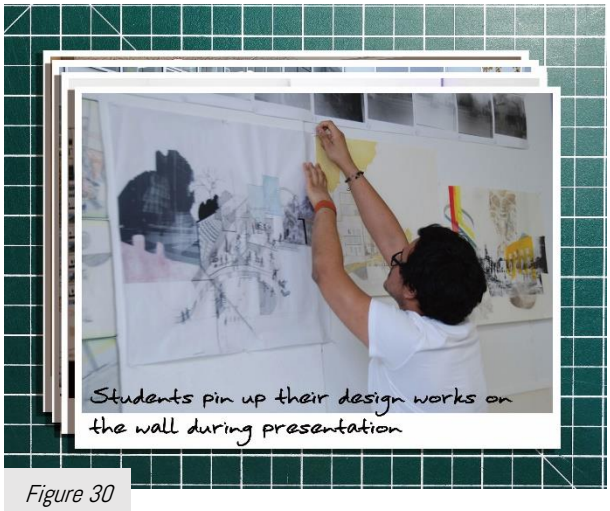


Figure 30

Figure 31

Figure 32

Figure 33

Figure 34

Presentation styles in the faculty range from formal to informal, to increase the ease of public access. The presentation process can be divided into three stages: the preliminary, intermediate, and final presentations. Under the encouragement of professors, presentations are given by students in reserved spaces. During these presentations (Figure 32), students' work will be displayed vertically and horizontally for comments. Moreover, the faculty students display their design work in celebration events at the end of their academic terms for presentation and communication purposes (Figure 33 and 34).

This study illustrates the possible presentations that can be held in the proposed WDC and, draws attention to the spatial organization with multiple displays and flexible arrangement functions. According to the presentation aspects of the current spaces in the Faculty of Architecture at the University of Manitoba, the author found that most of the design work is exhibited physically. Whereas, as discussed in chapter 2.0, the hyper-based learning context in the 21st-century tends to facilitate learning activities in digital and virtual formats. Therefore, it is critical to consider related digital technologies to present design students' works in more interactive ways.

3.2.3 QUIET ZONE.

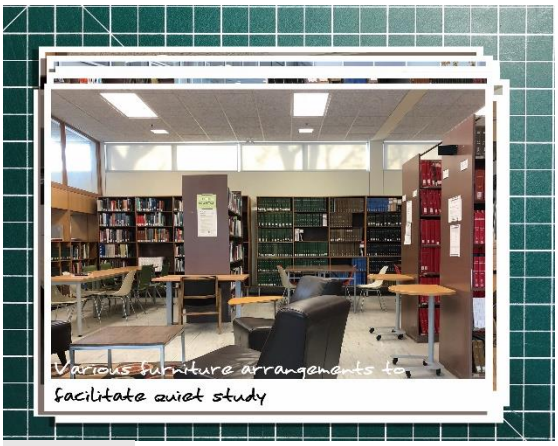


Figure 35

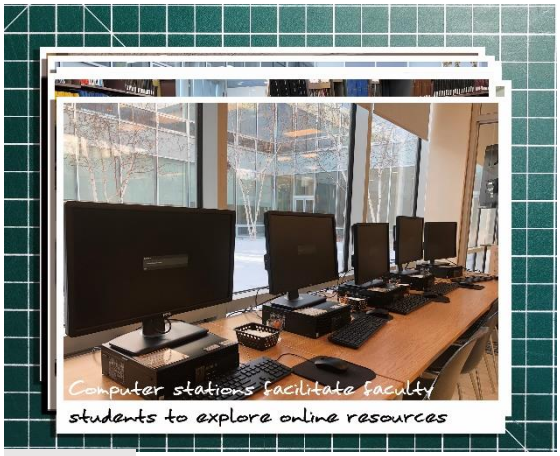


Figure 36

Figure 37

The quiet zone functions as a place for students to focus on their studies. Such spaces are significant to the experiential-based learning environment. According to chapter 2.0, the third stage of the experiential learning process, Abstract Conceptualization, intends to find the connection with other resources to create one's unique concept. Therefore, this method of learning requires a quiet context for learners to disengage from their distractions and concentrate on finding those connections.

The integration of the quiet zone in the current faculty building includes the library and the material resource library. The design activities occur in these settings are informal. Most of the time, students work by themselves to gather both physical and online resources.

The library acts as the primary site of design resources that are significant to support students' design work. The library not only provides students with physical resources but also offers the site to facilitate individual study by providing quiet study areas (Figure 35), computer stations (Figure 36), and quiet reading spots (Figure 37).

Figure 38

Figure 39

The material library serves the faculty students with product resources including samples and technical data by connecting local and global design communities. This space also provides quiet study areas (Figure 38) for students to work on their projects and assignments, as well as the working surfaces for students to lay out their selected material patterns and templates (Figure 39).

This study reveals the space requirements that can facilitate individual research in the Faculty of Architecture. The range of spatial conditions for the Abstract Conceptualization stage in the proposed WDC shall include private learning spaces, computer stations, a photocopy/print station, and a resource director's workstation.

3.2.4 STUDIO AND WORKSHOP.

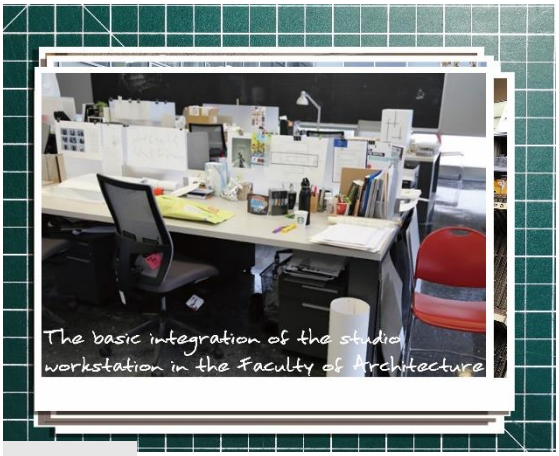


Figure 40

Figure 41

Figure 42

The studio and workshop spaces form the learning setting for hands-on experience in the Faculty of Architecture. In the aspect of experiential learning theory, this stage of learning is called Active Experimentation, which is the last stage of the learning process and an essential component for architectural educational settings. Each student in the faculty is provided with a personal spot that they can decorate with their preferences. The studio spots in each program of the faculty are equipped with similar integration including a main working surface, lockable storage, task seating, and personal display opportunities that are often customized by students' themselves as shown in Figure 40.

However, from general observation, the following are typical activities in the various studios. Students from different programs in the faculty use their studio differently. Architecture students use their studio more as a modeling site; Landscape Architecture students prefer drawing by hand, Interior Design students focus on digital design, while the Urban Planning students often use the studio as a drop-in meeting space.

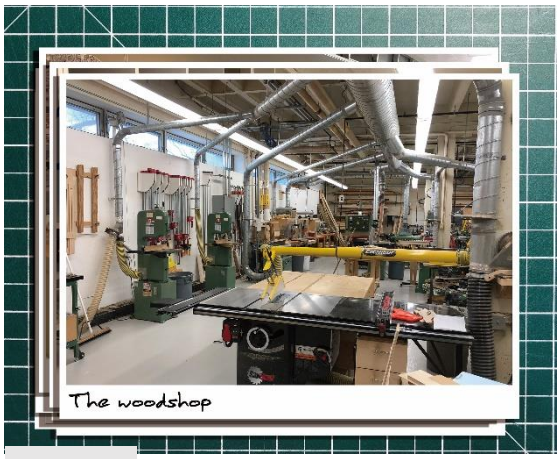


Figure 43

Figure 44

Figure 45

Since many old projects and moveable furniture occupy studio spaces as shown in Figure 41 and 42, students often do not have any additional space to store their old design work including models and posters. This study reveals that it is necessary to pay attention to the organization of space for the storage of students' work.

The studio spaces in the faculty are not only used as a design production site, but also as a social gathering place for guest lectures, exhibition events, public walk-throughs, and informal meetings. It is also significant to consider flexibility and adaptability of the studio environment.

One of the active ways for students to learn architectural knowledge is through the process of making. Currently, the Faculty of Architecture provides a woodshop (Figure 43) and a fabrication lab (Figure 44) to allow students to learn through a series of hands-on activities. The woodshop supplies various tools and equipment that can be used for students' design work. Unique features in the woodshop contain on-site materials including wood panels, plastic panels, and metal sheets that can be purchased or borrowed by students (Figure 45). Supported by the multiple learning processes, digital craft becomes an essential element in architecture practice as mentioned in chapter 2.0. Thus, the fabrication lab assists students in transforming their products from digital forms into physical craft.

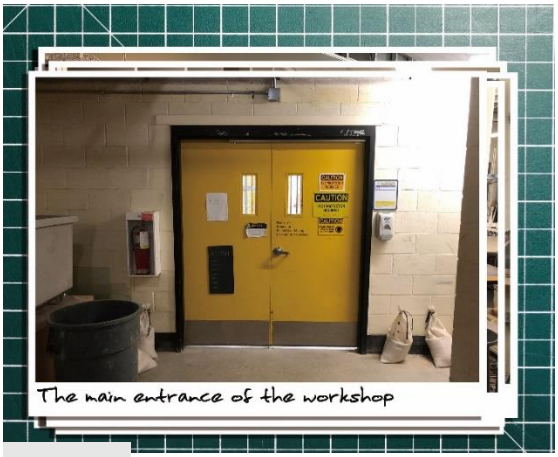


Figure 46

The fabrication lab consists of a variety of fabrication machines including laser cutters, CNC machines, and 3D printers. These digital technologies can be used to construct complex and highly detailed models. The woodshop and the fabrication lab can be entered through a loading dock and industrial double swing doors as shown in Figure 46, enabling the transportation of over-sized objects.

The trace study is based on the studio and workshop that reveals significant requirements for hands-on based learning environments including flexibility, adaptability, required equipment, loading and transportation needs. Due to the shortage of spaces in the Faculty of Architecture, the study also revealed the importance of providing extra open spaces for students to conduct design tests such as form development, lighting tests, virtual reality, and many other design-related experiential activities.

3.3 COLOR PSYCHOLOGY.

According to studies that the author conducted in previous chapters and sections, considerable evidence demonstrates that there is a distinctive relationship between individuals' cognitive process and their physical characterizes of educational context. In this section, the author will explore the basics of how individuals experience a learning environment through their sensations. This section will focus on color psychology in the physical setting of the educational environment. The significant practical opportunities explored in this section will be applied to the design proposal of this practicum project. The suggested approaches in this section are not for absolute design standards but rather aim to help architectural academies to create productive learning environments.

According to Peter Barrett, the President of the CIB (The Innovation in Building and Construction) argues that learning outcomes in schools are not only affected by teaching methods but also color in the physical conditions of the learning environment.[68] The application of color in a physical learning context can have a potent influence on emotion, that can eventually affect individuals' learning and working activities.[69] According to chapter 2.0, the ELT defines four learning stages for human's cognitive process, and each stage is hosting different learning activities that accommodate different epistemic goals. The author argues that color can also help define a specific learning environment's purpose whether it is for collaboration or individual study.

The application of color can be extensive, including wall, floor, ceiling, and accent colors of furniture, fixtures, and equipment. Elizabeth Stout, an American interior designer argues that the application of color within the

[68] Barrett, Peter, and Yufan Zhang. "Optimal Learning Spaces Design Implications for Primary Schools." *SCRI Research Report*: 40-45. Accessed Oct. & Nov. 2010.
[69] Barrett, Peter, and Yufan Zhang. "Optimal Learning Spaces Design Implications for Primary Schools." *SCRI Research Report*: 40-45. Accessed Oct. & Nov. 2010.

current educational environment has been limited to functionality.[70] In general, the present higher education facilities in North America typically have a neutral wall color and apply the school's colors as an irregular emphasis.[71] Furniture is commonly selected based on functionality, durability, and ergonomics. According to Stout, color is not often considered as an educational component in current learning environment designs.[72]

Nevertheless, color is a significant part of the educational environment. The author argues that different educational spaces shall require different color applications to facilitate different learning activities. In following sections, the author will introduce practical guidelines drived from a review of a research study by Naz Kaya Titled Relationship Between Color and Emotion: A Study of College Students; for incorporating color into three major areas in the proposed project interior spaces including lecture spaces, study zones, and common areas. Possible color application approaches will illustrate these guidelines for the future consideration of this practicum project.

[70] "Color Your World." Smith System. December 18, 2017. Accessed Oct. & Nov. 2017. https://smithsystem.com/resource-library/article-library/color-world/#.
[71] Cheryan, Sapna. "Designing more effective on-campus teaching and learning spaces: a role for academic developers." *Policy Insights from the Behavioral and Brain Sciences*, 12th ser., 1, no. 4 (April & May 2014). doi:10.1177/2372732214548677 bbs.sagepub.com.
[72] "Color Your World." Smith System. December 18, 2017. Accessed Oct. & Nov. 2017. https://smithsystem.com/resource-library/article-library/color-world/#.

3.3.1 NAZ'S COLOR STUDY.

According to Naz Kaya, a Turkish interior architect and artist, our visual world is formed by five principle hues (red, blue, yellow, green, purple), five intermediate tones (green-yellow, blue-green, yellow-red, purple-blue, red-purple), and three achromatic colors (white, gray, black)[73], shown in Figure 47.

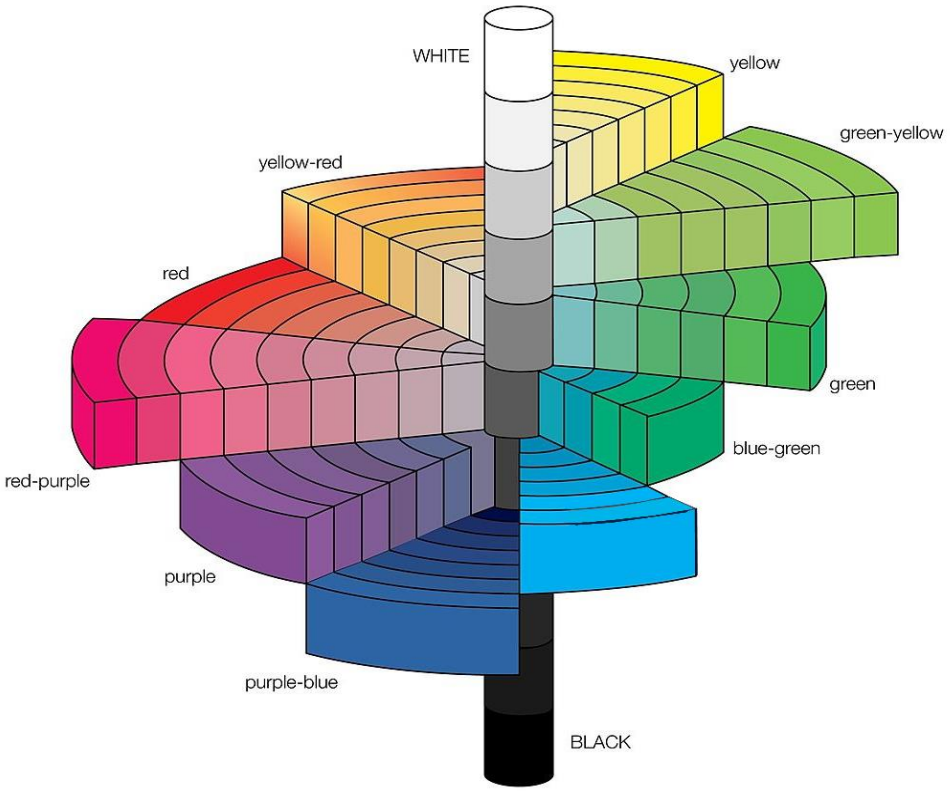


Figure 47. Fundamental colors in our visual world according to Kaya 2004.

The purpose of Naz's color study is finding the relationship between college students' emotional responses and those colors shown in Figure 47 which is also significant for this practicum project to consider identifying proper color applications in different educational spaces. The sample of Naz's study consisted of ninety-eight volunteer students from thirty-eight different educational institutions in the United States. Participants were examined independently in a private room where each of them was seated in front of

[73] Kaya, Naz. "Relationship between Color and Emotion: A Study of College Students." *College Student Journal* 38 (September 2004).

a personal computer. Naz displayed 10cm by 12cm color samples one at a time in the middle of the computer screen. Participants were asked the following questions during the process[74]:

1. How does this color make you feel?
2. What emotional response do you associate with this color?
3. Why do you feel this way?

Participants could define only one emotional response for each color sample. The collected data was analyzed through a Statistical Package for Social Sciences known as SPSS system. Based on participants' responses, there were twenty-two emotions gathered.[75] Some of the similar or overlapped emotions (e.g., happy and joy) were organized under one emotion category. The emotions were also coded into "positive," "negative," and "no emotion."[76]

According to the results of Naz's study, green took the highest percentage (95.9%) of positive responses. Most participants voted for green because it signifies feelings of happiness, relaxation, comfort, hope, and soothing emotions. Yellow closely followed green with the second highest actual percentage (93.9%). Yellow was commonly seen as an energetic color with allied feelings of excitement and happiness.

Among those principle hues, the next highest percentage (79.6%) of positive response came from blue, followed by red (67.3%) and purple (65.4%). Blue revealed feelings of quietness, security, calmness, and peace. Additionally, red was a stimulating color and associated with love and enthusiasm. Finally, purple was mainly associated with childhood and happiness.

[74] Kaya, Naz. "Relationship between Color and Emotion: A Study of College Students." *College Student Journal* 38 (September 2004).
[75] Ibid.
[76] Ibid.

For the intermediate hues, blue-green got the highest percentage (81.6%) of positive responses, followed by red-purple (76.5%), red-yellow (75.4%), and blue-purple (65.3%). In contrast, the color yellow-green got the highest percentage (71.4%) of negative emotional responses. Most participants associated the color yellow-green with sickness and aversion.[77] Therefore it is essential to avoid using such intensity in the proposed project.

For the achromatic colors, white got the highest percentage (61.2%) of positive responses followed by only (19.4%) of positive responses from black. Most participants perceived white as a purified color with the allied emotion of peace, clean, and hope. Black represents richness, power, and formality. In contrast, the color gray got the highest percentage (89.9%) of negative responses with associated feelings of depression, tiredness, and sadness.

Naz's study revealed that colors are affluent with symbolism. According to Naz, this symbolism can influence in how an individual associates colors with physical objects or spaces.[78] Based on the results of Naz's study, in following sections, the author will apply possible color applications into four significant areas of the proposed WDC that include lecture space, activity zones, personal study zones, and common areas.

[77] Kaya, Naz. "Relationship between Color and Emotion: A Study of College Students." *College Student Journal* 38 (September 2004).
[78] Ibid.

3.3.2 LECTURE SPACE.

In educational facilities, lecture space is used for various intentions, especially for design schools, but the primary purpose is active learning. Therefore, to develop productive lecture space, colors in these spaces shall "maximize information retention."[79]. According to Naz, it is crucial to avoid overstimulation in a classroom environment that usually produces large amounts of bright colors such as red, orange, and yellow. Instead, colors such as green and blue shall be applied to bring calmness, happiness, and comfort feelings into such spaces.[80] According to Naz, in different classrooms such as lecture rooms, studios, and seminar rooms it is good to have a calming color on the walls, whereas floors and furnishing can add a splash of bold color such as yellow, orange, and red to result in excitement, happiness, and liveliness.[81] These bright colors in small quantities can also invite students' attention to a certain part of the space to engage learning activities. If the design concept intends to match all elements of the space, according to Naz, furnishing colors can be like the primary colors of learning space.[82]

[79] "Color Your World." Smith System. December 18, 2017. Accessed Oct. & Nov. 2017. https://smithsystem.com/resource-library/article-library/color-world/#.
[80] Ibid.
[81] Ibid.
[82] Ibid.

3.3.3 PERSONAL STUDY ZONE.

Personal study zones are used for developing students' synthesis and problem-solving skills that include libraries, quiet study zones, and a study lounges with in both academic and non-academic environments. These spaces aim to attract students to research, think and reflect based on everything they have learned.[83] Since study zones are intended to allow, students to think and reflect. According to Naz, it is critical to consider applying calming colors such as blue and green as the primary color scheme for walls and floors as well as the color of furnishings to maximizes the effects of color in such spaces.[84]On the contrary, if an area is used for more interaction-based, colors can provide some excitement.[85] For example, in spaces such as study lounges and working group areas; neutral colors can be applied on walls and floors whereas bright colors such as reds, yellows, and oranges can be used for furnishings.

[83] "Color Your World." Smith System. December 18, 2017. Accessed Oct. & Nov. 2017. https://smithsystem.com/resource-library/article-library/color-world/#.
[84] Ibid.
[85] Ibid.

3.3.4 COMMON AREAS

Unlike classrooms and study zones, common areas in an educational facility are more informal and include entryways and lounge spaces that promote casual conversations. The color application approaches for the physical environment of common areas are limitless, however still shall reflect the function of the area.

Spaces in the proposed WDC such as the main entryway, reception space, collaboration spaces, and lunchroom are significant instances of a common areas. They are used as an interface as well as a gathering place for students before school and after school. Typical activities in such areas include informal chat and last-minute conversation. According to Naz, color application for the main entryway should maximize excitement through bold and active colors such as red, yellow, and orange.

CHAPTER 4: DESIGN CONTEXT

In this chapter, the author analyzed the design context of the proposed WDC. A site study will be conducted to determine if the selected site is appropriate for the proposed project. Following the site study is a condition analysis based on the chosen building that summarizes the building's history, construction techniques, and existing features within the building.

4.1 SITE SELECTION.

In this Practicum Project, the author intends to create a design centre that ultimately promotes a dialogue plus the relationship between architectural design educators, students, professional practice, and the public at an urban campus. The proposed WDC will open its facilities to the public, supporting professional and community interests with united partnerships locally and globally. Further, based on the nature of the proposed WDC its site should bring certain penetrability to the surrounding community members. Therefore, the author selected the Carlton Building (Figure 47), located at the intersection of Portage Avenue and Carlton Street for the site of the proposed WDC. The Carlton Building is bordered by retail stores, commercial office buildings, restaurants and entertainment facilities that provide amenities for pedestrians.

Figure48. The Carlton Building.

4.1.1 SITE HISTORY.

Portage Avenue in the city of Winnipeg comprises a rich history. Tools and animal's bones from the Stone Age were discovered on and around Portage Avenue.[86] This fact demonstrates that early Aboriginal people inhabited this area. In 1738, by the guide of the Red River, Europeans found the Portage Avenue area. Since then, the current name The Forks became an essential place for Europeans and Aboriginal people to conduct fur trades, as well as establish the development foundation for what is now downtown Winnipeg.

During the 1800's and 1900's, the development of railways in Canada led Winnipeg to handle the largest grain stocks in western Canada.[87] As a result, Winnipeg became one of the largest commercial centers in North America.[88] The dramatic changes of Portage Avenue occurred since the grand opening of the Royal Hotel in 1860. From then on, in 1905 the completion of the T. Eaton Company located at 320 Portage Avenue welcomed a significant amount of businesses including offices, retail stores, banks, and service institutions to increase the amount of pedestrian and vehicular traffic. By 1915, after the completion of the Nova Scotia Bank building, the Boyd building, the McArthur building, and the Hudson's Bay building, Portage Avenue began to overtake Main Street area as the commercial center of economic life in Winnipeg.[89]

Unfortunately, during the World War I, the Great Depression dropped the prices of grain. This was a especially hard for Winnipeg because the

city's economy was so dependant on grain trades. There were insufficient numbers of architectural developments in the city of Winnipeg during the Great Depression until the completion of the Richardson Building in 1969.

[86] "354 PORTAGE AVENUE CARLTON BUILDING." *354 PORTAGE AVENUE – CARLTON BUILDING*, July 4, 2012, 3-8. http://www.winnipeg.ca/PPD/Documents/Heritage/ListHistoricalResources/Portage-354-long.pdf.
[87] Ibid, p.4
[88] Ibid, p.5
[89] Ibid, p.8

This modern structure activated a series of expansions to renew Portage Avenue in the 1970's with the goal of further developing Portage Avenue as the outstanding commercial zone in Winnipeg.

In 1977, a By-law of the City of Winnipeg was implemented to protect and conserve buildings of architectural or historical interest.[90] In 1989, the Downtown Winnipeg Business Improvement Zone (BIZ) was established. The BIZ is an "organization that represents 1,300 businesses and runs programs to provide services that improve downtown's image, cleanliness, safety, transportation, and parking."[91] Today, there are many buildings along Portage Avenue that are recognized as heritage buildings. By selecting a site in this leading commercial center along Portage Avenue for the proposed WDC, students from the Faculty of Architecture will be engaged in the process of renovation in the downtown Winnipeg.

Figure 49. Context Map

[90] City of Winnipeg Planning, Property & Development, and City of Winnipeg. "Planning, Property & Development." Historical Buildings and Resources Committee - Planning, Property and Development - City of Winnipeg. Accessed Sept. & oct., 2018. http://www.winnipeg.ca/ppd/Heritage/HistoricalBuildingsAndResourcesCommittee.stm

[91] "About." Downtown Winnipeg BIZ. Accessed August 12, 2017. http://downtownwinnipegbiz.com/about/.

4.1.2 SITE PROFILE.

Figure 50. The urban context of the proposed site.

The Carlton Building affords a sharp distinction to the existing faculty building in the suburban Fort Garry campus and is an appropriate site choice for the proposed WDC based on the possibility that architectural design students can be engaged in a real urban context. Figure 49 illustrates various institutional characters of Portage Avenue, such as education, commercial, residential, corporate, and public facilities. Figure 50 shows the contrast in nature between the historic building and surrounding modern structures.

Figure 51. Context map showing surrounding building usage.

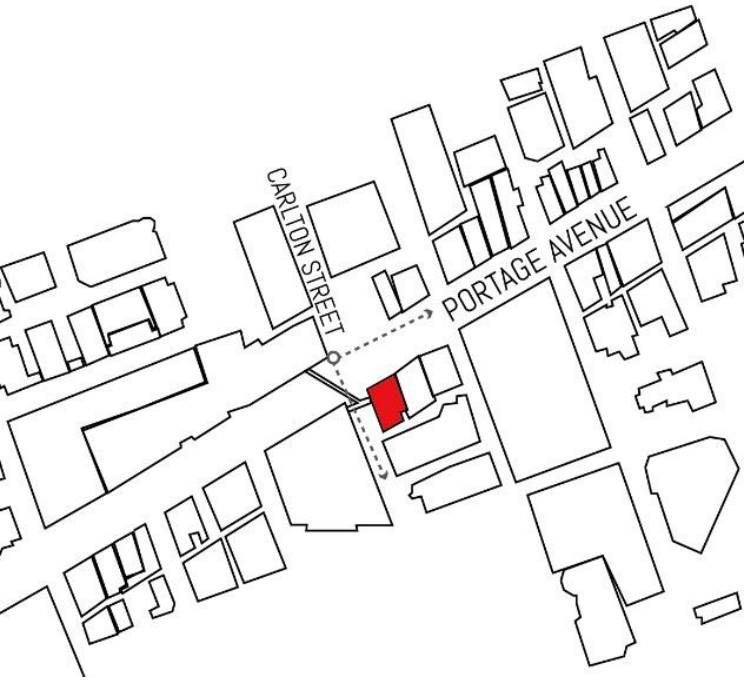
4.1.3 SITE VIEWS.

Site views are significant for the design proposal of this practicum project because site views act as one of the most critical factors that can provide a connection between the public and the interior spaces of the proposed WDC. Jan Gehl, a Danish architect, and urban design consultant states:

> *"Looking at city life is one of the most important and most popular urban attractions. People watching is a universal activity that takes place constantly as we walk, stand or sit."*[92]

Thus, to create the connections between the public and interior activities in the proposed WDC, thinking carefully about the view options is a critical component in the design proposal.

Figure 52. View identification map



[92] Gehl, Jan. *Cities for People*. London: Island Press, 2010, p.137.

4.1.4 SITE CIRCULATIONS [PEDESTRIAN + BICYCLE].

According to Statistics Canada's 2016 census data, the population in the downtown of Winnipeg is over 15,075 people.[93] There are a significant number of individuals that travel Portage Avenue as part of their daily life for work, education, entertainment, and other activities. Although the winter climate condition in Winnipeg is harsh, the city provides a 2km indoor skywalk system connecting most of the significant buildings in downtown Winnipeg, promoting and improving pedestrians' travel experience during winter times. The selected Carlton Building is also connected with this system make this site an ideal location for the proposed WDC, as it is located at one of the busiest pedestrian traffic paths in the downtown district. The nature of the proposed project location can also immerse the building occupants into the public context-both indoors and outdoors.

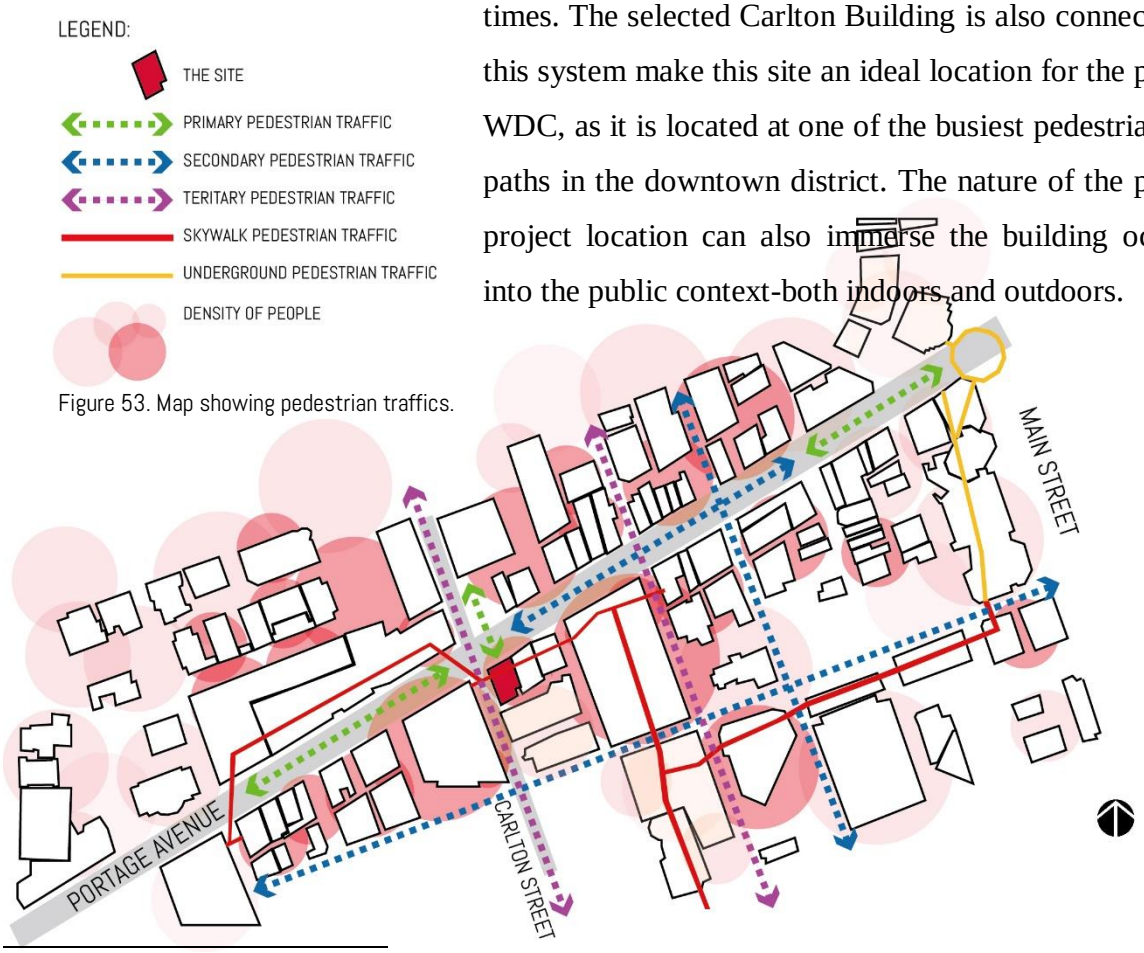


Figure 53. Map showing pedestrian traffics.

[93] City of Winnipeg Planning, Property & Development, and City of Winnipeg. "Planning, Property & Development." Historical Buildings and Resources Committee - Planning, Property and Development - City of Winnipeg. Accessed Sept. & oct., 2018. http://www.winnipeg.ca/ppd/Heritage/HistoricalBuildingsAndResourcesCommittee.stm

4.1.5 SITE CIRCULATIONS [VEHICLE + PUBLIC TRANSPORATION].

Since the proposed WDC is a public access facility, accessibility and mobility are two critical factors that the author had considered when selecting the Portage Avenue site. The Carlton Building is easily accessible by many modes of transportation because it is situated firmly into one of the primary transit centers in the city of Winnipeg. There are a variety of bus stops along Portage Avenue serving numerous neighborhoods in the city. The proposed project site is not only beneficial for individuals who travel by bus, but also for those individuals who use personal vehicles as their primary transportation method. The public parkade at the southern side of the building and outdoor parking spots along Carlton Street make the site an ideal location for the proposed WDC enabling access to everyone.

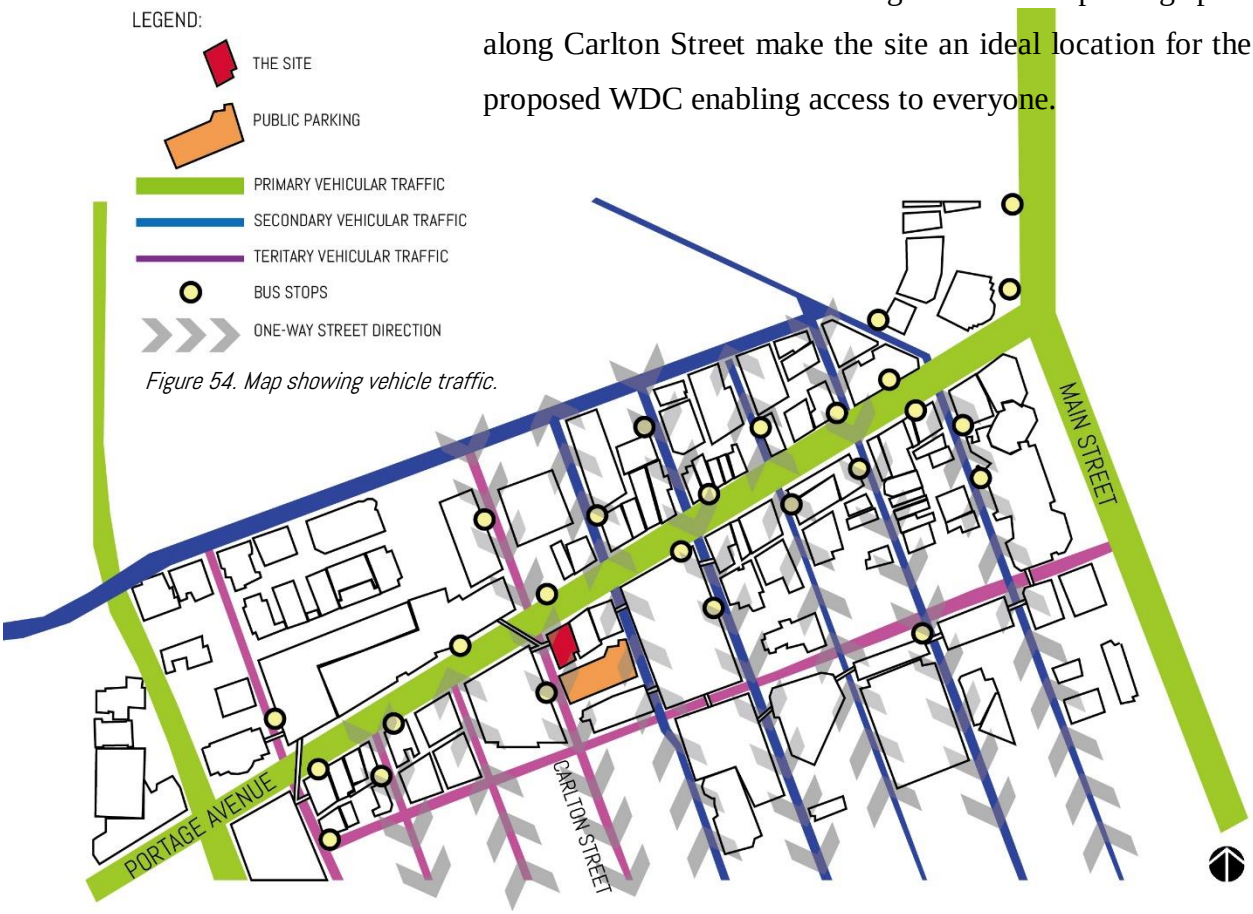


Figure 54. Map showing vehicle traffic.

4.1.6 SITE CLIMATE.

Climate conditions of a site are essential elements to consider for this practicum project. The city of Winnipeg is situated in the Canadian Prairies; this geographical location provides it a humid continental climate with the characteristic of sizeable seasonal temperature differences.[94] Winnipeg's annual temperatures range from -30C to +30C. Accordingly, the essence of the significant annual temperature deviation promotes the requirements of the buildings in the city to be designed and constructed to bear extreme weather conditions. Daylight is another critical element needed to be considered for the proposed project since sunlight holds the potential influence on interior views.

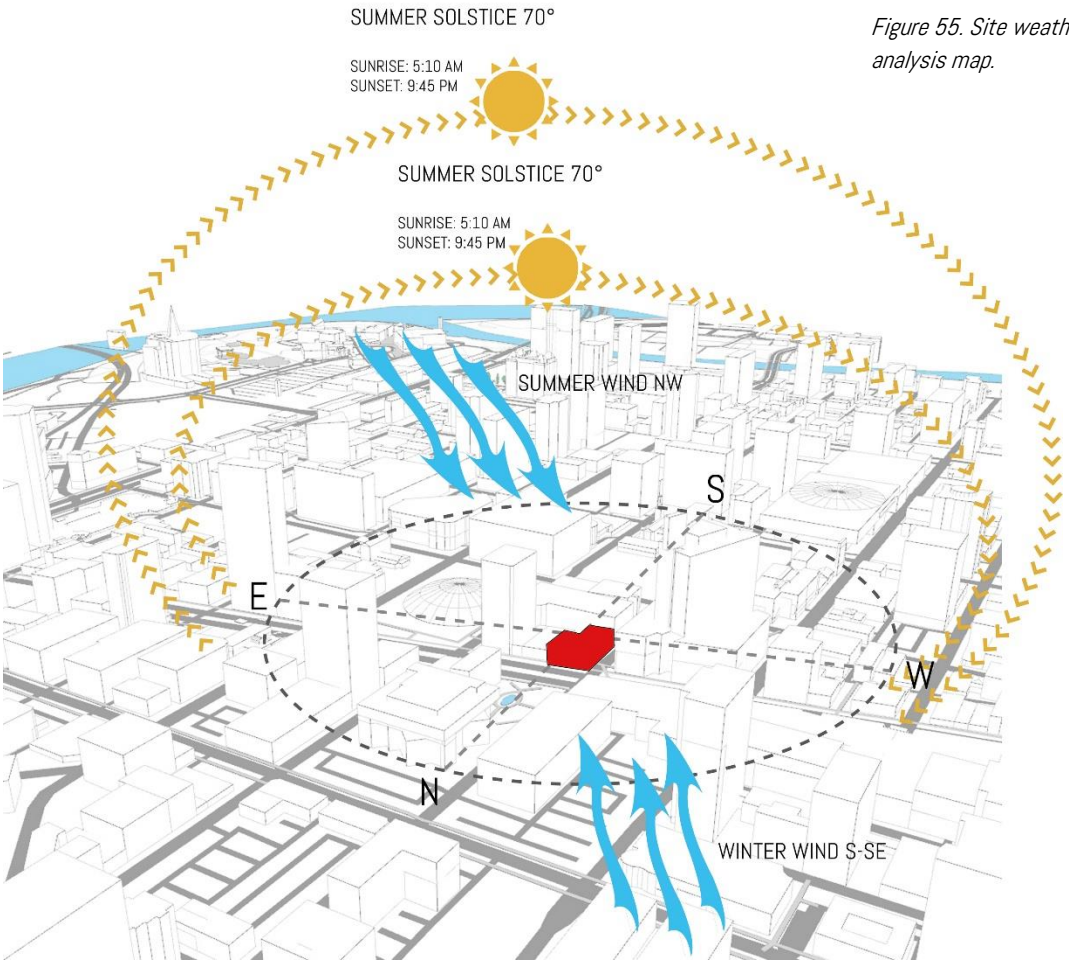


Figure 55. Site weather condition analysis map.

[94] "Humid continental climate." Wikipedia. September 05, 2017. Accessed November 12, 2017. https://en.wikipedia.org/wiki/Humid_continental_climate.

4.2.1 BUILDING HISTORY

The Carlton Building was designed by Winnipeg architect J.D. Atchison and constructed in 1912 by the Sutherland Construction Company. The Carlton Building in Winnipeg is one of many remarkable historical buildings in the city with its Chicago architectural style. Initially, the building was built for the Winnipeg financial investment firm Kirby, Oldfield and Gardner. The Carlton Building is situated along Portage Avenue's commercial strip. The building opened to the public in late 1912 with retail stores on the main level and the firm's offices on the top two levels. There is also a basement level used as storage for tenants. In 1917, Holt Renfrew, a high-end retail store, occupied the entire Carlton Building. In 1942, the store experienced a major renovation by Moody and Moore Architects. This renovation project included covering the main level exterior façade with Tyndall stones, adding elevators to the building, and updating the storefront with large glass panels. The store reopened to the public in the same year. In 2002, the North Portage Development Corporation signed a long-term lease agreement for the Carlton Building and began another renovation of the building. The renovation was completed in 2003, and it brought new tenants including an active clothing retail store, a restaurant, an insurance company, a business management firm, and most recently an engineering consultant company.[95]

[95] "Winnipeg Downtown Places." 350 - 354 Portage - The Carlton Building. Accessed Nov. & Dec. 2017. http://winnipegdowntownplaces.blogspot.ca/2012/07/350-354-portage-carlton-building.html.

4.2.2 EXISTING CONDITIONS

The Carlton Building follows the traditional Chicago Style that was an influential architectural style in the 1880s and 1890s in North America. The construction approach of the Carlton Building used steel framing and reinforced concrete. Since the building featured non-load-bearing exterior walls, it allowed for large sized openings on those perimeter walls for windows. The overall blueprint of this building followed the classic rectangular column layout that rested on a concrete foundation. Steel beams are used to reinforce wood joists. Materials used on the two public façades include cut stones, brick, and terra cotta.

The building has two main entrances on the north part of the building along Portage Avenue, and one entrance on the western part of the building on Carlton Street. The interior spaces have been altered based on the tenants' requirements over the years. These renovation activities have removed all original finishes from the building. The current main level of the building is empty. To accommodate the public skywalk system, a 17-foot-wide public corridor has been built through the northern portion of the building on the second floor. Currently, there are three retail spaces along each side of the open hallway. The only tenant located on the third level is an architectural engineering consultant firm.

EXISTING BUILDING EXTERIOR ELEVATIONS

Figure 56. North exterior elevation of the Carlton Building

Figure 57. West exterior elevation of the Carlton Building

EXISTING BUILDING INTERIOR CONDITIONS

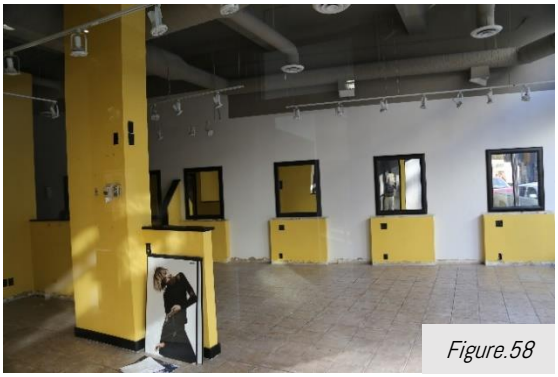


Figure.58

Figure.59

Figure.60

Figure.61

Figure.62

Figure.63

EXISTING BUILDING FLOOR PLAN

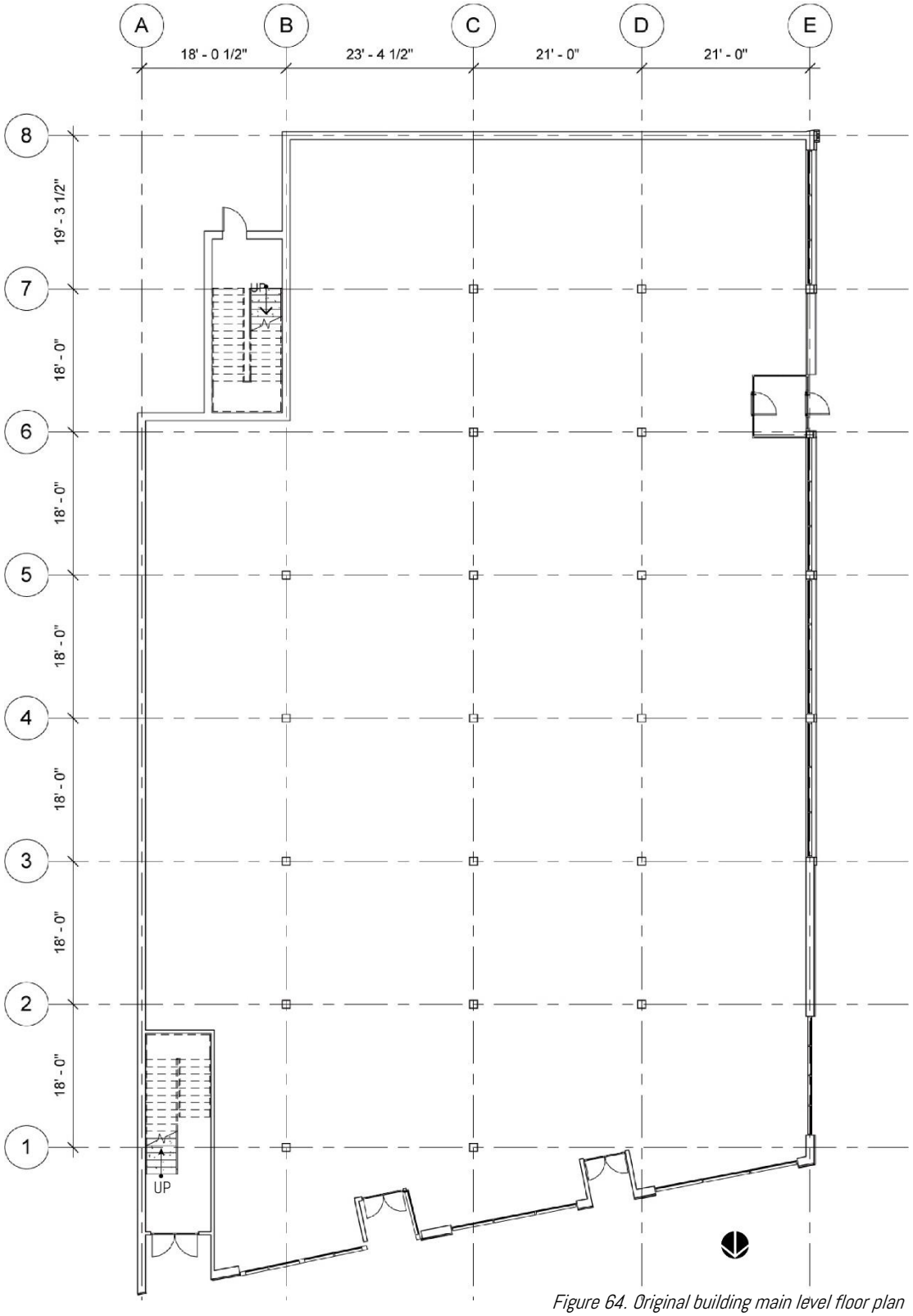


Figure 64. Original building main level floor plan

EXISTING BUILDING FLOOR PLAN

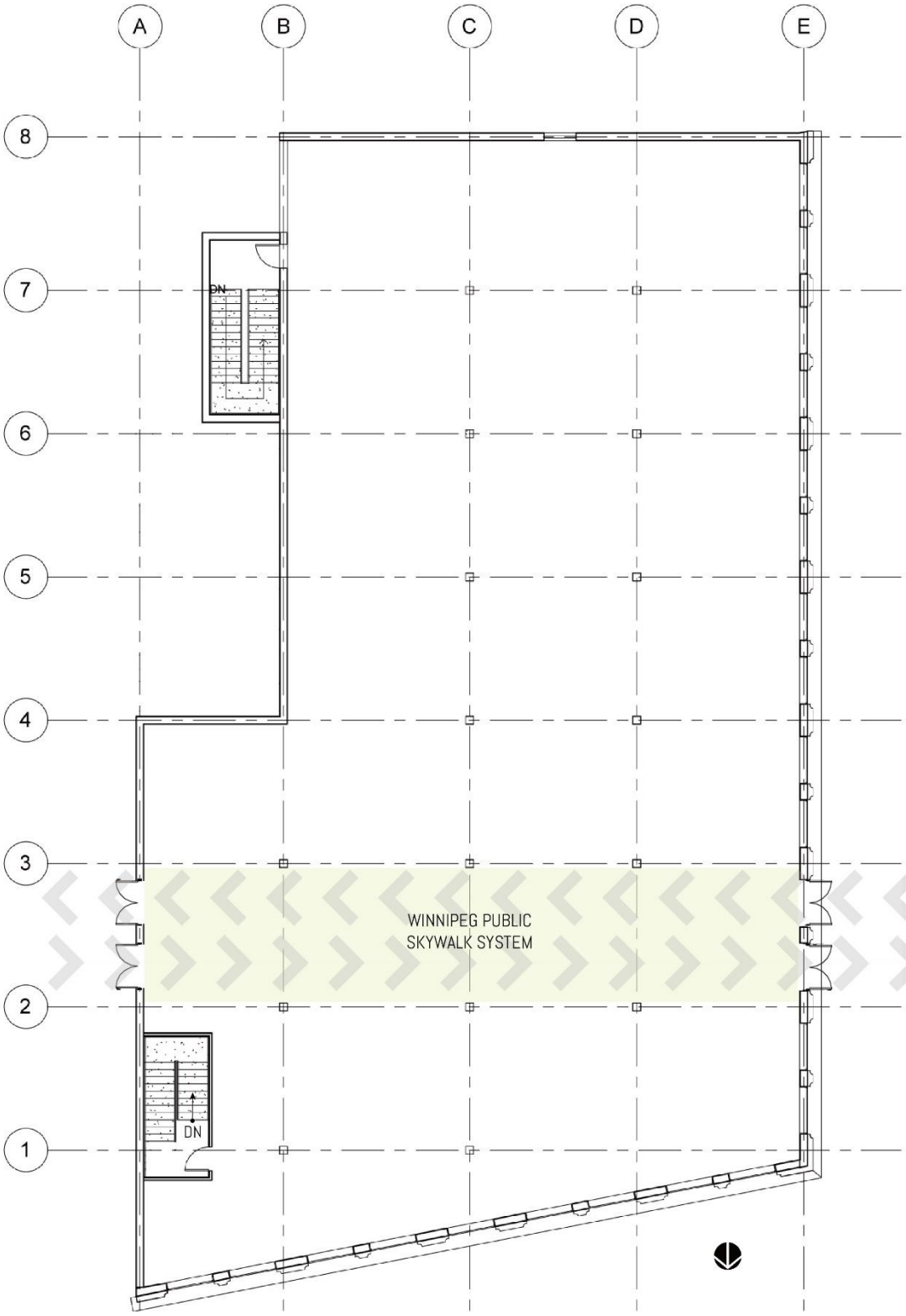


Figure 65. Original building second level floor plan

EXISTING BUILDING FLOOR PLAN

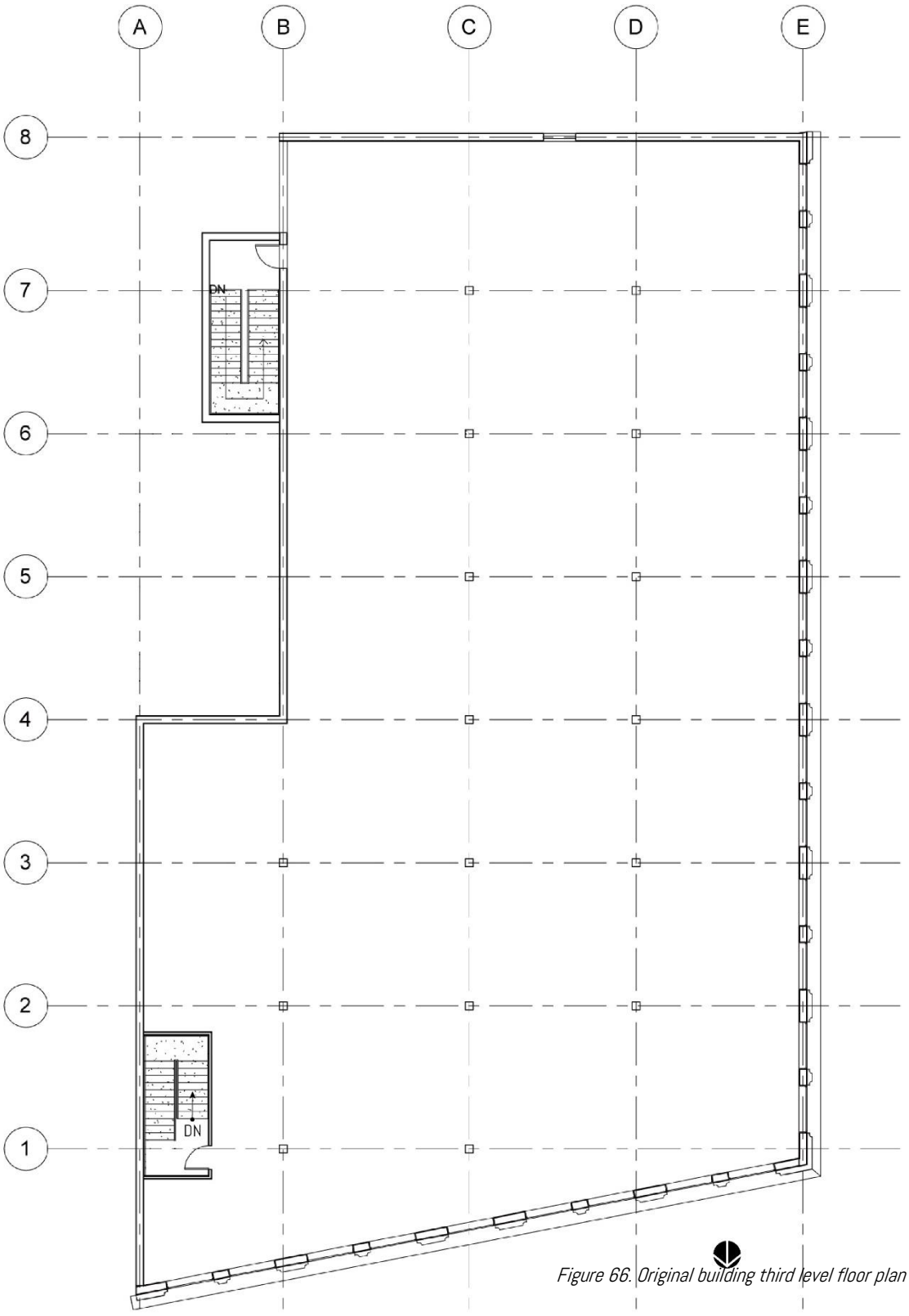


Figure 66. Original building third level floor plan

EXISTING BUILDING MATERIALS

Figure 67.

Figure 68.

Figure 69.

Figure 70.

Figure 71.

Figure 72.

Figure 73.

Figure 74.

Figure 75.

Figure 76.

CHAPTER 5.0: CONCEPTUAL EXPLORATION

By conducting the investigation study in chapter 2.0 and the observational study in 3.0, the author found that architectural education is an integrational system of experiences and social interactions. To support the 21st century architectural design education, the proposed WDC must facilitate these two main components during students' learning processes.

To apply the lessons learned in the theoretical framework in chapter 2.0 and studies in 3.0 to the design concept of the proposed project, the author created a study that helps the author to explore a design concept including the spatial organization, spatial adjacency, and form development. Lego bricks, a type of child's toy was used as the medium to explore the design concept that promotes experience and the social interaction nature of 21st century architectural design education. This study was recorded by photography, graphics, and sketches to analyze the process.

5.1 THE LIVING-TEXTBOOK.

The living-textbook concept for the proposed WDC represents the physical setting as an instructional resource to teach architectural knowledge. This concept is reached by the investigation in chapter 2.0, and the observational studies that were conducted in chapter 3.0. The author organized findings into three sub-concepts including Habitat, Digitalization, and Flexibility.

HABITAT

The concept of habitat plays a role in expressing the journey of design processes. To achieve this concept, it is critical to consider and apply the ELT into the spatial organization. The design learning spaces should support the operation of the ELT by providing learners with different learning experiences. Necessarily, the learning environment in the proposed WDC would become the pedagogical resource for its users.

DIGITALIZATION

Digital technologies will lead the future of architecture to a dynamic system of connections and will blur the distinctions between the physical and virtual environment. These advanced technologies also continually alter our way to learn since the author discussed hyper-learning in chapter 2.0. Therefore, it is significant to support architectural education environments with digital technologies including interactive touch screens, immersive virtual reality technologies, long distance visualization connectors, as well as digital display systems.

FLEXIBILITY

The concept of flexibility forces the necessity for adaptability within both public and private spaces to accommodate multi-function, mobility, and personalization in the aspect of operable educational space integrations.

5.2 CONCEPTUAL INVESTIGATION.

In chapter 2.0, section 2.3, the author discussed that a constructivist-based learning concept focuses on the experience of knowledge construction process, meanwhile in chapter 2.0, section 2.3.2, the ELT demonstrates that learning processes naturally pass through a learning cycle with four stages, each stage containing specific cognitive processes ranging from gathering information to generating meaning of information, to creating new concepts from made sense to experiment with established ideas. Every two adjacent stages formed preferred learning styles for a learner. The design concept of the proposed WDC is to introduce five boxes stacked on top of each other to form a cyclical structure that represents the Experiential Learning Cycle, the boxes on the very top and the one on the very bottom contain the same learning process space relative to the four type of learners' preferred learning habitat as shown in the preliminary concept sketch in Figure 77.

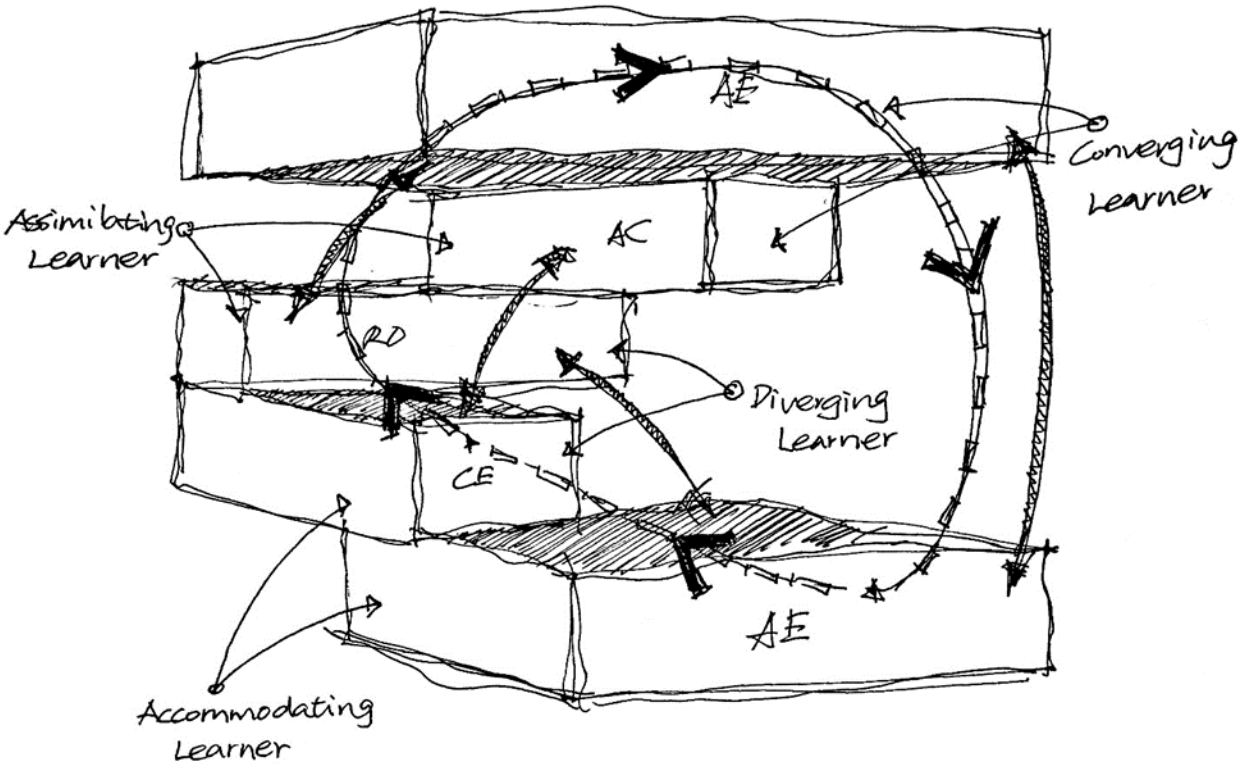


Figure 77. Form development sketch

5.3 THE LEGO STUDY.

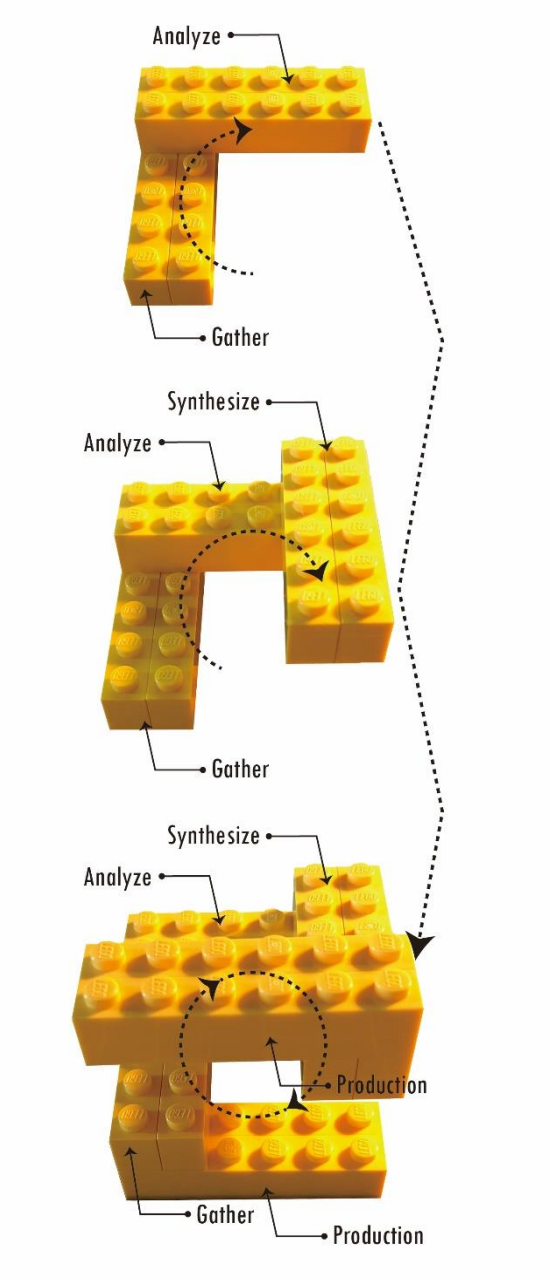


Figure 78. Implied spatial connections between each learning process based on the ELT.

The author re-generalized the four stages of a learning process based on the Experiential Learning Theory into four core learning areas to accommodate each phase of learning shown in Figure 78:

Gather: Space will shape the learning environment for the first stage of the ELT, Concrete Experience, the site for developing students' social communication skills such as verbal presentation, visual presentation, leadership as well as social responsibilities.

Analyze: Space will shape the learning environment for the second stage of the ELT, Reflective Observation, the site for developing students' critical thinking and analysis skills.

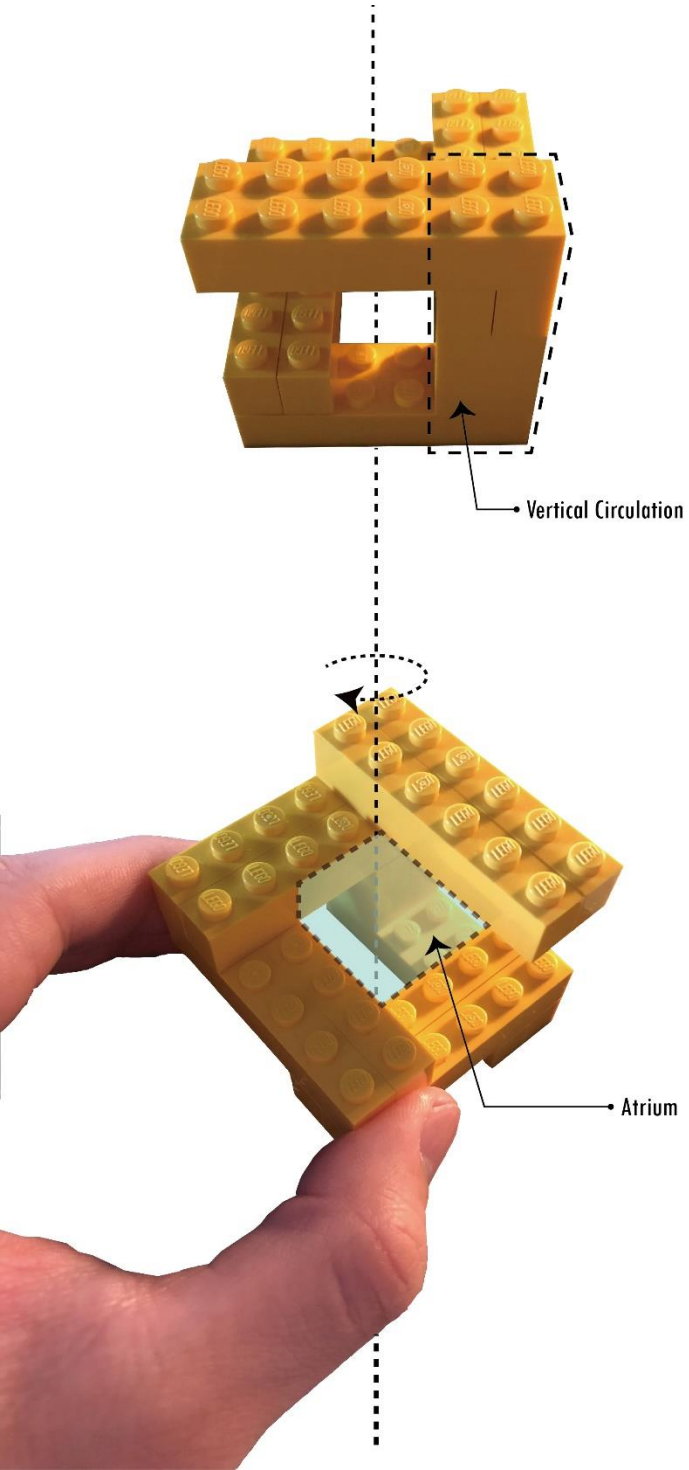
Synthesize: Space will shape the learning environment for the third stage of the ELT, Abstract Conceptualization, the site for developing students' independent knowledge integration abilities.

Production: Space will shape the learning environment for the final stage of the ELT, Active Experimentation, the site for developing students' creative thinking and hands-on design abilities.

The spatial development shall focus on the movement through the multiple learning experiences based on the concept of the ELT. The vertical zoning of the proposed design center is an expression of the learning cycle and layers of architectural knowledge that the author discussed previously. The central atrium as well as the core vertical circulation connect each level and move learners through each learning process in the proposed WDC (Figure 79).

As the five boxes are stacking together, the cycle-like structure naturally forms four terrace spaces A, B, C and D, shown in Figure 80. Since each terrace space is attached to two adjacent boxes, thus each of these spaces will serve as an auxiliary for the learning activities occurring in the adjacent boxes.

Figure 79. The vertical zoning concepts.



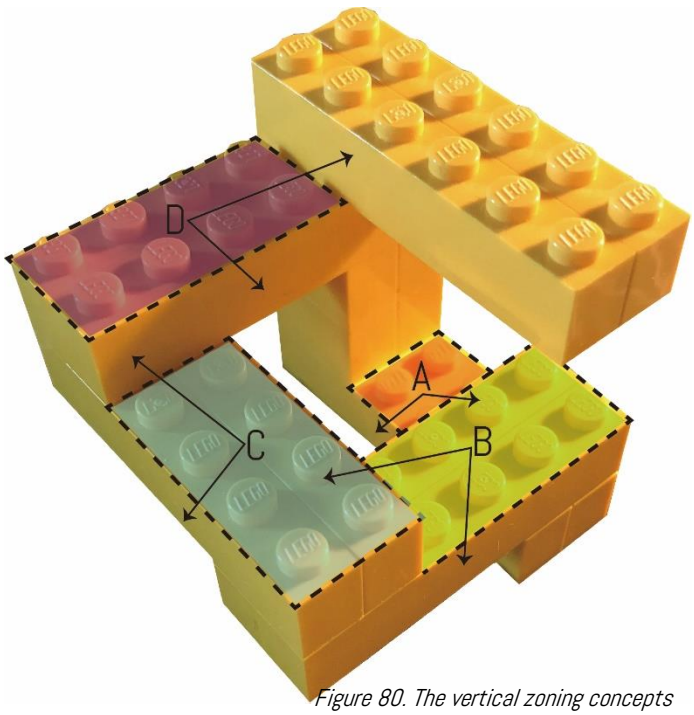


Figure 80. The vertical zoning concepts inform spatial adjacencies.

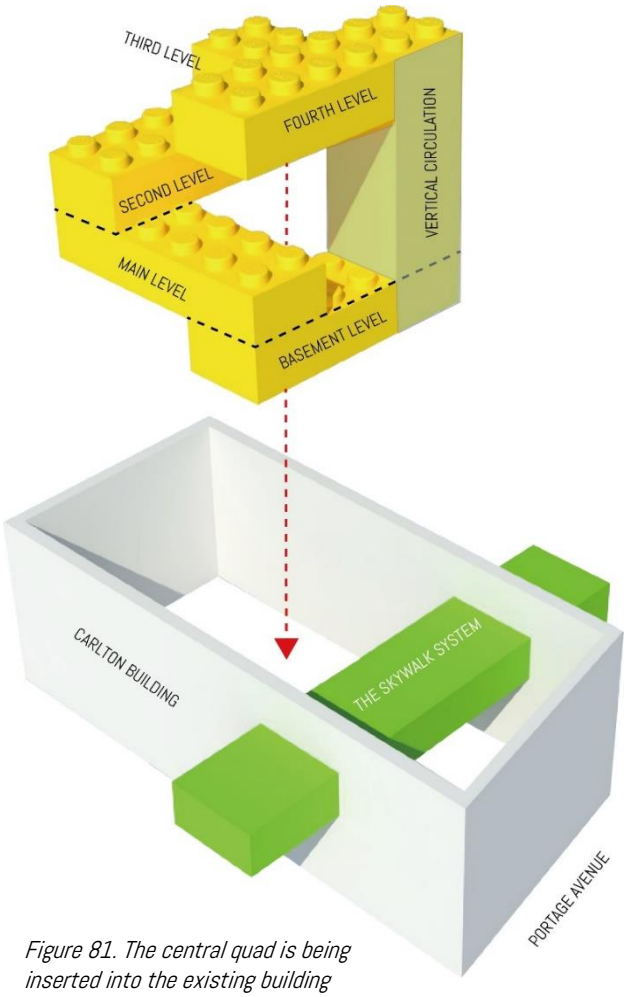


Figure 81. The central quad is being inserted into the existing building

Then the author inserts the stacking-box form into the existing building, intent to create a central quad; this central quad represents the primary learning spaces in the proposed WDC. The remaining area includes an interface (orange) and utility (grey) spaces shown in Figure 81.

To understand the connotations of the spatial relationship and the Lego study, it is necessary to explore spatial vocabularies for the proposed WDC. These connotations are expressed in table 7, where the functions, attributes and possible spaces in each proposed segment will be evaluated. It was assumed that this study would inform the design language and spatial organization of this practicum project.

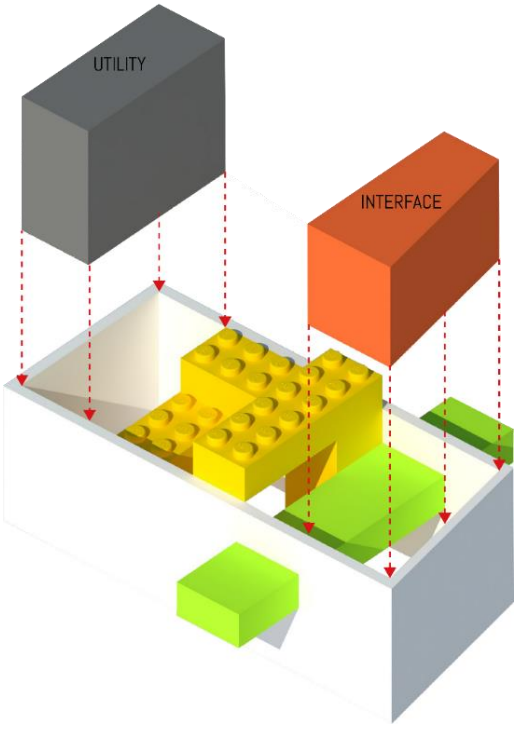


Figure 82. The interface and utility volume are being inserted into the front and rear of the existing building.

	ATTRIBUTES	FUNCTION	SPACE
INTERFACE	- Public - Welcoming - Engaging - Flexible - Dynamic	The most public space in this facility, as it will connect both interior and exterior space to create the public dialogue relationship. This space creates the first impression for building users.	- Main entrance - Reception - Exhibition space - Public gathering - Administration
TERRACE A	- Public - Engaging	The space function as the auxiliary for both gather and production learning areas.	- Inspiration station
GATHER	- Flexible - Functional - Engaging	This space is open and will be involved group working sessions.	- Meeting space - Public lectures space - Presentation space
TERRACE B	- Public - Flexible	The space function as the auxiliary for both gather and production learning areas.	- Public critique space - Exhibition space
ANALYZE	- Quiet - Efficient - Formal	The space functions as a structured learning space for knowledge transference.	- Lecture room - Seminar Room
TERRACE C	- Informal - Interactive - Functional	Space functions of a resource-rich space that contains knowledge of architectural materials and products.	- Material library - Print station - Temporary workstation
SYNTHESIZE	- Quiet - Private - responsive - Unrestricted	This space will be involved design activities that would be focused on quiet study sessions.	- Quiet study room - Reading stations - Library
TERRACE D	- Outdoor - Public - Dynamic	This space functions as the venue for the expression of the social culture of design education and facilitate learning through socialization and play.	- Lounge space - Outdoor design test space - Social space
PRODUCTION	- Efficient - Flexible - Dynamic - Engaging	An integration of spaces that provide home bases of common areas of design work that support design learning and teaching activities.	- Studio - Workshops - Indoor design test space
UTILITY	- Functional - Efficient	An integration of spaces that provide essential service for occupants.	- Washrooms - Electrical Room - mechanical Room - Storages

Table 7. The analyze of the Lego study and corresponding design considerations.

CHAPTER 6.0: PROGRAMMING

In this chapter, the author unifies the concepts explored in chapter 2.0 as well as the observational study in chapter 3.0, research into an integrated programme. This chapter contains comprehensive user profiles, which analyze user needs, activities and values that are significant to accommodate in the design proposal of the WDC.

6.1 USER PROFILES.

The users of the proposed project represent a new generation of students and employees who have grown-up in a digital-based, internationalized, and knowledge intense culture. As contemporary architecture schools encourage their students to use computers to propose and generate design concepts, therefore, students come to rely on enhanced digital skills and neglect the traditional design techniques such as hand drafting. Technologies have their advantage of high work efficiency in producing both technical and conceptual drawings. Digital technologies become a significant component of this proposed project. The 21st century introduces a remarkably global integration which has defined a diversified student group in Canadian universities; these students come from diverse cultural backgrounds, experiences, career perspectives and life values.

To fully understand the requirements and needs of the proposed WDC users, the author has organized the user profile into primary, secondary, tertiary and peripheral user groups. Each pattern of user group contains a general characterization, and an outline of users' values, psychological needs, physical needs, sensory needs, and possible learning activities that may be hosted by the user group.

6.1.1 PROFILE OF PRIMARY USERS.

The primary user group for the proposed WDC consists of the undergraduate and graduate students in the Faculty of Architecture, at the University of Manitoba. These primary users may have grown up in Canada or come from a range of international locations. The typical age of this group of users is from 18 to 35.

Although the physical environment of the proposed WDC will serve a co-operative education program or pop-up studio courses which will be taken by 40 students, the facility will also be open for use by any students from the faculty, whether they are participating in one of the courses or not. These students will be as outstanding as the individuals who will be using the proposed facility on a formal and regular basis. This group of users will require working group spaces, quiet study spaces, hands-on working space in groups or individually, lecture space, and exhibition spaces.

PRIMARY USERS: STUDENTS

VALUES	PSYCHOLOGICAL NEEDS	SENSORY NEEDS	PHYSICAL NEEDS
Mobility to work and learn in various contexts	Creative spaces to inspire creativity and imagination	View opportunities to the exterior and natural light	Flexibility to accommodate different learning activities
Access to innovative technology and equipment	Providing accurate interior colors to engage different learning activities	Various materials and textures to inspire design	Flexibility to accommodate different events including exhibition and social events
Ambiguous boundaries between students and instructors	Accurate interior colors to engage different learning activities	Acoustical and privacy control opportunity	Access to internet and electrical outlets
Collaborative opportunities with students in various design disciplines and years of the program	Accurate design height relates to human scales	Good quality of indoor air and climate atmosphere	Access to food, beverage, washrooms, storage, and parking
Engaging socially with faculty, professional practices, and the public	Ability to provide privacy and secure		Access to both physical and virtual resources
Establishing partnerships with clients and the public	Various options for learning behavior to support extended hours of learning		Mobile furniture collections
Flexibility for working and learning collaboratively and individually			Maintainable materials

Table 8. Primary user summary.

6.1.2 PROFILE OF SECONDARY USERS.

Since constructivism supports the design concept of the educational environment in the proposed WDC, according to chapter 2.0 the instructor under this form of education will be acting as a facilitator between students and learning objects. These facilitators will include professors who are currently employed by the Faculty of Architecture and professional practitioners who are interested in teaching. The significant role of these facilitators will be helping the client to plan a set of objectives into a studio project, for students to accomplish through an academic term, and guiding the process of the project to accommodate both clients' and students' needs. These facilitators promote learning through real experiences and aim to stimulate students' creative and innovative thinking abilities to produce meaningful projects.

SECONDARY USERS: FACILITATORS

VALUES	PSYCHOLOGICAL NEEDS	SENSORY NEEDS	PHYSICAL NEEDS
Inspiring students' creative and innovative thinking ability	Providing a supportive and facilitative environment	View opportunities to the exterior and natural light	Flexibility to accommodate different teaching activities
Facilitating studio projects to connect both students and clients	A learning environment that can adapt to various educational approaches	Various materials and textures to inspire design	Flexibility to accommodate different events including staff meeting, group critiques, and assignment evaluating
Ensuring students' work meets academic standards	Accurate interior colors to promote working	Acoustical and privacy control opportunities	Access to internet and electrical outlets
Greating a dialogue relationship between architecture education and the public	Accurate design height relates to human scale	Good quality of indoor air and climate atmosphere	Access to food, beverage, washrooms, storage, and parking
Generating a new image for architectural education in the 21st century	Ability to provide privacy and securely		Access to both physical and virtual resources
Fostering architectural knowledge through interdisciplinary collaboration	Various options for learning behavior to support extended hours of teaching and facilitating		Mobile furniture collection
Discovering students' learning needs			Access to updated technologies

Table 9. Secondary user summary.

6.1.3 PROFILE OF TERTIARY USERS.

Since the physical environment of the proposed WDC will primarily serve a co-operative education program and pop-up studio courses, thus real clients will be encouraged to offer live projects as academic assignments for the students from the Faculty of Architecture who will be participating in the WDC programs. By facilitating the WDC programs, a relationship between education and professional practice will be established.

Therefore, the tertiary users in the proposed project will be clients from a variety of contexts including design firms, development companies, the public, government, profit and non-profit organizations. The secondary users, facilitators, will work with clients to outline the parameters of design projects. During this interactive learning process, students will gain meaningful experience from the clients and the projects, while clients will also learn creative and innovative design concepts from students.

TERTIARY USERS: CLIENTS

VALUES	PSYCHOLOGICAL NEEDS	SENSORY NEEDS	PHYSICAL NEEDS
Sharing ideas and information with students and facilitators	Providing an easily navigated circulation system	View opportunities to the exterior and natural light	Easy to navigate
Introducing the requirements of design projects	Encouraging participation	Various materials and textures to inspire design	Access to transportation
Promoting a favorable prospect of companies and organizations	Accurate interior colors to promote collaboration and communication	Acoustical and privacy control opportunities	Access to internet and electrical outlets
Feeling welcomed into the facility	Accurate design height relates to human scale	Good quality of indoor air and climate atmosphere	Access to food, beverage, washrooms, storage, and parking
Feeling safe while in the facility	Ability to provide privacy and securely		Access to both informal and formal spaces
Learning and inspiring by students' creative and innovative design concepts	Various options for communicative behavior including meeting, online meeting, telephone meeting, long-distance meeting		Require views from outside to inside
Sharing shortages and issues related to design			Access to communication technologies

Table 10. Tertiary users' summary.

6.1.4 PROFILE OF PERIPHERAL USERS.

Architectural students communicate via diversified means, through direct face to face communication with their facilitators and clients, and indirectly design presentations including presentation boards, physical model displays, and digital presentations. The author argues that the proposed WDC should identify communication as the priority for its design concepts to encourage its members to work collaboratively and learn design from each other. This is since the architectural design is a social worker and architectural design practitioners must develop strong communication skills to present their concepts to different audiences, such as individuals from other disciplines as well as individuals from the public with little professional knowledge about architecture. By encouraging the public to participate in the proposed WDC for design related activities and events, students will become familiar with such various individuals that they will be expected to communicate to once they are entering the workforce.

The peripheral users will include individuals who work, study and live in the area, future students who are wishing to join in the faculty, and individuals who are interested in architectural work. These users hold various values and needs that are important for considering, to draw them into the proposed WDC.

TERTIARY USERS: CLIENTS

VALUES	PSYCHOLOGICAL NEEDS	SENSORY NEEDS	PHYSICAL NEEDS
Sharing ideas with students	Providing an easily navigated circulation system	View opportunities to the exterior and natural light	Easy to navigate
Connecting to the faculty	Encouraging participation	Various materials and textures to inspire design	Access to transportation
Feeling welcomed into the facility	Accurate interior colors to promote collaboration and communication	Acoustical and privacy control opportunities	Access to internet and electrical outlets
Feeling safe while in the facility	Accurate design height relates to human scale	Good quality of indoor air and climate atmosphere	Access to washrooms, storage, and parking
Learning and inspiring by students' creative and innovative design concepts	Ability to provide privacy and security		Require views from outside to inside
Sharing shortages and issues related to design			Require various levels of gathering space including formal and informal
Participating in public events and forums to create the dialogue relationship between public and the architecture industry			

Table 11. Tertiary users' summary.

6.2 PROGRAMME

The spatial programming and organization for the proposed WDC are based on the theoretical framework discussed in chapter 2.0 and the Lego study in section 5.0. The proposed WDC will accommodate 150 occupants at any given time in +40,600 square feet of space. The occupants of the proposed facility include 40-80 full-time students, 30-40 drop-in students, 2-4 facilitators, 5-10 clients, two reception staff, five administrative staff, one resource library staff, 1-2 workshop staff, and 1-2 maintenance staff. The proposed WDC's spaces include a welcoming center, private offices, meeting spaces, group working spaces, lounges, exhibition spaces, a studio, a lecture room, a workshop, and various hands-on working space to accommodate the activities that will occur during a studio project, as well as multiple areas for informal work. The spatial requirements of the proposed WDC are divided into five main segments as the language of the spatial organization that is driven by the Experiential Learning Theory and Constructivist Education discussed in chapter 2.0 as well as the Lego study in chapter 5.0.

ORGANIZATION	FUNCTION	REQUIREMENTS
MAIN LEVEL: THE INTERFACE + TERRACE A	Area for sharing and exchanging ideas and providing feedback through the exhibition. Welcoming area for visitors provides opportunities for visitors to review design work from different phases of design	Reception Exhibition space Administrative Offices Administrative Meeting Room Coat Room Coffee Station
MAIN LEVEL: GATHER	Space for students to meet a client, experts, and professionals Space for students to review the projects	Multi-functional Meeting Space (client meeting, final presentation, public lectures, private events).
SECOND LEVEL: TERRACE B	Space for students to work in groups Informal meeting space for students and facilitators that are supporting learning through mentoring.	Multi-functional Critique Space (group critiques, group brainstorming, concept development through sketches, public critique space)
SECOND LEVEL: ANALYZE	A formal learning space for knowledge transference. Knowledge and information exchange through seminars and formal lectures.	Lecture Room to accommodate 40 students
THIRD LEVEL: TERRACE C	The space for supporting research and gathering information through architectural product collections. The space for the exhibition of advanced building products.	Material Showroom Print Station
THIRD LEVEL: SYNTHESIZE	Space provides quiet context for learning, reading, and thinking. A resource-rich space that supports design inspiration	Quiet study room Resource Library
THIRD LEVEL/ADDITIONAL LEVEL/BASEMENT LEVEL: PRODUCTION	Space for hands-on design experimentation The home-based learning environment for design students.	Studio Workshops Student Lounge Open workspace for modeling Print Station VR Room

Table 12. Summary of spatial requirements for the proposed project.

6.2.1 MAIN LEVEL – THE INTERFACE.

SPACES	QUANTITY	OCCUPANCY LOAD	USERS PER SPACE	SQUARE FOOTAGE REQUIRED
Reception	1	20 SQ. FT	20	400 SQ. FT
Exhibition	2	20 SQ. FT	40X2	1600 SQ. FT
Administrative Offices	5	100 SQ. FT	1	500 SQ. FT
Administrative Meeting Room	1	20 SQ. FT	8	160 SQ. FT
Coat Room	1	15 SQ. FT	6	90 SQ. FT
Coffee Station	1	15 SQ. FT	6	90 SQ. FT
Washrooms	3 Female 3 Male 1 Universal Washroom	75 SQ. FT 50 SQ. FT 95 SQ. FT	3 3 1	225 SQ. FT 150 SQ. FT 95 SQ. FT
Storage	1	10 SQ. FT	5	50 SQ. FT
Total Square Footage				3,360 SQ. FT

Table 13. Spatial requirements for the primary level interface area.

DESCRIPTION

The Interface forms the spaces where students, facilitators, clients, and visitors engage the facility for their first experience. This is also space where the public can view the processes of design and creative work. This level will also contain the administrative offices, a staff meeting room, storage, a chat room, and a coffee station.

6.2.2 MAIN LEVEL – GATHER.

SPACES	QUANTITY	OCCUPANCY LOAD	USERS PER SPACE	SQUARE FOOTAGE REQUIRED
Multifunctional Meeting Room	1	20 SQ. FT	45	900 SQ. FT
Storage	1	10 SQ. FT	5	50 SQ. FT
Total Square Footage				950 SQ. FT

Table 14. Spatial requirements for the primary level Gather area.

DESCRIPTION

The Gather space forms the spaces where students, facilitators, and clients will familiarize themselves as well as the site for students to gather design problems and project related information such as requirements and parameters.

6.2.3 SECOND LEVEL – TERRACE B.

SPACES		QUANTITY	OCCUPANCY LOAD	USERS PER SPACE	SQUARE FOOTAGE REQUIRED
Multifunctional Group Working Space		1	20 SQ. FT	48	960 SQ. FT
	Total Square Footage				960 SQ. FT

Table 15. Spatial requirements for the second level Terrace B area.

DESCRIPTION

The Terrace B forms an informal meeting space for students and facilitators that supports design learning through critiquing, mentoring, and transferring practical knowledge. This space can also be used as public critique space.

6.2.4 SECOND LEVEL – ANALYZE.

SPACES	QUANTITY	OCCUPANCY LOAD	USERS PER SPACE	SQUARE FOOTAGE REQUIRED
Lecture Room	1	20 SQ. FT	41	820 SQ. FT
Total Square Footage				820 SQ. FT

Table 16. Spatial requirements for the second level Analyze area.

DESCRIPTION

The Analyze area forms a formal learning space for knowledge transference. Knowledge and practical information will be shared and exchanged through seminars and lectures to accommodate larger groups of students.

6.2.5 THIRD LEVEL – TERRACE C.

SPACES	QUANTITY	OCCUPANCY LOAD	USERS PER SPACE	SQUARE FOOTAGE REQUIRED
Material Showroom	1	20 SQ. FT	30	654 SQ. FT
Print Station	1	20 SQ. FT	2	40 SQ. FT
Total Square Footage				694 SQ. FT

Table 17. Spatial requirements for the third level Terrace C area.

DESCRIPTION

The Terrace C area forms a resource-rich space that exhibits advanced architectural products to students and the public. This space provides a searchable database accessible to various architectural product companies, and supports design students' studio projects.

6.2.6 THIRD LEVEL – SYNTHESIZE.

SPACES	QUANTITY	OCCUPANCY LOAD	USERS PER SPACE	SQUARE FOOTAGE REQUIRED
Quiet Study Room	1	20 SQ. FT	20	400 SQ. FT
Resource Library	1	20 SQ. FT	15	300 SQ. FT
Resource Library Staff Office	1	100 SQ. FT	1	100 SQ. FT
Total Square Footage				800 SQ. FT

Table 18. Spatial requirements for the third level Synthesize area.

DESCRIPTION

The Synthesis area forms a quiet study space for mobile students who use the space for a few hours to conduct research, reading and work; they pack up when they leave.

6.2.7 THIRD, NEW ADDITIONAL LEVEL, BASEMENT LEVEL– PRODUCTION.

SPACES	QUANTITY	OCCUPANCY LOAD	USERS PER SPACE	SQUARE FOOTAGE REQUIRED
Studio	1 in the third level	20 SQ. FT	40	800 SQ. FT
Open space for modeling	1 in the additional level 1 in the basement level	75 SQ. FT	25 in each	3,800 SQ. FT
Workshop	1 in the basement	100 SQ. FT	25	2,500 SQ. FT
Virtual Reality Space	2 in the basement	50 SQ. FT	15 each	1,500 SQ. FT
Student Lounge	1 in the additional level	20 SQ. FT	50	1,000 SQ. FT
Storage	1 in the basement	20 SQ. FT	4	80 SQ. FT
Workshop Staff Office	1 in the basement	100 SQ. FT	1	100 SQ. FT
Total Square Footage				9,780 SQ. FT

Table 19. Spatial requirements for third, new additional level, and basement level production areas.

DESCRIPTION

The Production areas provide the spaces to support the process of architectural design concept development through various creative design approaches typically used by the students from the Faculty of Architecture including physical model making, sketching, digital experimenting, etc.

6.2.8 CIRCULATION.

The circulation system throughout the proposed WDC will incorporate a horizontal circulation system including corridors and bridges as well as vertical circulation system including stairs and elevators, to move students through to experience different phases of the site

SPACES	QUANTITY	OCCUPANCY LOAD	USERS PER SPACE	SQUARE FOOTAGE REQUIRED
Circulation	-	20% of total	-	4,100 SQ. FT
Total Square Footage				4,100 SQ. FT

DESIGN CONCEPT SUMMARY.

To understand the connections between the theoretical frameworks, precedent studies, trace studies, as well as the Lego study, the author has summarized the fundamental concepts and design connotations in the following key terms and words. The design concept summary in Table 17 will guide the design approach for the proposed Winnipeg Design Center.

- Learning by Doing
- Cyclical Relationship
- Central Quad
- Adaptable
- Experience

THEORY/STUDY	KEY CONCEPTS	DESIGN CONNOTATIONS
THEORY: CONSTRUCTIVIST EDUCATION	The constructivist education promotes vital reciprocity of mind and culture, abstract information, and meaning, truth and experience. As an exploration-based learning process encourages diversified perspectives of content exposing that there are multiple solutions for problems.	Learning by doing
THEORY: EXPERIENTIAL LEARNING THEORY (ELT)	The process of learning in any discipline should follow the procedure of having an experience, reflecting on the experience, learning from the background, and testing from experience.	Cyclical Relationship
STUDY: PRECEDENT STUDY	Providing a focal point for various purposes Highly visible social spaces including pubic critique areas and exhibition spaces High degree of flexibility and adaptability in students' learning environments to facilitate different kinds of learning activities	Central Quad
STUDY: TRACE STUDY	Adaptability to accommodate various social activities Flexibility in students' workspaces Different presentation opportunities for design students both verbally and physically	Adaptable
STUDY: LEGO STUDY	Design Vocabularies: Interface Gather Analyze Synthesize Production	Experience

Table 20. Summary of connections between theories/studies and the design concept.

CHAPTER 7.0: DESIGN PROPOSAL

In this chapter, the author will discuss the development of the design concept for the proposed Winnipeg Design Centre, the satellite campus for the University of Manitoba's Faculty of Architecture in downtown Winnipeg. The design proposal of this project reflects the understanding and integration of the knowledge and connotations acquired through the investigation study and design exploration studies that the author conducted from chapter 2.0 to chapter 6.0. In this chapter, the author will examine the rationale, intention, and ideas that support the proposed practicum project.

7.1 BUILDING EXTERIORS.

According to Chapter 5.0 and 6.0, 350 Portage Avenue, Carlton Building was selected for this practicum project based on its prime urban center location and the possibilities for connection to both public and professional communities. The existing building provides a broad span of structural grid space as well as high ceilings that enhance more potential for design and architectural language decisions. According to Chapter 6.0, since the square footage of the existing building cannot accommodate the programme of the proposed project, an additional structure was added to satisfy functional and programmatic requirements.

In 2001, the Winnipeg's Property Development Department and Resources Committee recognized the Carlton Building as a historical landmark in the city of Winnipeg; thus, the author desired to preserve as much of the existing building façade as possible. At the same time, the author also wanted to propose some design elements that can provide an identity for the proposed WDC to the public through students' work since it is the first impression for the visitor to the venue.

Accordingly, the author employed Graeme Brooker and Sally Stone's insertion design principles to remodel the selected Carlton Building. The author has chosen to preserve the original façade of the second and third floors while inserting a series of aluminum deep-framed windows that allow the displaying of students' design work within. The featured windows on the second level along the northern portion of the building are rotated 10 degrees toward to the westbound vehicular traffic on Portage Avenue while on the third level these windows are rotated 15 degrees toward to the eastern vehicular traffic on Portage Avenue (Figure 83).

Figure 83. The northern exterior perspective on the Portage Avenue.

Figure 84. The western exterior perspective on the Carlton Street.

Additionally, the featured windows continue the rhythm along the east portion of the building, whereas all these windows are rotated 10 degrees toward to the northern vehicular traffic on Carlton Street since Carlton Street is recognized as a one-way traffic street (Figure 84). The intention of this design feature is to allow expanded views from all spaces out of the existing building such as the outdoor pedestrian path, outdoor vehicular path, indoor pedestrian path (the skywalk system), and adjacent structures. These featured windows act as a visual bridge between the WDC itself and the urban context (Figure 85 and 86).

Figure 85. The featured building exterior windows act as a medium to connect both the public and the proposed WDC with the indoor pedestrian path.

Figure 86. The featured building exterior windows act as a medium to connect both the public and the proposed WDC with the outdoor vehicular path.

Figure 87. New additional skylight systems allow more natural lights coming into the proposed WDC.

The author also introduced two skylights to the original building, a significant one covering most of the central core spaces in the proposed facility as well as a series of smaller ones covering the administrative center on the main level. The intention is to allow more natural light to filter into the proposed spaces as well as to bring the urban context into the proposed interior environment.

As the author mentioned previously, the proposed WDC contains an additional level with an area of 4,325 square feet that is located on top of the original building. The new structure is surrounded by full height contemporary glazed curtain wall as well as solid walls with aluminum wall cladding on the eastern portion. The simplicity and modern style of the structure places an architectural contrast from the original building. Moreover, the high degree of transparency that is created by the large

amount of glazing allows the WDC to reveal itself to the public context and brings the urban environment into the new added structure.

Figure 88. Glazed new additional structure creates high degree of transparency to reveal the proposed WDC to the public context.

Figure 89. Southern view of the new additional structure.

One of the primary goals of the proposed WDC is to act as an expansive urban threshold that brings the public, professionals, and academics together to perform creative designs. Therefore, the penetrability between the physical environment of the proposed WDC and the urban environment is a significant element to consider. The author devotes himself to address

this challenge beginning with the WDC's intended entrance since it is the first 'hand-shake' for visitors to the building. The author removed the existing storefront glazing panels on the main level from the northern original building façade. Relocating the main entrance of the building as well as the storefront glazing panels (now the panels are becoming operable glass walls) behind the original building's northern perimeter to create a void space with a double-storey high ceiling. This will unite the space with the public sidewalk through the application of the same floor tiles. In this void space, the author also incorporates a self-service merchandise store to sell snacks, drinks, and convenience items. These design approaches intend to draw people's attention into the proposed facility from the public context as well as welcome everyone who comes to visit the proposed design center.

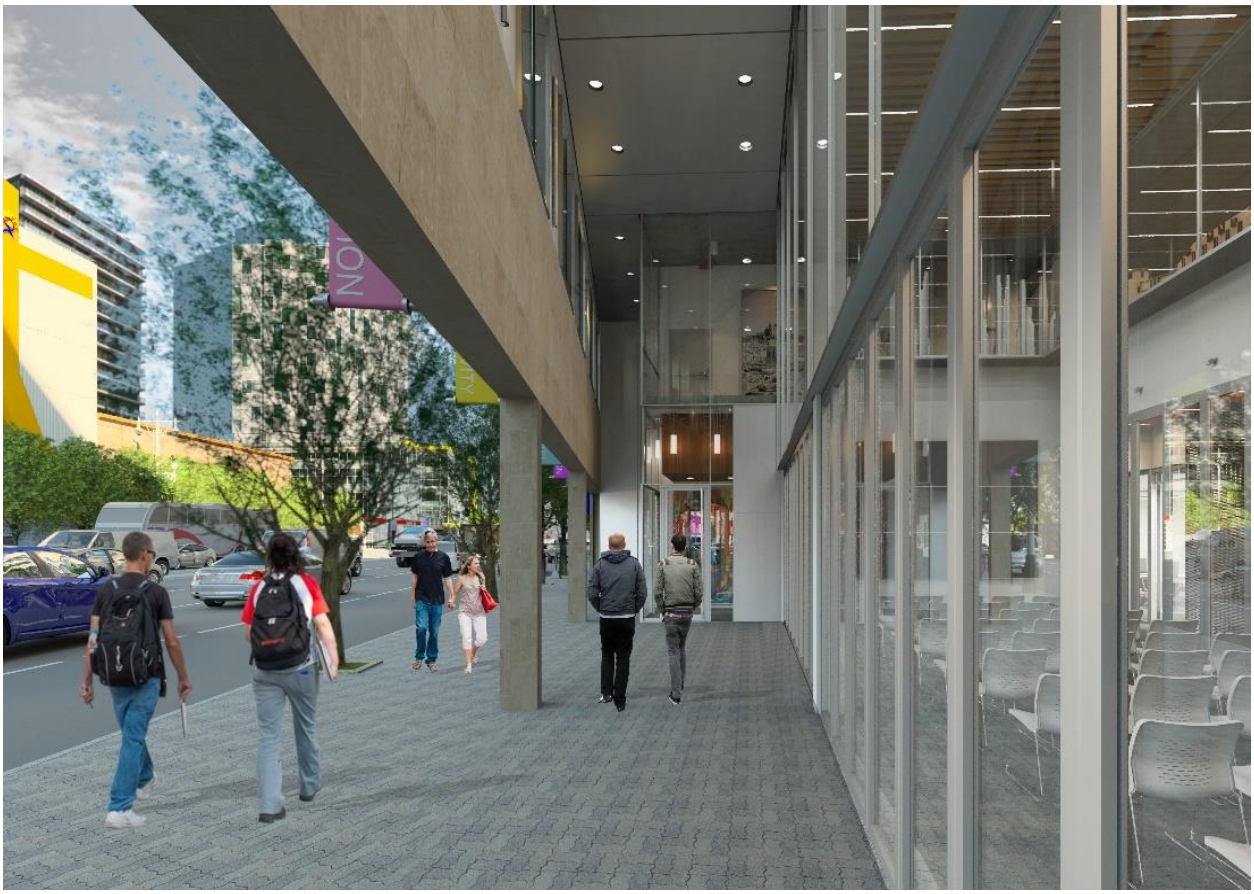


Figure 90. The double-storey high space acts as a transition space between the urban context and the interior spaces of the proposed WDC.

7.2 SPATIAL ORGANIZATION

The spatial organization of this proposed WDC is arranged based on the cyclical nature of the ELT (Experimental Learning Theory) that the author described in Chapter 2.0. The physical environment of the proposed project forms an integrative educational setting that reveals a four-stage learning cycle connected through social interactions. The following sectional elevation of the proposed project explains the typical learning experiences that design students will encounter when they have learning objectives. According to Chapter 2.0 and 5.0 that the author described previously, these learning stages can be recognized as information gathering, knowledge analysis, concept synthesis, and design production. Throughout this four-stage learning process, students may go back and forth between the stages. Thus, the primary goal of the spatial origination for this proposed WDC is to support and boost this four-stage learning process. Moreover, the spatial organization of the proposed WDC is also driven by the conceptual vocabulary of five stacked boxes from the Lego study that the author conducted in Chapter 5.0 based on the framework from the ELT (Figure 91).

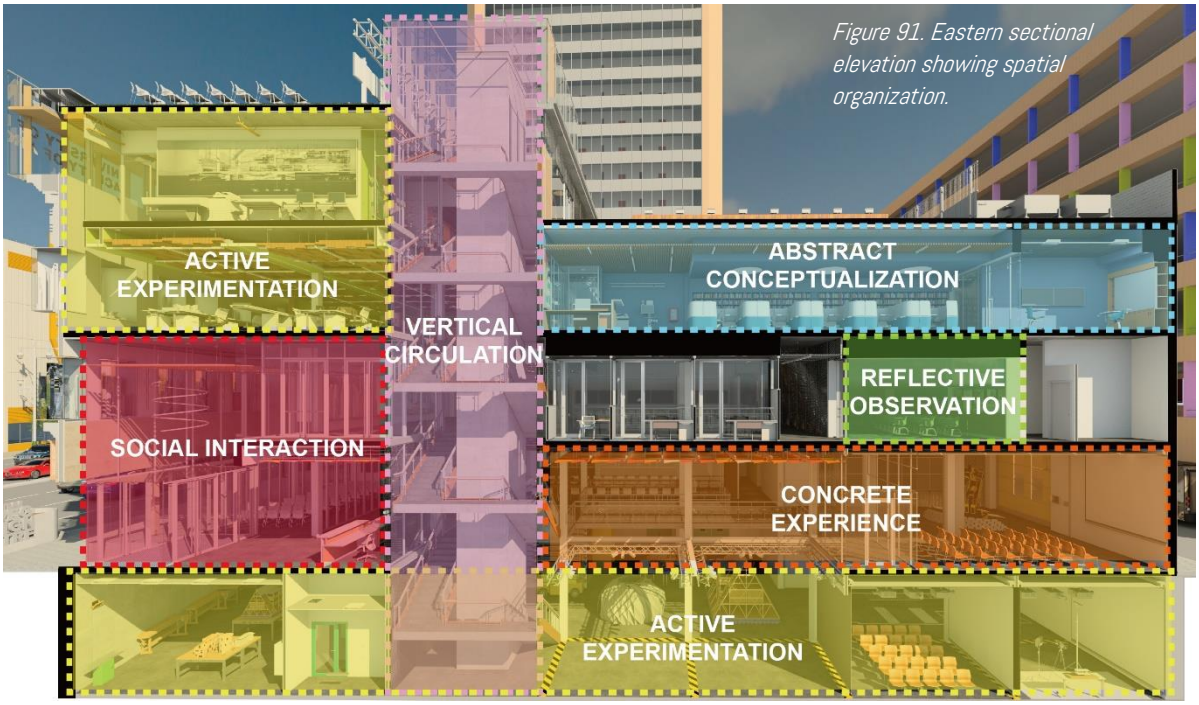


Figure 91. Eastern sectional elevation showing spatial organization.

7.3 INTERFACE [LEVEL 1 AND LEVEL 2]

The interface includes the central entrance area and a multifunctional space on the first level as well as the secondary entrance area in the Skywalk system on the second level. One of the primary goals of the design proposal in such spaces is to establish an interactive relationship between the public, professional practices, and the design education community.

Figure 92. The first level floor plan showing the location of the interface.

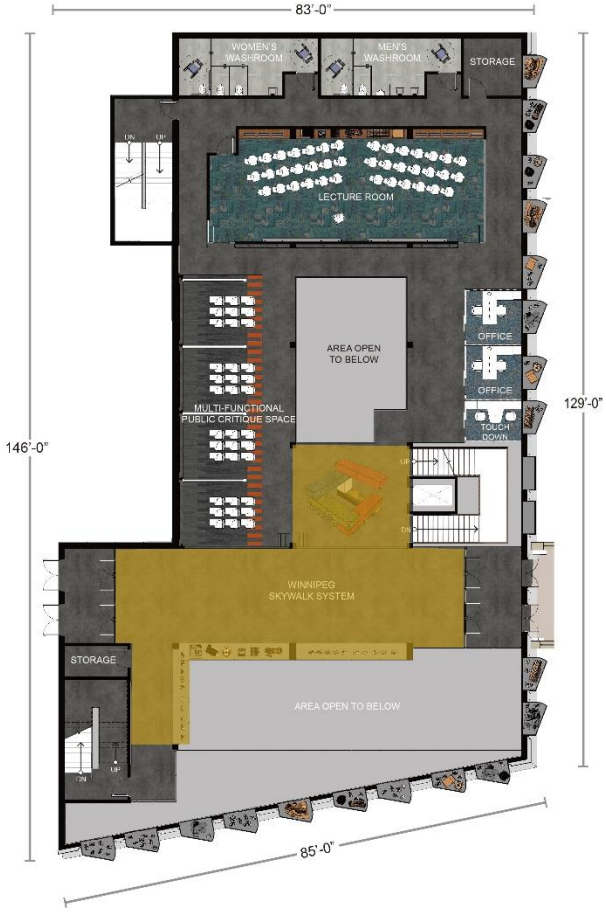


Figure 93. The second level floor plan showing the location of the interface.

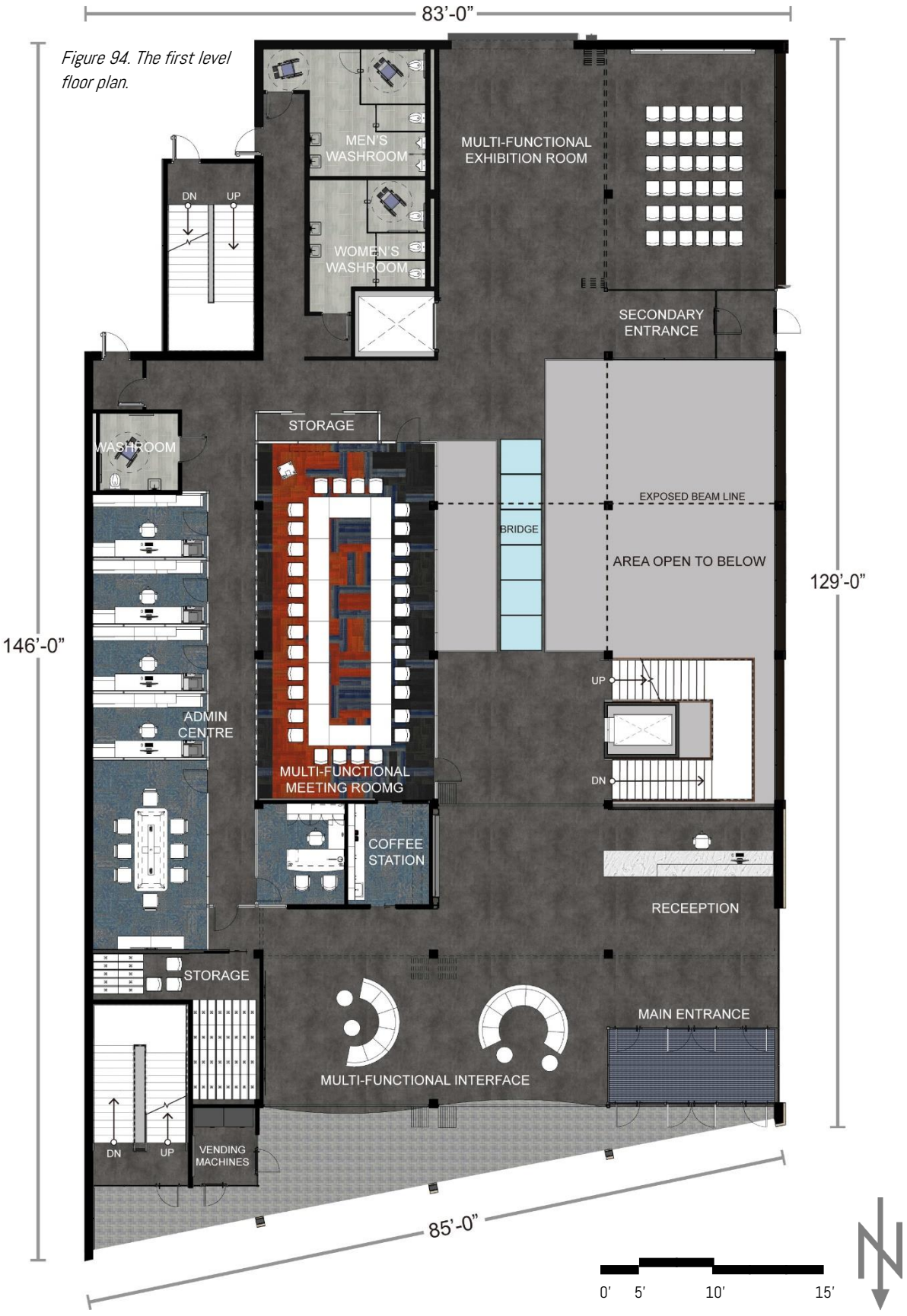


Figure 94. The first level floor plan.

The main entrance of the proposed WDC is in the north-west corner of the building that faces the intersection of Portage Avenue and Carlton Street. The reception area is surrounded by full height storefront glazing that allows an extensive view between both exterior and interior. Design features in this space include a reception desk designed with a giant LED screen that can be used to display the center's business promotion, students' works, and upcoming event information (Figure 95).

Figure 95. Proposed reception area on the main level.

Additionally, there is an electronic free poster system in this area that will allow users to upload and display information and images on different sized LED screens. Information will be uploaded wirelessly to this electronic poster system, and no physical paper is required. People can use mobile device applications to dispatch their desired poster format. When the post expires, the LED screen will become blank to indicate that a spot is available for others to use. This design feature is intended to reduce the

consumption of paper and ink, saving resources (Figure 96). 3D form acoustical ceiling panels cover most of the space in the reception area with color tones of red, yellow, and orange. Since, according to Chapter 3, the color study, colors red, yellow, and orange can motivate people's feeling of excitement and happiness.

The interface area on the first level is the most public aspect of the design proposal. The author introduces a multifunctional space adjacent to the reception area designed with two-story high, open volume space that can be seen from both Portage Avenue outwardly and the public Skywalk system on the second level inwardly. The primary function of this space is connecting the WDC's activities with urban life in the city. This multi-functional space features operable glass panels on two sides that allow a

Figure 96. The digital public post system in the main level reception area.

high degree of flexibility to accommodate various functions. At any given time, this space can be utilized as a public lecture room, a gallery, a public lounge, or a rentable venue space for special events. During summer, the operable curtainwall on the perimeter wall can be opened to allow more display opportunities on the street.

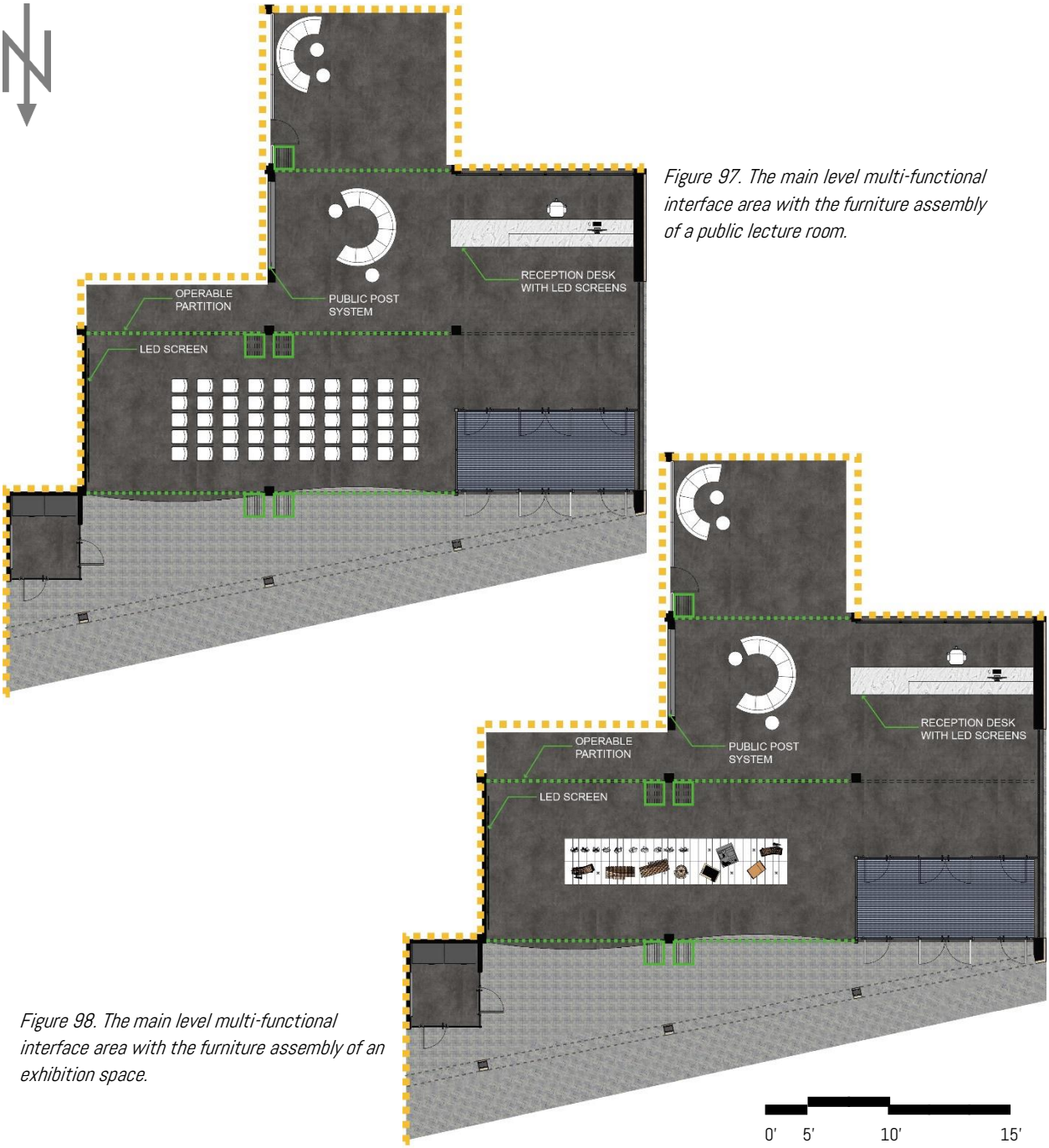


Figure 97. The main level multi-functional interface area with the furniture assembly of a public lecture room.

Figure 98. The main level multi-functional interface area with the furniture assembly of an exhibition space.

Figure 99. The main level multi-functional interface area with the furniture assembly of a public lecture room interior perspective.

Figure 100. The main level multi-functional interface area with the furniture assembly of an exhibition space interior perspective.

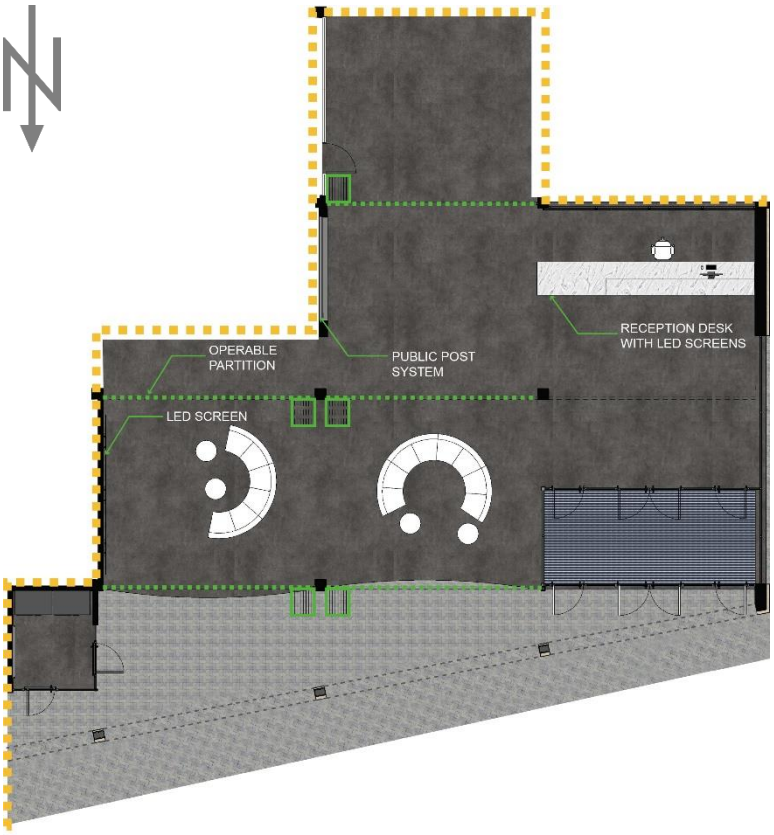


Figure 101. The main level multi-functional interface area with the furniture assembly of a public lounge space.

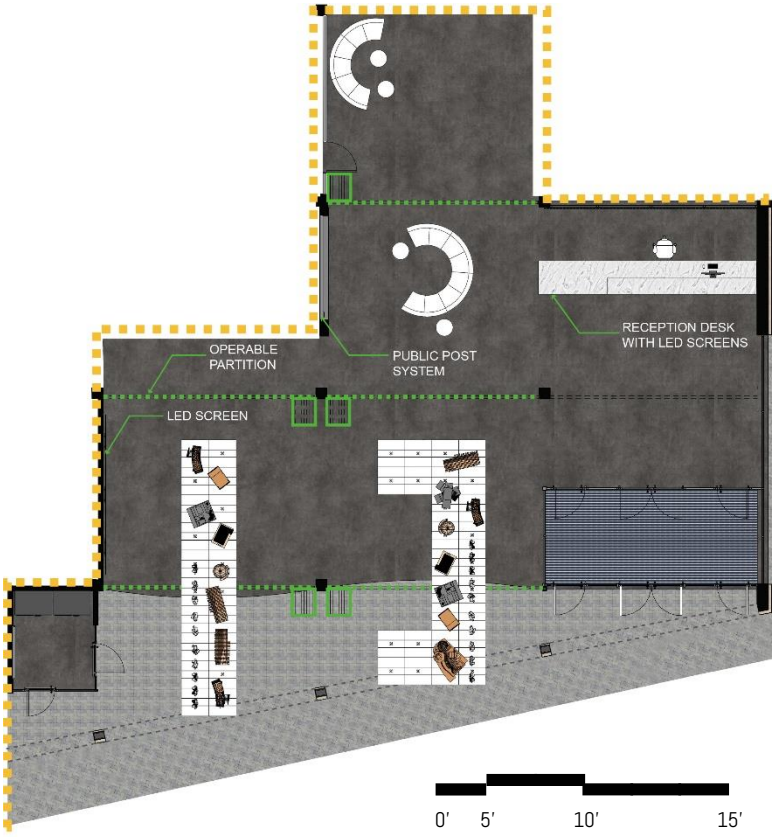


Figure 102. The main level multi-functional interface area with the furniture assembly of an outdoor exhibition space

Figure 103. The main level multi-functional interface area with the furniture assembly of a public lounge space interior perspective.

Figure 104. The main level multi-functional interface area with the furniture assembly of an outdoor exhibition space interior perspective.

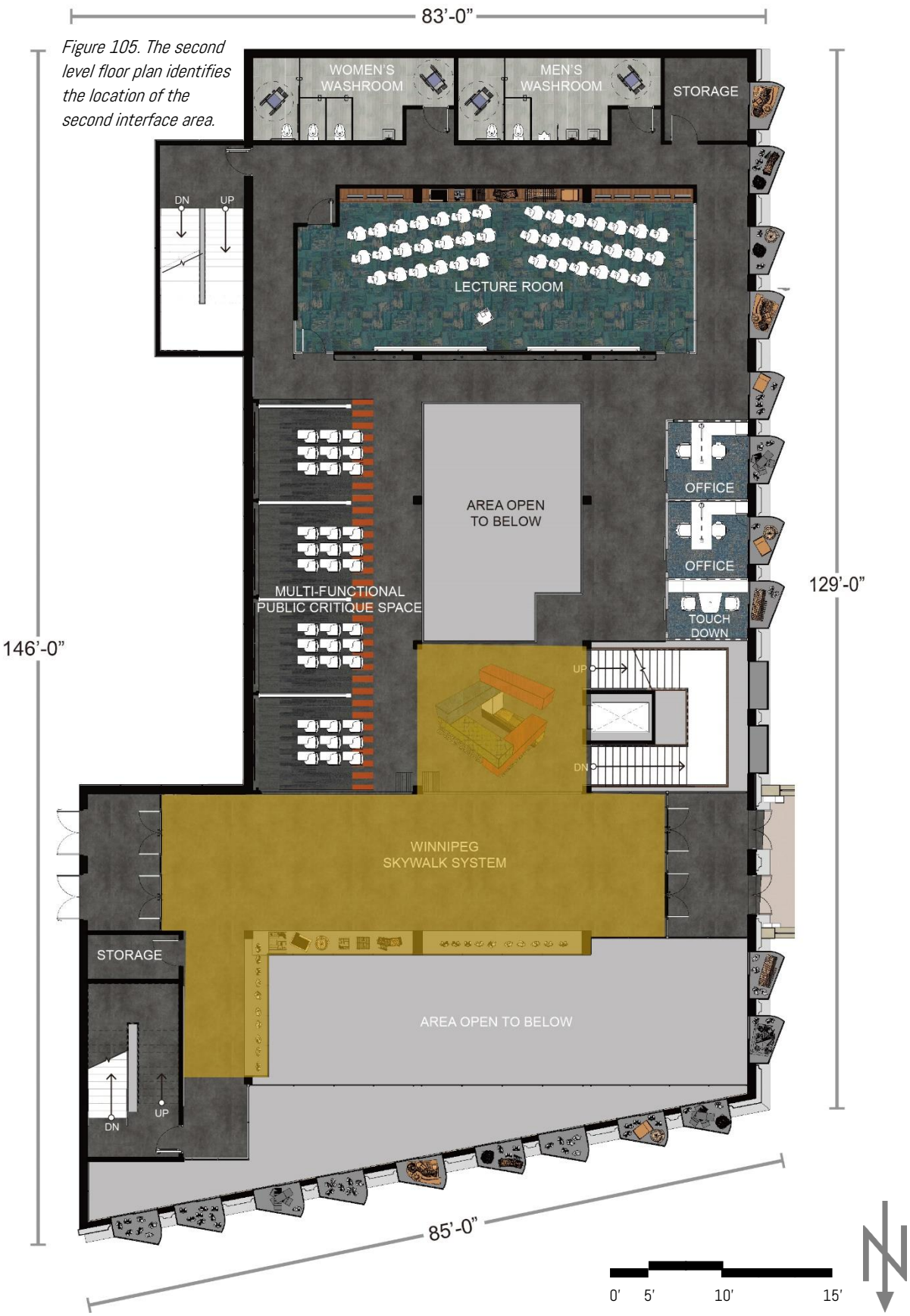


Figure 105. The second level floor plan identifies the location of the second interface area.

Due to the unique location of the selected site, as the author mentioned the existing building is connected to Winnipeg's Skywalk system. Therefore the author designed a secondary entrance on the second level for people who travel by this indoor path. On the north side of the Skywalk system, the author applied a series of deep framed glass partitions that allow students to display their design work; and on the opposite side, there are two 20' by 10' operable glass walls intended to reveal the entire WDC to the public.

Figure 106. The second level interface space features a deep-framed display shelving to exhibit students' design work.

Figure 107. The second level interface space's entrance features the proposed WDC's brand logo.

7.4 INFORMATION GATHERING [LEVEL 1]

By passing the interface area on the first level, visitors will reach the core area of the proposed WDC. The first level is designed to support the ELT's first stage of learning known as Concrete Experience. This floor is where faculty members, clients, and individuals from professional practice will familiarize themselves with design objects as well as orient themselves to the proposed centre. This is also the area where visitors will first engage with the faculty members' design work in the gallery as well as experience the process of design through the exposed workshop in the basement. This level also features an administrative centre, washrooms, storage, and a loading dock.

According to the Chapter 5.0, the author used Lego bricks to propose a design language with five boxes stacking together to form a circular structure that was inserted into the existing building; each box represents a specific learning setting based on the ELT. Figure (108) shows the first box (room) that represents the site for information gathering.

Figure 108. The main level multi-functional meeting room with the furniture assembly of a public lecture room.

In this room, faculty members will meet clients and individuals from professional industries to gather required information regarding to the faculty's projects. The color tone of this room continues the element from the reception area with red, yellow, and orange; since, according to Chapter 3.0, these colors can also stimulate people to share information and talk. The ceiling design is another feature of this room. The author applied a customized translucent plastic panel, fabricated into an urban map of Winnipeg to become the ceiling feature of this room. The furniture layout is also flexible in this room. When faculty members do not book it, this room can be rented as a boardroom accommodating thirty-two people to serve the public (Figure 109).

Figure 109. The main level multi-functional meeting room with the furniture assembly of a formal boardroom.

Since the five-stacked-box concept naturally forms an atrium space in the middle portion of the building and leaves a large opening on the main level floor slab, the author introduces a bridge to connect both northern and southern portions of the first level. By crossing this bridge, an individual can see design activities that would happen in the basement (Figure 110). The existing 10' high storefront glazing filters natural light through both the main level and the basement. At the same time, people walking along

Carlton Street can also see design activities that would occur both on the main level and in the basement from the exterior (Figure 111).

Figure 110. The main level new additional bridge area allows view access to basement workshops.

Figure 111. The existing 10' high storefront glazing filters natural light through both the main level and the basement.

The last feature space on this level is a multifunctional exhibition space that is adjacent to a sub-entrance on Carlton Street. This space features a loading dock and a service elevator that allows oversized items to be delivered to this proposed facility as well as operable glass walls that would enable this space to accommodate different exhibition purposes at any given time (Figure 112). The ceiling of this space is covered with aluminum expanded metal mesh, also commonly applied in the rest of the proposed WDC spaces. Its purpose is to create more opportunities for suspending and hanging students' design work.

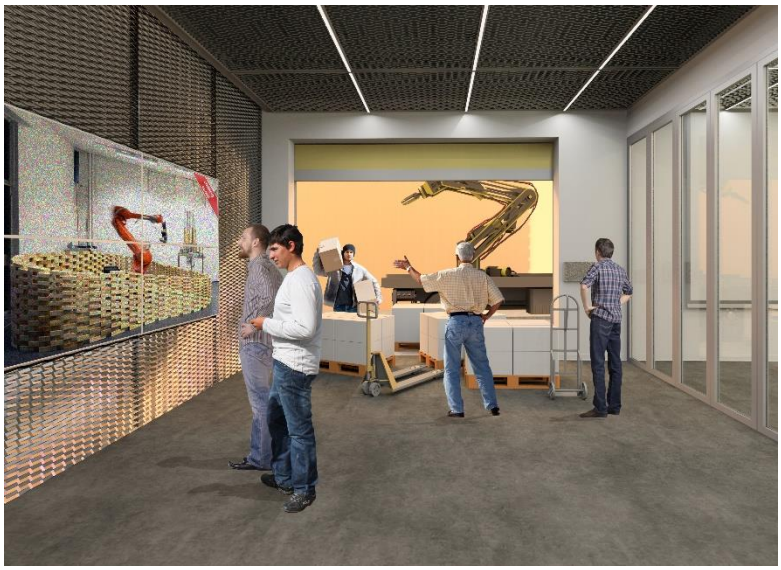


Figure 112. The main level multi-functional exhibition space features a loading dock that allows over-sized equipment to be delivered to the proposed facility.

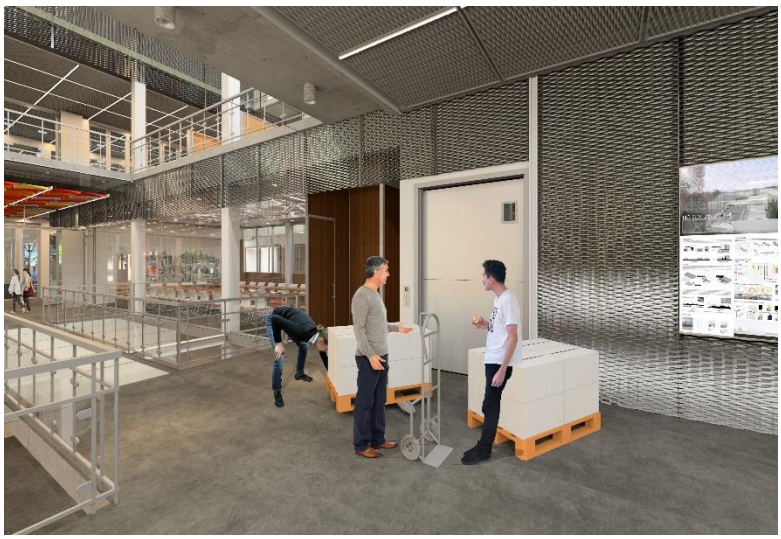


Figure 113. The main level multi-functional exhibition space features a service elevator that allows over-sized equipment to be delivered to the basement workshop.

Figure 114. The main level multi-functional exhibition space with the furniture assembly of an industrial product exhibition space.

Figure 115. The main level multi-functional exhibition space with the furniture assembly for a design company exhibition.

7.5 KNOWLEDGE ANALYSIS [LEVEL 2]

Visitors will access the second level through the vertical circulation in the middle portion of the building by taking an elevator or stairs. The second level is designed to support the ELT's second stage of learning which is known as Reflective Observation. This floor is where students learn design knowledge through observation and listening. This level features a multifunction critique zone, a lecture room, two temporary offices for professors, an informal touch-down space, washrooms and two storage areas.

Figure 116. The vertical circulation system of the proposed WDC is located close to the interface area.

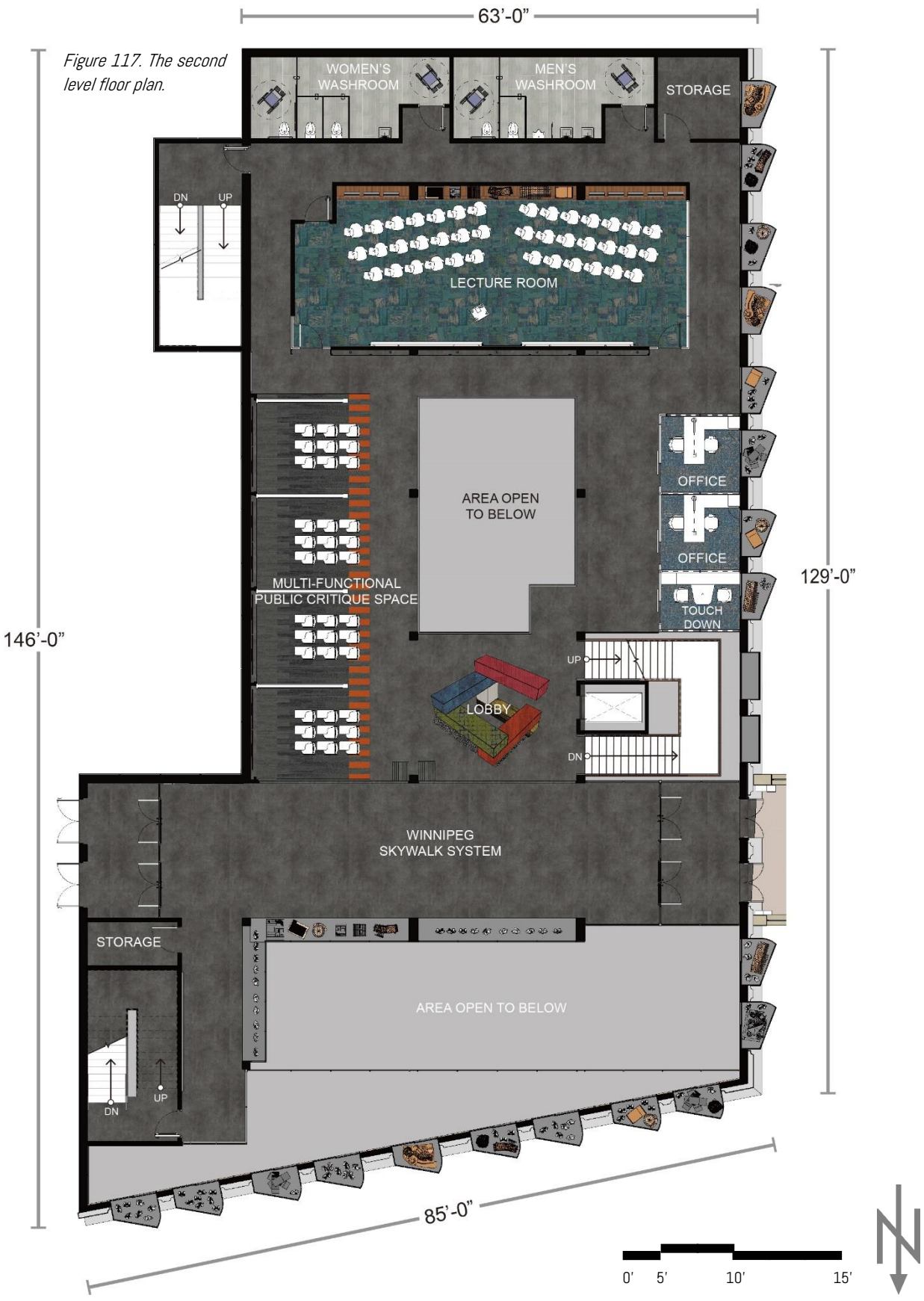


Figure 117. The second level floor plan.

7.5.1 PUBLIC CRITIQUE ZONE [LEVEL 2]

The first space when visitors reach the second level either from the vertical circulation or the entrance from the Skywalk system is a multifunctional critique zone. By locating the critique space in such a busy circulation area, students' design work can be quickly exposed to the public and can also establish a dialogue relationship between the proposed WDC and the public. This critique zone also demonstrates flexibility and adaptability depending on the requirements of users. The author introduces four pivoting boards with a whiteboard on one side as well as pin-up board on the other side. These operable boards can be arranged into four sections of semi-private spaces. In each section, there is an LED screen which can be used for display and presentation purposes. This space can be used for multiple group critiques or presentations when these pivoting boards are in the open mode, or when these boards are not in use, this space can be used for exhibitions, group work or open space for the public lounge.

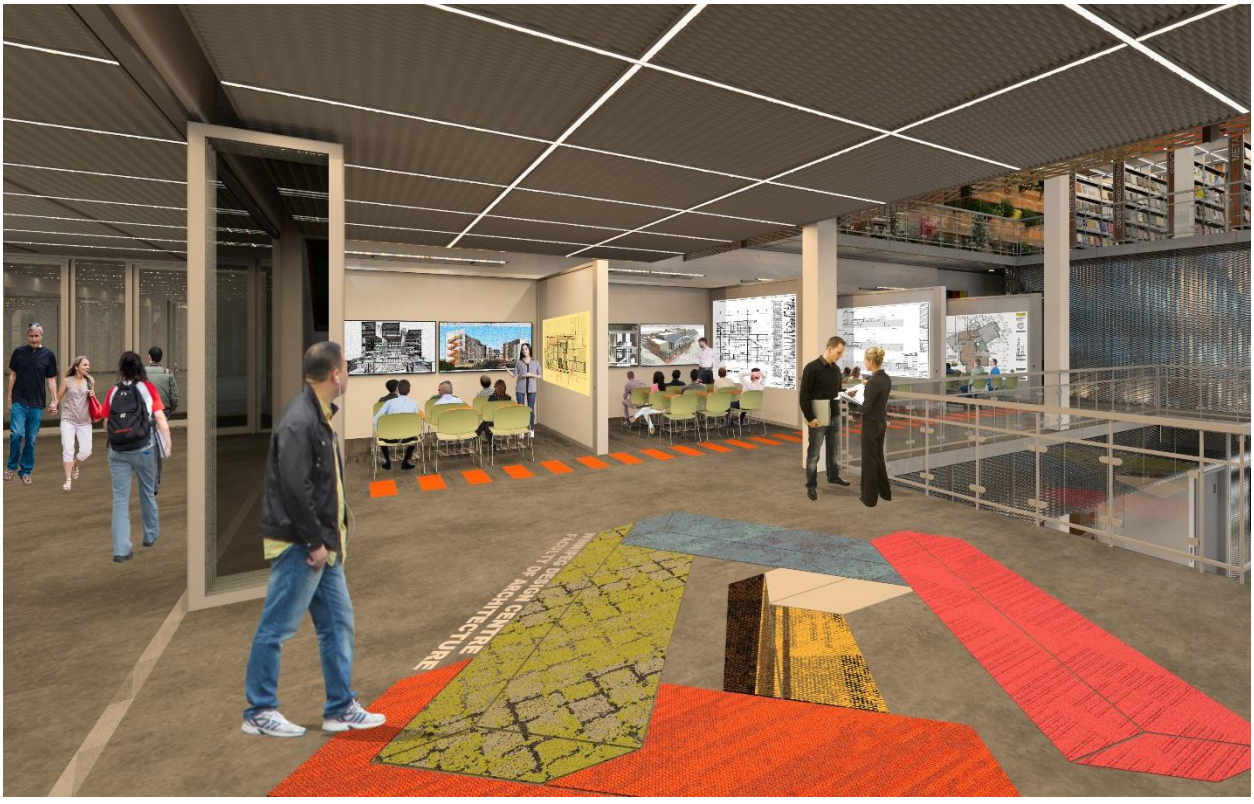


Figure 118. The featured operable boards allow the public critique space to be arranged into four sections of semi-private spaces.

Figure 119. In each section of these public critique semi-private space features two LED screens and pin-up boards.

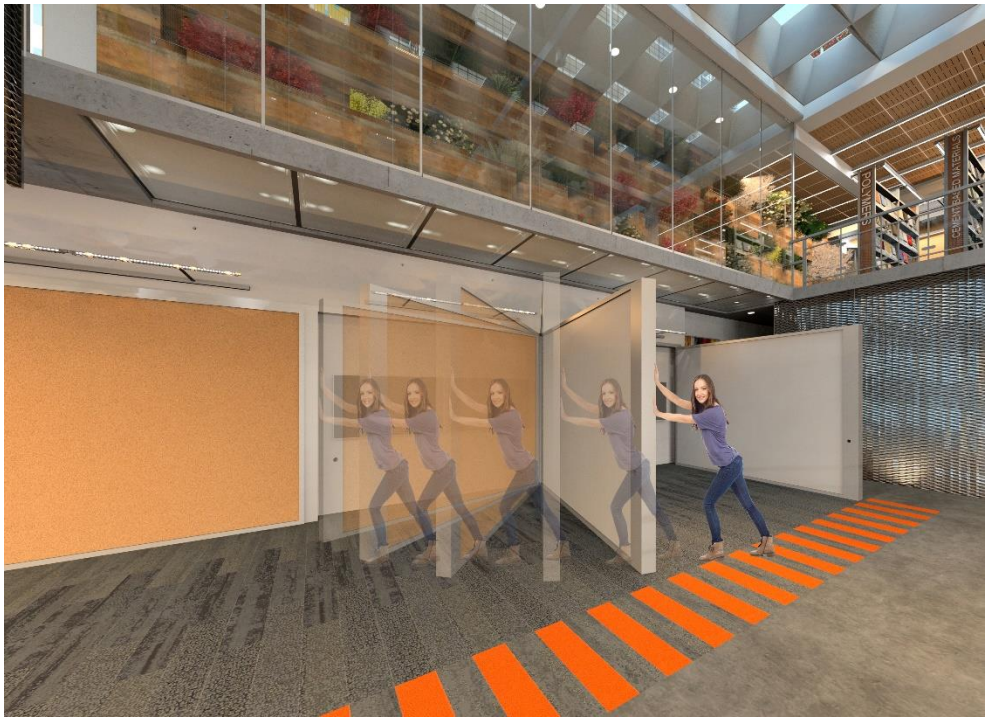


Figure 120. The pivoting boards can be folded in different angles to accommodate different functional requirements.

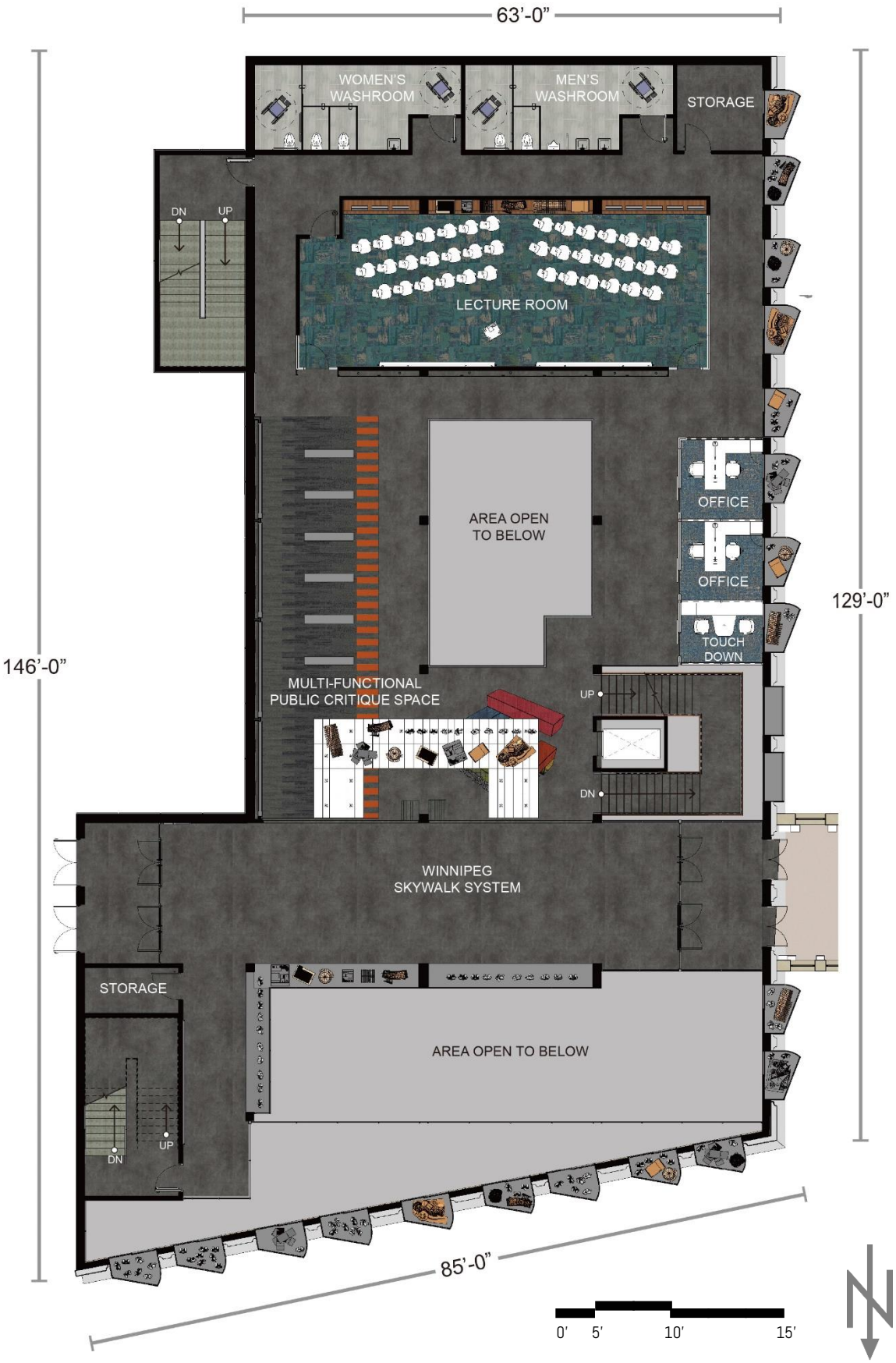

63'-0"
WOMEN'S WASHROOM
MEN'S WASHROOM
STORAGE
DN
UP
LECTURE ROOM
AREA OPEN TO BELOW
OFFICE
OFFICE
TOUCH DOWN
129'-0"
146'-0"
MULTI-FUNCTIONAL PUBLIC CRITIQUE SPACE
UP
DN
WINNIPEG SKYWALK SYSTEM
STORAGE
AREA OPEN TO BELOW
DN
UP
85'-0"
0'
5'
10'
15'

Figure 122. The proposed second level public critique space with the furniture assembly for a design exhibition interior perspective.

Figure 123. The proposed second level critique space can be opened to the public.

7.5.2 LECTURE ROOM [LEVEL 2]

The second feature space on this level is a lecture room which is the second box of the five-tacking-box concept. This space is used for formal lectures and presentations and can accommodate forty people. A feature wall was designed on the south side of the room to be used for displaying students' physical models and presentation boards. The author applied green and blue as the primary color tones in this room, since according to Chapter 3.0 these colors can increase learners' concentration and enhance the human brain's information retention abilities. Wood texture was primarily used in this room with the intention of bringing nature into the interior space.

Figure 124. The proposed second level lecture room.

7.6 CONCEPT SYNTHESIS [LEVEL 3]

In this section, the author leads visitors to review the proposed learning environment for the third stage of the ELT known as Abstract Conceptualization. According to chapter 2.0, the goal of abstract conceptualization is to build more complex knowledge frameworks that are developed from previous experience, and extend with freshly gained information; it is the stage that learners will generate their knowledge and concepts.

Figure 125. Interior perspective shows the overall design concept of the proposed third level.

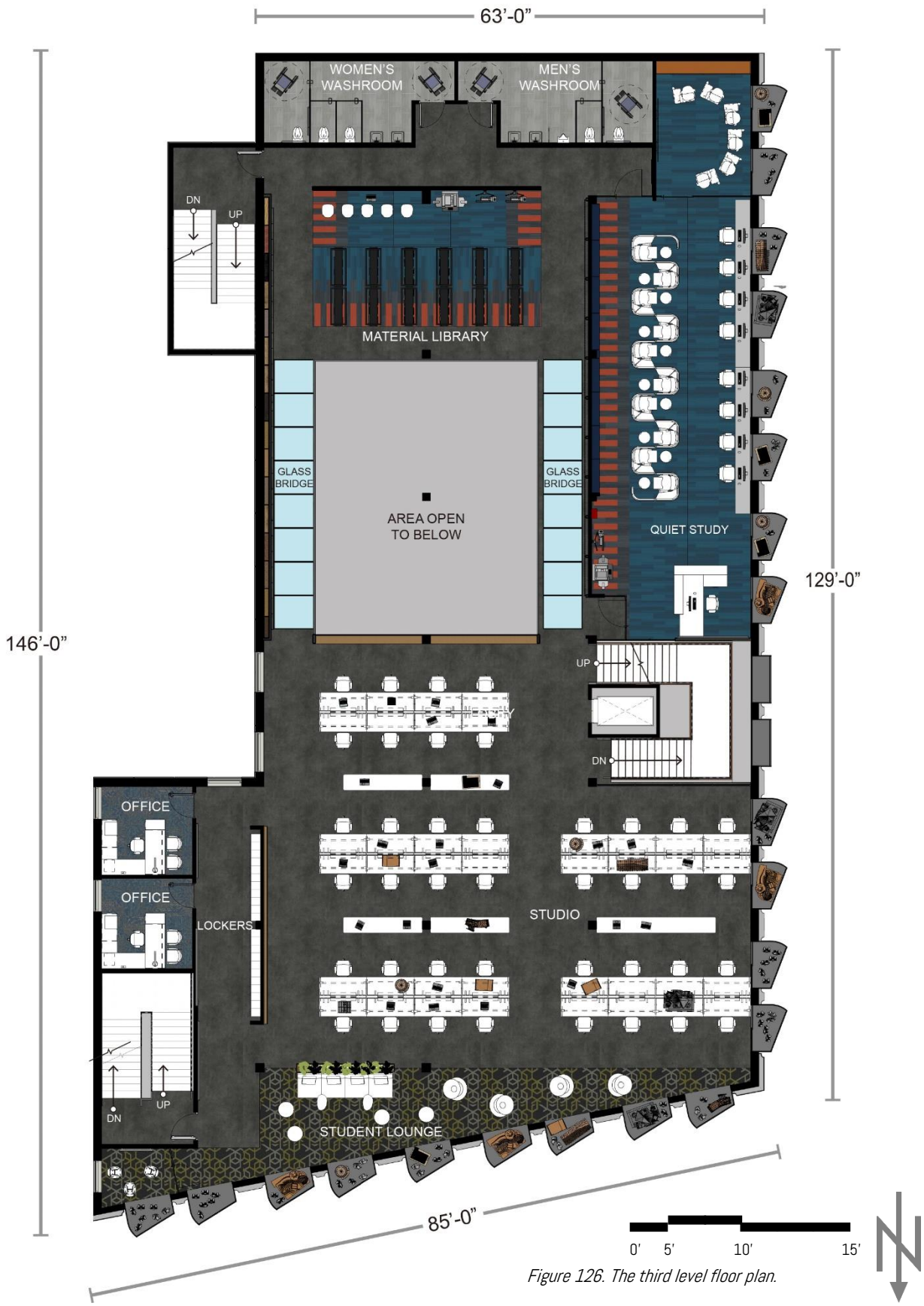


Figure 126. The third level floor plan.

7.6.1 QUIET STUDY ZONE [LEVEL 3]

The author applied an absolute quiet study zone in the third box for learners to concrete their thinking as well as have some reflective time by themselves. This space features extensive book shelving for additional resource support, computer stations for quick conceptualization, quiet study spots for reading and writing, a private study room for group discussion, a copy/scan center and, a helping station. The author used monochromatic blue color tones for this space because according to chapter 3.0, blue can facilitate people to think as well as provide people with feelings of calm, relaxation, and a sense of privacy.

Figure 127. The proposed quiet study room on the third level.

Figure 128. The proposed quiet study spots for reading and writing in quiet study room on the third level.

Figure 129. The proposed private study room for group discussion in quiet study room on the third level.

Figure 130. The proposed copy/scan center in quiet study room on the third level.

Figure 131. The proposed helping station in quiet study room on the third level.

7.6.2 MATERIAL ARCHIVE [LEVEL 3]

In the terrace space, just outside of the third box that is provided by the stacked boxes between box two and three, the author places a material archive. This archive is also the site for running a proposed cooperative program with the New York-based company known as Material ConneXion's. This company is a materials consultancy group that helps the design based institution to explore cutting-edge materials to improve sustainability, performance, and aesthetics for various projects.

Figure 132. The proposed material archive located on the terrace space between the stacked second and third box.

This space features six lines of double-sided display shelving that can accommodate up to one hundred different materials. The archive is organized in six categories including glass, metals, natural materials, polymers, ceramics, and cement-based materials. Each month, local and international product representatives will come to the site and update their materials. Each material on this shelving has a unique barcode. Visitors can use their smart-phone to scan these barcodes to get detailed information about the materials in this archive. There is also a computer-based research station located on the south side of these display shelves; the computers are connected to ConneXion's material worldwide database, featuring over

7,000 of the world's most advanced materials that are all available for different applications.

Figure 133. The proposed material archive is organized in six categories including glass, metals, natural materials, polymers, ceramics, and cement-based materials.

Figure 134. Each month local and international product representatives will come to the site and update their materials in the proposed WDC's material archive.

Figure 135. Visitors can use their smart-phone to scan these bar codes to get detailed information about the materials in this archive.

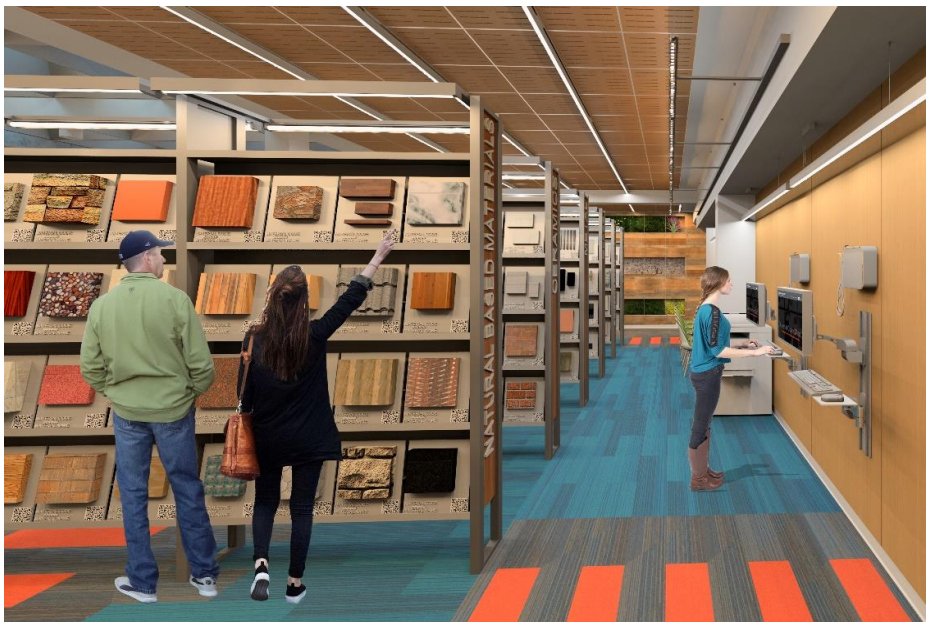


Figure 136. The computer-based research station located on the south side of these display shelves; these computers are connected to ConneXion's material database word-wide.

7.7 DESIGN PRODUCTION [LEVEL 3, LEVEL 4, AND BASEMENT]

After reviewing previous learning environments that are proposed to support the first three stages of ELT based learning mode. In this section, the author would introduce proposed learning spaces for the last stage of ELT learning process known as Active Experimentation. According to chapter 2.0, Active Experimentation is the learning process to examine earlier held knowledge in the Abstract Conceptualization and Reflective Observation stages. These learning environments share spaces in the fourth box and fifth box arranged on the third, fourth and basement level.

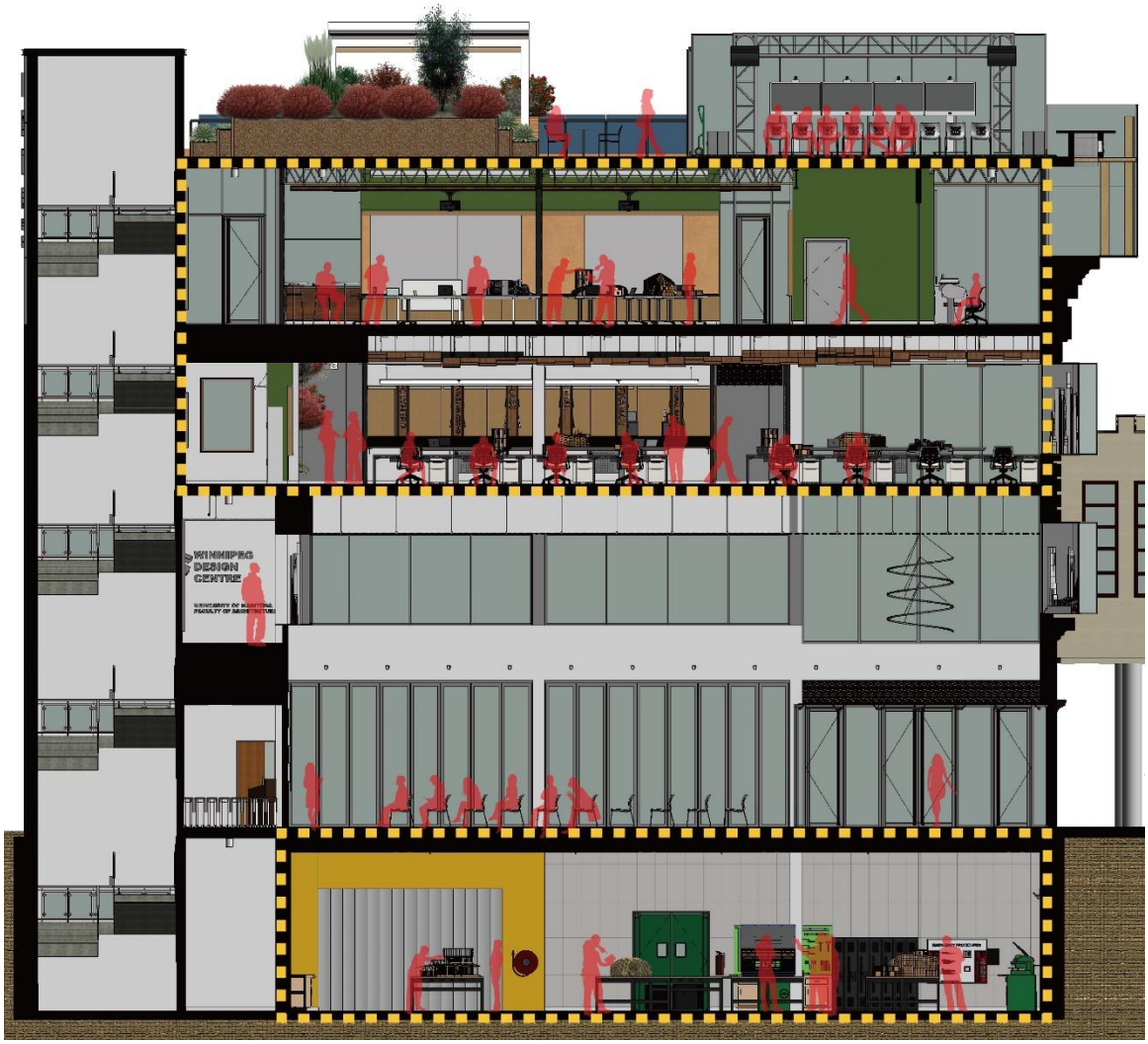
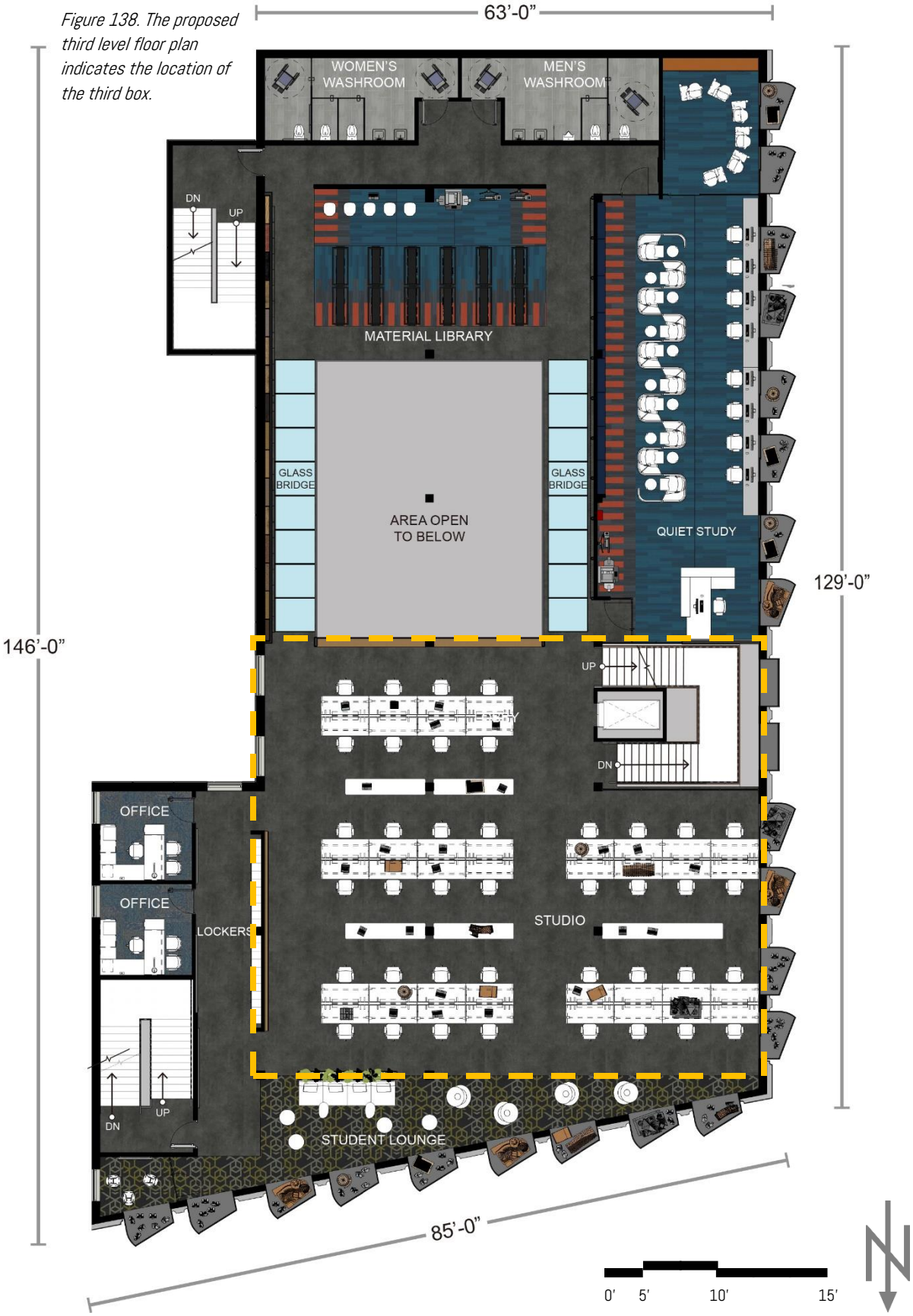


Figure 137. Sectional elevation indicates location of the fourth and fifth box.

Figure 138. The proposed third level floor plan indicates the location of the third box.



7.7.1 STUDIO [LEVEL 3]

The author designed the fourth box with two levels on the third floor and one additional floor on top of the original building. The portion of the third level features a design studio, a student lounge, students' locker space, two professors' offices as well as an indoor experiment site for landscape architecture students. The critical design purpose for these spaces on the third level is to help design students work productively. According to chapter 3.0, to design an active educational environment, space shall avoid over stimulation that is often produced by a significant amount of bright colors such as red and orange. Therefore, the author chose to use green as the primary color tone for the studio space to create the feeling of happiness, relaxation, and calmness; since green can typically remind people of nature. The author also added a splash of yellow on furniture to elicit feelings of energy and liveliness (Figure 139).

Figure 139. The proposed design studio space on the third level.

The design studio can accommodate up to forty students. According to chapter 3.0, the trace study, each proposed studio workstation shell contains a task chair, personal lockable storage, and two working surfaces to accommodate the human behavior requirements in such a space. Since the third floor would be occupied by a high volume of student groups, sound control, and air ventilation are two critical elements that the author has considered. The author applies five chunks of a square-patterned acoustic ceiling system constructed of waved unfinished wood bricks to control the noise that would be produced in the studio space. Along the northern original building perimeter wall, the author provids a double-floor open volume lounge space that connects to a non-mechanical ventilation tower on the rooftop of the new additional structure. As a significant amount of people would occupy the studio space, warm air and carbon dioxide are encouraged to naturally filter out of the building (Figure 140/141).

Figure 140. The proposed student lounge space close to the design studio on the third level.

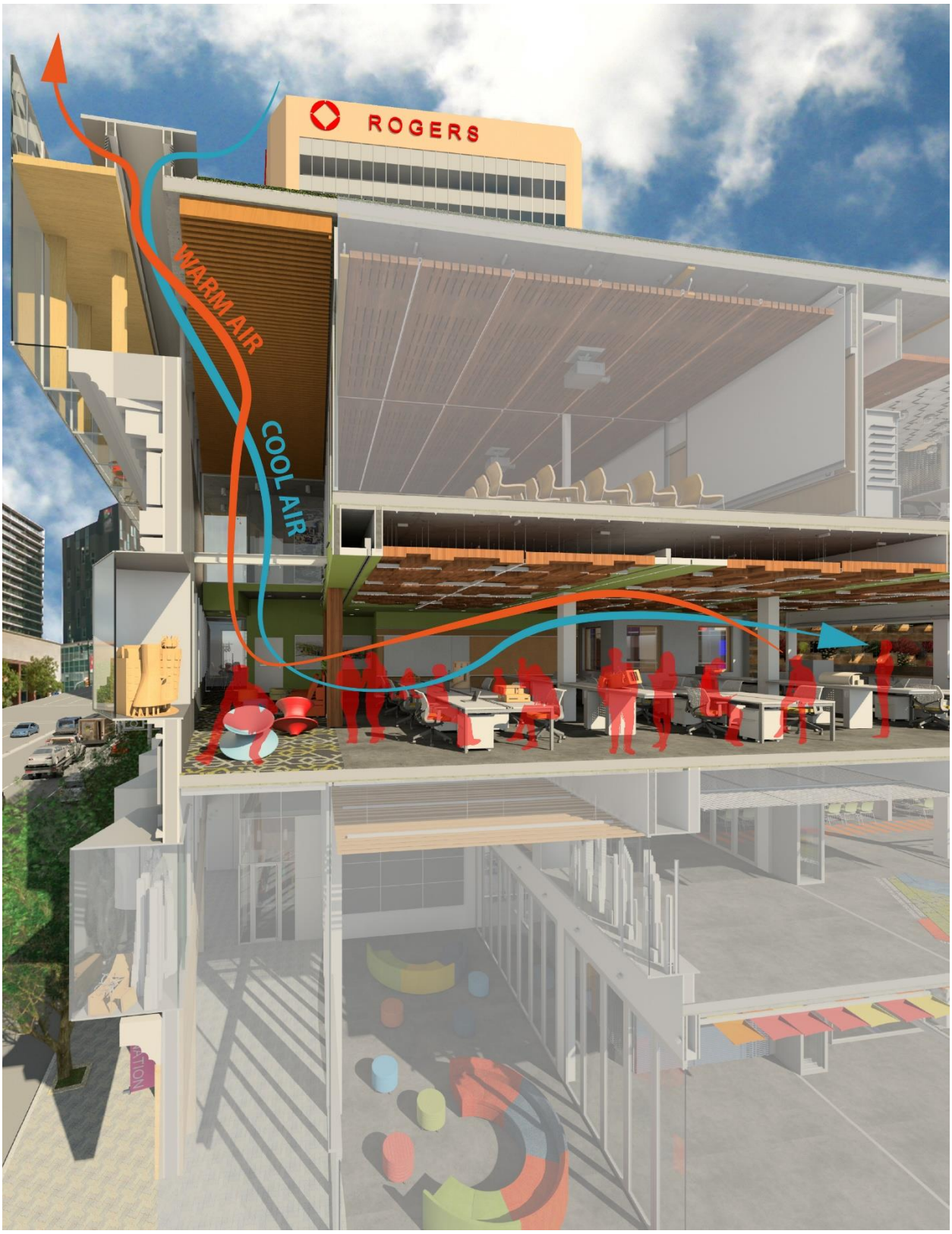


Figure 141. The proposed Non-mechanical ventilation system in the third level design studio space.

7.7.2 INDOOR LIVING EXPERIMENTATION SITE [LEVEL 3]

The last design feature on the third level was designed for landscape architecture students; this design feature is a living wall system designed with multiple planter sections with different soils that can satisfy different plants' living conditions. Landscape architecture students can use this feature as an experimentation site for their learning objectives. The featured living wall can also become an indoor air-purifier for the proposed facility (Figure 142, 143, and 144).

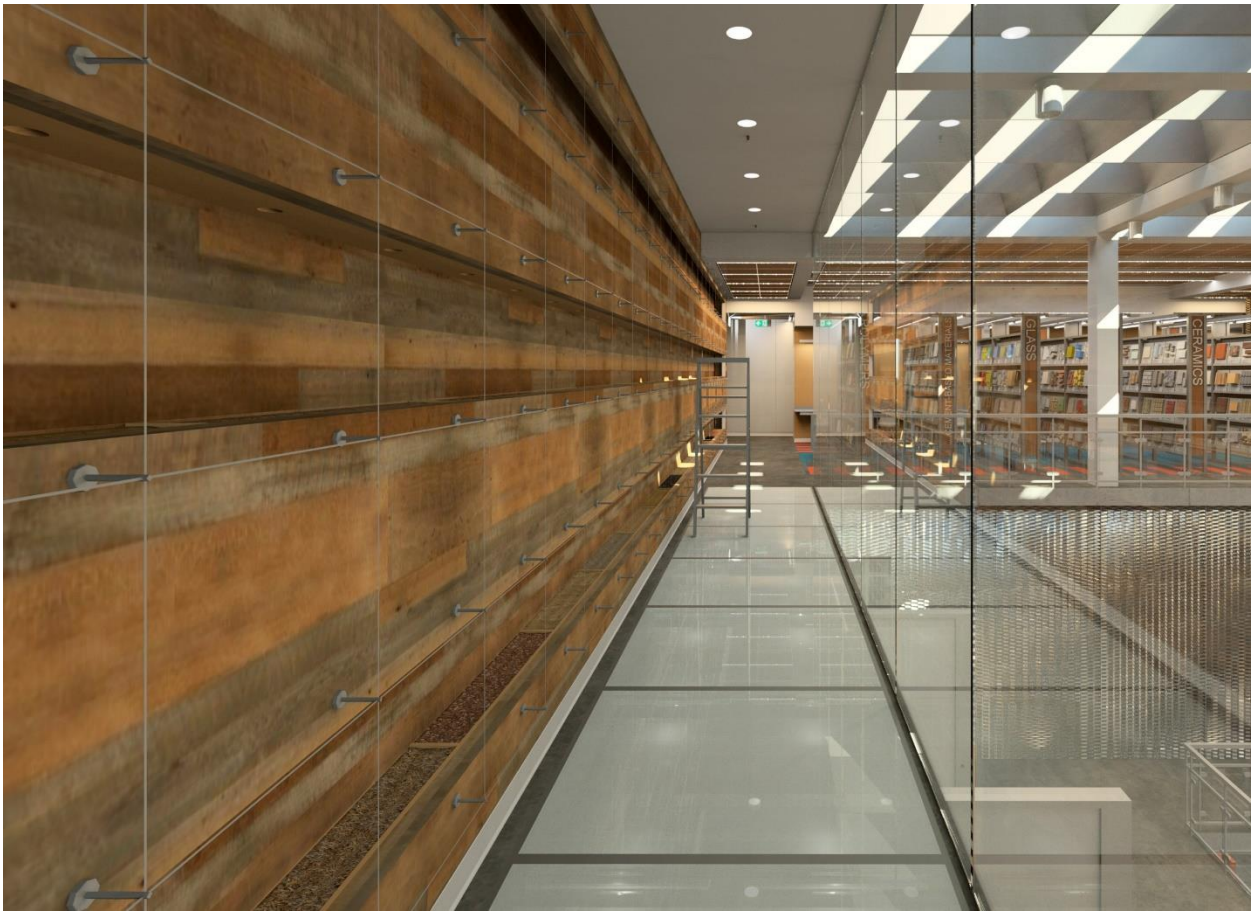


Figure 142. The proposed living wall system designed with multiple planter sections with different soils that can satisfy different plants' living conditions.

Figure 143. The proposed living wall system acts as an experimental site for landscape architecture students.

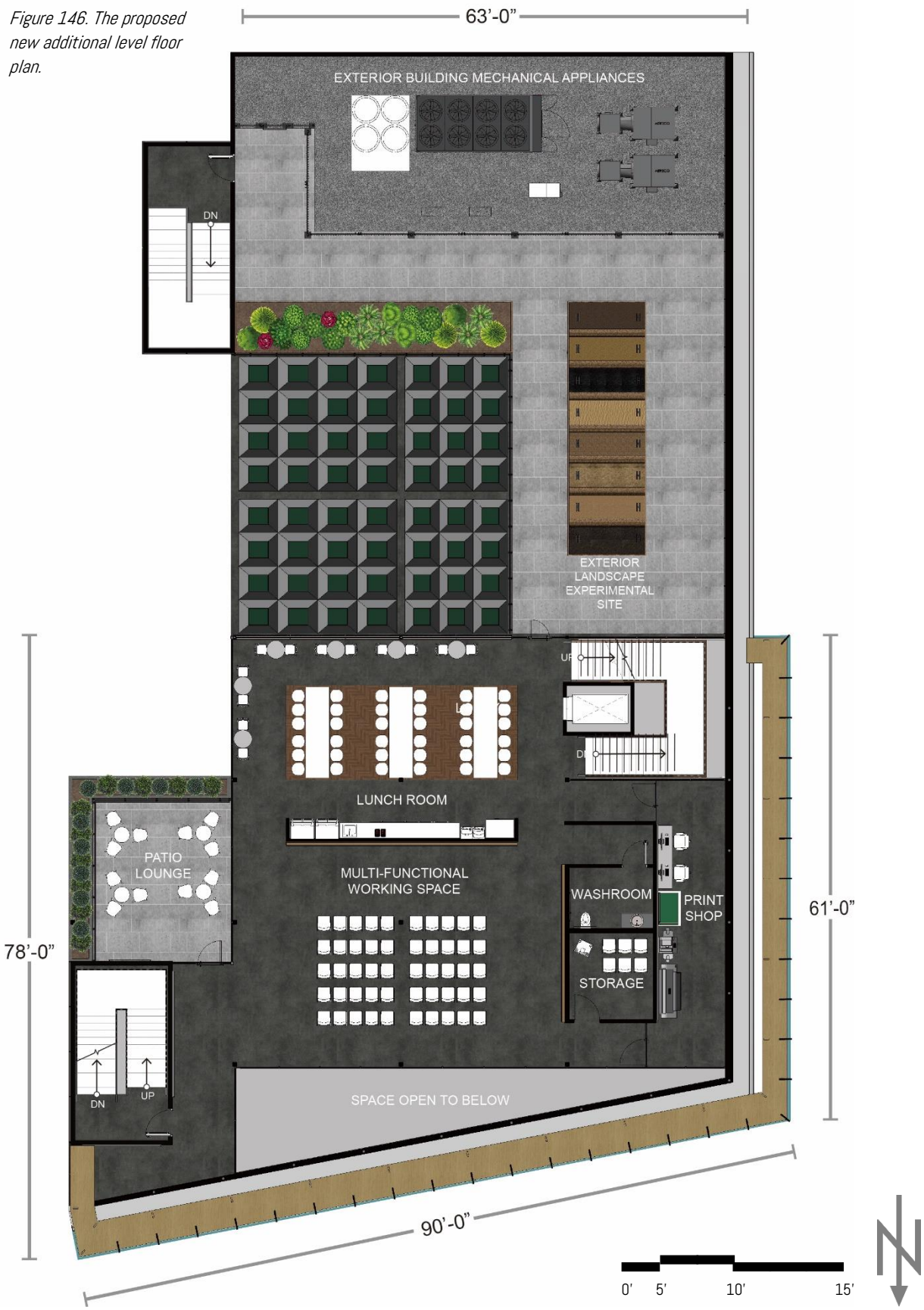
Figure 144. The living wall can be seen from most of the atrium space in the proposed WDC.

7.7.3 STUDIO LOUNGE [LEVEL 4]

The second portion of the fourth box was designed on level four, which is the new additional level. This level features a student lunchroom, a multifunctional working space, a print shop, a storage area, a universal washroom and two exterior courtyards. This level was designed mainly for faculty members as well as to support activities that would take place in the design studio on the third level.

Figure 145. The new additional structure of the proposed WDC.

Figure 146. The proposed new additional level floor plan.



The first space when visitors enter this level is a students' lunchroom that can accommodate forty-eight people; features a vending machine, a water station, a customized kitchen cabinet with marble counter as well as standard kitchen appliances including two microwaves, two coffee machines, and two refrigerators. Due to the column-free and open concept floor plan, the lunchroom can also be organized as an open space for special events such as graduation celebrations, milestone parties, or an invitation party for guests. The lunchroom space also features a 3D form acoustical ceiling panel with cross waved plastic strips to block soundwaves; as well as a feature wall with painted abstract architectural art to provide this space with a sense of leisure and relaxation (Figure147).

Figure 147. The proposed students' lunch-room with the furniture assembly of a standard dining area.

Figure 148. The proposed students' lunch-room with the furniture assembly of a buffet style dining area.

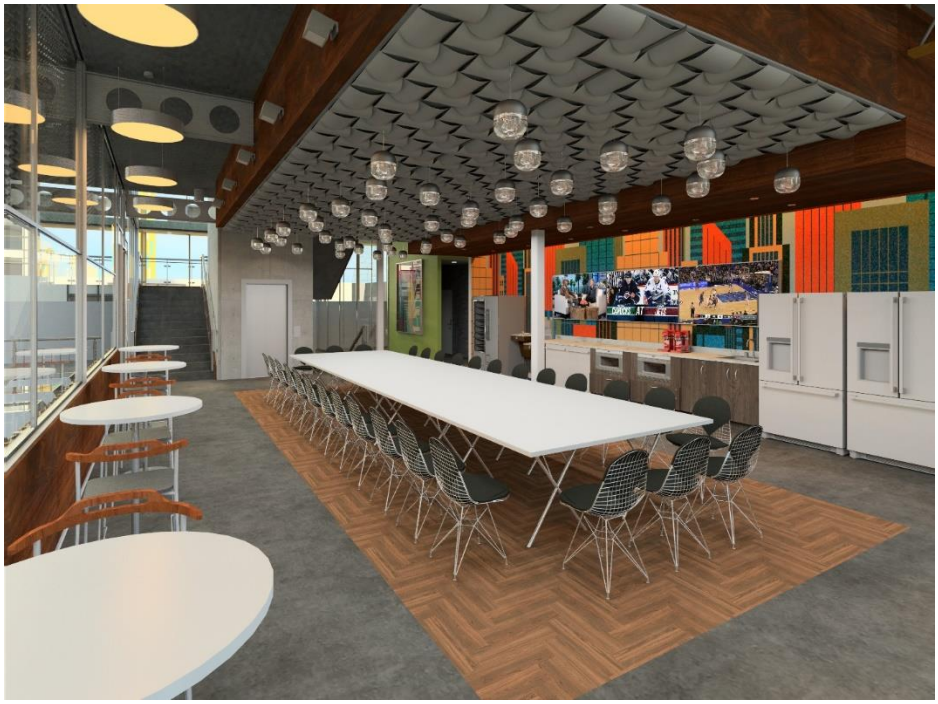


Figure 149. The students' lunch-room with the furniture assembly of a group dining area.

A large open space is also designed on the north side of the lunchroom, featuring two large write/pin-up boards as well as two projection screens. At any given time, this space can be changed into a modeling site, a presentation space, or a group work area. Mobile furniture can be stored in the adjacent storage area for convenience.

Figure 150. The proposed new additional level multi-functional work area with the furniture layout for large scale modeling space.

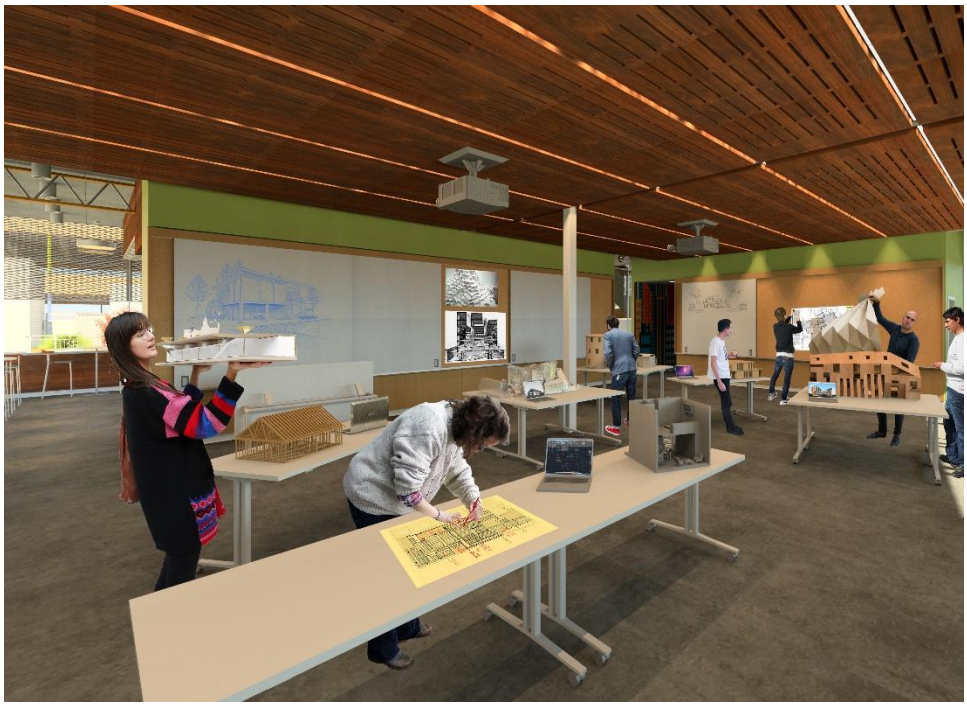


Figure 151. The proposed new additional level multi-functional work area with the furniture layout for group working space.

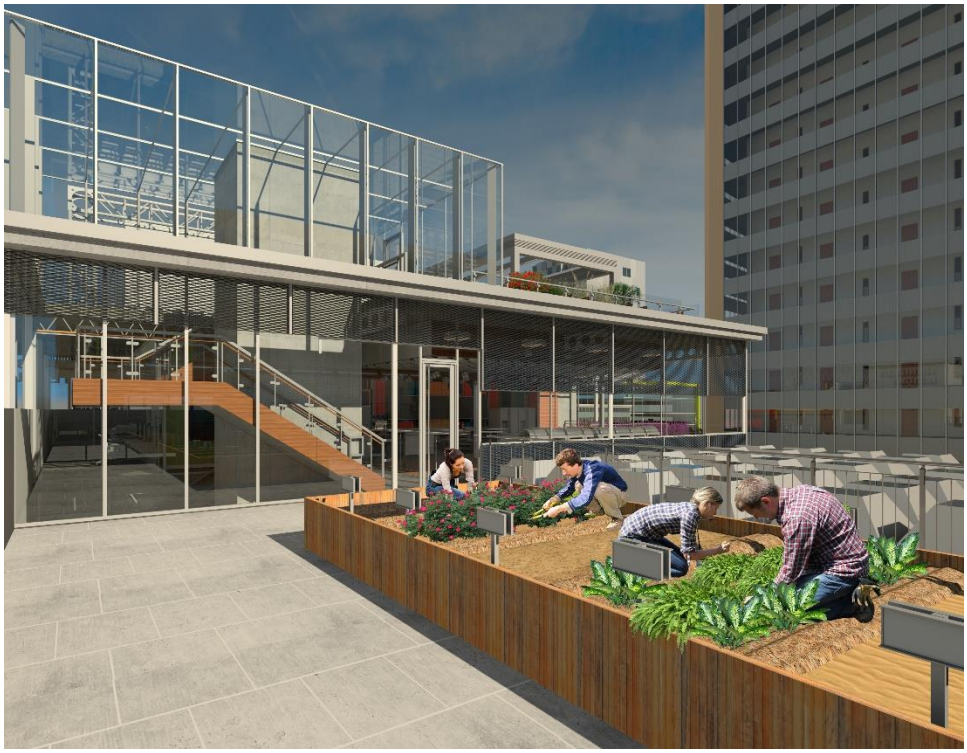
Figure 152. The proposed new additional level multi-functional work area with the furniture layout for student presentation or lecture.

Figure 153. The proposed atrium space connects both the new additional level and the third level student lounge space.

There are two outdoor courtyards on this new additional level, a smaller one measuring 249 square feet of usable area for leisure purposes; as well as a larger one on the south portion of the building measuring 1500 square feet to accommodate an outdoor experimentation site for landscape architecture students.

Figure 153. The proposed courtyard on the new additional level for leisure purposes.

Figure 154. The proposed courtyard on the new additional level for an outdoor experimentation site for landscape architecture students.



7.7.4 WORK-SHOP [BASEMENT]

The basement level accommodates the fifth box, a series of working spaces, storage, washrooms, and building service rooms. In the fifth box, the author proposes a learning environment that contains the same learning purpose as in the fourth box, to experiment with design concepts and knowledge that would be gained through the first three stages of ELT learning. The fifth box includes a woodshop and a fabrication lab that encourages students to test their design concepts by hands-on experimentations.

Figure 155. The proposed wood shop in the basement.

Figure 156. The proposed fabrication lab in the basement.

Figure 157. The proposed basement floor plan.

The author also includes an ample open space on the outside of the fifth box as well as under the bridge area on the first level. This space can be used as a modeling site, full-scale design test area, or an interesting program space for the public.

Figure 158. The proposed open modeling area allows users to make large sized physical models.

Figure 159. The proposed open modeling area allows to accommodate an interesting program area for both the public and WDC members.

The author argued in the introductory chapter that the architecture industry is undergoing a radical revolution relative to how people design, create and produce things. These advanced technologies can always provide successful communications between consumers and fabricants through the transformation from 2D drawings to 3D BIMs (Building Information Modeling). Thus, the author applies four sections of virtual reality sites along the west exterior wall of the existing building. These spaces can be used for screen share meetings/presentations, virtual design experimentations, or design walkthroughs for collaborative markups. There are also two sections of such Virtual Reality spaces that feature darkroom screens as well as variable lighting sources that can accommodate a photographic lab for photographing design work or lighting studies.

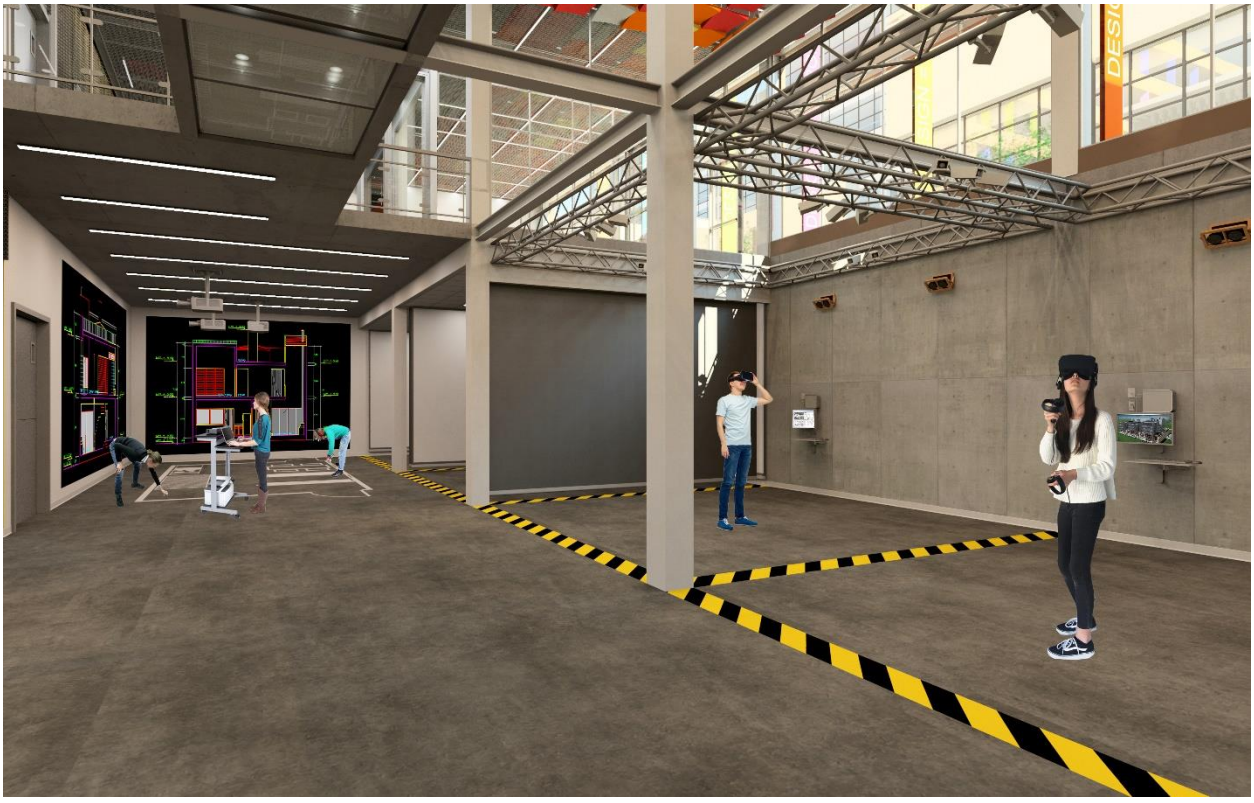


Figure 160. The proposed digital BIM experimentation area in the basement.

7.8 LEISURE AND SOCIALIZING [ROOF TOP-LEVEL 5]

On the rooftop of the new additional structure, the author designed a space that connects the interiors of the proposed WDC back to the exterior context. This connection provides another dialogue relationship between the proposed WDC's activities with the urban setting. The rooftop space features a patio lounge area with casual chairs/tables, an open area for planned events, and offers views to the urban surroundings.

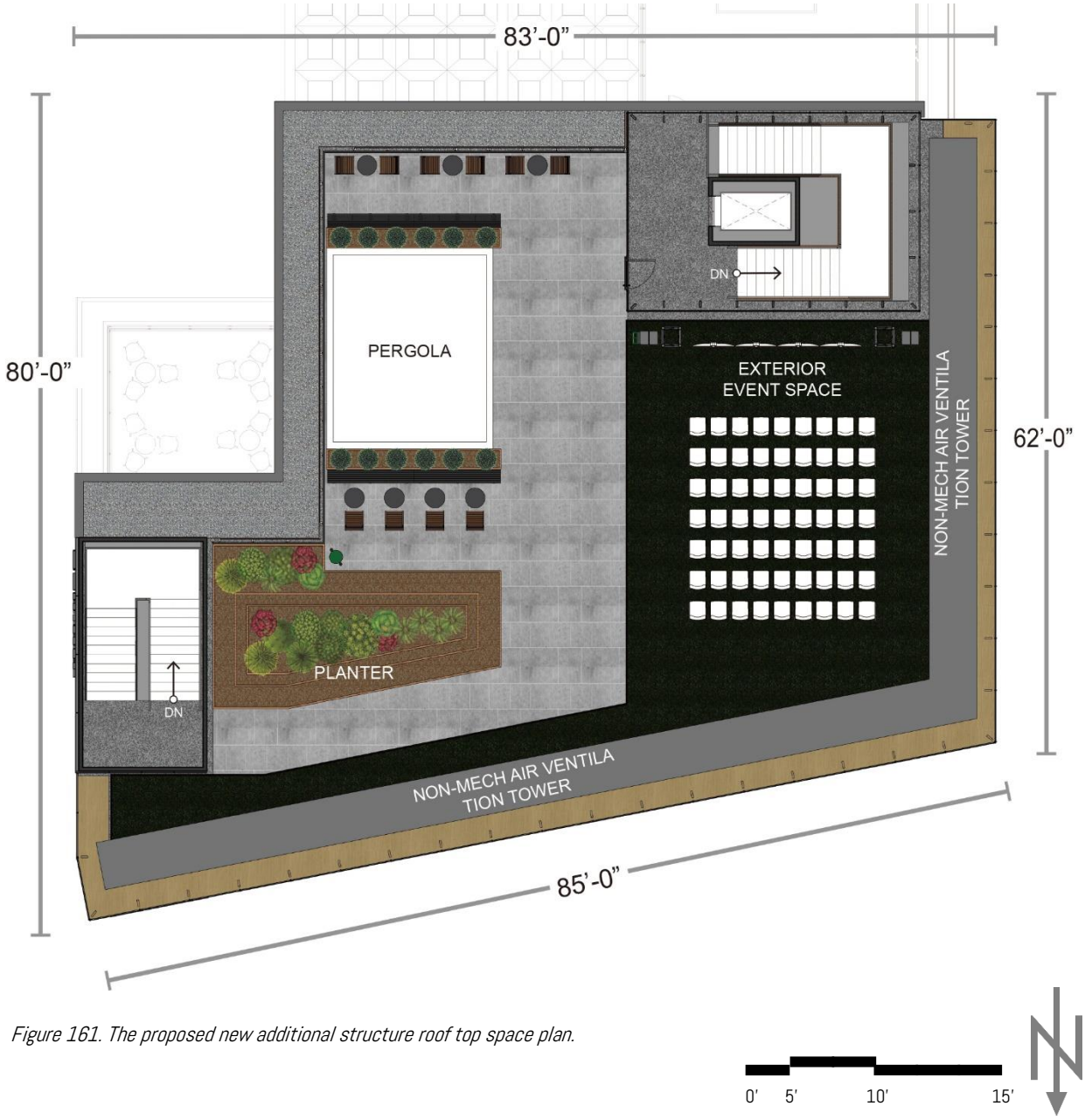


Figure 161. The proposed new additional structure roof top space plan.

Figure 162. The proposed new additional structure roof top event space.

Figure 163. The proposed new additional structure roof top leisure space.

CHAPTER 8.0 CONCLUSION

The ubiquity of contemporary communication technologies as well as infinite ways of information access has led to a pedagogical revolution in the foundation of 21st century higher education. Public dialogue has exploded the boundaries of traditional education and developed into a hyper-learning mode that connects educational communities, the public, and professional practices to exchange information and create valuable knowledge. Learning activities are no longer limited to standard educational settings.

The overall intention of this Practicum project was to explore and examine a desired physical learning environment that can face the challenges of educational culture shifts in the 21st century's architectural design education. Through the design proposal, the author has investigated the possibilities of an urban satellite campus – a public based design centre typology that will facilitate a dialogue relationship between architectural education communities, professional practice, and the public. This is achieved by extracting design guidelines through the study of principles of Experiential Learning Theory (ELT), Constructivist Learning Theory (CLT), Hyper-Learning, as well as the social climate of design education.

Although the structure of education in the architectural design discipline has a distinct difference compared to conventional post-secondary classrooms, according to chapter 1.0, current architectural schools still keep numerous pedagogical traditions from the 1920's Bauhaus era that have to stay unvaried regardless of changes in 21st century's learning styles. The proposed Winnipeg Design Centre questions the traditional form of architectural education by involving ELT-based, CLT-based, as well as Hyper-Learning for a new architectural design education attempt; re-conceptualizing the physical settings of architectural design education to enhance collaboration between architectural design education communities,

professional practice, and the public. The spatial organization of the proposed Winnipeg Design Centre (WDC) facilitates an interactive design experience that blurs the boundaries between disciplines, people, and academy, as well as academy and professional industries. The proposed WDC is arranged to provide a diverse range of design activities that support the ELT-based learning processes, from information gathering to knowledge analysis, to concept synthesis, and to design production.

This practicum project is also designed primarily for Faculty of Architecture students who can engage in urban life, thus acquiring first-hand information of building users' demands. This was achieved by selecting the Carlton Building as the proposed site of this practicum project based on its predominant urban centre located in the city of Winnipeg. To reflect the identity and character of the proposed WDC, the author applied Graeme Brooker and Sally Stone's insertion principle to remodel the original building's façade and the main entrance to provide an architectural contrast between the historical character and modern concept. This design strategy shall attract the public's interest and curiosity about the proposed facility. By incorporating different co-operative programs in the proposed WDC, there is also the potential to draw future clients and individuals from professional industries to visit the proposed site while; at the same time, producing meaningful design related knowledge and information for architecture students.

Throughout this design investigation study, the author has argued that to achieve the challenges of the 21st-century architectural design; architectural educational institutions must focus their pedagogics on social interactions. These interactions include public socialization, multi-disciplinary collaboration, and professional-practice communication. The author argues that future architecture-related educational institutions may consider applying design strategies that have been proposed in this study. This proposed project could be designed through various approaches to explore

further to accommodate future shifts within education. Although interior design cannot alter the higher education pedagogical structure, a facility like the proposed WDC can begin to promote new learning styles through various spatial experiences. The purpose of interior design in this study is to provide a framework for a casual dialogue relationship between different groups of individuals, allowing for collaborative learning.

In conclusion, the design concept in this Practicum project suggests a new type of educational institution, providing a flexible and multifunctional physical learning setting to support the collaborative architectural design education. Throughout this investigation study, a comprehensive understanding of the needs and requirements of 21st-century architectural students was gained. As a result, the proposed satellite campus, the Winnipeg Design Centre is an experiential education complex conceived to support new architectural design learning styles in the 21st century.

CHAPTER 9.0 REFERENCES

Bashier, Fathi. "Reflections on Architecture Design Education: Understanding the Role of the Design Method. *"World Journal of Islamic History and Civilization*, 2014, 20-24.

"Benefits of Co-operative Education for Students, Employers, and Institutions." Benefits of Co-operative Education for Students, Employers, a. Accessed October 02, 2017. http://www.cewilcanada.ca/about-us-benefits.html.

Berlyne, Daniel E. "Comments on Relations between Piaget's Theory and S-R Theory." Monographs of the Society for Research in Child Development 27, no. 2 (1962): 127. doi:10.2307/1165534.

Brune, Emmanuel. "The Architecture of the Beaux-Arts." *Journal of Architectural Education* 29, no. 2 (1975): 16-17. doi:10.1080/10464883.1975.10758022.

Cheryan, Sapna. "Designing more effective on-campus teaching and learning spaces: a role for academic developers." *Policy Insights from the Behavioral and Brain Sciences*, 12th ser., 1, no. 4 (April & May 2014). doi:10.1177/2372732214548677 bbs.sagepub.com.

City of Winnipeg Planning, Property & Development, and the City of Winnipeg. "Planning, Property & Development." Historical Buildings and Resources Committee - Planning, Property, and Development - City of Winnipeg. Accessed Sept. & oct., 2018. http://www.winnipeg.ca/ppd/Heritage/HistoricalBuildingsAndResourcesCommittee.stm

Constructivism as a Paradigm for Teaching and Learning. Accessed April 29, 2017. http://www.thirteen.org/edonline/concept2class/constructivism/

"Conditions and Procedures for the Certification of Educational Qualifications." CANADIAN ARCHITECTURAL CERTIFICATION BOARD. 2010. http://cacb.ca/en/the-canadien-education-standard/.

Collins, H. M. *Tacit and explicit knowledge*. Chicago: The University of Chicago Press, 2010.

Crimson, Mark, and Jules Lubbock. *Architecture: art or profession? Three hundred years of architectural education in Britain*. Manchester: Manchester Univ. Press, 1994.

Cramer, James P. "A Proposal to Improve Architectural Education." Design Intelligence. Accessed September 25, 2017. https://www.di.net/articles/a-proposal-tos-improve-architectural-education/.

Demirel, Bucket. "ARCHITECTURE AND PUBLIC DIALOGUE: AN EVALUATION OF THE ROLE OF ARCHITECTURE CENTERS." *January 05, 2005*. Accessed July 26, 2017.

Fisher, Thomas. *Designing our way to a better world*. Minneapolis: University of Minnesota Press, 2016.p.15

Fisher, Thomas. "Welcome to the Third Industrial Revolution: The Mass-Customization of Architecture, Practice, and Education." *Architectural Design* 85, no. 4 (2015): 40-45. doi:10.1002/ad.1923.

Goodman, Greg S. *Educational psychology reader: the art and science of how people learn*. New York: Peter Lang, 2014.

Joseph, P. Michael. "And What Do You Mean by Learning? by Seymour B. Sarason." *Catholic Education: A Journal of Inquiry and Practice*, 5th ser., 9, no. 4 (July 2013). p. 2

Julia Wyatt. "How architecture education is limiting students." Architects Journal. Accessed March 15, 2017. https://www.architectsjournal.co.uk/how-architecture-education-is-limiting-students/8643685.article.

Kaya, Naz. "Relationship between Color and Emotion: A Study of College Students." *College Student Journal* 38 (September 2004).

Kasparek, Nick. *Toward a Utopian Peace Education. Peace as a global language: Peace and welfare in the global and local community*. 2016.

Kolb, A. Y., and D. A. Kolb. "Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education." *Academy of Management Learning & Education* 4, no. 2 (2005): 193-212. doi:10.5465/amle.2005.17268566.

Kolb, A. Y., and D. A. Kolb. "Learning Styles and Learning Spaces: Enhancing Experiential Learning in Higher Education." *Academy of Management Learning & Education* 4, no. 2 (2005): 193-212. doi:10.5465/amle.2005.17268566.

Lata, Hemant, and Leena Sharma. "Effect of Constructivist Approach on Academic Achievement of Seventh Grade Learners in Mathematics." *International Journal of Scientific Research* 2, no. 10 (2012): 43-56. doi:10.15373/22778179/oct2013/36.
[1] Richardson, Virginia. "Constructivist Pedagogy." *Teachers College Record* 105, no. 9 (2003): 1623-640. doi:10.1046/j.1467-9620.2003.00303.

Murphy, Colette. "Psychology for the Classroom: constructivism and social learning - By Alan Pritchard and John Woollard." *British Journal of Special Education* 38, no. 4 (2011): 213-14. doi:10.1111/j.1467-8578.2011.00521
Ascher, Barbara Elisabeth. "The Bauhaus: Case Study Experiments in Education." *Architectural Design* 85, no. 2 (2015): 30-33. doi:10.1002/ad.1873.
Lewis, J. L. (1950). A study of the craft guilds of the European middle ages and their contribution to industrial arts education. *Unt Theses & Dissertations*.

Peter Jamieson. "Designing more effective on-campus teaching and learning spaces: a role for academic developers." *International Journal for Academic Development* 8, no. 1-2 (2010): 119-33. doi:10.1080/1360144042000277991.

Rezaei, Hassan, Iraj Etessam, and Seyed Mustafa MokhtabadAmre'ei. "The Influence of Paris School of Fine Arts on Architecture Education." *International Journal of Architecture and Urban Development* 3 (August 21, 2013).

Schrader, Dawn E. "Constructivism and Learning in the Age of Social Media: Changing Minds and Learning Communities." New Directions for Teaching and Learning 2015, no. 144 (2015): 23-35. doi:10.1002/tl.20160.

Schneider S, Kuliga S, Hölscher C, et al. Educating Architecture Students to Design Buildings from the Inside Out: Experiences from a Research-based Design Studio[C]// *International Space Syntax Symposium*. 2013.

Winifred, Newman, Shahin, & Vassigh. (2016). What would Vitruvius do? re-thinking architecture education for the 21st-century university, 166-174.

Winkelhake, Claude, and Walter Gropius. "The New Architecture and the Bauhaus." *Journal of Aesthetic Education* 2, no. 3 (1968): 151. doi:10.2307/3331342.

Yurtsever, Bengi, and Gozde Cakir. "An Assessment for Interdisciplinary Education Modal Implementation of Basic Design Education in Architecture."*Procedia - Social and Behavioral Sciences*51 (2012): 157-61. doi: 10.1016/j.sbspro.2012.08.137.
Barrett, Peter, and Yufan Zhang. "Optimal Learning Spaces Design Implications for Primary Schools." *SCRI Research Report*: 40-45. Accessed Oct. & Nov. 2010.

CHAPTER 10.0 APPENDIX

10.1 BUILDING CODE ANALYSIS

3.4.2.1. Minimum Number of Exits

every *floor area* intended for *occupancy* shall be served by at least 2 *exits*.

3.4.2.3. Distance between Exits

The maximum diagonal dimension of the floor area, but need not be more than 9 m for a floor area having a public corridor, one half the maximum diagonal dimension of the floor area, but not less than 9 m for all other floor areas.

3.4.3.2. Exit Width

Except as permitted by Sentence (3), the minimum c required width of exits serving floor areas intended for assembly occupancies shall be determined by multiplying the occupant load of the area served by

a) 6.1 mm per person for ramps with a slope of not more than 1 in 8, doorways, corridors and passageways,

b) 8 mm per person for a stair consisting of steps whose rise is not more than 180 mm and whose run is not less than 280 mm, or

c) 9.2 mm per person

3.6.3. Vertical Service Spaces and Service Facilities

3.6.3.1. Fire Separations for Vertical Service Spaces

A *vertical service space* shall be separated from all other portions of each adjacent *storey* by a *fire separation* having a *fire-resistance rating* conforming to Table 3.6.3.1. for the *fire-resistance rating* required.

3.8.1.2. Entrances

1) In addition to the *barrier-free* entrances required by Sentence (2), not less than 50% of the pedestrian entrances of a *building*.

2) The *first storey* of a *building*, or in a *storey* to which a *barrier-free* path of travel is provided, and that is completely separated from the remainder of the *building* so that there is no access to the remainder of the *building*, shall have at least one *barrier-free* entrance.

3) A *barrier-free* entrance required by Sentences (1) or (2) shall be designed.

4) At a *barrier-free* entrance that includes more than one doorway, only one of the doorways are required to be designed in accordance with the requirements of Article 3.8.3.3.

3.8.1.3. Barrier-Free Path of Travel

1) Except as required elsewhere in this Part or as permitted by Article 3.8.3.3.
pertaining to doorways, the unobstructed width of a barrier-free path of travel shall be not less than 920 mm.

2) Interior and exterior walking surfaces that are within a barrier-free path of travel shall

a) have no opening that will permit the passage of a sphere more than 13 mm diameter,

b) have any elongated openings oriented approximately perpendicular to the direction of travel,

c) be stable, firm and slip-resistant,

d) be bevelled at a maximum slope of 1 in 2 at changes in level not more thann13 mm, and

e) be provided with sloped floors or ramps at changes in level more than 13 mm.

3) A barrier-free path of travel is permitted to include ramps, passenger elevators or other platform-equipped passenger-elevating devices to overcome a difference in level.

4) The width of a barrier-free path of travel that is more than 30 m long shall be increased to not less than 1 500 mm for a length of 1 500 mm at intervals not exceeding 30 m.

3.8.3.2. Exterior Walls

1) Exterior walls that form part of a *barrier-free* path of travel shall

a) have a slip-resistant, continuous and even surface,

b) be not less than 1 100 mm wide, and

c) have a level area conforming to Clause 3.8.3.4. (1)(c) adjacent to an entrance doorway.

3.8.3.3. Doorways and Doors

1) Every doorway that is in a *barrier-free* path of travel shall have a clear width not less than 800 mm when the door is in the open position.

3.8.3.6. Spaces in Seating Area

1) Spaces designated for wheelchair use referred to in Sentence 3.8.2.1. (3) shall be

a) clear and level, or level with removable seats,

b) not less than 900 mm wide and 1 525 mm long to permit a wheelchair to enter from a side approach and 1 220 mm long where the wheelchair enters from the front or rear of the space.

3.8.3.9. Water Closets

1) A water closet for a person with physical disabilities shall

a) be equipped with a seat located at not less than 400 mm and not more than 460 mm above the floor,

b) be equipped with hand-operated flushing controls that are easily accessible to a wheelchair user or be automatically operable,

c) be equipped with a seat lid or other back support, and

d) not have a spring-actuated seat.

3.8.3.10. Urinals

1) If urinals are provided in a *barrier-free* washroom, at least one urinal shall be

a) wall mounted, with the rim located between 488 mm and 512 mm above the floor, or

b) floor mounted, with the rim level with the finished floor.

2) The urinal described in Sentence (1) shall have

a) a clear width of approach of 800 mm centred on the urinal,

b) no step-in front, and

c) installed on each side a vertically mounted grab bar that is not less than 300 mm long, with its centreline 1 000 mm above the floor, and located not, more than 380 mm from the centreline of the urinal.

3.8.3.12. Universal Toilet Rooms

1) A universal toilet room shall

a) be served by a barrier-free path of travel,

b) have a door capable of being locked from the inside and released from the outside in case of emergency and having

c) have one lavatory conforming to Article 3.8.3.11.,

d) have one water closet conforming to the requirements of Article 3.8.3.9. that has a clearance to the walls of

i) not less than 285 mm and not more than 305 mm on one side, and

ii) not less than 875 mm on the other side,

e) have grab bars conforming to Clause 3.8.3.8. (1)(d),

f) have no internal dimension between the walls that is less than 1 700 mm,

g) have a coat hook conforming to Clause 3.8.3.8. (1)(e) and a shelf located not more than 1 200 mm above the floor.

3.8.3.16. Drinking Fountains

1) If drinking fountains are provided, at least one shall be barrier-free and shall

a) have a spout located near the front of the unit not more than 915 mm above the floor, and

b) be equipped with controls that are easily operable from a wheelchair using one hand with a force of not more than 22 N or be automatically operable.

10.2 REFLECTED CEILING PLANS

Figure 164. The proposed main level reflected ceiling plan.

Figure 165. The proposed second level reflected ceiling plan.

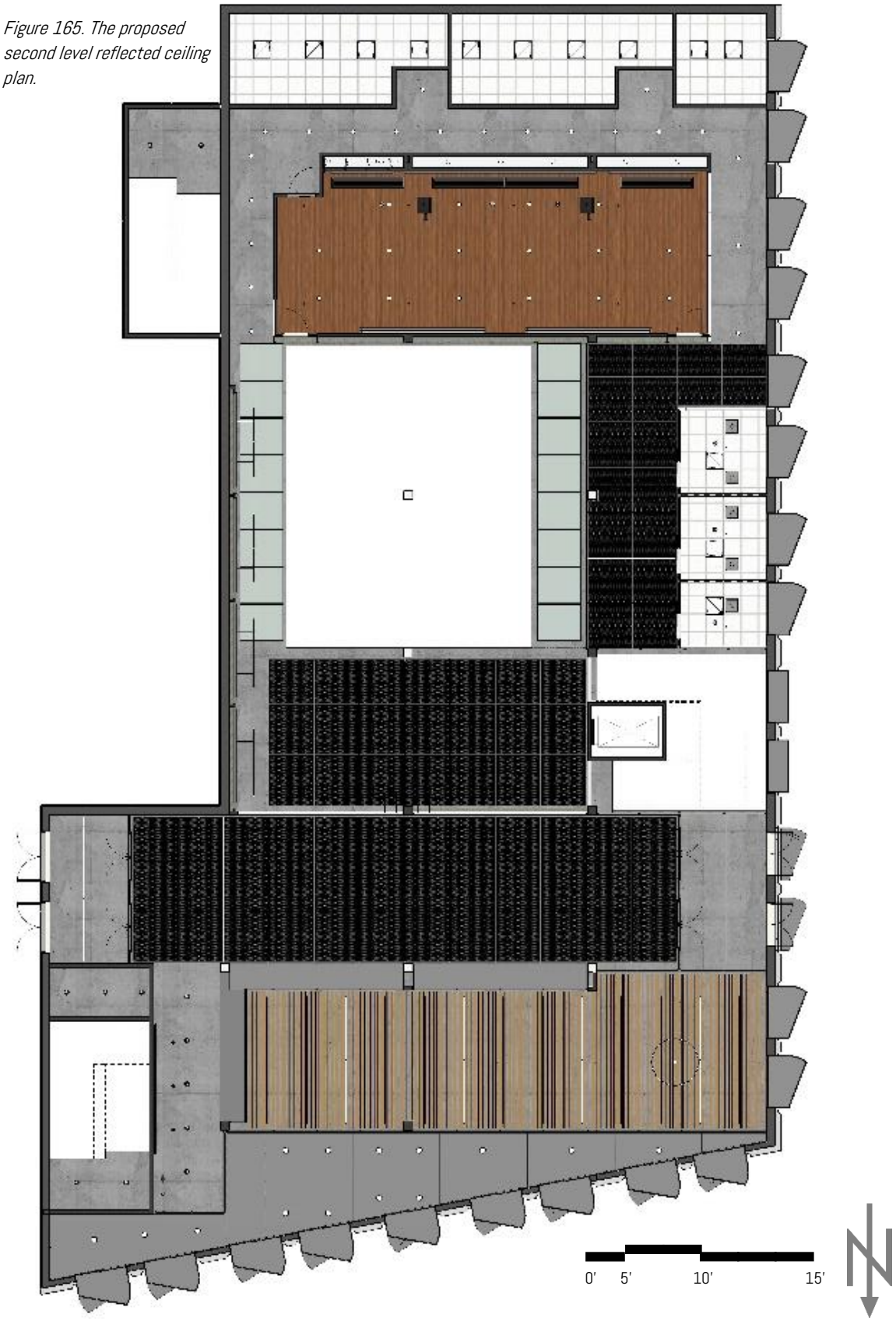


Figure 166. The proposed third level reflected ceiling plan.

Figure 167. The proposed new additional level reflected ceiling plan.

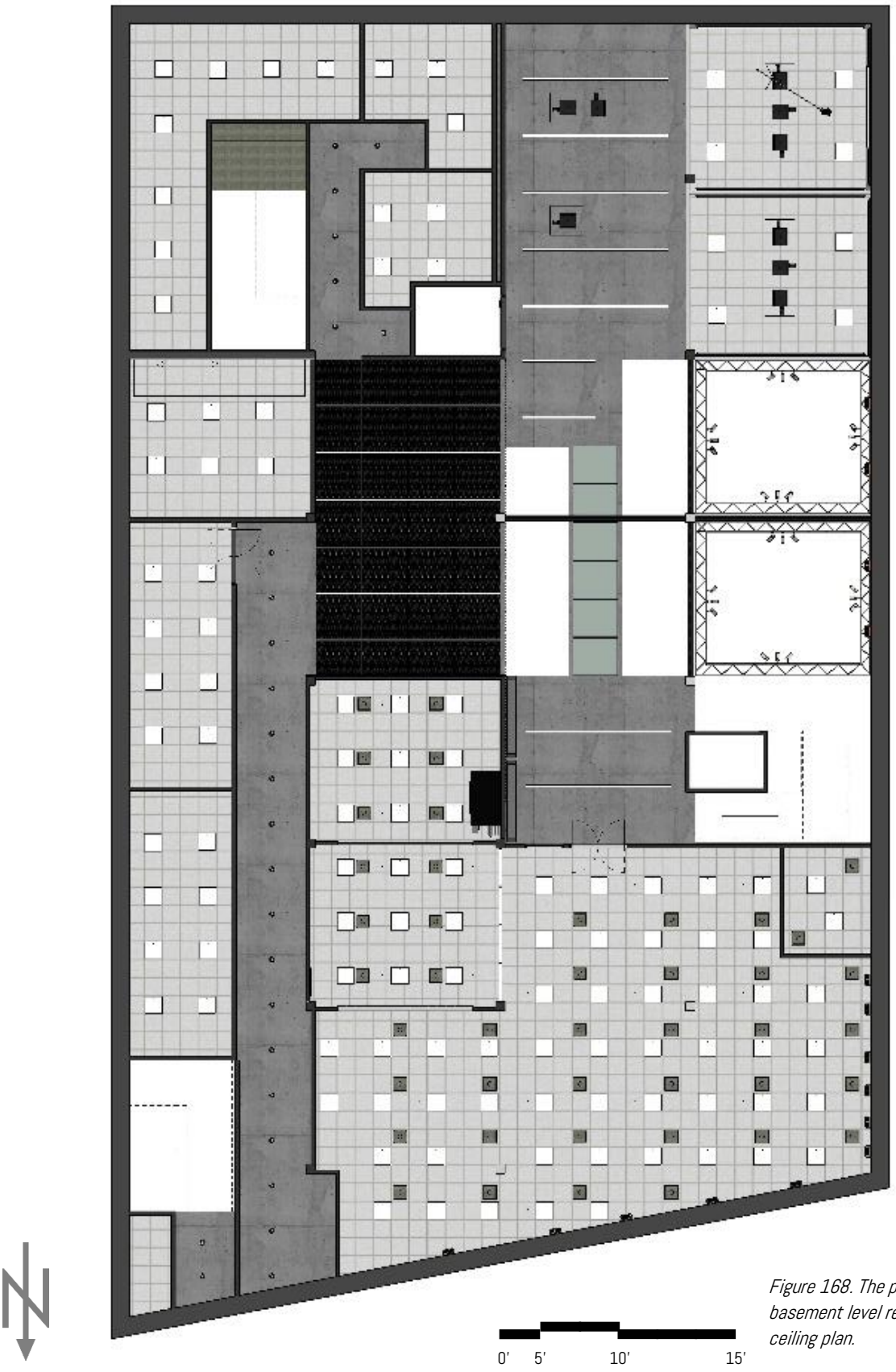
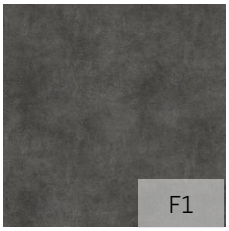
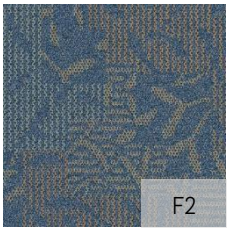
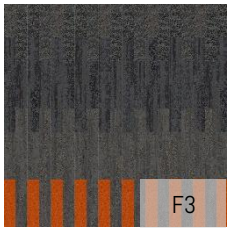


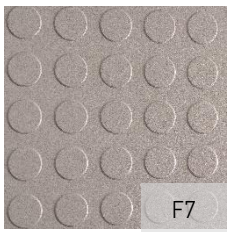
Figure 168. The proposed basement level reflected ceiling plan.

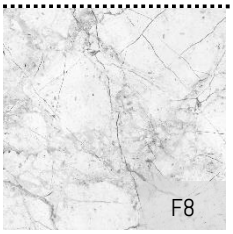
10.3 MATERIAL SELECTIONS

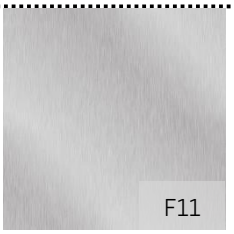


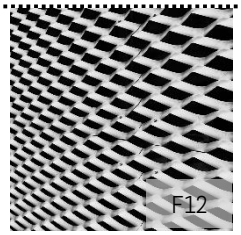


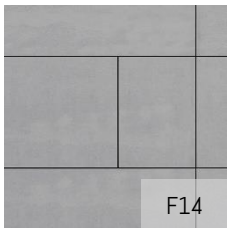


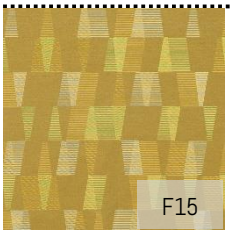


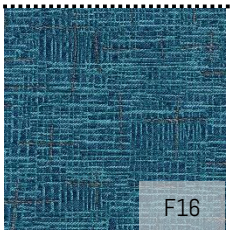


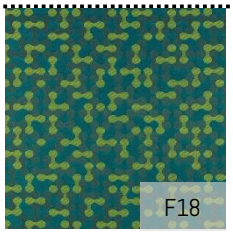


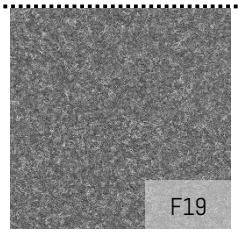










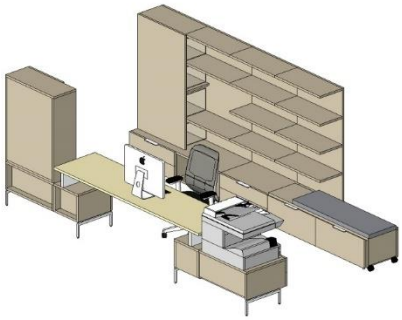


F1: Interior concrete flooring. F2: Interior private office carpet tile. F3: Interior public space carpet tile. F4: Interior wood flooring F5: Interior lecture space carpet tile. F6: Washroom flooring tile. F7: Safety flooring. F8: Counter-top stone. F9: Wood wall panel. F10: Wood ceiling panel. F11. Interior metal finish. F12: Metal mesh wall covering. F13: Stonewall tile. F14: Metal wall panel. F15~F18: Interior fabric finish. F19: Interior felt.

10.4 FURNITURE AND EQUIPMENT SELECTIONS

F1: Stackable guest chair. F2: Meeting room chair. F3: Private office task chair. F4: Stackable lecture chair F5: Lecture room chair. F6: Private office guest chair. F7: Studio task chair. F8: Semi-private reading/writing chair. F9: Lunchroom bar chair. F10: Lounge chair. F11. Lunchroom chair. F12: Exterior lounge chair. F13: Double-sided foldable table. F14: Foldable table. F15: Boardroom table. F16: Lunchroom table. F17: Work-shop table. F18: Speech table. F19: Side table. F20: Lunchroom bar table.

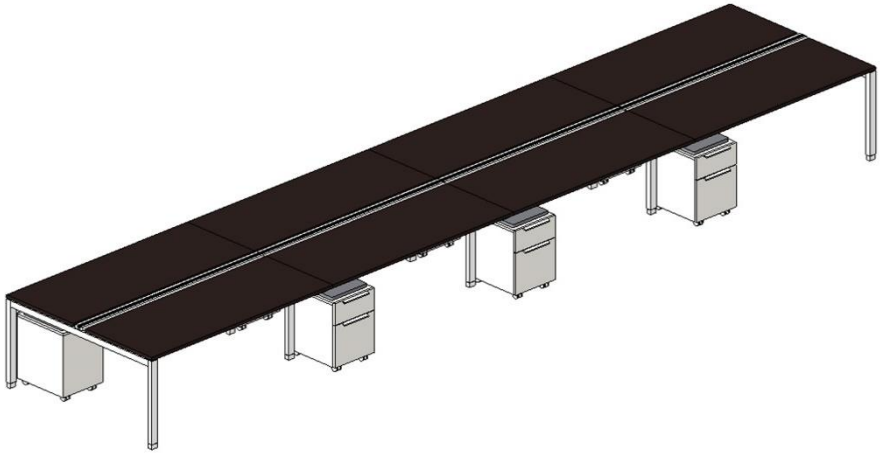
F21: Typical director's office workstation.



F22: Typical administrative staff private office workstation.

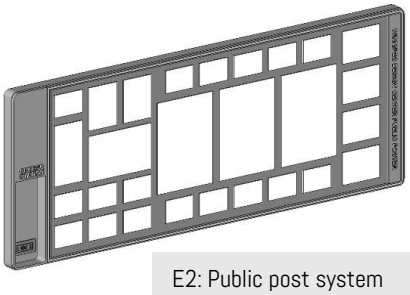
F23: Typical short-term professor's office workstation.

F24: Typical long-term professor's office workstation.



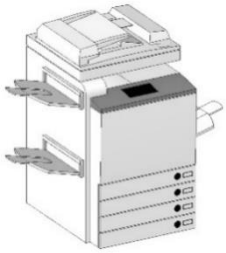
F25: Typical studio space workstations.

E1: Wallmounted computer station



E2: Public post system

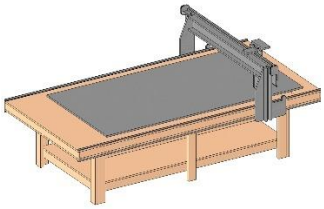
E3: Plotter



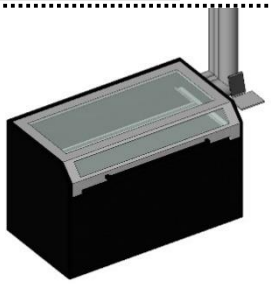
E4: Scan/Copy machine

E5: Desktop Computer

E6: Virtual Reality System

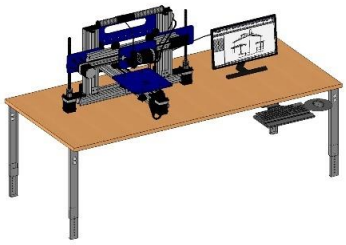


E7: CNC machine



E8: Lacer Cutter

E9: 3D printer

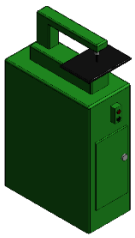


E10: Small scaled 3D printer

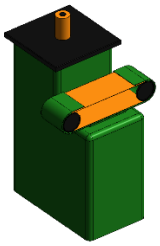
E11: Mobile computer station

E12: Saw/worktable

E13: Band Saw

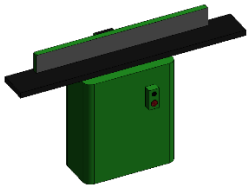


E14: Sander



E15: Jig saw

E16: Bench Drill



E17: Surface Planer